Russian Academy of Sciences

Russian Astronomers

Moscow 2022

Russian Astronomers

1917–2021

The reference book is published by:
Institute of Astronomy,
Russian Academy of Sciences
P.K. Sternberg Astronomical Institute
of M.V. Lomonosov Moscow State University
Kazan (Volga Region) Federal University
Under the Auspices of the Scientific Council “Astronomy”
of the Physical Sciences Department, Russian Academy of Sciences

Science editor:
A.M. Cherepashchuk, RAS member

Editorial board:
Chair: **A.M. Cherepashchuk**, RAS member
Vice-chair: **O.B. Dluzhnevskaya,** chairperson of the “Databases and Information Facilities” section of the CSA, PhD, senior researcher
Science secretaries: **D.A. Kovaleva**, PhD; **Yu.L. Mentsin**, PhD, senior researcher

Editorial board members:
G.S. Bisnovatyi-Kogan, D.Sci., Prof.
R.D. Dagkesamansky, D.Sci.
S.N. Fabrika, D.Sci., Prof.
Yu.N. Gnedin, D.Sci., Prof.
K.V. Kholshevnikov, D.Sci., Prof.
V.D. Kuznetsov, D.Sci.
A.A. Lutovinov, D.Sci., RAS Professor
M.Ya. Marov, RAS member
Yu.A. Nefedyev, D.Sci., Prof.
K.A. Postnov, D.Sci., Prof.
L.V. Rykhlova, D.Sci.
N.N. Samus, D.Sci., Prof.
B.M. Shustov, RAS corresponding member
A.V. Stepanov, RAS corresponding member

Translators: A.O. Andreyev, E.A. Chukhlantseva, S.A. Khaletskaya

Technical editor: **E.D. Wiebe**

Russian Astronomers 1917–2021, science editor: A.M. Cherepashchuk, Russian Academy of Sciences, 2022. – 658 pp.

This edition follows up the biographical reference book "Russian Astronomers 1917–2017", published in 2018, translated into English and supplemented with additional information about Russian and foreign astronomers associated with Russia. It is intended to provide a brief sketches on the Russian astronomers and the results of their activities in the period from 1917 to the present.

This reference book which serves as a complete guide allowing setting up the basic ideas on astronomical research carrying out by the Russian astronomers throughout the time frame indicated, is published for the first time.

The book is intended to both professional astronomers and those who are interested of astronomical research in the Russian Federation.

Preface

At the beginning of 2018, a reference book "Astronomers of Russia 1917–2017" was issued in Russian, published by the decision of the Scientific Council for Astronomy (SCA) of the Russian Academy of Sciences (RAS). This reference book containing about 550 biographical sketches was the first publication of this kind in the history of Russian Federation involving the former Soviet Union and modern Russia. It gave basic ideas on astronomical research carrying out in the Russian Federation since the October Revolution in 1917, and astronomical study in the Soviet Union and performed in various astronomical institutions of the country. It is fair to say that the publication of this reference book made it possible to compose “a collective portrait” of Russian astronomical science. However, publication of the book in Russian did not allowed foreign colleagues to get an easy access to its content.

For the years after publication of the reference book, a new generation of active astronomers have appeared in Russia. This required to introduce the new names including those who, for some reasons, were missed in the previous edition of the reference book but are deserved to be involved as well as to correct biographies of some astronomers have been included.

It is worth to note that the reference book is important not only for the Russian astronomers but also for the foreign colleagues. This is why the Scientific Council for Astronomy of the Russian Academy of Sciences decided to publish a new version of the book in English, with some supplements. As before, we pursue the policy that the Russian astronomical organizations submitted candidates for the reference book are responsible for the content and objectivity of the published information about the scientists they have proposed based on consideration and acceptance of their Scientific Councils. Besides, the rights to propose candidates for the book were given to the full members (academicians) and sections chairmen of the Scientific Council for Astronomy of the Russian Academy of Sciences, subject to the follow on approval by the scientific councils of their home institutions

Unlike the first edition, in the new reference book were included scientists with no Russian citizenship who worked earlier or works now abroad and made significant contribution to science. RAS academicians with the consent of the respective scientists recommended the list of outstanding names. This made the reference book more comprehensive compared to the former edition. It contains now biographical sketches of 633 Russian astronomers rather than 546 names in th book published in 2018.

In 2007, the Springer published a reference book "The Biographical Encyclopedia of Astronomers" prepared by a representative international group of authors, containing information on about 1550 names of the world-recognized astronomers. Unfortunately, only about 30 Russian names were included. The new reference book intends to damp such a disproportion giving international community an opportunity to be acquainted with the major part of Russian astronomers who have been actively working since 1917 to the present.

The Russian version of the handbook was initially prepared with the necessary corrections in the biographical sketches published in the first edition and supplemented with the names of colleagues included in the new edition. Since the sketches came from various sources – from institutions, from scientists themselves, from colleagues who wrote about scientists who passed away, they were usually not translated into English. The Editors made this work using the sketches from the reference book prepared for publication in Russian, with an exemption for those written by some scientists in English themselves. Obviously, the level of English proficiency of colleagues living in Russia and in English-speaking countries is different. However, as it was mentioned in the first edition, the handbook is referred to as a collective product of the numerous authors with various styles of presentation and such a difference turned out unavoidable.

Likewise the publication in 2018, the new edition of the reference book was prepared by the same Editorial Board (EB) but two active members passing away: Yuri N. Gnedin and Konstantin V. Kholshevnikov. The new members Gennady S. Bisnovaty-Kogan and Aleksander A. Lutovinov have been coopted.

Translation and proofing of the text were made by A.O. Andreev, E.A. Chukhlantseva and S.A. Khaletskaya.

We acknowledge contribution of the Kazan Federal University, personally, Prof. Yu.A. Nefediev, to successful realization of the project of the first edition of the reference book.

We are grateful to akademicians R.A. Sunyaev, M.Ya. Marov and E.M. Churazov for their recomendations to invite many outstanding scientists to be included in the handbook.

We are also grateful to prof. N. Samus a well as the graduate students for help with English translation of some references: N.D. Utkin, P.R. Zapevalin, Ya.A. Lazovik. E.V. Rubtsov, A.A. Svetlova, D.S. Stepanov, A.I. Filetkin, A.R. Shaykhutdinov.

We hope that the world astronomical community and broader readership will meet the updated and complemented edition of the reference book on the Russian astronomers in English, with an interest.

A.M. Cherepashchuk
O.B. Dluzhnevskaya

Preface to the first edition of the reference book “Russian astronomers 1917–2017”

Astronomy is the oldest of sciences, it has deep roots in Russia and serious traditions. By tradition, astronomy is among leading fields of scientific research conducted in institutions of the Academy of Sciences, universities and other institutions of higher education. Beginning with the 18th century, M.V. Lomonosov’s studies, research of Russian astronomers, aimed at the Moon and solar-system planets, won international recognition. Outstanding results in different fields of astronomy were achieved with the beginning of space research, started on October 4, 1957, when the Sputnik, first artificial satellite of the Earth, had been launched in the Soviet Union.

Astronomy experiences unprecedented expansion during the recent decades. Discoveries made by space probes and modern ground-based systems, new theoretical conceptions developed on their basis are simply fascinating: dark matter, dark energy, neutron stars, gravitational waves, exoplanets around other stars, etc. These discoveries were made possible thanks to newly introduced high-technology instrumentation and observational facilities, implication of highly productive computer systems and computing technologies.

Thanks to the now existing possibility to take telescopes outside the terrestrial atmosphere, astronomy became an all-wavelengths science; astronomers acquired possibilities to observe the sky not only in the optical range but in other ranges of the electromagnetic spectrum as well: in the gamma-, X-ray, ultraviolet, infrared ranges as well in the long-wavelength radio range. The ratio between extreme wavelengths of the detected electromagnetic radiation increased from 2 to 10^{16} (!). The result is that, in many cases, reliability of our conclusions about the nature of astronomical objects became the same as reliability of physical laboratory experiments. And this is the case despite tremendous distances to astronomical objects: thousands, millions, and billions of light years.

Research problems in modern astronomy cover not only the traditional spheres: astrophysics, stellar astronomy, astrometry, celestial mechanics, gravimetry, but also new fields, such as high-energy astrophysics, relativistic astrophysics, space geodynamics, astrobiology, archeoastronomy. Besides the electromagnetic-wave channel, modern astronomy masters new channels of information from open space: the neutrino channel, cosmic-ray channel, gravitational-wave channel. An also important achievement of the recent decades is implementation of highly productive computational technologies in astronomy, they make it possible to effectively reduce huge bulks of information as well as to work with global databases, like the International virtual observatory that connects sets of observational data from observatories of the world into a united world-wide system.

Recently, the term “multimessenger astronomy” is more and more widely used by scientists, with the fact in mind that modern astronomy uses not only the electromagnetic channel of information from space but other channels as well: the gravitational-wave, neutrino, cosmic-ray channels.

All these outstanding achievements of modern astronomy were prepared with studies performed by many generations of scientists from different countries during at least a century. Russian astronomers made a large contribution to studies in traditional fields of astronomy as well as in modern, trend-determining fields. In today’s Russia, astronomical research is conducted in more than 40 scientific organizations, engaging dozens of RAS members and corresponding members, many hundreds of Doctors and Candidates of Science (D.Sci.and PhD).

Up to now, there were no sources enabling the reader to get the impression on particular astronomical studies and their authors in scientific institutions of Russia. The good reference book "Astronomers" (in Russian; authors I.G. Kolchinsky, A.A. Korsun, M.G. Rodriguez; 1st edition 1977, 2nd edition 1986) is already seriously obsolete; besides, it presents astronomers of all the world, with insufficiently complete coverage of Russian astronomers.

The aim of the present reference book is to fill the gap and to give, in the most condensed form, information on Russian scientists in the field of astronomy and on their achievements. Note that, following the rules approved by the SCA, a single page is allocated for the scientist's biography plus his most important contributions to astronomy, independent of his position and scientific degrees.

The reference book's materials give an impression about development of astronomical research in Russia during the recent hundred years. It should be noted that scientific activities of Russian astronomers were most tightly related to activities of the world astronomical community. Thus, the Executive Committee of the International Astronomical Union (IAU), recognizing achievements of Soviet astronomers in studies of variable stars, decided in 1946 to make the Moscow team of variable-star researchers working in the Sternberg Astronomical Institute (SAI) and in the Astronomical Council of the USSR Academy of Sciences responsible for compilation of catalogs of variable stars. A sign of recognition of the Soviet scientists' contribution to the development of world astronomy was that the X IAU General Assembly took place in 1958 in Moscow. Between 1955 and 1961, B.V. Kukarkin, Professor of SAI, was the IAU Vice-president. Subsequently, two Russian and Soviet scientists, Academy members were IAU Presidents: V.A. Ambartsumian (1961–1964) and A.A. Boyarchuk (1991–1994). IAU Vice-presidents were Academy members A.A. Mikhailov (1946–1948), A.B. Severny (1964–1967, 1967–1970), N.S. Kardeshev (2000–2003), Academy corresponding member E.R. Mustel (1970–1973, 1973–1976). B.M. Shustov, RAS corresponding member, was an IAU Vice-president between 2015 and 2021.

Besides, many Soviet and Russian astronomers held positions of "IAU officers". M.Ya. Marov was the President of Division III Planetary Systems Scientists (2000–2003).

At different times, IAU Commission Presidents were:
V.K. Abalakin, **Comm. 4** Ephemerides (1976–1979),
D.Ya. Martynov, **Comm. 5** Documentation & Astronomical Data (1955–1958, 1958–1961),
O.B. Dluzhnevskaya, **Comm. 5** Documentation & Astronomical Data (1997–2000, 2000–2003),
N.N. Samus, **Comm. 6** Astronomical Telegrams (2009–2012),
G.N. Duboshin, **Comm.7** Celestial Mechanics & Dynamical Astronomy(1964–1967,1967-1970),
V.A. Brumberg, **Comm. 7** Celestial Mechanics & Dynamical Astronomy (1985–1988),
M.S. Zverev, **Comm. 8** Astrometry (1952–1955, 1955–1958),
A.A. Nemiro, **Comm. 8** Astrometry (1967–1970)
I.I. Kumkova, **Comm. 8** Astrometry (2006–2009),
V.B. Nikonov, **Comm. 9** Instruments (1970–1973),
A.B Severny, **Comm. 10** Solar Activity (1958–1961, 1961–1964),
A.G. Kosovichev, **Comm. 12** Solar Radiation & Structure (2009–2012),
L.I. Mashonkiva, **Comm. 14** Atomic & Molecular Data (2012–2015),
M.Ya. Marov, **Comm. 16** Physical Studies of Planets & Satellites (1994–1997),
G.A. Chebotarev, **Comm. 20** Positions & Motions of Minor Planets, Comets & Satellites (1967–1970),
V.B. Nikonov, **Comm. 25** Astronomical Photometry & Polarimetry (1961–1964, 1964–1967),
B.V. Kukarkin, **Comm. 27** Variable Stars (1952–1955, 1955–1958),
N.E. Piskunov, **Comm. 29** Stellar Spectra (2009–2012),
S.B. Pikelner, **Comm. 34** Interstellar Matter & Planetary Nebulae (1964–1967),
A.G. Masevich, **Comm. 35** Stellar Constitution (1967–1970),
Yu.N. Pariisky, **Comm. 40** Radio Astronomy (1973–1976),
D.V. Bisikalo, **Comm. B1** Computational Astrophysics (2018–2021),
Z.M. Malkin, **Comm. A2** Rotation of the Earth (2021–).

Currently, there are 428 active members from Russia in the International Astronomical Union.

On November 26, 2015, the Scientific Council "Astronomy" of the Department of Physical Sciences of the RAS supported the initiative of the SCA Section No. 13 "Databases and Information Facilities" and decided to publish a reference book of biographies of Russian Federation's scientists, astronomers, who worked in Russian institutions in 1917–2016.

The choice of the century is due to the fact that, prior to 1917, astronomers of the Russian Empire were also staff members of institutions of the now independent Baltic countries, Poland, Finland, as well as those in the Caucasus countries and Middle Asia. Similar situation happened after the dissolution of the Soviet Union, when former USSR republics became independent countries. For these reasons, we decided that the reference book should include only astronomers of the Russian Federation who worked in the period between 1917 and our days.

The SCA meeting approved a unified form for all candidates to the reference book: a single page of text with the candidate's brief biography plus description of his contribution to astronomy, in total, not exceeding 3000 symbols, and a black-and-white photograph. It was decided to publish the book in two languages, Russian and English, as separate editions with 1000 copies each.

The SCA also discussed and approved the list of 40 astronomical institutions of the Russian Academy of Sciences and the Ministry of Science and Higher Education where astronomical research was conducted. On behalf of the SCA, letters were sent to these institutions, suggesting to present information on their candidates to the reference book according to the approved format.
Candidates for the reference book were suggested from astronomers who worked (works) in the institution beginning with 1917 and contributed much to the development of astronomy in Russia by his (her) scientific research, scientific and technical, methodological, or pedagogic work, scientific organization activity. As a rule, candidates were astronomers known by their achievements who had the D.Sci. scientific degree and also PhD (candidate of science) degree if they are(were) members of the IAU or other international organizations in the field of astronomy

Scientists not satisfying these criteria but deserving being included into the reference book, like, for instance, astronomers who participated in World War II, could be recommended by scientific councils of corresponding institutions, and this recommendation had to be mentioned in the letter from the Director. For example, according to the recommendation from the SAI scientific council, the reference book includes E.M. Rudneva (Hero of the Soviet Union) and N.E. Kurochkin who had no PhD degree but was widely known for his studies of variable stars.

Directors of the following 23 institutes and observatories expressed their being ready to submit biographies of staff members of their organizations: SAI, CAO RAS, SAO RArS, CrAO RAS, INASAN, LPI RAS (including ASC), IZMIRAN, IKI RAS, IRE RAS, GEOCHEM RAS, KIAM RAS, PTI RAS, ISTP SB RAS, IAA RAS, IGA RAS, IAP RAS, NIRFI, KFU, SPbSU, UrFU, TSU, ChelSU, SFU.

According to the approved rules, the institutions presented biographic sketches of their staff members in the electronic form plus in the form of printouts, with a covering letter containing the list of candidates and signed by the director. In most cases, the lists of candidates to the reference book were discussed and approved by scientific councils. In total, about 560 biographic sketches were received from the institutions.

To work with biographic sketches of candidates suggested for the reference book, the following editorial board was created and confirmed with the SCA decision: chairperson, A.M. Cherepashchuk; vice-chairperson, O.B. Dluzhnevskaya (INASAN); science secretary, D.A. Kovaleva (INASAN); members: S.N. Fabrika (SAO RAS), Yu.N. Gnedin (CAO RAS), R.D. Dagkesamansky (FIAN), K.V. Kholshevnikov (SPbSU), V.D. Kuznetsov (IZMIRAN), M.Ya. Marov (GEOCHEM RAS), Yu.L. Mentsin (SAI), Yu.A. Nefedyev (AO KFU), K.A. Postnov (SAI), L.V. Rykhlova (INASAN), N.N. Samus (INASAN), B.M. Shustov (INASAN), A.V. Stepanov (CAO RAS).

The following order was established for the work with arriving materials. The sketches were distributed for reviewing among the editorial board members, if possible, taking into account their narrow field of research. The board members analyzed the biographic sketches they received, and their reviews were sent by the editorial board to the institutions who had suggested the candidates. After recommended corrections, the biographic sketches were sent to the editorial board again and posted with direct access for all board members. During its meetings, the editorial board discussed and approved the sketches thus prepared and passed them, for final editing, to the editorial board chairperson as the scientific editor, and further on, for technical editing of the Russian language and corresponding correction of the biographic sketch's English version. Technical editing was performed taking into account the adopted abbreviations and rules approved at the editorial board meetings.

In this process, SAI staff members performed the technical editing of biographic sketches for SAI candidates: the SAI presented about one fourth of all sketches of astronomers, those still working as well as those deceased but with their memory living in their scientific heritage. The INASAN administration arranged technical editing of all sketches presented by all institutions except the SAI. It should be added that some institutions initially announced their participation and sent lengthy lists of their candidates but then actually presented bibliographic sketches only for several of their staff members. In exceptional cases, when it was clear that a famous scientist had not been represented, colleagues from other institutes had to fill the gap.

We also note certain difficulties related to the very definition of an astronomer. Some known scientists who work in related fields of science (theoretical physics, geophysics, space research, etc.) and have made a large contribution to astronomy do not want to consider themselves members of the astronomers' community. Because of this, our reference book does not containg information about them. In this connection, the editorial board members would like to affirm the reader that they have taken all possible measures in order to turn the attention of such scientists to our reference book.

According to our rules, each sketch ends with the words: "The sketch was provided by the institute (observatory)…". This means that the institutions in question are responsible for the contents of the sketch, including its being reliable.

Certainly, our reference book is not a book written by a single author but a collection of articles by many authors, with different author stiles. However, in our opinion, this does not decrease but rather increases its value, permitting to feel creative scientific atmosphere and obtain an impression of the high level of scientific studies performed by Russian astronomers during the recent century.

A.M. Cherepashchuk
O.B. Dluzhnevskaya

Abbreviated names of astronomical institutions

CAO RAS: founded as Pulkovo Observatory in 1839. During the Soviet period, the Central Astronomical Observatory of the USSR Academy of Sciences. Currently, the Central (Pulkovo) Astronomical Observatory of Russian Academy of Sciences (CAO RAS).
ChelSU: founded in 1976 as Chelyabinsk State University (ChelSU).
CrAO RAS: organized in 1945 as Crimean Astrophysical Observatory of the USSR Academy of Sciences. Currently, Crimean Astrophysical Observatory of Russian Academy of Sciences (CrAO RAS).
GEOCHEM RAS: founded in 1947 on the base of Laboratory of Geochemical problems of USSR Academy of Sciences. Currently, V.I. Vernadsky Institute of Geochemistry and Analytical Chemistry of Russian Academy of Sciences (GEOCHEM RAS).
IAA RAS: founded in 1987 as Institute of Applied Astronomy of Russian Academy of Sciences (IAA RAS).
IAP RAS: created in 1976, on the base of several NIRFI departments, as Institute of Applied Physics of the USSR Academy of Sciences. Currently, Institute of Applied Physics of Russian Academy of Sciences (IAP RAS).
IGA RAS: founded in 1956 after its separation from the Geophysical Institute of the USSR Academy of Sciences. Currently, E.K. Fedorov Institute of Applied Geophysics of Russian Academy of Sciences (IGA RAS).
IKI RAS: founded in 1965 as Space Research Institute of the USSR Academy of Sciences. Currently, Space Research Institute of Russian Academy of Sciences (IKI RAS).
INASAN: founded in 1936 as the Astronomical Council of the USSR Academy of Sciences. Currently, Institute of Astronomy of Russian Academy of Sciences (INASAN).
IRE RAS: founded in 1953 as Institute of Radio Engineering and Electronics of the USSR Academy of Sciences. Currently, V.A. Kotelnikov Institute of Radio Engineering and Electronics of Russian Academy of Sciences (IRE RAS).
ISTP SB RAS: founded in 1960 on the base of Nikolay Irkutsk Geophysical Observatory as Siberian Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation of the Siberian Branch of the USSR Academy of Sciences. Since 1992, Institute of Solar-Terrestrial Physics of the Siberian Branch of Russian Academy of Sciences (ISTP SB RAS).
ITA RAS: started its work in 1919 as the Computational Institute at the All-Russian Astronomical Union. In 1923, it was merged with the Astronomy and Geodesy Institute and renamed into the Astronomical Institute. Since 1943, Institute of Theoretical Astronomy of the USSR Academy of Sciences. Since 1998, it is a part of the Institute of Applied Astronomy of Russian Academy of Sciences (IAA RAS).
IZMIRAN: founded in 1939 as the Terrestrial Magnetism Research Institute. Currently, N.V. Pushkov Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation of Russian Academy of Sciences (IZMIRAN).
KIAM RAS: founded in 1934 as V.A. Steklov Mathematical Institute of the USSR Academy of Sciences; renamed into Institute of Applied Mathematics of the USSR Academy of Sciences; named after M.V. Keldysh in 1978. Currently, MV. Keldysh Institute of Applied Mathematics of Russian Academy of Sciences (KIAM RAS).
KFU: founded in 1804 as Empire Kazan University. Currently, Kazan (Volga region) Federal University (KFU).
LPI RAS: founded in 1934 as Physical Institute of the USSR Academy of Sciences. Currently, P.N. Lebedev Physical institute of Russian Academy of Sciences (LPI RAS). In 1990, the Astro Space Center (ASC) of the LPI was created. Since 1990, the ASC incorporates Pushchino Radio Astronomy Observatory (PRAO ASC LPI) that was founded in 1956 as the LPI Radio Astronomy Station and has its current name since 1996.
NIRFI: founded in 1956 on the base of the faculty of radio physics of Gorky (Nizhny Novgorod) State University as the Research Institute of Radio Physics (NIRFI);
PTI RAS: founded in 1922 as the State Physics and Technology Institute of Roentgenology. Since 1925, State Physical and Technological Institute; since 1933, Leningrad Physical and Technological

Institute; since 1960, A.F. Ioffe Physical and Technological Institute of the USSR Academy of Sciences. Currently, A.F. Ioffe Physical and Technological Institute of Russian Academy of Sciences (PTI RAS).

SAI MSU: created in 1931 on the base of Moscow University's astronomical observatory. Currently, P.K. Sternberg State Astronomical Institute of Lomonosov Moscow State University (SAI MSU).

SAO RAS: founded in 1966 as Special Astrophysical Observatory of the USSR Academy of Sciences. Currently, Special Astrophysical Observatory of Russian Academy of Sciences (SAO RAS).

SFU: founded in 1915 as Warsaw Empire University in Rostov-on-Don. Since 1925, Northern Caucasus State University; since 1934, Rostov-on-Don State University; since 1957, Rostov State University. Since 2006, Southern Federal University (SFU).

SPbSU: successor of the Academy University founded in 1724. Since 1821, St. Petersburg Empire University; since 1924, Leningrad State University (LSU). Currently, St. Petersburg State University (SPbSU).

TSU: founded in 1878 as Siberian Empire University. Since 1917, Tomsk University; since 1934, Tomsk State University. Currently, National Research Tomsk State University (TSU).

UrFU: created in 2010 on the base of Ural State Technical University (USTU) named after B.N. Yeltsyn, the first President of Russia. In 2011, merged with A.M.Gorky Ural State University. Currently, B.N. Yeltsin Ural Federal University (UrFU).

A list of accepted abbreviations

acad. – academician, academy
assoc. - associate professor
b. - born
c. – city
chm. - chairman
cmte. - committee
comm. - commission
dep. – deputy
dept. - department
dept. - department
dist. - district
div. - division
e. b. - editorial board
e. o. - editorial office
ed. - editor;
EEA - Exhibition of Economic Achievements
engr. – engineer
fcty. – factory
h. – head
ind. - industrial
inst. – institute
j. - junior
j. r. - junior researcher
l. res. – leading researcher
lab. - laboratory
m. - main,
math. - mathematical
mech. - mechanical
mgr. - manager, mgmt. - management
natl. - national
org. - organization
org. comm. - organazing committee
ped. - pedagogical
pr. - principal
pr. res. – principal researcher
prgm. - program
prod. - production
prof. - professor
prov. – province
rep. - republic
res. - responsible
rgn. - region
sci. - scientific
sci. d. – doctor of sciences
set. - settlement
soc. - society
st. – state
th. – thesis
v. – village
wkr. - worker, work

ABALAKIN Viktor Kuzmich

Born 27.08.1930 in Odessa. In 1953, graduated from Odessa State University. In 1953–55, worked at the Geophysical Institute of the USSR Acad. Sci. in Moscow. In 1955–57, worked at the Institute of Theoretical Astronomy of the USSR Acad. Sci. in Leningrad. After completing postgraduate studies at Odessa State University in 1960–65, worked at the Astronomical Observatory of the University. In 1963–65, senior lecturer at the Faculty of Astronomy of Odessa State University. In 1965–94, head of the Department of the Astronomical yearbook of the USSR at the Institute of Theoretical Astronomy. In 1983–2000, director of the Pulkovo Observatory. In 1976–79, president of the IAU Commission 4 "Ephemerides". In 1978, obtained Dr. Sci. degree. In 1982, he was awarded the State Prize of the USSR. In 1987, a corresponding member of the USSR Acad. Sci. Member of IAU. Editor-in-chief of the "Zemlya i Vselennaya" journal. Died 23.04.2018 in New York, USA.

V.K. Abalakin's main areas of research relate to celestial mechanics, ephemeris astronomy, stellar dynamics, geodynamics, and history of astronomy. He made major contributions to the development of basic principles of the Moon laser ranging for solving problems of geo– and selenodynamics, and to the development of the corresponding mathematical methods. In his monograph "Foundations of Ephemeris Astronomy" (1979) and also in several chapters written by him for the "Manual on Celestial Mechanics, Astronomy and Astrodynamics" (1971, 1976), the ephemeris astronomy was finally established as an independent research area. Co-author of a series of works on the creation of the relativistic theory of motion of inner planets of the Solar system (awarded the USSR State Prize, 1982).

The asteroid 2722 Abalakin discovered by N.S.Chernykh on April 1, 1976, at the Crimean Astrophysical Observatory was named after V.K.Abalakin. Chairman of the Board of the Internet Culture Fund (since 1999). Member of the St.-Petersburg Scientific Center of the Russian Academy of Sciences, member of the St.-Petersburg branch of the Russian Pugwash Committee of the Russian Academy of Sciences. Awarded the USSR State Prize (1982), the Medal of the Order of Merit for the Motherland of the II Degree (2006).

ABRAMENKO Valentina Izosimovna

Born 09.21.1950 in Arkhangelsk, Russia. Education: 1973 – M.A.: Leningrad State Univ., Leningrad (now Saint Petersburg State Univ., St. Petersburg); 1990 – PhD in astrophysics at the Ioffe Institute for Physics and Technology, St. Petersburg, Russia; 2016 – Doctor of Science in solar physics at the General (Pulkovo) Astronomical Observatory of the Russian Academy of Science (GAO RAN). Affiliations: 1975–2002: Crimean Astrophysical Observatory of the Soviet Academy of Science (since 2016: Crimean Astrophysical Observatory of the Russian Academy of Science, CRAO RAN), senior researcher; 2002–2013: Big Bear Solar Observatory, USA, research professor; since 2015 has been employed as a leading researcher at CRAO RAN and as a part-time senior researcher at GAO RAN (Pulkovo). Chief of the Department of Solar Physics and Solar System of CRAO RAN since 2017.

Scientific publications are devoted to solar physics. V.I. Abramenko authored more than 200 publications, 115 of them were published in the referred scientific journals. The citation index is 1720 and the h-index is 28.

During 1986–1993 V.I. Abramenko in collaboration with S.I. Gopasyuk, M.B. Ogir, and V.B. Yurchyshyn elaborated an approach to study electric currents in the solar atmosphere. The approach allowed studying dynamics and flaring productivity of active regions via exploring electric currents systems. The method turned out to be very effective and now is extensively continued by solar physics community in Russia and abroad.

In 1995 V.I. Abramenko spent a half-year at the Huairou Solar Observing Station in China. During this time period she elaborated a method to derive the electric current helicity from magnetograms of active regions. Her first statistical results were published in 1996, and her method became a basis for broad investigation of current helicity by other research teams. This field of research is continued today, and the results serve as a criterion for solar dynamo modeling.

Since 1998 V.I. Abramenko has been studying fractal nature of the solar magnetic field and connected problems such as: Self-Organized Criticality, solar flare forecast, turbulent and multifractal properties of the solar magnetic field. The proposed flare forecast method on the basis of turbulent characteristics of the magnetic field found further elaboration by colleagues. Her publications and oral presentations at international solar physics meetings motivated the solar community to explore problems of intrinsic connection between large-scale and small-scale processes on the Sun, a role of the turbulent dynamo in the solar magnetism. In 2009–2013 she participated in observations with the 1.6 m New Solar Telescope at Big Bear Solar Observatory, USA. In collaboration with V.B. Yurchyshyn and a team of American astronomers, she found that the minimum size of magnetic elements is less than 80 km and is not reached yet; magnetic flux dispersion occurs in the turbulent regime of super-diffusivity; on scales less than 600 km a multifractal subset of minigranules is observed.

Some results obtained by V.I. Abramenko are included in the textbook Cosmic Elelectrodynamics by G. Fleishman and I. Toptygin (2013); in a monograph on solar-type stars published by R. Gershberg (2015), in the book by R. Gershberg, N. Kleeorin, L. Pustilnik Physics of Stars (Fizmatlit, 2020).

With great interest V.I. Abramenko collaborates with young scientists. Three PhD theses were completed under her supervision.

AFANASIEV Viktor Leonidovich

Born 01.05.1947 (Slavyansk, Donetsk region, USSR). Graduated from Kiev State University in 1970, Head of Laboratory at the Astronomy Department. Worked at the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) since 1973: Junior Researcher (1973-1979), Senior Researcher (1979-1985), Director (1985-1993); as of 1993 – Chief Research Scientist at SAO RAS. Defended his Ph.D. thesis, "Comparative investigation of the universal properties of Seyfert galaxies", in 1983. In 1990, defended his doctoral thesis "Structure and evolution of active galaxies". Professor of astronomy (2003), member of the IAU, member of several specialized academic councils, and editorial boards of Russian astronomical journals. Died 21.12.2020 in Zelenchuk.

V.L. Afanasiev’s main areas of research are related to active galactic nuclei, kinematics and dynamics of galactic discs, minor bodies of the Solar System, and astronomical equipment design; he is the author of over 250 scientific papers.

From the very beginning of his work in SAO, V.L. Afanasiev has been actively participating in equipping the 6-m BTA telescope with modern light detectors and spectroscopic facilities. He and his colleagues have developed and implemented, for the first time in Russia, the methods of two-dimensional and multiple object spectroscopy at the telescope. V.L. Afanasiev, among a group of authors, was awarded the USSR State Prize in the field of science and technology in 1991 for a series of papers "Development of digital television devices for investigations of extremely faint astronomical sources with the BTA telescope of the Academy of Sciences of the USSR".

In the 1980s, V. Afanasiev, together with colleagues from SAI (V.Yu. Terebizh, O.K. Silchenko, et al.), conducted comparative photometric and spectroscopic studies of normal and Seyfert galaxies. It was shown that the morphology and kinematics of these galaxies do not differ, but the central regions of active galaxies exhibit a radial inflow of matter to the galaxy center, which facilitates the "feeding" of the active nuclei, sufficient to explain the observed energy output resulting from the accretion of gas.

The studies of galaxy rotation curves, carried out by V.L. Afanasiev and his colleagues with the 6-m telescope, revealed several fine details – rapidly rotating nuclear regions, several hundred parsecs in size, beyond which the angular velocity plummets abruptly, as well as compact formations at the very center, rotating in the direction opposite to the direction of galaxy rotation. In several galaxies, observations with the BTA revealed gigantic vortex structures, which were theoretically predicted by A.M. Friedman. V.L. Afanasiev, among a group of coauthors, was awarded the Russian State Prize in the field of science and technology in 2003 for the work "Prediction and discovery of new structures in spiral galaxies".

Starting from 2005, extensive polarimetric studies of various sources – active galaxies, peculiar stars, minor bodies of the Solar System (satellites of planets and comets) – are conducted with the BTA by V.L. Afanasiev and his staff. He proposed a new method of determining the mass of black holes in galaxies based on spectropolarimetric data of broad emission lines.

Six Ph.D dissertations have been prepared and defended under his academic supervision.

V.L. Afanasiev was honored with the following State Awards: Medal for distinguished work (1981), and the Order of Friendship (1999).

AGAFONOV Mikhail Igorevich

Born 08.10.1954. 1972-1977, a student at Gorky N.I. Lobachevsky State University (GSU, now Nizhny Novgorod State University (NNSU)). Defended Ph.D. thesis in 1990, D.Sc. thesis in 2007. Senior Researcher since 1993. Since 1977, engineer, researcher, senior researcher, Scientific Secretary, Scientific Deputy Director of the Institute, Head of the sector at the Radiophysical Research Institute (NIRFI). Awarded the honorary diploma of the Federal Agency for Science and Innovations of the Russian Federation in 2009. Member of the IAU since 2016.

M.I. Agafonov's fields of research are radio astronomy, signal and image processing, astrophysics and remote sensing, with a particular interest in astrotomography, binary star systems, 3D Doppler tomography, signal and image processing. M.I. Agafonov developed (together with O.A. Sharova and M.T. Richards) the radioastronomical approach to the reconstruction method in the few projections tomography and first realized 3D Doppler tomography.

The presence of a coronal mass ejection from a donor star and the gas flow deviation from the direction of the orbital plane was established experimentally for the binary star systems (using 3D Doppler tomography for Algol beta Per and RS Vul). These results confirm the model of magnetic activity of the system. According to the model there is an emission structure in the space between the stars, which is the result of the magnetic interaction of the accretion flow and entrained magnetic field lines of the donor star.

M.I. Agafonov is the author of more than 130 scientific papers.

M.I. Agafonov actively participates in the work of international organizations such as IAU, URSI, ADASS, and a speaker at conferences and assemblies of these organizations with the invited reports. Image processing techniques developed by M.I. Agafonov are widely used and evolve in a number of scientific institutions of the Russian Federation.

M.I. Agafonov participates both in research and educational activities. Since 1993, a lecturer for several years at the Department of Applied Mathematics, Faculty of Computational Mathematics and Cybernetics of N.I. Lobachevsky Nizhny Novgorod State University. Since 2003, M.I. Agafonov has been teaching a specialized course on biomedical signal processing at the Faculty of Physics and Technology of R.E. Alekseev Nizhny Novgorod State Technical University.

AGEKYAN Tateos Artem'evich

Born 12.05.1913 in Batumi, Georgia. In 1938, graduated from the Faculty of Mathematics and Mechanics of Leningrad State University (LSU, now St. Petersburg State University, SPbSU). Worked as a school teacher and lecturer at the Leningrad Institute of Transport; did postgraduate studies at LSU, with V.A. Ambartsumian as a supervisor. Veteran of the Great Patriotic war. Ended the war in the rank of captain. In 1946, completed his PhD at LSU, with K.F. Ogorodnikov as a supervisor. Since 1946, worked at LSU (SPbSU); professor since 1961. Doctor of Physical and Mathematical Sciences (1959), Professor of the Department of Celestial Mechanics at LSU (1963), Honorary Professor of SPbSU (2001). Founder (together with K. F. Ogorodnikov) of the Leningrad scientific school of stellar dynamics. Died 16.01.2006 in St. Petersburg, Russia.

T. A. Agekian's main research interests relate to galactic astronomy, dynamics of stellar systems, and extragalactic astronomy. He is the author and co-author of about 200 works, including 7 books, some translated into foreign languages.

In the 1950s, T. A. Agekian developed the theory of dynamical evolution of non-stationary rotating stellar systems. Identified two evolutionary sequences for rotating stellar systems; determined the boundary between them according to a critical value of oblateness. These results explained the absence of strongly oblate elliptical galaxies.

In the 1960s, introduced a new fundamental characteristic to describe the process of dissipation of stellar systems: the distribution of variations of a star's velocity due to close encounters with other stars. This showed that the rate of decay of systems of stars with various masses is higher than those of stars with similar masses.

Became one of the founders of numerical-experimental stellar dynamics, realizing that computer technologies enable one to discover many interesting properties of stellar systems that cannot be obtained analytically. In the mid-1960s, initiated the studies of the dynamics of triple stars and galaxies by the Monte Carlo method, using numerical integrations of the equations of motion in the N-body problem. Numerical simulations performed under his guidance revealed new patterns in the dynamical evolution of triple systems.

T. A. Agekian was the first to suggest using the full profile of neutral hydrogen radio line (21 cm) for constructing the Galaxy rotation curve not only for the Galaxy's inner part but also for its outer part based on analysis of the line profiles obtained in various directions.

Using original statistical methods, identified several moving star clusters in the Solar neighborhood. Put forward a hypothesis that the Galactic disk is mostly composed of mutually penetrating stellar flows; this was later confirmed in many studies.

Worked intensively on developing the theory of motion in the field of the rotationally symmetric potential, as well as on the problem of the third integral of motion.

State awards: two Orders of the Great Patriotic War, medal "For Defense of Leningrad", war veteran medals, Honoured Scientist of the Russian Federation (1999). The asteroid 3862 Agekian, discovered in 1972 by T. M. Smirnova (Crimean Astrophysical Observatory), was named after T. A. Agekian.

AHARONIAN Felix Albertovich

Born 18.06.1952, Yerevan, USSR. Graduated from Moscow Engineering Physics Institute (1974). PhD (1979); Doctor of Sciences (1987). Yerevan Physics Institute 1979-1991 (Leading Researcher); the University of Chicago 1991-1992 (Visiting Professor); Max Planck Institute for Nuclear Physics (Heidelberg) 1992-2018 (Group Leader); Dublin Institute for Advanced Studies, 2006 onwards (Professor). Visiting professor at GSSI, L'Aquila, and MEPhI, Moscow; Honorary Member of the Ioffe Institute, Saint Petersburg. Prize of the President of Armenia (2005); EU Descartes Prize (2006), Rossi Prize (2011); Ambartsumian Prize (2014). Elected Member of the Max Planck Society (2008), Royal Irish Academy (2012), and Academia Euorapaea (2017). Foreign Member of the NAS of Armenia (2008). IAU member (since 2012), Vice President of Division D "High Energy Phenomena and Fundamental Physics" (2012–2015).

From the beginning of his scientific activity, F.A. Aharonian has been involved in both observational and theoretical studies of high energy phenomena ranging from compact relativistic objects to the largest cosmological structures. His research is focused on the extreme particle accelerators linked, in particular, to the supernova remnants, young stellar clusters, pulsar wind nebulae, active galactic nuclei, etc. He has substantially contributed to research on the properties of high energy radiation processes in cosmic environments; the acceleration and propagation of cosmic rays; the physics and astrophysics of relativistic outflows, etc.

He has proposed the stereoscopic approach to the "imaging atmospheric Cherenkov" technique and formulated the basic principles of the method. In the mid-1980s, the gamma-ray astronomy group of the Yerevan Physics Institute, led by Felix Aharonian, has proposed the first stereoscopic array of imaging Cherenkov telescopes initially planned to be installed on Mt. Aragats (Armenia) but later built on the Canary Island La Palma under the name HEGRA. Later, he proposed the concept of stereoscopic arrays consisting of tens of the 10m class Cherenkov telescopes partly realized by H.E.S.S. experiment in Namibia. These projects transformed the ground-based gamma-ray astronomy from a modest branch of Cosmic Ray investigations to an independent astronomical discipline. Later he joined the LHAASO collaboration with the status of the Senior Scientific Advisor. The detectors of LHAASO, a giant cosmic ray facility located in China, recently discovered the first PeV gamma-ray sources and thus opened a new window in the cosmic electromagnetic spectrum. He was the representative of ESA in the JAXA-NASA-ESA X-ray mission Hitomi (ASTRO-H).

Since the early 1990s, F.A. Aharonian has led a large group in the Max-Planck Institute for Nuclear Physics in Heidelberg and later also in the Dublin Institute for Advanced Studies. He has given regular lectures on High Energy Astrophysics in University College Dublin (UCD), Trinity College Dublin (TCD), Gran Sasso Science Institute (GSSI), L'Aquila, and supervised 25 PhD students. He has established two series of international meetings, "Heidelberg International Symposium on Gamma-Rayrgy Gamma-Ray Astronomy" (1994 onwards) and "High Energy Phenomena in Relativistic Outflows" (2007 onwards).

Felix.Aharonian@mpi-hd.mpg.de

AKIM Ephraim Lazarevich

Born 14.03.1929, in Galich, Kostroma region. Since 1955, he worked at the Institute of Applied Mathematics of the USSR Academy of Sciences (now –Keldysh Institute of Applied Mathematics Russian Academy of Sciences). All his work activities are connected with KIAM. Since 1968 Head of Department of Applied Celestial Mechanics. In 1970 he defended his PhD thesis, in 1982 defended his doctoral thesis. In 1985 he was awarded the academic title of professor, in 2008-corresponding member of the Russian Academy of Sciences. Since 1989, the head of the Department of Mechanics and Motion Control of the KIAM. Since 1994 Deputy Director of KIAM for scientific work. Since 1965, Head the KIAM Ballistic Center. Member of the International Astronomical Union. Died 13.09.2010 in Moscow.

E. L. Akim’s scientific research is mainly in the fields of celestial mechanics and dynamics of space flight. E. L. Akim is the author of more than 200 scientific papers in domestic and foreign journals, including 3 monographs.

E. L. Akim’s research solved the problem of determining the astronomical constants and coordinates of planets based on observations of the movement of spacecraft and natural celestial bodies, which is of fundamental importance for the spacecraft navigation and flight control.

For the first time in world practice, E. L. Akim determined the quantitative characteristics of the gravitational field of the Moon, specified the constant gravities of the Earth and the Moon, dynamic compression, and the parameters of the rotation of Venus. This ensured the implementation of successful flights to the Moon of domestic spacecraft. For the implementation of the first landing of the Luna-9 spacecraft on the Moon, E. L. Akim and his co-authors were awarded the Lenin Prize in 1966. Under his supervision and with his direct creative participation, the navigation support of all flights of our domestic spacecraft to the Moon, Venus and Mars was successful.

E. L. Akim and his research team solved the problem of navigation support for the unique experiment on radio mapping of Venus performed by our country for the first time with the help of the Venus-15 and 16 spacecraft. The high-precision navigation data obtained by him is the basis for the first "Atlas of Venus". E. L. Akim built the most accurate theory of the motion of Halley's comet, which made it possible to increase the precision of the coordinates of the comet by three orders of magnitude and to make a close approach to it of the Vega-1 and 2 spacecraft. For the creation of this space complex, E. L. Akim and his co-authors were awarded the USSR State Premiume in 1986.

E. L. Akim was a member of the Russian National Committee for Theoretical and Applied Mechanics, the Interdepartmental Expert Commission on Space, the Problem Council for Onboard Control Systems of the Roscosmos, the International Academy of Astronautics, the International Astronomical Union; a full member of the Russian Academy of Cosmonautics named after K. E. Tsiolkovsky.

E. L. Akim-Honored Worker of Science and Technology of the Russian Federation, winner of the Lenin Premium, three times winner of the USSR State Prize, winner of the Russian Government Prize in Science and Technology, winner of the K. E. Tsiolkovsky Prize of the Russian Academy of Sciences 2007. He was awarded the government awards: The Order of the Badge of Honor (1961), the Order of the Red Banner of Labor (1976), the Order of the October Revolution (1991). A minor planet of the Solar System, the asteroid (8321) Akim, is named after him.

AKSENOV Evgeniy Petrovich

Born 11.10.1933 in the village Victory (Ryazan region). Graduated in 1957 mech.-mat. Faculty of Moscow University (MSU), in 1960, postgraduate study at the Physics Faculty of Moscow State University. Cand. diss. "Influence of triaxiality and heterogeneity of the Earth on the motion of an artificial satellite" (1961). Thesis "Analytical theory of satellite motion based on a non-Keplerian intermediate orbit" (1968). In 1960-1995 he worked at the State Astronomical Institute. PC. Schberg (GternSh) Moscow State University. Professor of Moscow State University (1970). Head Astronomical Department of Moscow State University (1976-1986). Head Department of Celestial Mechanics GAISH (1979-1991). Deputy Director of the SAI for scientific work (1973-1976). Director of the State Aviation Institute (1976-1986). Died 26.03.1995 in Moscow.

His scientific interests are celestial mechanics, theoretical astronomy, analytic dynamics, the theory of analytic functions, and the history and methodology of astronomy. Together with E.A. Grebenikov and VG Demin is the author of the "generalized problem of two stationary centers", which has found many effective applications in celestial mechanics, astrodynamics and the dynamics of stellar systems. The creator of the modern high-precision theory of the motion of artificial earth satellites. The author of a new method for constructing a theory of motion of natural satellites of the planets of the solar system. Completed a series of works on qualitative methods of celestial mechanics. He is the author of a number of new results in the three-body problem: the proof of the existence of several new classes of spatial periodic orbits in the circular restricted three-body problem, a qualitative analysis of the properties of motion of the averaged version of the elliptic restricted three-body problem and the study of the evolution of orbits in this problem. One of the founders of "geodynamics" – a new scientific direction that studies the Earth as a large planet of the solar system by methods of astrometry, gravimetry and celestial mechanics. He made a significant contribution to the analytical theory of functions of celestial mechanics. Author of monographs "Theory of motion of artificial earth satellites" (1977) "Special functions in celestial mechanics" (1986), which were highly appreciated by specialists.

At Moscow State University A. lectured for undergraduate and graduate students: "Theoretical astronomy", "The theory of attraction", "Celestial mechanics", "Special functions in celestial mechanics", "Fundamentals of perturbation theory", "The theory of periodic orbits", "The theory of motion of artificial satellites of the earth", etc. Prepared 17 candidates and 3 doctors of science. More than 80 scientific papers have been published.

Together, E.A. Grebenikov, V.G. Demin and G.N. Duboshin is a laureate of the USSR State Prize in Science and Technology (1971). He was awarded the Order of the Badge of Honor (1980). Member of the IAS (1964).

ALBITZKY Vladimir Alexandrovich

Born 04(16).06.1891 in Kishinev. In 1914 graduated from the Department of Physics and Mathematics in Moscow State University. In 1915–1922 he worked at the Odessa Observa-tory, in 1922 was transferred to the Simeiz Division of the Pulkovo Observatory. Between 1934 and 1936 – Head of this Division, since 1945 – a researcher at the Crimean Astro-physical Observatory, Head of the Department. In 1951 he defended the Doctoral thesis. A member of IAU Commission on radial velocities and Sub-commission on spectral binary stars. Died 15.06.1952 in Moscow.

The basic papers are concerned with stellar spectroscopy, methods for observations and measurements of radial velocities. The name of V.A. Albitzky is forever associated with history of the 40-inch reflector of the Simeiz Observatory. In 1925 he took active part in its mounting and putting into operation, was a principal observer at this telescope for many years. Jointly with G.A. Shajn he derived the world-known results on studying stellar rotation distinguished by high accuracy. In 1932–1933 they published the determined radial velocities for hundreds of stars of different spectral types and provided theoretical and empirical reasons for the fundamental role of axial rotation in stellar evolution. One more achievement of Albitzky is a theoretical presentation of the Doppler-Fizo Principle and problems of studying radial velocities considered in his Doctoral thesis. His other works relate to classical branches of astronomy – investigations of the Sun and minor planets. He carried out observational programs Solar Patrol and Minor Objects of the Solar System: investigated solar activity with the Dallmeyer photoheliograph, discovered a significant number of minor planets, 9 of them acquired numbers (among them Olbersia, Mussorgskia, Komsomolia, etc.). Some papers are devoted to studying variable stars. V.A. Albitzky discovered several dozens of new spectral binary stars and detected their orbits, discovered HD 161817 star with the highest radial velocity in the Galaxy – 360 km/s. He significantly contributed to the development of methods for measuring stellar radial velocities and designing devices for astrophysical investigations including a spectrograph mounted on the 50-inch reflector of the Crimean Astrophysical Observatory (1952). V.A. Albitzky actively participated in reconstructing the observatory, putting into operation many telescopes and devices.

An author of 28 papers published in Russian and foreign journals and a series of chapters in “A course of astrophysics and stellar astronomy”. A minor planet (1783 Albitskij) discovered by G.N. Neujmin on March 24, 1935 at the Simeiz Observatory was named in his honour.

ALEXEYEV Stanislav Olegovich

Born 03.03.1969 in Moscow. Student, Faculty of physics, Lomonosov Moscow State University (MSU), 1987–1994. PhD student, Theoretical physics chair, MSU (1994–1997).
PhD dissertation "Classical solutions of string gravity with the second– order curvature corrections" (1997). Staff member of the Sternberg Astronomical Institute (SAI) of the MSU (researcher, senior researcher, leading researcher) since 1997. Professor of the Department of Quantum Theory and High Energy Physics, Physics Faculty of MSU from 2017. DSci dissertation "Consequences of the string gravity with second-order curvature corrections and possibilities of experimental verification" (2009). Scientific Secretary of MSU Dissertation Council on Astronomy since 2001 till 2017

A. suggested and developed a new restriction on the minimal black hole mass in string gravity with the higher-order curvature corrections. Based on this restriction, he suggested a new model of black hole evaporation with deceleration of evaporating rate at last stages. A model with primordial black hole relic remnants was suggested, with corresponding observational constraints.

A new method to study space-time singularities in implicit Hilbert–Einstein equations, suggested by A., has the key idea to investigate the zeros of the main determinant of the implicit linear differential equations. A new type of space-time singularity was found and investigated; it occurs in cosmological as well as in black-hole-type solutions.

He demonstrated a possibility of experimental verification of string gravity with the second-order curvature corrections and their higher-dimension extensions in high energy physics, found the required experimental accuracies.

It was demonstrated by A. that there existed a possibility of observational verification of string gravity with the second-order curvature corrections and of its generalizations in the form of f(R) gravity and of the Randall–Sundrum model in the weak and strong field approximations; the required observational uncertainties were estimated.

A. found the range of modern cosmological parameters compatible with observational constraints for which a bounce in the extended Brans-Dicke model occurred. New constraints on f(R) gravity were established using pulsar timing data and post-Newtonian parameters measured in the solar system. Stricter (by more than six orders of magnitude) limitations on the possible range of the “tidal” charge in extended gravity were derived and their possible observational consequences demonstrated. New ideas of extended gravity constraints at different scales are suggested.

A. is the author of more than 60 papers, a text-book “Introduction to General Relativity. Its Modern Developments and Applications” (with E.A. Pamyatnykh, A.V. Ursulov, D.A. Tretyakova, K.A. Rannu, 2015, revised and published in 2017, 2019, 2020), 6 collective monographs. He was a supervisor of 4 PhD dissertations and 13 graduation papers.

AMBARTSUMIAN Victor Amasaspovich

Born 18.09.1908 in Tiflis (now Tbilisi, Georgia). Graduated from Leningrad State University (LGU) in 1928. In 1928 – 1931, post-graduate at Pulkovo obs. (with A.A. Belopolsky as a supervisor). In 1931, started teaching at LGU; 1935 – Dr. Sci. honoris causa. 1934–1947 Founder and Chair of Astrophysics at LGU. In 1939 – 1941, Director of Astron. Obs. LGU and scientific provost of LGU. In 1941 – 1943, headed a scientific division of the LGU evacuated to Elabuga (on Kama River). The founder and first director of Byurakan Astrophys. obs. (Armenia; 1946 – 1988). Academician of USSR Acad. of Sci. (1953; corresponding member since 1939). Academician and president of Acad. of Sci. of Armenian SSR (1947 – 1993). President of IAU (1961 – 1964). Founded the Soviet school of theoretical astrophysics. Died 13.08.1996 in Byurakan, Armenia.

V.A. Ambartsumian's early publications were on the physics of planetary nebulae. He studied multiple scattering of Lyman-alpha photons produced by recombination after photoionizations of hydrogen atoms by UV radiation of the central star of a nebula. He estimated the role of radiative pressure produced by Lyman-alpha photons in the dynamics of these objects. V.A. Ambartsumian developed the method of determination of electron temperatures of gaseous nebulae from the observed ratio of intensities of forbidden OIII lines λ 4383 and N1+N2. He also estimated masses of envelopes ejected by novae and the rate of mass loss by stellar winds.

V.A. Ambartsumian's publications of the 1930s are on stellar dynamics. Statistical study of orbits of binaries led him to an estimation of the Galaxy age which was three orders of magnitude less than that advocated by Jeans. V.A. Ambartsumian's result is consistent with the recent research results. His paper on the dissipation of stars from open clusters is now classical. He developed a method that enables one to restore the 3D distribution of stellar velocities from their observed radial velocities. He used statistical approaches for the estimation of parameters of interstellar absorbing clouds and the influence of absorption lines on temperature distribution in stellar atmospheres. The latter approach anticipated the method of opacity probability distribution functions (OPDF) widely used in the construction of modern models of stellar atmospheres.

In the early 1940s, V.A. Ambartsumian introduced a novel approach to classical problems of multiple scattering of light (and particles); this approach is known as the invariance principle. By using simple physical considerations, it enables one to find elegant solutions to a wide class of problems of transfer of radiation. This approach is now widely used in various branches of physics.

In 1947, V.A. Ambartsumian discovered stellar associations, a new class of stellar structures, and proved that they are young. Thus, it was established that star formation in the Galaxy occurs in groups and continues nowadays. In the late 1960s, he pioneered studies of the activity of galactic nuclei and calculated models of superdense baryonic stars.

V.A. Ambartsumian's cosmogonical views were drastically different from those that are common nowadays. According to his concept, stars (and even stellar systems) are formed by the ejection of matter from superdense bodies of unknown nature.

ANTONOV Vadim Anatolievich

Born 05.20.1933 in Perm. In 1955, graduated from Molotov State University with a degree in experimental biology, and until 1960 worked at the D.N. Pryanishnikov Perm Scientific Research Agricultural Institute. In 1964, completed his postgraduate studies at the Faculty of Mathematics and Mechanics of the Leningrad State University (now St. Petersburg State University). In 1964-1989, worked at Leningrad State University in various research positions; in 1989-1998, a leading researcher at the Institute of Theoretical Astronomy of the Russian Academy of Sciences, then the Central Astronomical Observatory at Pulkovo of the Russian Academy of Sciences (Pulkovo Observatory). In 1999-2010, chief researcher at Pulkovo Observatory. Doctor of Physical and Mathematical Sciences (1983), professor (1999). Died 07.08.2010 in St. Petersburg.

V.A. Antonov's main scientific activities are in the field of stellar dynamics and related problems of mathematics and physics. He is the author and co-author of more than 200 scientific papers, including 3 books.

Laid foundations of the theory of stability of collisionless gravitating systems, which led to the emergence of a novel part of stellar dynamics: theory of stability of stellar systems. In the 1960s, developed a variational method for studying the stability of spherical stellar systems with isotropic velocity distribution. Proved that only those perturbations that do not violate spherical symmetry can interfere with stability. A hydrodynamic analogy was developed, according to which the problem of the stability of a stellar system can be reduced to a much simpler problem of the stability of a gaseous system. The main related results are formulated in the fundamental monograph by J. Binney and S. Tremaine "Galactic Dynamics" as four "Antonov laws".

In 1973, he was the first to show that spherical star clusters with purely radial emotions are unstable. After his related research article was translated in English and published in 1987, it became one of the most cited works of V.A. Antonov.

In the 1970s, he investigated the stability of spatially homogeneous models of stellar systems. Developed the method of Lagrangian displacements in phase space, which made it possible to find the complete solution to the stability problem. Extended the method of Lagrangian displacements to the study of nonlinear oscillations of stellar systems.

In 1962, he researched the most probable phase distribution in spherical stellar systems. Based on the law of increase of entropy, proved that there is no absolute maximum of entropy for gravitating systems, and the Maxwellian distribution of velocities corresponds to a relative maximum only when the density contrast is less than critical. Otherwise, the system will shrink indefinitely, and the central velocity dispersion will increase. Later, as proposed by D. Linden-Bell, the phenomenon discovered by V.A. Antonov was called the "gravithermal catastrophe". In essence, V.A. Antonov showed that "heat death" is impossible in the world of gravity.

Obtained fundamental results in the theory of representing the gravitational potential of planets by the Laplace series and by a system of point masses (with E.I. Timoshkova and K.V. Kholshevnikov). Obtained important results in the theory of dynamical systems. He freed the theory of area-preserving twist transformations of a ring from unnecessary smoothness conditions. A novel way of finding periodic orbits in stellar systems is provided by this theory.

APTEKAR Rafail L'vovich

Born 27.09.1936 in Leningrad. In 1959 he graduated with honors from the Physics Department of Leningrad University and was enrolled at the Leningrad Physical-Technical Institute (the Ioffe Institute). Since 1961 he participated actively in experimental studies of cosmic dust and cosmic gamma-ray radiation. Candidate of Physical and Mathematical Sciences (1976), Leading Researcher (1992). Head of the Laboratory for Experimental Astrophysics at Ioffe Institute and principal investigator of the Russian-American space experiment Konus-Wind (2013-2020). Member of the RAS Council on Space Research. Died 28.12.2020 in St. Petersburg.

R.L. Aptekar – known Russian astrophysicist, who took an active part in studies of cosmic dust, comet matter and cosmic gamma-ray radiation.

In studies at the spacecraft "Cosmos-135" and "Kosmos-167" for the first time reliable data on flux and mass spectrum of the dust particles in near-Earth space had been obtained using the Ioffe Institute instruments. A study of the dust coma of Halley's comet in a wide range of particle masses from 10^{-6} grams up to 10^{-16} grams was performed in the project "Vega". The completeness and reliability of these unique data significantly exceeded the results of measurements obtained by the European mission "Giotto".

Since early 1970's, when one of the first independent confirmations of cosmic gamma-ray bursts (GRBs) came from the Ioffe Institute detector onboard the Kosmos-461 satellite, R.L. Aptekar was actively involved in the studies of this exciting phenomenon lead at Ioffe by Eugeny Mazets. In 1978-1983, using highly sensitive instruments onboard interplanetary probes "Venera 11-14", the basic observational characteristics of GRBs were firmly established. In 1979, a new type of astrophysical sources was discovered – Soft gamma repeaters (SGRs), which were associated later with highly-magnetized neutron stars (magnetars).

R.L. Aptekar actively participated in the Ioffe Institute cosmic gamma-ray burst studies with a Russian scientific instrument Konus onboard the American spacecraft "Wind" and, simultaneously, onboard Russian "Kosmos" and "Coronas" spacecraft series. Unique observations were made of a giant flare of gamma-repeater SGR1806-20 and its reflection from the Moon. The synchronous observations from the two spacecraft gave, for the first time, the reliable data about the time profile of the giant flare and its huge energy.

High-quality results from the Konus-Wind experiment, lead by R.L. Aptekar since 2013, are widely used by the international scientific community in the fields of modern multi-wavelength gamma-ray burst studies and multi-messenger astronomy.

R.L. Aptekar was awarded the Order "Badge of Honor" (2011) and Medal of the Order "For Merit to the Fatherland" of the second degree (1999). The scientific activity of R.L. Aptekar was awarded the Russian Government Prize in Science and Technology (2008.). For participation in the discovery of the soft gamma repeaters, he was awarded the Academician Belopolsky Prize.

ARKHIPOVA Vera Petrovna

Born 28.07.1935 in Moscow. Student of the MSU Faculty of Mechanics and Mathematics (Dept. of Astronomy), 1953–1958. PhD student, stellar astronomy chair, MSU Faculty of Physics, 1958–1961. PhD dissertation "P Cygni Stars", 1964.

Staff member of the MSU Sternberg Astronomical Institute (SAI): from junior to leading researcher, 1961 till now. IAU member: Commissions 34 (interstellar medium), 27 (variable stars), 28 (galaxies). Medal "For discoveries of new astronomical objects" of the Astron. Council (USSR Acad. Sci.), 1988. Medal "In memory of the 850th anniversary of Moscow", 1997. Medal "Veteran of Labor", 1997. Medals of the Exhibition of Achievements of National Economy, 1968–1969 and 1985.

A. is an expert in physics of stars, planetary nebulae, and galaxies. In 1959–1961, she used the new objective-prism telescope of the SAI Crimean station to perform spectrophotometry for more than ten hot high-luminosity stars with signatures of strong stellar wind, obtained their first temperature estimates from the continuous spectrum. She demonstrated that the continuum of the wind had virtually no influence on energy distributions in their spectra, in variance with Wolf–Rayet stars.

In 1959–1969, she actively participated in the SAI study on absolute spectrophotometry of 171 planetary nebulae (PNe), highly estimated at the IAU Symposium 134 in Tatranska Lomnica (Czechoslovakia) in 1967. Together with E.B. Kostyakova, she estimated parameters of these PNe (first estimates for most of them) that later permitted to suggest the first empirical evolutionary sequence of PN nuclei. In 1967, Kostyakova and Arkhipova initiated a program of studies of 10 PN nuclei earlier suspected of variability. 40 years of observations of FG Sagittae, a PN nucleus, resulted in the discovery and study of its unique photometric and spectral variations related to the fast evolution of the nucleus as a result of the last helium flash of the shell energy source. The long-term variations of the nucleus and nebula IC 4997 were found to be due to a non-stationary wind from the nucleus and, possibly, to binarity.

A. was a co-author of B.A. Vorontsov-Velyaminov in his "Morphological Catalog of Galaxies" (parts 2–5, 1962–1974) and complete "Catalog of Interacting Galaxies" (2000). She obtained radial velocities, rotation curves, UBV magnitudes for many interacting galaxies.

Since early 1990s, A. is the leader of the study of stars – candidate future PNe (protoplanetary objects, PPOs), discovered in the IRAS infrared survey. Long-term UBV photometry of more than 20 PPOs with SAI telescopes resulted in discoveries of PPO variability, its type significantly dependent on the star's temperature. Variations of PPOs at different stages of their evolutionary tracks were studied. Spectroscopy permitted to find and study the second known rapidly evolving star, V886 Herculis, to study spectral evolution of Hen 3-1357, the first known object of this kind; three more PPOs can show rapid evolution in the nearest future.

A. made a large contribution to studies of Novae and symbiotic Novae: she performed the first spectroscopic and photometric study of HM Sagittae (discovered in her SAI department), half-century spectroscopic and photometric monitoring of V1016 and V1329 Cygni after their outbursts, studied binarity of yellow symbiotic stars, light curves of Novae of different types, etc.

She supervised 2 PhD dissertations and more than 10 university graduation papers. She is the author of 250 published papers and reviews.

ARTAMONOV Boris Pavlovich

Born 21.12.1937 in Verkhni Ufalei (Chelyabinsk region). In 1962, graduated from Ural State University, Sverdlovsk (now Ural Federal University, Yekaterinburg). After that, he worked at the Southern station of the Sternberg Astronomical Institute (SAI), Lomonosov Moscow State University (MSU). Having ended his post-graduate course at the MSU astrophysics chair in 1969, he worked at the Special Astrophysical Observatory (USSR Acad. Sci.). Permanently at the SAI since 1974, positions from junior researcher to laboratory head. SAI senior researcher since 2014. PhD dissertation in 1970. A. has the title of senior researcher. He was a member of the SAI Scientific council. A member of the SAI council on astrophysics, a member of the International Astronomical Union.

A. performs scientific research in different fields of astrophysics: structure and composition of filamentary reflecting nebular, star formation in galaxies, astronomical atmospheric conditions and construction of new observatories, diffraction telescopes, observations of active galactic nuclei and lensed quasars and their analysis. He published about 100 scientific papers.

In 1960s, A. performed a series of photometry of the reflecting nebula near Merope and computed a model of dust grains explaining colors of the nebula. During the post-graduate years, he also developed a theoretical model describing formation of filaments in magnetic fields, based on S.B. Pikelner's ideas. In 1970–1974, he was engaged in photometry and spectroscopy of star-formation galaxies of the M82 type.

In mid-1970s till 1980s, A., together with S.B. Novikov and A.A. Ovchinnikov, was actively engaged in the construction of a new observatory in Uzbekistan, on Mt. Maidanak: he studied the atmospheric conditions, computed nearly-diffractional optics of the 1.5-m telescope, participated in the in-shop and mountain tests of this optics. He took part in the project of an echelle spectrograph for the 1.5-m telescope and in other projects of importance for economics.

Since 1995, A. was the head of the Russian team for international monitoring of gravitational lenses. Observations with CCD cameras and different filters were performed (and are continued) using the 1.5-m Maidanak telescope. With M.V. Sazhin, A.G. Yagola, E.V. Shimanovskaya, and E.A. Koptelova, he developed methods of precise photometry of closely spaced images of a quasar projected on the lens galaxy based on Tikhonov's regularization of ill-posed problems. This team solved the inverse problem aimed at restoration of the brightness profile of the quasar's central part from microlensing effects in the gravitational lens of Einstein's Cross.

A. took an active part in creating a bank of observational data for a dozen gravitational lenses and several SyGs obtained at the Maidanak observatory with high angular resolution. Some of the data are published in MNRAS, A&A, Astr.Let., Astr.Rep.

A. pays much attention to students and young graduates. As an invited lecturer, he delivered a 5-year lecture cycle in the Rostov State University. In 1992–2012, he presented a lecture course "Astronomical spectroscopy" for students of the MSU astronomy department. He is one of organizers of the regular conferences on gravitational lenses for observers of the Maidanak observatory.

A. was awarded the title of MSU distinguished researcher, a medal "In memory of the 850th anniversary of Moscow", a breastplate to celebrations of the 250th anniversary of the MSU, Certificates of honor from the SAI and the MSU.

ARTYUKH Vadim Sergeevich

Born 13.04.1940 in Kazan. In 1963 he graduated from the Kharkov state institute. From 1963 to the present time he has been working at the P.N. Lebedev Physics Institute of Russian academy of Sciences (LPI) at the Pushchino Radio Astronomy Observatory in various positions: from research trainee to head of a laboratory. Doctor Phys.-Math. Sciences (1990).

The main scientific works relate to radio astronomy studies of extragalactic radio sources. He has published over a hundred papers and a textbook "Radio Astronomy Research Methods".

In 1964, observations of the Crab nebula occultation by the Moon revealed that the radio emission of this nebula at meter waves comes from the same region as the optical radiation (co-authors: V. V. Vitkevich, V. I. Vlasov, G. A. Kafarov, L. I. Matveenko). In 1965-1967, under the leadership of V. V. Vitkevich, together with R. D. Dagkesamansky, the flux densities of all radio sources in the 3C catalog were measured at the Wide-band Cross-type Radio Telescope of LPI (DKR-1000) at a frequency of 86 MHz (most accurate measurements in the meter wave range). Since 1976, observations of hundreds of compact radio sources (together with Yu. N. Vetukhnovskaya, M. A. Oganisyan, and S. A. Tyulbashev) have been made at the Large Phased Array of LPI (BSA) at a frequency of 102 MHz using the interplanetary scintillation method. Together with the staff of the Moscow State University (A. N. Tikhonov, V. B. Glasko, A.V. Goncharsky, A.V. Yagola) V. S. Artyukh was an initiator and an active participant in the creation of a system for automating observations at DKR-1000 and the BSA.To study the physics of active galactic nuclei (AGN), V.S. Artyukh developed methods for estimating the physical parameters of compact radio sources located in galactic nuclei. In 1988, the method based on the uniform model of a synchrotron radiation source was developed, and in 2006, the method based on the nonuniform model of a synchrotron radiation source was developed (together with P. A. Chernikov). These methods are used to estimate the magnetic field induction, the relativistic electron density, and the magnetic field and particle energy density for dozens of active galactic nuclei. In 2016 a method is developed for estimating the Doppler factors of relativistic radio jets (which do not have optical spectral lines) moving not only towards the observer, but also away from it.

Under the leadership of V. S. Artyukh, three PhD theses were defended. He gives lectures at the Pushchino State Natural Science Institute.

AVDYUSHEV Victor Anatolievich

Born 11.12.1971 in Pervomayskoe of Tomsk region. In 1989 he entered the Mechanics and Mathematics Faculty of Tomsk State University (TSU), from which he graduated in 1994 with a degree in mechanics. In 1994–1997 got trained in graduate school of the same university. In 1999 defended his candidate's dissertation, and in 2010 — the doctoral thesis in astrometry and celestial mechanics. In 2012–2019 headed the Department of Astronomy and Space Geodesy of the Physical Faculty of TSU, and also heading the Laboratory of Celestial Mechanics of the Research Institute of Applied Mathematics and Mechanics of TSU (RIAMM). Since 2019, a professor at TSU and a leading researcher at RIAMM.

The area of his scientific interests is numerical modeling and investigation of the orbital motion of asteroids, Jovian satellites, as well as artificial Earth satellites; development of numerical methods in special perturbation theory, orbit determination, stochastic simulation of orbital uncertainty, orbit integration.

The main research results till 2015 are reflected in the book — Avdyushev V.A. Numerical modeling of the orbits of celestial bodies. Tomsk: Publishing House of Tomsk State University, 2015. 336 p.

Created a new theory of collocation methods for the numerical integration of orbits. Developed nonlinear piecewise transition methods for stochastic simulation of orbital uncertainty. Introduced original indicators for evaluating nonlinearity in inverse problems of orbital dynamics. On the basis of linear mappings, developed a fast method for determining the probability of an asteroid collision with a planet.

In 1999, the numerical model of Jovian Galilean satellites, developed by Avdyushev, was included in the list of the most important achievements of Russian astronomical research.

For his services in the development of Russian cosmonautics in 2001, he was awarded the Medal. Yu.A. Gagarin.

Website: scharmn.narod.ru

BABADZANJANZ Levon Konstantinovich

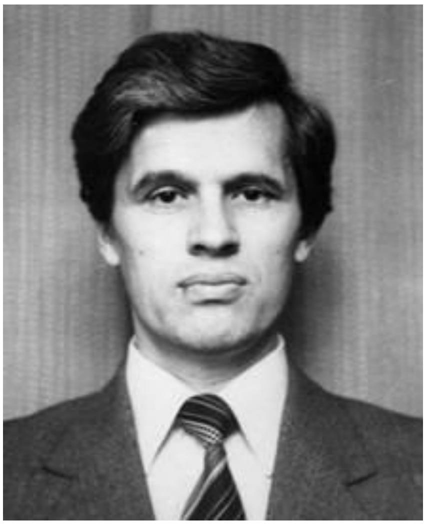
Born 24.05.1940 in Tbilisi, Georgian SSR. In 1958-1964, studied at Leningrad (now St. Petersburg) University, first at the Faculty of Physics, then at the Faculty of Mathematics and Mechanics (since 1961). The graduation thesis was named "An approximate method for solving the integral equation of light scattering in planetary atmospheres" (scientific supervisors I. N. Minin and V. V. Sobolev). Defended his PhD thesis "Analytical methods for calculating perturbations in the coordinates of planets" in 1970 (scientific supervisor V. S. Novoselov) and his Dr. Sci. thesis "The method of infinite systems in problems of celestial mechanics" in 1985. Since 1965, worked at LSU as a junior researcher, associate professor (since 1970), professor (since 1987). In 1971-1987, Head of Laboratory of Control and Management Methods in Problems of Celestial Mechanics and Responsible officer of several contract-based types of research on space topics.

His research interests relate to the mathematical problems of celestial mechanics, cosmic dynamics; stability theory and controlled motion; perturbation theory; analytical and numerical methods for solving differential, integral, and other equations; optimization problems, optimal control; mathematical problems in physics, chemistry, life sciences, etc. The author of more than 100 publications.

In 1976-1978, published a solution to the Weierstrass problem (Acta Mathematica, VII, 1885/1886) on the representation of the dynamics of N material points, moving under Newtonian attraction, in the form of series converging at the maximum intervals of existence for any initial conditions. The main results are presented in the works "Continuability and representation of solutions in problems of celestial mechanics", "Existence of the continuations in the N-body problem", "On the global solution of the N-body problem" and in his Dr. Sci. dissertation. In 2010, published necessary and sufficient conditions for the reducibility of differential equations to a polynomial form by a method of additional variables. These conditions mean that the right-hand sides of differential equations are superpositions of functions that are themselves solutions of complete polynomial systems. Therefore, the Weierstrass problem can also be considered as solved for such differential equations; for example, for systems whose right-hand sides are superpositions of elementary or special functions of mathematical physics.

Since 1965, taught at the Faculty of Mathematics and Mechanics, and, since 1971, at the Faculty of Applied Mathematics and Control Processes of LSU (SPbU). Lecturer on classical and quantum mechanics, calculus, differential equations, mathematical modeling, and automation of solving differential equations. Under his scientific supervision, 11 PhD theses were defended.

BABIN Artur Nikolaevich



Born 23.10.1930, Bragino village, Yashinsky district, Altai Krai. Graduated from Tomsk State University in 1953. Between 1953 and 1961, performed duties of the Head of the Mountain-Taiga Station of the national Solar Patrol Service (Ussuriysk) of the Far East Division, SB, the USSR Academy of Sciences. Between 1961 and 1965, took his postgraduate course and worked in the Crimean Astrophysical Observatory, the USSR Academy of Sciences. Since 1965 to 1998, worked in the Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation of the SB, the USSR Academy of Sciences (since 1992, the Institute of Solar-Terrestrial Physics, ISTP SB RAS) as a Lab Supervisor and a Senior Researcher. Doctoral degree in Phys.-Math. Sciences (1991), a Member of IAU (1967–1998). Died 20.08.1998 in Irkutsk.

Main research works relate to solar physics and astrophysical instrument engineering. Author of more than 70 scientific papers and co-author of the book “Solar Flares" (in Russian).

In 1961, entered a postgraduate program and was sent to Crimean Astrophysical Observatory of the USSR Academy of Sciences. His research advisor was academician A.B. Severny. In Crimea, Valery Banin succeeded in getting unique echelle spectrograms covering all evolution stages of a large solar flare. Carried out a number of studies on chromospheric outbreaks, on their basis, wrote a Candidate's dissertation for a degree in Physical and Mathematical science. From July 1965 to his last days, worked in ISTP SB RAS in Irkutsk. Between 1965 and 1986, he headed one of solar laboratories.

For many years, Valery Banin was a Research Supervisor of the ISTP SB RAS Baikal Astrophysical Observatory (BAO) in Listvyanka village. He directed the works on selecting the location, studying astroclimate, designing and constructing the observatory, was one of the principal project managers during the Large Solar Vacuum Telescope (LSVT) construction in BAO. Also known for construction of a number of full-disk chromospheric telescopes for filter observations.

His studies allowed considerable progress in understanding the mechanisms of solar flares. Banin investigated morphological and photometric features of large flares, assessed physical parameters, developed a structural space and time model of energetic two-ribbon solar flares. His explanation of red asymmetry of emission line profiles during flares has been confirmed and recognized. Under his leadership and with his participation, ISTP SB RAS carried out research on phenomenological, statistical, and physical characteristics of solar activity complexes, their geoeffective manifestations. Valery Banin and his disciples studied the correlation between activity complexes and energetic proton flares and coronal holes in detail; they developed the method to forecast long-term variations in solar activity.

A Member of IAU since 1967, Valery Banin actively participated in its commissions and in many international projects.

Awards: the Medal “Veteran of Labor” (1984).

BADALYAN Olga Gnunievna

Born 15.11.1941 in Fergana (Uzbek Republic). In 1945, the family returned to Moscow. In 1965 graduated from Physical Department of the Moscow Lomonosov State University and continued post-graduate studies. After having completed post-graduate course, worked at the Sternberg Astronomical Institute. Since 1971 has been working at the Pushkov Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation RAS. Candidate of Science in Physics and Mathematics since 1975.

The field of research of O.G. Badalyan is the solar and solar-terrestrial physics. She is the author of more than 150 scientific papers.

Her Candidate thesis (under the supervision of M.A. Livshits) was devoted to the study of optical and line emissions of photospheric faculae, the depth of origin of photospheric lines, turbulent velocities in the quiet photosphere and in faculae.

O.G. Badalyan was engaged in the study of energy transport in sunspots in collaboration with V.N. Obridko and V.M. Dashevsky (1975-1980); and in the study of optical emission of solar flares in collaboration with M.A. Livshits (1980-1985).

Since 1985, her scientific interests have been mainly focused on the physics of the solar corona. Together with M.A. Livshits, she carried out a detailed study of coronal optical emission under the conditions of hydrostatic density distribution, polarization of the corona in undisturbed regions, coronal holes, and large streamers. Many studies were carried out in collaboration with the research team of the Slovak Astronomical Institute, in particular, those based on eclipse observations of J. Sykora who accumulated a unique bulk of data on polarized emission of the solar corona in the green spectral line 530.3 nm. These observations provided valuable information on the green line polarization and its relationship with various large-scale coronal structures, the intensity of line emission and magnetic fields in these structures (a number of publications in co-authorship with J. Sykora, M.A. Livshits, and V.N. Obridko).

The data on the green-line brightness for the period 1939-2001 accumulated by J. Sykora were used to investigate its cycle variations and latitude-longitude distribution, as well as the correlation with the calculated coronal magnetic fields (in co-authorship with J. Sykora and V.N. Obridko). A series of work based on the data on latitude and longitude distribution of the green-line brightness was devoted to time and latitude variations in the differential rotation of the solar corona (in co-authorship with J. Sykora and V.N. Obridko). A model of two modes of the coronal rotation was suggested.

A series of papers (in co-authorship with J. Sykora and J. Rybak (Slovak Rebublik), and V.N. Obridko were devoted to the North-South asymmetry of solar activity in several indices relating to different layers of the solar atmosphere from the photosphere to the corona.

BAGROV Alexander Viktorovich

Born 30.06.1945 in Vladivostok. He graduated from M.V. Lomonosov Moscow State University in 1968. In 1987 defended his PhD thesis, and in 2002 defended his DSc thesis. Since 1972 affiliated with the Institute of Astronomy of the Russian Academy of Science (before 1988 – Astronomical Council USSR Academy of Science). Since 2000 collaborated with Lavochkin Association. Since 2000, a member of the IAU. Died 20.08.2020 in Moscow.

During 1968-1970, V.A. Bagrov investigated the astroclimate of the Mt. Sanglok, where later were installed telescopes of Institute of Astrophysics of Tajikistan Rep., and Optical Center of Space Control Surveillance ("OKNO") was built.

For more than 20 years (1980-2002) his research interests were artificial satellites and application of astrophysical methods of telescopic observation to artificial satellites. In collaboration with M.A. Smirnov, he invented some devices for specific observations of objects in Near-Earth space (obtained 5 patents). The complex analysis of photometrical and spectral-photometric data of ground-based observations was done. As a result of these investigations, V.A. Bagrov and his colleagues designed an algorithm for the reconstruction of satellite's shape and orientation exclusively from telescopic observation data. This method was used for the reconstruction of several objects on geostationary orbit real view (including secret military ones) and provided analysis of the real condition of space probes after unsuccessful launches.

In 1990-th his research interests widened to include natural bodies of the Solar System migrating through Near-Earth space. He proposed a new cosmogony hypothesis that claims that planetary systems are created at the pre-solar stage of the proto-planetary nebula. One of the conclusions of this hypothesis shows that no meteoroid particles could be made directly from the interstellar dust cloud after its simple accretion, and that well-known standard cosmogony fails to explain existence in comet nuclei large refractive particles. Since 2000 V.A. Bagrov reactivates optical meteor observations in Russia with the aim to get evidence for his cosmogony. Also, he conducted research on space debris and developed observational techniques for studying them.

The technical interests of V.A. Bagrov are wide too. He was the main investigator of the Russian project of space astrometrical interferometer OSIRIS 1995-2006 (project canceled in 2014). He is a designer of light-beacons technique for global positioning with a single satellite (adapted to "Luna-25" and "Luna-26" Russian missions). In addition, he was the co-author of a project of an interstellar spaceship with superconductive mirror, lunar space elevator, hyper-velocity penetrators for science payload delivery to the Moon, asteroids, and comets, non-rocket launch from Mars, active defense of the Earth against space dangerous bodies, optical light beacons for space probes and others (10 patents). He published more than 200 papers and 2 monographs.

A.V. Bagrov devoted much attention to legal issues of space exploration and international space law. Member of the editorial boards of a number of publications and expert councils of various societies.

A.V. Bagrov was awarded medals of the Russian Cosmonautic Federation and Soviet National Achieving Exhibition. He was Honor USSR Inventor (1990) and Honor Constructor of Space Technique (2015), Academician of the International Academy of the Studies of Future (2019).

BAJKOVA Anisa Talgatovna

Born in 1953 in Bashkiria. Student at Ufa Aviation Institute (1970–1975), Bashkir State University (1976 to 1981). Post-graduate course at the Chair of Pulse and Computer Engineering, Leningrad Bonch-Bruevitch Electrotechnical Institute for Communications (1982–1984). Cand.Sci. (1984): «A Synthesis of Efficient Algorithms of FFT and Cyclical Convolution». 1985–1987: Junior Researcher at Special Astronomical Observatory of Academy of Sciences of the USSR, 1988 to 2003 with Institute of Applied Astronomy of RAS (Researcher, Scientific Secretary, Leading Researcher), since 2003 – with The Central Astronomical Observatory at Pulkovo (Leading Researcher, Chief Researcher). Dr.Sci. (1995): «Image Reconstruction of VLBI Images Using Generalized Non-Linear Optimization Methods». Member of IAU.

Expert in digital signal processing, mathematical methods of analysis of astronomical data, radio source mapping with the use of VLBI techniques, non-linear image reconstruction methods based on optimization of various information measurements. Suggested a generalization of the maximum entropy method for reconstruction of alternating-sign and complex images and signals; the generalized method was applied to multifrequency synthesis of VLBI images, to algorithm of phase reconstruction from the source spectrum amplitude, to techniques of mapping of the objects from their projections, to differential mapping, and more. The suggested techniques were applied in the studies of several active galactic nuclei.

In observational cosmology, she suggested a method of detection of spectral spatial fluctuations of the cosmic microwave background radiation in pre-galactic epoch, and also a technique of removal of contaminating point sources from CMB maps.

In galactic astronomy, proposed a new method of periodogram-based analysis of residual velocities of objects, aimed at determination of parameters of the spiral density wave. A series of works was devoted to kinematic analysis of maser sources with measured trigonometric parallaxes; as a result, the rotation curve of the Galaxy, parameters of spiral density wave and the distance from the center of the Galaxy to the Sun were updated. Periodic variations in vertical velocities were discovered. New values for parameters of several models of the galactic potential were obtained from velocities of objects within a broad range of galactocentric distances. A method of determination of parameters of the galactic bar was suggested on the basis of the analysis of stellar streams in the solar neighborhood. Kinematic technique was used to find the most likely solar twin candidate – HD 162826. Dr A. Bajkova authored and co-authored more than 130 science papers.

bajkova@gaoran.ru, anisabajkova@mail.ru

BALEGA Yury Yuryevich

Born 08.01.1953 in Kolchyno village, Zakarpattia Oblast of the Ukrainian SSR. In 1974, graduated from Uzhgorod State. From 1975, has been working at the Special Astrophysical Ob-servatory, AS of the USSR (since 1991 – the Russian Academy of Sciences), in different positions: from Research Technician to Director (1993-2015), from 2015 – Scientific Head. In 1985, de-fended his Ph.D. dis-sertation. In 1996, defended his Dr.Sci. dis-sertation on "Speckle-Interferometric Studies with the Big Azi-muth Telescope".
Corresponding member of RAS since 1997, Professor in "Astro-physics and Stellar Astronomy". An IAU member; from 2012 – Vice President of IAU Commission 26 "Binary and Multiple Stars", a member of Commision 9 "Astronimical Methods and Instruments".

Yu.Yu. Balega is a creator of new methods and techniques of interferometric observations at large optical telescopes with diffraction spatial resolution. With application of those methods, unique results in physics and evolution of stars were obtained. The author of about 300 scientific papers.

Fundamental characteristics of hundreds of stars were determined from observations of orbital motions of components of different-type binary and multiple systems. Angular diameters of cool giant stars in different spectrum regions were measured and models of their extended atmospheres were constructed. Based on observations, he developed models of envelopes for stars with mass-loss high rates. Yu.Yu. Balega was the first to determine masses of brown dwarfs included in multiple systems from direct observations. He developed a differential method of speckle-spectroscopy at the 6-m telescope making it possible to measure motion rates of gaseous clouds in nuclear region of the nearest active galaxy, for example. Yu.Yu. Balega is doing active work for creation and exploration of new detection and image processing systems in the visible and infrared spectral range.

Has tutored 10 highly qualified professionals. Head of Department at ITMO, Professor at North-Caucasus Federal University. Honored Professor of Stavropol State University.

Heads Doctoral Dissertation Council of the SAO RAS. Editor-in-Chief of the "Astrophysical Bulletin" journal.

He is performing duties of Deputy Chair of the Presidium of the Southern Scientific Center of Russian Academy of Sciences, heads "Optical telescopes and techniques" section of the Scientific Council on Astronomy of the RAS, a member of the Russian Foundation For Basic Research Board. From 2014 Yu.Yu. Balega heads Research Coordination Board of the Federal Agency for Scientific Organizations. He took part in the work of Organizing Committees of a number of scientific conferences and symposia. Yu.Yu. Balega is a President of the Scientific Society of the Karachay-Cherkessia.

Honored Scientist of the Karachay-Cherkess Republic

Honored with USSR State Prize (1991), Laureate of the State prize of Ukraine in science and technology (2003), Government prize of the Russian Government in science and technology (2011), A.A. Belopolskij Prize (2014).

Honored with the following awards: Orders of Friendship (1999) and Honour (2010), medals "For Distinguished Labour" (1981), "For Labour Valour" (1986), second-class medal "For Merit to the Fatherland (1999).

BANIN Valery Gavrilovich

Born 23.10.1930, Bragino village, Yashinsky district, Altai Krai. Graduated from Tomsk State University in 1953. Between 1953 and 1961, the Head of the Mountain-Taiga Station of the National Solar Patrol Service (Ussuriysk) of the Far East Division, SB, the USSR Academy of Sciences. Between 1961 and 1965, took a postgraduate course and worked at the Crimean Astrophysical Observatory, the USSR Academy of Sciences. Between 1965 and 1998, worked in the Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation of the SB, the USSR Academy of Sciences (since 1992, the Institute of Solar-Terrestrial Physics, ISTP SB RAS) as a Lab Supervisor and a Senior Researcher. Doctoral degree in Phys.-Math. Sciences (1991), a Member of IAU (1967–1998). Died 20.08.1998 in Irkutsk.

V.G. Banin’s main research interests relate to solar physics and astrophysical instrument engineering. He is the author of more than 70 scientific papers and co-author of the book “Solar Flares" (in Russian).

In 1961, entered a postgraduate program and was sent to Crimean Astrophysical Observatory of the USSR Academy of Sciences. His research advisor was academician A.B. Severny. In Crimea, V.G. Banin succeeded in getting unique echelle spectrograms covering all evolution stages of a large solar flare. His research on chromospheric outbreaks led to his PhD in Physical and Mathematical science. Between 1965 and 1986, head one of the solar laboratories. From July 1965 until his last days, worked in ISTP SB RAS in Irkutsk.

For many years, V.G. Banin was a Research Advisor for the ISTP SB RAS Baikal Astrophysical Observatory (BAO) in Listvyanka village. He was in charge of selecting the location, studying the astroclimate, designing and constructing the observatory. He was one of the principal project managers during the Large Solar Vacuum Telescope (LSVT) construction in BAO. Also known for the construction of several full-disk chromospheric telescopes for filter observations.

His research considerably contributed to understanding the mechanisms of solar flares. V.G. Banin investigated morphological and photometric features of large flares, assessed physical parameters, developed a structural space and time model of energetic two-ribbon solar flares. His explanation of red asymmetry of emission line profiles during flares has been confirmed and recognized. Under his leadership and with his participation, ISTP SB RAS carried out research on phenomenological, statistical, and physical characteristics of solar activity complexes and their geoeffective manifestations. V.G. Banin and his followers studied the correlation between activity complexes and energetic proton flares and coronal holes in detail; they developed the method to forecast long-term variations in solar activity.

A Member of IAU since 1967, V.G. Banin actively participated in its commissions and in many international projects.

Awards: The Medal “Veteran of Labor” (1984).

BARANOV Alexander Sergeevich

Born 09.23.1944 in Leningrad. In 1966 graduated from Leningrad State University with a degree in stellar astronomy. In 1966-1969, a graduate student at the Department of Celestial Mechanics and Stellar Dynamics of Leningrad State University. From 1969–1998, worked at the Institute of Theoretical Astronomy of the Academy of Sciences of the USSR (RAS), progressing from a junior researcher to a senior researcher. Following the reorganization of the Institute in 1998, together with several other leading researchers of the Institute, moved to the Central (Pulkovo) Astronomical Observatory (GAO RAS), where he actively worked until his last days, first as a senior researcher, and, since 1999, as a leading researcher. A renowned expert in the field of theoretical astronomy. In 1974, competed his Ph.D.; in 1994, competed his Dr. Sci. in astronomy, astrometry, and celestial mechanics. Died 22.06.2009 in St. Petersburg.

A.S. Baranov's research is mainly in the field of stellar dynamics and related branches of astronomy. In 1974, together with V.A. Antonov, he investigated the collisional evolution of quasi-stationary systems. To date, they are among the first to apply the expression for the collisional term of the Boltzmann equation to gravitating systems, previously derived for plasma by M. Rosenbluth et al. In particular, they examined the interaction of two subsystems and found how the energy of each of them changes as the system approaches statistical equilibrium. During that time, in a series of research studies, A.S. Baranov, jointly with Yu.V. Batrakov, researched dynamical friction in stellar systems. To study the dynamical friction, he used methods previously developed by Yu.V. Batrakov who investigated the influence of atmospheric drag on the motion of artificial satellites. This showed that when a star cluster moves in a galaxy, it can capture the stars of the field. The number of such stars cannot be large, but in their characteristics (age) they can differ sharply from the stars of the cluster. Almost immediately after his article, it was hypothesized that these are the "blue stragglers" observed in some open clusters. Continuing V.K. Abalakin's work, in 1979, A.S. Baranov developed a method for constructing periodic orbits in axisymmetric stellar systems that do not differ much from spherical ones. A.S. Baranov (1992) carefully studied what happens to Maclaurin ellipsoids near the bifurcation point, taking into account the viscosity. In several publications, the authors, jointly with V.A. Antonov, managed to find new features in such a seemingly thoroughly studied phenomenon as the Jeans gravitational instability. In another series of joint articles, V.A. Antonov and A.S. Baranov investigated the dynamics of the protoplanetary cloud. He was also at the forefront of computer studies of stellar systems in Russia. At a time when direct computer modeling of systems of a large number of bodies was impossible, T.A. Agekian proposed an interesting computer algorithm for quasistationary modeling of stellar systems by calculating the trajectories of a small number of bodies. During his student years, A.S. Baranov did calculations using this method and arrived at an interesting model of spherical systems. A.S. Baranov had a broad scope of research interests. He was especially interested in the topic of life outside the Earth. In the 1970s, he gave public lectures on this topic. Member of the Academic Council of the Pulkovo Observatory, member of the International Astronomical Union, member of the European Astronomical Society, member of the Editorial Board of the journal "Izvestiya GAO RAN", editor of the abstract journal "Astronomy" (section of theoretical astronomy), member of the American Mathematical Society, member of the Editorial Board of the American journal "Mathematical Reviews".

BARANOV Vladimir Andreyevich

Born 03(15).09.1872, in the village. Mikulino, Samara province. From 1918 to 1937 (?) – Director of the Kazan City Astronomical Observatory and Head dept. astronomy and geodesy, Kazan State. Univ. From 1937 to 1941 – head of the department astrometry of KSU. Professor of Kazan University since 1918. Died 14.02.1942 in Kazan.

V.A. Baranov is the author of two positions directory of variable stars, observed minor planets, comets, binary stars, and produced gravity measurements in gravimetric points of the European part of the USSR.

Since 1899, V.A. Baranov, an assistant of the Department of Astronomy and Geodesy headed by D.I. Dubyago. He was a participant in the expeditions of Kazan University. As a result, 55 gravimetric points were determined with respect to the city of Kazan University Observatory, due to that Kazan has become a reference point for measuring the force of gravity in the center and east of Russia.

Member of the Russian-Japanese war.

In 1913 he carried out (in collaboration with Professor of Potsdam geodesic L.Gaazemanom Institute) gravimetric connection of two astronomical observatories (urban and Engelhardt Observatory) of Kazan University to Potsdam.

After the death of D.I.Dubyago that occurred in 1918, V.A.Baranov was appointed as professor on the RSFSR government's decision.

V.A. Baranov (together with AA Yakovkin) organized an astronomical and geodetic department of the University of Kazan, whose task was to prepare specialists needed to work on mapping and general gravimetric investigations in the USSR. This branch was opened in January 1930 with the rights of the individual units KSU. In 1931 this branch department of organized all-Russia training courses for heads of topographic units.

BARKHATOVA Klavdiâ Aleksandrovna

Born 07.11.1917 in Nizhny Tagil, Perm province. Graduated from Ural State University (1941). Worked at Ural State University from 1941 to 1990. She was Dean of Faculty of Physics and Mathematics (1951-1953), Head of Department of Astronomy and Geodesy (1960-1986), Director (1965-1975), and Scientific Director (1975-1987) of Kourovka Astronomical Observatory. Completed Ph.D. in Physical and Mathematical Sciences (1948), Professor (1968). Member of the IAU (1951-1990). Died 19.01.1990 in Sverdlovsk.

K.A. Barkhatova’s scientific research was devoted to the study of compact stellar groups (open star clusters). She estimated the total number of these objects in the Galaxy, studied their spatial and kinematic characteristics, color-magnitude diagrams, and found the dependence of the angular diameters of clusters from the distance to the Sun, which was a possible indication that the cluster distance scale used in astronomy was erroneous. Based on her initiative, the Department of Astronomy and Geodesy at Ural University was reestablished. Initiator and head of the construction Kourovka astronomical observatory in the Urals. K.A. Barkhatova is the author of "Atlas of diagrams «color-magnitude» of open star clusters" and more than 150 scientific papers. Founder of the Ural scientific school of stellar astronomy.

K.A. Barhatova played a significant role as a scientific organizer. She worked as an organizer for a committee dedicated to the study of star clusters and associations, Chairman of the working group "Star Clusters" of the Astronomical Council of the USSR Academy of Sciences, a member of the Council on Astronomical Personnel of the USSR Academy of Sciences, a member of the scientific-technical and scientific-methodological councils of the USSR Ministry of Higher Education, Chairman of the Head Council for Astronomy of the RSFSR Ministry of Higher Education (1969-1986).

She was not only a talented teacher, a prominent scientific organizer, and scientist, but also a person of broad interests: she was fond of theater, music, fine arts, and poetry. She was awarded the Order of the «Badge of Honor» (1961), medal «For Labor Distinction» (1967), medal «For Valiant Labor», medal “In commemoration of the 100th anniversary of the birth of V.I. Lenin (1970)”, award «For successes in work» (1975), award «Excellence in higher school» (1976), medal of the USSR Exhibition of Economic Achievements (1981). Two open stellar clusters carry names “Barkhatova 1” and “Barkhatova 2”. The minor planet N 5781 is named BARKHATOVA in honor of K.A. Barkhatova.

BARKIN Yury Vladimirovich

Born 23.04.1951 in Urazovka the village of Gorky region. In 1973 he graduated from the Physics Faculty of the Moscow State University. Engineer (1973) in Kuibyshev University. Graduate student (1975) in Physical Faculty of the Moscow State University. He defended his thesis in 1978 on the theme "Periodic solutions to the problem of translational-rotational motion of celestial bodies." He defended his doctoral thesis in 1989 on the theme "The Dynamics of the system nonspherical celestial bodies and the theory of the rotation of the Moon." Assistant (1979), Associate Professor (1982), Professor (1990) in Bauman MSTU. Leading researcher (1995) in SAI MSU. Member of the Russian Academy of Natural Sciences since 2001. Died 10.01.2016 in Moscow.

All life of B. was devoted to the service of science. The range of his scientific interests is diverse: from classical problems of mechanics – to contemporary problems of astronomy, celestial mechanics, geodynamics. In 1983, for the cycle of works about the rotational motion of bodies in the solar system and the theory of the development of the theory of translational and rotational motions of celestial bodies B. was awarded the title of Laureate of the Moscow Komsomol Prize.

In 2010 the decision of Presidium of the Russian Academy of Natural Sciences (RANS) B. it is awarded by the Medal of "For Merits in Development of Science and Economy of Russia" academy for a cycle of scientific works on research of endogenous activity of Earth and mechanisms of activity of planetary natural processes". In 2013 B. have gained a medal and the diploma of the Moscow society of testers of the nature "Founder and the patron of MOIP, Alexander I".

Problems in sciences about Earth, many decades facing scientists have received the decision and dynamic interpretation thanks to B.: in a fundamental problem of power of terrestrial processes and their recurrence century drift and jumps of a pole of an axis of rotation of Earth have received an explanation; not tidal acceleration of Earth, core nutation; broad interpretation was received also by an explanation of the main properties of planetary natural processes, their synchronism and unity: activity of polar regions of planets and satellites of Solar system and their latitudinal dependence; irregularity, "sawtooth" of the course of activity of natural processes. He applied this concept to an explanation of endogenous activity of the Sun, planets and their satellites, and also in a explanation of climate change on Earth.

He has written more than 300 articles, 3 books, 333 report made at various conferences, 362 theses of reports are declared, he participated in seven research and developments. B. was a member of 12 scientific societies, worked in programmatic and organizational committees of many international conferences – such as the «Japan Geoscience Union Meeting» (from 2012 to 2015.); «International Symposium & Summer School on Planetary Science» (IAPS, 2013), Shanghai (China); at the European Planetary Science Congress in 2010. «Europlanet» (Roma, Italy, 19-25 September, 2010); «Meeting of the Americas» (Foz do Iguassu, Brasil, 8-13 August, 2010); at the General Assembly of the European Union Earth Sciences; B. was a member of the Editorial Board of the journal «Astronomical & Astrophysical Transactions».

BARKOV Maxim Vladimirovich

Born in 1977, Zheleznodorozhny, Moscow Region, USSR. Graduated from M.V. Lomonosov Moscow State University, Moscow, Russia, Summa Cum Laude, 2000. In 2000–2003 PhD student at Space Research Institute RAS, Moscow. PhD thesis “Sporadic outburst from relativistic objects and their observational evidence” (2004). Doctor thesis “Magnetohydrodynamic flow in the relativistic objects” (2019). In 2000–2006 various positions in Space Re-search Institute (IKI) of Russian Academy of Sciences, Moscow, Russia. In 2006–2009 Research Fellow at the University of Leeds, UK. In 2010–2013 Max Planck Fellowship for High Energy Astrophysics, MPI-K, Heidelberg, Germany. In 2014–2016 Researcher at Astrophysical Big Bang Laboratory, Riken, Wako, Japan. In 2016–2017 Researcher at Deutsches Elektronen-Synchrotron, Zeuthen, Germany. In 2017–2020 Researcher at Purdue University (West Lafayette, USA). In 2021 appointed as a Leading Scientific Fellow at the Institute of Astronomy of the RAS.

M.V. Barkov’s research focus is mainly on the field of theoretical/computational astrophysics. He uses massively parallel simulations to understand both the large-scale dynamics and small-scale plasma physical properties to interpret the resulting emission signatures of high-energy astrophysical sources. These methods have been applied to study a number of fundamental problems of pulsar wind interactions, launching of relativistic jets by black holes, jet formation in the central engines of GRBs, dynamics and emission properties of relativistic outflows in merging neutron stars and associated gravitational wave emission. Many of these simulations have been the first of their kind, paving the way for many other research groups worldwide.

One of his significant research results is the numerical simulation of magnetic jet acceleration where he has achieved for the first time the agreement between observations, numerical simulations and analytical models. He has pioneered a new model for understanding the very fast variability in the Very High Energy band of Active Galactic Nuclei. His recent work on pulsar wind interaction with interstellar matter gives rise to a new line of research and opens up new ways for interpreting many astrophysical phenomena such as: (a) morphology of bow-shock Pulsar Wind Nebulae; (b) nature of X-ray filaments from pulsars and Radio filaments in the Galactic Center.

By the beginning of 2021 he published over 60 peer reviewed publications, with a total of 2000 citations (NASA ADS). His Hirsch index h = 25. He has been a major contributor to the development of the Kerr (GR MHD), ED (RMD) and Janus (relativistic two-fluid MHD) codes that are widely used in modern numerical astrophysics research. A member of the Cherenkov Telescope Array (CTA) collaboration.

BARYSHEV Yurij Victorovich

Born 08.05.1948 in Pavlovsk (a suburb of St. Petersburg). In 1973, graduated from Leningrad Electro-technical Institute with specialization in Radio Engineering. Since 1971, worked in the Astronomical observatory LGU, in Laboratories of Radio astronomy, Active galactic nuclei, and Theoretical Astrophysics in different positions, from a senior engineer to a leading scientific researcher. In 1985, completed his PhD with a thesis titled "Kinematics and dynamics of stream blobs from active galactic nuclei". In 2003, completed DSc with a doctoral dissertation "Space distribution of galaxies and tests in relativistic cosmology". IAU member. Died 29.01.2021 in St. Petersburg.

Y.V. Baryshev's main scientific interests lie in the fields of relativistic astrophysics and cosmology. He is the author of 120 papers and 3 monographs, one of which was published in English, Italian, and Polish.

His primary area of research is the development of astrophysical tests of the Feynman relativistic field theory of gravitation (theoretical-field approach to the description of gravitational interaction). The field equations and equations of motion of matter in the gravitational field were first deduced by him together with V.V.Sokolov. Comparisons were made between predictions of the field theory of gravitation (gravidynamics) and GRT (the Einstein geometrical approach). It was shown that, although all actual verified relativistic gravitational effects agree in both approaches, there are significantly different predictions in cases of both the weak and strong gravitational fields.

In the field of cosmology, he was the first to develop a fractal approach to the analysis of the large-scale structure of the Universe. Together with colleagues in Italy, Finland, and France, he was the first to obtain estimates of the fractal dimension of galaxies space distribution based on the surveys of redshifts of galaxies 3MRS, 2dF, and SDSS. It was shown that, at least in the scale interval from 0.1 Mpc to 100 Mpc, the distribution of galaxies is described by a fractal model with dimension D=2 (whereas the homogeneous distribution corresponds to D=3). Based on these observational data, the fractal cosmological model was first-ever proposed and astrophysical observational tests were developed for its verification.

The history of research of the large-scale structure of the Universe and theoretical foundations of modern cosmological models are given in monographs:

Baryshev Y., Teericorpi P. Discovery of Cosmic Fractals, WSPC, 2002;

Baryshev Y., Teericorpi P. Fractal Structure of the Universe, SAO RAS, 2005 (in Russian);

Baryshev Y., Teericorpi P. Fundamental Questions of Practical Cosmology, Springer, 2012.

BASILEVSKY Alexander Tikhonovich

Born 04.10.1937 in Voronezh city. In 1959 graduated from Voronezh State University. After PhD studentship at the Chair of Geochemistry of Moscow State University and work in Geological Buro of Central Regiones, worked in 1968-1974 in the Institute of Space Research of the USSR Academy of Sciences as junior scientist, scientist and senior scientist. In 1975 moved to the Vernadsky Institute of Geochemistry and Analytical Chemistry, where worked as senior scientist, head of laboratory and the main scientist.

Doctor of Geological-Mineralogical Sciences (1986), Professor in Geochemstry and Methods of Geochemical Prospecting (2007), member of several scientific councils and editorial boards of international and Russian journals in Space Research and Geochemistry.

The main scientific works are in the area of geologic-morphologic analysis of TV and radar images of surfaces of the Moon, Venus, Mars, Mercury, satellites of the giant planets and comet nuclei. More than 250 articles and 3 collective monographs have been published.

In 1968-1974 A.T. Basilevsky in collaboration with C.P. Florensky and other members of the Institute of Space Research of the USSR Academy of Sciences studied the detailed photographs of lunar surface aiming to select and characterize landing sites for the Soviet manned expedition to the Moon (cancelled). The acquired data and experience were later used for selection and characterization of landing sites for robotic missions to the Moon and Venus. Results of these studies were published in several articles and became to be a beginning for the broader analysis of characteristics of lunar surface, including geologic-morphologic studies along the routes of Lunokhod 1 and 2.

Since mid-1980’s A.T. Basilevsky actively participated in geologic analysis of radar images of Venus surface taken by the Venera 15/16 and Magellan missions that led to working out model of global stratigraphy of planet Venus (jointly with J.W. Head, Brown University, Providence, R.I., USA). In 2015 based on analysis of IR survey of Venus surface by the Venus Express mission, A.T, Basilevsky jointly with colleagues from the Institute of Space Research (Moscow) and Max-Planck Institute of Solar System Research (Gottingen, Germany) have received first reliable evidence of present day volcanism on this planet.

In 1990’s-2000’s as a result of analysis of images of Mars surface there were revealed some peculiarities of geological history of this planet, in particular, it was found correlation between episodes of volcanic and fluvial activity (jointly with G. Neukum and his colleagues from the Free University of Berlin).

After getting by the Lunar Reconnaissance Orbiter TV camera images of lunar surface with 0.5 m resolution (after 2009) there were done studies on geologic analysis of the landing sites of Soviet spacecraft (Lunas-Lunokhods) and were estimated the survival times of rock boulders on the surface of the Moon and a number of other atmosphereless bodies.

Under his scientific leadership were done and defended seven PhD and one Doctor of Science dissertations.

Awards: Order of the Red Banner of Labour (1983), the USSR State Award (1989). International awards: Humboldt Foundation Award, Germany (1999), Runcorn-Florensky Medal of European Geophysical Society (2000), Barringer Medal if International Meteoritical Society (2001).

In honor of A.T. Basilevsky was named asteroid 3991 Basilevsky discovered in 1987 by E.G. Bowell (Lowell Observatory, Flagstaff, Arizona, USA).

BATRAKOV Yurij Vasil’evich

Born 06.05.1926 in Tashkent; graduated from the Leningrad University (1950) and its postgraduate department (1955); working at the same time at the Leningrad Mechanical Institute (from 1953 to 1955), then at the Institute of Theoretical Astronomy of the USSR Academy of Sciences (from 1955 to 1998) where he became Deputy Director for Science (1967) and acquired the title of Professor (1978). He was a chief scientist at the Institute of Applied Astronomy of the Russian Academy of Sciences (from 1998 to 2013). His PhD Thesis (1953) was entitled: "Using the Schwarzschild Periodic Solutions for the Problem of Emptiness in the Asteroid Ring". His Doctoral Thesis (1974) was named "Research in the Theory of Motion of Artificial Earth Satellites and in the Using Their Observations for Scientific Purposes". Died 22.05.2013.

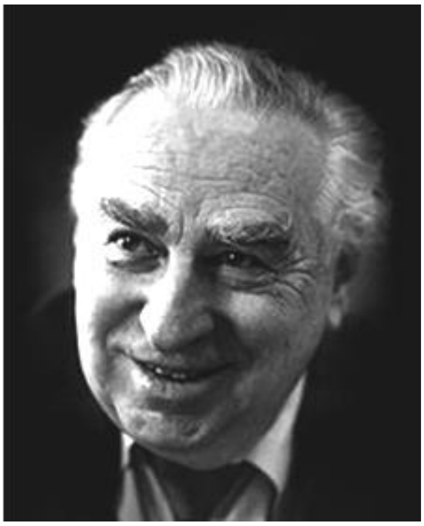
Y.V. Batrakov devoted his main scientific works to celestial mechanics. He found (1955) periodic solutions of the spatial restricted circular three-body problem with a moving node and ascertained (1957) the existence of the relative equilibria positions (libration points) for the satellites of an ellipsoidal planet. Geostationary satellites are now placed in these points. He found (1958) the minor planet great semi-axes distribution asymmetry with respect to commensurabilities concluding that there were more asteroids (in average) on the inner side of any commensurability than on its outside. He built the analytical theory of satellite motion (together with V.F. Proskurin; it was published in 1959 before the first artificial satellite was launched); developed a method to determine the orbits of satellites from those optical observations which had errors of time (1960) and a method to determine the Earth's gravitational field from the motion of resonant satellites (1963); constructed (from 1974 to 1980) a new type of intermediate orbits in order to study a small body perturbed motion; showed (in 1974; together with A. S. Baranov) that the dynamical friction in star clusters resulted in the accumulation of massive stars in the vicinity of the cluster’s center (if the cluster was not rotating) or in the vicinity of the cluster’s equator plane (if it was rotating); developed (from 1981 to 1982) a method to construct ephemerides of celestial bodies using Chebyshev splines; and suggested (1984) a method to determine final orbits of the celestial bodies using the orbits obtained during their occasional individual appearances instead of the original observations.

Since 1990 (together with Yu. A. Chernetenko and others), he dealt with the problem of determining the mutual orientation of the dynamical and stellar coordinate systems from minor planet observations. A number of Yu. V. Batrakov’s works were concerned with the problem of the multiple asteroid motion stability.

Yu. V. Batrakov was the Editor-in-Chief of the Yearbook "Ephemerides of Minor Planets" (from 1980 to 1998); he headed the working group "Motion of Minor Planets and Comets" of the "Celestial Mechanics" sector in the USSR Astronomical Council (from 1980); and he was a Member of IAU Commission No.20 Organizing Committee (in 1980s).

Yu. V. Batrakov was a scientific advisor for more than a dozen graduate students and PhD and Doctoral applicants (including those from foreign countries). He was the Honored Scientist of the Russian Federation (1987). Died on May 22, 2013 and was buried in the Pulkovo Memorial Cemetery. Minor planet (2702) Batrakov is named in his honour.

BELETSKY Vladimir Vasil'evich



Born 02.05.1930 in Irkutsk. Graduated from M.V. Lomonosov Moscow State University (MSU) in 1954. After graduation, he joined Keldysh Institute of Applied Mathematics (former the Division of Applied Mathematics of the Mathematical Institute of USSR Academy of Sciences), where he pioneered studies of attitude motion of artificial Earth satellites. The results of these studies served as the basis for his PhD and D.Sc. theses (1961 and 1965 respectively). Since 1966 he did research at KIAM as well as teaching at MSU, 25 PhD theses were prepared under his supervision. Professor (1969), member of International Academy of Astronautics (1992), corresponding member of Russian Academy of Sciences (1997). For advances in astrodynamics and celestial mechanics, V.V. Beletsky was awarded the Humboldt Prize (Germany, 1992), Keldysh Medal of Cosmonautics Federation of USSR (1991), Tsander Prize of Russian Academy of Sciences (1999). Asteroid 14790 Beletskij was named after V.V. Beletsky in 2001. Died 20.07.2017 in Moscow.

V.V. Beletsky developed the comprehensive theory of the attitude motion of natural and artificial celestial bodies under the influence of the various disturbing factors (torques due to the gravity gradient, torques due to atmospheric drag, magnetic torques, torques to solar radiation pressure, etc.). He proved a fundamental theorem on the stability condition of a satellite's relative equilibrium in circular orbit, investigated the properties of a satellite's librations in case of motion in an elliptic orbit, proposed effective procedures determining the actual motion of the satellites and the parameters of the perturbing torques from the onboard measurements.

V.V. Beletsky investigated the possibility of "resonance" regime formation as a result of the attitude motion evolution caused by tidal torque. He also gave a mathematically rigorous justification of empirical Cassini laws characterizing the rotational motion of the Moon.

V.V. Beletsky was the first who started studying the motion of the tethered satellite system (TSS) as a problem in the dynamics of mechanical systems with unilateral constraints. Lately this approach became standard for investigations on TSS dynamics.

Significant scientific results were obtained by V.V. Beletsky in his research on spacecraft's orbital motion evolution due to the small disturbing forces. In particular, he found analytically an approximate expression of the control law providing the optimal transition from circular to the parabolic orbit of the spacecraft equipped with the low-thrust engine (the so-called "spiral" trajectory).

V.V. Beletsky published more than 200 scientific papers and 11 monographs. His book "Essays on the Motion of Celestial Bodies", written in an unusual way when mathematically rigorous fragments are combined with publicists' comments, was translated into many languages.

BELINSKI Alexandr Alexandrovich

Born 02.06.1978 in Moscow. 1996-2002 – student of the Astronomy Department of the Physics Faculty of Moscow State University. In 2008, after graduating from graduate school, he defended his thesis for the degree of Ph.D. specializing in astrophysics and radio astronomy. Since 2002, an employee of the SAI MSU, since 2012, Deputy Director for Science and Prospective Development of the SAI MSU.

Research interests – modern information technologies used in astronomical research, the creation of automated observational optical telescopes and complexes, the creation of automated systems for processing and analysis of astronomical data, the development of experimental instruments for optical observations, the study of exoplanets by methods of precision photometry of transit.

2002 to 2012 participated in the creation of a network of robotic observatories "MASTER", "MASTER-II" and "MASTER-VWF". In the process of work, complexes of programs were created for fully automatic identification of fields, determination of coordinates and photometry of objects on wide-field images. Methods for end-to-end storage and online analysis of several tens of billions of individual measurements obtained by MASTER in Open Source PostgreSQL DBMS have been developed, which made it possible to detect transient events in observations in real time.

Since 2007, he became a member of the committee for the creation of the Caucasian Mountain Observatory of the Sternberg Astronomical Institute of the Moscow State University and its flagship 2.5-meter telescope. He was directly involved in the design of the observatory, assembly, adjustment and creation of new observational equipment for the 2.5-meter CMO telescope. From 2018 to 2019, under his leadership, the second telescope of the observatory, the automated photometric telescope RC600 KGO, was designed and put into permanent operation.

Author of 36 articles and over 500 telegrams. Member of the Academic Council of MSU, SAI MSU and FCR MSU. In 2020, he was awarded a certificate of honor of the Ministry of Science and Higher Education of the Russian Federation.

E-mail: aleks.sai@gmail.com

BELKOVICH Igor Vladimirovich

Born in 1904 in the settlement Urmary, Tsivilsky County of the Kazan province (now Chuvashia). In 1927 graduated from the Kazan University as an Astronomer. In 1928 he joined the Engelhardt Astronomical Observatory (EAO) of the Kazan University and held various assignments: since 1930 an assistant astronomer, at the same time a lecturer at the Department of Geodesy and Astronomy at the Kazan University, since 1932 a senior researcher of the Astrometric Department of EAO, from 1941 Head of the Astrometric Department of EAO. PhD in Physical and Mathematical Sciences (1938), Grand PhD in Physical and Mathematical Sciences (1948). For a long time, until the end of his life, he served as the secretary of the Lunar commission at the Astronomical council of the Academy of Sciences of the USSR, in 1948 joined the 17th Commission of IAU. Died in 1949 in Kazan.

The main direction of his scientific activity was the study of the rotation of the moon and its figure.

From 1931 he began a series of observations of the Moon with the only heliometer operating in the USSR.

With great theoretical knowledge and a thorough approach to processing the heliometer observations, he proposed a new method, which greatly simplifies the treatment process.

He re-processed the observations series of A. A Mikhaylovsky. Having at his disposal his own large series of heliometer observations (151), he added to them two more the Kazan series of T.A. Banahevich (130) and A.A. Yakovkin (251), as well as the series of Hartwig, and made their joint processing. This gave him the opportunity to make a particularly reliable determination of the lunar rotation elements, to produce a radical revision of the constant of the physical libration of the Moon, and to draw a conclusion about the duality of the value of this quantity. In this work, I.V. Belkovich calls into question the existence of a free libration, in any case, within the accuracy of modern observations and makes the most interesting new conclusions about a figure of the lunar disk. All these, huge on the volume of calculating works, researches made the subjects of his PhD's and Grand PhD's theses: "Constants of the Moon’s physical libration" (1938) and "The Moon’s physical libration" (1948).

He devoted the last years of his life to working on a design and construction of the horizontal long-focus telescope to study the Moon rotation and its figure photographically since his research work led him to a conclusion about the need for further increase of the accuracy of observations unattainable with the heliometer observations. At the beginning of 1949, the telescope was ready and investigated. The experimental photos of the Moon executed by means of this telescope showed that regular work can be begun. The premature sudden death of I. V. Belkovich (1949) interrupted his work.

His constant interest in the main work did not prevent him to be interested in many other problems of astronomy both in astrometry and in astrophysics. He observed planets and comets using the 12" refractor (1928–1931), and also photographed them with the astrograph; he was engaged in observing the variability of latitudes and studying the systematic errors of declinations in observations at the passage telescope with the levels of Talcott (1932–1935), observed and processed the lunar occultations of stars.

I.V. Belkovich's published works, which include questions from purely mathematical to quite special, are the result of his multifaceted research activity.

I.V. Belkovich made notable contributions to astronomy. The crater Belkovich on the Moon was named in his honor.

BELKOVICH Oleg Igorevich

Born 29.12.1934 in Kazan, Russia. In 1957 graduated from the Kazan State University as a Radio physicist. His positions at the Kazan State University (nowadays the Kazan Federal University): an engineer (1957), Associate Professor of the Radioastronomy Department (1965), Deputy Director on Scientific Work of the Engelhardt Astronomical Observatory (EAO) of the Kazan University (1970), Director of EAO (1976-1991), the Chief Researcher of the Meteor Department of EAO (since 1991), then Professor and Head of the Theoretical and Experimental Physics Department of the Zelenodolsk branch of the Kazan University (1996-2014). PhD in Physical and Mathematical Sciences (1964), Grand PhD in Physical and Mathematical Sciences (1988). Was a Professor in the specialty "Astrometry and Celestial Mechanics" (1994). Died 11.07.2020 in Kazan.

The area of his scientific interest in meteor astronomy. His main scientific works are devoted to the study of the distribution of meteoric matter in the vicinity of the Earth's orbit. He is the author of about two hundred scientific publications in the Russian and foreign editions, including his monography "Statistical Theory of Radar of Meteors".

At first, he worked as a radio engineer, worked on the development and improvement of equipment for radar observations of meteors. Then he moved close to solving the problems related to the methods of processing and interpretation of observation results.

He proposed an entirely new, based on the theory of probability approach to solving the problems of processing and interpretation of radar meteor observations. For the first time in the world, he had derived analytic distributions of amplitudes and durations of meteor echoes taking into account the random positions of the reflecting points at the meteor trails, and in addition to them the distribution of heights of the reflecting points. He also developed the theory of calculation of the stream density of meteoric bodies by results of radar observations. He had summarized the results of these works in his PhD's and Grand PhD's theses on subjects "Statistical Theory of Radar of Meteors" (1964) and "Statistical Theory of Meteors" (1988).

O.I. Belkovich is the co-author of two State Standards: "Meteoric Matter. Terms, Definitions, Letter Symbols" and "Meteoric Matter. Model of Spatial Distribution".

He was the Member of the Commission on the International Project “Global Meteor Observation System (GLOBMET)” at the Academy of Sciences of the USSR (1980 – 1990).

In 1966 he became the Member of the International Astronomical Union (IAU), was the Vice-president (1979-1982), and the President of the IAU Commission 22 "Meteors, Meteorites & Interplanetary Dust” (1982-1985).

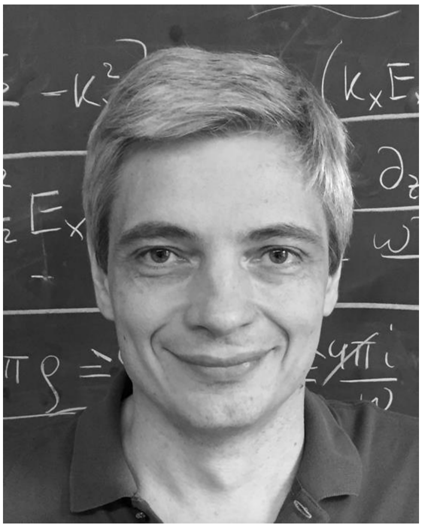
He organized an international scientific school for young researchers of meteors.

O.I. Belkovich is the holder of Honorary Titles: Honorary Member of the International Meteor Organization (since 2005), Honored Scientist of the Tatarstan Republic (1995), Honored Scientist of the Kazan University (2009), the Best Lecturer and Educationist of the Kazan University (2008).

O.I. Belkovich is recognized worldwide for his fundamental research works in the field of meteor astronomy and his achievements in scientific, educational, and public activities.

The Main-belt Asteroid 179595 Belkovich (2002 MK4) is named in his honor.

BELOBORODOV Andrei Mikhailovich



Born 09.10.1968 in Moscow. Graduated from Moscow Institute of Physics and Technology in 1991. Completed his PhD at Astro-Space Center of Russian Academy of Sciences in 1995. Later worked at the Astro-Space Center (1995-1997), Stockholm Observatory (1997-2001), Canadian Institute for Theoretical Astrophysics (2001-2003). Professor of Physics at Columbia University since 2003.

Theoretical astrophysicist. A.M. Beloborodov's research is mainly in the physics of black holes, neutron stars, and cosmic explosions:

— Developed models of radiative transfer with creation of electron-positron pairs near accreting black holes (1999), in the ultra-strong magnetic fields of magnetars (2013), and in relativistic explosions (2002, 2011). Proposed outflowing coronae of accreting black holes to explain their hard X-ray spectra (1999).

— Investigated matter in disks around spinning black holes with ultra-high accretion rates, including disks in cosmological gamma-ray bursts (GRBs) cooled by neutrino emission. Demonstrated their self-regulation to a state dominated by free neutrons (2007, with W. Chen).

— Showed that in GRB jets nucleosynthesis occurs similar to the big bang nucleosynthesis, with a special feature – a neutron excess (2003). Found that heating by nuclear collisions in the expanding neutron-rich jet produces radiation consistent with observed GRBs (2010).

— Found a simple formulation for gravitational bending of light (2002), which is widely used for emission from neutron stars.

— With Y. Levin (2003) discovered that the measured velocities of massive stars in the central parsec of our Galaxy imply their rotation in a thin disk – a possible remnant of a past accretion disk around the supermassive black hole.

— Developed a method for first-principle kinetic modeling of the plasma discharge in pulsars (2014, with A. Chen). The result proved that most of the pulsar power is released in the electric current sheet formed around the spinning neutron star.

— Proposed the electrodynamic model for the evolution of deformed magnetospheres of magnetars and their emission (2009, 2013). Investigated heating of active neutron stars (2016, with X. Li); proposed thermoplastic waves in the star's crust (2014, with Y. Levin).

— Proposed the hypothesis of hyper-active magnetars in distant galaxies as the sources of repeating fast radio bursts (2017). Developed the model of burst emission by blast waves in the relativistic wind from the magnetar and a hot radio nebula formed by the magnetar ejecta.

Main current research interests: neutron star mergers; fast conversion of magnetic energy into radiation; ultra-strong electromagnetic waves in plasma; radiative shocks.

Awards: Humboldt Prize (2018), Simons Investigator Award (2016), Merle Kingsley Distinguished Caltech Visitor (2012), Alfred P. Sloan Fellowship (2003), Beatrice Tremaine Fellowship (2002).

BELOPOLSKY Aristarch Apollonovich

Born 13.07.1854 in Moscow. In 1877 graduated from Dept. of Physics and Mathematics of Moscow University. In 1879–1888 – Research Assistant at the Astronomical Observatory of Moscow University. Since 1888: with Pulkovo Observatory; 1908 to 1916 – Vice Director, 1916 to 1919 – Director, since 1933 – Honorary Director. Member of St.-Petersburg Academy of Sciences (1906). Since 1905, Chairman of The Russian Department of the International Union for Cooperation in Solar Research (the Department was instigated by him). Member of the Royal Astronomical Society, London, Italian Society for Spectroscopy, and several other international scientific societies. Died 16.05.1934 in Pulkovo.

Apprentice of F.A. Bredikhin and V.K. Cerasky. One of the founders of the modern astrophysics. On a submission from Director of Pulkovo Observatory F.A. Bredikhin, in 1891 was appointed the First staff astrophysicist of the Observatory. Heavily contributed to equipment of Pulkovo Observatory with astrophysical instrumentation. Founded Pulkovo «glass library» of astronomical negative images. Owing his activities, Pulkovo Observatory in 1910-ies turned into a leading center of astrophysical observations in Russia. Applied astrophysical methods to studies of stars. Was among the first who obtained photographical spectra of celestial bodies with the use of a spectrograph of his own design. Pioneered photographing spectra of numerous variable stars, revealing spectral binaries and even multiples. In particular, focused on flares of Novae (1892, 1901, 1912, 1918, and 1920); carried out comparative studies of their spectra. His measurements of radial velocities of stars made (starting from 1894) with the device of his own design on the basis of Doppler principle were a breakthrough. Using laboratory experiments, proved the applicability of Doppler principle to light phenomena. Determined radial velocities of about 200 stars 2^{nd} to 4^{th} magnitude. In 1894, discovered the periodicity of variations of radial velocity of δ Cep, which appeared to be common for all cepheids. Found that variations of the radial velocities of cepheids are parallel to those of their brightness. The commonly accepted opinion that variations of brightness of the cepheids result from their periodic pulsations due to some inner physical reasons was established on the basis of Belopolsky's works. In 1895, applied measurements of radial velocities to studies of Saturn rings and showed that the rings are clusters of tiny cosmic bodies rotating around the planet. In 1896, discovered the spectral binarity of α Gem (Castor B). Studied physics of comets; suggested a relation between the type of a comet's tail and its physical structure and chemical composition. Took part in several astronomical expeditions. Authored the famous textbook «Astrospectroscopy» (1921). In 1951, his «Astronomical Works» were published.

Awarded the Janssen Gold Medal (1908) and Lalande Prize of Paris Academy (1918) for his studies of the Sun, Two Prizes from the Russian Astronomical Society. Minor planet № 1004, discovered in 1923, named Belopolskiya. A lunar crater was also named after him. Academy of Sciences of the USSR (now RAS) established Belopolsky Prize (the first awardee: E. Mustel, 1981).

BELYAKINA Tamara Sergeyevna

Born 14.01.1934 in Arsentyevskiye Vyselki, Lipetsk region. In 1950 she gradu-ated from the secondary school in Pavlovkiy Posad, Moscow region, and entered the Department of Astronomy of Moscow State University. After graduation Tamara Sergeyevna was directed to the Crimean Astrophysical Observatory where she worked her whole professional life. Died 13.06.2016 in Nauchnyy.

Working at the Stellar Physics Department, T.S. Belyakina took part in compiling catalogues of photoelectric magnitudes and colors of stars close to the Sun and in detecting true color dispersion on the two-color diagram in the UBV system. While taking part in these works, she mastered all the nuances of stellar electrophotometry. Then T.S. Belyakina carried out spectral and spectrophotometric studies of Nova Herculis 1960 and in developing criteria for the spectral classification of stellar metallicity. Thus she also mastered the technique of spectroscopic investigations. As a result, she succeeded as an independent and many-sided researcher of the non-stationary stellar objects.

In the 60s T.S. Belyakina carried out an extensive series of works on electrophotometry of symbiotic stars which formed the basis for the Ph.D. thesis "Photometric studies of symbiotic stars" successfully defended in 1972. These investigations were included in the developed concept of symbiotic stars and other close binary systems at the late stages of evolution.

In subsequent years T.S. Belyakina continued photometric and colorimetric studies of different non-stationary and peculiar objects: many symbiotic stars and closely related objects, Nova Cygni 1975, PU Vul (Kuwano-Honda object), binary XX Oph, Mira-type objects HM and Sgr. A number of publications that allow to estimate parameters of these systems' components and to follow their variations in time were concerned with many symbiotic stars, XX Oph system and especially PU Vul. The number of papers published by T.S. Belyakina in Soviet and foreign issues exceeds 60.

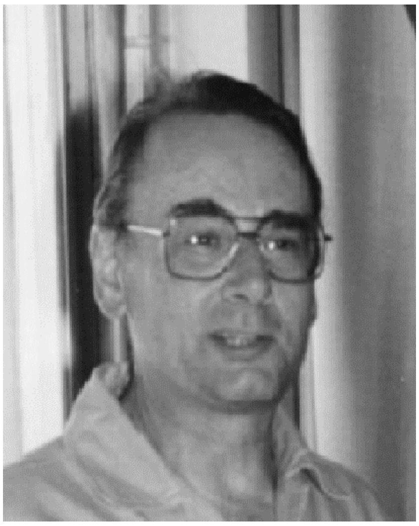
BELYAVSKY Sergey Ivanovich

Born 25.11(07.12).1883 in St. Petersburg. An expert in the field of astrophysics and astrometry. In 1906 he graduated from Petersburg University. Director of the Simeiz Division of the Main Astronomical Observatory (MAO) (1909–1925, 1931–1933); senior researcher of MAO of the USSR Academy of Sciences (1944–1953). Doctor in Physics and Mathematics, Professor. A corresponding member of the USSR Academy of Sciences (January 29, 1939). A holder of the “Mark of Honour” award and medals. Died 13.10.1953 in Leningrad.

S.I. Belyavsky is known as a discoverer of minor planets, comets and variable stars. In 1909 he was the first permanent astronomer at the Simeiz Observatory. His first night sky image and subsequent ones taken with the double astrograph laid the groundwork for the photographic collection of the Simeiz Observatory which is accounted for about 10 thousand plates. He discovered a bright comet C/1911 S3 (Beljawsky), 37 minor planets, over 250 variable stars. Jointly with G.N. Neujmin, he carried out systematic observations within the International program on searching for minor planets. According to the number of discoveries the Simeiz Observatory took the leading places for many years.

S.I. Belyavsky contributed to the photographic astrometry by compiling “Catalogue of photographic magnitudes of 2777 stars” (1915) and “Astrographic catalogue of 11322 stars” (1947). An author of about 20 publications. In the most difficult years in the history of our country he was Director of the Pulkovo Observatory and its Simeiz Division and promoted in continuous astronomical observations, equipment preservation and support of the staff working efficiency.

BERLIN Alexander Borisovich



Born 26.12.1936. A Research Technician (1954), a Development Engineer in Radio Astronomy Department at the Main (Pulkovo) Astronomical Observatory, AS of the USSR (1968), a Leading Engineer of the Special Astrophysical Observatory, AS of the USSR (from 1969). In 1968, graduated from Northwestern State Technical University (Leningrad). In 1984, finished his Ph.D. thesis on "High Sensitive Radiometric Complex RATAN-600 for the Continuum Study of Cosmic Radio Sources". The Head of Laboratory of high-sensitive receivers at the Special Astrophysical Observatory, AS of the USSR (1976). The Chief Structural Engineer of the RATAN-600 radio-electronic (1984). An IAU member, a Member of the "Radio Astronomy" Board, RAS. He was awarded the Order of the Badge of Honor (1978) and Medal for Veteran of Labor. Died 05.01.2015 in Zelenchuk.

A.B. Berlin joined the Radio Astronomy Department of the Pulkovo Astronomical Observatory in August 1954 after completing High school, and since then his life had been totally devoted to radio astronomy instrument engineering.

At first, A.B. Berlin designed radiometers for the Big Pulkovo Radio Telescope – the first large radio telescope in the world and then participated in the development of the receiving equipment and solar eclipse observations in New Zealand, Cuba, and Mexico.

In the 70s, A.B. Berlin made a substantial contribution to the design of the RATAN-600 equipment with a unique multi-frequency receiver complex. Since then, systematic measurements of cosmic radio emission from the Solar system objects, galactic and extragalactic objects, and the CMB fluctuations have been made with the instrument.

A.B. Berlin and D.V. Korolkov's school became leading in the field of radio astronomy instrument engineering in the Soviet Union. For the first time, tunnel and parametric amplifiers were developed and applied. In the 80s, pioneering work was done on the implementation of broadband low-noise transistor amplifiers with cryogenic cooling. For the first time in Russia, the micro cryogenic systems with hydrogen cooling providing sensitivity of radiometers on a global level were applied and they had been used for at least 30 years on a large scale. The multifrequency complex of high-sensitivity radiometers created under A.B. Berlin's leadership still provides the basic RATAN data, although, with modern components: uncooled transistor amplifiers with hetero-structures.

A.B. Berlin organized collaboration between specialized organizations in Russia to equip the radio telescope with the latest receiving devices. He was an ideologist in creating a successful implementation of the MARS unique 16-channel matrix complex at a frequency of 30 GHz. For the OKTAVA project, the idea of an ultra-broadband primary feed with a single-phase center at decimeter wavelengths was technically implemented for the first time in Russia. A.B. Berlin had a strong reputation in the field of radio astronomy instrument engineering; his expert evaluation was highly respected among other experts in radiometric instrumentation in Russia. He trained several generations of talented students who continue his legacy.

BIKMAEV Ilfan Fyaritovich

Born 22.04.1961, Andizhan city, Republic of Uzbekistan. Educated in Astronomy from Kazan State University (1978-1983). During the period 1983-1995 he has worked in the Special Astrophysical Observatory of the Soviet Academy of Sciences (now Special Astrophysical Observatory of Russian Academy of Sciences) at staff positions – engineer, researcher, scientific secretary. PhD student of SAO (1987-1991), Candidate of Sciences (1992). He works at Kazan University since 1995 (now Kazan (Volga region) Federal University) at staff positions – senior researcher, assistant professor, full professor, head of Department of Astronomy and Satellite Geodesy of Institute of Physics (2014-2020). Doctor of phys.-math. Sciences (2008). IAU Member (1997), EAS Member (1996). Head of "Astrophysics" Center of Tatarstan Academy of Sciences (Kazan). Corresponding Member of Tatarstan Academy of Sciences (2016).

Main scientific investigations belong to the fields of stellar and extra-galactic astronomy. I.F.Bikmaev is co-author of more than 100 scientific publications.

During 1985-1995 he obtained a large set of high-resolution stellar spectra by using 6-m telescope facilities (together with V.E.Panchuk and V.G.Klochkova) and investigated chemical compositions of solar-type stars of different Galaxy populations. In collaboration with N.A. Sakhibullin and L.I.Mashonkina (Kazan University) applied a non-LTE approach to determine abundance patterns of several chemical elements (Li, Na, Mg, Al, Fe, Ba) in the atmospheres of solar-type stars of different metallicity. In the same period, together with F.A.Musaev and G.A.Galazutdinov (SAO), he developed high-resolution echelle-spectroscopy at Coude foci of 1-2-meters telescopes.

I.F.Bikmaev was invited to Kazan University in 1995 to carry out works belong to the International project of 1.5-meter Russian-Turkish optical telescope (RTT-150) with a partnership of KFU, Academy of Sciences of Tatarstan (Kazan), Space Research Institute of RAS (IKI, Moscow), TUBITAK National Observatory (Turkey). He has actively participated in the creation of the set of modern scientific equipment for RTT-150

– CCD-photometers, low and high resolutions spectrometers. During the period 2003 – 2021 I.F.Bikmaev (in collaboration with the groups of academician Rashid Sunyaev at IKI and MPA, Germany) participates in programs of ground-based support of international space orbital Observatories – INTEGRAL, RXTE, SWIFT, CHANDRA, PLANCK, SPECTRUM-ROENTGEN-GAMMA.

By using RTT-150 and 6-m telescope facilities he optically identified and investigated several samples of new hard X-ray sources (distant quasars, active galactic nuclei, close binary systems with compact objects) and distant massive galaxy clusters, discovered by space Observatories.

By using RTT-150 high-resolution spectral facilities I. Bikmaev (together with KFU, Turkish, and Japanese colleagues) has discovered in 2017 a Jupiter mass planet around red giant star HD208897.

He participates in the program of complex investigations of the near-Earth hazard asteroids by using RTT-150 astrometry, photometry, polarimetry, and low-resolution spectroscopy.

I.F.Bikmaev leads actively scientific works with students, PhD students, and young researchers. He is the supervisor of two successful PhDs.

I.F.Bikmaev (together with his KFU Colleagues) is the Winner of the Tatarstan Republic's State Award in the field of Science (2009).

I.F.Bikmaev is a member of Russian inter-organizations

Working groups – «Minor Planet's Hazard" and "Development of Ground-based Astronomy". He is an expert of the Russian Academy of Sciences in the field of Astrophysics.

BISIKALO Dmitry Valerevich

Born 03.05.1961 in Irkutsk, Russia. In 1984 graduated from the Moscow Institute of Physics and Technology (MIPT). Since 1987 he has been working in the Astronomical Council of the USSR (Astrosovet, in 1991 it was renamed to the Institute of Astronomy of the USSR, now the Institute of Astronomy of RAS – INASAN) in various scientific positions. Since 2016 – director of INASAN.
Doctor of Physical and Mathematical Sciences (1998), Professor (2010), Corresponding Member of the Russian Academy of Sciences (2011). Chief editor of "Astronomy Reports" since 2015.
The asteroid 269485 Bisikalo was named in honor D.V. Bisikalo.

D.V. Bisikalo is an expert in the fields of gas dynamics of interacting binary stars, the accretion discs, and the atmospheres of planets of the solar and extrasolar systems. D.V. Bisikalo is actively involved in the development of numerical methods for the study of astrophysical objects by the methods of molecular (solving the kinetic Boltzmann equation) and continual (Euler gas dynamic equations) gas dynamics. Results of his work are published in 6 monographs, 4 reviews, and more than 250 scientific articles. D.V. Bisikalo's scientific results received international recognition and are widely cited in the literature. His work was awarded prizes of the "MAIK-Nauka" Publishing house for the best publication in 1996 and 2010, the main prize of the "MAIK-Nauka" Publishing house for the best publication in 1999, the RAS Prize of A.A. Belopolsky in astrophysics (2011).

His main scientific achievements:

– Development of a fundamentally new direction in the study of binary stars, combining astrophysical observations with gas dynamic and MHD simulations.

– Development of a self-consistent model of mass transfer in close binary stars.

– Investigation of the accretion disc structure in binary stars. Discovered the existence of a new type of "precession" density waves in the discs. In collaboration with his colleagues proposed a scenario of the development of turbulence in accretion disks of nonmagnetic binary stars.

– Developed (in collaboration with his colleagues) a numerical kinetic model of the interaction of high-energy particle fluxes with the atmospheres of planets. The model is widely used in a number of space experiments (HST, EXOMARS, JUNO) to study the atmospheres of the planets of the solar and extrasolar systems.

– The possible existence of a non-spherical, extended, stationary atmosphere of the "hot Jupiter" type exoplanets was discovered. Verification of this hypothesis using observations from the Hubble Space Telescope confirmed the validity of the model.

– The electromagnetic radiation from merging black holes surrounded by an accretion disk is predicted.

D.V. Bisikalo actively works with young scientists. He is a professor of MIPT; about a dozen PhD and doctoral theses were defended under his leadership.

D.V. Bisikalo is vice-chair of the RAS Council on Space, member of the International Astronomical Union, president of the Commission "Computational Astrophysics" of the International Astronomical Union, member of European Astronomical Society.

More information about D.V. Bisikalo can be found in the Wikipedia link – https://en.wikipedia.org/wiki/Dmitry_V._Bisikalo

BISNOVATYI-KOGAN Gennady Semenovich

Born 06.12.1941 in Michailovka, Saratov reg., USSR. 1958-1967 graduate, postgraduate student of Moscow Physical-Technical Inst., supervisor: Ya.B. Zeldovich
Working 1967-1974 in Keldysh Institute of Applied Mathematics RAS, 1974 – present time in Space Research Institute RAS (IKI). PhD thesis (1968), Doctoral thesis (1977), Professor (1991), IAU member since 1970. Awards:
JSPS Fellowship, Tokyo Univ. (1978), Kapitsa Fellowship of Royal Society (1994), Perren Professorship Queen Mary College Univ. of London (1995), Prandtl Fellowship, Univ. of Goettingen (2000), Barabashev Award of National Acad. Sci. of Ukraine (1999). Member of European Academy of Sciences (Brussels) since 2002. Member of editorial boards of several astronomical journals.

G.S.Bisnovatyi-Kogan is the author of more then 550 scientific papers and reviews on stellar physics, supernovae explosions, accretion theory, X-ray and gamma ray astronomy, stellar system dynamics, cosmology, gravitational lensing. The idea of the magnetorotational supernovae model with collapsing core (1969), Numerical calculations in IKI group had shown high efficiency of this mechanism, and important role of magnetorotational instability strongly decreasing a time of the explosion. Prediction of existence of binary radiopulsars, their recycling, and magnetic field decay, was made in 1973. First binary pulsar was discovered in 1975. Nonequilibrium heating in beta reactions and its importance in SN was found in 1970. Critical stellar parameters at the border of collapse (1966), and limiting mass of hot neutron stars (1968) had been found. Prediction of X-ray radiation from young T Tauri stars (1977) was done, discovered in observations by Einstein satellite. In the accretion theory was first found formation of accretion disc coronae; first indication of convective instabilities in accretion disc around black holes (1976); formation of large scale magnetic fields in the vicinity of black holes (1976), model of advective accretion disk was first calculated. Formation of non-equilibrium layer in neutron star crust, processes in relativistic plasma were investigated, and upper temperature limit in the optically thin pair plasma was found.

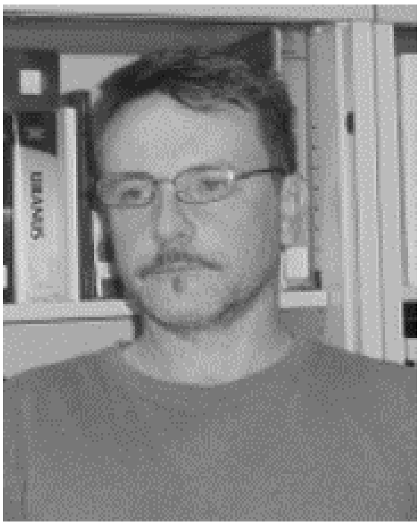
In the field of stellar dynamics the investigation of stability of binary galaxies with account of tidal forces, and kinetic instabilities in non-collision gravitating media had been first investigated. In general relativity was shown the existence of stable stellar system with arbitrary large central red shift, and binding energy close to the rest mass energy. Collision integral for gravitating particles without divergences was derived due to account of the universe expansion. The size of the non-zero rest mass neutrino horizon in the expanding universe first was found, and the middle energy neutrino background from core-collapse supernovae (1-100 MeV) was calculated. A new method of registration of neutrino from core-collapse supernovae was suggested, by correlated observations of rapid electrons, and free neutrons from highly excited nuclei. Analytic model of the magnetic jet collimation due to torsion oscillations was constructed. New effect of gravitational lensing was discovered, which is connected with chromatic dependence of the angle of lensing of the light ray by the gravitational body, in presence of a uniform plasma. The size of a black hole shadow of very distant supermassive black holes at large redshifts was calculated. This size is increasing with increasing of redshift due to universe expansion.

Books: "Physical problems of theory of stellar evolution (1989 in Russian).The English translation in two volumes as "Stellar Physics", in 2001, Springer. Updated second edition of Vol.2 "Stellar evolution and stability" was printed in 2011 by Springer. "Relativistic Astrophysics and Physical Cosmology", published in 2010 by URSS (Moscow), in Russian

He was a supervisor of 16 PhD theses and works as professor, giving lectures to students of National Research Nuclear University MEPhI since 2005 year.

Email: gkogan@iki.rssi.ru.

BIZYAEV Dmitry Vasilevich

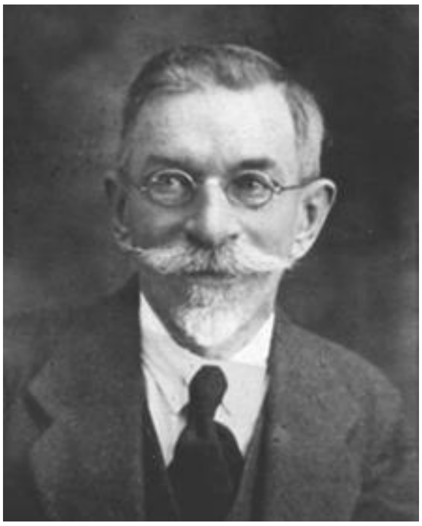


Born 07.02.1969 in Saratov. Graduated from the Physics Faculty of M.V. Lomonosov Moscow State University in 1993 (astronomy major). Completed his PhD in 1997. Worked at the Sternberg Astronomical Institute of M.V. Lomonosov Moscow State University (SAI MSU), at the University of Texas, at the National Optical Astronomy Observatories, and at the Apache Point Observatory of New Mexico State University. From 2015, Senior Researcher at the Extragalactic Department at SAI MSU.

D.V. Bizyaev has a broad range of scientific interests: astronomical photometry and spectroscopy, extragalactic astronomy, physics of galaxies, star formation, galactic dark matter, observational cosmology, stellar astrophysics, massive stars, astronomical observations, large sky surveys, and astronomy education.

D.V. Bizyaev began his research in extragalactic astronomy at SAI MSU, where explored connection between galactic disk instabilities and star formation led by prof. A. V. Zasov. Developed new methods of determining extragalactic distances. Worked on a reference catalog for future space astrometry missions, observational stellar spectroscopy, stellar spectra analysis, and precision stellar radial velocities. Later focused on research of galactic subsystem properties via the exploration of galactic disk vertical structure. Studied properties and motion of high altitude ionized gas in galaxies, as well as the gas exchange between the galaxies and circumgalactic medium. Investigated the nature of unique galaxies with extremely thin disks and highlighted the importance of cosmologic environment and dark halo features in the creation and evolution of superthin galaxies. An active participant of the Sloan Digital Sky Survey (SDSS) from 2007. The asteroid 114022 (2002 UZ51) discovered by SDSS was named Bizyaev. D.V. Bizyaev is the author and co-author more than 400 professional papers.

BLAZHKO Sergey Nikolaevich



Born 05(17).11.1870 in Khotimsk, Mogilyov province (now Mogilyov region, Belarus). In 1892, graduated from the Faculty of Physics and Mathematics, Moscow University. Assistant professor (1894) of the Moscow university observatory. Associated professor (1910), professor (1918) of Moscow University. Corresponding member of the USSR Academy of Sciences (1929). Deputy director (1918–1920), director (1920–1931) of the Moscow university observatory, director of the Institute of Astronomy and Geodesy of Moscow State University (MSU) (1922–1931). Head of the MSU astronomy chair (1931–1937), MSU astrometry chair (1937–1953). Died 11.02.1956 in Moscow.

B. was a disciple of Prof. V.K. Ceraski. He was an expert in variable stars, an author of several original designs and improvements of observational instruments. He founded the Moscow school of variable-star research. For more than 20 years, he headed the Variable-star Commission of the Astronomical Council (the USSR Acad. Sci.). In 1904–1907, using equipment of his own design, B. was one of the world-first to photograph meteor spectra and provided their first correct explanation. In 1911–1914, he performed the first analysis of the influence of star-limb darkening on light curves of Algol-type eclipsing binaries and suggested a method of correction for this effect when improving orbital elements of binary systems. He discovered variations of periods and light-curve shapes for several short-period RR Lyrae stars (the “Blazhko effect”). Participating in observations of a total solar eclipse (1914), he used an instrument of his own design to prove that the light from the solar corona was polarized. In 1919, he suggested a new method of discovering asteroids on photographs, developed an original technique for determining coordinates of celestial bodies. In 1895, following guidance of V.K. Ceraski, he initiated systematic photographing of the night sky aimed at discoveries of variable stars, thus founding the famous SAI astronomical plate collection. B. designed several instruments: a non-slit stellar spectrograph, a blink microscope for detecting new variable stars, a device attenuating star light when observing star passages with a meridian circle, etc.

B. delivered MSU lecture courses on practical and general astronomy, initiated the first MSU lecture course on general astrophysics. He was the author of three university textbooks: “A course of practical astronomy” (1938), “A course of general astronomy” (1947), “A course of spherical astronomy” (1948). He authored the first fundamental history of the development of astronomy in Moscow university. B. had several state decorations (orders and medals). In 1934, he got the title “Distinguished Person in Science and Technology of Russian Federation”; in 1952, he was awarded Stalin Prize for his course of spherical astronomy. B. authored more than 100 scientific publications. The minor planet No. 2445 and a crater on the Moon’s back side were named after him.

BLINNIKOV Sergei Ivanovich

Born 25.11.1948, in Okha, Sakhalin. In 1972, he graduated from M.V. Lomonosov Moscow State University (the Physics Faculty, the Astronomy Department). Yakov Zeldovich and Gennady Bisnovatyi-Kogan were his research advisors. Completed his Ph.D. with a thesis titled "Equilibrium and stability of rotating stars". His doctoral dissertation "Non-stationary radiation and hydrodynamic processes in supernovae" was defended in 2000. Currently S.I. Blinnikov is a Principal Scientist at the Alikhanov Institute for Theoretical and Experimental Physics of NRC "Kurchatov Institute". Member of the IAU.

S.I. Blinnikov's research interests range from the models of dark matter to supernovae and gamma-ray bursts. The author of over 300 scientific papers. His work is widely known in the world, with more than 4,000 references to his research results. He collaborates with scientists all over the world, including Germany, Japan, the USA, Sweden and other countries.

In the 1970s, S.I. Blinnikov started his research career with the work on the stability of rotating stars and magnetized gas disks. S.I. Blinnikov and G.S. Bisnovatyi-Kogan were the first who predicted the formation of a hot corona in accretion disks around black holes.

In 1983, in collaboration with M.Yu. Khlopov, S.I. Blinnikov examined in detail the so-called mirror matter. They were the first to suggest it is one of the possible dark matter candidates.

In his research paper "Exploding neutron stars in close binaries" (1984), S.I. Blinnikov, in collaboration with I.D. Novikov, T.V. Perevodchikova, and A.G. Polnarev, suggested the possible origin of a class of gamma-ray bursts as a result of mass exchange in a close system of two neutron stars with the subsequent explosion of a low-mass component. Later, in 1990, this model was studied by the authors in more detail using the numerical calculations of D.K. Nadyozhin and V.S. Imshennik. At that time, the model did not attract much attention, but almost 30 years later, in 2017, the parameters of an unusual gamma-ray burst accompanying the first observation of a gravitational signal from a merger of neutron stars, surprisingly agreed with the calculations of 1990! The work proved to be a remarkable manifestation of the authors' intuition.

Various aspects of the theory of stellar explosions and related physical phenomena are the main topics of the S.I. Blinnikov' research. He developed one of the world's most successful radiation-hydrodynamic numerical codes for calculating the supernova light curves. This code is employed for the simulation of the radiation from all types of supernovae, including very peculiar superluminous supernovae, whose luminosity is two orders of magnitude higher than that of ordinary ones. In collaboration with foreign colleagues S. Woosley and A. Heger, S.I. Blinnikov developed the idea of D.K. Nadyozhin on the interaction of the supernova ejecta with the extended circumstellar medium, which provides the natural explanation for these objects. S.I. Blinnikov's research on the instabilities of flame propagation (in collaboration with P.V. Sasorov) and on the role of spectral lines in the opacity of the supernova material expanding with high velocity was also very important for the understanding of supernova explosions.

In addition, S.I. Blinnikov's achievement is also a purely mathematical work (in collaboration with R. Moessner) on the development of an algorithm that most efficiently calculates the terms of the Edgeworth series, which is an expansion that determines the difference between any distribution and a Gaussian one. The expansion finds applications not only in cosmology but also in geophysics, biology and economics.

BLINOV Nikolay Sergeevich

Born 04.10.1933 in Moscow. The student of MSU from 1951 to 1956. The high laboratory assistant since 1956. The junior researcher since 1961. He received phd degree on April 26, 1962. The high research associate of the Time service since November 1, 1967. Since December 1, 1972 – associate professor. Since May 16, 1977 he was the head of the Time service department of SAI MSU. Member of the 9 and 31 MAS commissions. He received doctor of science degree on July 6, 1990. The subject of the dissertation: "Determination of Universal time". Professor since July 6, 1992. Died 29.08.2002 in Moscow.

All life of Nikolay Sergeyevich was connected with SAI MSU. In 1957 when the first artificial satellite of Earth was launched, the laboratory assistant N. S. Blinov participated in work of the optical barrier – groups of observers who monitored the movement of the satellite using special telescopes with big field of sight. Many years Nikolay Sergeyevich worked hard as the observer at the transit instrument. In 1977 Nikolay Sergeyevich became the head of the Time service department of SAI MSU. He run regular observations of Earth rotation parameters during nearly 40 years, the active work on enhancement of equipment and methods of observations was carried out.

N. S. Blinov gave the considerable part of his time to pedagogical activities. From 1972 Nikolay Sergeyevich was the associate professor of physical faculty of MSU, and since 1992 – professor. He gave courses of the general and spherical astronomy, astrometry and a number of special courses. His special course "Time service" (the monograph "Exact time service", based on it, was written in a co-authorship with P. I. Bakulin) is most known. The first issue of this book was in 1968, and the second, considerably processed and added – in 1977. Under his leadership many phd students has received their phd degrees, his postgraduates work in SAI MSU and other Russian astronomical organizations. Nikolay Sergeyevich paid much attention to promotion of astronomy in Russia, he wrote articles to newspapers and magazines, appeared on television and radio.

In the 70th years of the 20 century the intensive development of new methods of astrometric measurements began. The RSDB method – the radio interferometer with superlong basis was the most perspective. Now this direction became the large part of the modern astronomy. The first N. S. Blinov’s article concerning this method was published in 1970, special attention was paid to the development of RSDB method basis.

N. S. Blinov is the author of 58 issued works, including 2 monographs.

He died 29 August, 2002, buried in Zvenigorod

BOBROV Mar Sergeevich

Born 15.02.1914, in Moscow. In 1939, graduated from the Moscow Institute of Education. In the Red Army in 1939-1945. PhD student of M.V. Lomonosov Moscow State University in 1946-1950. PhD thesis «Photometric analysis of the composition of Saturn rings» in 1951. Worked at the Moscow Institute of Energy in 1951-1957. Worked at the Astronomical Council of Academy of Science of USSR in 1957-1986. D.Sci. (1968, dissertation «Optical properties of Saturn rings»). Died in 1990 in Moscow.

M.S. Bobrov's research interests were in the field of planetary physics and solar-terrestrial physics. His major results are related to the nature of Saturn rings. These studies are summarized in his book «Saturn rings». M.S. Bobrov improved the classical Seeliger theory of light reflection from an ensemble of particles with the shadow effects. Using the new theory and the observational angular dependence of the brightness of the ring, M.S. Bobrov was able to recover estimates of body sizes in the outer rings (between centimeters and ten meters) and volume fraction occupied by these bodies (about one percent). These results were confirmed later by experiments performed with the fly-by space probe Voyager 1. In the field of solar-terrestrial physics, M.S. Bobrov studied the relation between properties of streams of solar plasma and various types of geomagnetic disturbances. He found that the crucial factors for the sporadic geomagnetic disturbances are the sign of the vertical (w.r.t. ecliptic) component of the interplanetary magnetic field of the solar plasma stream and the amplitude of magnetic field fluctuations. M.S. Bobrov published more than 80 scientific papers.

BOBYLEV Vadim Vadimovich

Born in 1958 in the city of Ozersk, Kaliningrad region, USSR. Student of Leningrad State University from 1975 to 1980. Since 1980 he is working at Central (Pulkovo) Astronomical Observatory of Russian Academy of Sciences. He defended his PhD thesis in 1995 on the topic "Research methodology of determining proper motions of stars relative to galaxies in the basis of photographic observations at Pulkovo". At Pulkovo Observatory took up the post of research Intern, head of the Ordubad expedition of the USSR Academy of Sciences, head of sector, head of laboratory. He defended his doctoral thesis in 2005 on the topic "Kinematic analysis of the Local Star System".

Scientific achievements of V. Bobylev related to the study of stellar motions. Together with colleagues N. M. Bronnikova and N. Shakht he is the author of the Pulkovo photographic catalog of absolute proper motions of stars in fields with galaxies (PUL2). Work on this catalog was the final stage of long-term work of Pulkovo astronomers devoted to the implementation of the international plan of A. N. Deitch. The PUL2 catalog is included in the Strasbourg database under the number of I/295.

Among the scientific interests of V. Bobylev a significant place is given to the study of the Gould Belt. He proposed a nonlinear method to study the own rotation and own extension of this star system. This method generalizes the previously known linear Lindblad's method.

V. Bobylev fulfilled the analysis of galactic orbits of the stars close to the Sun, which were computed using high-precision kinematic data from the HIPPARCOS catalog, with the purpose of determination of close approaches to the Sun in the past and the future. It was shown, in particular, the possibility of such approaches to a distance less than 1 pc (206265 a.u.). V. Bobylev has shown that the record belongs to the star Glieze 710, which approximately in1.5 billion years could get closer to the Sun at a distance of about 0.3 pc, so practically could enter into the outer layers of the Oort comet cloud. Such close approach may cause a comet shower, which after some time can reach the Earth's vicinity.

Together with A. Bajkova and I. Ramirez with his team he is the author of the discovery of the star in the Solar neighborhood, which is probably formed from the same dust and gas cloud as the Sun. This star is designated as HD 162826. In addition to the fact that its chemical composition is virtually indistinguishable from the Solar one, its orbit is close to the orbit of the Sun for a few billion years backward. Thus the star HD 162826 can be considered as a Solar sibling.

From the analysis of the distribution and kinematics of galactic masers with measured trigonometric parallaxes V. Bobylev together with his group has received new estimates of a number of important structural characteristics of the Galaxy. In particular, there were redetermined the value of the distance of the Sun to the Galactic center, the rotation velocity of the Galaxy and the parameters of the Galactic spiral structure. He has shown, for example, that our Galaxy most likely is characterized by a four-armed spiral pattern with pitch angle of about 13 degrees.

V. Bobylev has published more than 100 scientific papers. Repeatedly his research results were included in the list of achievements in the field of astronomy by decision of the RAS Scientific Council on Astronomy.

BOCHKAREV Nikolay Gennadievich

Born 19.05.1947 in Moscow. In 1971, graduated from the astronomical dept., Faculty of Physics, Lomonosov Moscow State University (MSU). PhD, MSU, 1974. Staff member of Sternberg Astronomical Institute (SAI), MSU: junior, senior, leading researcher, head researcher, D.Sci., 1988. Full member of the Russian Acad. of Natural Sciences (1997). In 1976, trained in France, and in 1984 and 1991, in the USA.

Head of the section "Interstellar matter and star formation" of the Scientific Council on Astronomy (Russian Acad. Sci., RAS) since 1979. Member of the Council on Astrobiology of the RAS (2010). One of the main initiators of the Soviet Astronomical Society (now Eurasian Astronomical Society, EAAS), co-chaired it in 1990-2002. Honorary member of the EAAS. Founder and, since 1991, editor-in-chief of the scientific journal "Astronomical and Astrophysical Transactions".

B. authored more than 350 scientific papers and reviews and 8 monographs, including the textbook "Basic Physics of the Interstellar Medium". His main scientific works deal with interstellar matter, active galactic nuclei (AGN), X-ray binaries. He also has publications on astrobiology, archaeoastronomy, history of astronomy, and telescope construction.

In 1970–1973, B. developed a quantitative theory of interaction of penetrating radiation with rarefied cosmic plasma. He studied superbubbles around OB star associations; in 1986–1992, he showed that the Local Interstellar Medium was a superbubble created by the Sco–Cen OB star association. In 1988, B. discovered a new class of X-ray sources: nebulae formed by stellar wind.

In 1982, B. proposed a method of reverberation mapping of active galactic nuclei (AGNe) and, first in the world, began to put it into practice. Since 1986, he conducts, together with A.I. Shapovalova et al., monitoring of AGNs aimed at determination of mass, size, and structure of "the central engine" mostly by the reverberation mapping methods, and studying AGN long-term variability. In 1992–2002, he headed the Russian segment of the largest international program "AGN Watch".

Together with E.A. Karitskaya and N.I. Shakura, B. developed detailed models of photometric variability and linear polarization variability of binary X-ray sources and obtained restrictions on system parameters, including those for the first black hole candidate, Cyg X-1 (1975). He studied optical manifestations for a number of other binary X-ray sources. In 2007–2009, together with E.A. Karitskaya, he discovered magnetic fields in systems containing black holes.

B. is an active public figure, the founder of the EAAS, honorary member of the Armenian Astronomical Society, Association of Planetaria of Russia, founder member of the European Astronomical Society, European Association for Promotion of Science and Technology (Euroscience), vice-president of the Union of Scientific Organizations of Russia (1993–1996), member of the IAU (since 1984) and several other scientific societies. B. is an honorary scientist of the MSU, honorary person of higher education of the Russian Federation, honorary person of science and technology of Moscow. He was awarded the medal "In Memory of the 850 Anniversary of Moscow" (1997), the breastplate "250 years of the MSU" (2004), the medals of the EAAS (2008) and "100 years of the Tunguska meteorite" (2008), the diploma of the Nizhny Novgorod Region governor (2007). One of the Main belt asteroids is named "19915 Bochkarev".

BOGACHEV Sergey Alexandrovich

Born 17.03.1974 in the city of Meshchovsk, Kaluga region. In 1997 he graduated from the Moscow State University (MSU) with a degree in Astronomy. Since 2000, after postgraduate studies, he is an employee of the SAI (GAISH) MSU – an engineer, then a scientific researcher. From 2005, he works in LPI (FIAN): senior, then leading then principal researcher. From 2008, he is the Doctor of Science in physics and astronomy. Since 2018, he is a Professor at the Russian Academy of Sciences.

His main scientific works are related to the fields of astrophysics, solar physics, and space instrumentation. He is the author of about a hundred scientific works.

In the late 1990s – the first half of the 2000s, together with B.V. Somov (MSU), he developed a theory of particle acceleration in the solar corona in collapsing magnetic traps. Within the framework of the proposed concept, the formation of hard X-ray sources in the Sun's corona was explained, as well as the motion of X-ray sources during the impulsive phase of solar flares. The theory made it possible to bring the standard model of a solar flare into conformity with space experimental data in X-rays and EUV.

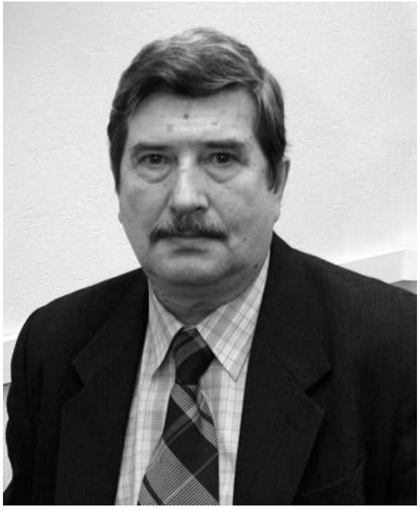
In the second half of 2000, he became one of the leaders in the study of high-temperature plasma in the solar corona and made a significant contribution to its theoretical description and research. He also took an active part in the design of space solar observatory KORONAS-Foton, launched in January 2009. Under his scientific guidance, multiple successful experiments were carried out onboard this observatory to study the Sun and the solar activity.

Since the beginning of the 2010s, he has been developing a new direction – the study of solar activity on a small spatial and time scale. Under his scientific guidance, the first EUV observations of the solar corona with a time cadence of about 4 s were conducted. The plasma acceleration in solar macro-spicules was measured for the first time; the plasma heating in extremely weak solar microflares was discovered; the energy distributions of solar nano-flares were measured in the energy range of 10^{24}-10^{25} erg.

He is the scientific leader of the ARKA space mission included in the Russian Federal Space Program. This observatory is designed to provide for the first time the imaging of the solar EUV corona with a spatial resolution of less than 100 km.

In 2008 he was awarded the Zeldovich Medal of the international COSPAR Committee for his contribution to space researches.

BOGDANOV Mikhail Borisovich



Born 28.02.1951 in Saratov. In 1973, he graduated (with honors) from Saratov State University (SSU) Physics Department majoring in Physics. For many years, he worked at the SSU Scientific Research Institute of Mechanics and Physics: a laboratory assistant (1969-1973), a junior research fellow (1973-1978), a senior research fellow (1978-2000), the Astronomy and Geophysics Lab Supervisor (2000-2009). He has been the Meteorology and Climatology Chair Professor (the Geography Department, SSU) since 2009 and the Head of the Chair (2014-2018).

PhD in Physics and Mathematics with a thesis titled "Research of Brightness Distribution across Red Giants Discs Based on their Lunar Occultations Observations" (1984). Dr. Sci. in Physics and Mathematics with a dissertation titled "Methods of Image Restoration and Investigations of Stars with High Angular Resolution" (1996).

While studying at university, M.B. Bogdanov started working as an observer at the Satellite Tracking Station No. 1044. He took part in photographic observations of planetoids, comets and variable stars. He was in charge of the complete astrometric processing of satellite photographic observations obtained by different stations of the Astronomical Council of the Academy of Sciences of the USSR. Since 1973 he has been involved in astronomy teaching at SSU.

His primary research area is stars exploration by methods of increased angular resolution for search for close binary stars, measuring stars angular diameters, and analyzing the brightness distribution across their discs. He developed new efficient algorithms for signal and image restoration based on the general regularization theory of ill-posed problems and offered new approaches to solving image restoration phase problems. Application of this technique to the analysis of lunar occultation observations of stars and speckle interferometry data made it possible to detect a series of close binaries, measure angular diameters and obtain brightness distributions across discs of late spectral types giant stars. The problem of the source function restoration in the stellar atmosphere has been solved and temperature distribution in the extended atmosphere of a Wolf-Rayet star of the V444 Cygni system has been obtained.

In cooperation with A.M. Cherepashchuk, a member of the Academy of Science, the possibilities of exploitation of gravitational microlensing effect by compact objects for researching brightness distribution across stellar discs, studying accretion discs surrounding supermassive black holes in active galactic nuclei, as well as obtaining estimates of masses and proper motion components of gravitational lenses have been investigated. A technique has been developed for searching exotic species of matter, including clusters of weakly interacting massive particles, space-time tunnels (wormholes), and magnetic monopoles based on the analysis of photometric, chromatic, and polarization effects of stellar gravitational microlensing.

In collaboration with O.G. Taranova, Dr. Phys.-Math. Sci. (1938-2017), models of dust shells of late spectral types giant stars, Miras, and symbiotic novae were developed.

M.B. Bogdanov investigated the effects of cosmic rays with the Earth's atmosphere interaction and insolation changes resulted from planetary perturbations of the Earth's orbit, as well as cosmic factors effects on the Earth's climate system. The time constant and sensitivity of the system to changes in radiative forcing were estimated.

M.B. Bogdanov is the author and co-author of one monograph and about 200 scientific papers. He is an expert of the Advanced Studies Fund and a member of the Scientific Council for Astronomy of the Russian Academy of Sciences (RAS).

BOGOD Vladimir Mikhailovich

Born 06.06.1942 in Tashkent, Uzbek SSR. He studied at Radiotechnical Institute in Taganrog from 1961 to 1966 and then became a specially appointed post-graduate student at the Radio-astronomy division (he began his post-graduate course in 1968 at the Main Astronomical Observatory of the Academy of Sciences of the USSR and finished it in 1972 at the Special Astrophysical Observatory of the Academy of Sciences of the USSR). Since 1973 V.M. Bogod has been working at the Special Astrophysical Observatory of the Academy of Sciences of the USSR (Russian Academy of Sciences since 1991) first as the Head of a group in the positions from Junior to Chief Researcher, and since 2004 as the Head of St. Petersburg Branch of the Special Astrophysical Observatory of the Russian Academy of Sciences. V.M. Bogod defended a Ph.D. thesis in 1981 and a Dr.Sci. thesis in 1993.

The main research field of V.M. Bogod are solar radio astronomy studies carried with big reflector antennas (first the Large Pulkovo Radio telescope and then RATAN-600 radio telescope). V.M. Bogod has published over 160 scientific papers and two monographs coauthored with other researches «Plasma heliophysics» and «Extreme nature disasters and catastrophes».

V.M. Bogod directed the development of several high-precision spectroscopic complexes covering milti-octave frequency range of the RATAN-600 radio telescope with high-precision polarimetric measurements. The most advanced of these complexes covers the entire frequency range of RATAN-600 with a 1% frequency resolution and high polarization measurement accuracy simultaneously at 112 wavelengths, and has no analogs among solar-study instruments. Optimization of spectral complexes combined with the high performance parameters of the radio telescope made it possible to significantly develop various techniques for the analysis of the properties of the solar coronal plasma.

In 1975 V.M. Bogod together with D.V. Korol’kov discovered small-scale radio brightness fluctuations in the solar atmosphere (the so-called ”radio granulation”) and investigated the main properties of these fluctuations. In 1986-2000 he developed, together with G. B. Gel’freikh, a number of methods for measuring magnetic fields in the corona and chromospheres both by thermal and cyclotron emission. These measurements remain unique and serve as reference data for the development of modern radio heliographs. In 1999-2005 V.M. Bogod, together with L.V. Yasnov, used fine spectro-polarization measurements to discover long-term nonthermal decimeter-wave emission in the form of microflares and developed a theory that explains the generation of these events in terms of magnetic-field reconnection at the tops of archlike structures. In 2001-2008 V.M.Bogod discovered a number of effects involving the inversion of circular polarization, which allowed preflare current structures and magnetic arches in the solar atmosphere to be detected using radio-astronomical methods. During the period from 2005 to 2016 V.M. Bogod, together with L.V. Yasnov, developed a precise multiwave polarization spectroscopy method for measuring the vertical structure of the coronal magnetic field above a sunspot with RATAN-600 radio telescope.

Since 2013 V.M. Bogod is a professor of St. Petersburg National Research University of Information Technologies, Mechanics and Optics. V.M. Bogod is a member of a number of research and expert boards, member of the IAU, European and Russian astronomical societies, member of the Solar section bureau of the Astronomical Council of the Russian Academy of Sciences. Honored Scientist of the Karachay-Cherkess Republic (2008).

BOGOMAZOV Alexey Ivanovich

Born 03.12.1978 in Kaliningrad. Graduated from Falulty of Physics of M. V. Lomonosov Moscow State University, the speciality is astronomy (astrophysics). In 2005 he defended PhD thesis on the theme «Calculation of the evolution and observational manifestations of neutron stars and black holes in binary systems» under the supervision by Prof. V. M. Lipunov. Since 2005 he is a permanent staff member of P. K. Sternberg Astronomical Insitute of M. V. Lomonosov Moscow State Universtity. In 2021 he defended the Doctor of Sciences thesis entitled «The evolution of close binary stars in the frames of scenario approach».

Main scientific results relate to the population synthesis of evolution of close binary stars using the «Scenario Machine» code and to the search of additional bodies in eclipsing binary stars using photometric observations. Author of more than thirty scientific publications in WoS/Scopus journals. He showed that a radio pulsar paired with a non-degenerate star can be used as a probe to find the density of the optical star`s wind and the orientation of the wind`s structures using observations of the absorption and changes of the dispersion measure of the radio emission by the wind. Also he showed that radio pulsar can be an indicator of the temperature distribution of the non-uniformly heated optical star (if the orbit of the pulsar is close to the plane of the sky) using observations of the hard emission originated as the result of the inverse Compton scatter of the soft emission of the optical star on relativistic particles of the pulsar. He found that the total mass of merging carbon-oxygen white dwarfs exceeding Chandrasekhar limit drops in the evolutionary process by 10% in average during 1-2 billion years after the star formation burst, and the difference between the maximum and minimum summary mass is at least 1.5 times during the most of the age of the Universe, and the fat majority of the most massive white dwarfs should be results of mergers of white dwarfs with less masses. He conducted computations according to which neutron stars in close binary systems can accumulate the matter until the Oppenheimer-Volkov limit with the subsequent accretion induced collapse with the formation of low mass black holes. He showed that the frequency of collapses of cores of Wolf-Rayet star in most close binary systems is enough to explain long gamma ray bursts as a phenomenon associated with the evolution of close binary stars. He calculated possible evolutionary tracks of the Cyg X-3 system predicting the CG X-1 system (BH+BB: the black hole paired with the Wolf-Rayet star filling its Roche lobe) and the second gravitational wave event GW151226. Also he showed that the first gravitational wave event GW150914 can be described as the final result of the evolution of the close binary stellar system. Winner of several grants for young PhDs (Scolarship of MSU 2008, 2009, Presidental grant 2009, grant of MSU 2009, 2010, grant of RFBR 2012). Member of the subject committee of Moscow and regional olypiads on astronomy. Teaches astronomy in School of young researcher of the cosmos of the Fuculty of Space Research of MSU.

BONDAR' Natalia Ivanovna

Born 01.02.1948, Izobilnoye, Nizhnegorsky region, Crimea). In 1970 she graduated from Crimean Pedagogical Institute, since 1966 – a member of the All-Union Astronomic-Geodesic Society (VAGO) and Secretary of its Crimean branch in 1970–1977. Since 1980 she has been working at the Crimean Astrophysical Observatory, sen-ior researcher, PhD in Phys. and Math. (2001).

The basic researches relate to studying non-stationary stars and magnetic activity of red dwarfs by methods of photometry and spectrophotometry. N.I. Bondar' obtained extensive observational data for different types of stars: symbiotic, long-period Mira stars, eclipsing system ε Aur, K-M dwarfs, Orion Trapezium stars. Based on these data she studied in detail energy distributions at different stages of developing their activity, estimated a relative contribution of each component in symbiotic systems and titanium molecular bands in Mira stars, and detected the signs of pulsations of the white dwarf in the CH Cygni system.

N.I. Bondar' participated in several cooperative programs, including the study of energy distribution in PU Vul and ε Aur stars based on ground and space observations from the Astron station in the wide range, including the UV region. As a result, parameters of hot components of these systems were determined.

In the papers concerned with problems of magnetic activity of the red dwarfs she searched for and studied stellar cycles, investigated in detail individual stars and a level of their spottedness, relationships between stellar physical parameters and activity indices, changes in the activity level during stellar evolution. The stellar cycles of some dwarfs were found to be 3–5 times longer than the 11-year solar cycle and spots cover photospheric areas dozens of times larger than on the Sun. It was found that fast rotating K dwarfs with the rotation period less than 5 days are distinguished by the highest level of activity among BY Dra stars. The role of age and structure of stellar systems in the manifestation of certain types of non-stationarity is considered in her thesis. N.I. Bondar' authored more than 100 publications, the results on activity of K-M dwarfs are included into monographs by R.E. Gershberg, and photometric studies of Orion Trapezium stars – into the book by E.A. Vitrichenko Orion Trapezium (in Rus.).

N.I. Bondar' significantly contributed to preserving the historical heritage of the Crimean Astrophysical Observatory, creating a database of plate collection of the Simeiz Observatory and organizing CrAO Virtual Observatory, participated in projects on including CrAO into the list of objects of the World heritage protected by UNESCO, a co-author of the book Crimean Astrophysical Observatory. N.I. Bondar' is involved in the work on popularization of astronomical knowledge. An organizer of the astronomical correspondence school in the Minor Academy of Sciences of Crimea named Iskatel. She was awarded the prize of the State Council of the Republic of Crimea.

BORDOVITSYNA Tatiana Valentinovna

Born 28.12.1940 in Novosibirsk. In 1963 she graduated from Tomsk State University (TSU) and was left to work at this university, where she works constantly. In the years 1964-1968 she completed her postgraduate studies at TSU. In 1972 she received her candidate's degree and in 1987 – a doctoral degree. In 1991 she received the title of professor. In different years she held positions of assistant, associate professor, professor of the department, head of the department, combining teaching work with a scientific at the Research Institute of Applied Mathematics and Mechanics (RIAMM) of TSU, where she acted as a senior researcher, head of laboratory and head of department. At present she is a professor at the Department of Astronomy and Space Geodesy at TSU Faculty of Physics and manages the Department at RIAMM of TSU.

The main scientific works are connected with the creation of high-precision numerical algorithms for predicting the motion of celestial bodies and the study of the dynamics of the satellites of the planets. In 1968-73, together with Bykova L.E., the numerical theories of the motion of the group of external satellites of Jupiter were constructed. The results of this work were published in the monograph "Numerical theories of the motion of VI, VII and X of the satellites of Jupiter and ephemeris to 2000" published in 1974 by the publishing house of TSU.

In the late 70's and early 80's, there was a need for high-precision numerical algorithms for predicting the motion of small bodies of the solar system, including artificial Earth satellites. In the RIAMM of TSU a group of specialists successfully worked on the creation of such algorithms under the leadership of Bordovitsyna T. V. The results of the work were published in two monographs, one of which "Modern numerical methods of celestial mechanics" without co-authors was published in 1984 in the publishing house "Nauka", and the second collective monograph "Numerical algorithms for high-precision prediction of the satellite motion" was published in 1991 by the publishing house TSU.

Since the beginning of the 2000s, T. V. Bordovitsyna, together with a group of young employees of the RIAMM of TSU, has been studying the dynamics of near-Earth and near-Moon objects of artificial origin. Software complexes for numerical modeling and investigation of the chaotic motion of large systems of artificial satellites of the Earth and the Moon, for determining the parameters of the motion of artificial satellites of the Earth based on measurement data have been created in the environment of parallel computing. A numerical method for modeling the process of formation of cosmic debris particle fluxes during explosions and collisions has been developed. A numerical-analytical technique for detecting and studying secular resonances in the motion of near-Earth and near-Moon objects has been developed, and a number of fundamental results on the dynamic structure of near-Earth and near-Moon orbital spaces have been obtained.

Bordovitsyna’s list of papers includes more than 100 titles. She is a member of the Council of RAS on astronomy, a member of the Eurasian Astronomical Society, a federal expert on celestial mechanics. Bordovitsyna T.V. noted the state medal "For Labor Valor" (1986). She was given the rank “Honored Worker of the Higher School of the Russian Federation” (2002), as well as several departmental awards of the Cosmonautics Federation . The Main-belt asteroid 9262 Bordovitsyna, discovered on September 6, 1973 by T. M. Smirnova (Crimean Astrophysical Observatory), is named in honor of T. V. Bordovitsyna.

BOROVIK Valeriya Nikolaevna

Born in 1938. Scientific consultant of the Central Astronomical Observatory at Pulkovo of the Russian Academy of Sciences (2014), Doctor of Sciences (Physics and Mathematics), 1998. Died 03.02.2021 in St. Petersburg.

Dr. Borovik is an expert in the fields of radioastronomy and solar physics, the author of over 200 scientific publications.

Borovik is working at Pulkovo Observatory since 1960. She was engaged in methods, analysis and interpretation of solar observations at microwaves obtained with the Large Pulkovo Radio-telescope, the radiotelescope RATAN-600 and during solar eclipses. Her main studies based on the solar radio observations during the period of over four 11-year solar activity cycles were devoted to the quit Sun and its cycle variation, coronal holes, active regions and post eruptive arcades. Borovik V. – an active member of "pulkovo" group of solar radio astronomers, and she has got the medal for investigations of the "peculiar sources" as the precursors of powerful solar flares.

V.Borovik and colleagues, using the large archives of RATAN-600 data and current solar observations, continue to search precursors of powerful (geo-effective) solar flares for their forecasting.

Dr.Borovik is a member of the International Astronomical Union.

BOYARCHUK Alexander Alekseevich

Born 21.06.1931 in Grozny. In 1953, he graduated from the Mathematics and Mechanics Department at Leningrad State University (major in astronomy). Worked at the Crimean Astrophysical Observatory from 1953 to 1987 (from 1969 to 1987 – Deputy Director). Worked at the Institute of Astronomy of the Russian Academy of Sciences (formerly the Astrosovet of the USSR Academy of Sciences) (from 1987 to 2003-Director, from 2003 to 2015-Scientific director). In 1976, elected to the corresponding member, in 1987, to the full member of the USSR Academy of Sciences. Died 10.08.2015 in Moscow.

A.A. Boyarchuk made a significant contribution to astrophysics in the field of interacting binary stars of different types. A.A. Boyarchuk was the first to propose the now generally accepted model of a symbiotic star, which closely linked the general principles of stellar evolution with observations of a wide class of nonstationary stars. The consolidated catalog of the rotational velocities of 2362 stars, compiled by him during his work at the Crimean Astrophysical Observatory, was unique at that time. Under A.A. Boyarchuk's guidance, a new direction in research of interacting binary stars, combining astrophysical observations with gas-dynamic calculations, was developed. The obtained results made it possible to explain many of the observed phenomena in binary systems of different types. An important area of research under A.A. Boyarchuk's leadership was the study of red giants by astrospectroscopy.

A.A. Boyarchuk was a prominent expert in extra-atmospheric astronomy. He was the scientific director of the successful Astron space experiment, the ultraviolet Astrophysical Observatory. A.A. Boyarchuk was awarded the USSR State Prize in Science and Technology for the development and creation of the astrophysical station "Astron". He was the head of the international space project "World Space Observatory-Ultraviolet" ("Spectrum-UV").

He was the head of the School of Experimental Astronomy at the Faculty of Physics, M.V. Lomonosov Moscow State University. "Studies of interacting stars" by A.A. Boyarchuk has a well-deserved world-class reputation.

He was the editor-in-chief of the Astronomy Reports, and also a member of the editorial boards of a number of journals.

He was awarded many Russian and international awards, including the Order of Merit for the Fatherland, IV and III degrees, the Order of Honor, and the Order of the Badge of Honor. The minor planet MPC 7785 is named after A.A. Boyarchuk.

He held positions in the Russian Academy of Sciences: 1990-2002 – member of the Presidium of the Russian Academy of Sciences, 2002-2015-Adviser to the Russian Academy of Sciences, Deputy Academician-Secretary, Academician-Secretary of the Department of General Physics and Astronomy, Chairman of the National Committee of Russian Astronomers, and for more than 10 years he was Deputy Chairman of the RAS Council for Space.

He was a member of many international and Russian societies and academies. In particular, from 1988 to 1997 he was a member of the top management of the International Astronomical Union (IAU), from 1991 to 1994 he was President of the IAU. He was a founding member of the European Astronomical Society.

BRODSKAYA Emma Semyonovna

Born 31.03.13 and spent her childhood in the village Yablon', Bryansk region. After a year at the Workers' Faculty of the Pedagogical Institute and a year of studying at the Institute of National Economy she entered Leningrad University. After graduation in 1939 she was taken on to the staff of the Abastumani Astrophysical Observatory. Died 19.02.2002 in Simeiz.

Supervised by V.B. Nikonov, E.S. Brodskaya was involved in photometric observations of variable stars. In 1945 she began her postgraduate study at the Crimean Astrophysical Observatory and in 1946 she arrived at the Koshka mountain, Simeiz Observatory, to work with G.A. Shajn, P.F. Shajn and V.F. Gaze. Here she continued photoelectric observations of variable and peculiar stars and in 1950 she defended the Ph.D. thesis "Electrophotometric study of some supergiants of early spectral types and Wolf-Rayet stars". E.S. Brodskaya continued these investigations until the 70s and studied the character of variability in the UBV bands of magnetic and symbiotic stars, blue supergiants, Wolf-Rayet stars, peculiar objects ρ Cas, EW Lac, CH Cyg. The high quotation of her papers in the prestigious international journals evidence about the quality of observations. In 1961 she was appointed a senior researcher.

E.S. Brodskaya was one of the first to involve in an extensive Plan of G.A. Shajn to study interaction of the interstellar medium and groups of early-type stars. It turned into the study of the Galaxy structure. The plates with direct sky images were obtained at the Dogmar telescope in Simeiz, and plates with images of spectra with an objective prism – at the 16″ telescope in Nauchny. Emma Semyonovna was the first observer at this telescope. She developed a method for spectral and photometric observations according to Shajn's Plan which was also used by followers of this program. Partly in cooperation with P.F. Shajn and N.B. Grigoryeva, E.S. Brodskaya investigated five areas along the Milky Way and derived photometric and spectral characteristics of nearly 15 thousand stars. This involves about a half of all the number of stars studied in the framework of G.A. Shajn's Plan. These data allow determining the structure of the absorbing matter, constitution of stellar clusters and associations, defining more precisely their sizes and taking distribution of different spectral-type stars in spiral arms of Orion and Perseus. She was the first to obtain reliably the light absorption in the direction of the Crab Nebula what allows clarifying the character of the continuum nebula's spectrum in optics.

In the last years Emma Semyonovna wrote notes on the history of the Simeiz Observatory, was a keeper of heart-warming traditions and a good hostess on the Koshka mountain.

BRONSHTEN Vitaly Alexandrovich

Born 18.10.1918 in Moscow. In 1947, he graduated from the mechanic and mathematics department of Moscow State University (MSU). In 1942-43 he worked at the Engelhardt Observatory; 1945-56 taught astronomy at pedagogical universities; 1948-64 lecturer, then scientific adviser to the Moscow Planetarium. Candidate of physical and mathematical sciences (1963). In 1964-83 – Scientific Secretary of the All-Union Astronomical and Geodetic Society (at the Academy of Sciences of the USSR). Since 1983, he worked in the Committee on Meteorites of the USSR Academy of Sciences; since 1985, senior researcher at the Astronomical Council of the USSR Academy of Sciences (now INASAN). Member of the editorial boards of scientific journals "Solar System Research" and "Earth and Universe". Died 01.02.2004 in Moscow.

He was a specialist in the field of solar system research and paid particular attention to meteor astronomy; a talented organizer of amateur astronomy club in the USSR, a popularizer of science, an astronomy historian. In 1937, he entered the astronomical department of the faculty of mechanics and mathematics of Moscow State University. During the Great Patriotic War, he worked at the State Union Geophysical Trust in Bashkiria and at the Observatory named after V.P. Engelhardt (Kazan). In 1945-48 he taught astronomy at pedagogical institutes in Moscow and Ryazan. He graduated from Moscow State University as an external student in 1947. He lectured at the Moscow Planetarium, in 1948-64 he was a scientific consultant there. In 1964-83 he was the scientific secretary of the All-Union Astronomical and Geodetic Society, which at that time was a highly respected scientific organization. Scientific interests of V.B. lay in the field of research of the Solar System. From 1938, he studied noctilucent clouds. He showed that meteoric particles serve as condensation cores for freezing ice crystals (1950). In 1970, his book was published in collaboration with N.I. Grishin "Noctilucent Clouds" (translated to English in 1973). In 1956, at the Shemakha Astrophysical Observatory (Caucasus), he observed the melting of the polar cap of Mars. In 1959, he constructed a diagram of the structure of the rays of the solar corona based on photographs of the solar eclipse of 1936. The most important works of V.B. are related to meteoric astronomy (more than 150 publications). Observed Draconids (1946) and Leonids (1966) meteor showers. While working on the theory of the meteoric process, he applied the principles of gas dynamics in the physics of meteoric phenomena, considered the problems of glow, deceleration, and mass loss by a meteoric body moving in the atmosphere, together with A.N. Chigorin performed calculations of kinetics, ionization in a shock wave generated by a large meteoric body, as well as drag and heat transfer coefficients for various intervals, velocities, masses, and densities. Known for his hypothesis on the radio emission of electrophone fireballs. Author of the books "Problems of the motion of large meteorite bodies" (1963, in the USA in 1965), "Physics of meteoric phenomena" (1981, in the Netherlands in 1983). V.B. – one of the most serious researchers of the Tunguska phenomenon: performed mass estimates, trajectory calculations; considered the anomalous glow of the sky as a result of secondary scattering of sunlight. His book "The Tunguska Meteorite: A History of Research" (2000) has become the most complete chronology of research on this phenomenon. He stood on the position that the Tunguska catastrophe was caused by the explosive destruction of the icy cometary nucleus that invaded the Earth's atmosphere. In the last years of his life, he was seriously engaged in the history of science, the author of the books "Claudius Ptolemy", "Ernst Julius Epicus", "M.A. Vilyev "," K.P. Stanyukovich" and a large number of articles. Honorary Member of the American Society of Astronomy Amateurs. The minor planet N 7002 was named "Bronstein".

BROVAR Vsevolod Vladimirovich

Born 04.10.1918, Gorokhovets, Vladimir province. Specialist student "Astronomical-geodesy" geodetic. f-that Mos. in-that engineers of geodesy, aerial photography and cartography (1936-1941, 1944-1946). Art. technician 1 dep. Centre. military project (March-July 1941), engineer-geodesist of the UAS UNKVD and GUSHOSDOR. Postgraduate student of the department. gravimetry and geophysics (1946), assistant (1949), p. teacher (1952), associate professor (1956), professor of the department. higher geodesy (1967). Candidate (1950), Doctor of Technical Sciences (1966). Consultant of the Department of Gravimetry of the SAI MSU (1973). Died 29.12.1999 in Moscow.

In the field of solving external boundary value problems, B. supplemented Stokes' theory: the Stokes integral formula was obtained in the most general form (taking into account the difference in potentials on the geoid and ellipsoid), the Stokes problem was solved in integral form for an ellipsoidal Earth with an error of the order of the squared compression, and several methods were given for solving the elementary the boundary value problem of Molodensky, an integral equation for solving the boundary value problem of Molodensky for the real Earth was compiled and solved (1996).

In the design of gravimetric surveys: their optimization for the derivation of plumb deviations of increased accuracy, the calculation of the world survey for use in the geodetic works of the USSR, the possibility of rarefaction of the survey in a remote area due to more detailed surveying near, the calculation of errors of representation on the oceans, the influence of systematic errors, etc. Calculation of gravimetric surveys in precision construction. He was the first to propose a method for studying the gravitational field in a closed volume without the requirement at infinity with the combined use of gravimetric and variometric determinations at different heights. B. studied the related issues of experimental gravimetry: statistical features of gravimetric determinations, the effect of changes in atmospheric pressure on gravity, determination of the gravitational constant at geophysical distances, control of global astronomical and geodetic materials of the Earth and the influence of the fifth force (1993). Study of the gravitational field of the Moon: determination of the potential of the Moon by radial accelerations, study of mascons.

The method of optimization of the normal Earth in the form of a level ellipsoid: the problem of determining the semi-major axis as a fundamental parameter under the condition of the minimum dispersion of the Earth's anomalous field has been resolved (1995).

In 1956 he taught a course on the theory of the figure of the Earth at Novosib. in-those engineers of geodesy, aerial photography and cartography. In 1957–58, he read a course on the theory of the figure of the Earth and gravimetry at the Wuhan Institute of Geodesy and Cartography (China); a lecture notes were published in Russian and Chinese. Author of the textbook "Theory of the Earth's Figure" (1961, jointly with V. A. Magnitsky and B. P. Shimbirev). This is the first textbook, where at all stages the presentation was based on the theory of Molodensky (in 1964 translations into German and English). Gave a course of lectures on Molodensky's theory (1965, Potsdam Geodetic Institute). Monograph "Gravitational field in the problems of engineering geodesy" (1983).

The total number of works is 55.

Awards: medal “For Valiant Labor in the Great Patriotic War of 1941-45”, medal “Sino-Soviet Friendship”, medal “50 years of victory in the Great Patriotic War of 1941-45”.

BRUMBERG Victor Alexandrovich

Born 12.02.1933 Moscow (USSR); graduated from the Moscow State University in 1955; post-graduated from the Institute of Theoretical Astronomy (ITA) of the USSR Academy of Sciences in 1958; since 1958 became a chief scientist of ITA (head of dept.) and since 1988 was a chief scientist and a head of lab. of the newly organised Institute of Applied Astronomy (IAA) of the USSR Academy of Sciences (now RAS), Dr. of Sciences in astrometry and celestial mechanics in 1967, Professor (1988) and Honorary Scientist of the Russian Federation (1999); the President of the IAU Commission No.7 "Celestial Mechanics" (1985–1988); the Chairperson of the IAU Working Group "Relativity in Celestial Mechanics and Astrometry" (1995–1997) and the assistant ed. of the international journal "Celestial Mechanics and Dynamical Astronomy" (until 2005); was awarded the USSR State Prize (1982), the Humboldt Research Award (Germany, 1993) and the Brouwer Award of DDA/AAS (USA, 2008).

Professor Brumberg is an internationally known astronomer. He has made great contributions to the development of many branches of classical and relativistic celestial mechanics. His most important contribution in the celestial mechanics was a series of polynomials in the three-body problem which were constructed to converge in any real moment of time. He also made new advances in the analytical celestial mechanics – the theory of special functions and perturbation theory (construction of compact analytical theories using the elliptic function expansions, development of general planetary theory to represent the motion of the major planets in pure trigonometric form without fictitious secular terms); the introduction of computer technologies into the practice of domestic research in celestial mechanics, including analytical calculations on a computer and the organization of pioneering work on the automation of ephemeris publications.

The main contribution was made by V.A. Brumberg to the formation, development and practical use of the General Relativity Theory (GRT) in celestial mechanics. V.A. Brumberg was the first in the world to develop methods for taking into account relativistic effects in the motion of celestial bodies, propagation of light, in the reduction of optical and radio-technical observations. In particular, the question of comparing the calculated (coordinate) values with the results of observations was resolved. It was shown that the results for the observed quantities will not depend on the choice of the coordinates used if the calculation of the ephemeris and the processing of the observations are carried out within the same coordinate system. V. A. Brumberg was one of the founders of a Unified Relativistic Theory of the motion of inner planets, which was a decisive step in the construction of a new generation of ephemeris in the USSR, necessary to support Soviet experiments in deep space. This work was awarded the USSR State Prize in 1982. The IAU Working Group, which worked in 1994-1997 under the leadership of V. A. Brumberg, identified inaccuracies and mismatches regarding relativistic reference systems and time scales in the IAU 1991 resolutions. Recommendations for more accurate implementations of relativistic reference systems were developed, which were approved by the IAU General Assembly in 1997. The work was based mainly on the monograph by V. A. Brumberg in 1991.

While investigating extensive problems of classical and relativistic celestial mechanics, Prof. Brumberg has never confined himself to doing his own studies, but has tried to set up creative teams by attracting young specialists in astronomy, mathematics and physics. His scientific school of students, associates and followers includes 4 Doctors of Sciences and 18 Ph.D. scientists. His activity has always implied international collaboration. Prof. Brumberg has been a member of the European Academy since 1993, the Correspondent Member of the Bureau des Longitudes (France) since 1994, and the Emeritus Member of American Astronomical Society since 2010. V. A. Brumberg is the author of 6 monographs and more than 120 scientific articles. Minor planet (4916) Brumberg is named after V. A. Brumberg.

BRUNS Andrey Vladimirovich

Born 21.12.1931 in Moscow. In 1955 he graduated from Crimean Agricultural Institute, in 1959 – All-Union Power Engineering Institute. In 1956 – a construction engineer at the Crimean Astrophysical Observa-tory, in 1964 he defended the PhD thesis, since 1975 – Head of the Department of Experimental Research of the Sun. Since 1992 – a leading researcher, Dr. Sci. in Phys. and Math. (1984), an Honored Worker of Science and Technology of Crimea. Died 31.03.2017.

A.V. Bruns was involved in developing extra-atmospheric methods of solar physics investigations, issues on helio– and astroseismology. He designed a number of original devices for studying UV solar spectrum operated in different years onboard spacecrafts of various series. His greatest achievement is the Solar Telescope OST-1 mounted in 1975 onboard the Salyut-4 orbital station, at which cosmonauts of two expeditions carried out their observations. A wide-known expert in the field of cosmic experiments, A.V. Bruns was repeatedly invited to take part in the international projects on cosmic investigations. Within the cooperative project with Sweden he developed equipment for the Intercosmos-16 satellite, the international experiment IFIR (in cooperation with Switzerland and France) was organized and carried out onboard the FOBOS spacecraft. A unique material obtained during the experiment provided new data on spectra of the 5-min solar oscillations. Under the supervision of A.V. Bruns the SOJA complex was developed for observing solar oscillations onboard the Mars interplanetary station. In the last years A.V. Bruns was involved in studying excessive noise in the course of high-accuracy measurements and influence of cosmophysical factors on it. To monitor noise at different electronic measuring instruments, he developed the 16-channel device Ekzakt.

He authored over 80 publications in scientific journals, 8 author’s certificates, three collections on history of the Crimean Astrophysical Observatory.

A.V. Bruns was awarded the Order of the Red Banner of Labour, VDNKh Medal, Jubilee Medal for Meritorious Labour, in 1994–1998 he was a member of the Supreme Soviet of Crimea. A minor planet discovered by N.S. Chernykh on September 24, 1979 was named Brunsandrej in his honor. It is worth noting that Bruns' work supplemented the contributions of his famous predecessors to astronomy. On the maternal side he is an ancestor of Leonhard Euler, on the paternal side – a relative of Ernst Heinrich Bruns, Director of the Leipzig Observatory in the early XXth century.

BUGOSLAVSKAYA Evgeniya Yakovlevna

Born 09(21).12.1899 in Moscow. Graduated from Moscow University in 1924. In 1925–1928, PhD student of the Moscow University's Institute of Astronomy and Geodesy. In 1928–1932, B. worked at the department of military topography of the Red Army. PhD in photographic astrometry (1931). Since 1932, in the Sternberg Astronomical Institute (SAI) of the Lomonosov Moscow University (MSU). Lectured in the MSU since 1934. D. Sci. dissertation "Structure of the solar corona" (1948). MSU professor (1949). Science secretary, Central Council of the All-Union Astronomy and Geodesy Society (1946); vice-president of the same Society (1955). Died 30.05.1960 in Moscow.

B.'s scientific research was mainly in the fields of photographic astronomy and solar studies. In B 1936–1937, she determined proper motions of stars in the regions of the eastern branch of the Taurus-Perseus dark nebula and Orion nebula. B. co-headed the multi-problem expedition for observations of the solar corona from different USSR locations during the total solar eclipse on June 19, 1936. Reductions of resulting photographs performed together with S.K. Vsekhsvyatksy revealed structural forms of the corona and detected its rotation. She was among principal observers during total solar eclipses of 1941, 1945, 1952, 1954, participated in reductions of acquired material. B. studied the fine structure of the solar corona and inner motions in the corona from observations of 1887–1941 eclipses, the relations of the inclination of the coronal flows on the solar activity phase and heliographic latitude. Her study "Structure of the solar corona", published in Proceedings of the SAI in 1950, was her D. Sci. dissertation successfully defended in 1948.

B. was active in instrumental astronomy, studied errors of telescopes and developed techniques of their use in conditions of a city. After the 2nd World War, B. joined the work initiated by B.P. Gerasimovich and N.I. Dneprovsky, aimed at compiling a Catalog of Faint Stars, with reference to extragalactic nebulae, the most distant objects, thus least changing their positions. Mesospheric clouds were B.'s another field of interest. She developed a technique of astrometric reductions for these objects. B. participated in observations according to international programs of the Second International Polar Year (1932–1933) and the International Geophysical Year (1957–1958). During the latter event, she organized observations of mesospheric clouds. A talented organizer, B. played an important role in introducing new observing instruments in the SAI in 1950s.

B. devoted much of her energy and time to teaching. She authored a well-known textbook "Astronomical photography" (1947). In total, she was the author of about 50 scientific publications.

BURENIN Rodion Anatolievich

Born in 1972 in Voronezh. In 1995, he graduated from the Moscow Institute of Physics and Technology, Faculty of Physics and Energy Problems, Department of Space Physics. Since 1994, he is working at the Space Research Institute of the Russian Academy of Sciences. Candidate of Physical and Mathematical Sciences (since 2000), member of the International Astronomical Union.

Specialist in the field of X-ray and optical astronomy, observational cosmology, author of more than a hundred scientific papers. The main results are related to the compilation of catalogues of galaxy clusters, observations of cosmic gamma-ray bursts, active galactic nuclei, and X-ray binary systems.

Using the data of SIGMA telescope onboard Granat orbital observatory, for the first time discovered the afterglow of cosmic gamma-ray bursts in the hard X-ray range, which allowed to obtain important constraints on the initial gamma-ray factor of the shock in the gamma-ray burst source.

He was one of the main authors of distant galaxy clusters survey based on all available data from the ROSAT satellite. As part of an international team of researchers, he made a major contribution to the optical identification and measurement of the redshifts of the most massive galaxy clusters in the observable part of the Universe, discovered using the observations of Sunyaev-Zeldovich effect in Planck all-sky survey. He made a significant contributions to the work on obtaining various cosmological parameter constraints based on the observations of galaxy clusters, such as the constraints on dark energy equation of state and neutrino mass.

He is one of the main organizers of astronomical observations at the Russian-Turkish 1.5-m telescope, 1.6-m telescope of the Sayan Observatory. He regularly carry out the observations on various programs on the SAO RAS 6-m telescope, as well as on many optical telescopes all over the world. He is deeply involved in the processing of data from the eROSITA and Pavlinsky ART-XC telescopes on board the SRG space observatory, as well as in the organization of optical support programs for the SRG X-ray sky survey.

Awarded the MAIK "Nauka/Interperiodica" awards for the best publication in physics and astronomy.

BUSAREV Vladimir Vasil'evich

Born in 1955 in Alexandria town of Kirovograd region (Ukrainian SSR). A student of the physical faculty of the Moscow Lomonosov State University (MSU) from 1977 to 1983. A postgraduate student the physical faculty of MSU from 1985 to 1988. He defended his thesis in 1989 on the theme "A remote search of ilmenite-content rocks on the Moon". A Researcher (from junior to leading) of Sternberg Astronomical Institute (SAI) MSU, from 1989 − present. He defended his doctoral thesis in 2012 on the subject "A study of the asteroid nature by spectrophotometric methods".

Scientific activity of V. V. Busarev began in his student years in the Department of Lunar and Planetary Research of SAI of Lomonosov Moscow State University: the study of photometric characteristics of the lunar surface from panoramic images of Lunokhod-2, multispectral photographic observations of the Moon and spectrophotometry of individual sections of the lunar surface. These results were used by him to study the mineralogy of rocks on the lunar surface that are of resource value for a future habitable lunar base.

In 2003, based on the study of the reflectance spectra of Edgeworth-Kuiper objects and the analysis of data on the composition of comet and meteorite matter, V. V. Busarev, together with A. B. Makalkin (IFZ RAS) and V. A. Dorofeeva (GEOHI RAS), for the first time performed an analytical justification of the origin and existence (for several million years) of the internal water ocean on rock-ice bodies (more than 200 km) behind the “snow line” in the early Solar system due to the decay of short-lived isotopes (^{26}Al et al.).

In 2007, V. V. Busarev and V. V. Prokof'eva-Mikhailovskaya (CrAO) developed a new spectral-frequency method for studying asteroids and other atmosphereless celestial bodies using a sufficiently long row of successive reflectance spectra and its frequency analysis. This method established the presence of spots of carbonaceous-chondrite material and hydrosilicates (based on variations of the equivalent width of Fe^{3+}absorption band at 0.44 μm) on the asteroid 21 Lutetia, an object of the Rosetta SC (ESA).

In 2011, Vladimir proposed a hypothesis on the origin of C-type asteroids and carbonaceous chondrites as fragments of stone-ice bodies from the Jupiter formation zone, after their heating (at the decay of ^{26}Al, etc.), water differentiation, and ejection by Jupiter into the main asteroid belt. He got observational confirmations of this: on asteroids of high-temperature types, spectral signs of the presence of phyllosilicates unusual for them were found. In the same year, similar features were found on 4 Vesta, an asteroid of basaltic composition, with the help of the Dawn SC (NASA).

On the surface of icy Galilean satellites of Jupiter in the ranges of 0.38–0.9 microns (Busarev, 2014) and 1.0–2.5 microns (Busarev et al., 2018), spectral signs of O+ (O_2) implanted in the Jupiter magnetosphere, as well as of unknown by origin of CH_4 were found.

UBVr′i′-photometry (2019-2020) and modeling of the reflectance spectra of the interstellar comet 2I/Borisov showed (Busarev et al., 2021) that aggregates of Mg-Fe and organic submicron particles without any signs of H_2O ice dominate in the dust matter of 2I. It points to similarity of 2I to comets of the Solar system with a high content of dust.

Busarev V. V. continues to study the spectral characteristics of main-belt and near-Earth asteroids, as well as their analogues – minerals and meteorites. In his opinion, detailed studies of these celestial bodies, especially their primitive types, can provide key information about the mechanism of water delivery to the Earth and the origin of life.

BYCHKOV Konstantin Veniaminovich

Born 02.06.1948 in Moscow. In 1972 he graduated from physics. fac. Moscow State University M.V. Lomonosov. From 1972 to 1986 he worked at the SAO of the Academy of Sciences of the USSR, since 1992 he has been working at the SAI Moscow State University c. n. from. Candidate dis. "Nebulae – remnants of supernovae" (1975). Doctoral dis. "Interaction of supernova remnants with the interstellar medium" (1992). V. n. from. dep. stellar astrophysics GAISH MSU. Member IAU (2006).

The main areas of work: radiative gas dynamics, physics of the interstellar medium, supernovae, stars with strong winds, and nonstationary phenomena in stellar atmospheres. Main results. To explain the discrepancy in the determination of the expansion velocity of supernova remnants from X-ray and optical data, together with S.B. Pikel'ner proposed a model for the cloud structure of supernova remnants at the adiabatic stage of stripping (1975): an expanding gas glows in the X-ray range; it compresses dense compact clouds that emit in the lines of the optical spectrum, the Doppler shift of which corresponds to low speeds. In 1978 he showed that the two-component model explains the observed slope of the "radius-luminosity" dependence for synchrotron emission of supernova remnants. In 1979, to explain the filamentous structure of supernova remnants, he put forward the hypothesis of a "clumpy" stellar wind from a pre-supernova. Subsequently, a two-component stellar wind was discovered in stars of the Wolf-Rayet type. In 1979, together with V.S. Lebedev explained the emission of the high-speed gas of the Cygnus Loop in the lines of the Balmer series as the glow of neutral hydrogen heated behind the front of the shock wave to several million degrees. Before ionization, the hot gas has enough time to excite the atom, so the probability of emission in the lines is proportional only to the first power of a small quantity – density, and not to the second, as in the stationary case. In 1985, together with O.V. Fedorova and T.G. Sitnik and explained the stratification of optical radiation in supernova remnants and in 2006, together with T.G. Sitnik – reverse stratification in nebulae around Wolf-Rayet stars. In 1979, together with V.S. Bychkova was the first to calculate the synthetic spectrum of supernova radiation, taking into account the overlapping of metal lines, and showed that the observed spectrum is explained with a normal abundance of metals. In 2000, he showed that the clumpy stellar wind model explains the appearance of dust around OB + WR binary stars. In 2005, he explained the nonthermal radio emission of WR stars in the model of the acceleration of suprathermal electrons during the compression of the emission gas behind the shock front in the cloud. In 2010, he proved the thermal stability of the stellar wind of WR stars. In 2017, jointly Sun O.M. Belovoy showed the importance of the influence of triple recombination on the ionization state of a gas with an electron density above 10^8 cm^{-3}. Author of the textbook "Atomic Physics" for students of astronomical departments of universities (together with Yu.K. Zemtsov) (2010–2017) and the textbook "Continuous emission spectrum of stellar atmospheres and interstellar medium". Author of a four-semester course for students of the astronomy department: "Astronomical aspects of general physics".

BYCHKOVA Vera Solomonovna

Born 09.11.1945 in Moscow. In 1972 she graduated from the astronomical department of physical. fac. Moscow State University. From 1972 to 1985 she worked at the SAO of the USSR Academy of Sciences (North Caucasus). In 1982 she defended her thesis. on the topic: "Phys. conditions in the envelopes of novae and supernovae ". From 1990 to the present, he has been working at the Astro Space Center of the Lebedev Physical Institute in the position of s. n. from. From 1995 to 2015 she was the scientific secretary of the ASC FIAN.

The main scientific work was carried out in the field of stellar astronomy and astrophysics, 22 scientific articles have been published. The main research results up to 1982 were works devoted to the interpretation of the dynamics of envelopes of new stars in the early stages of flares, the transition of the pre-maximum spectrum to the main and main to the diffuse spark as a manifestation of the propagation of the shock front in the stellar envelope. Calculations were carried out to simulate the absorption spectrum of an isobaric freely expanding supernova shell of type I (together with K.V. Bychkov). From 1995 to the present, the main work has been devoted to the study of the variability of radiation from active galactic nuclei in the optical and radio ranges (together with the staff of the SAO and CrAO). Optical observations are carried out at the SAO RAS on the BTA and Zeiss-1000 telescopes, radio observations – at the CrAO, using the RT-22 radio telescope of the Research Institute of the CrAO. The variability of the emission of a number of quasars on different time scales, from hours to years, was found. Searches have been made for the periods of variability of the blazar emission. For blazars S5 0716 + 714, AO 0235 + 164 and S4 0954 + 658, studies have shown the presence of harmonic components of variability on time scales from 2 to 10 years. The data of multifrequency observations do not contradict the hypothesis of bright active galactic nuclei as representatives of close binary systems of supermassive black holes. In the famous blazar S5 0716 + 714, traces of the host galaxy around the object and a cluster of three galaxies with almost identical redshifts were found, which made it possible to estimate the redshift of the source. The work was carried out in collaboration with the staff of the CAO and GAO.

BYKOV Andrey Mikhailovich

Born in 1956 in Tashkent in the family of astronomer M.F. Bykov. He graduated with honors from Physical-Mechanical faculty of Leningrad Polytechnic Institute (1978, LPI). In 1978-1990 he was a lecturer at the Theoretical and Mathematical Physics department of LPI, a senior researcher at the Ioffe Institute (1990, St. Petersburg), the head of the High Energy Astrophysics laboratory (2010), the head of the Plasma Physics, Atomic Physics, & Astrophysics division of the Ioffe Institute (2014). Dr. Sci. (1992), full professor (1995). Corr. Member of the RAS (2019). Main areas of research are observational astronomy, theoretical physics and astrophysics. Member of the IAU and of the International Academy of Aeronautics. Member of the of the Space Council of the RAS and science committee of the International Space Science Institute (Bern, Switzerland), and program committees of international observatories XMM-Newton, INTEGRAL, SRG and LOFAR.

A.M. Bykov is an eminent astrophysicist who significantly contributed to theoretical and observational studies of energetic space objects. A brief list of his achievevments includes the following main results. A nonlinear kinetic theory of formation of energetic particle spectra and nonthermal emission in active starforming regions with multiple stellar winds and supernovae (SNe) was developed, which is widely acknowledged as a base for modern models of emission spectrum formation and light elements evolution in the galaxies. A theory of formation of magnetic fields and spectra of relativistic particles in galaxy clusters was developed, which allows us to assess the contribution of nonthermal components to the energy balance in the hierarchical model of large scale structure of the Universe. A novel theory of formation of polarized X-ray images of synchrotron shells of supernova remnants (SNRs) with strong stochastic magnetic fields was developed. Extensive studies of gamma-ray transients including a theory of formation of giant gamma-ray flares in the Crab Nebula and connections of soft gamma-repeaters with fast radio bursts were developed. A new class of X-ray objects – fragments of SN ejecta in molecular clouds – was predicted. He performed studies of cosmic positrons. A number of large-scale observational projects devoted to studies of supernova remnants and pulsar wind nebulae were carried out with HST, CGRO, Beppo-SAX, XMM-Newton, Chandra, INTEGRAL, KONUS-Wind and SRG space telescopes. The results of 44Ti mass measurements in the shell of Cas A SNR and a study of 511 keV line sources in the Galaxy are widely used in the literature.

A.M. Bykov has authored and co-authored more than 200 research papers, including a number of reviews published in most influential scientific journals. He is an author and editor of monographs “Turbulence, current sheets, and shocks in cosmic plasmas” (Gordon and Breach, 1993), “Large-Scale Magnetic Fields in the Universe” (Springer, 2012), “Particle Acceleration in Cosmic Plasmas” (Springer, 2013), “Jets and Winds in Pulsar Wind Nebulae, Gamma-Ray Bursts and Blazars” (Springer, 2016), “Supernovae” (Springer, 2018), “Star Formation” (2020). A.M. Bykov is a member of the editorial board of the international journal “Space Science Reviews” (SSR). He was the editor of the special issue of SSR “George Gamov and Astrophysics”, which contains review papers of world-leading scientists. A.M. Bykov is a member of Dr. Sci. council at the Ioffe Insitute and also a visiting member of PhD committees at Leiden Univ., Sorbonne, Univ. of Toulouse, and some others.

A.M. Bykov has been awarded the D.S. Rozhdestvensky medal of the Russian Optical Society (2006), the “300 anniversary of St. Petersburg” medal (2003), and the “Honoured labour” medal (1987), Ioffe Award St.Petersburg, (2018).

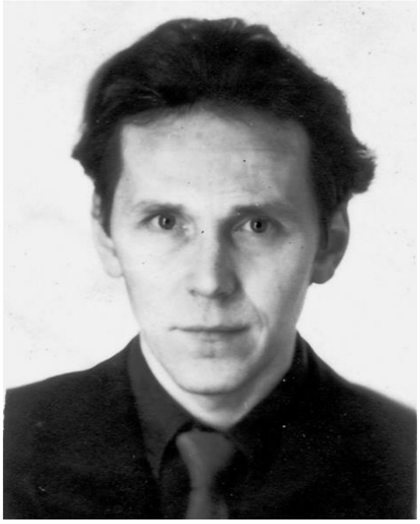
CHASHEI Igor Vladimirovich

Born 21.11.1946 in Mogilev, Belarus. In 1971, he graduated from the Lomonosov Moscow State University. Since 1971, he has been constantly working at the Pushchino Radio Astronomy Observatory (now PRAO ASC LPI) in various positions: from young researcher to Deputy Director for Scientific Affairs. Doctor of Physics-Mat.of Sciences (1991). Member of the IAU, member of a number of scientific councils.

I. V. Chashei is a specialist in the field of solar wind physics, author of more than 200 scientific papers. The main scientific results are related to the study of physical processes in interplanetary and near-solar plasma. I. V. Chashei developed a dispersion method for analyzing interplanetary scintillation data and based on it, the characteristics of the jet structure of the solar wind outflow were obtained. He proposed a self-consistent model of the formation of the solar wind and heating of solar corona by wave energy-momentum sources, and also quasi-stationary models of solar wind turbulence. Chashei was the first to construct the spectrum of interplanetary plasma turbulence in a wide range of spatial frequencies. Within the framework of international scientific cooperation, he actively participated in the analysis and interpretation of the results of experiments on the radio sounding of the solar wind by coherent signals from spacecraft. According to the data obtained with the help of the Helios, Ulysses, Galileo, Mars Express, Venus Express, Rosetta spacecraft, he studied the turbulence regimes in various regions of the solar wind. In collaboration with other employees of the PRAO ASC LPI, he studied the dynamics of the global structure of the solar wind in the solar activity cycle, as well as the development of large-scale disturbances of flare origin in the solar wind, using interplanetary scintillation data.

I. V. Chashei conducts teaching work. On his initiative and with his active participation, the Education Center for Astrophysics and Radio Astronomy of the Pushchinsky State University (currently the Pushchinsky State Natural Science Institute) was established on the basis of the PRAO ASC LPI, of which I. V. Chashey has been the dean since the establishment of this educational institution. Under his leadership, two PhD theses were defended. For many years (since 2000), he has been conducting extensive scientific and organizational work as the Deputy Director of the Observatory for Scientific Affairs. His work was awarded the medal "In memory of the 850th Anniversary of Moscow" and awards of the Moscow region, including the Badge "For Works and Diligence" of the Governor of the Moscow Region (2006) and the Badge "Labor Valor" of the Moscow Regional Duma (2016).

CHAZOV Vadim Viktorovich



Born 03.11.1952 in the city of Krasnokamsk, Perm region. In 1970-1976, he studied at the Astronomical Department of the Physics Faculty of Moscow State University. In 1976-1978 he worked in the Kuibyshev as an engineer in the Central special design Bureau, in 1978-1981 he worked in Moscow as an engineer in the Institute of Applied mechanics; 1981-1986 he worked as engineer in Astrosovet of USSR Academy of Sciences; 1986-1989 – senior engineer of the Department of astrometry in Sternberg astronomical Institute; 1989-1990, junior researcher, then scientific employee in SAI. He got PhD 22.02.1996. 1999 – 2016 senior researcher of the Department of astrometry and time service of SAI. 04.04.2013 he defended his doctoral thesis on astrometry and celestial mechanics. He worked from 2016 to 2019 as senior researcher in the laboratory of space monitoring of SAI.

VVC has been working in SAI since 1986. His research interests are in celestial mechanics, rather the theory of motion of artificial satellites. Based on the fundamentally new approach developed by himself, VVC managed to create a set of programs for processing satellite observations, which is not inferior in accuracy to the programs used in the world's data centers, but thanks to the analytical approach, it surpasses them in speed and is favorably compact. This is the subject of his PhD thesis: «The creation of a high-precision analytical theory of the motion of the satellite». He determined a number of important geodynamic parameters with high accuracy. The program package has been transferred and is successfully used in many domestic organizations.

From 2003 to 2013, VVC continued to develop models of the motion of celestial bodies in numerical and analytical forms. The main difference between the proposed method and the work of other researchers is in the recurrent algorithms for the representation of the perturbing function. The recurrent algorithm allows us to obtain formulas for the perturbing function in the form of an explicit dependence on the elements of the intermediate orbits of objects. The use of the numerical-analytical method significantly reduces the calculation time. All this was reflected in the doctoral dissertation: «Development and application of an algorithm for the numerical-analytical method for calculating the positions of artificial Earth satellites».

The recurrent algorithm in combination with the numerical-analytical approach was used to study the evolution of the elements of the orbits of the large planets of the Solar System. Graphs of long-period variations of the elements of the orbits were plotted over an interval of 50 million years. A previously unknown period of change in the semimajor axes of the giant planets has been revealed. The magnitude of the period is 14 million years and is due to the comparabilities in proper motions of Jupiter, Saturn, Uranus and Neptune.

VVC is actively working on the MASTER MSU project (a global network of robot telescopes for Monitoring Near and Far Space for the purpose of detecting and studying cosmic explosions), the LOMONOSOV MSU orbital observatory (MASTER-SHOCK) and is PI of the RNF grant.

Based on their work, VVC developed and taught the students of the Moscow State University Department of Astronomy the semester special course «Standard of computing in Space Geodynamics» (2013-2015), and also taught the course «Theory of Motion of artificial Earth satellites» (2013, 2017).

VVC published from 1986 to 2017 47 scientific papers, written personally and co-authored. In the team, VVC enjoys authority and has established himself as a high-class specialist capable of solving complex celestial mechanical and astrometric problems.

CHEBOTAREV Gleb Alexandrovich

Born 01.08.1913 in St. Petersburg; graduated from the Leningrad University in 1937; post-graduated from the Celestial Mechanics Department under the guidance of M. F. Subbotin; got his PhD degree in 1940 and his Doctorate in 1951; was Associate Professor of Astronomy and Mechanics Department at Tomsk University from 1940 to 1942, acting Deputy Director and then Director of the Library of the USSR Academy of Sciences from 1951 to 1960; worked at the Institute of Theoretical Astronomy of the USSR Academy of Sciences in Leningrad (ITA) from 1943 up to his death in 1975 heading the Department of Applied Celestial Mechanics from 1960 to 1967, the Department of Analytical Celestial Mechanics from 1967 and being Director of ITA from 1964 to 1975. Died 04.08.1975 and was buried at the Pulkovo Memorial Cemetery.

The main field of his scientific works was celestial mechanics. He used periodic orbits of the three-body problem as an intermediate orbit developing new effective techniques (1950 and 1951) to study the motion of minor planets in the neighborhood of commensurabilities of their mean motions with the mean motion of Jupiter. Using this technique, he built analytical theories of the motion of minor planets of the Hestia and Gilda groups, to which the classical methods of celestial mechanics could not be applied. He was the first (1957) to work out an example of the symmetrical trajectory for a rocket orbiting the Moon and returning to the Earth without spending fuel on the way. The first rocket was launched in that flyby trajectory around the Moon in the Soviet Union in 1959. He developed (from 1962 to1965) a new theory of the artificial Earth satellite motion for the cases of near circular orbits. It eliminated errors that previous theories had produced as not being adapted to the cases of small eccentricities. He started studying peculiar characteristics of the Solar System's small body motion in 1953. From 1961 to 1968 he investigated the evolution of the major planet satellite orbits in the context of the three-body problem and found that the satellites' retrograde motion was more stable than their forward motion. This conclusion was of great importance for cosmogony, as it facilitated the solution to the problem of the planets' retrograde satellites. He was the first to estimate (1971) the theoretical size of the Solar System from the previously investigated gravitational influence produced by the Galaxy and nearby stars on the comets from the Oort Cloud. He studied the orbit evolution of several asteroids, carried out an extensive research on the minor planet statistics, discovered new features of the asteroid belt structure and tested the hypothesis about the origin of the asteroid belt as a result of collision of several large bodies (from 1958 to 1975). He was the author of the monograph "Analytical and Numerical Methods of Celestial Mechanics" (1965) and more than 70 scientific papers; a co-author of the monograph "Minor Planets" (1973); the President of the IAU Commission No.20 “Minor Planets, Comets and Satellites” (from 1967 to 1970) and the Chairperson of the USSR Astronomical Council's “Small Bodies of the Solar System” Working Group (from 1971 to 1975). Minor planet (1804) Chebotarev is named in his honour.

CHECHETKIN Valery Mikhailovich

Born 23.03.1941 in Moscow. In 1964 he graduated from the Moscow Institute of Physics and Technology. Since 1968, after completing his postgraduate studies at the Institute of Applied Mathematics of the USSR Academy of Sciences, he worked at M.V. Keldysh Institute of Applied Mathematics RAS in positions from junior researcher to chief researcher. Dr. Phys.-Math. Sci. (1984), Prof. (2000). Prof. of MEPhI. Author of over 400 publications. State awards: Honored Scientist (2006), G.A. Gamow (2004). Member of MAS from Russia. Chevalier of Ordre des Palmes académiques (2017).

V.M. Chechetkin is an expert in the field of theoretical astrophysics and fundamental physics. One of the founders of physical and mathematical modeling for astrophysical processes and phenomena. Also the following achievements can be highlighted:

– obtained the structure of the explosion in type I SN, which, when using these supernovae as standard candles, makes it possible to draw conclusions about dark energy in the Universe;

– proposed a new mechanism for the formation of heavy elements, which makes it possible to determine the age of a Galaxy on the basis of the yield of uranium – thorium isotopes and to reveal the properties of the physical vacuum. This enabled in 1987 placing restrictions on dark matter and on the density of dark energy;

– proposed the process of development of large-scale convection in a proto-neutron star, which leads to an increase in the average energy in neutrino radiation at early stages and accelerates the output of a neutrino pulse;

– based on the study of the kinetic processes of the interaction of antiprotons with helium-4 and the abundance of light elements, obtained restrictions on the primary content of antimatter in the Universe and restrictions on possible new unstable particles. Also, obtained restrictions on the concentration of primordial black holes;

– obtained restrictions on the axion mass from astrophysical estimates;

– discovered the nuclear meson mechanism of the formation of neutrino and gamma radiation from relativistic shock waves and during accretion of matter onto the surface of a neutron star;

– for the first time in the world, three-dimensional unsteady calculations of MHD flows under astrophysical conditions of accretion disks were performed, the flow structure was constructed, and the mechanisms of matter outflow in jets were proposed. The large-scale structure of magnetorotational instability was investigated under astrophysical conditions;

– investigated the flow of matter in close binary stellar systems. The results obtained in a new way represent the distribution of matter in binary systems and highlight new hydrodynamic structures (for example, the existence of a common shell and the emergence of detached shock waves from rotating stars in it). When interpreting observations of close binary stellar systems, proved the incorrectness of the "hot spot" model, which contradicts the laws of gravitational hydrodynamics;

– proposed a physical model of the formation of large organized structures in turbulence for a free shear flow and discovered the mechanism of the formation of a cascade due to the secondary instability of large structures in a three-dimensional flow;

– proposed a mechanism for the development of large-scale turbulent structures in accretion disks, leading to a redistribution of angular momentum without heating the matter.

CHENTSOV Eugene Leonidovich

Born 01.05.1937 in Cheboksary, Chuvash ASSR. In 1959 graduated from the Ural State University (UrFU for now), Ekaterinburg. From 1959 to 1965, he had been a post-graduate student and Researcher of the Crimean Astrophysical Observatory, AS of the USSR. From 1965 to 1968, he taught in the Astronomy and Geodesy Department of the Ural State University. From 1968, he has been working at the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) in different positions: beginning from Junior (1968) to Senior (1981) Researcher and Leading Researcher from 2005. In 1980, he defended his Ph.D. thesis on "Observational Manifestations of the White Supergiant Instability". In 2004, he defended his Dr.Sc. dissertation on "Optical Spectroscopy of Extremely Luminous Stars In the Galaxy". A member of the International Astronomical Society (IAU). Died 25.11.2021.

His main area of research is related to astrophysics and spectroscopy; he is the author of 120 scientific papers.

In the 1970's, E.L. Chentsov conducted high-resolution spectroscopy for a number of white super– and hypergiants (Rigel, the 6th of Cassiopeia, etc.) and together with L.I. Snezhko) applied model calculations to obtain kinematic cross-sections of their atmospheres and to solve related metrological problems. In the 1970's and 1980's, energetically participated in the studies and improvement of spectral instruments of the 6-m telescope and in the development of methods of high resolution spectrum processing.

From the 1990's till now, his main works are related to hot hypergiants and LBV of the Galaxy. Non-sphericity and instability of their winds and their influence on star formation in the associations (6 Cas in Cas OB5, star No.12 in Cyg OB2 HD 168607, and HD168625 in Ser OB1A). It is stated that the last two objects make a unique pair of the Galactic LBVs.

During these years, together with V.G. Klochkova, V.E. Panchuk et al., he studies supergiants of medium mass at the post-AGB evolutionary stage. The important effect of their "spectroscopic mimicry" for supergiants and hypergiants of great mass.

In collaboration with Yu.Yu. Balega et al., Teta 1OriC was studied as a SB2-type spectral binary.

E.L. Chentsov is constantly teaching and popularizing the astronomy: students' practical training and astronomical schools for senior students in the observatory, adaptation of the STAR educational program, popular papers and lectures, and astronomical tourism.

Honored with the silver medal of the Exhibition of Economic Achievements (1978).

In 2016, E.L. Chentsov was given a title of "KChR Honored Scientist"

CHEREPASHCHUK Anatoly Mikhailovich

Born 07.07.1940 in Syzran, Kuybyshev region. Graduated from M.V. Lomonosov Moscow State University (MSU) in 1964 and completed postgraduate studies at the Faculty of Physics (FPh) of MSU in 1967. Staff member of P. K. Sternberg Astronomical Institute (SAI MSU) since 1967. Director of SAI MSU (1986-2018), scientific director of SAI MSU (since 2018), head of the stellar astrophysics department of SAI MSU (since 1978), head of the department of astrophysics of FPh MSU (1986-2018), professor of FPh MSU (since 2018). Doctor of Physical and Mathematical Sciences (1976), professor (1985), academician of the Russian Academy of Sciences (2006), associated member of the Royal Astronomical Society (2000), vice-president of the European Astronomical Society (2000-2005), chairman of the Astronomical Council of the Russian Academy of Sciences, member of many research and editorial boards of foreign and Russian astronomical journals. Vice-chairman of the Academic Board of Moscow Planetarium (2008).

A. M. Cherepashchuk's area of research is the physics of highly-evolved close binary stellar systems. In 1967 he predicted the X-ray emission from collisions of supersonic stellar winds in massive close binary systems, which was confirmed by later observations from the Einstein orbital X-ray observatory. In 1968-75 he discovered the evolutionary status of Wolf-Rayet stars (WR) and the relation between WR-stars, neutron stars and black holes in close binary systems. In 1973 A. M. Cherepashchuk together with V. M. Luytuy and R. A. Sunyaev discovered and investigated different types of regular optical variability of X-ray binaries, and he was one of earliest researchers who measured the mass of the black hole in the X-ray binary system Cygnus X-1. In 1981 he discovered optical eclipses in SS433 and showed that this object, which had previously been unexplained, was in fact a highly-evolved massive X-ray binary system with a precessing supercritical accretion disc. During 1971-73 A. M. Cherepashchuk in cooperation with V. M. Luytuy discovered the effect of the lag of emission-line variations relative to continuum variations in spectra of active galactic nuclei. This effect became the basis of the reverberation mapping method to calculate masses of supermassive black holes ($\sim 10^6 \div 10^{10}$ solar masses). It was used to find masses of hundreds of them and, as a result, a new field of astrophysics, the demography of black holes, was created.

A. M. Cherepashchuk was the first researcher in Russia who performed observations of lunar occultations to measure angular diameters of stars with a resolution about 10^{-3} arc seconds. In 1978, 1985 and 1996, in cooperation with mathematicians, A. M. Cherepashchuk published three monographs on modern methods for solving inverse problems of astrophysics. Twenty eight postgraduate students defended PhD theses and five researchers defended Doctor of Sciences theses under his supervision. Since 1996 A. M. Cherepashchuk has been the principal researcher of the Leading Russian scientific school of physics of close binary systems.

A. M. Cherepashchuk directed the foundation of the Caucasian Mountain Observatory of SAI MSU with a 2.5-m diameter telescope (2005-2015). A. M. Cherepashchuk was awarded: the Lenin Komsomol Prize (1974), M. V. Lomonosov MSU Prizes (1988, 2001), A. A. Belopolsky Prize of the Russian Academy of Sciences (2002), the State Prize of the Russian Federation in science and technology (2008), the Prize of the Government of the Russian Federation in the field of education (2013). He was also awarded the Order of Friendship (1999), the Order of the Badge of Honour (2005), the Order of Alexander Nevsky (2020). The minor planet 4307 was named after A. M. Cherepashchuk.

E-mail: cherepashchuk@gmail.com

CHERNYKH Nikolay Stepanovich

Born 06.10.1931 in Usman', Voronezh region, and died on May 25, 2004. In 1954–1959 – student at Irkutsk Pedagogical Institute. In 1961–1964 – Ph.D. student at the Institute of Theoretical Astronomy, Leningrad (ITA). In 1963–2004 – researcher at the Crimean Astrophysical Observatory (junior, senior, leading researcher). In 1971 he defended the Ph.D. thesis "The determination of Jupiter's mass from the analysis of modern observations of the minor planet 10 Hygiea". In 1999 he defended his Doctoral thesis "The Crimean survey of minor planets". A holder of medals "For discovering new as-tronomical objects" (1975, 1977, 1982), "For outstanding scientific achievements of a year" (2003), E.P. Fedorov prize of the Academy of Sciences of Ukraine (2004). Died 25.05.2004 in Nauchnyy.

An outstanding expert in the field of astrometry and dynamics of minor bodies of the Solar system. In 1963, being a post-graduate student of the Leningrad Institute of Theoretical Astronomy, he was directed to the Crimean Astrophysical Observatory (CrAO) to organize regular observations of minor planets. N.S. Chernykh investigated astrometric properties of the double 40-cm astrograph, improved some nodes of this telescope, developed methods of observations and processing, trained the staff of observers. Along with scientific supervision he took active part in observations: carried out about 30 % of observations and over 40 % of discoveries of minor planets made by the Crimean team. He was head of the joined team ITA-CrAO that took the leading position in the International service of minor planet observations. The results derived in Crimea for over 40 years represent one of the most complete surveys in the history of photographic observations of minor planets and include over 80 % asteroids known then. A significant number of new minor planets were discovered in CrAO, 1286 of them received permanent numbers, and 538 of them were discovered by N.S. Chernykh personally.

The scientist obtained a great number of exact positions (2680) for over 80 comets. Under the supervision of N.S. Chernykh and with his participation extensive series of position observations of the comet Halley and other bright comets were obtained, as well as images for studying their large-scale structure; observations of many other comets and asteroids with unusual orbits were carried out. He actively observed the Shoemaker-Levy comet and its falling on Jupiter. Two new comets (Smirnova-Chernykh 1975 VII and Chernykh 1978 IV) were discovered and long series of positions were obtained which played an important role in detecting orbits of these comets and investigating peculiarities of their motion in the secular time scale.

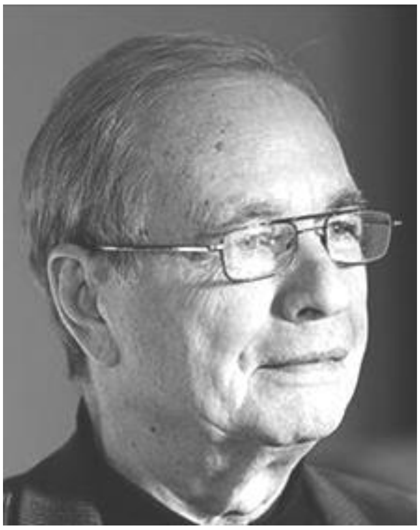
As an expert in astrometry and theoretical astronomy N.S. Chernykh for many years partic-ipated in the program on position observations of far space vehicles at the 2.6-m reflector of ZTSh (CrAO). He obtained the series of observations of many interplanetary automated stations launched in the USSR to the Moon, Venus and Mars and some other objects. He participated in the first in the USSR work on laser location of the Moon.

In the last years N.S. Chernykh was involved in studying near-Earth asteroids.

An author of more than 200 scientific publications, a co-author of three cooperative monographs.

A member of IAU (Commission 20 and 15, working group NEA). A foundation member of the European Astronomical Society and member of the Euro-Asian Astronomical Society.

CHERNIN Artur Davidovich



Born 05.12.1939 in Pyatigorsk (USSR, now Russian Federation). In 1963 has been graduated the physical and mechanical dept. of Leningrad Polytechnical Institute. PhD (1969), doctoral thesis (1979). In 1963-1982 – a researcher at the Leningrad Ioffe Institute of Physics and Technology. In 1982–1989 – a professor of the Leningrad State Pedagogical Institute named after A.I.Herzen. Since 1989 to the last days – a professor of Sternberg Astronomical Institute in the Lomonosov Moscow State University. Died 11.01.2021 in Moscow.

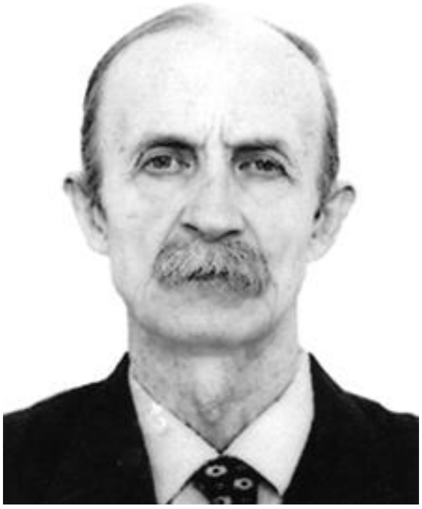
A.D. Chernin is an astrophysicist-theorist. His diploma work as well as his PhD thesis in astrophysics titled "The origin of large-scale cosmic structures" were supervised by prof. L.E. Gurevich. In 1979 at the Pulkovo Observatory he defended his doctoral dissertation "The early stages of evolution of large-scale cosmic structures."

Research works by Chernin were devoted to cosmology and extragalactic astronomy. In 1965 he found exact solutions to the equation of isotropic cosmology for a mixture of relic radiation and nonrelativistic matter. In 1970 he proposed a theory of formation of rotating galaxies in supersonic flows of the space medium. In 1983–2003 (with co-authors) he obtained a set of exact nonlinear analytical solutions in the theory of the formation of galaxies and their systems. A series of works by Chernin were devoted to the origin of large-scale star-forming regions in the Milky Way and other spiral galaxies and to the mechanisms stimulating star formation. In 2000 he proposed a hydrodynamic theory of the formation of "broken" shape (“rows”) of spiral arms observed in some galaxies. In 1968 he put forward, and (after the discovery of a dark energy) developed in 2002-2008 the concept of the internal symmetry of cosmological energies. In 2000 and later he (in co-authorship) studied the local influence of dark energy on dynamics of galaxies in systems of different scales (triplets, groups, and clusters of galaxies) and in their immediate vicinity. In particular, he estimated the so-called radii of zero acceleration for nearby systems of galaxies within which the expansion of the universe is balanced by gravitation of a galaxy system.

Author of over 250 articles and 12 books, including a monograph on physics and astronomy of dark energy: “Path to Dark Energy” by G. Byrd, A. Chernin et al. (De Gruyter, Berlin / Boston, 2012), and a series of popular books.

Member of the IAU (1990), European Astronomical Society, Eurasian Astronomical Society. Laureate of the Lomonosov Prize of Moscow State University (1996), together with A.V. Zasov and Yu.N. Efremov.

CHERNITSOV Alexander Mikhailovich



Born 29.01.1945 in Kuibyshev of the Novosibirsk region. In 1968, after graduating from Tomsk State University (TSU), he joined the Research Institute of Applied Mathematics and Mechanics (RIAMM) at the TSU. In 1977 he defended his PhD thesis. In 1996–1999 he was trained in the doctoral studies of TSU and in 2000 defended his doctoral thesis in the specialty of astrometry and celestial mechanics. Since 2003 he worked as a professor at the Department of Astronomy and Space Geodesy of the Physics Department of TSU and was a leading researcher at the Astrometry and Celestial Mechanics Department of RIAMM.
Died 23.09.2018 in Tomsk.

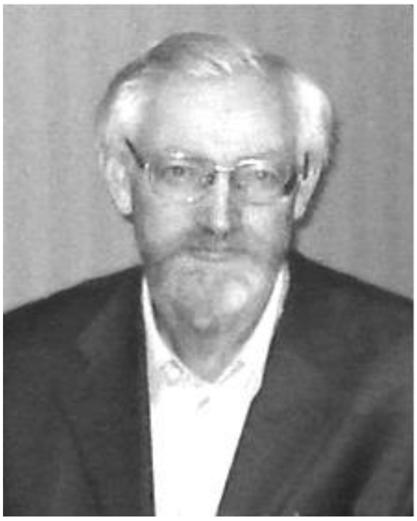
His main scientific works are related to the study of the motion of small bodies of the Solar system. He developed and theoretically substantiated a number of effective algorithms for determining LS-estimations of the initial parameters of the motion of small bodies and developed a new approach to constructing regions of possible motions of small bodies of the Solar system. Within this approach, theoretical developments were completed as well as linear and nonlinear methods for one-parameter mappings of probabilistic regions were implimented. A criterion for the applicability of the methods for investigating the evolution of small body motion was constructed. Methods for estimating nonlinearity in problems of constructing regions of possible asteroid motions were developed. The relation between different indicators of nonlinearity was shown as well as recommendations were given that allow one to reduce the degree of nonlinearity. A method for estimating the influence of disturbing forces on the accuracy of constructing a probabilistic orbital model of asteroids was developed. A method for estimating the probability of a collision of asteroids with large planets was proposed based on the representation of confidence regions in the parametric space by their boundary surfaces. The higher efficiency of this method was shown in comparison with the conventional method, where the confidence regons are determined in the form of a set of points filling them. A method for estimating the efficiency of the rejection of observations and the introduction of weight matrices was proposed based on the comparison of confidence regions.

Application of the developed techniques and algorithms allowed obtaining a number of practical results. For the first time the system of orbital elements of the comet 35P/Herschel–Rigollet was determined from its observations of two appearances (1788–1789 and 1939–1940) and also the accuracy of the comet ephemeride was estimated.

Two Ph.D. theses were defended under the leadership of A.M. Chernitsov,.

He was awarded the medal "For Participation in Ensuring the Implementation of Space Programs of the USSR" (1981) and the badge "Honored Worker of Higher Professional Education of the Russian Federation" for merits in the field of education (2003).

CHERNOV Gennady Pavlovich



Born 30.10.1941 in Chelybinsk region. In 1966, graduated from the Leningrad University in the speciality Astronomy. Since 1967, has been working at the Pushkov Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation of the Russian Academy of Sciences (IZMIRAN). Since 1990 has been Leading Researcher. Dr. Sci. in Physics and Mathematics (1990), member of several international organizations (IAU, EAS, EAAS, CESRA) and member of scientific council of IZMIRAN.

The main scientific interests of G.P. Chernov lay in the field of the Solar Astrophysics. He is the author of about 200 scientific publications and three monographs.

In the beginning of the scientific activity in IZMIRAN as Assistant researcher he participated in the construction of a radio spectrograph with high frequency and time resolution in a meter range (150-250 MHz).

First degree of Candidate of sciences was defended in IZMIRAN (1977), with the thesis "Microstructure of solar meter bursts". Senior scientist in IZMIRAN – 1985.

Second Degree of Doctor of sciences with the thesis "The study of Solar radio emission fine structure in the meter range. Observation and interpretation" was defended in IZMIRAN (1990). Leading Researcher in IZMIRAN – 1990.

The main topic of Chernov G.P. includes observations of solar radio bursts and theoretical interpretation of their fine structures in the dynamical radio spectrum: spike-bursts, fast pulsations, stripes in emission and absorption at the background of a continuum of type IV bursts (zebra-patterns and fiber-bursts). The Doctor thesis is devoted to a unique model of the fine structures in emission and absorption and essentially to a whistler instability and whistler propagation in the solar corona. Only this unique model explains several complex fine structures (splitting of zebra stripes, sawtooth frequency drift, synchronous changes of the frequency drift with spatial drift of their radio sources) that couldn't be made within the alternative model at double plasma resonance.

This topic is not so narrow. The theory of the zebra pattern is related to mechanisms of radiation of all solar radio bursts. In addition, the zebra pattern was observed also in a radio emission of pulsars.

Chernov G.P. possesses a priority in discovery of new elements of the fine structure: splitting of zebra stripes, sawtooth frequency drift synchronously with spatial drift of their radio sources, super fine structures of the zebra stripes in the form of millisecond spikes. These new findings were published in collaboration with colleagues from the other observatories (Meudon, Triest, NAOC) with whom he fruitfully cooperated for many years. The discovery of the super fine structure of zebra stripes has received a wide resonance in the literature, however the most adequate interpretation has been made by Chernov G.P. in the frame of uniform model of the fine structure with whistlers.

Chernov G.P. continues those investigations in cooperation with Chinese colleagues during some short working visits in NAOC where new solar radio heliograph were constructed. Chernov G.P. participates also in the development of new radio experiment in the future Interhelioprobe space project.

CHERTOK Ilya Moiseevich

Born 01.01.1941. In 1963 graduated from the radiophysical faculty of the N.I. Lobachevsky Gorky State university. Since the same year, he has been constantly working at the N.V. Pushkov Institute of terrestrial magnetism, ionosphere and radio wave propagation of the Russian Academy of Siencies (IZMIRAN) in positions from a probationer to a leading researcher. Candidate of physical– mathematical sciences (1971). A member of IAU (Division E Sun and Heliosphere), of the International Astronomical Society (Russia, Commonwealth of Independent States, and Baltic countries), of the Solar sections of the Scientific Council for Astronomy of RAS. A solar astronomer, expert in solar-terrestrial physics.

The main scientific works relate to the field of solar physics and solar-terrestrial relations, an author of more than 260 published articles.

In the 1960s I.M. Chertok in collaboration with V.V. Fomichev studied meter solar radio bursts of various types, interpreted their polarization and other characteristics. From them, in particular, the magnetic field strength at different heights in the solar corona was determined.

In the 1970s and 1980s, together with S.T. Akinyan and V.V. Fomichev, developed a method for the quantitative diagnostics of solar proton flares based on the accompanying radio bursts, which makes it possible to estimate the expected flux of tens of MeV protons near the Earth and their energy spectrum several hours in advance. The technique is used for short-term forecasting of space weather, since protons of these energies make the main contribution to disturbances in the radiation environment in near space, to disruptions of short-wave radio communications on high-latitude traces, and to other disturbances. This technique has also proved to be a useful tool for investigating a number of properties of solar cosmic rays. It was shown, in particular, that their origin is due not only to the primary flare energy release and shock waves, but also to the post-eruptive relaxation of the magnetic field high in the corona.

Since the mid-1990s, I.M. Chertok has been studying coronal mass ejections (CMEs), which are the main drivers of non-recurrent geomagnetic storms and Forbush-decreases of the galactic cosmic ray density, and also has been investigating the associated large-scale dimmings (temporary brightness depressions in the ultraviolet and X-ray ranges), coronal waves and post-eruptive arcades. Based on these studies carried out in the 2000s and 2010s together with V.V. Grechnev, he developed a technique for early diagnostics of solar eruptions, which allows, before obtaining information about CMEs, with a lead time of 1 to 4 days, to estimate the probable intensity and temporal parameters of geomagnetic storms and Forbush-decreases from the magnetic flux of dimmings and arcades at the photosphere level.

He successfully cooperates with Russian and foreign colleagues, works with young scientists.

ichertok@izmiran.ru

CHIBISOV Gennady Vasilievich

Born 23.09.1946. He obtained his PhD in 1972, from the Moscow Institute of Physics and Technology, with a thesis entitled "Entropy perturbations in cosmology". In the period from 1972 to 2008 worked in the theoretical department of the Lebedev Physical Insitutre. Died 07.08.2008 in Moscow.

Main scientific works were related to the fields of theoretical physics and cosmology. G. Chibisov is best known for his 1981 paper on the origin of cosmological density perturbations from quantum fluctuations, coauthored with Viatcheslav Mukhanov. The predictions of this paper were briliantly confirmed in numerous experiments on the measurements of the Cosmic Microwave Background fluctuations. The Mukhanov-Chibisov discovery was honored by numerous international awards.

CHILINGARIAN Igor Vladimirovich

Born 16.05.1980 in Moscow. Graduated from M.V. Lomonosov Moscow State University (MSU), Faculty of Physics, in 2003 (MSc in astronomy), PhD in astrophysics in 2006 (MSU Claude Bernard Lyon-1, France). A researcher then leading researcher at Sternberg Astronomical Institute, M.V. Lomonosov Moscow State University (SAI MSU) since 2005. I.V. Chilingarian worked at the Special Astrophysical Observatory, Russian Academy of Sciences (SAO RAS), Paris Observatory (France), the University of Strasbourg (France), and Harvard-Smithsonian Center for Astrophysics (USA). Doctor of phys.-math. sciences (2010). Serves as an expert at the Russian Science Foundation (Russia), National Science Foundation (USA), regularly performs peer-reviewing for highly ranked journals in the field of astronomy and astrophysics.

I.V. Chilingarian main research expertise: formation and evolution of early-type galaxies, compact stellar systems (globular clusters, ultracompact, and compact elliptical galaxies), stellar populations, optical and infrared spectroscopy, data reduction and analysis pipelines for optical and infrared data, astronomical archives and databases, the Virtual Observatory. Published over 100 papers.

In the mid-2000s while working on his PhD, I.V. Chilingarian developed a novel data analysis technique for absorption-line spectra of galaxies and star clusters NBursts, which could extract internal kinematics and stellar population information. I.V. Chilingarian and his collaborators published over 50 papers based on the NBursts technique. The detailed analysis of spectra of dwarf elliptical galaxies enabled I.V. Chilingarian to describe their evolution in clusters and groups.

In 2004-2015 I.V. Chilingarian led the development of theoretical and observational data archives at SAO RAS (ASPID, Archive of Spectral, Photometric, and Interferometric Data), Paris Observatory (GalMer, Galaxy Mergers Database), Harvard-Smithsonian Center for Astrophysics (Hectospec science data archive). In 2003-2011 I.V. Chilingarian made a major contribution to the development of technologies and their subsequent scientific usage in the international initiative called “Virtual Observatory”.

Using the Virtual Observatory technique, I.V. Chilingarian discovered more than 200 compact elliptical galaxies (there were only 6 of them known prior to his work), explored in detail their properties, and described processes of galaxy evolution in clusters where they might lose up to 99% of their stars as a result of tidal interactions with other cluster members. Three papers on this subject were published in the world's most prestigious research journals Science (2009, 2015) and Nature (2015). I.V. Chilingarian was awarded a medal of the Russian Academy of Sciences for young researchers (2012) for his studies of compact stellar systems.

Since 2014, I.V. Chilingarian has been actively developing a new direction in astrophysics – explaining astrophysical phenomena using mathematical methods from statistical physics and network science. The first paper (in collaboration with A.Klishin) presenting a theoretical explanation of the stellar initial mass function was published in 2016.

I.V. Chilingarian collaborates with undergraduate and graduate students and junior researchers in Russia, France, and the US. He supervised two PhD projects.

CHUDOVICHEV Nikolay Ivanovich

Born 04.10.1902. Graduated from Kazan State University (KSU) in 1930. Practicing astronomer-astrophysicist at Engelhardt Astronomical Observatory (EAO) 1930-1942. Master's degree in physics and mathematics in 1939. A head of the astrophysical department of EAO 1942-1951. Doctor's degree in physics and mathematics in 1951. Died 29.08.1951 in Kazan.

Dr. Chudovichev's scientific interests lied in Astrophysics. He studied eclipsing variable stars. He carried out numerous spectrophotometric researches with objective prism. Dr. Chudovichev was the first in EAO who applied the methods of spectrophotometry. He was also the first in EAO who carried out researches on the structure of the chromosphere and solar corona. Dr. Chudovichev participated in gravimetrical expeditions and expeditions to observe the total solar eclipse as well. Dr.

Dr. Chudovichev built "The Catalogue of relative photometric and spectral elements of eclipsing variable star".

In parallel with his work at the Observatory, N.I. Chudovichev taught astronomy as an associate professor at Kazan University and at the Kazan Pedagogical Institute. N.I. Chudovichev defended his doctoral dissertation in 1951. NI Chudovichev died untimely from malignant hypertension at the age of 49 at 29.08.1951.

CHUGAYNOV Pavel Fedorovich

Born 14.01.1933 in Simferopol. After graduation from Simferopol all-boys school 7 he entered the Department of Astronomy, Faculty of Mechanics and Mathematics, Moscow State University. Having graduated from the University, P.F. Chugaynov was taken on to the staff of the Crimean Astrophysical Observatory and worked his whole life there. He successfully advanced from junior researcher to head scientist. Here he was practiced by V.B. Nikonov on the photoe-lectric photometry and practically the whole life carried out photoelectric observations of non-stationary stars. In 1964 defended the Ph.D. thesis "Photoelectric observations of UV Cet stars" and in 1982 – the Doctoral thesis "Photometric and spectral study of non-stationary stars of low luminosity". Died 05.02.1992 in Nauchnyy.

The research interests involve a study of non-stationary stars by a method of photoelectric photometry. Since the late 1950s he was among the first to begin systematic photoelectric observations of the red dwarf UV Cet stars and for hundreds of hours of patrolling their brightness he recorded several dozen sporadic flares of these objects. P.F. Chugaynov carried out a patrol of flare stars' brightness during radio-astronomy observations of these objects by Professor Lovell at the Jodrell Bank Observatory. As a result of these investigations it was established that power of radio flares in these stars substantially predominates over power of solar flares. The performed photoelectric observations of UV Cet stars parallel with time-resolved spectral observations carried out by R.E. Gershberg at ZTSh allowed determining the basic characteristics of spectral development of flares in these stars. P.F. Chugaynov was one of organizers and an active participant of the international cooperative campaigns on observations of flare stars being carried out since 1967 and for many years by IAU Commission on variable stars. Based on accumulated extensive data, color characteristics of flares, statistical dependences of the basic parameters of flares on the properties of stars were defined; a distribution of flares by duration and by energy of optical radiation was obtained.

Since early 70s P.F. Chugaynov began systematic investigations of inhomogeneities of surface stellar brightness – a phenomenon revealed by G. Kron as early as in 1950. He was the first to detect a spottedness of BY Draconis star. Then a variability of red dwarf stars accounted for by uneven brightness of their surface gained a generally accepted definition "BY Draconis variability". In the last years P.F. Chugaynov studied spotted T Tauri young stars and evolution of stars' rotation at early stages of their development.

He took active part in the work of IAU, was an active member of the All-Union Astronomical and Geodetic Society and carried out effective work in the "Znanie" Society. A number of his popular scientific papers were published in such journals as "Nature" and "Earth and the Universe" (in Russian).

An author of more than 100 publications widely quoted in our country and abroad. Up to his last days, P.F. Chugaynov carried out active observations particularly in cooperation with Italian researchers. For this aim he even learnt Italian. But an early death prevented all his numerous plans from being realized.

CHUGAI Nikolai Nikolaevich

Born 14.02.1942 in Shakhty. In 1966, graduated from M.V. Lomonosov Moscow State University (MSU). PhD student of the MSU astrophysics department from 1968 to 1971. Since 1972, in the Astronomical Council (currently, the Institute of Astronomy of Russian Acad. Sci., INASAN) in positions from junior researcher to senior staff scientist. PhD thesis "Supernovae spectra and physical conditions in their envelopes" (1985). D.Sci. (1992, dissertation "Physics of supernova envelopes"). Member of the editorial board of Astronomy Letters.

N. N. Chugai's research interests lie in the fields of supernovae and radiation transfer theory. In 1980 he modified the theory of the hydrogen Ly-alpha resonance scattering in an expanding media of large optical depth. The result enables a description of the Ly-alpha spectrum in the supernova envelope and in the universe at the hydrogen recombination epoch. N. N. Chugai considered a possibility to account for the pulsar velocities invoking asymmetry of neutrino emission by the hot neutron star (1984). In 1986 he proposed a test for the scenario of the explosion of type I supernova in a binary system with the normal companion. In contrast to the common view that the entrained hydrogen should have large velocities, N. N. Chugai showed that the bulk of entrained hydrogen has low velocities and resides in the center of the supernova envelope. The presence of this hydrogen in type I supernova can be revealed by the detection of a narrow Hα emission line powered by the Co-56 decay. In 1990 he proposed a mechanism of a high luminosity of type IIn supernovae, widely accepted now. The principle is that the luminosity is powered by the collision of supernova ejecta with the dense circumstellar matter lost by the star before the explosion. In 1992, N. N. Chugai explained the polarization of the supernova 1987A in the Large Magellanic Cloud via an asymmetric distribution of nickel-56 in the supernova envelope. In 2006, a similar model was applied to the explanation of the strong asymmetry of the Hα emission line and polarization in the supernova 2004dj. In collaboration with the American scientists, he analyzed the spectrum of supernova 1987A taken by the Hubble space telescope eight years after the explosion and estimated the amount of the radioactive titanium-44 that powered the supernova light (1997). Fifteen years later, this estimate was confirmed by the detection of the gamma-ray flux by the INTEGRAL space observatory. N. N. Chugai explained the unusual shape and large width of emission lines in supernova 1998S via the effect of multiple Thomson scattering of quanta in a dense circumstellar envelope (2001). He proposed a solution to a problem of strong hydrogen lines at the photospheric stage of type IIP supernovae; the primary role belongs to the time-dependent recombination effect formerly ignored (2005). In 2007, he explained the origin of narrow high-velocity hydrogen absorption lines in spectra of type IIP supernovae. These lines are found to emerge from the cool dense shell that forms as a result of the shock interaction of supernova with the stellar wind. N. N. Chugai published over 190 scientific papers.

CHUJKOVA Nadezhda Alekseevna

Born 02.24.1940 in Kurovskoe (Moscow region). In 1963 she graduated from the Astronomical Department of the Faculty of Physics Moscow University (MSU). Post-graduate student of the Department of Celestial Mechanics and Gravimetry, Moscow State University (1966-1969). Since 1969 he has been working in the P.K. Sternberg State. astronomical institute (GAISh) Moscow State University (junior researcher, senior researcher, leading researcher). Ph.D. thesis on the topic: "The gravitational field and the figure of the moon" (1970). Doctoral dissertation on the topic: "Gravitational field on the physical surfaces of planets" (1991).

Specialist in the field of gravimetry. N.A. Chujkova created a theory and determined the gravitational fields and figures of the Moon and the planets of the Earth group according to modern satellite data. A new solution to the inverse ill-posed problem of gravimetry for determining the internal structure of the terrestrial planets based on satellite data has been obtained. This solution has been successfully verified for the Earth, where it can be compared with the data obtained using seismic observations of the depths of the Mohorovichich surface for the Earth. So far, such data are available from all terrestrial planets only for the Earth, and this determines the scientific value of the new solution obtained. On the basis of the new theory, a complex of programs was created and the internal structure of Mars was determined. The total number of publications is 126 (72 articles, 52 abstracts).

CHURAZOV Eugene Mikhailovich

Born 01.11.1961 in Chelyabinsk. Graduated with honors from the Moscow Institute of Physics and Technology (1985). Doctor of Physical and Mathematical Sciences (1996), Member of Russian Academy of Sciences (2019). Leading Researcher at the Space Research Institute (Mos-cow) and Research Group Leader at the Max Planck Insti-tute for Astrophysics (Garching). Member of the International Astronomical Union.

Eugene Churazov works in the field of theoretical astrophysics and at the same time actively uses data from space observatories. He actively participated in the analysis and interpretation of data of the KVANT module of the Mir space station, GRANAT and INTEGRAL (European Space Agency) observatories. At present, his main scientific interests are related to the physics of hot gas in galaxy clusters, a diffuse medium in our Galaxy, and cosmology, in particular, using new data from the SRG observatory.

The most important scientific results:

1. AGN Feedback model: the theory of heating hot gas in the centers of galaxy clusters by the mechanical energy of relativistic plasma flows from supermassive black holes. This theory solves the problem of the gas thermal balance and the co-evolution of supermassive black holes and elliptical galaxies.
2. Studies of the annihilation radiation of positrons in the central zone of the Galaxy.
3. Measurements of the spectrum of the cosmic X-ray background by the Earth shadowing.
4. Discovery of gamma lines of radioactive 56Co from the type Ia supernova SN2014J in M82.
5. Development of new methods for diagnostics of hot plasma in galaxy clusters.
6. Diagnostics of molecular gas in the central zone of the Galaxy via scattered X-ray radia-tion from the supermassive black hole Sgr A*.

Awards: Y.B. Zeldovich Silver Medal for young scientists (COSPAR, 1994), the Sir Harry Massey Gold Medal (COSPAR, 2014), and the A.A. Belopolsky medal of Russian Academy of Sciences (2017).

CHUVAEV Konstantin Konstantinovich

Born 12.10.1917 in Chernoistochinsk, Sverdlovsk region. In 1935–1940 – a student in the Faculty of Physics and Mathematics of Kazan University. In 1940–1941 – a researcher in the Abastumani Observatory. In 1941–1946 – a soldier in the Workers' and Peasants' Red Army. A holder of service orders and medals. Since 1946 he worked at the Crimean Astrophysical Observatory (CrAO). In 1952 he defended the Ph.D. thesis "The study of sky light in several spectrum regions". Died 15.11.1994 in Nauchnyy.

Over the first years of working at CrAO K.K. Chuvaev dedicated his time to the development and study of the modern receiving equipment. In 1949–1951 he designed a photometer for studying the sky light. The numerous observations formed the basis for his Ph.D. thesis. The sky light observations taken at the six-channel photometer in the framework of IGY in 1957–1960 were recognized the best in the USSR.

In 1950 K.K. Chuvaev participated in photometric stellar observations to compile a catalogue of magnitudes and colors of stars close to the Sun with the aim of constructing the color-luminosity diagram. K.K. Chuvaev found the brightness variability in some stars.

In the 1960s after studies of cascade image-tube detectors with magnetic focusing he was the first to use them in the prime focus of the 2.6 m telescope (ZTSh) to observe galaxies. The galaxy images were taken with narrow interference filters covering the wavelength range from 3600 to 7400 Å. He developed a technique of standardizing galaxy images. Jointly with I.I. Pronik, he obtained negatives for 200 galaxies which were used by researchers of CrAO to determine compact regions with emission lines in galaxies of different types, to study energy distribution in emission of stellar groups.

Since the early 70s and over 20 years K.K. Chuvaev carried out a spectral monitoring of more than 30 active galaxies in the region of H_α and H_β lines. The acquired observations showed a large variety of phenomena occurring in AGNs. V.I. Pronik and K.K. Chuvaev detected a complex nature of variability of the H_β broad emission line in spectra of Mrk 6 that was explained by temporal changes in conditions of matter ionization and excitation in the broad line region. The significant changes in the H_α and H_β profiles were recorded in many other Seyfert galaxies (NGC 4151, NGC 5548, NGC 7469, and 3C 390.3 etc,), although in some AGNs (NGC 1275, Mrk 509, 3C 120) at significant variation in emission line fluxes, their profile remains practically unchangeable. In some Seyfert galaxies a broad component of emission lines disappeared during 2−3 months (i.e. transition from Sy1 to Sy2 type) and subsequently returned to Sy1 type.

K.K. Chuvaev published 79 research papers. In his honor the minor planet 3429 was named "Chuvaev".

DAGKESAMANSKII Rustam Davudovich

Born 17.04.1938 in Baku, Azerbaijan. In 1960 graduated from the Facul-ty of Mathematics and Mechanics of the Leningrad State University, spe-cializing in astronomy. In 1960 joined the Lebedev Physical Institute (LPI), where he went from the laboratory assistant to the head (since 1988) of the LPI Radio Astronomy Station in Pushchino, Moscow Region (from 1994 to 2020 the director of the LPI Pushchino Radio Astronomy Observatory (PRAO)). Defended PhD thesis on 1969 and Doctor of Sciences thesis on 1998. The chief researcher of PRAO (from 2020).

The main direction of scientific activity is extragalactic radio astronomy. On the basis of his measurements of the flux densities of radio sources from the 3C catalog at 38, 60, and 86 MHz on the East-West arm of Cross-type Radio Telescope of LPI (DKR-1000), he studied the low-frequency spectra of several hundreds radio sources. By the end of 1960s the dependence of the average spectral index of low-frequency sample of radio sources on their flux density was established for the first time. It is shown that this dependence reflects the evolution of the average spectral index of radio galaxies and quasars with a cosmological epoch.

Based on observations with the Pushchino meter-wavelengths radio-link interferometer in 1972-1985 the structures of about one hundred and fifty 3CR radio sources were investigated. It was shown that quasars from the sample have extended components that practically do not differ in radio luminosity and linear sizes from similar extended components of powerful radio galaxies. For the first time, the size and luminosity of the extended component (radio halo) of the spiral galaxy M 31 (the Andromeda nebula) were reliably measured from observations with the Large Phased Array antenna of LPI (BSA). At the same radio telescope, the parameters of radio emission from 24 X-ray clusters of galaxies were investigated and a survey of the northern sky was carried out. In the late 1980s, R.D. Dagkesamanskii, together with I.M. Zheleznykh, proposed a method for detecting cosmic rays and ultrahigh-energy neutrinos using the Moon as a target and large ground-based radio telescopes as detectors. He is author of more than 80 scientific articles and co-author of two books.

R.D. Dagkesamanskii teaches at the Pushchino State Natural Science Institute (faculty of Astrophysics and Radio Astronomy). He is a member of the RAS Scientific Council on Astronomy, a member of the International Astronomical Union, of the Eurasian Astronomical Society, and a member of the editorial board of the Astrono-my Reports.

DAMBIS Andrey Karlovich

Born 28.11.1961 in Moscow. He graduated the Division of Astronomy of the Faculty of M.V.Lomonosov Moscow State University in 1985, defended his Candidate of Physical and Mathematical Sciences dissertation "Luminosities and kinematics of supergiants in the Galaxy" in 1995 and Doctor of Physical and Mathematical Sciences dissertation "Refining astronomical distance and time scales" in 2008. A.K.Dambis has been working since 1985 at Sternberg Astronomical Institute of Moscow State University as an engineer, junior, senior, and leading research fellow, and department head.

Russian astronomer specializing in Galactic astronomy. Principal research interests include the distance scale in the Universe, structure and kinematics of Galactic populations, study of Cepheids, open clusters, and RR Lyrae variables.

Since 1996 A.K.Dambis has been taking part in programs of the comprehensive study of classical Cepheids and RR Lyrae type variables (in collaboration with L.N.Berdnikov, A.S.Rastorguev, O.V.Vozyakova, V.V.Kravtsov, and A.Yu.Kniazev.)

A.K.Dambis investigated the kinematics of young Galactic populations, determined the Galactic rotation curve, velocity dispersions of various populations, and spiral-pattern parameters along with refining the distance scales of objects of various types (in collaboration with Yu.N.Efremov, A.S.Rastorguev, M.V.Zabolotskikh, E.V.Glushkova, and A.M.Mel'nik). A.K.Dambis used the statistical-parallax technique to determine the kinematic parameters of the populations of halo and thick-disk RR Lyraes and blue horizontal branch stars, refined the period-metallicity-luminosity relations for RR Lyrae variables and the photometric distance scale of blue horizontal branch stars.

Together with Yu.N.Efremov and O.V.Durlevich A.K.Dambis used the star coordinates given in Ptolemy's Almagest catalog combined with modern high-precision proper motions to estimate the date of the underlying observations. It was concluded that most of observations were made not by Ptolemy but rather almost three hundred years before him by Hipparchus.

A.K.Dambis has coauthored about 100 papers.

DANILOV Vladimir Mihajlovich

B. 28.05.1948 in Chelyabinsk. Graduated from Ural State University (1971) (now – Ural Federal University, Ekaterinburg). Postgraduate courses at the Department of Astronomy and Geodesy of Ural State University (1975). Works at Ural State University since 1970. Worked at Kourovka Astronomical Observatory progressing from a junior researcher to a chief researcher. Doctor Phys.-Math. Sciences (1993). Professor (2004). Member of the International Astronomical Union (1989), member of different councils and societies.

V.M. Danilov's research interests are stellar dynamics, astrophysics. Belongs to the scientific school of stellar astronomy created by professor K.A. Barkhatova. Developed a method for estimating the size and number of stars in open star clusters (OSCs) based on stellar counts in the vicinity of clusters. Together with his colleagues from Kourovka Astronomical Observatory of Ural State University, V.M. Danilov used this method to study the structural and dynamic characteristics of 103 OCLs from the vicinity of the Sun. Discovered the influence of the gravitational force fields of the star-forming regions – massive gas-stellar complexes (GSK) – on the sizes of young OSCs. For the first time, he did theoretical and numerical-experimental study of the stability of dynamic models of OCL in the total field of forces of the Galaxy and GSK, which explained the observed dependences between the structural and dynamic parameters of OSC in the regions of star formation in the Galaxy. The obtained data are applicable to estimate the total masses and average densities of matter in several GSCs in our Galaxy based on the data on the characteristics of the OSCs formed as a part of these complexes. For the first time, did research on natural vibrations in the nuclei of numerical dynamic models of the OSC. The instability of such oscillations was shown. The development of such instability leads to the dominance of oscillations with a certain (natural) frequency corresponding to the growth rate of this instability, which makes it possible to explain the causes and features of the development of large-scale oscillations in the OSC and the numerical dynamic models of the OSC.

V.M. Danilov prepared and delivered lecture courses "Dynamics of stellar systems", "Mathematical modeling on a computer".

He is the author of 140 research publications, including a teaching manual and a monograph. Academic advisor for two Ph.D. theses.

V.M. Danilov was awarded the first prize of Ural State University for young scientists (1975), the first prize of Ural State University for a comprehensive study of open star clusters (1983, collective work). Awarded with silver and bronze medals of the Main Committee of the Exhibition of Economic Achievements of the USSR (1986, 1988). Awarded with the honorary title "Honorary Worker of Higher Professional Education of the Russian Federation" (2003).

DEMIDOV Mikhail Leonidovich

Born 07.11.1955, Yoshkar-Ola, the Mari Autonomous Soviet Socialist Republic (now the Mari El Republic). Graduated from Kazan State University (now Kazan Federal University) with full honors in 1978 and joined the Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation of the SB, the USSR Academy of Sciences (since 1992, the Institute of Solar-Terrestrial Physics, ISTP SB RAS) and has been working continuously in different scientific positions. Since 2014, a Deputy Director for Academic Work, the Head of the Solar Physics Department. Doctoral degree in Phys.-Math. Sciences (2006), a Member of the ISTP SB RAS Academic and Dissertation Councils, a Member of IAU.
http://ru.iszf.irk.ru/Демидов_Михаил_Леонидович

M.L. Demidov's research mainly relates to solar magnetic fields and the development of astrophysical instruments, improvement of observational techniques and methods of data processing and interpretation. He is the author and co-author of more than 110 scientific papers, 1 monograph, and 3 inventions.

While studying at Kazan University, M.L. Demidov did training at the Crimean Astrophysical Observatory. Based on his graduation thesis results, published his first research article in the journal “KraO Bulletin” (together with V.A. Kotov) on studying features of the Sun's general magnetic field (GMF) (the magnetic field of the Sun as a star). Later, based on observations with the Solar Telescope for Operative Prediction (STOP) at the Sayan Solar Observatory, he investigated GMF physical and statistical characteristics. Since 1997, the STOP researchers started using CCD receivers for GMF observations of the Sun; spectropolarimetric measurements began simultaneously in many spectral lines. This enabled investigating features of manifestations of small-scale magnetic elements in observations of general and background magnetic fields of the Sun.

M.L. Demidov is an active participant in international projects, performs joint theoretical and experimental research with foreign colleagues.

In addition to research, M.L. Demidov is involved in the development, design and implementation of new generation solar telescopes. Actively collaborates with industrial enterprises and other scientific institutions. A Member of the SB RAS Joint Academic Council on Physical Sciences, a certified expert of RAS. M.L. Demidov gives a high priority to training young researchers.

Awards: the honorary title "Honored Veteran of the SB RAS" (1999), Certificate of Honor from the RAS and trade unions of workers of the RAS (1999), honorary badge "Silver Sigma" (2007), Letter of Gratitude from the Mayor of Irkutsk (2007), Certificates of Honor from the SB RAS (2010, 2015).

DEMIN Vladimir Grigorievich

Born 06.08.1929, Agafonikha village, Novosibirsk region. Died 16.09.1996, Moscow. Student of the astronomical department of the Faculty of Mechanics and Mathematics of Moscow State University (1946-1951). Graduate student of the Department of Celestial Mechanics and Gravimetry, Faculty of Mechanics and Mathematics of Moscow State University (1951-1954). Candidate dissertation on the topic "New classes of periodic solutions of the restricted circular three-body problem" (1961). Doctoral dissertation on the topic "Motion of an artificial satellite in an off-center gravitational field" (1969). Professor of the Faculty of Mechanics and Mathematics of Moscow State University (1971-1996). Laureate of the 1st degree Lomonosov Prize (1969), laureate of the USSR State Prize for Science and Technology (1971). Member of the IAS (1971). Died 16.09.1996 in Moscow.

Celestial mechanic and mathematician. One of the authors (together with E.A. Grebenikov and E.P. Aksenov) of "generalized problem of two stationary centers", which has found many effective applications in celestial mechanics, astrodynamics, and dynamics of stellar systems. Specialist in analytical and celestial mechanics, theories of intermediate orbits of artificial satellites, perturbation theory of integrable Hamiltonian systems, theory of periodic Poincaré solutions. He developed the methods of Poincaré-Hadamard for the qualitative study of orbits, the second method of Lyapunov, and the method of Chetaev. He was engaged in applications of the Kolmogorov-Arnold-Moser theory to the dynamics of space flight and other areas of celestial mechanics and astrodynamics. Laureate of the Lomonosov Prize of the 1st degree (1969) (together with E.P. Aksenov, E.A. Grebenikov, and G.N. Duboshin). Laureate of the USSR State Prize in Science and Technology (1971) (together with E.P. Aksenov, E.A. Grebenikov, G.N. Duboshin, and M.D. Kislikom).

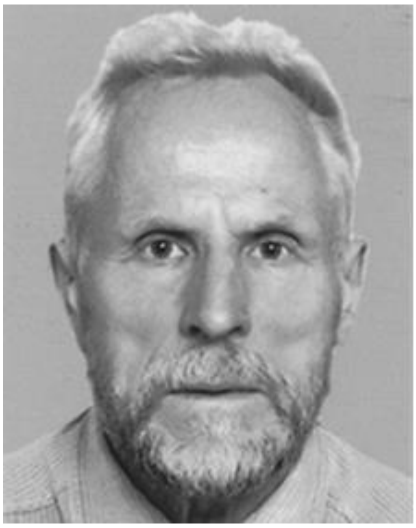
Junior Researcher, Department of Theoretical Astronomy at Sternberg Astronomical Institute of MSU (1954-1962). Associate Professor of the Department of Mathematical Analysis at Peoples' Friendship University of Russia (1962-1965). Associate Professor of the Department of Theoretical Mechanics at the Faculty of Mechanics and Mathematics of Moscow State University (1965-1971). From 1971 to 1996 – Professor of the Department of Theoretical Mechanics at the Faculty of Mechanics and Mathematics of Moscow State University (1971-1996).

Co-founder and academician-secretary of Russian Academy of Cosmonautics named after K.E. Tsiolkovsky, one of the organizers and active participants of scientific readings in memory of K.E. Tsiolkovsky in Kaluga.

He has trained more than one hundred and ten candidates and doctors of Physical and Mathematical Sciences (Russia, Ukraine, Moldova, Georgia, Armenia, Azerbaijan, Kazakhstan, Uzbekistan, Germany, Greece, Egypt, Israel, Kuwait, India, China, Vietnam, and other countries). Published around 120 publications, including several monographs, textbooks, and popular science books

Minor planet No. 5086 is named after Demin.

DERGACHEV Valentin Andreevich



Born 24.04.1937 in Vitebsk. In 1965 graduated from the Physics and Mechanics Department of the Leningrad Polytechnical Institute. Since 1964 a collaborator of the Ioffe Institute in the following positions: trainee researcher, junior researcher, senior researcher, principal researcher, head of the laboratory. Deputy Director of the Ioffe Institute for scientific work (2003-2013). Since 2013 – the Head of the Cosmic Ray Laboratory at the Ioffe Institute. The particular special field: astrophysics and solar-terrestrial physics. Member of the Council of the Russian Academy of Sciences on Space, the Scientific Council on the complex problem "Cosmic Rays" of the Russian Academy of Sciences, the Councils for the Doctoral Thesis in the Ioffe Institute, and Pulkovo Observatory.

V.A. Dergachev is a well-known Russian astrophysicist and geophysicist who took an active part in the study of solar neutrinos, studies of supernova explosions, cosmic rays, in system studies of solar-terrestrial relations. He is the scientific leader for the study of the polarization of hard X-ray radiation. A polarimeter for the Coronas – Photon experiment was constructed in a laboratory headed by V.A. Dergachev. X-ray radiation of the Sun was studied using this apparatus. Further research in the framework of the space project the “Intergeliosond” results in the creation of a new polarimeter PING-M. A series of experiments on the study of solar and galactic cosmic rays was carried out using a track detector made in the laboratory and installed at the MIR and ISS stations. The most important data on solar X-ray flares, the energy spectra of cosmic rays formed during powerful events on the Sun were obtained using this device.

The works of V.A. Dergachev on the study of various astrophysical and geophysical processes and patterns of changes in natural processes on a long-time scale based on data on the content of isotopes whose generation in the Earth's atmosphere is influenced by solar activity and cosmic rays have contributed to the formation of a new scientific direction of research, which lays at the intersection of nuclear physics, astrophysics, and geophysics. In these studies, several new fundamental results were obtained concerning the secular and super-secular cycles of solar activity, long-term changes in the geomagnetic field, and processes in the environment, including the new data on the heavy nuclei of low-energy cosmic rays in the Earth's magnetosphere. V.A. Dergachev obtained several fundamentally new scientific results that have found wide international recognition and fame.

V.A. Dergachev is the author of more than 400 scientific works and monographs, a highly qualified specialist with extensive experimental and scientific-organizational experience. Candidate of Physical and Mathematical Sciences (1973), Doctor of Physical and Mathematical Sciences (1985), principal researcher (2005). Four candidate's theses were prepared and defended under his supervision. He works intensively as a member of many commissions and specialized dissertation councils. He takes part in the organization of major scientific arrangements devoted to solar activity and cosmic ray physics.

State awards: medal "In Commemoration of the 300th Anniversary of St. Petersburg" (2003), Medal of the Order of Merit to the Fatherland, II Degree "(2010), Jubilee Medal" 70 Years of Victory in the Great Patriotic War "(2013 g.).

DEUTSCH (DEICH) Alexander Nikolaevich

Born 31.12.1899. Doctor of physics-mathematical Sciences, Professor. Born in Reni (now the Odessa region., Ukraine). After high school entered the Saratov University. In may 1919 was mobilized into the Red Army. Since 1920 worked as a lab technician in the Military and Economic Academy of Red Army and Navy in Petrograd and taught mathematics on the preparatory department. Demobilized in 1923, in 1924 graduated from the Leningrad University. In 1923 entered to the Pulkovo Observatory, where worked until 1986. In 1935, for cumulative work, he had the academic degree of candidate of Sciences. In 1941 he de-fended his doctoral thesis on the basis of the determination of 18,000 proper motions of stars of selected areas of Kapteyn. In 1936 headed the Pulkovo group of photographic astrometry. From 1945 to 1973 – the head of Department of photographic astrometry and stellar astronomy. Died 22.11.1986 in Leningrad.

During the Great Patriot war since September 1941 to February 1942, was acting as the director of the Observatory. Many instruments, books of the library stock and materials of glass library have been saved by means of efforts of A. N. Deutsch and of the staff of the Observatory.

Main scientific works of A. N. Deutsch treat photographic astrometry and stellar astronomy. Also he participated in expeditions for the observation of a total solar eclipse (1927, 1936, 1945) and in two expeditions for determinations of the longitude of Sverdlovsk, Tbilisi (1930) and Arkhangelsk (1932). In 1929, he discovered the asteroid, which was named 1148 Rarahu. Participated in a study of the unique material observations of the solar corona on 19 June 1936. In the late 50s has developed a method of determining of coordinates of the artificial satellite.

A major contribution of A.N. Deutsch in the creation of the Inertial coordinate system was the implementation of the idea of B. P. Gerasimovich und N. I. Dneprovsky about the determination of absolute proper motions with reference to galaxies. This program was outlined in the report at the VIII Congress of IAU in Rome in 1952 and adopted as the international one and was supported at many observatories in the world. For many years, A. N. Deutsch was the head of the work, which was carried out on four Soviet observatories and on seven foreign ones. In the early 1970s, organized a work on attraction of observations of quasars for solving problems with absolutization of proper motions of stars. His work " Nuclei of galaxies", published else in 1966, made it possible to draw preliminary conclusions about the physical nature of these objects. Examining long series of Pulkovo observations of the star 61 Cygni, made a hypothesis about its possible satellites of substellar nature with periods rotation of 6 and 12 years (Izv.GAO, 1951,1957, Astron Lett.,1978).

A.N.Deutsch is author of over 120 scientific papers. One of the authors of the famous Pulkovo "Course of astrophysics and stellar astronomy." From 1936 to 1981 A. N. Deutsch taught courses "Photographic astrometry", "Double star" and "Approximate computing." at the Leningrad University. Since 1932, for a number of years A. N. Deutsch taught a course of nautical astronomy in the High Naval College of M.V. Frunze. During the two terms in 1961—1966 he was the President of the Commission No. 24 "Photographic astrometry" of International Astronomical Union. Small planet open L. I. Chernykh on January 24, 1968 in the Crimean astrophysical Observatory, named as “1792 Reni”, in honor of the birthplace of A. N. Deutsch.

DEVYATKIN Alexander Vyacheslavovich

Born 16.01.1959 in Lipetsk Region. In 1981, graduated from Astronomical section of Dept. of Mathematics and Mechanics of the State University of Leningrad (now, the State University of St.-Petersburg). Since 1981, with The Central Astronomical Observatory of the USSR Academy of Sciences (now, The Central Astronomical Observatory of RAS) at positions of Head of Group, Head of Laboratory, Head of Department, Deputy Director. Dr.Sci. (2011), Member of IAU, Member of Expert Group on Space Hazards with RAS Council on Space, Member of Science and Dissertation Boards, of the Editorial Board of «Izvestiya of the Pulkovo Observatory» Journal.

His basic works belong to areas of ground-based and space astrometry, asteroid and comet hazards, photometry, celestial mechanics, atmospheric refraction, astronomical engineering and software.

Introduced the theory of astrometric reduction of position and photometrical observations of Solar system bodies taking into account geometrical and photometric factors: the phase effect, photometric inhomogeneity of reflecting surface, chromatic refraction, peculiarities related to the method of observations of planets and their satellites, ways of detecting and measurements of images, etc.

Supervised series of astrometric and photometric observations of Solar system bodies. Organized CCD observations with robotized telescopes; at the Mountain Station of the Pulkovo Observatory, with meridian instruments obtained astrometric series of observations of the Sun, Mercury, Venus, Mars and determined elements of orientation of the dynamical coordinate system with reference to the stellar coordinate system. Obtained new data on asteroids, including those approaching the Earth. Studied the details of the impact of asteroid 2008 TC3. Analyzed series of astrometric observations of Uranus, Neptune, and Pluto aiming at searching of a large-mass planet X beyond Neptune using dynamical techniques. Studied conditions for the “green ray” sunset phenomenon. Supervised the development of the software for processing CCD astronomical observations and controlling robotized telescopes. Directed modernization and robotization of telescopes of the Pulkovo Observatory (ZA-320M Mirror Astrograph, Meniscus Maksutov Telescope, and others). Participated in establishment of astrometric facilities for meridian observations of the Sun and large planets at the Mountain Astronomical Station of the Pulkovo Observatory, and later in transfer and mounting of MTM-500M telescope. Authored more than 300 science papers. Organized the renewal of All-Russia Astrometric Workshops.

DIBAI Ernst Apushevich

Born 06.08.1929, Agafonikha village, Novosibirsk region. Died 16.09.1996, Moscow. Student of the astronomical department of the Faculty of Mechanics and Mathematics of Moscow State University (1946-1951). Graduate student of the Department of Celestial Mechanics and Gravimetry, Faculty of Mechanics and Mathematics of Moscow State University (1951-1954). Candidate dissertation on the topic "New classes of periodic solutions of the restricted circular three-body problem" (1961). Doctoral dissertation on the topic "Motion of an artificial satellite in an off-center gravitational field" (1969). Professor of the Faculty of Mechanics and Mathematics of Moscow State University (1971-1996). Laureate of the 1st degree Lomonosov Prize (1969), laureate of the USSR State Prize for Science and Technology (1971). Member of the IAS (1971). Died 11.11.1983 in Moscow.

Celestial mechanic and mathematician. One of the authors (together with E.A. Grebenikov and E.P. Aksenov) of "generalized problem of two stationary centers", which has found many effective applications in celestial mechanics, astrodynamics, and dynamics of stellar systems. Specialist in analytical and celestial mechanics, theories of intermediate orbits of artificial satellites, perturbation theory of integrable Hamiltonian systems, theory of periodic Poincaré solutions. He developed the methods of Poincaré-Hadamard for the qualitative study of orbits, the second method of Lyapunov, and the method of Chetaev. He was engaged in applications of the Kolmogorov-Arnold-Moser theory to the dynamics of space flight and other areas of celestial mechanics and astrodynamics. Laureate of the Lomonosov Prize of the 1st degree (1969) (together with E.P. Aksenov, E.A. Grebenikov, and G.N. Duboshin). Laureate of the USSR State Prize in Science and Technology (1971) (together with E.P. Aksenov, E.A. Grebenikov, G.N. Duboshin, and M.D. Kislikom).

Junior Researcher, Department of Theoretical Astronomy at Sternberg Astronomical Institute of MSU (1954-1962). Associate Professor of the Department of Mathematical Analysis at Peoples' Friendship University of Russia (1962-1965). Associate Professor of the Department of Theoretical Mechanics at the Faculty of Mechanics and Mathematics of Moscow State University (1965-1971). From 1971 to 1996 – Professor of the Department of Theoretical Mechanics at the Faculty of Mechanics and Mathematics of Moscow State University (1971-1996).

Co-founder and academician-secretary of Russian Academy of Cosmonautics named after K.E. Tsiolkovsky, one of the organizers and active participants of scientific readings in memory of K.E. Tsiolkovsky in Kaluga.

He has trained more than one hundred and ten candidates and doctors of Physical and Mathematical Sciences (Russia, Ukraine, Moldova, Georgia, Armenia, Azerbaijan, Kazakhstan, Uzbekistan, Germany, Greece, Egypt, Israel, Kuwait, India, China, Vietnam, and other countries). Published around 120 publications, including several monographs, textbooks, and popular science books

Minor planet No. 5086 is named after Demin.

DLUZHNEVSKAYA Olga Borisovna

Born 27.01.1936 in Moscow. 1959, graduated from M.V. Lomonosov Moscow State University (MSU) with specialization "Astronomy". Since 1959, worked at the Astronomical Council of the USSR Ac.of Sci. (currently, the Institute of Astronomy of Russian Acad. Sci., INASAN). 1959-1962 - junior researcher, 1962–1965, PhD student, PhD thesis "Investigation of the evolution of early-type stars» (1966), 1968-1975, Scientific Secretary of the Astronomical Council, the leading researcher, editor "Scientific information" of this organization (1966–1975). Since 1981 until present – Head of Astronomical Data Centre of INASAN. Chairman of Section 13 "Databases and information support" of the SCA of the Department of Physical Sciences RAS (2000–present) a member of the Council of Library of RAS (2003-present).

After graduating from MSU, O.B. Dluzhnevskaya worked at the Astronomical Council of the USSR Ac. of Sci. She focused on the Moon and Mars study and she was involved in satellite observations, data processing and the development of high precision astronomical camera (ВАУ) design that is patented. Since 1966, after defending her Ph.D. thesis, she continued to work in the Astronomical Council (Department of Physics and Evolution of Stars headed by Prof. A.G. Masevich). The main research problems: the interstellar matter, star formation, study of various characteristics of young open clusters based on the results of theoretical calculation of evolution of the stars of early spectral types.

In 1975–1985 O.B. Dluzhnevskaya - Vice-President of the Problem Commission of Multilateral Cooperation of the Ac. of Sci, of Socialist Countries "Physics and Evolution of Stars" and also the scientific secretary of the bilateral cooperation with astronomers from France, India and Finland.

By her initiative, the Center of Astronomical Data (CAD) at the INASAN was established, where she occupy a director position since 1981 to present. CAD is a branch of the Strasbourg International Center of Stellar Data (CDS) that was founded for astronomers of the USSR and socialist countries. This enabled free access to all astronomical data accumulated in the world. She was a member of the International Scientific Council of the CDS (1980-86). Among her initiatives are the creation of the International Database of glass libraries of astronomical observatories.

Her contribution to these projects and collaboration with scientists from different countries were reflected in the numerous publications. The total number of published papers is about 150.

In 1991, she was elected Vice-President (1991–94, 1994–97), and then President (1997–2000, 2000-2003) of the Commission 5 "Documentation and Astronomical Data" of the International Astronomical Union (IAU). The most important results of her activity in these years were the set-up of the Com.№5 IAU WG, bringing together the libraries of astronomical institutions over the world. Also, by her initiative, the project of International Virtual Observatory (IVO) was suggested (2000) and the Russian VO was approved as the national part of the IVO (2001 to present), for which she is in charge. O.B. Dluzhnevskaya is a member of the Org. Com. IAU Division XII (2009–12), a member of the Org. Com. of the WG "Women in Astronomy" of the Ex.Com. IAU (2005–2015).

Since 2004 she acted as Focal point from Russia in UNESCO World Heritage Thematic Initiative "Astronomy and World Heritage"(2004 to present). She was a Director of the exhibition "Space research in the USSR" in the UN General Assembly USA (1982), Head of the Department of similar exhibitions in Italy (1964,1968), Canada "Expo 67", Mexico (1981), Brazil(1983), Finland(1984), Denmark(1992).

She was awarded the "Badge of Honor" (1980) and 2 medals as well as 2 EEA medals, 2 Certificates of honor from the RAS, the M.V. Keldysh medal, the medal of the Ministry of Education and Science of Russia and other departmental awards. She is a member of the Writers' Union of Russia (2018). Minor planet 2009SH215 «DLUZHNEVSKAYA» is named after O.B. Dluzhnevskaya in 2011.

DNEPROVSKY Nikolay Ivanovich

Born 13.11.1887 in Yartsevo near Smolensk. In 1911, graduated from Moscow University and was kept with the Chair of Astronomy for preparation to Professorate. From 1912 – Supernumerary Assistant of the Observatory of Moscow University. 1914–1915 – military service, at I World War. 1915–1937 with Pulkovo Observatory (since 1932, Director of Science). At the same time, since 1920 lectured in Leningrad Astronomical and Geodetical Institute. In 1919 organized the radio-technical time service at Pulkovo Observatory, which from 1921 provided regular exact time signals for the whole country. Since 1924: Secretary of Interdepartmental Committee on Time Service at Pulkovo Observatory, since 1925 – Head of its Technical Bureau. Died 04.02.1944 in Vologda.

His basic science works belong to fundamental astrometry. Determined declinations of stars from observations with the Struve–Ertel Vertical Circle; from these observational data, compiled three original absolute Catalogs and one Union Catalog. On the basis of detailed studies of dome refraction, concluded that the Vertical Circle is to be transferred from the Meridian Hall, and в 1928 organized its transfer to a separate dome, 200 meters to the south of the Main Building, with the aim of creating ideal observational conditions for the telescope. From 1928 to 1941 the Vertical Circle worked in this dome. Published a number of studies aimed at improvement of Pulkovo Tables of Refraction, and prepared their Third edition (1930).

In 1920–1921, instructed hydrographers and attendees of the Military Engineering Academy, assigned to Pulkovo Observatory.

In 1932, at the Astrometric Workshop in Pulkovo, along with B.P. Gerasimovich presented a talk «Stellar astronomy and fundamental systems of stellar positions», which greatly affected future development of astrometry in the USSR. In the talk, an establishment of a new independent coordinate system was proposed, to be realized through a stellar Catalog based on observations of only faint stars, whose proper motions would be determined with the reference to distant galaxies. Later, had devoted much attention to organization of this work, in post-war years widely carried out in observatories of the USSR under the supervision of M.S. Zverev, and also in some foreign observatories.

In the same time with the astronomer of Nikolayev Observatory B.K. Zalessky suggested the idea of observations of declinations of stars with the same instrument from two observatories located symmetrically relative to the equator in Northern and Southern hemispheres. This idea was later realized in Munich Observatory and reflected in works of the Chilean expedition of the Pulkovo Observatory with the Photographic vertical circle (1963–1966).

In 1936, was arrested in Leningrad during Stalin "purges" and sentenced to 10 years in prison (1937). Was imprisoned in Vologda, sentenced to capital punishment (1938), executed in Vologda (1944).

DOBRONRAVIN Petr Pavlovich

Born 01.01.1908 in Rostov, Yaroslav region and died on 10.03.2000 in Nauchny. In 1922–1925 – head of the meteoro-logical station NKI RSFSR. In 1926–1930 – student at Lenin-grad University. In 1930–1933 – Ph.D. student at the Institute of Astronomy (since 1943 the Institute of Theoretical As-tronomy of the USSR Academy of Sciences). In 1934–1935 – senior researcher at the Institute of Astronomy, Leningrad University. In 1933–1934 he took part in foundation of the Abastumani Observatory. In 1935–1937 – researcher at State Optical Institute. In 1937–1942 and 1944–1945 – senior re-searcher at the Pulkovo Observatory. In 1942–1944 and 1945–1946 he served in the Workers' and Peasants' Red Ar-my. Between 1946 and 2000 he worked at the Crimean As-trophysical Observatory. In 1938 – took the Ph.D. degree (without defending the thesis). In 1940 – was appointed as senior researcher. Died 10.03.2000 in Nauchnyy.

P.P. Dobronravin is an astrophysicist-spectroscopist and science administrator.

In the 1930s in cooperation with academician G.A. Shajn he studied the integral spectrum of Milky Way and first reliably established the similarity of this spectrum with spectra of other stellar systems (galaxies). In the post-war years he was engaged in spectral investigations of the late-type stars and detecting coordinates of spacecrafts (State Prize of the USSR in 1971).

P.P. Dobronravin was a talented science organizer, participated in foundation of the Abas-tumani and Crimean Astrophysical Observatory, in reconstruction of the Simeiz Observatory. Such prominent instruments of their days as 2.6 m telescope named after academician G.A. Shajn and 22 m radio telescope RT-22 in CrAO were designed with his participation.

For 35 years (1954–1990) he was an editorial staff member of the journal "Izvestiya Krymskoi Astrofizicheskoi Observatorii" (in Rus.).

The asteroid 3119 Dobronravin was named in his honor.

An author of over 100 scientific and popular scientific publications.

P.P. Dobronravin was awarded a medal "For the defense of Leningrad" (1944), order "Mark of Honor" (1953), order "Red Banner of Labor" (1961), State Prize of the USSR for works on precision engineering (1971).

DOKUCHAEVA Olga Dmitrievna

Born 22.12.1925, Moscow. In 1943-48 she was a student of Moscow State University (MSU), Faculty of Mechanics and Mathematics. From 1944 to 1995 she worked at Sternberg Astronomical Institute (SAI) as a preparator, laboratory assistant, researcher and senior researcher. In 1950-1953 she was a postgraduate student of the Department of Stellar Astronomy, in 1954 she defended her Ph.D. thesis on the topic "Investigation of Be-Type Stars", supervisor – prof. B.A. Vorontsov-Velyaminov. In 1955-1987 she was the head of laboratory of astronomical photography.

She participated in the formation of the new SAI (since the early 1950s). She organized and equipped the laboratory of astronomical photography with instruments for sensitometric studies of astrophotographic materials and specific reproductions, as well as for observers support and the educational process.

All imported and Soviet astrophoto materials were studied in the laboratory (astronomers were interested in 150 varieties). In 1960, in contact with ORWO, she succeeded in eliminating the defects made by the manufacturer in the form of black dots on the emulsion. Developed methods for storing and using especially highly sensitive Soviet astro-films. She gave a course of lectures on astrophotography for students MSU. Laboratory assistants were constantly trained. In an article on the history of photography, she pointed out that the first pictures of a lunar eclipse were taken in Russia in 1844 (IAI, 1966, issue 9, 199 p.).

She carried out observations and photometry of extended celestial objects, comet Arenda-Roland 1956h and the Orion nebula, and for the first time obtained an estimate of the nebula's mass. She was studied Be stars and shown that their kinematics and visible distribution, as well as the parameters of the continuum in the visible region of the spectrum, are similar for the stars Be and B. The co-authors carried out observations and photometry of planetary nebulae, compiled a catalog of the intensities of emission lines in the spectrum for 171 objects. The difference is revealed in the physical parameters of planetary nebulae visible in the direction of the center of the Galaxy and in other directions. Discovered a Nova V3645 Sgr (co-authored). The protoplanetary object HM Sge was discovered.

She published about 200 articles, the monograph “Astronomical photography. Materials and methods". M. Physmatlit. 1994, 479 p. Russian translation of the book by J. Vaucouleurs "Astronomical photography" Paris, 1958, 102 p. She was engaged in the popularization of astronomy, also she was a freelance lecturer at the planetarium (1951-1954).

Member of the Organizing Committee of the IAU on Astrophotography, member of the Commission on Planetary Nebulae No. 35. She was warded medals of the Academy of Science USSR and VDNH. Co-author of inventions, copyright certificates № 624197 and 641387.

DOLGOV Alexander Dmitrievich

Born 01.07.1941, Moscow, graduated from MIPT with speciality experimental nuclear physics. From 1967 works in ITEP and from 2012 works in Novosibursk State University as a professor and director of the Center of Partilcle Physics and Cosmology. Doctor of physico-mathematical sciences. Got the Landau-Weizmann, Pontecorvo, Friedmann, and Markov awards.

Main scientific works are dedicated to the application of particle physics to cosmology of the early universe and astrophysics. He derived kinetic equation for neutrino oscillations in the epoch of the Big-Bang Nucleosynthesis (BBN) with the rigorous account of the collision integral in the matrix form. It was shown that the effective number of the neutrino species at BBN exceeds 3 by about 0.04. He has proven that the canonical equilibrium Bose/Fermi distribution satisfies kinetic equation even if T-invariance is broken. The modification of the cosmological expansion regime in F(R) gravity was studied (in collaboration with E.V. Arbuzova). The instability of a large class of modified gravity models was discovered which got the name the Dolgov-Kawasaki instability. In 2012-2016 A.D. Dolgov was PI of the megagrant of the Goverment of the Russian Federation. A new mechanism of formation of supermassive black holes was proposed together with J. Silk. A.D. Dolgov (with M.I. Vysotsky and Ya. B. Zeldovich) derived cosmological upper limit on the heavy neutrino mass. This bound is known as the Lee-Weinberg bound which was independently derived at the same time. The derived expression for the mass density of heavy particles is used now in all the works dedicated to the calculations of the density of cold dark matter. The Maxwell equations have been derived with the quantum correction induced by the conformal anomaly. It is shown that the anomaly breaks the Parker theorem and allows for the photon production in conformally flat Friedmann-LeMaittre-Robertson-Wallker metric. Pioneer works on the universe heating after inflation have been done.

DOMBROVSKY Victor Alekseevich

Born 30.09.13 in Rostov, Yaroslavl province. Graduated from Leningrad State University (LGU) (now St. Petersburg State University) in 1936 (6 scientific papers already published). Since 1936, scientific researcher at LGU Astron. Observatory (AO LGU); since 1944, associate professor at the Department of astrophysics of LGU; since 1962; professor of the Department and Director of AO LGU. Dr. Sci. in phys.-math. sciences (1960), member of IAU, member of several scientific councils, and editorial boards of Soviet astronomical journals. Died 01.02.1972 in Leningrad.

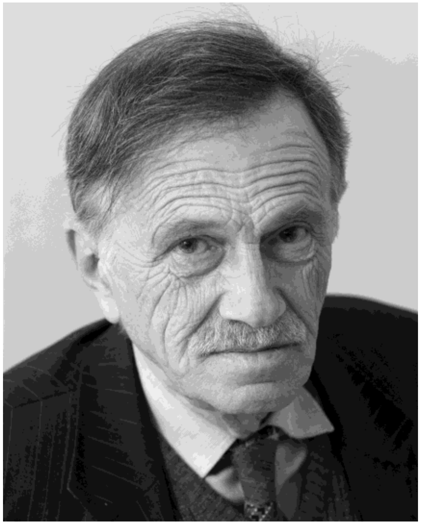
V.A.Dombrovsky's research is mainly related to observational astrophysics. He was the first in the USSR who started, in the 1940s, research on the polarization of light of stars and nebulae. Deservedly considered as the founder and leader of the Soviet school of electropolarimetry. He is the author of about a hundred scientific publications and a chapter on polarimetry in the Pulkovo course of astrophysics and stellar astronomy.

At the end of the 1930s and the beginning of the 1940s, he accomplished photometric and spectrophotometric studies of nebulae and, from the brightness ratio of the continuous and linear spectra, suggested the presence of dust in the Orion Nebula. His detection of radial polarization for this nebula in 1950 confirmed the gas-dust nature of diffuse nebulae. In the 1940s-50s, did polarimetric observations of stars and nebulae. In 1949, discovered, simultaneously with W. Hiltner and J.S. Hall, the polarization of starlight. Received the Leningrad State University Prize for this discovery. Analysis of the starlight polarization, which originates in the interstellar medium, became an efficient method of investigation of the ISM.

V.A.Dombrovsky designed and constructed the first Soviet photoelectric astro-polarimeter, and with its help, he discovered in 1953 a strong non-radial polarization of the radiation of the Crab Nebula, which confirmed the hypothesis of the synchrotron nature of continuum radiation from this nebula. It was due to his initiative and leadership that the South Observational Station of AO LGU was built in the 1960s, next to the V.A.Ambartsumian Byurakan Astrophysical Observatory (Armenia). In the 1960s, V.A.Dombrovsky was involved in research of the proper polarization of starlight. Together with his collaborators, he obtained long sequences of photometric and polarimetric observations of various types of variable stars. These observations demonstrated the presence of the proper polarization due to the light scattering in circumstellar gas/dust envelopes.

During that time, the team led by V.A.Dombrovsky also performed polarimetric observations of the nuclei of Seyfert galaxies and presented interpretation of the results. For the series of polarimetric studies of stars, nebulae, and galaxies, V.A.Dombrovsky (posthumously) and his students O.S.Shulov and V.A.Hagen-Thorn were awarded the USSR Ac. Sci. F.A.Bredikhin Prize (1974).

DOMOGATSKY Gregory Vladimirovich



Born 15.01.1941 in Moscow. In 1964 he graduated from the Physics Department of the Moscow State University. M.V. Lomonosov. Since 1964 to 1970 worked at the Physics Institute. P.N. Lebedev of the USSR Academy of Sciences. From 1971 to the present at the Institute for Nuclear Research, Russian Academy of Sciences. Since 1980 in the position of Head of the Laboratory of High Energy Neutrino Astrophysics. Doctor of Physical and Mathematical Sciences (1980), Corresponding Member of the Russian Academy of Sciences (2008). Chairman of the RAS Scientific Council on Neutrino Physics and Neutrino Astrophysics (1988).

Main scientific works relate to the field of neutrino physics and neutrino astrophysics, author of about 200 scientific publications.

Completed by G.V. Domogatsky studies of the processes of interaction of low-energy neutrinos with matter played a significant role in the formation of the scientific program of the Baksan Neutrino Observatory of the INR RAS. In particular, G.V. Domogatsky is a co-authore with G.T. Zatsepin. paper (1965), where the possibility of detecting a burst of neutrino radiation accompanying the gravitational collapse of stars was shown for the first time.

Investigations of the processes of interaction of neutrinos emitted by the collapsing core of a star with the matter of its envelope, carried out by G.V. Domogatsky. (together with D.K.Nadezhin) showed that these processes make a significant contribution to the formation of the isotopic and chemical composition of the ejected shell material. At the same time, a natural solution was found to the problem of the formation of bypassed isotopes of heavy elements and a number of isotopes (primarily ^{7}Li, ^{9}Be and ^{11}B) of light elements. The mechanism of neutrino nucleosynthesis proposed by the authors has become an integral part of the modern theory of the origin of chemical elements

Since 1980 G.V. Domogatsky leads the international Baikal neutrino project (the head organization is INR RAS), within the framework of which, in 1998, with a significant contribution from DESY Zeuthen (Germany), the world's first deep-sea neutrino telescope NT-200 was created. NT-200 along with the AMANDA detector at the South Pole, almost for ten years, the world's largest instrument for studying natural fluxes of high (over 10 TeV) neutrinos. The experience gained made it possible to develop by 2011 a project of a cubic kilometer-scale detector – Baikal-GVD, which would allow investigating the flux of high-energy neutrinos of an astrophysical nature. Active switching on of JINR (Dubna) into work on the project (2015) allowed to proceed to the creation of a detector. Since the spring of 2021, the effective volume of the detector operating on Lake Baikal has already been 0.40 cubic km in the search for shower events from high-energy neutrinos of an astrophysical nature, and it has become the largest neutrino telescope in the northern hemisphere. Its joint work with the IceCube neutrino telescope in Antarctica makes it possible to search for sources of high-energy neutrinos throughout the entire celestial sphere.

G.V. Domogatsky is a laureate of the P.A. Cherenkov Prize of the Russian Academy of Sciences and the International B.M. Pontecorvo Prize.

DOROFEEVA Vera Alekseevna

Born 03.10.1945. In 1970 she graduated from the Physics and Chemistry Department of the Moscow Institute of Chemical Technology D.I. Mendeleev by named, specializing in chemical cybernetics. Since 1970 he has been working at the V.I.Vernadsky Institute Academy of science as an intern-researcher, 1973-75. – Postgraduate student, since 1980 – senior, since 2008 – leading, since 2016 – chief researcher. Since 2016, V.A. Dorofeeva – Head of the Laboratory of Thermodynamics and Mathematical Modeling of Natural Processes. In 1977 she defended Ph.D. on the topic "Mathematical modeling of the process of endogenous uranium ore formation on the example of a specific deposit." In 2002 defended on the dissertation "Volatiles in the early solar system" for the degree of Doctor of Chemical Sciences.

V.A. Dorofeeva is a specialist in the field of physicochemical and mathematical modeling of geochemical and cosmochemical processes. She has developed a number of algorithms and programs for studying the forms of transfer of elements in hydrothermal solutions, surface waters and high-temperature gas systems, as well as for determining the optimal values of the stability constants of complex compounds in aqueous solutions of electrolytes from experimental data.

The approaches developed by V.A. Dorofeeva also made it possible in the shortest possible time in 1986 analyze the behavior of radionuclides during the Chernobyl accident.

Since 1979 V.A. Dorofeeva mainly works on the topic "Cosmochemistry". The results of modeling the processes that regulate the chemical composition of the troposphere and the cloud layer of Venus, obtained by her, were included in the geochemical model of the atmosphere and crust of the planet Venus developed in the 80s at the V.I. Vernadsky Institute Academy of science.

V.A. Dorofeeva (together with A.B. Makalkin, Schmidt Institute RAS) developed mathematical models of the internal structure of the circumsolar gas-dust accretion disk for different stages of its evolution, as well as models of accretion protosatellite disks of Jupiter and Saturn. With their help, the behavior of volatiles was studied, estimates of variations in redox conditions were obtained in both the circumsolar and circumplanetary disks, taking into account the kinetic limitations and the role of the radial transport of dust and large bodies. A number of fundamentally new conclusions have been made about the possible composition of protoplanetary and proto-satellite bodies, as well as parent bodies of meteorites. The publications on this topic in the Solar system research magazine were awarded the "Interperiodica" Prize for 1997 and 2009. In recent years, Dorofeeva has been studying the composition of cometary nuclei, which makes it possible to assess the mechanisms of their formation and dynamic conditions in the circumsolar gas-dust disk.

V.A. Dorofeeva published more than 100 scientific works. She is the author of the monograph «Volatiles in the Early Solar System. Cosmochemical and physical aspects of the problem», 2003, Publishing House of Editorial URSS, 261 p. (in collaboration with A.B. Makalkin), and “Systems of Jupiter and Saturn. Formation, composition and internal structure of large satellites", LKI Publishing House, 2008.574 p. (co-authored with O.L. Kuskov, V.A. Kronrod and A.B. Makalkin), as well as co-author of individual chapters in 3 more monographs. V.A. Dorofeeva has been teaching, since 2013, she reads the course “Cosmochemistry” developed by her at the State University “Dubna”, as a professor of the Department of Chemistry, as well as the course “Cosmochemistry and the elements of cosmogony” for postgraduates of the V.I. Vernadsky Institute Academy of science.

DOROSHENKO Valentina Trofimovna

Born 15.01.1938 in Voronezh of Voronezh region. In 1955 she graduated the school in Tambov with a silver medal. In 1955 to 1960 she was a student of the astronomical department of Mechanics and Mathematics Faculty in Moscow State University. From 1960 to 1961 she worked as an engineer in Bolshevo of Moscow region. From 1961 to 1966 she worked as an Assistant at the laboratory of South Station of Sternberg Astronomical Institute (SAI) in the Crimea. From 1966 to 1969, V.T. was a post-graduate student of Physical Faculty of Moscow State University and SAI. In 1973 she gained her PhD under the Direction of P.V. Scheglov. Her thesis was named "The interference and spectral study of gaseous nebulae". From 1969 she works in the Crimean Laboratory of the SAI, firstly as a Junior Scientist (until 1986), then as a Researcher (1986-1990) and from 1990 to present – she is a Senior Scientist.

Research interests of V.T. are associated with the observations of various astronomical objects: nebulae, stars, galaxies. From 1961 to 1965 V.T.Doroshenko carried out a spectroscopic observations of planetary nebulae in the frame of the program of Professor B.A. Vorontsov-Velyaminov, and besides she studied Nova Her 1963. From 1969 till 1972 she carried out investigations of the velocity fields in the nebulae by observing with a Fabry-Perot interferometer, and moreover she obtained also spectral observations of gaseous nebulae for determination of their physical parameters: temperature, density, etc. Years 1969 – 1984 were related with the observations of spectral energy distributions of bright stars and with the creation of a network of secondary spectral standards. The result of this work was the publication of the handbook "Spectrophotometry bright stars", ed. Dr. I.N. Glushneva. These materials were used for measurements of Teff, the gravity acceleration, the radii of stars. Besides these observations V.T. carried out a study of variable stars: Cyg X-1, X Per, N Cyg 1975, δ Sct, Pleione. In parallel, since 1978, she (along with V.Yu. Terebizh) engaged in the search for active galactic nuclei (AGN) from the list of objects with high surface brightness, compiled by M.A. Arakelyan. Step by step, the study of active galaxy nuclei had become a major subject of her work. AGN observations with telescopes of South Station of SAI and Crimean Astrophysical Observatory (CrAO) were used by her to obtain long-term (30 years or more) unique photometric and spectral database for Seyfert galaxies (SyG). These observations allowed to investigate the nature of flare activity of SyG, to measure the lags between variations in the B and in the V, R, I bands. In cooperation with astronomers of CrAO she performed the spectral research of the emission line flux variability as a response to variations in the central continuum of source with a delay due to light-travel effects within the broad line region (BLR) in SyG, as well as she measured the black hole masses for SyG. These investigations have given evidence for variety (chaotic, virial, and infalling) of gas motions in BLR. When observations with space telescopes became available, V.T. published a number of works with the analysis of the optical and X-ray radiation variability in SyG.

Extensive photometric observations of AGN required careful photometry of comparison stars, and V.T. published the photometric catalog of 940 stars of 13–17 mag in V band measured with an accuracy of 0.01 mag in the vicinity of more than 100 SyG, quasars, and blazars. These works were used by observers in different observatories. Many variable stars were detected among the studied stars, some of them have been investigated in detail.

V.T. Doroshenko participated in many international multiwavelength monitoring campaigns of AGNWatch, contributing her own optical photometric observations.

By 2016, she is the author and co-author of 215 scientific publications.

DOROSHKEVICH Andrey Georgievich

Born 22.01.1937 in Moscow. In 1960 graduated the Moscow State University. During 1963 – 1997 worked in Institute of Applied Mathematic as scientist and senior scientist, during 1995 – 2005 as professor of Astro Space Center of Niels Bohr Institute, Copenhagen, Denmark. After 2005 is leading scientist and header of laboratory in Lebedev Physical Institute of RAN. Doctor habilitatus (1980), member of council of science.

Main scientific pudlications – almost two hundred papers – relate to the General Relativity, cosmology, CMB and the investigations of the first galaxies and structure of the Universe.

In cooperation with Ya.B. Zeldovich and I.D. Novikov during 1960–1980 the basic properties of the black holes and gravitational waves have been established. At the same time properties of the anisotropic cosmological models were considered. Later during 1970–2000 main attention was concentrated on the problems of the nonlinear theory of gravitational instability proposed by Ya.B. Zeldovich in 1970. In particular at this time the tidal torque theory has being developed (in cooperation with P.J.E. Peebles and S.D.M. White). It describes the creation of rotation of compact objects formed from small perturbations owing to the gtavitational instability. In 1980 the first cosmological model with domination of the Hot Dark Matter (massive neutrinos) was developped (with Ya.B. Zeldovich, M.Yu.Khlopov and R.A.Sunyaev).

Later in 1990–2005 main attention was concentrated on the analysis of the Large Scale Structure of the Universe in observed catalogues of galaxies – the Las Campanos, TWODF and SDSS and in observations of the Ly-alpha forest. These results are compared with analysis of the Large Scale Structure created in large numerical simulations (with S.F. Shandarin, M. Demianski, R. Fong, A. Klypin, S.Gottloeber, D.Tucker, M. Way, V.I Turchaninov). To do this the original numerical codes (pencil beam & minimal spanning tree codes) and the special methods of statistical description of these processes has been created. Thus in 1996 the analytical model of the correlation function for the spatial distribution of galaxies and clusters of galaxies has been proposed (with O.E.Buriak).

During 2000–2010 the main attention has been concentrated on the investigation of the WMAP observations of the fluctuations of temperature and polarisation of CMB. The original powerfull numerical codes (GLESP) have been generated and used for the analysis (with I.D. Novikov, P.D. Naselsky, O.V. Verkhodanov, V.I. Turchaninov). The application of the Minkovski functional has been used for description of the map of CMB polarisation (with I.D. Novikov, A.D. Dolgov, D.I. Novikov). Special attention was put for the problem of separation of the CMB signal and the Galactic foreground (with O.V. Verkhodanov, 2011). These observations were used for limitations of the deviations of the real Universe from the Standard Cosmological Model (with M. Demianski, 2007).

During 2005–2016 more attention was concentrated on the problems of the formation of first galaxies and reionisation of the Universe (with V.N. Lukash, E.V. Mikheeva, S.V. Pilipenko, M. Demianski). The special approach was proposed in order to test the Dark Matter composition and to estimate the shape of small scale initial power spectrum. Our methods allow us to obtain reasonable estimates of these characteristics and to formulate promissing planes of further investigations with the cosmic missions (Hubble, James Webb, Hershel, Radioastron, etc.).

DRAVSKIKH Alexander Fedorovich

Born 07.01.1929 in Krasnoyarsk. Graduated from the Lenin-grad Polytechnic Institute (LPI) in 1955. Enrolled in the Main Astronomical Observatory of the Soviet Academy of Sciences, where he completed graduate school and got his Ph.D. in physics and mathematics (1962), and worked until 1969 in various positions from senior Laboratory Technician to Senior Researcher. From 1969 to 2003, worked in the Leningrad branch of the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991), occupying the positions of Senior Researcher, Head of the Radioastronomy Department, Director of the Leningrad branch of SAO (1971-1986). Member of the SAS Council for Radioastonomy, member of the IAU. Coauthor of a discovery (1964). Holder of a USSR state award (1988).

His main scientific research is related to radio spectroscopy of the Sun and galactic gaseous nebulae, as well as to the study of the physical properties of quasars and the interstellar medium. He is the author of about 120 scientific papers.

The study of the spectral composition of Solar radio bursts has shown their extreme diversity, the explanation of which requires various mechanisms of their formation, as well as a possible presence of the $2^2P_{3.2} – 2^2S_{1/2}$ hydrogen emission line (3.04 cm) in the local formations responsible for the bursts of radio emission (1962) (this line was predicted by J.P. Wild). The line was detected in radio for the entire Solar disk (1986).

He was a co-author of the discovery "Theoretically predicted and experimentally detected phenomenon of the existence of discrete radio lines, associated with type $n \rightarrow n\text{-}1$ transitions between highly excited states of the hydrogen atom" (1964). The discovery is listed in the State registry of discoveries of the USSR under number 47, with the priority from August 31, 1964.

He was awarded the title of Laureate of the USSR State Prize for his series of papers dedicated to the study of interstellar matter (1988).

Statistical research has shown that the luminosity of quasars with absorption spectra is, on average, 2.2 times higher than that of the quasars without absorptions (1993); they also exhibit a number of peculiarities that set them apart from the quasars without absorption features.

Statistical studies of the absorption spectra of quasars in the range of Z (3.6 – 0) have shown that the density of the gaseous component of the observed Universe rapidly decreases (the rate of decrease of the linear size of gaseous formations is $(1+Z)^{1.73}$) (2003).

He was awarded a "Badge of Honor" for his contribution to the development of the RATAN-600 radio telescope (1978), and a second-degree medal "For Merit to the Fatherland" for his participation in the development of the radio interferometric project "Quasar-KVO" (1999).

DUBINSKIY Boris Adolfovich

Born 1929 in the Poltava region. 1948-53: student of Radio engineering faculty of Moscow power engineering Institute.
1956–1059 – post-graduated student of the Institute for radio engineering and electronics (IRE) Academy of Siences (AS) of the USSR. 1962 recieved cadidate (Phd) degree. After post-graduation school works permanently in the IRE (recently – Kotelnikov IRE Russian AS) subsequently as junior – senior – leading researcher.
1967: the academic rank "Senior researcher on the speciality RadioAstronomy" was appropriated.
Member of the International astronomical Union (IAU).
Honorary member of the internanional Group for the Coordina-tion of Space Frequencies (SFCG).

Author of over 70 scientific works and , main of which devoted to the questions of optimal recieving signals, radar investigation of planets, methods for maping of radio soureces, protection radio observations. In the book "Radio Astronomy" (in the set "Library of Rradio Engineer " ,1973.) issued with collaboration of V. I. Slysh he outlined the physical basis and methods used in Radio

Astronomy including Planetary radar. His astronomical activity began from radar studies of the planets Venus, Mercury, Mars and Jupiter and from correcting the value of the Astronomical Unit by radar of Venus in 1961.

Starting in 1964 as a scientific Secretary of the Scientific Council on Radio Astronomy (SCRA) of AS USSR (Chairman V. A. Kotelnikov) coordinated of creation Infrastructure of Radio Astronomy, participated in the creation the main radio telescope of the AS USSR/ Russia – RATAN-600.

In 1972, headed an expedition of the AS in Cuba, founded in Havana Radio Astronomy Station for observations of the Sun, further was joined to Soviet "Service of the Sun".

Accordingly the saggeston of SCRA worked on protection of radio astronomy observations from radio interference. On this direction he participated in the process of allocation of primary list of frequency bands for Radio Astronomy service that took place in the Radiocommunication sector of the International telecommunication Union (ITU-R), proposed the concept of the priority of Radio Astronomy while using radio frequency spectrum in the shielded zone of the Moon (included in Radio Regulation p. S22.22), took initiative to recommend the "quiet" zone in the vicinity of the libration point L2 of the system Earth-Moon.

He was elected repeatedly (for several terms) as a representative of IAU in the "Inter-Union Commission on frequency allocations for radio astronomy and space research" (IUCAF) as the member of which participated in organizing and conducting negotiations with the administration of the space system GLONASS (1991–1993), which were succesfuly ended with the cleaning the frequency band of hydroxyl line from satellite radiation. Represented IUCAF at the meetings of ITU-R and SFCG.

As the expert of AS interacts with the Telecommunication Administration of Russia to perform assessments of the potential interference to Radio Astronomy observations from the radio means of the mobile telecommunication services and to recommend the conditions under which these means can be electromagnetic compatible with ground-based radio stations of Russia.

Awarded medals: "For valiant labor", "In memory of Moscow 850 Anniversary " and medal of Russian cosmonautics Federation named after V. P. Glushko.

DUBOSHIN Georgy Nikolaevich

Born 25.12.1904, Serpukhov, died 20.10.1986, Moscow. In 1924 he graduated from Physics and Mathematics Faculty of Moscow State University (MSU), Ph.D. degree (1929), Habilitation (1935). Since 1924 he worked at the State Astrophysical Institute, which in 1931 became part of the newly created Sternberg Astronomical Institute Moscow State University (SAI MSU). Since 1935 he was a professor MSU. In 1956-1979 – head of Department of Celestial Mechanics and Gravimetry, Moscow State University, and also head of Department of Theoretical Astronomy SAI. Vice-chairman (1959-1965), Chairman (1965-1972) of the Commission on Celestial Mechanics of the Astronomical Council of the Academy of Sciences USSR. Died 20.10.1986 in Moscow.

D.'s main scientific work is devoted to problems of celestial mechanics. He made a significant contribution to astrodynamics, theoretical mechanics, stability theory, theory of attraction, theory of integration of differential equations. In 1940 he first investigated the stability of the motion of celestial bodies under the influence of continuously acting disturbing forces. He developed a high-precision theory of the motion of Saturn's satellites, which makes it possible to take into account all the main disturbances in their motion. He was the first to study in detail the relationship between translational and rotational motions in celestial mechanics. He carried out research on the rotational motion of artificial celestial bodies around the centers of mass, which was of great practical importance in the problems of stabilizing spacecraft. He investigated the motions of stars in the Orion Trapezium, in the ζ Perseus association, in the region of the Orion Sword clusters. He studied the motion of a system of material points under the action of forces that depend not only on mutual distances, but also on speeds and accelerations.

D. – the author of the textbooks "Foundations of the theory of stability of motion" (1952) and "Theory of attraction" (1961), as well as a fundamental cycle of textbooks on celestial mechanics: "Foundations of celestial mechanics" (1938), "Celestial mechanics. Basic tasks and methods" (3rd ed. 1975), "Celestial mechanics. Analytical and Qualitative Methods" (2nd ed. 1978), "Celestial Mechanics. Methods of the theory of motion of artificial celestial bodies" (1983).

Member of the International Academy of Astronautics (1969), President of the Commission №7 "Celestial Mechanics" of the IAU (1970–1973). Minor planet 2312 is named after "Duboshin".

Honored Scientist of the RSFSR (1976). Laureate of the M.V. Lomonosov Academy of Sciences of the USSR (1969). Together, E.P. Aksenov, E.A. Grebenikov and V.G. Demin is a laureate of the State Prize in Science and Technology of the USSR (1971).

He was awarded the Order of Lenin (1951), also he had seven medals, including "For the Defense of Moscow" (1944) and "For Valiant Labor during the Great Patriotic War of 1941-1945" (1946).

DUBOV Emil Efimovich

Born 20.07.1921. In 1950, graduated from Moscow State University. In 1951, he was employed at the Crimean Astrophysical Observatory, Department of Solar Physics. In 1957, defended his PhD thesis. In 1962 – a senior scientist, Dr. Sci. in Physics and Mathematics (1967). Between 1976 and 1988 – a senior scientist, Head of the group on solar activity of the World Data Center of the Interagency Geophysical Committee. Died 12.04.1992 in Nauchnyy.

E.E. Dubov was born in 1921 in Gomel. His father was an employee, and mother was a doctor. In 1928, the family moved to Uzbekistan. In 1938, he graduated from School 2 in Tashkent and entered Moscow Region Pedagogical Institute. In 1939, a student of the Faculty of Physics in MSU. He was called to RKKA, a military student of the Red Banner Military Aviation School of Communication (1940–1941). During the Great Patriotic War – a radio technician of the storm aviation. A holder of two medals: the Medal "For the Victory Over Germany in the Great Patriotic War 1941–1945" and the Medal "For the Liberation of Prague". In 1945, after demobilization, entered MSU and in 1950 graduated the Faculty of Physics, a specialist in astrophysics. In 1951, he was employed at the Crimean Astrophysical Observatory and worked as a junior researcher in the Department of Solar Physics. He was involved in studying solar chromosphere and magnetic activity issues, carried out a number of experimental and theoretical works. He upgraded the coronagraph and instruments for observing chromospheric flares, elaborated a technique for analyzing a solar spectrum to determine lithium in the atmosphere and sunspots, as well as the presence of other elements through the spot spectra. E.E. Dubov carried out studies of hydrodynamic processes, particularly the structure of the gas flow behind the shock front, performed a series of laboratory experiments on the shock tube. Theoretical works are devoted to the problems of energy balance in the chromosphere, heating mechanisms, issues on the formation of chromospheric flares, and turbulence in solar prominences.

In the course of the International Geophysical Year, E.E. Dubov was involved in the coordination of chromospheric flare observations in observatories of the country. Being a member of the Geophysical Committee, E.E. Dubov worked on the problems of the influence of solar activity on the Earth, on the creation of the information database on solar activity for the international data exchange. He published about 100 scientific works. Defended PhD thesis "Peculiarities of inner motions and scintillation of quiescent prominences" (1957) and Doctoral thesis "The chromosphere structure and some issues on the manifestation of solar activity in the chromosphere" (1967). E.E. Dubov was an editor of the translated versions of Physics of Solar Chromosphere, a collection of papers of the IV Symposium on Cosmical Gas Dynamics. Authored several reviews and popular articles. A member of two Commissions of IAU, a participant of international conferences.

DUBROVICH Victor Konstantinovich

Born 02.04.1947, in Chimkent, Kazakh SSR. Graduated from Novosibirsk State University in 1970. Since 1970 he has been working in the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) occupying the positions of Research Assistant (1970-1973), Junior Researcher (1973-1981), Senior Researcher (1981-2003), Head of the Galactic and Extragalactic Research Laboratory of the SPbB (2003-2015), and Leading Researcher from 2015. In 1977, he defended his Ph.D. thesis on “Spectral Distortions of the CMB”. In 1997, he passed his Dr. Sci. defense on “Spectral Properties of the CMB and Research Techniques of the Early Universe”.

V.K. Dubrovich’s major scientific works related to cosmology, formation of spectral distor-tions of the cosmic microwave background (CMB) in the primary hydrogen and helium recombina-tion epoch and in the “Dark Ages” epoch. He is the author of 90 scientific papers and 5 patents.

In the early 70’s, V.K. Dubrovich developed a theory of detection of gravitational waves us-ing the method of their conversion into the electromagnetic. Later, the same method was used to estimate the possibility of the axion detection. The projects of suitable telescopes were developed.

From the middle 70’s, he started systematic investigations of formation mechanisms of spec-tral and spectro-spatial fluctuations (SSFs) of the CMB in the protostellar epoch of the Universe evolution. He performed numerous calculations of parameters of hydrogen and helium recombina-tion lines. He predicted and theoretically studied in detail the SSFs effects from primary molecules at the “Dark Ages” epoch. For the first time, a comprehensive program for the study of early stages of the Universe evolution was presented.

V.K. Dubrovich carried out works on a number of technical matters: construction and adjustment of ground-based (the RT-70 “Suffa” project) and large deployable cosmic radio antennas (2 patents, the “Millimetron” project), cosmic contamination prevention (2 patents), investigations of the astroclimate in Yakutia, and participation in the developement of sub-millimeter bolometer arrays.

Under the guidance of V.K. Dubrovich two Ph.D. theses were defended. Several times he act-ed as an opponent of the defense of Ph.D. and Doctor theses. From 2013 to 2016, he was the chair-man of the SGC at the Astronomy Department of the Faculty of Mathematics and Mechanics of the SPbSU. From 2012, he is a member of the Astrophysics and Space Science Council of the Ioffe Physical-Technical Institute (St.Petersburg).

DUBYAGO Alexander Dmitrievich

Born 08.12.1903. Dr. Alexander Dubyago started to work at Engelhardt Astronomical Observatory (EAO) as a "human computer" in 1918. Dr. Alexander Dubyago graduated from Kazan State University (KSU) in 1925. Assistant Professor at Astronomy department of KSU 1925 – 1934. Associate Professor at Astronomy department of KSU 1934 – 1941. Master's degree in Physics and Mathematics in 1938. Doctor's degree in Physics and Mathematics in 1941. Full Professor at Astronomy department of KSU and head of Geodesy and Gravimetry department in 1941. Director of EAO 1954 – 1959. Died 29.10.1959.

Alexander Dmitrievich Dubyago is the world-famous scientist astronomer, son of D.I. Dubyago. At the age of 14 years, she discovered a new star in the constellation Aquila in 1917. He also discovered two comets: C/1921 H1 (Dubiago) in 1921 and 1923 III (Bernard — Dubiago) in 1923.

Dr. Alexander Dubyago founded the Kazan School of Comet Astronomy. His scientific interests lied in Theoretical Astronomy, Comet Astronomy, Astrophysics, History of Astronomy, Astrometry, and Gravimetry.

Dr. Alexander Dubyago carried out fundamental research work on the Brooks comet and 1909 1V comet. He represented a new method to obtain secular changes in the elements of orbits of short-period comets. Dr. Alexander Dubyago considered that comets formed from the dust of the Solar System. Dr. Alexander Dubyago carried out research series of variable stars as an astrophysicist. He is one of a few astronomers in the world who executed computing work for his researches by himself in a great volume.

Dr. Alexander Dubyago organized several geodesics and gravimetric expeditions to the eastern parts of the USSR.

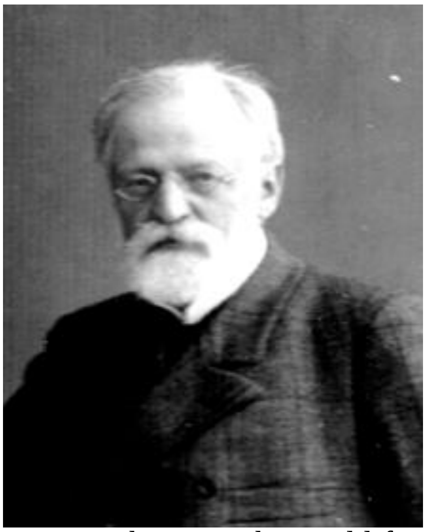
Dr. Alexander Dubyago wrote a fundamental monograph "Orbit determination" in 1949, which was translated into English and published in the USA in 1961. He translated into Russian from French a book "Sketches about meteors" written by astronomer Fyodor Bredikhin. Dr. Alexander Dubyago represented several theoretical research works about the integration of gradients of gravity. He also wrote several works about Nicolai Lobachevski.

After D.Ya. Martynov to Moscow, Dubyago became the director of the Engelhardt Astronomical observatory, which was founded by his father.

On October 29, 1959, Alexander Dmitrievich died. Severe heart disease prematurely interrupted the life of a talented scientist. He laid the foundation for a new direction of cometary astronomy and prepared students whose work of life was the continuation of science in the direction of cometary astronomy.

Dr. Alexander Dubyago was awarded The Donohoe Comet Gold Medal by The Astronomical Society of the Pacific and a gold medal by the Russian Astronomical Society. One Lunar crater and two comets were named after Dr. Alexander Dubyago.

DUBYAGO Dmitry Ivanovich



Born 03.10.1849. Dr. Dmitry Dubyago graduated from Saint Petersburg Imperial University in 1872. Practicing astronomer at the Pulkovo Astronomical Observatory1873-1884. Master's degree in astronomy and geodesy in 1878. Doctor's degree in astronomy and geodesy in 1881. Associate professor at Saint Petersburg Imperial University 1874-1884. Professor of astronomy at Kazan Imperial University (KIU) and director of Kazan Astronomical Observatory 1884-1918. Dean of the Physico-mathematical department at KIU 1890-1899. Head of KIU 1899-1905. Director of Engelhardt Astronomical Observatory (EAO) 1901-1918. Died 22.10.1918.

D.I.Dubyago – the world-famous Russian astronomer. Born into the family of a hereditary nobleman Repoito-Dubyago. Pupil of A. Savich and O. Struve. While a student at Petersburg University D.I.Dubyago took an active part in the observations at Pulkovo Observatory. In 1871 D.I. Dubyago was awarded the gold medal of St. Petersburg University. In 1875 D.I.Dubyago elected member of the International Astronomical Society. In 1883. D.I. Dubyago personally met the patron and famous astronomer-observer Dr. Engelgardt. Dr. Dmitry Dubyago founded the Kazan school of astronomy. His scientific interests lied in theoretical astronomy, astrometry, and gravimetry. Dr. Dmitry Dubyago cataloged 4281 stars (a part of the international zone catalog) from observations by Kazan astronomers for the period from 1869 till 1882. He studied Triton's orbit and created the theory of motion of the Diana asteroid.

Dr. Dmitry Dubyago initiated regular publishing of "Transactions of the Kazan Astronomical Observatory." Dr. Dmitry Dubyago founded the suburban Astronomical Observatory of KIU named after Dr. Basil Engelhardt, who donated all the instruments from his private observatory in Dresden to KIU. EAO was built in two years from 1889 till 1901 due to the efforts of Dr. Engelhardt and Dr. Dmitry Dubyago. On September 21, 1901, the grand opening of the observatory took place, which was named the Engelhardt Astronomical observatory. DI Dubyago became the director of both observatories. The University also demanded great attention, the rector of which Dubyago was from 1899 to 1905.

Dr. Dmitry Dubyago published his lectures about Theoretical Astronomy and two books "The basics of Theoretical Astronomy" and "Practical Astronomy."

DI. Dubyago put all his efforts to ensure that both observatories were preserved during the civil war and revolution. For his great work, DI Dubyago was awarded many orders: St. Stanislav of all degrees, St. Anna, and many other awards. Dr. Dmitry Dubyago became a member of the International Astronomical Society in 1875. He was awarded a gold medal by Saint Petersburg Imperial University in 1871. Dr. Dmitry Dubyago was awarded Privy Councillor and Distinguished Professor titles in 1906. Dmitry Ivanovich died on October 22, 1918 during the Spanish flu epidemic and was buried in a crypt under the southern world – a tomb in the EAO, next to his friend, V.P. Engelhardt, whose ashes were transported from Germany and buried here on September 21, 2014. D.I.Dubyago made an enormous contribution to the development of Russian astronomy, became the founder of Kazan astronomical school, laid the foundations of the main directions of scientific research, has brought a decent shift. Due D.I.Dubyago Kazan University became the all-Russian center for training specialists in astronomy and geodesy. One Lunar crater and one minor planet were named after Dr. Dmitry Ivanovicn Dubyago.

DUDOROV Alexander Egorovich

Born 18.07.1946 in Katav-Ivanovsk city, Chelyabinsk region. Graduated from Kazan State University in 1971. Worked at Bashkir State University since 1974, after postgraduate study at the Astronomical Council of the Academy of Sciences of USSR. Head of the theoretical physics department in Chelyabinsk State University from 1978 to 1986 and from 1992 up to now. Dean of the physical faculty of Chelyabinsk State University in 2005-2008. Member of the Bureau of the Scientific Council of the Russian Academy of Sciences, a member of the International Astronomical Union, a chairman of the dissertation council D212.296.3, an honored Worker of Higher Education of the Russian Federation, Doctor of Science in Physics and Mathematics (1992), Professor (1994), an Honored Professor of Chelyabinsk State University. Died 03.03.2021 in Chelyabinsk.

A.E. Dudorov's primary research areas are the star formation in the interstellar rotating magnetic clouds, magnetic stars' evolution, MHD instabilities, convection, MHD turbulence, and magnetic field generation mechanisms. He is the author of more than 200 scientific and methodical publications including monographs.

In 1978-1988, A.E. Dudorov, together with Yu.V. Sazonov and A.V. Tutukov, developed the theory of the fossil magnetic field according to which the magnetic field of young stars and stars of the upper main sequence is considered as an induction amplified magnetic field of the protostellar clouds. In 1984-1992, A.E. Dudorov investigated several applications of the theory of fossil magnetic field, including interaction of the magnetic field with convection, angular momentum problem in young stars, generation of the jet outflows, and so on.

Since 1993, A.E. Dudorov, together with A.G. Zhilkin and O.A. Kuznetsov, developed modifications of Godunov's finite-difference method for the solution of the systems of equations of MHD with self-gravity and implemented corresponding numerical codes. These developments enable numerical simulations of the processes of the formation and evolution of stars with accretion and/or protoplanetary disks taking into account ionization, magnetic diffusion, and turbulence.

A.E. Dudorov developed and analyzed the hierarchical structure of the interstellar clouds, formulated the "convective" theorem for young stars, developed analytical and numerical MHD models of the dynamics of the accretion and protoplanetary disks of young stars with fossil large-scale magnetic field.

The fall of the Chelyabinsk meteorite couldn't be ignored by A.E. Dudorov. He is an ideological inspirer and principal investigator of most of the meteorite investigations conducted at Chelyabinsk State University. In 2016, the book "Chelyabinsk Superbolide" was published by N.N. Gorkavyi and A.E. Dudorov.

A.E. Dudorov had been leading astrophysicists teaching at Chelyabinsk State University since 1978. More than 100 graduates of the Chelyabinsk State University are his students, including. 14 PhDs and 4 Doctors of Sciences in Physics and Mathematics. A.E. Dudorov taught a series of core and specialized courses in theoretical physics and astrophysics. He was awarded a prize "Hooker distinguished visiting professor" (McMaster University, Canada, 1996), the prize of the Chelyabinsk region's Governor, a Goddard's Prize (USA, 2014, together with N.N. Gorkavyi, A. Da Silva, and P. Newman). International Astronomical Union named the main-belt asteroid 8795 (1981 E09), discovered in 1981, "Dudorov" for his contribution to the study of the Chelyabinsk meteorite.

DUGIN Nikolay Aleksandrovich

Born 26.09.1945 in the city of Gorky (now Nizhny Novgorod). 1963-1968, student of the Radiophysical Faculty at Gorky N.I. Lobachevsky State University (GSU) (now the Faculty of Radiophysics at N. I. Lobachevsky State University of Nizhny Novgorod (UNN)). Defended PhD thesis ("Development and research of a two-element aperture synthesis system") in 1983, D.Sc. thesis ("Development of methods and devices for high-precision measurements in radio astronomy and radio interferometry") in 2007. Senior Researcher since 1991. Professor of the Department of Physics of the Electromechanical Faculty at the Volga State University of Water Transport (VSUWT) since 2005. 1968-1971, post-graduate student at the UNN. 1971-2016, occupied different positions, from junior researcher to head of the department of the Radiophysical Research Institute (NIRFI). Member of the Russian National Committee of the International Union of Radio Science (URSI) (Commission J) Awarded a diploma from the Ministry of Education and Science of the Russian Federation.

N.A. Dugin's research interests are theoretical and experimental research in the fields of applied radio astronomy, antenna techniques and radio interferometry.

In applied radio astronomy, N.A. Dugin developed and tested several radio-astronomical methods for determining the parameters of radio astronomy instruments and improving the accuracy of absolute measurements. In particular, he developed a two-temperature calibration standard of noise radiation by which it became possible to perform high-precision absolute flux density measurements of the three most powerful discrete cosmic radio sources. The creation and application of this standard was the highlight of the development of the "artificial moon" method proposed at the NIRFI by V.S. Troitsky, a corresponding member of the USSR Academy of Sciences.

In the field of antenna techniques, N.A. Dugin developed and perfected the calibration methods and techniques of different design antennas, including cable-stayed structures for the complexes of deep-space communications.

Together with his colleagues from the NIRFI, he created and put into operation the first domestic radio interferometers in decimeter and meter wavelength ranges as elements of aperture-synthesis systems.

Under N.A. Dugin's leadership, the NIRFI put into operation the VLBI complex with five receiving points, where there were made the nation's first direct measurements of GLONASS (the Russian Global Navigation Satellite System) and GPS (the United States Global Positioning System) signals to develop an autonomous coordinate support system for GLONASS. He participated in work on the VLBI-location of "space debris" and asteroid 2012DA14 carried out on the International VLBI network.

The results on the VLBI-location of "space debris" and asteroid 2012DA14 carried out on the International VLBI network were recognized as very important and innovative in this field of research.

In 2013, N.A. Dugin started research on the use of carbon composite materials with graphene-containing binders to create antenna-feeder devices and conductive coatings in the radio frequency range. He and his team, developed models of dipole and microwave horn antennas made of carbon composite materials. He and his colleagues received a patent for a "Microwave antenna-feeder unit made of carbon composite material and its manufacturing method".

N.A. Dugin published more than 200 works, received 5 patents on the devices and methods for high-precision measurements in radio astronomy and radio interferometry.

DYUKOV Ivan Alexandrovich

Born 06.06.1888 in the village Riverlands of Tver province. Died in 1961. He graduated from Yuryev (now Tartu) University in 1912. He worked in the gymnasium of St. George from 1912 to 1919. From 1919-1921 he is an astrometry observer in Odessa Observatory. Later he had a position of astrometrist in Engelhardt astronomical observatory of Kazan University. From 1937 to 1941 years he headed the Department of Geodesy and gravity and from 1941 to 1947– the Department of astrometry at KSU. From 1947 to 1957 he is the head of The Department of astronomy at Kazan State. Univ. Professor of the Kazan University. Died in 1961 in Kazan.

Known astrometrist, who made a great contribution to the drafting of several catalogs of stars and geophysicist who had organized several expeditions to determine masterpoints and measurements of the force of gravity on the territory of the USSR.

In the 20 years at the meridian circle of the Engelhardt astronomical observatory (EAO) of Kazan University I.A.Dyukov performed astrometric observations of declinations of stars for a new fundamental catalog for the international program.

In the same years, he began the work to clarify the values of the acceleration of gravity for the EAO and the establishment of their connection with the gravimetric Poltava gravimetric observatory. He carried out the pendulum definition in the buildings of the town Kazan observatory and EAO using the Shternek pendulum construction. Chronometers' corrections were determined by receiving radio signals of the exact time. In April 1927 he performed gravimetric connection of Kazan observatory with Poltava observatory.

In 30 years, he organized expeditions for the determination of the gravity field in our country. The results of these expeditions had given a scientific foundation for works for the identification of new oil, ore, coal, and other mineral deposits.

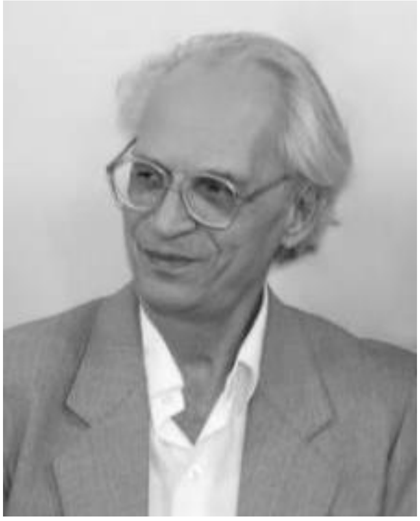
EFANOV Viktor Alekseevich

Born 18.07.1932. In 1963 he graduated from All-Union Energetic Institute with a degree in radio technique. Since 1956 – researcher at the De-partment of Radio Astronomy, Crimean Astrophysical Observatory (CrAO). In 1974 he defended his Ph.D. thesis "Re-sults of studying slowly varying solar component in the mil-limeter radio range". Died 16.06.1983 in Katsiveli.

The basic researches relate to the field of solar physics and astrophysics. In the 1970s he developed centimeter and millimeter radio astronomy investigations at RT-22. In 1969 and 1971 V.A. Efanov took part in the first intercontinental VLBI-experiments on the base Simeiz-Green Bank. In 1971 he visited the USA with a work trip to carry out VLBI data reduction and study the Sun with radio telescopes of the National Radio Astronomy Observatory. He developed the princi-pal equipment for the 22-m radio telescope RT-22 – a complex of radio astronomy equipment in the range 4–16 mm to study the structure and main physical characteristics of solar active regions. A layout of the multi-channel radiometer was implemented at 8 mm that by means of RT-22 ena-bled recording radio emission simultaneously from five different areas of the solar active region – layout of the radio telescope with a fan-shaped directional diagram. All the sources with increased radio emission in the range 1.35–4 mm were shown to be optically dense formations and their emission is thermal. There was detected a close relationship between S-component sources at the wavelength of 8 mm with magnetic hills at the photospheric level in regions without spot groups. The polarization vector's rotation direction in sources was shown to correspond to emersion of an unusual wave. Based on observation results in the period of passaging Mars across the solar disk, data on the fine structure of the Sun at the wavelength of 8 mm were derived. Two types of inho-mogeneities were detected with typical sizes from 1.6″ to 3.4″ and from 17″ to 40″.

V.A. Efanov authored about 50 research papers and publications in press.

EFIMOV Yuri Sergeevich



Born 20.11.1935 in Dnepropetrovsk. In 1953 he graduated from the school with a silver medal and studied at Sverdlovsk Polytechnic Institute for one year. In 1954 he was transferred to the Faculty of Mechanics and Mathematics of Lomonosov Moscow State University. Since 1958 he worked at the Crimean Astrophysical Observatory (CrAO). In 1987 he defended the Ph.D. thesis "Polarimetry of eruptive stars". Died 21.10.2011 in Simferopol

The first papers of Yu.S. Efimov were related to theoretical calculations of the magnetic amplification of spectral lines and TV observations of stars and artificial earth satellites. Since the mid 60s he began studying polarization of the sky objects. He developed a method of measuring linear polarization of eruptive stars at the time of rapid changes in its brightness and modernized a stellar polarimeter to investigate linear polarization of fast stellar processes. Subsequently, his method was applied at the Institute of Astrophysics of Tadzhikistan Academy of Sciences and at the Astronomical Observatory of Kharkov National University. Based on observations at various telescopes of CrAO, Yu.S. Efimov acquired new and important results on polarization of flare stars, X-ray binaries, novae and supernovae, white dwarfs and active galactic nuclei. During observations of the red dwarf stars he obtained reliable measurements of linear polarization of these stars and demonstrated the lack of any significant synchrotron component in its radiation. Studying the R Corona Borealis stars, Yu.S. Efimov discovered the influence of the growth of dust particles on color variations and on linear polarization of these stars at their minimum brightness. He proposed a direct method for estimating the dust particle size and successfully applied this concept to the interpretation of peculiar object Kuwano-Honda.

In 2009 Yu.S. Efimov proposed a new, physically reasonable approximation of dependence of the observed interstellar polarization degree on the wavelength in the range from 0.2 to 4 microns. This approximation had certain advantages over the previous widely used formula by Serkowski.

For more than 20 years, Yu.S. Efimov investigated the polarization variability of blazars and obtained (jointly with N.M. Shakhovskoy) evidences of polarization plane rotation in OJ 287 in 1994-1996, that points directly to the helical structure of the jet magnetic field and the possibility of long-term keeping of the magnetic field topology. Since 2005 he carried out regular photometric observations of Seyfert galaxies and cosmic afterglow of gamma-ray bursts within the international projects.

Jointly with colleagues from MAO NASU and the Institute of Astronomy of Kharkov National University, Yu.S. Efimov was involved in polarization observations of asteroids and comets. He contributed significantly to solving problems of the origin and evolution of the Solar System, problem of the asteroid hazard, monitoring of global climate changes on Earth and ecological control of the terrestrial atmosphere. For this work the group of researchers was awarded the State Prize in Science and Technology of Ukraine in 2010. In honor of Yu.S. Efimov the asteroid 8781 was named «Yurka».

The author of more than 200 papers published in the leading astronomical journals. A member of the International Astronomical Union, Euro-Asian, Russian, and Ukrainian Astronomical Associations.

EFREMOV Yury Nikolaevich

Born 11.05.1937. In 1955, finished school No. 692 in Moscow with a silver medal and became a student of the astronomy department of the Faculty of mechanics and mathematics, Lomonosov Moscow State University (MSU). After graduation, in 1960–1973, was affiliated to the Astronomical Council (USSR Acad. Sci.), at positions to junior researcher, and then changed affiliation to the position of senior researcher at the Sternberg Astronomical Institute (SAI), MSU. In 1989–2000, E. headed the SAI department for studies of the Galaxy and variable stars. Since 2000, SAI Chief Researcher.
PhD dissertation "Main characteristics of classical Cepheids" (1967). D. Sci. dissertation "Cepheids and star groups" (1983). Died 26.08.2019 in Moscow.

Till 1973, E.'s main research direction was the work on variable star catalogs, headed by B.V. Kukarkin and P.N. Kholopov, the mission delegated to Moscow astronomers by the International Astronomical Union (IAU). Later on, he was engaged in studies of variable stars and large-scale features of star formation. E. discovered the period–age relation for Cepheids, introduced the concept of star complexes as the largest groupings of young stars.

Supervised two D. Sci. and five PhD dissertations. Professor title since 1997.

E. was awarded the MSU Lomonosov prize (1996) and the prize of the Eurasian Astronomical Society (1996), together with A.V. Zasov and A.D. Chernin, for a series of studies of star complexes in galaxies. He is a board member of the Russian Academy of Sciences' Scientific council on astronomy, a member of IAU commissions on variable stars, star clusters, galactic structure. E. is a member of scientific councils of the SAI and of the Institute of history of natural sciences and technology (Russian Acad. Sci.). He is a founding member of the USSR Astronomical Society (1990; currently the Eurasian Astronomical Society).

E. is the author of more than 200 scientific papers and many popular science publications. According to the Astrophysics Data System (ADS), he is among the ten best-referenced Russian astronomers. He is actively fighting pseudo-science, being the deputy editor-in-chief and the author of many papers of the Russian Academy of Sciences' Bulletin "In support of science". He played a crucial role in denunciation of the pseudo-scientific astronomical chronology of historical events suggested by A.T. Fomenko.

Main books: "Sites of star formation in galaxies: Star complexes and spiral arms" (1989), "Into the depths of the Universe" (2003), "Star islands: Galaxies of stars and the Universe of galaxies" (2005).

EGOROV Vsevolod Aleksandrovich

Born 12.12.1930 in Khasavyurt (Dagestan). In 1953, graduated from the Mechanics and Mathematics Faculty of M.V. Lomonosov Moscow State University. A. A. Kosmodemyansky's student. M.V. Keldysh was his supervisor during the postgraduate course. As a student, V.A. Egorov began working at the Mechanics Department of the Steklov Mathematical Institute of the USSR Academy of Sciences (MIAS). Since 1953 – an employee of the Department of Applied Mathematics of MIAS. Since 1966, worked at the Institute of Applied Mathematics of the USSR Academy of Sciences (now the Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences). Ph. D. (1957), Doctor of Physical and Mathematical Sciences (1967), Professor of the School of Theoretical Mechanics of M.V. Lomonosov Moscow State University (1973-2001). Read lectures "Dynamics of space flights", "Theory of flight to the Moon".

V.A. Egorov's scientific research is mainly related to the fields of celestial mechanics and the dynamics of space flight. V.A. Egorov is the author of more than 100 scientific papers, including 2 monographs (Egorov V.A. The spatial problem of reaching the Moon. Moscow: Nauka, 1965; Egorov V.A. Gusev L.I. Dynamics of flights between the Earth and the Moon. Moscow: Nauka, 1980).

V.A. Egorov developed the method of approximate calculation of flight paths to the Moon, based on the concept of the sphere of influence. He considered the intercept trajectories that at their first (relative to the Earth) half-turn cross the sphere of influence of the Moon. Found that for any intercept trajectories, the speed of entry of the spacecraft into the sphere of influence of the Moon, calculated relative to the Moon, will always be greater than the selenocentric parabolic velocity at the boundary of the sphere of influence, which means that the spacecraft will either hit the Moon or necessarily leave the sphere of influence of the Moon, passing by the Moon on a hyperbolic trajectory. The method created and applied by V.A. Egorov for the calculation of flight paths to the Moon enables building complex trajectories of the three-body problem by simple means. He calculated, analyzed, and described hundreds of trajectories of Earth-Moon-Earth flights, compiled a complete classification of the trajectories of the approach from the spacecraft to the Moon.

The results obtained by V.A. Egorov played an important role in the implementation of spacecraft flights to the Moon.

V.A. Egorov was awarded the Lenin Prize (1960) for the ballistic support of the flight of the Luna-3 station that delivered the first photos of the reverse side of the Moon (1959). V.A. Egorov worked as an Editorial Board Member of the Journal "Cosmic Research" for a long time. The asteroid (8450) Egorov is named after V.A. Egorov.

EIGENSON Moris Semenovich

Born 12.01.1906 in Ekaterinoslav (Dnepropetrovsk). In 1927, graduated from Leningrad State University. After completing his PhD, taught at the University. Since 1938, Dr. Sci. in Physical and Mathematical Sciences. Since 1939, Professor. In 1934-1953, worked at Pulkovo Observatory. In 1938-1951, Head of the Department of Solar service at the Observatory. In 1937-1951, Chairman of the Commission on Solar Physics of the Astronomical Council of the USSR Academy of Sciences. Head of the Solar Service Network. In 1952, in the course of the campaign "fight against cosmopolitism," he was suspended from leading the Department of Solar Physics at Pulkovo Observatory and fired from Leningrad State University. From 1953 until the end of his life, professor at Lvov University. In 1953-1959, Director of the Astronomical Observatory at Lvov University. Died 18.08.1962 in Lvov.

M.S. Eigenson’s research is related to extragalactic astronomy and solar physics. In 1935-1938, investigated light absorption in galaxies. He showed that in all spiral galaxies, and not only in those seen edge-on, an absorbing matter is also present. Developed methods determining the optical thickness of galaxies. In 1938, pointed out the presence of dark matter in space between galaxies. Studied the orientation of the rotation axes of spiral galaxies and found that they are oriented chaotically. In 1936, published the first richly illustrated monograph on extragalactic astronomy in Russian "The Big Universe", and in 1960 – the monograph "Extragalactic Astronomy".

Investigated geophysical effects caused by solar activity, which enabled him to provide reasonable predictions for some of the processes taking place on Earth due to the Sun's influence. Proposed new indices of the solar activity. Established the existence of the secular solar cycle manifested in some geophysical phenomena. One of the authors of the collective monograph "Solar activity and its manifestations on Earth" (1948) and the author of the monograph "Essays on physical and geographical manifestations of Solar activity "(1957). In 1957-1958, actively worked on organizing observations under the program of the International Geophysical Year.

At the beginning of his scientific career, M.S.Eigenson, together with L.V. Mysovsky, researched cosmic rays. In 1934, just two years after the discovery of the neutron by J. Chadwick, they, using a Wilson camera to register particles, discovered the presence of neutrons in cosmic rays.

M.S. Eigenson was actively involved in the popularization of astronomy. In 1938, he published a popular science book for children "The Sun".

EISMONT Natan Andreevich

Born in 1939. Entered Moscow Institute of Aviation in 1956. Graduated from faculty of flying craft of this Institute in 1962 as mechanics engineer. In 1968 graduated from mechanics and mathematics faculty of Lomonosov Moscow State University as mathematician. In 1961-1968 was member of staff in the company now known as Russian Rocket and Space Corporation Energia taking positions technician, engineer and senior engineer.

Since 1968 up to now member of Space Research Institute staff: postgraduate student, junior researcher, senior researcher, lead scientist. In 1972 received Ph.D. in the area of spacecraft dynamics and motion control.

During his work in Energia Rocket and Space Corporation N.A. Eismont took part in the projects connected with robotic missions to Venus, Mars and Moon, namely developed ballistics parts of the projects as appropriate software for purposes of their implementation. He is the author of developments related to manned mission to the Moon known as N1-L3 project. They include optimization of missions architecture consisting from scenario of mission up to landing on the surface of the Moon and choosing of rocket complex optimal parameters.

During his work in Space Research Institute N.A. Eismont continued his activity in the area of research and development aimed for solution of software for the flights to Mars and Venus and for designing spacecraft for astrophysics tasks, such as Relict, Relict-2, Prognoz series, including Interball, Interball-2. The last ones were successfully used for solar-terrestrial physics studies. For Relict-2 project trajectories were developed in cooperation with American scientists. Pioneering method was proposed for this supposing reaching vicinity of solar-terrestrial collinear libration point L1 with the use of gravity assist maneuver near Moon. For small subsatellite of Interball project orbital and attitude control system were developed and implemented for real flight.

N.A. Eismont has developed scenario for launch operations and has chosen the orbit for INTEGRAL which allowed to fulfill experiments in roentgen and gamma bands onboard this space laboratory during almost twenty years keeping constraints for staying in radiation belts and demands on radio links with ground stations. For his important input into project European Space Agency awarded him by diploma.

Now days Spectrum-Roentgen-Gamma observatory is in orbit near solar-terrestrial L2 libration point. It was launched and is controlled now as a result of research and development done by N.A.Eismont.

Another area of N.A. Eismont scientific interests is the problem of hazardous sky objects mitigation. His studies allowed to propose use of small asteroids to deviate the dangerous ones from collision with Earth by applying gravity assist maneuvers. The same approach was developed for the capture small asteroids onto resonance orbits with their successive transfer onto Earth satellite trajectories.

List of N.A. Eismont scientific publications includes 95 ones.

EMEL’YANENKO Natalia Yuryevna

Born 17.11.1951 in Volkovisk, Grodno region. 1969-1974, student in astronomy, Kazan State University. 1978-2010, Assistant-Professor at the Higher Education Institutes of Chelyabinsk. 1983-1986, PhD student, Department of Astronomy, Kazan State University. Since 2010, Leading Researcher, Institute of Astronomy, RAS. PhD (1989, Thesis on ‘The investigation of cometary motion in the Jupiter sphere of action’), D.Sc. (1994, Thesis on ‘The evolution of orbits and the kinematics of short-period comets at encounters with Jupiter’). Associate Professor (1991).

N.Y. Emel’yanenko’s research interests are related to the dynamics of small Solar system bodies. The author of about 60 scientific papers, including two monographs.

In 1973-1974, N.Y. Emel’yanenko studied, together with N.Belyaev, lost comets (with missing apparitions). The improved orbital elements of Comet 66/P Du Toit led to the rediscovery of this comet in 1973. The improvement of orbital elements and the study of the orbital evolution for the comet D/1896 Giacobini showed that the most favorable time for the rediscovery would be in 2008. Comet Giacobini was rediscovered in 2008 after fifteen missing perihelion passages.

Since the late 1970s, N.Y. Emel’yanenko did research on the encounters of comets and, subsequently, other small Solar system bodies with major planets.

Statistical and qualitative analysis of several thousand encounters of comets with Jupiter enabled separating low-velocity and high-velocity encounters. Later, low-velocity and high-velocity encounters were found for Saturn and Earth. Models of low-velocity encounters were suggested, explaining all the features of encounters and their combinations.

In 2010-2015, she proposed and justified the classification of encounters according to planetocentric distances, based on the sphere of gravity and the Hill sphere. The result of this work is a significant expansion of the region of encounters for planets that are external to Jupiter. Analyzed the set of encounter regions for the planets of the Solar system. It was shown that between the terrestrial planets, there are gaps in which small bodies may exist for millions of years without experiencing encounters with planets. Determined the intersection regions for the giant planets. Objects of these regions can have encounters with neighboring planets on short timescales (of the order of few decades). The latter circumstance leads to the rapid evolution of orbital elements. There is a continuous exchange of objects for the giant planets. At the same time, some objects reach the inner Solar system.

Awarded Diploma of the Ministry of Education and Science of Russia.

EMEL’YANENKO Vacheslav Vasilevich

Born 28.08.1952 in Ukmerge, Lithuania. 1969-1974, studied astronomy at Kazan State University. 1974-1977, PhD student, Department of Astronomy, Kazan State University. 1977-1978, Research Fellow, Batabat Department, Shemacha Observatory. 1978-2009, Chelyabinsk Polytechnical Institute (South Ural State University since 1997). 1994-1996, Research Fellow, Liverpool John Moores University and Armagh Observatory. Since 2009, Leading Researcher, Institute of Astronomy, RAS. PhD (1977), D. Sc. (1994), Professor (2001).

V.V. Emel’yanenko’s research interests are mainly in the field of celestial mechanics and the dynamics of small solar system bodies. The author of about one hundred and thirty scientific papers, including two monographs.

In the 1970s and 1980s, V.V. Emel’yanenko published a series of works in which he studied the dynamical features of short-period comets, calculated non-gravitational effects in the motion of a number of comets, estimated velocities of breakup for comets, and investigated the relationship of observed comets and meteoroid streams.

Later, he developed the resonance perturbation theory for orbits with large eccentricities, obtained an analytic expansion of the perturbing function in the restricted three-body problem for orbits with eccentricities close to unity, worked out the diffusion theory for comets and meteoroid streams, introduced a method of algebraical mappings to describe the dynamics of near-parabolic comets, constructed a new method of symplectic integrations of the celestial mechanic's equations.

In the 2000s, he developed, together with D. Asher and M. Bailey, a model of the solar system comet cloud formation, worked out a theory for migration of comets from the outer solar system to near-Earth space, explained the dynamics features and the origin of observed short-period comets and Centaurs, found a new dynamics class of distant trans-Neptunian objects.

He studied features of migration for distant planets interacting with planetesimal discs. Found new mechanisms for the transfer of planetesimals to the outer region without any resonant trapping, discovered the reversion of the planetary migration, contributed significantly to the understanding of the structure and the origin of the Solar system trans-Neptunian region, investigated the process of the resonance exoplanet configuration formation using a unified model of planetary migration.

Immediately after the Chelyabinsk event, he organized and participated in the expedition that led to the determination of the basic physical and dynamical characteristics of a celestial body that entered the Earth's atmosphere on February 15, 2013. He showed that the Chelyabinsk object had been very close to the Sun about a million years ago.

Awarded Medal of the Astronomical Council of the USSR "For the discovery of new astronomical objects" (together with N. Belyaev) for the prediction of the Comet Taylor position, based on which the comet was discovered 60 years after the loss. Asteroid 5617 was named 'Emelyanenko' by IAU. Winner of the International Academic Publishing Company Prize IAPC "Nauka / Interperiodica" for 2012.

EMELYANOV Nikolay Vladimirovich

Born 08.06.1946 in Smolensk. In 1970, graduated from the Astronomy Department, Faculty of Physics, Lomonosov Moscow State University (MSU). Later on, he took post-graduate courses of the MSU Faculty of physics in the field of celestial mechanics. Since 1973, a staff member of the Sternberg Astronomical Institute (SAI) of the MSU. PhD (1974), DSci (1986). Since 1991, E. is the head of the SAI department of celestial mechanics. Since 1995, he also teaches at the chair of celestial mechanics, astrometry, and gravimetry (MSU faculty of physics). E. has the title of Senior Researcher.

In the SAI, E. actively worked on the analytical theory of motion of artificial Earth satellites and on improving their orbits from observations. In 1978–1988, E. was engaged in applied research as a principal researcher.

Since 1987, E. is actively engaged in modeling the motion of natural satellites of planets on the base of observations. He developed new original motion models for all the 107 distant satellites of planets and for the main satellites of Uranus and Neptune.

E. developed a complete set of facilities for studying dynamics of natural satellites of planets: an ephemeris service of natural planet satellites and satellites of asteroids, a special database of all observations of natural planet satellites and satellites of asteroids available in the world, a bibliographic database, an information system on physical and orbital parameters of planets and satellites. All these facilities are combined into a united system MULTI-SAT available via Internet. The ephemeris facilities developed by E. are original, highly demanded in the world.

E. developed new methods permitting to obtain astrometric results from photometric observations of mutual occultations and eclipses of planet satellites. He used new methods to reduce results of all world-wide observing campaigns for such events. The result was valuable astrometric data on the motion of satellites. During the 20 recent years, E. permanently cooperates with the Institute of celestial mechanics and ephemeris computations in Paris, being an associated staff member of the Institute. The ephemeris service of natural planet satellites created by E. operates at the web site of the Paris institute, being a part of state facilities of the Republic of France for ephemeris computations.

E. supervises the SAI science theme “Celestial mechanics and dynamics of celestial bodies from observations” in the priority direction “Celestial mechanics and dynamics of space bodies”. He is the author of 130 papers in highly rated science journal, 3 books, 2 books of collected papers, 3 educational manuals. E. always takes part in education process, yearly delivers lecture courses “Practical celestial mechanics” and “Ephemeris astronomy”, presents seminars and practical studies. He regularly supervises scientific work of undergraduate and post-graduate students. E. supervised 3 PhD dissertations.

E. is a member of the EAU and European Astronomical Society, a member of the SAI Science Council, a member of the specialized MSU Science Council on astrometry and celestial mechanics.

ENEEV Timur Magometovich

Born 23.09.1923, in Grozny city. He graduated from M.V. Lomonosov Moscow State University in 1948, then completed a postgraduate course at MSU Mechanics Research Institute in 1951. PhD (1952), Doctor of Physico-mathematical sciences (1959), corresponding member of USSR Academy of Sciences (1968), full member of Russian Academy of Sciences (1992). Since 1951 till 1953 he was a junior researcher of the Steklov Mathematical Institute of USSR Academy of Sciences. Since 1953 till 1967 he was a junior researcher then a senior researcher in the Applied mathematics department of the Institute. Since 1967 he was a senior researcher, the head of sector and principle researcher in Keldysh Institute of Applied Mathematics, Russian Academy of Sciences. Died in 2019 in Moscow.

T.M. Eneev's major research results belong to celestial mechanics and space flight dynamics. He has over 200 research papers published in national and foreign scientific journals.

T.M. Eneev was the first to solve problems of fundamental significance to rocket and spacecraft flight dynamics. Developed an original method for solving optimal rocket injection problem. Did research on Earth artificial satellites orbits theory and such orbits' calculation methods. He also did pioneering research on spacecraft trajectory and orbit parameters determination based on trajectory measurement data. His research on spacecraft atmospheric descent dynamics defined the choice of the spacecraft for the first human flight of U.A. Gagarin.

T.M. Eneev suggested the method of spacecraft injection into an interplanetary transfer trajectory with the initial injection into a low Earth orbit. Also suggested a 'transport trajectory' method for calculation and design of the first interplanetary space flights with low thrust propulsion. Developed autonomous navigation theory.

T.M. Eneev developed models of spacecraft design and models for ballistic calculations of Earth satellites' orbits and spacecraft planetary descent trajectories.

T.M. Eneev and his research group worked on novel problems of large systems' dynamics, particularly such cosmogonic problems as galaxy evolution and spatial formation under gravity forces. They developed a new model of Solar system formation explaining planets formation and their rotations. A novel effective method of large-scale discrete systems' software modeling was invented.

T.M. Eneev did a comprehensive research on solar system small bodies' migration to the Earth vicinity in the context of asteroid hazard. Performed research on flights to small bodies in the Solar system with the help of low thrust propulsion. Obtained fundamental results with practical application in this scientific area.

T.M. Eneev was awarded the following prizes: Lenin Order (1961), Order of the October Revolution (1984), Order of the Red Banner of Labour (1956, 1975), Linin prize (1957), Order of Honour (2005). Russian Academy of Sciences awarded T.M. Eneev with Zander golden medal. T.M. Eneev is a laureate of Demidov prize (2006). International Astronomical Union named the small planet 5711 "Eneev" 1978S04 after him.

EREMEEVA Alina Iosifovna

Born 04.05.1929 in Moscow. In 1954, graduated from the Faculty of mechanics and mathematics, Lomonosov Moscow State University (MSU). Junior researcher at the Institute of history of natural sciences and technology, USSR Acad. Sci. (1954 – 1967). PhD dissertation (1967) on the base of her book "Herschel's Universe: Ideas and discoveries in cosmology and cosmogony", 1966. Junior researcher at the Astronomical Council, USSR Acad. Sci. (1967–1970), at the Committee on meteorites of the USSR Acad. Sci. (1970–1979). Since 1986, at the Sternberg Astronomical Institute (SAI) of the MSU; senior researcher since 1997.

Fields of research: history of astronomy (16^{th} – 20^{th} centuries), history of meteoritics, biographies of scientists, laws of science development. E. revealed (1966, 2018) W. Herschel's forgotten discoveries and ideas: (a) ever-first discovery of the signs of a large-scale layer structure of the Universe (1784); (b) theory of evolution of matter in space as it follows from randomly appearing gravitational "accumulation centers" (1785) and continued diffuse star formation (1791) ; (c) ever-first attempts to measure the depth of the Galaxy from globular clusters (1818). She revealed (1975) forgotten achievements of St. Petersburg physicist academy member F.U.T. Aepinus in astronomy and geophysics; as a result, his name was approved for a lunar crater (2009). In her books "The Birth of Scientific Meteoritics (History of Pallas Iron)" (1982) and "History of meteoritics (Origins. Birth. Becoming.)" (2006) E. was the first to study origins and the real history of the appearance of cosmic meteorite theory by E. Chladni (1794). As a result of several expeditions under her leadership in the mountain taiga near the Yenisei (1976 – 1978), the lost place of the original discovery (found 1749) of the first identified on Earth meteorite "Pallas Iron" (Krasnoyarsk) was restored (in 1981, the site was marked with the world-first monument to a meteorite). E. identified forgotten names of discoverers of chondrules (J. L. Williams, 1798), of the large-scale crystalline structure of meteoric nickel iron (W. Thomson, 1804), of the first researcher of the physics of bolides (T. Grotthuss, 1821). She was the first after O. Struve (1957) (articles: 1969, 1989, 2014, 2016, monograph – 2020) to investigate in detail scientific research and the fate of the pioneer of Russian (Soviet) theoretical astrophysics, Director of the Pulkovo Observatory B.P Gerasimovich (1889 –1937). Thanks to E., the minor planet 11793 immortalizes the name of Marshal V.I. Chujkov ("Chujkovia", 2004). She suggested an original author definition of the scientific picture of the world, developed an original theory of scientific revolutions.

E. authored over 200 publications in the field of the history of science including 5 books (1966,1982,1984, 2006, 2020), popular science (including 2 books , 1958,1966), and textbooks (1989, 2003 – coauthor F.A. Tsitsin (1931 – 2005), 2013, 2018). Veteran of Labor. Distinguished scientist of the MSU. Certificate of honor from the Ministry of Education and Science of Russian Federation (2009). Her name is given to the minor planet 17369 ("Eremeeva", 2017).

ESIPOV Valentin Fedorovich

Born 06.11.1933 in Nekouz village, Yaroslav region. Student of the astronomical department at the Faculty of Mechanics and Mathematics, Lomonosov Moscow State University (MSU), in 1952–1957. PhD dissertation “Spectrophotometric study of selected space objects using contact image tubes”, 1969. Assistant, junior researcher, senior researcher, head of a department, leading researcher at the Sternberg Astronomical Institute (SAI) of the MSU from 1957 to the present time. IAU member, Commission 9. Medal “For merits in space exploration”, 2012. Medal "In Memory of the 850 Anniversary of Moscow", 1997. Medal “Veteran of labor”, 1983. Died 15.05.2021 in Moscow.

E. is a leading expert in the field of space instrument and astronomical instrument design, astronomical spectroscopy. He took an active part in developing the Soviet electronic telescopy: application of image tubes (ITs) for astronomical observations. In coordination with industry, he designed a new IT type: a photo-contact tube, which made it possible to improve effectiveness of telescopes by a factor of 100. He created a series of astronomical spectrographs, developed techniques of observations using them and of data reductions. Together with E. Dibay, he performed the first spectroscopic studies of quasars. They detected variability of quasars in spectral lines, discovered 50 new Seyfert galaxies. Radial velocities were measured for about 1000 galaxies and radio sources, physical characteristics were studied for several types of objects: non-stationary stars, Novae and supernovae. Photoelectric photometry was performed for 300 globular clusters in the M31 galaxy. Between 1994 and 2010, a unique series of spectroscopy was obtained for the mini-quasar SS433. His many-year observations of galaxies and non-stationary stars are a serious contribution to astronomical research. E. designed a completely new imaging device based on an acoustics-optic filter (patent No. 2569907, 10.12.2015).

E. actively participated in exploration of the outer space. He took part in designing equipment for observations of artificial satellites. E. performed unique observations of the “artificial comet” released at the distance of 150000 km from the Earth by the Luna-2 automatic space probe. He participated in designing instruments on board space probes. The “Phobos” instrument designed by him flue to Mars on a space probe.

E. is the author of 269 scientific papers published in Russian and foreign scientific journals, with 1085 references to them. He is a member of the International Astronomical Union (IAU). The IAU committee gave the name Esipov to the minor planet No. 10481.

E. supervises students’ yearly and graduation papers, scientific studies of trainees and PhD students. Before becoming an MSU student, he worked at the construction of the MSU building as an electrician. Having graduated from the university in 1957, he became a staff member of the SAI department of radio astronomy.

In 1985–2009, E. was the head of the SAI department of radio astronomy. Since 2009, he is the leading researcher of the same department. Since 1992, he is the leader of the SAI local trade union organization. He was awarded a medal “100 years of trade unions”.

FABRIKA Sergey Nikolaevich

Born 08.05.1955. A student of Kazan State University in 1972-1977. Post-graduate student of the Astrophysics Department of Sternberg Astronomical Institute of Moscow State University in 1977-1981. Defended his Ph.D. thesis on «A study of broad-line regions of active galactic nuclei and quasars» in 1982. Dr. Sci. degree for «Jets and accretion disks in close binary systems» in 1998.

A staff member of the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991), holding different positions: Junior Researcher (1981), Research Scientist (1986), Senior Researcher (1989), Head of Stellar Physics Laboratory (1992). Professor on «Astrophysics, Radioastronomy» since 2001.

Sergei Fabrika is an expert in observational astrophysics, he has 270 publications and one monography «The Jets and Supercritical Accretion Disk in SS433». His scientific interests are related to physics and evolution of stars, supercritical accretion disks and jets around black holes, a study of global magnetism of stars, active galactic nuclei (AGN). S.N. Fabrika guides a teaching work, he supervised 9 PhD students.

Main scientific results of S. Fabrika are the following.

A method of kinematic mapping using light echo has been proposed for inner regions of active galactic nuclei and quasars, now it is the only direct method for studying inner surrounding of supermassive black holes.

He introduced magnetic field functions, these functions have been determined for white dwarfs and Main Sequence stars. An effect of magnetic field evolution in single white dwarfs has been revealed.

The only known supercritical accretor SS433 in our Galaxy has been studied by him. For the first time the SS433 relativistic jets and parameters of the funnel in its super-Eddington disk were determined. The black hole mass in SS433 has been measured.

A new type of extragalactic X-ray sources in external galaxies has been predicted which were discovered and named «ultraluminous X-ray sources» (ULX).

A new galaxy in the Local Group, UGC4879, has been discovered.

It has been found using optical spectroscopy that ULX are supercritical accretion disks around stellar-mass black holes with a prototype SS433.

Three new LBV stars (Luminous Blue Variables) have been discovered in the Andromeda galaxy in addition to four known stars discovered by E. Hubble in 1950th, one LBV star in M33 galaxy and one new LBV in our Galaxy.

He is a member of International Astronomical Union (IAU), European Astronomical Society (EAS), a member of Program Committee of the INTEGRAL space observatory, dissertation council of SAO RAS and editorial board of "Astrophysical Bulletin".

FADEYEV Yuri Aleksandrovich

Born 07.07.1951 in Moscow. Graduated from Gubkin Russian State University of Oil and Gas in 1979 with a master's degree in Applied Mathematics. From 1972 to 1978, worked at Sternberg Astronomical Institute of M.V. Lomonosov Moscow State University. Since 1978, worked at the Astronomical Council (currently, Institute of Astronomy of Russian Acad.Sci., INASAN). PhD thesis «Investigation of physical processes in the envelopes of pulsating stars» (1983) and D.Sci. dissertation «Hydrodynamic processes in pulsating stars» (1993). Published more than eighty scientific papers.

Y.A. Fadeyev's research interests relate to problems of hydrodynamic phenomena in stars. A lot of his research is focused on the simulation of stellar pulsations with the application of computational methods of radiation hydrodynamics. In the theory of stellar pulsations, Y.A. Fadeyev developed a new approach based on consistent stellar evolution and nonlinear stellar pulsation calculations. Application of this method to the pulsating stars with a known period of the light variation and rate of the period change provides estimates of the star's mass, radius, and age. This approach enabled Y.A. Fadeyev to overcome significant difficulties encountered due to the absence of direct methods of mass determination for single stars.

In the 1980s, Y.A. Fadeyev showed that the periodic shocks in the atmospheres of pulsating stars lead to physical conditions, which are necessary for the condensation of dust grains, and therefore, they are the main driver of dust envelope formation around the intermediate and late-type supergiant stars. Using the numerical methods of physical kinetics, he solved the problem of the carbon dust grain condensation in the R Coronae Borealis type stars and explained their photometric peculiarities arising during drops of the visual light.

Y.A. Fadeyev studied the structure of radiative shocks in the partially ionized hydrogen gas. The problem was solved using the method of global iterations based on the self-consistent solution of the equations of hydrodynamics, radiation transfer and atomic kinetics. Results of computations describe the properties of the shock wave gas flow and the radiation field generated by the shock as a function of the Mach number and the unperturbed values of gas density and gas temperature. The shock wave model is of importance not only for astrophysical applications but also for problems of controlled thermonuclear fusion.

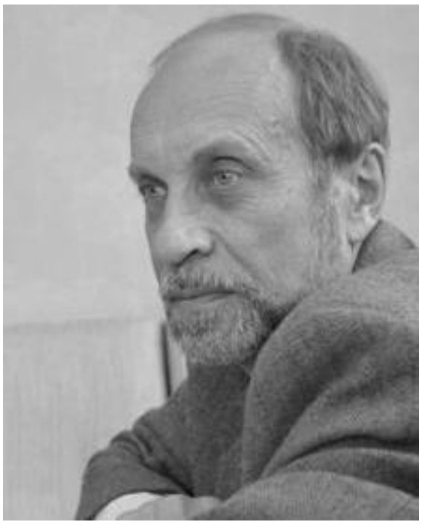
FESENKOV Vasily Grigorievich

Born 01(13).01.1889 in Novocherkassk. Died on 2 March 1972 in Moscow. He was a student of the Kharkiv University (1907-1911) and post-graduate student of the Sorbonne (1912-1914). His doctoral thesis was «The nature of the zodiac light» (1914). His master's thesis was «The nature of Jupiter» (1917, Kharkiv). He was a professor of Moscow State University (1933) and a director of the SAI MSU (1936-1939). He was First chairman of the Astronomical Council of the USSR Academy of Sciences (1936-1937), a director of the Astrophysical Institute of the Kazakh SSR Academy of Sciences (1950-1963, Alma-Ata), a chairman of the Committee on Meteorites (CMET) of the USSR Academy of Sciences (1945-1971), corresponding member (1927), academician (1935) of the USSR Academy of Sciences and a Member of the IAU (1938). Died 02.03.1972 in Moscow.

Fesenkov's scientific activity covered a wide range of areas of astronomy. One of the founders of astrophysics in the USSR. For the first time (1913), using a photometer of his design, he made a photometric study of the zodiacal light and on this basis obtained data on the distribution of interplanetary dust. He discovered the law of light reflection by opaque surfaces and applied it to the study of the surfaces of the Moon and planets. He clarified the properties of the atmospheres of Mars, Jupiter, and the Moon (he showed that the density of the latter is less than 10^{-6} of the Earth's). He developed optical methods (ground-based and satellite-based) for probing and refined the properties of the high atmosphere, and discovered the existence of a dust cloud around the Earth. He deduced the total mass of the Galaxy and gave a method for determining its compression (Fesenkov's theorem). As chairman of the Committee on Meteorites (CMET), he expanded its scope in the direction of astronomical research in meteoritics. Under his leadership, the cosmic orbit of the Sikhote-Alin iron meteorite was first determined (1947) and its asteroid nature was proved, which made it possible to consider meteorites as fragments of asteroids. In 1947, he led the first expedition of the USSR Academy of Sciences to the area of its fallout. He studied the motion of a meteor body with cosmic velocity in the Earth's atmosphere (1951). He substantiated the cometary nature of the Tunguska meteorite. He pointed out the significant role of the corpuscular radiation of stars and sharp local compressions of gas-dust matter under the influence of stellar wind and shock waves in the interstellar medium, and in the planetary cosmogony – the role of SN star flares; in the problem of the origin of life in the Universe, he hypothesized the essential role of catastrophic comet collisions for the formation of complex organic matter in space. He made a major contribution to the development of astronomy as an organizer. He founded and headed the State Astrophysical Institute in Moscow (1923-1931). He was one of the initiators of the creation of the Sternberg Astronomical Institute (1931), founder and director of the Kuchin Observatory of Moscow State University (1924-1937). In 1942, he organized the Institute of Astronomy and Physics at the Kazakh branch of the USSR Academy of Sciences (since 1946 – the Academy of Sciences of the Kazakh SSR). Founder and executive editor of the Astronomical Journal (1924-1964).

He is author of 650 scientific papers. He brought up many students (from candidates to academicians). He was awarded 3 Orders of Lenin, the Order of the Red Banner, and medals. Craters on the Moon and on Mars, minor planet №2286, are named after him. The name «Fesenkov» is given to the Astrophysical Institute (APHI) of the Academy of Sciences of the Republic of Kazakhstan. He was honored scientist of the Kazakh SSR (1947) and a member of the IAU (1938).

FILIPPOV Boris Petrovich



Born 01.09.1951 in Cherlak, Omsk Region. In 1975 he graduated from the Faculty of Physics, Lomonosov Moscow State University. Since 1975 he is in the staff of the Pushkov Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation of the Russian Academy of Sciences (IZMIRAN): trainee researcher, PhD student, junior researcher, senior researcher, head of the Laboratory of Solar Activity (1994 – 2016), head of the Solar Physics and Solar-Terrestrial Relations Department (2016 – 2017), since 2016 – chief researcher. He received Dr. Sci. in Physics and Mathematics in 1998. He is a member of IAU and a member of the adviser board of the International journal "Space Weather and Space Climate".

Research works of B.P. Filippov are devoted to studies of non-stationary phenomena in the solar atmosphere, namely magnetic-field evolution and its manifestations in the structure of the chromosphere and corona, problems of equilibrium, stability, and dynamics of solar prominences, formation of solar mass ejections from the corona into the interplanetary space.

In the 1980-1990s B.P. Filippov found formations in the structure of the chromosphere and corona that correspond to null points of magnetic fields. In 1987 in collaboration with M.M. Molodensky he developed a model of solar prominences, which allowed a catastrophic loss of equilibrium revealed by a sudden eruption. He found chromospheric manifestations of the inverse polarity of prominence magnetic fields, declared the dependence of interactions and connectivity changes of solar filaments (prominences) on their helicity and the photospheric magnetic field evolution. He justified the relationship of eruptive prominences with coronal mass ejections in the frame of the single process of the development of instability of magnetic flux ropes in the corona, demonstrated that trajectories of eruptive prominences and coronal mass ejections follow the shape of neutral surfaces of the potential magnetic field in the corona and that the material of quiescent prominences is concentrated near the neutral surfaces. In 2000 together with O.G. Den he proposed obvious and effective criterion for evaluation of stability of magnetic flux ropes in the corona based on the correlation of their heights above the photosphere with the decay index of the coronal magnetic field. This method allows one to forecast the strongest disturbances of space weather. He examined the interaction of large-scale coronal formations with the global magnetic field of the Sun and fields of moving flux ropes.

B.P. Filippov designed and prepared a number of installations for the study of the solar corona during total eclipses. He was a head of several foreign expeditions of the Russian Academy of Sciences for solar total eclipse observations. During the totality in 1991 in Mexico he performed precise measurements of the orientation of the linear polarization-plane in the continuum radiation of the solar corona.

He is an author of more than 170 scientific publications including books "The magnetic fields of solar active regions " (1992, in co-authorship with M.M. Molodensky), "Eruptive processes on the Sun" (2007), "Cosmic environment around us" (2006, in co-authorship) and others.

bfilip@izmiran.ru

FINKELSTEIN Andrey Mikhailovich

Born 07.02.1942 in Tavda of Sverdlovsk Region; graduated from the Leningrad State University (1968); worked at the Institute of Theoretical Astronomy of the USSR Academy of Sciences (from 1969 to 1973); in the Leningrad Branch of Special Astrophysical Observatory of the USSR Academy of Sciences (from 1973 to 1988) where he started as Junior Researcher and worked up to the position of Head of Branch; and at the Institute of Applied Astronomy of the USSR Academy of Sciences (now of RAS) as Director (from 1988 to his death in 2011); became Doctor of Sciences (1990), Professor in Astrometry and Celestial Mechanics (1999), a Corresponding Member of RAS (2003), a Foreign Member of the Royal Swedish Academy of Engineering Sciences, the Honoured Scientist of the Russian Federation (1999). He earned the Russian Federation Government prize in Science and Technology (2004). Died 18.09.2011.

A.M. Finkelstein is a Soviet and Russian astronomer. He is widely known in Russia and abroad as one of the greatest specialists in relativistic celestial mechanics, space geodesy and radio interferometry with very long baselines (VLBI). He was among the founders of such new scientific area as the fundamental positioning and time support which arose in early 1980s at the intersection of astrometry, radio astronomy and radio engineering.

A. M. Finkelstein formulated the first complete post-Newtonian relativistic theory of VLBI observations in the early 1980s. Its basic points are used now as a standard for reductions of high precision astrometric and geodetic VLBI measurements. At the same time, he developed new efficient algorithms for resolving the phase ambiguity of VLBI observations using multi frequency methods.

Since the mid-1980s, A.M. Finkelstein began work on the development of a scientific and technical project for creating a permanent VLBI network to solve astrometry, geodynamics and space geodesy problems. This idea was later carried out in practice by the “Quasar” project. To implement this project, the Institute of Applied Astronomy of the USSR Academy of Sciences was established in 1987, and A.M. Finkelstein was appointed its Director. Under the leadership of A.M. Finkelstein, the Institute became one of the largest astronomical institutions in the country and the leading Russian institute in the field of radio astrometry, space geodesy and VLBI technology.

As a talented researcher with a wide range of proposition interest, A.M. Finkelstein published 268 scientific works in Russian and international journals. He was active in teaching, was the head of the Radio Astronomy Department at the St. Petersburg State Electrotechnical University and the Branch Head of the St. Petersburg State Polytechnic University’s Department of radio physics. A total of 12 his researcher students and followers obtained their Doctoral and PhD degree.

A.M. Finkelstein was the chairperson of the RAS "Positioning, Navigation, and Time Support" Scientific Council, the chairperson of the section "Astrometry, Celestial Mechanics and Applied Astronomy" of the Scientific Council of the Russian Academy of Sciences on Astronomy, a member of the Board of Directors of the International VLBI Service for Geodesy and Astrometry. He earned the A.F. Ioffe Award (Saint Petersburg Scientific Center of RAS and the Government of St. Petersburg) and Yu.A. Gagarin Award (Roscosmos).

A.M. Finkelstein died on September 18, 2011 and was buried in the Pulkovo Memorial Cemetery. Minor planet (5706) Finkelstein is named in his honour.

FIRSTOVA Natalia Mikhailovna

Born 28.05.1941, Makeevka, Donetsk oblast, Ukraine. Graduated from High school in Nizhny Tagil (Sverdlovsk oblast) and entered Ural State University (now Ural Federal University, Yekaterinburg) in 1958. After graduation in 1963, joined the Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation of the SB, the USSR Academy of Sciences (since 1992, Institute of Solar-Terrestrial Physics, ISTP SB RAS) and worked in different positions. In 2003, she became a Senior Researcher. Doctoral degree in Phys.-Math. Sciences (2005). Died 06.01.2018 in Irkutsk. http://ru.iszf.irk.ru/ Category:Personnels.

N.M. Firstova's research mainly focuses on solar physics and astrophysical instrument engineering, including spectropolarimetric studies of processes in the solar atmosphere. The spectrograph of the Large Solar Vacuum Telescope (LSVT, ISTP SB RAS) was built due to her active participation, which enabled studies of solar activity at an up-to-date level. Author and co-author of 110 scientific papers and the monograph "Impact Spectropolarimetric Sensing", together with S.A. Kazantsev and A.G. Petrashen.

Extensive observations of small-scale structures of solar formations such as Ellerman bombs were conducted at BSVT with high spatial and spectral resolution.

For the first time, based on observations of solar flare spectral lines, several methods of plasma turbulence study were applied such as the method of dips in the wings of several Balmer lines (together with Czech scientists P. Heinzel and P. Kotrc), the Barange—Moser method of plasma satellites of the He I line restricted components, and the polarization method. The maximum level of turbulent electric fields in solar flare chromospheric layers was assessed experimentally.

Together with scientists at the Medon Observatory in Paris (J.-K. Henoux et al.), it was proved that accelerated electrons play an important role in chromosphere heating during a flare. This conclusion was based on the detection of impact linear polarization in flares from multi-year spectropolarimetric observations conducted at LSVT with high spatial, time and spectral resolution. For the first time, a small-scale structure and a short-term manifestation of impact linear polarization were detected, which agreed with the pulse pattern of the chromosphere bombardment by beams of accelerated particles during a flare.

N.M. Firstova worked closely with young scientists, was a research advisor for 1 PhD thesis.

Awards: the medals "Veteran of Labor" (1985), "Honored Veteran of the SB RAS" (2007), Certificates of Honor from the USSR Academy of Sciences and RAS.

FOKIN Andrei Borisovich

Born 18.06.1957 in Moscow. In 1980 graduated from the Moscow State University. From 1980–1983 worked as an engineer and researcher at the Scientific Research Institute of Instrument Design. From 1983 to 1986 attended post-graduate courses at the Astronomical Counsel of the Academy of Sciences of the USSR (now the Institute of Astronomy of the Russian Academy of Sciences). Since 1986 has been occupying various positions at the Institute of Astronomy of the Russian Academy of Sciences. Habilitation, University of Provence (2000). Doctor of phys.-math. sciences (2009).

A.B. Fokin is an expert in the field of atmospheres of pulsating stars. His research areas are mainly numerical modeling, radiation transfer, shock waves, atmospheric turbulence, convection. He is the author of 86 science papers and two monographs.

FOMICHEV Valery Viktorovich

Born 29.10.1941 in Gorky (now Nizhny Novgorod). In 1963, graduated from the Radiophysics Faculty of the Gorky State University named N.I. Lobachevsky. From the same year he is constantly working at the N.V.Pushkov Institute of Terrestrial Magnetism and Radio Wave Propagation (IZMIRAN) of the Russian Academy of Sciences in positions from trainee researcher to deputy director. A Candidate of Physics and Mathematics (1971), a Doctor of Physics and Mathematics (1986), the doctor dissertation – "Sporadic radio emission of the Sun at the meter wavelengths and diagnostic of the solar corona", a member of IAU (Division E Sun and Heliosphere), of the International Astronomical Society (Russia, CIS and Baltic States), of the Solar Section of the Russian Scientific Council of Astronomy.

Main scientific interests lay in the field of the solar and solar-terrestrial physics, an author of more 230 scientific publications.

In 1960s-1970s, V.V.Fomichev in collaboration with I.M.Chertok studied solar meter radio bursts of various types, he was engaged in the interpretation of their polarization and other characteristics. From them, in particular, the magnetic field strength at different altitudes in the solar corona was determined. Analysis of influence of the propagation effects of radio emission in the solar corona allowed to calculate theoretically the polarization profile of the type III radio bursts (generated by the accelerated electrons), confirmed later by the foreign scientists.

V.V.Fomichev together with the his collaborations carried out a large volume of the theoretical and experimental investigations of fine structure of the solar radio bursts at the meter wavelengths. On this basis the methods of diagnostics of the solar corona (density, magnetic field, inhomogeneity) and of the different propagating agents (accelerated particles, shock waves) were developed.

On the basis of the complex analysis of the number of the solar flares with a complex space-time structure V.V.Fomichev and his coworkers developed the concept of the multiplicity of the acceleration processes in such events.

V.V. Fomichev jointly with S.T.Akynian and I.M.Chertok has developed a technique of the quantitative diagnostics of solar proton flares by accompanying radio bursts allowing with a leading time of several hours to estimate the expected intensity and energy spectrum of the ten MeV proton fluxes near the Earth. The technique is used for short-term forecasting of space weather, because protons of these energies are major contributors to the perturbation of the radiation situation in the near space, to violations of the short-wave radio communication in the high-latitude routes, and other disturbances. This technique was also a useful tool for investigations of some properties of solar cosmic rays. It has been shown that their origin is due to not only the initial flare energy release and shock waves, but also to the post-eruptive relaxation of magnetic fields high in the corona.

Many investigatiobs were carried out in a cooperation with the Russian and foreign scientists (USA, France, Germany, Japan, Chinese, India ets.).

Awards: Tsiolkovsky, Keldysh, Korolev medals of the Federation of Cosmonautics of Russia

FRIDMAN Alexandr Alexandrovich

Born 16.06.1888 in St. Petersburg. In 1910, graduated from the Mathematics Department of Phys.-Math. Faculty of Saint Petersburg University, and was invited to work there "for preparing for the professor title"; since 1913, Master student. In 1914-1917, enrolled into Army, was awarded St. George Cross, golden weapons, and St. Vladimir order with swords and bow. In 1918-1920, the Acting Director of the "Aviapribor" factory (Moscow). In 1920-1924, the Researcher at the "Atom" commission at the State Optical Institute; since 1921, the Scientific Secretary and Director of the Main Physical Observatory (since 1924, Main Geophysical Observatory, later on, named after A.I.Voeikov), at that time in Pavlovsk. In 1922, completed his Master's thesis. Since 1925, Editor-in-chief of the "Climate and Weather" journal and Editor of the Section on geophysics of the Big Soviet Encyclopedia. Died 16.09.1925 in Leningrad.

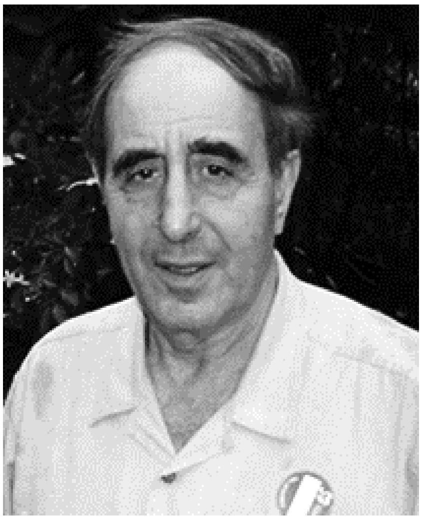
A.A.Fridman's research deals with problems of dynamical meteorology, including theories of an atmospherical whirlwind, discontinuities, and turbulence in the atmosphere. Based on his Master's thesis, he published the book "Essay on hydromechanics of compressible fluid". Travelled to Germany and Norway for research collaboration (1923), took part in the International Congress on Applied Mechanics (1924) in the Netherlands. In order to study atmospheric whirls high above the Earth's surface, he performed an aerostat flight to the height of 7400 m (in 1925, together with P.F.Fedoseenko).

In 1922-1924, obtained a solution of equations of the general theory of relativity describing geometrical structure and dynamics of the Universe as a whole. From the solution, it followed that the Universe may either expand or contract. To discern between these two possibilities, astronomical observations on cosmological distances were necessary. Choosing the expansion case, A.A.Fridman gave an approximate estimation of the age of the Universe, i.e. the time that passed from the beginning of the expansion till now: "some decades of billions of our usual earthly years" (nowadays estimated as about 14 billion years). First hints for the expansion of the Universe were noted in observations in 1927-1932 by E.Hubble. Later on, in observations in the second half of the 1990s, the linear dependence of the velocity of galaxies on the distance was confirmed, as given by Fridman's theory, at cosmological distances 1-10 Gpc. The observations also showed that, apart from the gravitational attraction, there exists a universal repulsion described by Einstein's cosmological constant. This entity was present and taken into account in Fridman's theory from the very beginning. It turned out that nowadays, in the Universe as a whole, the "antigravity" is stronger than the gravitational attraction. That is why, in accordance with Fridman's theory, the global cosmological expansion is accelerating.

A.A.Fridman delivered lectures at the Institute of Transport in 1910-1914 and the Gorny Institute in 1912-1914. In 1913-1914, worked at the Nikolaevskaya Aerological Observatory in Pavlovsk. In 1914, enrolled as a volunteer into Army, served in aviation of the Nothern and Western fronts (1914-1916), was at the head of the Front Central Aeronavigation Service, and taught at the School of aviators-observers in Kiev (1916-1917). In 1918-1920, was a professor at the Department of Mechanics at Perm University. In 1920-1924, taught mathematics and mechanics at the Physics and Mathematics Faculty of Petrograd University. At the same time, in 1920-1925, was a professor at the Physics and Mathematics Faculty of Petrograd Polytechnical Institute, and teacher (since 1921, professor) at the Department of Applied Aerodynamics at the Faculty of Avia-Communications of the Petrograd Institute of Transport Engineers.

The crater (with a diameter of 101 km) on the dark side of the Moon was named Fridman in his honour.

FRIDMAN Alexei Maximovich



Born 17.02.1940 in Moscow. Graduated from Novosibirsk State University in 1963. In 1966 he defended his thesis on "Some questions in the stability theory of inhomogeneous plasma in a magnetic field"; in 1972 – a doctoral thesis on "The stability theory of the gravitating ionized media". Full member of Russian Academy of Sciences (2000, Corresponding Member of the Russian Academy of Sciences since 1994). Laureate of the USSR State Prize ("For the prediction of the system of new satellites of Uranus", 1989), a laureate of the State Prizes of Russian Federation ("For the study of the dynamic properties of galaxies", 2003; "For pioneering discoveries in the field of galaxies physics of the intergalactic medium and relativistic objects", 2008). Died 29.10.2010 in Jerusalem.

A.M. Fridman is the author of more than 250 publications in various fields of physics.

At the end of 1960, A.M. Fridman creates an informal research team (V.L.Polyachenko, I.G.Shukhman, A.G.Morozov, V.I.Klimenko, et al.) at the Novosibirsk INP with the goal of the application and development of plasma physics methods to the instability theory of gravitating systems. In 1971, the team transformed into the "Laboratory of Dynamics of Space Plasma" based SibIZMIR, Irkutsk. The main results of the work on the stability theory for layer, disc, sphere, and cylinder were published in 1976 in the first monograph (together with V.L. Polyachenko) "Equilibrium and stability of gravitating systems, the first modern book on stellar and galactic dynamics. Several important results were obtained in cooperation with scientists from Kurchatov Institute in Moscow, in particular, with A.B. Mihaylovskij. Some latest results (non-Jeans instabilities, etc.) were included in the two-volume monograph (together with V.L. Polyachenko) «Physics of Gravitating Systems» published in English in «Springer» in 1984.

Since 1979, after moving to Moscow, he started working on the hydrodynamic theory of spiral structure formation in galaxies (with A.G.Morozov et al.). They investigated the Kelvin-Helmholtz instability in the rotating medium and instability due to circular velocity jump observed outside nuclei in some nearby galaxies. The equivalence of equations of plane hydrodynamics and shallow water equations enabled one to conduct laboratory experiments simulating the formation of galactic spiral arms in shallow water setup (in Kurchatov Institute, together with M.V.Nezlin et al.). The anticyclones in the velocity field discovered in the experiment were found later in spiral galaxies after implementation of "VORTEX" program of recovery of three velocity components of gas from the observed line-of-sight velocities (together with V.L. Afanasiev, V.V. Lyakhovich, O.V.Khoruzhij, et al.).

At the same time, A.M.Fridman initiated a study of planetary rings. By the beginning of 1985 he, together with N.N. Gor'kavyi, resolved the main problem of Saturn's rings, including their origin, dynamics, and stratification. In 1985, they put forward a hypothesis about the existence of unknown satellites of Uranus and gave estimated radii of their orbits based on simple resonance relations with the already-known radii of Uranus rings. American Voyager-2 confirmed the existence of the satellites in early 1986. For the prediction of new satellites of the Uranus system, N.N. Gor'kavyi and A.M.Fridman were awarded the USSR State Prize in 1989. Research on the planetary subject served as a basis for a monograph "Physics of planetary rings" written both in Russian (1994) and in English (1999).

A.M.Fridman was awarded two State Prize of Russian Federation in 2003 and 2008 for his research on the dynamical properties of galaxies.

FRIDMAN Vladimir Matveevich

Born 02.06.1942 in the city of Gorky (now Nizhny Novgorod). 1959-1964, student of Radiophysical Faculty at Gorky N.I. Lobachevsky State University (GSU, now Nizhny Novgorod State University (NNSU)). Defended his PhD thesis in 1983. Senior Researcher since 1992, Associate Professor since 2008. 1965-2016, junior researcher, senior engineer, deputy head of department, senior researcher, leading researcher, scientific secretary of the Radiophysical Research Institute (NIRFI). Member of The Community of European Solar Radio Astronomers (CESRA). Awarded The Jubilee Medal "For Valiant Labor – In Commemoration of the 100th Anniversary of the Birth of Vladimir Ilyich Lenin". Awarded a diploma of the Ministry of Education of the Russian Federation.

V.M. Fridman's research interests are radio astronomy, radio physics, solar physics, and solar-terrestrial relations.

Starting his scientific career with research in the field of applied radioastronomy, V.M. Fridman received a series of results on the application of the spatial frequency analysis techniques to the problems of radio astronavigation and antenna techniques and received two inventor's certificates (with coauthors). At the same time, he obtained the first observational results in the cm wavelength range of weak magnetic fields of solar plages and spots. He showed (together with O.A. Sheiner) that the transition region between the corona and the chromosphere is a very narrow layer with a size of ≤100 km. V.M. Fridman participated (two inventor's certificates with coauthors) in the design of the equipment and started studying the microwave solar radio emission with high frequency resolution using spectrographic methods. The obtained results allowed V.M. Fridman and his colleagues to develop diagnostic techniques for the physical parameters of solar plasma structures on the basis of narrow-band spectral structures of radio emission detected during the periods of solar activity on large antennas.

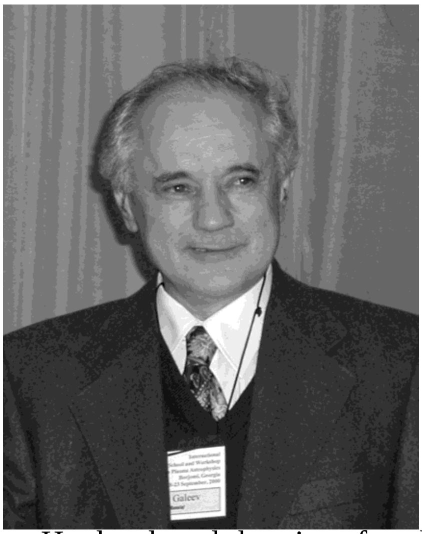
He, together with his colleagues, developed a patented method of short-term (1-2 days) forecasting of powerful solar flares by the dynamics of long-term quasi-periodic components of solar radio emission.

His investigations (together with O.A. Sheiner) of the processes at the stages prior to the powerful energy release on the Sun justified a number of spectral-temporal patterns of solar radio emission characteristics that can determine a number of parameters of flares and coronal mass ejections (CMEs) which followed this energy release.

The CME's geo-effectiveness at the stages prior to the CME event was another area of V.M. Fridman's research. On the basis of the solar radio emission observations in a wide spectral range from 400 to 15000 MHz, he and his colleagues found patterns of radio emission parameters which testified to the high geoeffectiveness of subsequent events.

V.M. Fridman had been the scientific secretary of the Solar Radio Emission Section of the Scientific Council on Radio Astronomy of the USSR Academy of Sciences for more than 20 years.

GALEEV Albert Abubakirovich



Born 19.04.1940 in Ufa, Bashkir ASSR. In 1957 he entered the Moscow Power Engineering Institute, then in 1961 he transferred to Novosibirsk State University, where he graduated in 1963. In 1964 he was awarded the degree of Candidate of Physical and Mathematical Sciences, and in 1968 – the degree of Doctor of Physical and Mathematical Sciences. Full member of the Russian Academy of Sciences (1992).

In 1961-1970, he worked at the Institute of Nuclear Physics of the Siberian Branch of the USSR Academy of Sciences. From 1971 to 1973, he worked at the Institute of High Temperatures of the USSR Academy of Sciences. Since 1973, at the Institute of Space Research of the USSR Academy of Sciences, where he headed the Department of Space Plasma Physics (1988-2003 – Director, since 2003 – Honorary Director of the IKI RAS)

He developed theories of such fundamental processes in cosmic plasma as ionization of rarefied gas by a magnetized plasma stream with velocities exceeding the critical value (the Alfven phenomenon), hybrid description of the loading of the solar wind with cometary ions, and acceleration of the fast solar wind by Alven waves from coronal holes. Developed the theory of the corona of a black hole accretion disk. His work describing the radiation and dynamics of this corona is by far one of the most cited works in astrophysics.

For one of his works devoted to the retention of plasma in magnetic traps, in 1967 Prof. A.A. Galeev received the Lenin's Komsomol Prize.

Together with Prof. R.Z. Sagdeev, he developed the theory of neoclassical transfer in toroidal systems "tokamak", for which they were awarded the Lenin Prize in Science and Technology in 1984.

Prof. A.A. Galeev was a participant and head of many projects related to space exploration. Among them are the Venus-Halley project, aimed at exploring the planet Venus and Halley's comet, and the Phobos project, which aim was to study Mars and its satellite Phobos. A.A. Galeev was one of the leaders of the projects "Prognoz-8", "Intershok" and INTERBOL, which, in particular, studied the formation of shock waves, plasma heating and particle acceleration.

Prof. A. A. Galeev is full member of the Russian Academy of Sciences (1992), a foreign member of the Max Planck Society (1994), the International Academy of Astronautics (IAA) (1985), the European Academy (1990) and the Russian Academy of Cosmonautics by K.E. Tsiolkovsky (1999).

He was awarded an honorary Doctorate from the University of Paris (1993), the von Karman award IAA (1995) and Alexander von Humboldt award (1997). In 2002, A.A. Galeev received the Presidential Prize for scientific achievements, and in 2005 the Presidential Prize in the field of education.

For his participation in the Venus-Halley space project, A.A. Galeev was awarded the Order of the Red Banner of Labor (1986), and in 2002 Order of the Badge of Honor. In 2008, A.A. Galeev was awarded the Hannes Alfven Medal of the European Geophysical Union for outstanding achievements in the field of physics.

For many years, he was a member of the Scientific Directorate of the International Space Science Institute in Bern (Switzerland). In addition, A.A. Galeev has been a member of the editorial board of the journal "Plasma Physics" almost since the founding of the journal.

GALISHEV Vladimir Saveljevich

Born 26.01.1927 in the village of Galisheva, Krasnopolyansky district, Sverdlovsk region. Graduated from the Physics and Mathematics Faculty of Ural University (1950) (now – Ural Federal University, Ekaterinburg). Senior Researcher at the Kourovka Astronomical Observatory. Doctor of Physical and Mathematical Sciences (1996). Died in 2007 in Yekaterinburg.

V.S. Galishev's main research results are the development of the multi-electron theory of excited states of semiconductors with an atomic lattice, the study of multiple scattering of gamma rays from the uranium and thorium families (together with A.N. Orlov and G.G. Taluts), the development of theory of the quadrupole exciton absorption of light in the cubic crystals (coauthored with V.I.Cherepanov), the method of modified spherical harmonics development in the theory of multiple scattering of particles, numerical analysis of the problem of eliminating the influence of the instrumental profile on the observed line profile, and the application of Hanle effect in solar physics.

V.S. Galishev's research is summarized in two monographs: "Questions of the theory of multiple scattering of particles" (1972) and "The method of modified spherical harmonics in the theory of multiple scattering of particles" (1980). The first monograph was translated into English and published in the USA. V.S. Galishev delivered lectures on general physics, calculus of variations, integral equations, theoretical astrophysics, and applied methods of mathematical physics.

In 1981 V.S. Galishev was awarded the first prize of Ural University for the best scientific work.

GAMOV Georgy Antonovich

Born 04.03.1904 in Odessa. After leaving school in 1921, he entered the mathematical department of the Physics and Mathematics Faculty of Novorossiysk University (Odessa). In 1922 he entered the Physics and Mathematics Faculty of Petrograd (Leningrad) University. At the university, he made friends with L. Landau, D. Ivanenko and M. Bronstein. In 1924 he was invited by D. Rozhdestvensky to the State Optical Institute. For a very short time, Gamow's doctoral adviser was A. Friedman. In 1925 he entered graduate school, and also worked at the Leningrad Institute of Physics and Technology and the Main Geophysical Observatory. In the fall of 1933, he left Russia forever. Corresponding member Academy of Sciences of the USSR (1932; expelled in 1938, restored posthumously in 1990), Member. National US Academy of Sciences (1953). Since 1934 prof. University of J. Washington, since 1956 prof. University of Colorado. Died 08.19.1968 in Boulder, Colorado, United States.

G.A. Gamow is a specialist in the field of atomic and nuclear physics, astrophysics and cosmology. The first scientific work of G. Gamow, together with D. Ivanenko and L. Landau, was published in 1928 – “World constants and the passage to the limit” (the authors themselves perceived it as a joke).

The first major scientific achievement, which made him widely known, was the construction of the theory of the alpha decay of a nucleus via tunnelling a potential barrier by particles (quantum tunneling). In 1932, G. Gamow and L. Mysovsky presented the project of the first cyclotron in Europe for consideration by the Scientific Council of the Radium Institute (Leningrad), where it was later implemented. In March 1932, Gamow was elected a Corresponding Member of the USSR Academy of Sciences. He was the youngest selected physicist in its entire history (28 years old).

In 1936, he (together with E. Teller) succeeded in generalizing the theory of Fermi beta decay by formulating selection rules and introducing the concept of “Gamow-Teller transitions”. In 1937-1940, Gamow constructed the first consistent theory of the evolution of stars with a thermonuclear energy source. In 1940-1941, together with M. Schoenberg, he studied the role of neutrinos in catastrophic processes occurring during stellar explosion (supernovae). In 1946, Gamow proposed the development of the hot “big bang” theory of the expanding universe. In 1948, Gamow, together with his graduate students R. Alfer and R. Herman, developed a theory of the formation of chemical elements – primordial nucleosynthesis. Within the framework of this theory, the existence of cosmic background microwave (relic) radiation was predicted and an estimate of its present temperature (in the range 1-10 K) was given. In 1954, Gamow was the first to formulate the problem of the genetic code. He realized that the structure of the basic building blocks of a cell must be encoded in a sequence of four possible nucleotides that make up a DNA molecule.

Gamow became widely known for his popular science works, in which modern scientific ideas are presented in a living and accessible language. In 1956, Gamow received the Kalinga Prize from UNESCO for the popularization of science.

GAYAZOV Iskandar Safayevich

Born 12.05.1952 in the village of Verkhnie Laschi, Buinsky district of the Tatar ASSR; graduated from the Kazan State University (1974); post-graduated from the Institute of Theoretical Astronomy (ITA) of the USSR Academy of Sciences (1977) and worked there in various positions from Junior Researcher up to Head of Laboratory (from 1978 to 1998); became Researcher (1998), Head of the Space Geodesy and Earth Rotation Laboratory (2006) and Head of the Fundamental and Applied Astronomy Department (2011) at the Institute of Applied Astronomy of the Russian Academy of Sciences (IAA RAS); Doctor of Sciences in Physics and Mathematics (2005) and the author of more than 100 scientific papers.

I. S. Gayazov devotes his scientific activity mainly to the issues of the artificial earth satellite motion, space geodesy, geodynamics and the Earth rotation. In the 1970s and 1980s, I.S. Gayazov, in collaboration with A.S. Sochilina and A.M. Fominov, developed a semi-analytical theory of the motion of specialized satellites and, on its basis, developed a software for processing satellite laser ranging data to determine Earth orientation parameters (EOP). On the basis of numerical algorithms he developed a software for processing observations of geodetic and navigation satellites to determine the EOP and some geodynamic parameters. He elaborated an effective empirical model for taking into account the effect of light pressure when calculating the orbits of navigation satellites. Based on the processing of long-term laser observations of the LAGEOS geodynamic satellites, the model of seasonal variations in the position of the geocenter was refined, and the coefficients of the secular change in the orientation of the figure's axis in the Earth's body were estimated.

Under the leadership of I.S. Gayazov, a center for processing and analysis of all types of high-precision observations of space geodesy operates at the IAA RAS, the results of which are used in the formation of official EOP series in the Main Metrological Center of the State Service of Time, Frequency and Determination of EOPs, as well as in the derivation of the international standard EOP series.

I.S. Gayazov is one of the key participants in the formation of the System for GLONASS Fundamental Support. He made a significant contribution to the upgrade of the “Quasar” radio interferometric network on the basis of a new generation radio telescopes and satellite laser ranging systems.

I.S. Gayazov is the Deputy Editor-in-Chief of the “IAA RAS Transactions”, the Chairperson of the Astrometry and Applied Astronomy Section of the RAS Scientific Council on Astronomy, a Member of the RAS Scientific Council for the problem of Positioning, Navigation, and Time Support; a Member of the Section 11 in the Roscosmos State Corporation Scientific and Technical Council; a Member of the Geodesy Section in the National Geophysical Committee; an IAU Member (1992); and an Associate Member of the International GNSS Service (IGS) and the International Laser Ranging Service (ILRS).

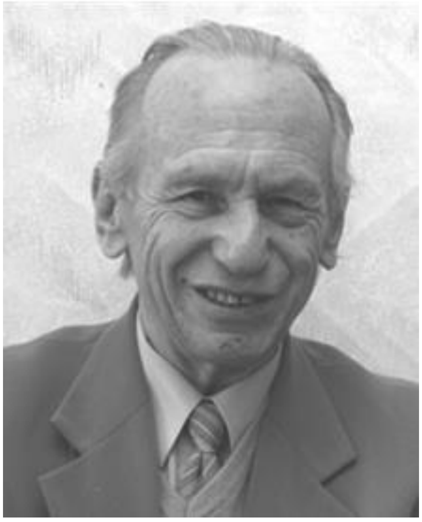
GAZE Vera Fedorovna

Born 17(29).12.1899, St. Petersburg. In 1924 she graduated from Petrograd Institute, since 1926 – was taken to the staff of the Pulkovo Observatory, in 1936–1940 – repressed, in 1940 – directed to the Simeiz Division of the Pulkovo Observatory, in the years of evacuation (1941–1945) she worked at the Abastumani Astrophysical Observatory, in 1945–1954 – a leading researcher at the Crimean Astrophysical Observatory, Ph.D. in Phys. and Math., vice-editor of the journal "Izvestiya Krymskoi Astrofizicheskoi Observatorii". Died 03.10.1954 in Leningrad.

Starting her scientific activity and working at the Institute of Astronomy, V.F. Gaze implemented a series of works on calculating orbits of minor planets with high accuracy and pub-lished in issues of the Institute of Astronomy and foreign issues. V.F. Gaze worked at the Department of Spectroscopy of the Pulkovo Observatory, working at the Simeiz Observatory she derived spectra with the 1-m reflector, determined radial velocities of several cepheids and described a spectrum of the star-supergiant ϒCas at the moment of forming the envelope in 1940. In Abastumani, jointly with Shajn, she investigated carbon stars, identified a significant number of new bands in their spectra including cyan molecules and detected a high relative abundance of carbon isotopes C12/C13, what put forward a problem of refining atomic data. After evacuation V.F. Gaze took part in reconstructing the Simeiz Observatory, in expeditions searching for a place to build a new observatory, summarized astroclimate investigations for four regions in Crimea. In the post-war years she was engaged in studying diffuse nebulae, she is a world-known expert in this field. Over 200 unknown before emission nebulae were presented in four lists published in 1950–1951. These publications gave impetus to studying a phenomenon of light nebulae at different observatories. Her researches considered issues associated with the gas structure and dynamics in nebulae, interrelations between emission nebulae and hot stars, results on significant masses of some nebulae based on original observations, roles of electromagnetic fields in forming their structure. One of her last papers co-authored with G.A. Shajn and S.B. Pikel'ner relates to finding out the role of gas and dust in light diffuse nebulae. She is a co-author of "Atlas of diffuse gaseous nebulae" published in 1952 that contains more than 300 nebulae studied at the Simeiz Observatory. In 1952, due to the topicality of compiling a new catalogue of emission nebulae, IAU Subcommission was established and V.F. Gaze actively participated in it.

An author of about 40 publications. A minor planet (2388 Gase) discovered on March 13, 1977 by N.S. Chernykh at CrAO was named in her honour.

GELFREIKH Georgy Borisovich



Born 19.06.1932 in Leningrad. In 1956, graduated from Astronomical section of the Department of Mathematics and Mechanics of the State University of Leningrad. Since 1956 until his death was with the Central Astronomical Observatory at Pulkovo. Since 1965, led special courses in Leningrad University on Radioastronomy, Solar Physics, and Physics of Cosmic Plasma. 1976: Dr.Sci. (Phys.-Math.) Since 1985 – Professor at the Chair of Astrophysics of the Department of Mathematics and Mechanics of the State University of Leningrad. Member of IAU, Member of Russian Academy of Natural Sciences. Head of Department of Solar Physics in The Central Astronomical Observatory (1984– 1986). Organizer of the team of researchers from Central Astronomical Observatory and Special Astronomical Observatory, known as «Pulkovo Team on Solar Radio Emission». Died 04.06.2010 in St.-Petersburg.

An important stage of the scientific biography of G.B. Gelfreikh was the observations of the solar eclipse on December 2, 1956. As a result, it was shown that radio sources related to sunspots display large brightness, but small sizes, close to those of sunspots. To increase the accuracy of observations, Prof Gelfreikh developed several techniques and special equipment. He organized and participated in expeditions for solar eclipse observations at Chukotka, in China, Polynesia, Cuba.

In 1963 Prof Gelfreikh suggested a program of multiwavelength studies of solar radio emission and managed regular spectral-polarization observations of the Sun with BPR (Big Pulkovo Radiotelescope) at five wavelengths in centimeter range. As a result, fundamental parameters of the sources of radio radiation above active formations on the Sun were studied Dr G.B. Gelfreikh took part in the construction of the largest native radio-telescopes RATAN-600 and SSRT in Siberia, in modernization of LPRT, in setting of science problems for them. He also actively supported small radio telescopes at The Mountain Station of The Central Astronomical Observatory near Kislovodsk. During his more than 50-year long creative period, G.B. Gelfreikh made a great number of original studies in solar physics and radio astronomy. He developed and implemented the method of determination of magnetic fields in the atmosphere of the Sun from the spectrum and polarization of thermal radio emission, suggested a notion of magnetospheres of active regions of the Sun. From observations with the radio-heliograph in Nobeyama (Japan), he detected 3– and 5-minute oscillations in the sources of thermal cyclotron radio emission of sunspots, and also revealed long-period oscillations caused by magneto-acoustical waves, which were important results for coronal seismology. Organized and participated in numerous national and international Programs of solar studies, actively collaborated with scientists from the USA, Italy, Greece, China, Japan, Germany, Finland, Australia. Apart from the Pulkovo Observatory, Prof. Gelfreikh devoted a significant part of his time to Leningrad (St.-Petersburg) University. In 1965 he developed special courses on radio astronomy, solar physics, and physics of cosmic plasma, and hold them until his death. His apprentices (their number exceeds twenty), Cand.Sci. and Dr.Sci., work fruitfully in Pulkovo Observatory, Special Astronomical Observatory, St.-Petersburg University, in Irkutsk, Yakutia, Tashkent, Riga, Cuba, and Mexica. G.B. Gelfreikh authored more than 200 scientific works.

GERASIMOV Igor Anatolievich

Born 22.10.1952 in Pushkino (Leningrad region). In 1976 he graduated from the Astronomical Department of the Physics Faculty of Moscow University (MSU). Cand. phys.-mat. Sciences (1983). Doctor Phys.-Math. Sciences (1992). From 1981 until the end of his life he worked at the State Astronomical Institute named after V.I. PC. Sternberg (GAISH) Moscow State University. Professor of Moscow State University (1995). From 1996 to 2005 – Deputy. Director of the SAI for scientific work. Full member of the Academy of Cosmonautics. K.E. Tsiolkovsky. Died 20.03.2005 in Moscow.

Specialist in the field of celestial mechanics. The main theme of G.'s scientific research is the problem of the evolution of the orbits of celestial bodies in the framework of the restricted elliptical three-body problem. He showed that the main phenomenon regulating the evolution of orbits is the resonances of motion. In particular, in the solar system, asteroids experience the main resonances from the influence of the gravity of Jupiter. Special classes of asteroids with certain types of resonances have been specially investigated. The reasons for the uneven distribution of asteroids according to the values of the semi-major axes are shown.

An important feature of G.'s work is the consideration of spatial movements. Investigated the three-dimensional case of motions in the restricted elliptic three-body problem. He found new classes of conditionally periodic motions of asteroids, showed the existence of five different classes of motions, constructed a theory of the motion of the asteroid Hecuba and other asteroids of the same type. At the same time, G. showed that a significant simplification of the calculation can be achieved by expressing elliptic functions in terms of theta functions. Developed a method for calculating theta functions, and through them also a method for calculating Weierstrass functions.

G. built a general theory of the dynamic evolution of the orbits of asteroids. This theory describes changes in the eccentricities of the orbits and the movement of the lines of the apses. Gerasimov obtained the periods and amplitudes of changes in the eccentricities of the orbits and constructed a model of the motion of the lines of the apses in cases of resonant motions for special classes of asteroids. The conditions for the transition of orbits from an unstable circulating motion to a stable librational motion of the line of apsides are obtained. He studied the evolution of the orbits of some satellites of the planets, in particular, Neptune's satellite Nereid and the main satellites of Saturn, studied the reasons for the uneven distribution of matter in the rings of Saturn. In collaboration with V.V. Chazov developed a new universal method for expanding the perturbing function in problems of celestial mechanics. Participated in the development of the Radioastron project. Studied the possibility of a collision of comets with the Moon.

G.'s students were Alfimova E.V., Vinnikov E.L., Rakitina N.V., Shinkin V.N., Sumarokov S.I., Gorbatko N.P. G. published 80 scientific articles and two monographs. The monograph "The Problem of Two Fixed Euler Centers" was published in 2007, posthumously.

GERASIMOVICH Boris Petrovich

Born 19(31).03.1889 in Poltava (Ukraine). Student at Kharkiv University (1910–1914), postgraduate student in Pulkovo (1914–1917). Senior astronomer, KhSU (1920–1933), prof. of KhSU (1922–1933). Was elected a member of leading European and Amer. astron. Societies (1924–1928). Visiting Researcher at Harvard AO (1926–1929). Deputy Chairman Sect. of Sci. of the St. Planning Com. of the Ukr. SSR (1930). Head of the Astrophys. Dep., Pulkovo Obs. (1931–1932), Director (1933). D.Sci. (1934). Chairman of the Commis. for Solar Studies and the Com. for Obs. of the Solar Eclipse on 19.06.1936 (1934). Winner of many sc. prizes (1912–1936). Initiated (1927) the entry of the USSR into the IAU (1935) and creation of the Astron. Council (AC) of the USSR Acad. Sci., dep. Chairm. of the AC (1936). Author of 190 publications; ed. and co-author of the Pulkovo "Course of astrophysics and stellar astronomy" (2 bands, 1934, 1936). Executed on 30.11.1937, rehabilitated in 1957.

Research fields of research: the first analysis of the theory of relativity from the point of view of an astronomer, development its astronomical effects (1912–1925); physics of shells of hot unstable stars, emission nebulae (mainly planetary, taking into account the quantum theory of radiation, viscosity, and non-equilibrium thermodynamics); interstellar medium and planetary atmospheres; variable stars; structure and dynamics of the Galaxy. For O and B stars, G and Me giants, G. estimated (1924) the size of particles in gas and dust shells, distances from the central star, and the size of stable shells. G. attempted (erroneously) to explain the main paradox of planetary nebulae (faintness of nuclei at obviously high temperatures) by selective absorption in a thermodynamically non-equilibrium shell. Later, he abandoned this idea and supported the idea by Menzel (1926) about nuclei of planetary nebulae as white dwarfs. G. showed, contrary to Menzel, that masses of the nuclei of such nebulae were very low and suggested that they were "probably collapsed stars" (1927, similar to Milne's explanation of Novae). G. assumed that planetary nebulae could appear around all non-stationary stars due to continuous outflow of matter as well as to partial ejection of shells. G. reduced van Maanen's estimate of absorption in planetary nebulae from 11m to 6m; explained the early spectra of their nuclei by their high ionization potential, and derived (1927) a more general formula (compared to Saha's formula for stellar atmospheres) for ionization of their shells. In the field of physical variable stars (mainly Cepheids, semi-regular, and long-period variables), he determined or improved periods, magnitudes at Max and Min, and variability types for more than 70 stars, discovered variability of 32 stars, suggested an upper limit for periods of classical Cepheids in the Galaxy (compared to other stellar systems), improved the zero point of the PL relation for Cepheids in the Galaxy and determined the distance to the galactic center (10 kpc, 1932). He established and attempted to explain multiperiodicity of some RV Tau stars, discovered period variations of long-period Me-stars, and pointed out the evolutionary relationship of physical variables, novae, planetary nebulae, and gas-dust shells in non-stationary stars. He proposed (1936) the first classification of Novae (close to the modern one). G. improved the distance of the Sun from the equatorial plane of the Galaxy (1927, with W. Luyten) and suggested a correct approach to revealing its invisible center (by means of IR observations). He was the first after Eddington to evaluate the role of irregular forces in the Galaxy (1931); proposed (1934–1937) a "unitary model of the Galaxy" as a single integral dynamical system, contrary to ideas of an aggregation of self-standing dynamic systems; generalized the existing laws of light reflection from opaque surfaces and scattering in optically thick atmospheres of planets (June 1937). As director of Pulkovo Observatory, he sought to introduce effective Harvard organization of scientific work, and with the beginning of political repressions in Pulkovo (1936), he tried to defend the honor of his arrested colleagues. A Moon crater and the asteroid 2126 ("GERASIMOVICH", 1961) were named after G.

GERSHBERG Roald Evgenievich

Born 12.03.1933 in Kiev. In 1950, he graduated from the All-Boys Secondary School 12 in Kurgan and entered the Department of Astronomy of Tomsk State University. In 1955, he began his postgraduate study at the Crimean Astrophysical Observatory of the USSR Academy of Sciences and after graduation he was taken on to the staff of CrAO. At present, he is a leading scientist of the Stellar Magnetism Laboratory.

In 1962, he defended the PhD thesis "The structure of galactic nebulae and some problems of evolution of the interstellar medium" and was involved in the research of non-stationary stars. In 1970, he defended the Doctor thesis "The study of UV Cet-type flare stars". And now he is still working in this field.

R.E. Gershberg offered a nebular model to interpret flares of some types of eruptive stars, concretized it to a chromospheric model for flares of the UV Cet-type stars, derived the first time-resolved spectra of such flares, estimated physical parameters of flares and quiet chromospheres of such stars, organized a wide international cooperation for photometric patrol observations of these stars in 1968-76 and comprehensive cooperative observations of the EV Lac flare star in 1986-98. As a result, a non-periodicity of stellar flares was established, a power character of their energetic power spectrum was found out, a variability of the spectral structure of flare radiation in the process of their development and an essential contribution of the blackbody radiation at the maxima of flare brightness were established, the phenomena of solar mass ejection were suspected, a zonal spottedness model of flare stars was offered and elaborated, a model of the quiet and active chromosphere of the red dwarfs was offered. He substantiated a concept of physical identity of activity in flare red dwarfs and the Sun. Many listed results were obtained in cooperation with colleagues from CrAO, our country and abroad. He took active part in developing spectral equipment for the 2.6 m mirror telescope named after the academician G.A. Shajn, in calculations and manufacturing optics for the 0.8 m space station ASTRON, in observations and analysis of the obtained data, in designing a spectrograph for the space vehicle SPECTRUM-UV. R.E. Gershberg is the author of monographs Flares of red dwarf stars (1970), Low-mass flare stars (1978), Solar-type activity in main-sequence stars (2002, 2005, 2015) and a coauthor of the monograph Physics of middle– and low-mass stars with the solar-type activity (2020).

Discovered on October 13, 1969 by B.A. Burnasheva (CrAO), the main-belt asteroid (2327) Gershberg was named in his honor.

In 1970, R.E. Gershberg was honored by the Lenin Jubilee Medal and in 2012 – by the Order of Merit of the third degree. He is a recipient of the N.P. Barabashov Award of the National Academy of Sciences of Ukraine (2010) and the A.A. Belopolskiy Prize of the Russian Academy of Sciences (2020).

GETMANTSEV German Grigor'evich

Born 07.04.1926, in the city of Gorky (now Nizhny Novgorod). Graduated from the Radiophysical Faculty at Gorky State University (GSU) (now the Faculty of Radiophysics at N.I. Lobachevsky State University of Nizhny Novgorod (UNN)) in 1949. 1949-1952, a post-graduate student of the GSU with V.L. Ginzburg as a research adviser. Defended his PhD thesis in 1952, defended his D.Sc. thesis in 1965. Since 1950, assistant, associate professor, professor (since 1967) of the Department of Radio Wave Propagation at GSU (UNN). 1956-1980, head of the department, deputy director, director (1972-1980) of the Radiophysical Research Institute (NIRFI). Member of the International Union of Radio Science (URSI). Died 30.04.1980 in Nizhny Novgorod.

The research interests of G.G. Getmantsev and the disciples of his scientific school are related to long-wave radio astronomy, radio wave propagation and nonlinear phenomena in the ionosphere.

At the start of his scientific work, G.G. Getmantsev, together with V.L. Ginzburg, studied the diffraction of solar and cosmic radio emission on the Moon's disk, which allowed them to create a precise method for determining the coordinates and angular dimensions of discrete sources. G.G. Getmantsev's works on the synchrotron mechanism of the generation of nonthermal cosmic radiation became classics. He derived the relation between the energy distribution of relativistic electrons and the spectrum of their synchrotron radiation. He revealed the peculiarities of the generation of radio waves by the relativistic electrons moving in the interstellar magnetic fields. He justified the conclusion on the difference between the frequency spectra of the Galactic radio emission in the directions of the Galactic Pole and its center which was confirmed in the experiments. In 1958, together with V.L. Ginzburg and I.S. Shklovsky, he suggested a program for extraterrestrial radio astronomy research. Together with his disciples, he developed a satellite-borne radiometer and conducted the cosmic radio spectrum measurements over the range 0,7-2,3 MHz onboard of the first Soviet satellites "Elektron-2" and "Elektron-4". For the first time, a low-frequency cutoff in the spectrum below 1.5 MHz was determined and the sporadic (kilometer) radio emission of the Earth's ionosphere was found.

Since the late 1960s, G.G. Getmantsev focused on the development of various methods for ionosphere and near-space studies, from direct satellite measurements and ionospheric raying by the satellite signals to those based on the medium-intrinsic radio emission. Under his leadership, the laborious measurements of the cosmic radio emission spectrum in a wide frequency range and the variations in the non-thermal radio spectral index across the sky were made.

G.G. Getmantsev was one of the initiators of a new scientific direction in radiophysics – the study of the ionospheric modification by powerful radio waves. The research carried out under his leadership at the NIRFI polygon "Zimenki" using the experimental ionospheric facility "Yastreb" led to the discovery of a new phenomenon. It was registered in 1980 as new discovery No. 231, namely, "The phenomenon of electromagnetic wave generation by ionospheric currents under the action on the ionosphere by the modulated short-wave radio emission – the Getmantsev effect."

G.G. Getmantsev initiated and led the development of a large complex at the NIRFI polygon "Vasilsursk" for the study of near and far space, the SURA facility, one of the unique Russian scientific installations.

G.G. Getmantsev was the chairman of the group "Nonlinear effects in the ionosphere" of the Scientific Council of the Academy of Sciences of the USSR on the Complex Problem "Propagation of Radio Waves", the Chairman of the Council of the USSR Ministry of Higher Education on radio wave propagation. He is the author of more than 150 scientific publications, his students successfully defended about 30 PhD and D.Sc. theses.

GILFANOV Marat Ravilievich

Born 18.07.1962 in Kazan. Graduated from Faculty of Physics and Energetics of Moscow Institute of Physics and Technology (1985). Doctor of physics and mathematics (1996), professor of VAK in astrophysics and stellar astronomy (2010). Corresponding member of the Russian Academy of Sciences (2016), Honorary Member of the Academy of Sciences of Tatarstan (2010). Leading researcher at the Institute for Space Research, Russian Academy of Sciences and Max Planck Institute for Astrophysics (Germany), Extraordinary Professor at the University of Amsterdam (2014-2019). Member of the International Astronomical Union, associated member of COSPAR, member of the editorial board of the Journal of Cosmology and Astroparticle Physics, member of the bureau of the Scientific Council on Astronomy of RAS.

M.R. Gilfanov is an expert in high-energy astrophysics and X-ray astronomy, working at the inter-face of theoretical and observational astrophysics. He was one of the leaders of the analysis and interpretation of data from the RENTGEN X-ray observatory on the KVANT module of the MIR space station and the GRANAT international orbital gamma-ray observatory. Author of well known papers on physical processes in the vicinity of accreting neutron stars and black holes, the analysis of their variability and observational diagnostics of turbulence in the accretion disk, the diagnostics of the boundary layer on the surface of the neutron star and determination of the nature of the compact object (black hole or neutron star) in X-ray binaries by means of broad band X-ray spectroscopy. His results on gravitational sedimentation of chemical elements and on resonance scattering of photons in the hot intergalactic gas are being used nowadays for interpretation of observational data on galaxy clusters by the Chandra and XMM-Newton orbital X-ray observatories. Using Chandra data he obtained a universal X-ray luminosity function of X-ray binaries in external galaxies, proposed and calibrated the method for measuring the star formation rate in galaxies from their X-ray luminosity, which is now used to determine the history of star formation in the Universe, investigated the dependence of the number of high-mass X-ray binaries on the age of stellar population, demonstrated the possibility of dynamic formation of low-mass X-ray binaries in the galactic nuclei. Author of well-known and cited papers on the nature of Type Ia supernovae – the standard candles of modern cosmology. He is actively engaged in the study of the large-scale structure and growth of supermassive black holes in the Universe by means of X-ray astronomy, is one of the pioneers of modern studies of cosmic X-ray background fluctuations and the use of these data for the problems of cosmology. He was an associate scientist of the PLANCK satellite.

Gilfanov is one of the scientific leaders of the Spektr-RG orbital X-ray observatory. He is the head of the scientific editorial board of the Russian SRG/EROSITA consortium and co-chairs key scientific working groups: on sky maps, the source catalog and on quasars, galaxies and tidal disruption events.

M.R. Gilfanov is a recipient of the COSPAR and RAS Ya.B. Zel'dovich Medal for Young Scientists and the Tsiolkovsky Medal of the Russian Cosmonautics Federation, recipient of the RAS Belopolsky Prize in astrophysics (2017, with E.M. Churazov). Under his supervision 16 postgrad-uate students defended their theses. He is the author of more than 400 papers with more than 13,000 citations, a Hirsch index of 55 (according to NASA Astrophysics Data System as of Aprill 2021).

GINDILIS Lev Mironovich

Born 03.09.1932 in Kiev, USSR. In 1955 he graduated from the Astronomical Department of MSU. Since 1955 he has been constantly working at the SAI MSU holding the positions from a senior laboratory assistant to a senior scientific worker, since 1965 he has been working at the Radioastronomy Division. From 1958 to 1963 he was the head of permanent High-mountain expedition of the SAI (that was later turned into the SAI Tien Shan station). In 1962 he defended a candidate thesis on the subject «Absolute spectrophotometry of antiglow» under N.N Pariyskiy's supervision. Died 27.05.2021 in Moscow.

In 1957 in connection with the International Geophysical Year L.M. Gindilis took part in organization and operation of High-mountain expedition of the SAI in Zailiyskiy Alatau. In 1964 he took part in organization of the first All-Union Conference on Extraterrestrial Intelligence in Byurakan, Armenia.

In 1965 he moved to the Division of Radioastronomy of the SAI MSU because of development of investigation on search for extraterrestrial intelligence.

L.M. Gindilis took part in creation of RATAN-600 radiotelescope. From 1967 to 1977 he was the commissioner for RATAN-600 of the General Physics and Astronomy Division of the Academy of Sciences of the USSR. From 1974 to 1975 he was the acting head of the SAI laboratory at RATAN-600.

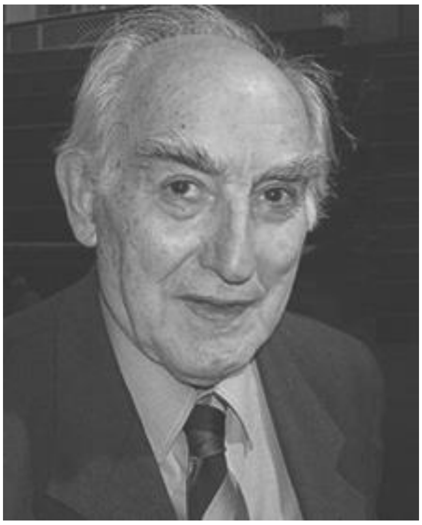
Gindilis's research works relate to study of faint extended celestial objects: zodiacal light, antiglow, nightglow. In 1962 he developed a theory of antiglow light that relate this phenomenon with scattering of sunlight on interplanetary dust particles. He also returned to study of cosmic dust later. A workgroup on cosmic dust study was established on his initiative. Collection of dust was made in highlands regions of Altai and in Antarctica within a program of science council on astrobiology at the Presidium of the Russian Academy of Sciences. Together with V. A. Tselmovich from the Schmidt Institute of Physics of the Earth of the Russian Academy of sciences he has made a research of Chelyabinsk meteorite dust component.

He took part in a number of projects on search for radio signals from extraterrestrial intelligence. In 1971 Gindilis developed a technique of search for pulse-shaped signals with compensation of dispersion from interstellar medium. He is the organizer and participant of many and conferences on extraterrestrial intelligence. From 1968 to 1969 he taught a lecture course on the fundamentals of interstellar connection for students of the Astronomical Department of MSU. He focuses significantly on topics of history, methodology and philosophy of science along with popularization of science in working with the children and young people.

He is the author of more than 300 scientific and popular science articles, the author of 7 books and a co-author of 5 joint monographs.

L.M. Gindilis is a member of the Science Council on Astronomy of the Russian Academy of Sciences and science council on astrobiology at the Presidium of the Russian Academy of Sciences. He is a also a member of SETI Commitee of the International Academy of Astronautics. For many years he was a consultant of Commission № 51 «Bioastronomy» of the IAU. Gindilis is a distinguished fellow of MSU, full member of the K.E. Tsiolkovky Russian Academy of Cosmonautics.

GINZBURG Vitaly Lazarevich



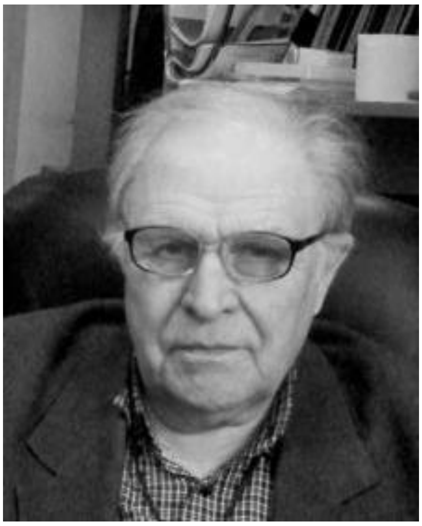
Born 04.10.1916 in Moscow. In 1938 he graduated from the Physics Department of Moscow State University and continued his post-graduate studies at the Department of Optics of Moscow State University. In 1940 he defended the candidate. diss. and was sent to work at Phys. Institute of the USSR Academy of Sciences (FIAN), where he worked until the end of his life. In 1942, after the defense of doct. diss. appointed to the post of deputy. head department of theory. Physics FIAN (from 1971 to 1988 – head of the department). Since 1968, he was in charge of the Department of Problems of Physics and Astrophysics of the Moscow Institute of Physics and Technology, which he created. Professor of the Gorky State University (1946), professor at MIPT (1968), Corresponding Member Academy of Sciences of the USSR (1953), Academician of the Academy of Sciences of the USSR (1966). Died 08.11.2009 in Moscow.

Scientific works are devoted to many areas of physics, radio astronomy and astrophysics. In 1940 he developed the quantum theory of the Vavilov-Cherenkov effect and the theory of Cherenkov radiation in crystals. In 1946, together with I.M. Frank created a theory of transition radiation that occurs when a particle crosses the boundary of two media. Since the 1950s he has been studying the theory of superconductivity and superfluidity. In 1950, together with L.D. Landau created a semi-phenomenological theory of superconductivity (the Ginzburg – Landau theory), and in 1958, together with L.P. Pitaevsky, created a semi-phenomenological theory of superfluidity (the theory of Ginzburg – Pitaevsky). He took an active part in the Soviet atomic project. His astronomical works are devoted to questions of the origin of cosmic rays, radio astronomy, and relativistic astrophysics. Developed the theory of magnetic bremsstrahlung cosmic radio emission and radio astronomy theory of the origin of cosmic rays. His name is associated with studies of radio emission from the Sun and general problems of radio astronomy. In 1958, together with V.V. Zheleznyakov investigated the problem of the propagation and release of electromagnetic waves from the plasma of the solar corona and the related problem of polarization of solar radiation. In the same year he formulated the theory of sporadic radio emission from the Sun. He proposed a number of new methods of radio astronomy research, including a method for studying the structure of discrete sources of sporadic radio emission from the Sun. In the 1950s, he established a connection between the characteristics of the electronic component of cosmic rays and the magnetic bremsstrahlung radiation produced by them in the magnetic fields of galaxies. Carried out the first studies of the role of plasma effects in the motion of particles in outer space. In 1964 he showed that with gravitational collapse, the magnetic field of a star should greatly increase when it turns into a neutron star. Installed together with L.M. Ozerny that the magnetic field during the collapse of the star first increases strongly, and then, as the surface of the star approaches the Schwarzschild sphere, disappears. In 1969-1975 he carried out research on the theory of radio emission from pulsars, on the problem of their atmosphere.

He created two major scientific schools – on cosmophysics in Moscow and on radiophysics in Gorky. Author of the monographs "Theory of Radio Wave Propagation in the Ionosphere" (1949), "The Origin of Cosmic Rays" (together with SI Syrovatsky, 1963), "Propagation of Electromagnetic Waves in Plasma" (1967), "On Physics and Astrophysics" (1974) ...

Laureate of the Stalin Prize of the first degree (1953), the Lenin Prize (1966), the Nobel Prize in Physics (2003). Prizes to them. L.I. Mandelstam (1947) and M.V. Lomonosov (1962) Academy of Sciences of the USSR. He was awarded the Order of Lenin and the Orders of Merit for the Fatherland, I and III degrees. People's Deputy of the USSR Armed Forces from the USSR Academy of Sciences (1989-1991). Member of the IAS (1961). Member of a number of foreign academies of sciences and scientific societies.

GLAGOLEVSKIJ Yuri Vladimirovich



Born 09.02.1932 in Leningrad. In 1956 he graduated from the Kazakh State University in Almaty. In 1956-1960 he worked as a Junior Researcher at the Astrobotany Sector of the KazSSR Academy of Sciences, between 1960-1967 – a Junior Researcher in the Astrophysical Institute of the Kazakh SSR Academy of Sciences. In 1966 he defended his Ph.D. thesis on "The spectrophotometric study of continuous spectra of magnetic and peculiar stars." Since 1967 he has been working at the Special Astrophysical Observatory of the USSR Academy of Sciences (since 1991 – RAS) holding various positions: Senior researcher (1967-1975, 1982-1989), Academic Secretary (1975-1982), Leading Researcher (1989-2003). Since 2003 he is a Chief Research Scientist of the SAO RAS. In 1988 he defended his Dr.Sci. thesis on "Problems of the origin and evolution of magnetic fields of chemically peculiar stars." Member of the International Astronomical Union (IAU).

The main scientific works of Yuri Glagolevskij are devoted to stellar astrophysics, physics of magnetic stars, stellar evolution. He is the author and co-author of more than 200 scientific publications.

In 1960s Yu. Glagolevskij was doing research on astroclimate in Kazakhstan, increasing the accuracy of satellite observations, studies of magnetic stars. In 1967 he organized the study of stellar magnetism at the 6-m telescope of the Special Astrophysical Observatory: in collaboration with the Working Group on magnetic stars he performed magnetometric and spectroscopic studies of stars. Under Yuri's guidance the systematic collection and analysis of the parameters of magnetic stars was organised to identify the mechanisms of formation and evolution of stars. In collaboration with the Potsdam Institute for Astrophysics an original method for modeling the global structures of magnetic fields inside the stars and on their surface was developed. Based on the modeling of a large number of these objects, a complete picture of basic properties of global magnetic fields was determined. The analysis of modeling results and other accumulated data allowed to develop a scenario for the origin and evolution of magnetic and non-magnetic chemically peculiar stars. There is good evidence that the main properties of these stars – slow rotation, the preferred orientation of the field lines, a 10% proportion of magnetic stars relative to the normal stars and other features were formed at the stages of the gravitational collapse with the presence of a magnetic field. It was found that magnetic stars rotate rigidly, while the total magnetic flux remains virtually unchanged over a lifetime on the Main Sequence. Normal stars are separated from the magnetic stars due to high rotation velocities and the emergence of a differential rotation, which entangles the magnetic field lines into an invisible toroidal shape during the gravitational collapse phase. The data on the preservation of all the main properties of magnetic stars during the passage of the non-stationary Hayashi phase was obtained. The relic mechanism of magnetic stars was established by observations.

Yu. Glagolevskij is awarded the medal "For Valiant Labor", silver and bronze ENEA medals of for the development of observational techniques, the "Veteran of Labour" medal, the decoration-medal "A resident of besieged Leningrad", diplomas of the USSR Academy of Sciences.

GLAZENAP Sergey Pavlovich

Born 25.09.1848 in the Tver province. In 1870 he graduated from St. Petersburg University, after which he was left there to prepare for a professorship; simultaneously worked as a supernumerary astronomer at the Pulkovo Observatory. From 1876 – assistant professor; from 1880 – Associate Professor of the Department of Astronomy; from 1885 to 1924 – Professor at St. Petersburg University. Founder of the University Astronomical Observatory (1881). One of the organizers of the Russian Astronomical Island (1890); in 1893-1905 and 1925-1929 – its Corresponding Member (1928), honorary member (1929) of the Academy of Sciences of the USSR. Died 12.04.1937 in Leningrad.

Research interests: celestial mechanics, practical geodesy, the study of variable stars. After graduation, he was engaged in research on the theory of eclipses of Jupiter's moons and in 1874 he defended his master's thesis on this topic. In 1873, he developed a method for determining the time based on the corresponding heights of the Sun using the solar ring. His doctoral dissertation, which he defended in 1881 at Moscow University, was devoted to the study of the deviation of light rays in azimuth due to the different densities of the atmosphere.

In 1874 he took part in an expedition to observe the passage of Venus across the solar disk in Eastern Siberia. In 1887 he headed an expedition to the Yaroslavl province to observe a total solar eclipse. Studying double stars, he went on an expedition to the southern coast of Crimea in Gurzuf, to the Caucasus in Abbas-Tuman; also conducted observations at his estate near Luga.

He was a brilliant popularizer of science, attracting a large number of listeners. While working as a professor at St. Petersburg University, he taught courses in general, spherical, and practical astronomy. With his care, the Astronomical Observatory at the university was built and equipped, in which training sessions on observation and computational work were conducted. In 1887-1888 he was the Dean of the Physics and Mathematics Faculty of the University. He lectured on astronomy and cosmography at the Higher Women's (Bestuzhev's) courses. In the post-revolutionary years until 1924, he taught astronomy at the Petrograd Pedagogical Institute named after A.I. Herzen.

Author of textbooks and manuals on astronomy and mathematics, as well as popular science books. Compiled a number of auxiliary mathematical, astronomical, and geodetic tables.

In addition to astronomy, he was fond of gardening and beekeeping, which he was engaged in professionally. He was one of the organizers of the Russian Society of Beekeeping (1891) and its first chairman. He discovered a pest of apple trees, wrote articles on fruit growing, edited a beekeeping journal.

For his method of determining the orbits of binary stars in 1889, he was awarded the prize of the Paris Academy of Sciences. Gold Medal of the World Exhibition (1900). In 1932 he was awarded the title of Hero of Labor. Honored Scientist of the RSFSR.

A crater on the far side of the Moon and a minor planet 857 Glasenappia are named after him.

GLUSHKOVA Elena Viacheslavovna

Born 18.06.1964 in the city of Lipetsk. In 1987 graduated from the astron. dept. of phys. fac. at Lomonosov Moscow State University; in 1990 – postgraduate study at MSU. In 1991 defended PhD thesis "Kinematics of open star clusters", in 2014 – Dr.Sci. thesis "Complex investigation of open star clusters". From 1990 – professor at LMSU phys. fac. (in posit. of the assistant and associate professor). Acad. assoc. professor title since 1998. Since 1995 she is senior research fellow at Sternberg Astronomical Institute in Dept. of Galaxy Studying and Variable Stars. Completed an internship at the Geneva Observatory (Switzerland).

She is a specialist in the field of star astronomy. Research interests: kinematics, dynamics and evolution of the Galaxy; star clusters; photometric and spectroscopic studies of stars.

Since 1987, as part of a team of scientists of Sternberg Astronomical Institute and INASAN, she has participated in an observational program for mass monitoring of high-precision radial velocities of stars in the northern sky with a correlation spectrograph, including 170 Cepheids of the Galaxy and members of open clusters. Together with A. S. Rastorguev, A. K. Dambis, M. V. Zabolotskikh, and A. M. Melnik, she studied in detail the kinematics and distance scale of the young populations of the Galaxy, determined the kinematic parameters of the disk and the parameters of the spiral pattern. According to HIPPARCOS and TYCHO2, the absolute proper motions of 180 young open clusters were measured. Together with S. E. Koposov and I. Yu. Zolotukhin, she discovered and investigated many previously unknown open clusters using the IR data of the 2MASS project. Together with S. E. Koposov and V. A. Belokurov, she derived the luminosity function of the Milky Way satellite galaxies. Using multicolour photometry data, together with A. K. Dambis, A. A. Chemel, and L. N. Yalialieva, she determined the physical parameters of a large number of young open clusters. She determined the absolute proper motions and orbits of the globular clusters of the Galaxy together with A.A. Chemel. Together with A. S. Rastorguev and M. V. Zabolotskikh, she investigated the relationship of open clusters with Cepheids.

For many years, he has been teaching a course of lectures on "Star Clusters" at the Astronomical Department of the Faculty of Physics of Moscow State University and conducts educational and organizational work at the astronomical department.

E.V. Glushkova is a member of International Astronomical Union.

GLUSHNEVA Irina Nikolaevna

Born 05.10.1934, Moscow. Died 05.12.2010, Moscow. Graduated from the Faculty of Mechanics and Mathematics of Lomonosov Moscow State University with a degree in astronomy (1957). Post-graduate student of the Physics Faculty of Moscow State University (1957-1962). Since 1962 she worked at Sternberg Astronomical Institute of MSU: Junior Scientific Researcher (1962), Senior Scientific Researcher (1967), Leading Scientific Researcher (1987). Candidate of Physical and Mathematical Sciences (1964), dissertation on the topic "Spectrophotometry of some hot stars in the ultraviolet range." Doctor of Physical and Mathematical Sciences (1985). Dissertation on the topic “Energy distribution in stellar spectrum: observations and astrophysical applications.” She was awarded the medal “For Labor Merit”. Died 05.12.2010 in Moscow.

Specialist in the field of stellar astrophysics. The main direction of her scientific research was the study of the absolute energy distribution in the spectra of stars of various spectral classes in the range from the visible to near-infrared by using photoelectric methods. For more than 10 years, she led a group of spectrophotometric studies of stars. The observations carried out by the group using a photoelectric spectrometer on the 48-cm reflector of the SAI South Station made it possible to obtain the absolute spectral energy distribution in the 3200-7600 A range of a large number of stationary stars, as well as several peculiar X-ray sources, namely Cyg X-1, X Per. The result of many years of work was the creation of a spectrophotometric catalog of bright stars, including data on the spectral energy distribution of 735 stars. Besides, a network of 7-8 magnitude standards based on the high-precision observations was developed. This network linked to a single spectrophotometric standard alpha Lyr allowed for absolute spectrophotometry in various regions of the northern sky, which is still widely used by the observers. The group investigated in detail the characteristics of the continuous spectrum and the equivalent widths of the Balmer lines in rapidly rotating class B and A stars. The obtained results were of great value in terms of the fundamental studies of the physics of stellar atmospheres. These results provided the creation of specialized stellar catalogs for attitude control, absolute calibration of stellar orientation sensors, etc. Within the framework of the topic "Investigation of solar analogue stars", Glushneva determined the effective temperatures, angular diameters, and radii of more than two dozen solar-type stars from the infrared observations at SAI South Station. Comparing the physical parameters of stars and IR color indices with the corresponding solar characteristics it was concluded that, of all the studied stars, 18 Sco is the only closest solar analog. Glushneva wrote more than 100 scientific works, including the monograph "Spectrophotometry of bright stars" (1982) in co-authorship with Voloshina I.B., Doroshenko V.T., Kolotilov E.A., Mossakovskaya L.V., Ovchinnikov S. L., Fetisova T.S. Member of the IAU (1973) and the European-Asian Astronomical Society.

GNEDIN Oleg Yurievich

Born 09.09.1972 in Leningrad. Graduated from St Petersburg State Technical University (now St Petersburg Polytechnical University of Peter the Great) in 1994 with BA in physics. Graduated from Princeton University in 1999 with PhD in astrophysics. Worked at Cambridge University in 1998-2001, at Space Telescope Science Institute in 2001-2004, and at Ohio State University in 2004-2006. Professor of Astronomy at the University of Michigan since 2006.

O.Y. Gnedin's research interests include theoretical astrophysics, formation and structure of galaxies, evolution of star clusters, and cosmological numerical simulations. Author of over 100 publications. Leader of a research group investigating the formation and dynamics of globular star clusters. Initiated studies of the formation of dwarf galaxies in the early universe and of the response of dark matter halos to condensation of baryons in galaxy cores. Developed a novel method of modeling stars and star clusters in galaxy formation simulations. In 2006-2015, led multi-cycle observations with the Hubble Space Telescope to discover the origin of hypervelocity stars.

Supervises research of graduate and undergraduate students at University of Michigan. Member of dissertation committees for the Astronomy and Physics Departments. Supervisor of 2 completed PhD theses and 3 in progress. Instructor for graduate and undergraduate courses «Extragalactic Universe», «Computational Astrophysics», «Galaxies and the Universe», «Introduction to Astrophysics», and «Aliens: Search for Life in the Universe».

Editor of the international journal New Astronomy since 2018. Member and Chair of the Division of Dynamical Astronomy's Rubin Prize committee of American Astronomical Society in 2018-2020. Member of Computational Resource Allocation Committee of the USA National Science Foundation since 2017. Chair of science organizing committees of 4 international conferences. Member of working group of HARMONI spectrograph for ESO's Extremely Large Telescope.

GNEDIN Yury Nikolaevich

Born 13.08.1935 in Tula. In 1959 he graduated from the phys.-tech. department of the Leningrad Polytechnic Institute.
From 1959 to 1984 he worked at the Ioffe Institute. From 1984 to 2016 Deputy Director on scientific work of the Pulkovo Observatory of Russian Academy of Sciences, head of Astrophysical Department (from 1984 at the present time). Obtained degree of Dr. Sciences (1979), Professor (1981), academician of the Russian Academy of Natural Sciences (since 2003), member of the IAU. Died 27.03.2018 in St. Petersburg.

The main areas of scientific interests of Yu.N. Gnedin include: theoretical astrophysics, theory of radiative transfer, x-ray and gamma-astronomy, physics of neutron stars and black holes, cosmo microphysics, as well as studies of the polarization of the radiation of cosmic objects. Together with R. A. Sunyaev predicted the existence of cyclotron lines emission of neutron stars that is the basis of the methods of measuring magnetic fields of neutron stars. Together with G.G. Pavlov he discovered the effects of quantum electrodynamics in the radiation of neutron stars and white dwarfs with strong magnetic fields. The result of the last works was the prediction and calculation of polarimetric effects associated with the discovery of new elementary particles – Gold-stone bosons and axions in stars and galaxies.

Yu.N.Gnedin is the Chairman of the The Large Telescopes Program Committee of Russian Academy of Sciences, the member of the Scientific Council on Astronomy of RAS.

He was awarded a Belopolsky Premium of Presidium of Russian Academy of Sciences. The planet (5048) Gnedin – 1977 FN1 was named in honor of Yurii Nikolaevich Gnedin. The author of over 335 scientific papers, including 4 monographs.

GNEVYSHEV Mstislav Nikolaevich

Born 15.05.1914 in the town of Tsarskoye Selo near St. Petersburg. In 1938, graduated from Leningrad University. In 1930-1936 was with Voeikov Main Geophysical Observatory of USSR Hydro-Meteorological Agency; from 1936 with Pulkovo Observatory. The founder and director of the Kislovodsk Mountain Station of the Pulkovo Observatory (1948). Dr.Sci. (1982): "Results of the study of solar activity and solar-terrestrial relations". During the II World War served in the Soviet Army and worked in the Institute of Arctic of the Northern Sea Route. Died 29.01.1992 in St. Petersburg.

His scientific works are devoted to solar physics and impact of the solar activity on geophysical phenomena. Established a number of new links between phenomena in ionosphere and magnetosphere and the solar activity. Organized first combined optical and radio observations of the development of solar activity in all layers of the atmosphere of the Sun, which made it possible to find some specific features of the 11-year solar cycle. From comparison of the data of observations of the solar corona from different observatories concluded that the 11-year cycle of the solar activity displays two rather than one wave of the amplification of the activity, which differ by their physical parameters. This refers to all phenomena occurring in the corona, chromosphere and photosphere, and also can be traced in some geophysical processes. Studied the impact of the solar activity of the biosphere of the Earth.

In 1948, under his supervision the Mountain Astronomical Station of Pulkovo Observatory near Kislovodsk at the altitude of 2070 m above the sea level was built. Owing to the efforts of M.N. Gnevyshev and R.S. Gnevysheva, it turned into one of the basic points of observations of the solar corona in the world, a leading institute of the USSR Solar Survey. Here, for the first time in the USSR, extra-eclipse observations of the solar corona were organized.

M.N. Gnevyshev took part in expeditions for observations of solar eclipses in the USSR (1936, 1968), Brazil (1947), and Cook Islands (1965). President of the IAU Commission No 12 «Radiation and Structure of the Solar Atmosphere» (1967–1970). Member of Editorial Board of Solar Physics (1967-1976).

GOLUBCHINA Olga Abramovna

Born on January 30, 1944, in Arkhangelsk. In 1967, she graduated from the Mathematics and Mechanics Department of the Leningrad State University named after Zhdanov, with a degree in astronomy. From 1967 to 1969, she worked at the Main (Pulkovo) Astronomical Observatory of the Soviet Academy of Sciences. Since 1969, she has been working at the Leningrad (now Saint Petersburg) branch of the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991). She has been a Senior Researcher since 1980. She defended her Ph.D. thesis in 1979, specializing in astrophysics and radioastonomy. In 2005, she defended her Dr.Sci. thesis on "Special methods of observing with variable-profile antennas and investigation of synchrotron brightening of Solar radio sources with RATAN-600".

Her scientific work is related to Solar physics, the development and implementation of special methods of observations of cosmic radio sources at RATAN-600, and of radioastronomical methods of variable-profile antenna (VPA) alignment: the Large Pulkovo Radio Telescope (LPRT), and the Radio Telescope of the Academy of Sciences (RATAN-600). She is an author of about 100 scientific papers, as well as of the monograph "Special observations of the Sun with the radio telescopes LPRT and RATAN-600" (2013).

In 1967-1978, Golubchina O.A., together with Gelfreich G.B., developed a new practice for observations with the radio telescopes LPRT and RATAN-600: the radioastronomical alignment of the VPA with the Sun and Moon in order to construct a high-accuracy reflective surface for the main mirror of the VPA. The radioastronomical Solar alignment has been regularly used for many years at the LPRT as the main alignment technique, allowing one to investigate the parameters of the RATAN-600 radio telescope. It served as the basis for the creation of special methods of observations with RATAN-600: "relay" and "zoned relay".

In 1980-1986, an observing technique with a decreased aperture ("relay") and an observing mode with a zoned surface ("zoned relay"), were developed and implemented at the RATAN-600. The special observation modes provided the possibility of multi-frequency monitoring of the Sun in order to study the evolution of the active regions of Solar radio emission, and allowed one to obtain two-dimensional images of the Sun with the use of the secondary reflector with a conical surface.

The special RATAN-600 observing methods are used to investigate the sympathetic flares (synchrotron brightening of local sources) of the Sun. It has been demonstrated that the Sun exhibits strong interactions of the active regions, which are positioned up to $L > 10^5$ km apart. For the first time, two different mechanisms of synchrotron brightening of Solar radio sources have been revealed in a narrow spectral region of microwave radiation (1.92 cm ÷ 3.21 cm): the activity of high-energy electrons and wavefronts.

Golubchina O.A. taught astronomy to the students of the Herzen State Pedagogical University of Russia, and headed the graduate school of the Leningrad branch of SAO RAS for many years.

For her active scientific and social work, Golubchina O.A was awarded an anniversary medal "For Valiant Work. In Commemoration of the 100th Anniversary of the Birth of Vladimir Ilyich Lenin " in 1970.

GONCHAROV Georgy Alexandrovich

Born 19.09.1966 in Novokuznetsk (Kemerovo Region). On graduation from the Department of Mathematics and Mechanics of the Leningrad State University, since 1988 worked as an Observer, Junior Researcher, Researcher, and Senior Researcher at the Central Astronomical Observatory of the Russian Academy of Sciences at Pulkovo. 2012: Dr.Sci. ("Spatial distribution of stars, their kinematics, and interstellar extinction within the nearest kiloparsec"). Member of IAU.

Main works of G.A. Gontcharov relate to astrometry, double stars, astrophysics and kinematics of stars, interstellar extinction, astrophysics of globular clusters, solar-terrestrial relations, and astrobiology. Authored more than 60 papers.

In 1988-1996, jointly with the scientific group of the Pulkovo Photographic Vertical Circle, observed, processed, and published PVC96 – the most accurate observational astrometric catalogue in the history of Russian astrometry. In 1992-1993, showed a statistical relation between solar activity and the greatest migrations of Asian nomads. In 1997-2010, discovered several unseen massive components of bright stars by comparison of old and new astrometric observations. In 2006, created the Pulkovo Compilation of Radial Velocities for 35493 Hipparcos Stars in a Common System, a widely used source of radial velocities of bright stars. In 2011, proposed several natural sources of the famous "Wow!" radio impulse of 1977. Since 2009, has developed a new model of spatial distribution of interstellar dust within the nearest kiloparsec, suggesting a significant dust container in the Gould Belt. In 2019, showed that the Gould Belt is a domain of peculiar interstellar dust and higher interstellar polarization related to some spatial variations of interstellar medium properties. Since 2010, jointly with A.V. Mosenkov, developed an original 3D map of interstellar reddening and extinction. This map is proved to be one of the most accurate 3D reddening and extinction maps. In a series of studies, showed that star-formation regions in the Galactic disc is the only domain where dust grain fragmentation dominates, while the Galactic bulge, disc periphery, halo and inter-arm space are the domains where dust grain growth dominates.

The obtained results were repeatedly included to the list of the most important results of scientific councils of RAS; the works were supported by grants of the INTAS, Russian Foundation for Basic Research (RFBR), Federal purpose-oriented Programs, Programs of the Praesidium of RAS, grants of the President of the RF within the Program of Support of Scientific Schools, and those of The Russian Scientific Foundation (RSF).

Very active in astronomical outreach. He has presented several thousands of popular lectures in the Saint-Petersburg Planetarium, lecture halls, popular conferences, universities, and schools. Published more than 50 popular scientific brochures.

georgegontcharov@yahoo.com

GOPASYUK Olga Stepanovna

Born in 1965 in Nauchny, Crimea. In 1987 she graduated from Sevastopol Engineering Institute. Since 1992 she has been a researcher at the Crimean Astrophysical Observatory. In 2012 – 2015 – Head of the Solar Physics Department. In 2001 she defended the PhD thesis "The magnetic field structure in active regions and plasma motions in sunspot umbrae". A member of IAU (since 2003).

The research papers relate to the physics of the Sun. The structure and dynamics of the magnetic fields and plasma in active regions at different levels of the solar atmosphere is studied. Jointly with S.I. Gopasyuk the observed magnetic field in the chromosphere was found to be a su-perposition of potential and current fields. She established behavior of the magnetic field structure in single sunspots; this allows one to understand the reason of magnetic structure stability. There was revealed plasma diffusion in the temperature minimum region in the magnetic field of sunspot umbrae across the lines of force. She elaborated a method for studying sunspot rotation according to observational data of the longitudinal component of the magnetic field and velocity vectors. There was investigated a possibility of applying data on sunspot torsional oscillations for a study of the magnetic field structure and plasma motion in deep layers of the Sun.

An author of more than 80 publications.

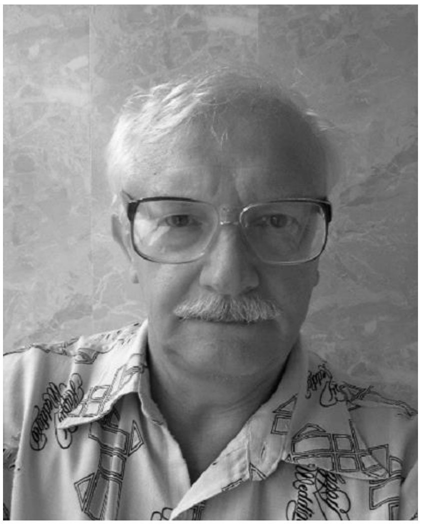
GOPASYUK Stepan Ilyich

Born 07.07.1930 in Legaty, Brest region, Belarus. In 1954 he graduated from Lvov University. Since 1954 – a researcher at the Crimean Astrophysical Observatory. In 1987–1989 – Head of the Solar Physics Department. Since 1989 – a leading researcher. In 1963 he defended the PhD thesis “Development of flares and solar magnetic fields”. In 1975 he defended his Doctoral thesis “Magnetic fields and motions in the solar atmosphere”. A member of IAU (since 1967). An Honored Worker of Science and Technology of Ukraine (2000). – Died 08.08.2005 in Nauchnyy.

The basic research papers are devoted to fundamental issues in solar physics, including problems of solar magnetism. The researcher showed important characteristics in the motion of plasma and magnetic field at the stage of sunspot occurrence and disappearance. It allows one to find out the physical mechanisms causing the concentration and decay of the magnetic field on the solar surface. A series of results concerning the nature of active and quiet regions were obtained, namely, a global electric current in the active region was detected, its role in the formation and stability of the active region was substantiated, the local currents were shown to be concentrated mainly in short and low magnetic loops, a significant part of the photospheric magnetic field is accounted for by currents flowing in the photosphere; it was established that photospheric motions play an important role in the generation of electric currents. S.I. Gopasyuk elaborated a method for studying the magnetic field structure in the upper layers of the solar atmosphere. Jointly with O.S. Gopasyuk, the observed field in the chromosphere was found to be a superposition of potential and current fields. He derived equations which describe such a field as a force-free one. The sunspot torsional oscillations with periods of 40 min and 6 days were detected. A complex study of the solar flares was carried out. There was revealed a close relationship between flare occurrence and increase in the sunspot motion and rotation as a source of accumulating magnetic energy of electric currents. The presence of shock waves in flares was proven, and their role in the development of H□ flares was studied. S.I. Gopasyuk established a relation between flare occurrence and electric current direction, found an asymmetry in H□ fluxes and hard X-ray flare emission. He studied the role of field compression and extension in magnetic loops filled with cold plasma and accelerated electrons in changing intensity of synchrotron and hard X-ray emission. The characteristics of electron acceleration spectrum, cold plasma and magnetic field were obtained.

S.I. Gopasyuk authored more than 190 publications, a review on solar electrodynamics and monographs on solar physics (as a co-author).

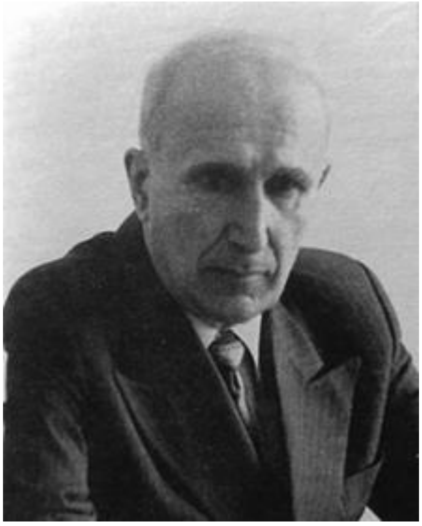
GORANSKIJ Vitaly Petrovich



Born 28.02.1949 in the village of Vasilievskoye, Smolensk region. Graduated from Moscow State University in 1973 as astronomer. Since 1973, he constantly works at the Sternberg Astronomical Institute (SAI) of the Moscow State University. He was head of Tien–Shan Astronomical Observatory of the SAI Moscow State University from 1992 to 1994 (before the nationalization of the observatory by the Republic of Kazakhstan). Physical and Mathematical Sciences Dr. Candidate (1983). Since 2000, he works at the Special Astrophysical Observatory on joint SAO RAS and SAI MSU scientific projects. Member of the International Astronomical Union. Member of the editorial board of the "Variable Stars" journal.

V.P. Goranskij is a senior researcher of Variable Stars and Galaxy Study Department at the SAI. Variable star explorer. He has over 320 scientific papers and publications. He worked on the General Catalog of Variable Stars (GCVS) in the working group of the SAI and the Astronomical Council of the Soviet Academy under the leadership by B.V. Kukarkin, P.N. Kholopov and later N.N. Samus (1973-2004). He initiated the work to update the GCVS to astrometric positions, developed computer programs for astrometric reduction and cross-identification of variable stars, determined the exact coordinates of thousands of variable stars in the Galaxy, in the Large Magellanic Cloud, and in M 31. He made a significant contribution to SAI collection of photographic plates with his observations at the SAI Crimean station. Goranskij developed new methods of observations and data processing. It is the method of eye estimates of star brightness without steps (scale method). Computer methods and softwares were created to search for periods of variable stars and to search for modulation periods (Blazhko effect, disc precession), also for digital processing of photo negatives and CCD frames. He uses own computer software system for processing photometry in the course of observations. For the first time, he applied regularization methods to solve the incorrectly posed problems to restore the Period – Time function from the O – C curve (RR Gem), and to restore the brightness distribution along the accretion disk rim in a binary system using the light curve in eclipse (IP Peg). Goranskij discovered the first double mode RR Lyrae type stars in the globular cluster M3 and in the Draco dwarf galaxy (1981–1982). His studies of RR Lyrae type stars with the modulation of pulsations and with the changes of pulsation modes confirmed the hypothesis of the Blazhko effect as a resonance of radial modes. In collaboration with V.M. Lyuty and R.A. Sunyaev, he investigated in optics first X-ray sources discovered at space observatories. Spectral and photometric monitoring of them in cooperation with the researchers of SAO RAS and SAI MSU continues up to these days. One such object, CI Cam, turned out to be a pulsating B[e] star with a white dwarf in a 19-day elliptical orbit, and its outburst in 1998 is interpreted as a thermonuclear explosion of hydrogen on the surface of a white dwarf. Goranskij discovered two dozen variable stars and variable objects, including the supernova 1972H, a Seyfert galaxy and the binary system with a black hole V4641 Sgr. In a large team of researchers from the SAI MSU and SAO RAS, he participates in the observations of the relativistic system SS 433. Based on the photometric data, he determined the mass of a neutron star in this system, $1.45 \pm 0.20\ M\odot$. The rare, powerful flares of SS 433 in optics and radio with an ejection of matter suggest that it may be a magnetar. His recent works are devoted to the study of the red novae phenomenon, or "cool explosions". Most of them are the events associated with the formation of common envelopes and the merger of components in binary systems. The nature of the progenitors of such explosions was established from the analysis of astronomical plate archives.

GORBATSKY Vitaly Gerasimovich



Born 16.02.1920 in Nevel, Pskov region. Graduated from Leningrad State Univ. (LSU), now St. Petersburg State Univ. (1941). Student of the Air Force Academy (since June 1941). Since 1943, enrolled in the Army and served as an officer in Air Force units. Post-graduate student of the Department of Astrophysics, LSU (1945-1948). PhD (1948). Researcher at the Astronomical Observatory, LSU (1948-1952). Associate Professor at the Department of Higher Mathematics at the Institute of Technology (1952-1959). Since 1960, Senior Teacher at Faculty of Mathematics and Mechanics, LSU. Since 1965, Professor at the Department of Astronomy; since 1985, Professor at the Department of Astrophysics. Dr. Sci. in Phys. and Math. Sciences (1963). Member of IAU (since 1958). Founding Member of the European Astron. Society (1991). Honored Scientist of the Russian Federation (1999). Died 01.01.2005 in St. Petersburg.

V.G.Gorbatsky's research was mainly focused on theoretical astrophysics. He researched a wide range of astronomical objects, including stars, nebulae, and galaxies. He was one of the first to apply gas dynamics methods to astronomical research. Author of more than 100 scientific papers and 7 monographs.

The work of the 1940-50s is devoted to studies of nonstationary stars. Using Sobolev's theory of moving stellar shells, interpreted changes in the brightness and shells of nonstationary stars and determined their dynamical properties. Explained continuous and line spectra of long-period variables, considering the processes of emission of their atmospheres after the passage of a shock wave. These results were collected in the monograph "Nonstationary Stars" (1963), co-authored with I.N.Minin. The book was awarded the Leningrad University Prize for scientific work.

In the early 1960s, studied properties of close binary systems of dwarf stars (nova-like variables, novae, recurrent novae). Studying the motion of gas in such systems, he was the first to consider the process of disk accretion. After the discovery of X-ray binaries, it turned out that this process plays a fundamental role. The results were summarized in the monograph "Cosmic Gas Dynamics" (1978).

Since the 1980s, his scientific interests gradually began to shift towards extragalactic research. He pointed out an important role of cosmic rays in heating the intergalactic medium emitting in X-rays. Analyzed the transfer of angular momentum in the interstellar gas of spiral galaxies, built a gas cloud coagulation model to explain characteristics of the Lyman-alpha forest. The results were included in his monograph "Introduction to the physics of galaxies and galaxy clusters" (1986) and textbook "Gas-dynamical instabilities in astrophysical systems" (1999). He was one of the initiators of regular conferences on extragalactic astronomy in Pushchino.

Supervised undergraduate students, postgraduate students, and young scientists, with more than 10 Ph.D. theses defended.

State awards: Order of Red Star, Order of Great Patriotic War II degree, Great Patriotic War veteran medals.

Minor planet 4509 was named after V.G. Gorbatsky.

GORKAVYI Nikolay Nikolaevich

Born in 1959 in Chelyabinsk. In 1976–1981 – a student of Chelyabinsk State University. In 1981–1986 – a Ph.D. student at the Institute of Astronomy of the USSR Academy of Sciences. In 1986 he defended the Ph.D. thesis "On the dynamics of planetary rings". In 1986–1998 – a senior researcher at the Simeiz Observatory. In 1990 he de-fended the Doctoral thesis "Physics of planetary rings". In 1998–2000 – NRC/NAS/USA senior associate. Since 2011 he has been working in the "Suomi" satellite group (NASA). A laureate of the USSR State Prize (1989).

N.N. Gorkavyi authored over 100 scientific papers on astronomy and two monographs. His major fields are physics of planetary rings, formation of the Moon, binary asteroids and irregular satellites. He published a number of papers devoted to the dynamics of the zodiacal cloud and exo-planets, Chelyabinsk superbolide and cosmology. He explained the existence of planetary rings by collisional disruption of friable particles in the Kepler disk. N.N. Gorkavyi developed a theory of transport for inelastic particles and discovered new collective instabilities of rings such as the quasi-secular instability, the accretion instability responsible for the large-scale structure of Saturn's rings, and the ellipse-instability causing the ellipticity of Uranus' rings. In 1985 he built a model of resonant rings of Uranus and predicted the presence of six undiscovered satellites, which were discovered later by Voyager-2. In 1989 N.N. Gorkavyi and A.M. Fridman were awarded the State Prize for the prediction of Uranus' satellites. Together with T.A. Taidakova, he built a dynamic model of Neptunian arcs. Together with A.M. Fridman he published the monograph "Physics of planetary rings. Celestial mechanics of continuous media" (Nauka, 1994; Springer, 1999). In collaboration with T.A. Taidakova, he developed a theory of the formation of irregular satellites of Jupiter, Saturn and Neptune as a consequence of regular captures of asteroids in certain circumplanetary zones. The model predicted two outermost groups of irregular satellites of Saturn and Neptune, which were later discovered. Per request of astronomer N.S. Chernykh, IAU named asteroid 4654 Gor'kavyj. In collaboration with Dr. John Mather, he built a model of the zodiacal dust cloud near the Sun, Beta Pictoris, Epsilon Eridani and Vega. For this work N.N. Gorkavyi took the award of the National Academy of Sciences (US, 1998). In 2007 he developed a new model of the formation of the Moon and double asteroids based on impacts of many bodies. In 2013 using "Suomi" data he discovered the stratospheric dust cloud from the Chelyabinsk bolide. Together with co-authors he was awarded the Goddard Award (NASA). He is a co-author of the monograph "Chelyabinsk superbolide" (ed. N. Gorkavyi, A. Dudorov, 2016; Springer-Praxis, 2019). In the framework of Einstein's theory together with A. Vasilkov he showed that in a system with decreasing gravitational mass the repulsive force arises that can explain the Big Bang and acceleration of the Universe (MNRAS, 2016; 2018).

GORSHKOV Petr Mikhailovich

Born on 24.06.1883 in Kharkov. He graduated from the Imperial St. Petersburg University in 1910, remained at the department of astronomy and geodesy to prepare for a professorship. In 1913 he was sent to Germany, where in 1914 he was interned. Since 1915 he was a secretary of the Russian Astronomical Society, taught at the Higher Women's (Bestuzhev) courses, since 1917 – at Petrograd University, since 1919 he was a Professor of the First Pedagogical Institute and Associate Professor of the Petrograd University, since 1925 – Professor and Head of the Department of Geodesy and Gravimetry, founded in the same year. In 1949-1951 – Dean of the Faculty of Mathematics and Mechanics of Leningrad State University (LSU). Scientific Secretary of the Council for the Study of the Productive Forces of the USSR. From 1941 to 1961 – Chairman of the Leningrad branch of the All-Union Astronomical and Geodetic Island. Member of IAU since 1928. Died on 31.07.1975 in Leningrad.

After graduating from the university, he was engaged in the theory of the motion of minor planets. In 1917, at a meeting of the First Congress of the All-Russian Astronomical Union, he proposed the creation of a Russian astronomical yearbook and a special computing institute for its publication. The offer was implemented two years later. He published several papers on secular perturbations of the orbits of bodies of the solar system. P.M. Gorhskov investigated the anomalous motion of the perihelion of Mercury and independently confirmed the first practical result of the general theory of relativity.

In 1928 P.M. Gorshkov took part in the International Astronomical Congress in Germany as a representative of Soviet astronomy and was elected a member of the IAU. At the same time, by the decision of the People's Commissariat of Education of the RSFSR, he was sent to Holland to get acquainted with the works of Vening-Meines. Since that time, the main area of scientific activity of P.M. Gorshkov became physical geodesy: the theory of the figure of the Earth, isostasy, and gravimetry. He actively cooperated with many scientific institutions (Institute of the Earth's Crust, Leningrad State University, Astronomical Institute).

Since 1926 he organized many scientific and industrial gravimetric expeditions to various regions of the USSR. The results of the expeditionary work are systematized and presented in his report "Gravimetric Survey from the Western Border of the USSR to Vladivostok", as well as in a number of monographs: "Gravimetric Survey of Kuzbass and Gornaya Shoria 1931" (1932), "Successes of Gravimetry" (1936), "Absolute Determination of the forces of gravity" (1939), "Tien Shan gravimetric expedition of the Leningrad State University in the summer of 1938" (1939). Independently of Wening-Meines, he developed the theory of a pendulum on a moving platform. The results of this work, presented in the monograph "The differential equation of motion of a pendulum on a moving support" (1939), led to the creation of marine gravimeters, which played an important role both in theoretical gravimetry and in a number of applied disciplines.

He was active in teaching at a number of educational institutions. In June 1941, due to his age, he was denied enrollment in the Vasileostrovskaya division of the People's Militia. Since the beginning of the war, he participated in the construction of defensive structures in Leningrad, fulfilling a double standard at the age of 58.

GOSACHINSKIJ Igor Vladimirovich

Born 09.04.1935 in Moscow. After graduating Moscow State University in 1958 worked at the Main (Pulkovo) Astronomical Observatory of the Academy of Scienc-es of the USSR from 1958 to 1969 in different positions and from 1960 to 1964 pursued post-graduate studies at the same ob-servatory. He defended a Candidate of Physics and Mathematics thesis on "Investigation of neutral hydrogen in some Galactic objects" in 1966. Since 1969 has been working at Leningrad (now St.-Petersburg) Branch of the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) as the Head of radio-spectroscopy laboratory (1985-2005) and Chief researcher consultant. I.V. Gosachinskij defended a Dr. Sci. thesis on "Investigation of the interaction of HII regions and supernova remnants with the interstellar medium". He was a member of the IAU and the Research Council for Astronomy of the RAS. Died 22.04.2018 in St. Petersburg.

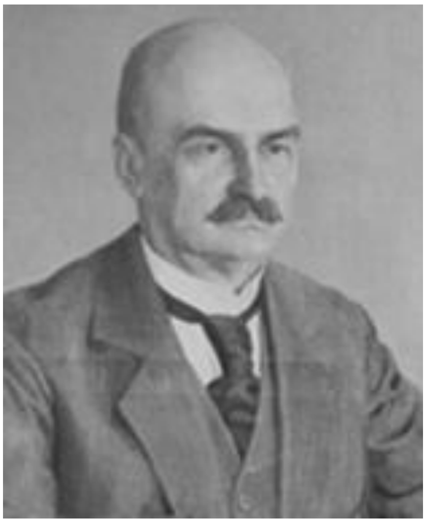
The main research field of I.V. Gosachinskij is the study of the interstellar medium in radio lines with the RATAN-600 radio telescope. I.V. Gosachinskij has published more than 180 research papers.

I.V. Gosachinskij discovered the contraction of gas in the Sgr B2 star-forming region by analyzing 6.2-cm H_2CO radio line observations and thereby experimentally confirmed the formation of stars from tenuous interstellar gas. He also used H110α radio-line observations in the Orion nebula to investigate its complex structure and determine the age of the main exciting star. I.V. Gosachinskij found that HB3 supernova remnant is surrounded by a double HI shell, which is indicative of the effect of the stellar wind of the supernova progenitor followed by the shock of the explosion.

I.V. Gosachinskij carried out several major radio-line surveys on RATAN-600 radio telescope, which yielded very interesting results. More than 7000 HI clouds were identified whose parameters showed weak effect of turbulence on atomic gas. A series of studies was performed to investigate the variability of H_2O masers and «synchronous» flares were detected in W49 radio source. I.V. Gosachinskij investigated the properties of molecular gas clouds in polar «caps» of the Galaxy. Carried out a survey of so-called «supergiant» HI shells and proposed a model to explain their nature. I.V. Gosachinskij studied interstellar gas in star-forming regions (more than 140 objects) and obtained important data about the process of molecularization of interstellar gas, searched for spectral and spatial fluctuations of cosmic microwave background and demonstrated their likely existence.

I.V. Gosachinskij has carried out extensive work to develop software for automated radio-spectrometric complex of the RATAN-600 radio telescope and a software suite for reduction and interpretation of observations.

GRACHEV Mikhail Avramievich



Born 24.10.1866. Dr. Grachev graduated from Kazan Imperial University (KIU) in 1892. Assistant professor at astronomy department of KIU in 1892. Practicing astronomer at Engelhardt Astronomical Observatory (EAO) of KIU 1900-1918. Master's degree in astronomy and geodesy in 1914. Full professor in Astronomy and Geodesy at KIU in 1918. Director of EAO from 1918 till 1925. Died 17.08.1925 in Kazan.

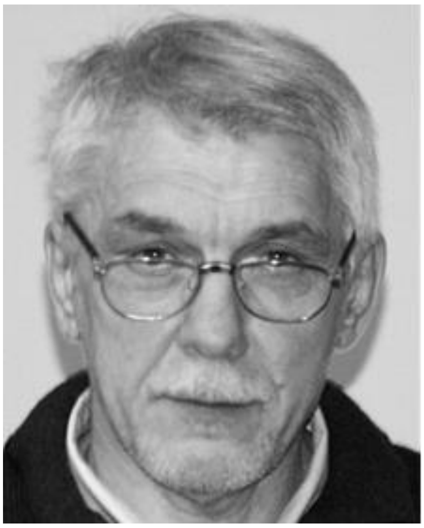
Dr. Grachev's scientific interests lied in astrometry and geodesy. He carried out observations with a meridian circle telescope and transit instruments. Dr. Grachev executed observations of the Mösting A and Proclus Lunar craters. These researches became the first in the Kazan Lunar Libration Series. He also performed meridian observations of Saturn, Vesta, Algol-type stars, comets, and some other objects.

Dr. Grachev started research work on the latitude variation of the Kazan Observatory in 1893, which was a part of the International research program. His observations, the first in Russia, were distinguished as very accurate and they represented a great scientific value for studying the movement of the Earth's poles. The result of the work was the determination of the constant of the aberration.

Dr. Grachev, apart from his scientific and educational activity, made great efforts to build EAO and start astronomical researches there as an assistant of Dr. Dmitry Dubyago.

Dr. Michail Grachev graduated from KIU with a gold medal. His student research of the latitude was also awarded a gold medal by KIU. Dr. Grachev was awarded the international prize and Russian Astronomical Society prize as recognition for his great scientific work.

GRACHEV Stanislav Ivanovich



Born in 25.03.1947 in Leninskoe Village of Khabarovsk Territory. Graduated from Leningrad State University (LSU, now Saint Petersburg State University) in 1970 (the astronomy major) and competed postgraduate studies at the Department of Astrophysics in 1973. Since 1973, worked at the Astronomical Observatory of LSU, as a junior research fellow, research fellow, and senior research fellow. Since 2012, professor at the Astronomy Department. In 1978, defended his thesis "Resonance radiation transfer in moving media." In 2000, defended his Dr. Sci. dissertation "Development of methods in the theory of radiation transfer." Member of IAU.

S.I. Grachev's research interests are in the areas of the radiation transfer theory and its astrophysical applications. Until 1991, was engaged in the development of the asymptotic theory of resonance radiation transfer in the linearly expanding media. In 1991, in his joint work with V.K. Dubrovich, calculations of primary hydrogen recombination dynamics in the expanding Universe were performed using a 60-level atom model and taking into account the recoil under scattering in the Lyman-alpha line. From the end of the 1990s up to the beginning of the 2000s, he was engaged in the development of the asymptotic theory of polarized radiation transfer in case of resonance scattering with the Rayleigh phase matrix. The formation of polarized lines in a weak magnetic field taking into account the Hanle effect was also analyzed.

Numerical and analytical solutions of some problems in the nonstationary radiation transfer theory were obtained, including solutions of Kompaneets' equation. In 2001, proposed a new method of numerical solution of nonstationary problems in the radiation transfer theory. This method was used later in 2014 to study spectrum evolution under multiple Compton scattering.

In 2004, in joint work with V.K. Dubrovich, there were calculated spectral distortions of cosmic microwave background (CMB in 2–50 cm range) due to the superposition of primary hydrogen recombination radiation in subordinate lines. The relative value of distortions was of the order 10^{-7}–10^{-6}. In 2008, he showed that in the light of the modern LCDM model of the Universe, accounting for the recoil under scattering in the Lyman-alpha line can lead to a noticeable acceleration of primary hydrogen recombination (up to 1.3%). In 2011–2016, in a series of works with V.K. Dubrovich, a local-burst model was developed for the CMB temperature fluctuations due to scattering on free electrons and in lines of primary hydrogen.

GRANKIN Konstantin Nikolaevich

Born in 1961 in Saratov. In 1984 he graduated from Saratov State University. In 1987–2007 – a staff member of Astronomical Institute, Uzbekistan. During the period he advanced from a senior engineer to Head of the Department of Variable Stars. In 1995 he defended his PhD thesis "A study of rotational modulation of brightness of young non-stationary stars". Since 2007 K.N. Grankin has been working at the Crimean Astrophysical Observatory. Since 2013 – Head of the Stellar Physics Department.

Scientific works relate to the photometry of variable stars, in particular: T Tauri stars (TTS), Herbig Ae/Be stars (HAeBe), and other post-T Tauri stars (PTTS). He took active participation in photometric observations in the framework of the ROTOR project at the Maidanak Observatory, Uzbekistan, for twenty years (1987–2007). As a result, a unique photometric database has been compiled, which contains more than 100000 UBVR-measurements of 370 objects in various star-forming regions (SFR). K.N. Grankin created a software package utilizing different methods for a statistical and periodogram analysis of astronomical time series. He identified six candidates for close binary systems among several dozen young stars and found out quasi-cyclic variations in light curves of 38 HAeBe. K.N. Grankin discovered rotational modulation of brightness from surface spots in 88 TTS. He showed that cyclic and quasi-cyclic photometric variability of HAeBe may be due to the presence of circumstellar structures of different origin. K.N. Grankin studied in detail the properties of rotational modulation from spots in sixty weak-line TTS (WTTS) in the Taurus-Auriga SFR. He defined the size and temperature of the spotted areas in several WTTS and traced the evolution of these parameters over time. K.N. Grankin discovered a phenomenon of stability of the initial epochs and rotation periods in 17 WTTS on a time scale from 5 to 19 years. This stability indicates that in each WTTS the active region remains on the same meridian for many years. He discovered that a significant change in the amplitude of light variations of the spotted WTTS is not accompanied by a significant change in the average brightness level. The modeling has shown that a decrease in the amplitude of light modulation is caused not by a reduction of the total area of spots, but a more uniform distribution of spots over the stellar surface. This conclusion was later confirmed by the Doppler mapping of surfaces of the selected WTTS (together with J.-F. Donati, France). K.N. Grankin became a co-author of a series of papers devoted to the study of AA Tau, which allowed investigating in detail the processes of magnetospheric accretion under the control of the magnetic field of the young star (in collaboration with J. Bouvier, France). He is an author of 144 scientific papers (1979–2020), a member of EAS, IAU, an Honored Worker of Science and Technology of the Republic of Crimea.

GREBENEV Sergey Andreevich

Born 29.10.1962 in Moscow. In 1985 he graduated with honors from the Moscow Engineering Physics Institute (now NRNU MEPHI) specializing in Theoretical Nuclear Physics, then completed a post-graduate course of this institute. Since 1988 he has been working at the Space Research Institute of the Russian Academy of Sciences (IKI RAS), currently being head of the laboratory for X-ray and gamma-ray astronomy. Doctor of Sciences in Physics and Mathematics (1996), Member of the International Academy of Astronautics (since 2020, Corresponding Member since 2016), Executive Editor-in-Chief of Astronomy Letters (since 1992), member of the IAU, the Space Council of the RAS and its section for Extra-Atmospheric Astronomy, Mission Scientist of the international gamma-ray astrophysics laboratory INTEGRAL, lecturer of the MIPT (Space Physics Department), Chairman of the State Examination Commission of the NRNU MEPHI.

Specialist in X-ray and gamma-ray astronomy, theoretical and nuclear astrophysics, author of more than 250 scientific papers, disciple of R.A. Sunyaev.

The main results are related to the study of the supernova radioactive emission and the process of accretion onto black holes and neutron stars. He was the first to compute the hard radiation spectrum formed in the supernova ejecta due to Comptonization of gamma-ray photons from the decay of radioactive Ni-56 (synthesized during the explosion) and its daughter product Co-56. He predicted the early appearance of the X-ray flux from SN 1987A (the only nearby supernova in the last 400 years). This initiated its intense observations by the MIR-KVANT observatory and led to the discovery of the hard emission. During the observations, he determined the degree of transfer of radioactive elements into the outer layers of the ejecta and their isotopic composition (the abundance ratio of Co-57 to Co-56). With the INTEGRAL observatory he discovered, in 2012, the emission in the 68 and 79 keV decay lines of Ti-44 (a longer-lived isotope than Co-56) from the SN 1987A remnant and participated in the discovery, in 2014, of the gamma-ray decay lines of Co-56 and Ni-56 from another unique supernova (SN 2014J of type Ia) which proved its thermonuclear nature.

He was the first to investigate, on the basis of MIR-KVANT and GRANAT observing data, the X-ray spectral states of black holes in binary systems depending on the accretion rate and showed that the hard state is observed not at a high (as was believed), but at a low accretion rate. He was one of the first to observe low-frequency (<1 Hz) quasi-periodic oscillations of the flux from black holes. He proved that the main optical emission of black holes is formed not at the periphery of the accretion disk, but in the zone of the main energy release. He participated in mapping the Galactic center region in X-rays and came to the conclusion, based on the data of the ART P coded-mask telescope of the GRANAT observatory, that the nucleus of the Galaxy has an unexpectedly low luminosity. He discovered ~20% of all known X-ray binaries in the Galaxy, including their new population – the “Fast X-ray Transients”, and proposed a successful model that explained the unusual properties of the "Fast Transients". He was the first to use the wavelet transform in the analysis of X-ray images and the study of small-scale fluctuations of hot gas in galaxy clusters. Together with R.A. Sunyaev, he computed the distortions in the X-ray background spectrum that arise in the hot gas of clusters.

He awarded the Ya.B. Zeldovich Medal in Astrophysics (COSPAR), the F.A. Bredikhin Prize in Astronomy (RAS), the Main Prize of the IAPC "Nauka/Interperiodica" in Physics and Astronomy, the Certificate of the European Space Agency for the outstanding contribution to the INTEGRAL project, medals of the Russian Federation of Cosmonautics. In 2001, he founded the series of annual conferences "High-Energy Astrophysics Today and Tomorrow" at IKI RAS, which became very popular at Russia and abroad. He has prepared 5 PhD scientists.

GREBENIKOV Evgeny Alexandrovich

Born 20.01.1932, Slobodzia, Romania. Graduated from the astronomical department of the Faculty of Mechanics and Mathematics of Moscow State University in 1954. Graduate student of the Department of Celestial Mechanics of the Astronomical Department of Moscow State University (1954 – 1957). Candidate of Physical and Mathematical Sciences (1957). Junior Scientific Researcher at Sternberg Astronomical Institute of MSU (1957-1962). Head of Department of Mathematical Analysis at Peoples' Friendship University of Russia (1962-1969). Doctor of Physical and Mathematical Sciences (1967), Professor (1968). From 1969 to 1978 – head of Department of Mathematics, ITEP. From 1978 to 1988 – Director of the Research Computing Center of Moscow State University. From 1988 to 1997 – deputy. Director for Science IPK (later IVVS) RAS. From 1997 to 2013 – Leading Scientific Researcher, Computing Center, RAS. Died 29.12.2013 in Moscow.

Specialist in the field of celestial mechanics, mathematician. Disciple of N. D. Moiseev. In 1957, he defended his candidate. dissertation on the topic "Analytical theory of the movement of Iapetus." In 1967, he defended his doctoral dissertation on the topic "The qualitative studies of differential equations of celestial mechanics". One of the authors (together with VG Demin and EP Aksenov) of the "generalized problem of two fixed centers" having many effective applications in celestial mechanics, astrodynamics, and dynamics of stellar systems. Completed a number of works on the qualitative theory of differential equations, applied and computational mathematics. He proposed a new method for constructing asymptotic solutions to some resonance problems in mechanics. He proved a number of theorems substantiating averaging methods (including the Delaunay-Hill method) and applied the obtained results to study the motion of a material point in the gravitational field of a rotating asymmetric body. Applying these results to the creation of high-precision theories of the motion of satellites and satellites of major planets, he proved the existence of almost periodic (toroidal) solutions in the problem of the material point motion in the normal field of a central body attraction. He developed a new hypothesis about the evolution of planetary systems over cosmological time intervals, according to which the planetary system necessarily passes through many resonant and nonresonant states. The number of states and the time spent in them is determined by the initial parameters of the system. This hypothesis has already been confirmed by the computer simulation. Grebenikov conducted research on the restricted three-body problem, having obtained results that complement the work of G.E. Bruns and A. Poincaré. Based on these studies, a new direction of computational mathematics has arisen, in which computers are used not as a means of calculations, but to test hypotheses about the existence of solutions of a given analytical structure. Laureate of the 1st degree Lomonosov Prize (together with G.N. Duboshin, E.P. Aksenov and V.G. Demin) (1969). Laureate of the USSR State Prize for Science and Technology (together with G.N. Duboshin, E.P. Aksenov, V.G.Dyomin and M.D. Kislik) (1971). Laureate of the USSR Council of Ministers Prize in the field of science (1983).

He has trained more than forty candidates and doctors of Physical and Mathematical Sciences. He has published about 250 publications, including 28 monographs, textbooks and popular science books. Minor planet No. 4268 is named after Grebenikov.

GRIB Sergey Anatolievich

Born 10.06.1944 in Leningrad. In 1966, he graduated from the Leningrad State University, Faculty of Mathematics and Mechanics. In 1966-90, he worked at the Leningrad Branch of IZMIRAN. He earned PhD in 1972 with thesis «Interaction of Shock Waves of the Solar Wind with the Magnetosphere of Earth: Some Problems». During the 1970s, he was on the team of a number of international projects (STIP, SOLTIP, and COSPAR). Starting in 1990, he works at the Pulkovo Observatory, as the Leading Scientific Researcher. In 2001, he earned the Doctor of Sciences (Habil.) degree with thesis «Interaction of MHD Discontinuities in the Solar and Space Plasma». Died 16.03.2018 in St. Petersburg.

Dr. Grib's principal scientific results relate to his study of solar shock waves, including their propagation, their generation inside the solar corona, and their effect on the system Bow Shock Wave – Magnetosphere of Earth. He is the author of the theory of a sudden geomagnetic field impulse that results from the impact of strong solar discontinuities. He has published about 150 research papers.

In1970s to 1990s, he and M.Dryer (USA) laid foundation for a magnetohydrodynamic theory of space, as a branch of the astrophysics of outer space. Methods of classical magnetohydro-dynamics were used and the new theory included both plasma and MHD theories of strong discontinuities. They also developed a model describing a strong solar discontinuity in the solar corona and solar wind (projects STIP, SOLTIP).

At the international conference BENA 5 (France, 1991) he became the first scientist to argue for the anthropic principle of outer space. The principle highlights the key role that the terrestrial magnetosphere and the solar MHD shock waves play in sustaining the biosphere of Earth (due to the Forbush effect).

In 1993-94, he described the emergence of slow shock waves near the coronal streamer (jointly with S.Koutchmy and V.N.Sazonova). In 2010, he and E.A.Pushkar' proposed a new model for the coronal heating that results from the refraction of solar rotational discontinuities in the solar transition region and from the working of the Landau decay.

In 2007-15, he developed a model describing the generation of secondary MHD waves in the magnetosheath and reverse shock waves of solar wind. His model of the reverse shock wave was included into the official "Accomplishments List" of the Russian Academy of Sciences, for the year 2010.

In 2014-15, in the context of a MHD study of space climate change, he proposed a model for the sudden perturbation of the magnetosphere of Earth due to the contraction of the system Bow Shock Wave – Magnetosphere of Earth by the plasma structures of the solar wind such as magnetic clouds and magnetic holes. He is currently engaged in applying this model to various parameters of the solar wind.

In 1990-2010, he served as Visiting Professor of Space Physics in various universities in the United States, Europe, and Russia. He was Principle Advisor for two doctoral dissertations.

In 1997, he became the recipient of the John Templeton Foundation Prize.

He is a member of several scientific councils, and a member of IAU (division E).

GRIGORYEV Victor Mikhailovich

Born 12.01.1939 in Ufa, Bashkirsky Territory. Since 1962 worked at the Siberian Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation (now the Institute of Solar-Terrestrial Physics RAS). After completing his PhD, worked at the Institute in various positions ranging from Senior Laboratory Technician to Deputy Director of Science. Since 2014 head of solar physics research at the Institute. DSc (1991), corresponding member RAS in astrophysics (2000), chairman of Solar Instruments Group, member of the Solar Physics group of the RAS Space Council, member of the United Scientific Council of Siberian Dep. RAS on Physical Sciences, the International Astronomical Union.

V.M. Grigoriev's research relates to astrophysics, solar physics and astrophysical instrument engineering. Author of more than 250 scientific papers, including the international monograph "Solar Interior and Atmosphere" and 13 inventor's certificates. Obtained new quantitative and qualitative characteristics of a general magnetic field of the Sun and its large-scale structure, was the first to measure a magnetic field vector in solar polar regions. Proved the emergence of a magnetic flux tube on the solar surface through direct measurements of a magnetic field vector upon the appearance of a new active region. Revealed a toroidal convection cell around a sunspot and showed its role in the structural stability of the sunspot magnetic field.

V.M. Grigoriev introduced the concept of "the crossover effect in sunspot spectrum" into solar physics detected in 1970. Developed the theory of the formation of magnetoactive absorption lines in a medium with velocity gradient. The theory explained the asymmetry of Stokes parameters, crossover effect, and integral circular polarization in the spectrum of sunspots.

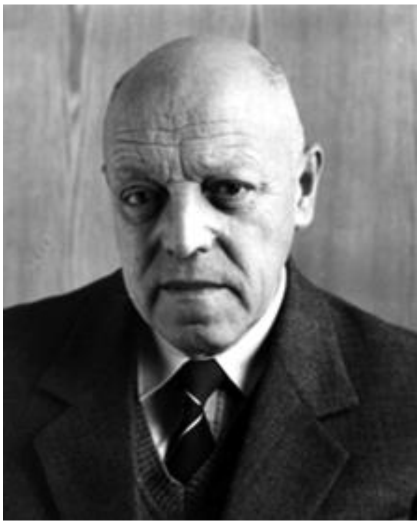
In his research field, he offered ideas for new methods of measurements, developed and led the design of new instruments and telescopes for astrophysical experiments, with some having inventor's certificates and patents. For the first time, a problem-oriented telescope was designed to study general solar characteristics such as the magnetic field of the Sun as a star, the distribution of background magnetic fields and radial velocities, global solar pulsations, and differential rotation.

In 1992, V.M. Grigoriev proposed a space stereoscopic experiment to observe the three-dimensional structure of the solar atmosphere. A design-project of the solar stereoscopic observatory was developed as part of the Federal Space Program.

For more than 25 years, V.M. Grigoriev has been a Research Supervisor of the ISTP SB RAS Baikal Astrophysical Observatory and the Sayan Solar Observatory. Between 1990 and 2014, he led work on the design of the Astrophysical Observation Complex of the Sayan Solar Observatory and led the construction of the first Russian infrared telescope and a wide-angle telescope for fast sky survey. In 2014, the Astrophysical Observation Complex was put into operation.

Awards: the Order of Honor (2006), the Order "For Merit to the Fatherland" 2nd class (1999), "Veteran of Labor" (1988), Certificates of Honor from the Russian President (2014), RAS, SB RAS, 1985, the honorary title "Honored Veteran of the SB RAS" (1985).

GRINGAUZ Constantine Iosifovich



Born 05.07.1918 in Tula. In 1941 – graduated from Electrotechnical Inst. in Leningrad, combining with the work as an engineer in the factories of NKEP. In 1945 – 50 – sen.eng., jun.sci., sen.sci. in Res. Inst. 20, where postgraduated and received Ph.D. on ionospheric influence on radio wave propagation (1949). In 1950 – 59 – sen.sci., head of lab. in p/b 2427. The pioneer of in-situ studies of interplanetary and near -planetary plasma. In 1959 – 71 – head of lab., head of dep. in RTI RAS. In 1971 – 93 – head of dep., head of lab., chief scientist in IKI RAS. Prof. Dr of Tech. Sci.. Died 10.06.1993 in Moscow.

Gringauz team began in-situ studies of near planetary plasma by radiophysical methods in 1954 with the launches of geophysical rockets. This team designed and manufactured the 'beep-beep' transmitter, which telemetered information about the temperature and pressure inside the first Earth's orbiter – Sputnik 1 (1957). In 1958, the radio physical measurements of the electron density in the ionosphere were first carried out above the F2 layer maximum, which discovered that, contrary to the then existing ideas the electron density does not decrease rapidly above the maximum of the F2 layer. These results were confirmed in the same year by the measurements of ~ 10000 ion spectra with specially designed ion traps for charged particles installed on Sputnik 3. The ion trap technique was further developed for the experiments on the first interplanetary spacecraft Luna 1, 2, 3 and Venera 1. In those experiments solar wind was discovered, its flux was measured, and previously unknown boundary of the Earth's cold plasma region – plasmapause – was revealed. The detached bow shock wave in the solar wind, which is formed by its interaction with Venus, was discovered in experiments on the spacecraft Venera-4 (1967) just one day before its intersection by US spacecraft Mariner 5; in 1969, successive plasma measurements on the spacecraft Venera-6 (1969) confirmed the bow shock existence.

In the plasma experiments aboard the satellites of the “Prognoz” series, a plasma “hot” zone was revealed on the periphery of the plasmasphere, and its asymmetry in the noon-midnight direction during geomagnetic quiet periods was found (1972-77).

The team led by prof. K.I. Gringauz (since 1970) has made a significant contribution to the discovery of the Martian magnetosphere (Mars 2,3,5, 1971-73; Phobos 2, 1989), found the main ionization source in mysterious till that time nighttime ionosphere of Venus. The crowning achievements of the scientific career of K.I. Gringauz were plasma experiments on the mission Vega 1,2 to Halley's comet (1986). Cometary mass-loading bow shock was discovered, earlier unpredicted boundary in the cometary plasma – cometopause – was found, and for the first time ionized and neutral components of the cometary atmosphere were in-situ measured.

For a long time – Chairman of the Solar Wind and Interplanetary Magnetic Field Section of IAGA and IGC AS, member of the editorial board of the journal "Nuovo Cimento", vice-chairman of the COSPAR commission on space plasma, full member of the International Academy of Astronautics.

In recognition of his accomplishments in the field of space research laureate of Lenin (1960) and the State (1986) Awards Prof.. K.I. Gringauz was bestowed by three medals, by the Orders of Red Banner of Labor (1957) and the Badge of Honor (1975), by the International COSPAR medal "For outstanding contribution to space research" (1988). On July 1, 2013 the International Astronomical Union has adopted the name Gringauz to one of the craters of Mars southern hemisphere (20.7° S, 342.3° E, D = 73 km).

GRININ Vladimir Pavlovich

Born in 1943 in Stroilovo, Leningrad region. In 1966 graduated from the Leningrad State University as astronomer, and started work at the Crimean Astrophysical Observatory of The USSR Academy of Sciences. In the same year, started post-graduate studies under supervision of Prof V.V. Sobolev. Cand.Sci.(1972) («Radiative transfer in envelopes of variable stars»). Dr.Sci.(1986): «Radiative transfer and the light pressure in moving media». Since 2000, with Pulkovo Observatory. Head of Star-Formation Laboratory, Professor, Member of IAU and EAS, the Associate Editor of "Astrophysics" journal.

The main scientific interests are concentrated in the radiative transfer theory, non-stationary processes in stars and circumstellar disks, physics of young stars. For the first time, solved the problem of propagation of thermal perturbations in temperature stratified media with the account of perturbations of the media's optical properties. It was shown that the pulsed heating of the outer atmospheric layers in cool stars leads to short-duration decrease in their brightness because of the strong increase in gas opacity. Similar effects are observed in flares of UV Cet stars and on the Sun.

In 1977, together with V.V.Sobolev, for the first time concluded that the source of optical radiation of flares in the UV Ceti type stars was dense gas with a temperature of about 10^4 K, located between the chromosphere and the photosphere. Its heating is connected with the generation of high-energy charge particle beams (similarly to the solar flares). This point of view is presently conventional. In 1975, together with S.I.Grachev, showed that in the envelopes moving with the large negative velocity gradient (accretion, outflows with deceleration), non-local radiative interaction in the spectral line frequencies occurs. Obtained corresponding generalization of the Sobolev approximation. In the series of papers published in 1978-1980, showed that in envelopes with axially symmetric motions, the direction of the preferential propagation of photons in the line frequencies does not coincide with the direction of the radius-vector. As a result, a tangential component of the radiative force appears, which can coincide or not coincide with the direction of the medium rotation. In 1986, suggested a model of formation of blue radiation observed in deep minima of UX Ori-type stars. Showed that scattered light of protoplanetary disks was a source of this radiation. This model had a significant impact on understanding of the nature of the variability of these stars.

Authored over 180 scientific articles. Supervised 9 PhD theses.

grinin@gaoran.ru

GRISHCHUK Leonid Petrovich

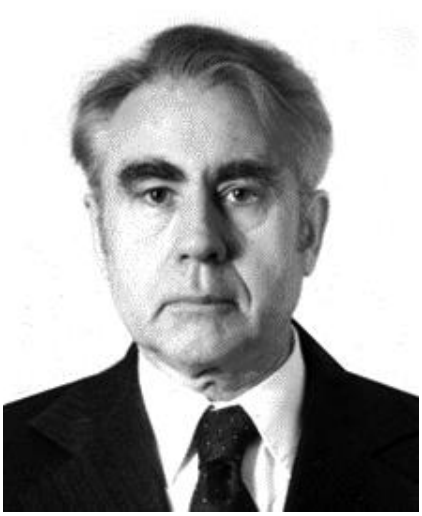
Born 16.08.1941 in Zhitomir (Ukraine). Grad. from Phys. Dep. of Moscow St. Univ. (1964). PhD thes.: "On problem of singularities in solutions to the Einstein equations" (1967). Sci. Hab. thes.: "Gravitational waves: their physical properties and astrophysical evidences" (1977). He had a constant position at the Sternberg Astronomical Inst. of Moscow St. Univ. from 1967; in 1987-1990 – the head of the Relativistic Astrophysics Group. Also he had positions: in 1990-1991 – Colorado Univ. (Boulder, USA); in 1992 – 1993 – Washington Univ. (St.-Louis, USA), from 1994 Prof. in Cardiff Univ. Died 13.09.2012 in Cardiff, UK.

The scientific field: theory of gravity, exact solutions to the Einstein equations, quantum gravity, generation and detection of cosmological and astrophysical gravitational waves. He is the author of more than 200 scientific works.

In PhD thes., the theorem on singularities in solutions to the Einstein equations with the dust matter on time-like hypersurfaces has been proved. In 1979, he has founded generation of gravitational waves as an inevitable process at earlier stages of the Universe expansion. He has shown that the gravitation wave equations are not conformally invariant, therefore the primary gravitons must be born in a huge number. He has founded the conception where the generation of cosmological perturbations in the earlier Universe is explained with the use of "squeezed" quantum states. He, together with his students, developed the field-theoretical formulation of general relativity on arbitrary curved backgrounds; elaborated modified theories with massive gravitons. He, together with V.A. Belinsky, I.M. Khalatnikov and Ya.B. Zeldovich, has proved that "inflation trajectories" in dynamical systems of gravitational and scalar fields are attracted in a framework of phase space.

Under supervision of L.P. Grishchuk more than ten PhD and Sci. Hab. thes. have been successfully defended. His former students are now leading scientists. His membership was in Editorial Board of journals: Soviet Physics Uspechi and Classical and Quantum Gravity; in many Scientific societies.

GRUSHINSKY Nikolay Panteleimonovich



Born 11.25.1915, Tambov. Graduated from the Faculty of Mechanics and Mathematics of Moscow State University in 1939. In 1939-1947 he worked at TsNIIGAiK. Candidate of Physical and Mathematical Sciences (1946). From 1948 he worked in the astronomical department of Moscow State University. Associate Professor at the Department of Gravimetry (1953). Head of Department of Gravimetry at Sternberg Astronomical Institute of MSU (1955-1972). Doctor of Physical and Mathematical Sciences (1964). Professor of the Faculty of Mechanics and Mathematics of Moscow State University (since 1964). Deputy Director for scientific work of SAI MSU (1960-1967). 1968-1970 – Deputy Vice-rector of Moscow State University for scientific work (1968-1970). Died 25.04.2001 in Moscow.

N.P. Grushinsky's main scientific interest lay in the theory of the figure of the earth. His doctoral dissertation "The gravitational field of the Earth and some conclusions about the structure of the earth's crust and the figure of the Earth" is devoted to this topic. Following this work, new coefficients were calculated in the formula of the Normal Earth. Numerous determinations of the gravity force on the Earth's surface accumulated over the previous years made it possible to obtain the desired coefficients with greater accuracy. Concerning the figure of the Earth, he found the asymmetry in the compression of the northern and southern hemispheres.

Working at TsNIIGAiK under the leadership of M.S. Molodensky, N.P. Grushinsky tested the first domestic gravimeters. During the Antarctic expedition, he measured the force of gravity at sea and on land in Antarctica. He eventually analyzed the gravitational field of Antarctica, built the first geoid of Antarctica and the adjacent seas, built the first models of the Earth's crust for the Antarctic region, made attempts to construct the gravitational fields of the Gondwana continents, and reconstruct Gondwana.

Within the framework of the opening of the IGY, N.P. Grushinsky, together with V.V. Fedynsky, created a new subdivision in SAI MSU called "Permanent marine gravimetric expedition" (1955). Nine long underwater expeditions and several trips to Antarctica were made owing to the new subdivision. He was also involved in the organization of science on an international scale. Member of the 2nd Soviet Antarctic Expedition (1956-1957). N.P. Grushinsky participated in the creation of a satellite observation station in Cairo (1962). In 1971, he worked at the University of Canberra in Australia. He led the UNESCO Project "Advanced Scientific Research in the Universities of India" (1972-1973). Adviser to the Rector of the University of Sant Jago de Cuba (Cuba) (1981).

N.P. Grushinsky wrote monographs "Theory of the figure of the Earth", "Gravitational studies" (co-authored with N.B. Sazhina), "Fundamentals of gravimetry", "Antarctica – an icy continent."

Author of more than 200 scientific works, including popular books "In the world of gravitational forces", "Through space to the knowledge of the bowels", "Antarctica" and others. N.P. Grushinsky was engaged in teaching for many years, conducted lecture courses "Higher geodesy", " Gravimetry", "Theory of the Earth's Figure".

GUBANOV Vadim Sergeevich

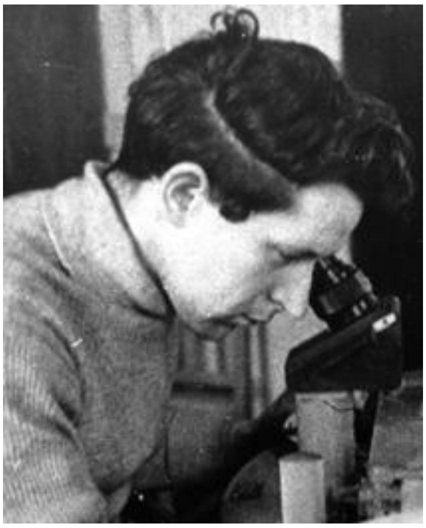
Born 20.07.1938 in Leningrad; graduated from the Leningrad State University Faculty of Mathematics and Mechanics (1963); post-graduated from its Department of Astronomy; worked in the Main Astronomical Observatory of the USSR Academy of Sciences in Pulkovo as a researcher, a head of the Radio Astrometry Laboratory; moved with his laboratory to the Leningrad Branch of Special Astrophysical Observatory (SAO) according to the Decree of the USSR Academy of Sciences Presidium (1986), then to the new Institute of Applied Astronomy (1988) where he was Chief Scientist. He was giving lectures to students of the University on various issues of astrometry and geodynamics for more than 30 years; became Doctor of Sciences in Physics and Mathematics (1991), Professor (1998) and Honoured Scientist of Russian Federation (2005); a Member of the IAA RAS Academic Council and Editorial Board of "The IAA RAS Transactions", the RAS Expert. Died 13.04.2021.

V. S. Gubanov's scientific interests lay in astrometry, space geodesy, geodynamics, problems of fundamental coordinate and time support, and mathematical methods for processing observations. He carried out regular positioning observations of stars at the Pulkovo Observatory using several astronomical instruments. He led the Soviet astronomical expedition to Chile in 1972 and 1973 to observe the right ascensions of stars in the southern sky. In total, he compiled three extensive star catalogs.

V.S. Gubanov is one of the pioneers in Russian radio astrometry and space geodesy. In the early 1980s, a geodynamic station was set up in Pulkovo under his guidance, where regular observations of satellites were made using the methods of laser ranging, radio interferometry and astrophotography. He proposed a method to synchronize clocks by satellite communication channels applying the VLBI technology and proved the effectiveness of mobile stations for VLBI observations of navigation satellites. But the most contribution V. S. Gubanov made to the development of the Quasar VLBI Network's scientific concept considering it to be the foundation of the fundamental coordinate and time support of the country. He became a co-author of Technical Proposals for Quasar Network, participated in choosing the sites for all the three observatories of this system, and in obtaining approval in numerous ministries and state departments of the USSR. In 1983, V.S. Gubanov published the monograph "Introduction to Radio Astrometry" together with A. M. Finkelstein and P.A. Friedman. He supervised a number of diploma and Ph.D. projects (eight Ph.D. theses were successfully completed under his supervision).

In the middle 1990s, V.S. Gubanov started developing new processing methods for VLBI observations where simulation patterns included stochastic signals caused by instability in atomic time scales and tropospheric delays. The results of these studies were published in his monograph "The Generalized Least Square Method. Theory and Application in Astrometry" (1997) and formed the basis of the QUASAR multifunctional software which was developed under his guidance. New important results were obtained from a number of internationally scheduled VLBI observations which were processed using this software. More precise reference coordinate systems and Earth orientation parameters were recorded, and some anomalous displacements of radio sources and ground stations were discovered. A new model of free nutation of the Earth's core with a variable period was constructed. High-precision parameters of solid Earth tides were obtained taking into account resonances and near diurnal variations of the Earth rotation parameters under the influence of ocean tides. The total number of V.S. Gubanov's publications is 160. He was awarded the Order of Honour (1999) and a few medals.

GULYAEV Albert Petrovich



Born 03.12.1927 in Elets. D. 30.03.1998 in Moscow. In 1953, graduated from the astronomy department, Faculty of Mechanics and Mathematics, Lomonosov Moscow State University (MSU). Since 1956, in the Sternberg Astronomical Institute (SAI) of the MSU. His PhD (1958) and D. Sci, (1989) dissertations were in the field of fundamental astrometry. Associated professor of the MSU Faculty of physics (1982–1988); since 1994, MSU professor in astrometry and celestial mechanics. Member of the International Astronomical Union since 1974. Member of the astrometry section of the Astronomical Council of the USSR Academy of Sciences. Died 30.03.1998 in Moscow.

G.'s main scientific research was in the field of fundamental astrometry. His teachers were S.N. Blazhko, M.S. Zverev, V.V. Podobed. In 1958, he defended his PhD dissertation "Determination of right ascensions for stars of the FK4 list in the polar region using the Moscow Observatory's meridian circle in 1953–1955". G. headed the SAI working group for investigation of the first Soviet-made meridian circle and observations with it. The resulting catalog of stars for photographic zenith telescopes turned out the most accurate among all Soviet meridian catalogs; this study was awarded a medal of the USSR Exhibition of Economic Achievements (EEA). G. suggested a new method for absolute determination of right ascensions, based on a group of circumpolar stars instead of distant terrestrial objects or polarissimas. In 1989, he successfully presented his D. Sci. dissertation "The circumpolar zone as a special region of right ascensions". Besides, G. finalized the general theory of rigorous referencing of relative determinations of coordinates, analyzed errors of the free chain method. His catalogs entered the FK5 fundamental catalog as its constituents. G.'s important scientific achievement is his analysis of the sequence of FK fundamental catalogs. His assumption that traditional fundamental catalogs were approaching the limits of their possibilities has been completely confirmed. G. participated in the works on the "Carte du Ciel" astrographic catalog. During his last years, he worked on the "Astrometric catalog of variable stars", coordinated the task group "A modern fundamental catalog" of the Astronomical Council (USSR Acad. Sci.). At the astronomy department of the MSU Faculty of physics, G. presented the lecture course "General astrometry", special courses "Fundamental astrometry" and "Modern astrometric catalogs". He is the author of the books "Fundamental star catalogs" (with P.I. Bakulin, 1980), "Differential star catalogs" (with L.M. Khommik, 1983). Awarded three EEA medals, three breastplates from the USSR Ministry of Higher Education.

GULYAEV Rudolf Alekseevich

Born 14.11.1934 in Izhevsk. In 1957, graduated in «Astronomy» from the Lomonosov Moscow State University. Since 1957 to present, has been working at the Pushkov Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation of the Russian Academy of Sciences in positions from the Junior Scientist to the Head of Laboratory. Ph.D. in Astrophysics (1964). In 1967-1968, he has completed general course of training in the Gagarin Cosmonaut Training Center as a fellow of the team of cosmonauts of the USSR Academy of Sciences. Member of IAU, EAS, ASTRO.

The main scientific interest of R.A. Gulyaev lay in the field of the physics of the solar atmosphere and interplanetary medium. He is the author of more than 100 scientific publications and the editor of few issues, the famous observer of solar eclipses.

In 1965-1966, the identity of chromospheric spicules in lines of different elements has been proved based on spectral observations with coronagraphs of IZMIRAN. It was not obvious formerly. In particular, the “helium” spicules were supposed to produce by the hot matter located in between the cold “hydrogen” spicules.

In 1972, an analysis of the spectral distribution of intensity in the He I recombination continuum based on data from the OSO-4 satellite has revealed the electron temperature of helium emission regions in the chromosphere to be near 12500 K. Such a low value is quite insufficient for the impact excitation of helium. Thus a serious argument has been obtained in favour of “cold” population of helium triplet levels through the photoionization with following recombination.

In the course of the total solar eclipse of 1973, cinematographic observations of the slitless coronal spectrum around the Fe X 6374 Å line have been carried out. An analysis of spectra have shown that the solar corona everywhere originates at very low heights (near 2000 km) above the photosphere, independently on brightness, morphological properties and heliographic latitude of a concrete region. It is a matter of common knowledge nowadays.

In 1978, the first observation of the spicule occultation by the Moon (similar to observations of star occultation) has been carried out during the partial solar eclipse. As a result, the brightness distribution across spicules and the true widths of individual spicules has been obtained. The observation was fulfilled in the light of Hα + 0.8 Å with the coronagraph of the Fessenkov Astrophysical Institute (in collaboration with A.K. and G.K.Ajmanov).

An unusual shape of the solar corona observed at the total solar eclipse in 1991 has stimulated a new analysis of relation between coronal shapes and the heliospheric current sheet (HCS) configuration. As a result, a concept of the “ Flat Solar Corona” as a base of the HCS has been developed. This concept allows a new interpretation of evolution of the corona shape during the solar activity cycle.

A new component of the coronal emission has been detected which is related with sublimation of the interplanetary dust near the Sun. This is the resonance emission of Ca II ions released in process of sublimation. The result was obtained through observations of the circumsolar space with the Fabre-Perot interferometer during the total solar eclipse in 1998 (in collaboration with P.V.Shcheglov). The result has been confirmed by observations during the next 3 eclipses.

Awards: Yu.A.Gagarin and S.P.Korolyov medals of the Federation of Cosmonautics of Russia, the sign «For the valiant labour».

GUSEV Alexander Sergeevich

Born 18.03.1973 in Lipetsk. Under– and postgraduate student (1990-1996), PhD student (1996-1999) on the Division of Astronomy of Faculty of Physics of Lomonosov Moscow State University. Researcher in the Institute of Solid State Physics of RAS (1999-2001), Kyungpook National University (2000-2001), Korean Astronomy Observatory (now is Korea Astronomy and Space Science Institute, 2001-2002). He has been working in Sternberg Astronomical Institute of Lomonosov Moscow State University since 2000. Dr. Habil. (2018), Leading Researcher (2019).

PhD thesis "Photometrical properties and a stellar population of galactic bars" (1999). Dr. Habil. thesis "Stellar population and the processes of modern star formation in galaxies" (2018).

Member of the European and Euro-Asian Astronomical and Russian Geographical Societies.

Specialist in the field of extragalactic astronomy. The main scientific works of A.S. Gusev are devoted to the morphology and stellar population content of galaxies, star formation regions and processes of modern star formation.

On the basis of an original method for estimating the stellar population content and the star formation history, he discovered a number of galaxies with the ordinary morphology with a secondary starburst.

Together with F.Kh. Sakhibov developed a method for searching, identifying and estimating the physical parameters of the stellar population of star formation regions in galaxies based on a combination of photometric and spectroscopic data. Based on the research results, a catalogue of 1510 star formation regions in 19 galaxies was compiled.

Using the example of the galaxy NGC 628, he found a united slope of the cumulative size distribution function of star formation regions on scales from 45 to 900 pc, witch is equal to the slope obtained earlier by B.G. Elmegreen et al. for scales of 2-100 pc. Thus, a united fractal dimension of young stellar groups was shown on scales from individual stars to stellar complexes – the largest regions of coherent star formation.

On the initiative of Yu.N. Efremov he is searching for and analyzing the spatial regularity of young stellar groups in the spiral arms and rings of galaxies. He was the first to discover the existence of regular chains of young stellar groups in the rings of galaxies. He also showed that the presence or absence of shock waves does not affect the formation of such spatial regularities.

He determined the characteristic time for establishing a stable atmosphere (3.5-4 hours after sunset, regardless of the season) at the Mt. Maidanak Observatory (Uzbekistan), which allows planning observations with a high angular resolution.

In the second half of the 1990s, on the initiative of Prof. A.V. Zasov he developed tasks for processing astronomical data using modern computer image data analysis systems for students of the Division of Astronomy of Lomonosov Moscow State University (together with D.V. Bizyaev and K.A. Postnov).

In the 2000s, he was one of the main Russian observers at the 1.5-m telescope AZT-22 of the Mt. Maidanak Observatory in Uzbekistan, where he performed observations on long-term monitoring of quasars, gravitational lenses and active galactic nuclei.

Author of over 60 scientific papers. As a renowned caves researcher, he has a number of publications, including one collective monograph, on the hydrology of karst massifs, morphology and morphometry of caves.

Personal page address on the Internet: http://lnfm1.sai.msu.ru/~gusev.

HAGEN-THORN Vladimir Alexandrovich

Born 12.01.1938 in Leningrad. In 1960, graduated from Leningrad University (LSU, now SPbSU) in astronomy. During 1959-1964, worked at Astronomical Observatory of LSU, first as a laboratory assistant, then as a senior engineer. In 1961-1965, external post-graduate student at the Astrophysical department. Since 1964, the official at the Astrophysical Department at Faculty of Mathematics and Mechanics of LSU: an assistant lecturer since 1964, assistant professor since 1974, professor since 1989, head of department since 2010. In 1998, defended his Ph.D. thesis "Polarimetric investigation of some galaxies and galactic nuclei". In 1986, defended his Dr.Sci. thesis "Polarimetric and photometric investigation of extragalactic objects". In 1991, he was conferred with the scientific title of Professor at the Astrophysical department. Member of IAU, several academic councils, and RAS committees.

V.A.Hagen-Thorn's field of research is observational extragalactic astrophysics. Author of more than 170 scientific papers.

In 1960s and beginning of 1970s, accomplished significant polarimetric observations of extragalactic objects. Showed that in some galaxies the origin of polarized radiation was due to the presence of dust in these galaxies. The first polarization survey of near-nuclear regions of Seyfert galaxies was carried out; it was found that the polarization was due to synchrotron nature of the radiation. The polarization variability was discovered. Special observations, accomplished with the aim to search for super-rapid variability, detected such variability in case of one blazar; this made it possible to limit the size of the radiation zone in optical wavelengths to about 10 AU. These studies contributed to a series of works "Polarimetric investigations of stars, nebulae and galaxies" (with V.A.Dombrovsky and O.S.Shulov) awarded by the Bredikhin prize of the USSR Academy of Sciences in 1974.

At the end of 1970s, with his colleagues, he initiated a program of detailed multicolor photometry of peculiar galaxies, mostly galaxies with polar rings. Later on, the program was supplemented by spectral and polarization observations which made it possible to investigate kinematics and stellar content of the rings. These results were used as an observational basis for identification of causes for emergence of these abnormal patterns.

Since mid-1980s, V.A.Hagen-Thorn's efforts were mainly directed to the investigation of variable sources responsible for activity of galactic nuclei. A method of separation of variable radiation sources from the total observed radiation was elaborated, and the synchrotron nature of these sources was confirmed. A joint examination of the polarization and photometric variability allowed to propose a phenomenological model of the active nucleus: the radiation of a permanent source with invariable parameters is summed with the radiation of variable sources with chaotically varying polarization and variable flux. In 1995, for a series of works "Variable sources in active galactic nuclei" V.A.Hagen-Thorn was awarded the First Prize of SPbSU for scientific research (with S.G.Marchenko and V.A.Jakovleva). Later on, scientific works were accomplished which contributed to construction of physical models of blazar jets.

IDELSON Naum Ilyich

Born on 13.03.1885 in St. Petersburg. In 1909 he graduated from the Physical and Mathematical and Legal Faculties of the Imperial St. Petersburg University. In 1909-1918 – assistant attorney and mathematics teacher in the secondary school. Since 1914 – a member of the Russian Astronomical Society and the Russian Society of Amateurs of World Studies, founded by N.A. Morozov. In 1918-1919 he was a researcher at the Astronomical Department of the Natural Science Institute named after P.F.Lesgaft. In 1919-1941 intermittently – a researcher of the State Computing Institute (from 1923 – Astronomical Institute, from 1943 – Institute of Theoretical Astronomy of the USSR Academy of Sciences). At the same time, in 1921-1926 – the head of the Petrograd (Leningrad) branch of the computing department of the Main (Pulkovo) observatory. Died 14.07.1951 in Leningrad.

Diversified scientific activity is associated with ephemeris astronomy, celestial mechanics, geodesy and gravimetry, cometary astronomy, the history of science. Author of 65 scientific and popular science articles, as well as numerous articles in the Astronomical Yearbook and Great Soviet Encyclopedia. He is the author of 6 books, 3 of which were published several times. Translator and editor of 10 books.

One of the organizers of the ephemeris service in the USSR and initiators of the creation of the Russian Astronomical Yearbook (since 1921), the Astronomical Yearbook of the USSR (since 1940) and the Marine Astronomical Yearbook (since 1929), published under his editorship. As a result of processing astrometric observations at the Pulkovo Observatory, more accurate values of some astronomical constants were obtained. He determined the elements of the orbits of several comets, predicted the circumstances of the appearance of comet Meshen-Tutl. He studied the figures of equilibrium of celestial bodies and the figure of the Earth. Numerous works on the history of science amaze with the depth of research. He wrote vivid biographies of Copernicus, Galileo, Newton, Laplace, Clerot, Lomonosov, Lobachevsky as well as short essays on W. Le Verrier, J. Darwin, M.A. Vil'ev, G.N. Neuymina, A.N. Krylov.

From 1926 until his death he taught at the Leningrad State University (from 1933 – as professor). In 1941-1943, in evacuation in Kazan, he worked at the Institute of Theoretical Geophysics of the USSR Academy of Sciences and the Kazan State University. Doctor of Physical and Mathematical Sciences (1936, without thesis defense).

In honor of N.I. Idelson were named asteroid 1403 Idelsonia (IAU) and the crater Idelson, 60 km wide and 3 km deep on the far side of the Moon (IAU, 1970).

IDLIS Grigory Moiseevich

Born 22.11.1928, Penza. In 1951 he graduated from Faculty of Physics and Mathematics of the Kazakh State University, in 1954 – postgraduate studies at the Astrophysical Institute of the Kazakh SSR (APHI). In 1954-1972 he worked at the APHI, from 1961 – deputy director and head of Department of Stellar Dynamics, since 1964 – director of the Institute, in parallel – Professor of the Department of Theoretical Physics at KazSU. Ph.D thesis defended in 1955 at the APHI, doctoral thesis – in 1964 at the SAI. Member of the IAU since 1952. In 1972-2010 he worked at the Institute of the History of Natural Science and Technology of the Academy of Sciences USSR (later IHST RAS), since the late 1990s – Head of the Department of History of Physical and Mathematical Sciences, in parallel – professor of the Department of History of Science at the Russian State University for the Humanities. Died 29.03.2010 in Moscow.

While still in graduate school, he became involved in research work. He showed the inconsistency of the law of planetary distances by O.Yu. Schmidt, extending the law of planetary distances by V.G. Fesenkov for the case of regular satellites of planets (1952). Derived the probabilistic laws of the distribution of fragments, formed during the random crushing of solids, in terms of size and mass. He showed that the observational data of asteroids, meteorites and meteoric particles correspond to these laws (1953). Clarified the received P.P. Parenago's gravitational potential of the Galaxy and was the first to build two analytical models of the Galaxy (1954) – spherical and flat – now known as "Idlis models". He showed that in a structurally infinite Universe the gravitational cosmological paradox of G. Zeeliger is eliminated when relativistic mass defects are taken into account (1956). He was the first to introduce into modern cosmology the anthropic principle, according to which the world we observe with all its characteristics stands out from all possible worlds, first of all, because it satisfies the necessary and sufficient conditions for the emergence and development of life in it (1957, 1958). He proposed a method for determining the masses of galaxies based on the effect of a gravitational lens and for the first time, together with other researchers at the APHI, discovered this effect for a number of galaxies (1962). He owns the idea according to which quasi-closed macroworlds of the Metagalaxy type from the point of view of an external observer are equivalent to elementary particles (1965), the so-called “concept of macro-microsymmetry”.

As a historian of science in the early 1980s, he considered four global natural science revolutions in natural science – Aristotelian, Newtonian, Einstein's and Post-Einstein's. In the late 1980s, he came to the conclusion that there are four related periodic systems of structural elements of matter (similar to the periodic system of chemical elements of D.I. Mendeleev), corresponding to four levels of its self-organization: physical, chemical, biological and psychological. He studied the biographies of prominent theoretical physicists and showed that the cycles of their creative activity correlated with the cycles of solar activity, and the probability of an accidental coincidence turns out to be negligible. He has written a significant number of biographies of prominent Russian physicists and astronomers for a number of encyclopedic publications. Author of over 250 scientific works (including 8 monographs) on astronomy, astrophysics, cosmogony, cosmology, natural science and history of science.

In 2000-2010, he headed two academic publications: "Historical and Astronomical Research" (HAR) and "Research on the History of Physics and Mechanics" (HPPM).

IKHSANOV Nazar Robertovich

Born 14.01.1964 in Leningrad. In 1986 graduated from the Leningrad State University (presently SPbSU, Saint-Petersburg). Since 1986 has been employed by the Central (Pulkovo) astro-nomical observatory of RAS at different positions from PhD stu-dent to Director (since 2016). Visiting scientist at the Special astrophysical observatory (1990-1993) and Korea astronomy and space science institute (2004-2005). Alexander von Humboldt fellow at the LMU and MPIfR (Germany), Maria Curie fellow at the IoA of Cambridge University (UK) and NPP fellow at the Marshall Space Flight Center (USA). Doctor of Sciences (2008). A member of IAU (since 2009). Professor of Astrophysical Department of the Saint Petersburg State University (since 2013).

Key scientific interests are in the fields of magneto-rotational evolution of compact stars (white dwarfs and neutron stars) in close binary systems, plasma astrophysics and processes of generation of high-energy emission. He is the author of more than 100 scientific publications and co-author of two books.

A cycle of publications by Ikhsanov is devoted to the investigation of properties of the peculiar nova-like cataclysmic variable AE Aquarii, on example of which the origin and evolution of fast rotating magnetic white dwarfs have been studied.

In collaboration with L.A. Pustil'nik and N.G. Beskrovnaya he constructed a new scenario of accretion by a neutron star from a magnetized gaseous medium (a so called magnetic levitation accretion).

IKHSANOV Robert Nazifovich

Born on 05.08.1930 in the town of Birsk (Bashkir ASSR). In 1953 graduated from the Leningrad State University (now SPbGU, Saint Petersburg) with a degree in astronomy. Since 1959, after post-graduate school at the Crimean Astrophysical Observatory, has been working at the Central Astronomical Observatory at Pulkovo at different positions from the junior to leading researcher, was the Head of Sector and Department of Solar Physics. Doctor of physical-mathematical sciences (1977), member of IAU (since 1967). Died 30.11.2020 in St. Petersburg.

Main scientific interests are in the field of solar physics and astrophysics of stars and nebulae. Author of more than 170 scientific papers, co-author of a book.

In 1960 R.N.Ikhsanov constructed the diagram of shared evolution of early-type stars in open clusters and expanding nebulae determining two evolutionary tracks: 1) for individual clusters; and 2) for the Galaxy.

Further studies of R.N.Ikhsanov were focused on the structure and evolution of sunspots. In 1964 he suggested that the divergent motions observed in bipolar groups could be explained by the rise of magnetic field from under the photosphere (with the average velocity of 115±30 m/s) while an increase of both the magnetic field strength and the sunspot area is determined by the growth of vertical field component in the magnetic flux rope as it floats up.

In 1966, in collaboration with the leading constructor Yu.P.Platonov, R.N.Ikhsanov created the six-channel solar magnetograph of the Pulkovo observatory.

Analyzing the images obtained at the Stratospheric Solar Observatory, he suggested the hierarchy system of magnetic flux ropes scales with the minimum rope diameter of ~1000 км, explaining the observed fine structure of the umbra and penumbra of a sunspot. Later on this system of scales has been included into the general system of scales revealed on the solar surface (1975).

In early 1980s R.N.Ikhsanov suggested the dynamical classification of the sunspot groups with respect to the type of spatial interaction of the rising magnetic complexes and showed that the most powerful flares, in particular, the proton flares are associated with classes I, II and III of the proposed classification in correspondence with three types of δ-configurations.

In collaboration with Yu.I.Vitinsky (1980s and 90s) and later on with V.G.Ivanov, R.N.Ikhsanov investigated peculiarities of solar rotation at certain phases of 11-year cycles and their dependence on the prevailing type of magnetic field configuration.

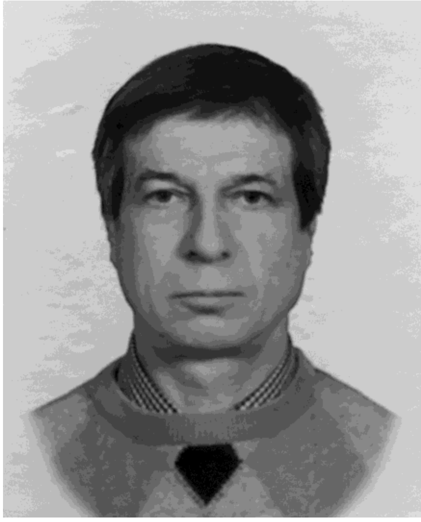
IKHSANOVA Vera Nikolaevna

Born 19.09.1929 in Rostov-on-Don. In 1953 graduated from The Leningrad State University (now, the St.-Petersburg State University). In 1959-1987, she was affiliated in the Central (Pulkovo) Astronomical Observatory of the USSR Academy of Sciences (now, The Central Astronomical Observatory of RAS) at the positions of PhD Student (Supervisor Prof. S.I. Khaikin), Junior Researcher and Senior Researcher. PhD (1959), Member of IAU (1964).

Basic studies refer to solar physics, radio-astronomy and history of astronomy. Authored or co-authored more than 100 publications, including a book and a number of astronomical dictionaries.

Vera Ikhsanova was involved into creation of the Big Pulkovo Radiotelescope (BPR, a 110 m prototype of RATAN-600) and performed the first solar observations with this telescope at 3.2cm. She got her PhD in 1959, it was the first PhD on radio astronomy in Pulkovo Observatory. Thanks to the high spatial resolution of the radio telescope, the sources of the sporadic solar radio emission were resolved and associated with active regions on the Sun. She initiated and conducted the Space Weather Alerts Program based on everyday radio observations of the Sun with BPR. In collaboration with O.A. Golubchina she proposed and realized a method of quasi-regular guiding in solar observations with RATAN-600

ILLARIONOV Andrey Fedorovich

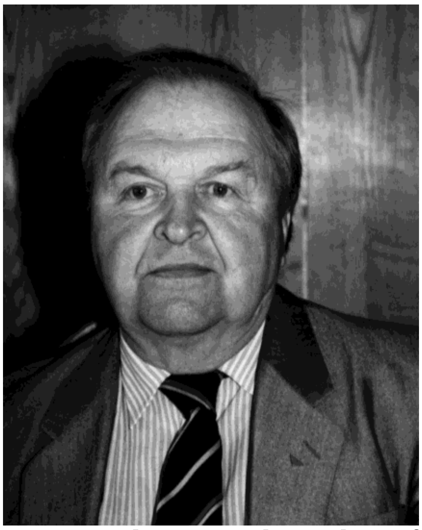


Born 23.01.1947 in Moscow. In 1965-1971 he studied at Moscow Institute of Physics and Technology, at the Faculty of General and Applied physics, with specialization in theoretical physics. After his graduation he worked in Keldysh Institute of Applied Mathematics in research group led by Ya. B. Zeldovich till 1977. Starting from 1977 until 1990 he worked in Space Research Institute of the Academy of Sciences of Soviet Union. Later, from 1990 to 2017, he was a member of the theoretical astrophysics department at AstroSpace Centre of P.N. Lebedev Physical Institute from 1990 till 2017. He got his PhD in 1974 and the degree of Doctor of Sciences in 2002.

Andrei Illarionov's main research works belong to the field of theoretical astrophysics. He is an outstanding expert in the theory of gas accretion and radiative transfer in astrophysical objects.

He has proposed a number of qualitatively new astrophysical effects. In the very beginning of his research career he contributed to the analytical studies of the process that later became known as «Zeldovich-Sunyaev effect». Together with Ya. B. Zeldovich and R. A. Sunyaev he developed a theory of spectral distortions of thermal radiation (including cosmic microwave background) due to Compton effect in 1972-1975. In 1975, together with R. A. Sunyaev, he proposed the well-known “propeller effect” in accreting neutron stars. Together with T. Kallman, R. McCray and R. Ross, in 1979 he found an exact solution for the spectral evolution of X-rays emitted by a monochromatic source and Compton scattered in an infinite homogenous medium. In 1980 г. A. F. Illarionov and C. Alcock developed a theory of diffusion of heavy elements in envelopes of white dwarfs. In 1987 he proposed a statistical theory of angular momentum of gas lost by stars of a slowly rotating stellar cluster. In 1990 he and D. A. Kompaneets put forward a new mechanism of spinning down of an accreting neutron star by gas outflows forming due to Compton heating and in 1993 he, I. V. Igumenshchev and D. A. Kompaneets showed that powerful outflows can also be formed during quasi-spherical accretion onto a source of X-rays. In 1996 he and J. Krolik pointed out that photon-photon absorption does not necessarily suppress the escape of gamma-rays from a compact source. In 1997 he and P. B. Ivanov showed that a stationary twisted accretion disc with a small constant α parameter around a Kerr black hole does not necessarily align with its equatorial plane (a statement known as «Bardeen-Peterson effect») and, instead, the disc could have an oscillating shape. In 1998 he and I. V. Igumenshchev proposed a theory of thermal instability of an optically thin plasma. In 1999 he and M. A. Chernyakova calculated a spectrum of gamma rays originating in a binary system with a pulsar. In 1999-2001 he together with M. A. Abramowicz, A. M. Beloborodov and I. V. Igumenshchev proposed a theory of accretion of low angular momentum gas onto a compact source of X-rays. A. F. Illarionov also contributed to studies of other astrophysical processes, including processes in nuclear stellar clusters, cosmology, tidal disruption of stars by black holes, and heavy element ionization in hot plasmas.

ILYASOV Yuri Petrovich



Born 24.10.1933 (Omsk). He graduated from the Radio Engineering Faculty of Moscow Power Engineering Institute in 1957. In the same year, he started work at the newly created Radio-Astronomical Station LPI (now – PRAO ASC LPI). He worked in the PRAO ASC LPI for 53 years. In the last years of his life he held the position of Head of Pulsar Astrometry Department. The disserta-tion for the degree of Candidate of technical Sciences on the topic: "The DKR-1000 wideband radio telescope (East-West antenna) of the LPI" (1970). Doctor of Technical Sciences (the dissertation "Meter wave radio telescopes of the LPI" in 1999). Professor. Died 08.10.2010 in Pushchino (Moscow region).

Yu.P. Ilyasov is the author of about 120 scientific papers, co-author of two monographs, and co – author of two monographs on radio astronomy translated into Russian.

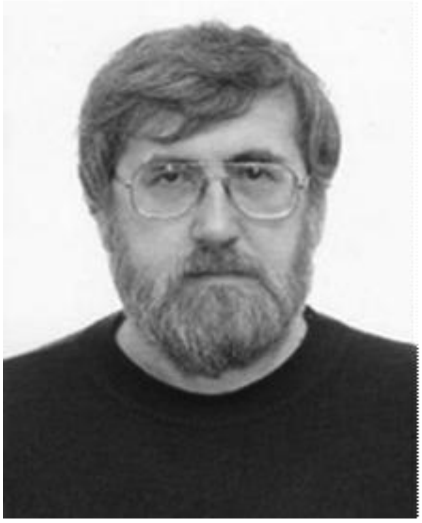
The main direction of the work of Yu. P. Ilyasov was the creation and technical support of the experi-mental base of the PRAO ASC LPI. He led the development and creation of the dipole-feeder system of the Wide-band Cross-type Radio Telescope (DKR-1000), the development and construction of antennas for measuring the solar wind speed in the area of the cities of Pereslavl-Zalessky (Yaroslavl region) and Staritsa (Kalinin Region). In the antenna group headed by him, a mobile antenna was developed for the remote point of the radio interfer-ometer with radio-relay, operating at a wave of 3.5 m. He took an active part in the completion of the work on the creation of the most sensitive meter-band radio telescope in the world – the Large Phased Array antenna (BSA) of the LPI.

In the late 1970s, Yu. P. Ilyasov, together with a number of employees of the PRAO ASC LPI and VNI-IFTRI, proposed a pulsar time scale. Work in the direction of its implementation was further developed in the cre-ation of a complex for precision timing of pulsars at the PRO ASC FIAN and at one of the largest instrument com-plexes in Russia at RT-64 in Kalyazin, where the only observations of this kind in Russia were successfully car-ried out. Around a completely new topic at that time, high-precision timing of pulsars, he gathered a team of a new laboratory, and later the Department of Pulsar Astrometry.

For many years, Y. P. Ilyasov participated in the work of the Council for Radio Astronomy of the USSR Academy of Sciences as the deputy chairman of the antenna section, and later was the chairman of the section "Radio Telescopes and Methods" of the Council for Astronomy of the Russian Academy of Sciences.

At Moscow State University, as a professor of the Department of Celestial Mechanics, Astrometry and Gravimetry, he taught a special course "Pulsar Astrometry".

IL'IN Vladimir Borisovich



Born 29.08.1955 in Novocherkassk. Graduated from Leningrad State University in astronomy in 1977. Since then, worked in different positions, from a laboratory assistant to the head of a laboratory at Astronomical Observatory of St. Petersburg University (now V. V. Sobolev Astronomical Institute). At the beginning of the 1990s, also worked at Fr. Schiller University (Jena). Humboldt Research Fellowship (1994). Since 2009, Professor of Department of Astrophysics at St. Petersburg University, Professor at SPb Univ. of Aerospace Instrumentation, and leading researcher at Pulkovo Observatory. Dr. Sci. (2007), Professor (2013), member of IAU.

V.B. Il'in's research interests are in the fields of astrophysics and mathematical physics. He is the author and coauthor of over 120 scientific publications, including 6 monographs.

At the end of the 1970s, together with V.V.Ivanov, initiated stellar structure and evolution research at Leningrad State University. At the beginning of the 1980s, together with N.V.Voshchinnikov, developed the theory of non-spherical dust grain motion. They proved the importance of the non-radial component of the radiation pressure force, in comparison with the Poynting-Robertson effect, and discovered effects of the particle shape on the dust grain charge and dynamics.

Since the mid-1980s, studied the extinction and scattering of radiation by cosmic dust in various astronomical objects. At the end of the 1990s, managed the creation of the Jena-Petersburg Database on Optical Constants for astronomy (JPDOC, now HJPDOC at the website of MPIfA, Heidelberg).

Since the beginning of the 2000s, in collaboration with V.G.Farafonov, developed new exact and approximate methods in the theory of light scattering by non-spherical particles, and mathematically investigated the applicability ranges of various popular methods of this theory. Among the obtained results, there is a new approximation of uniform internal field, a solution to the problem of light scattering by multi-layered particles, and a formal condition of applicability of the well-known Waterman method. Since the mid-2000s, together with N.V.Voshchinnikov and Th. Henning developed a model of cosmic dust as non-spherical inhomogeneous particles. Using this model, they explained the excess mid-infrared extinction observed towards the Galactic center.

He was awarded the St.Petersburg University Prize of 2011 (together with N.V.Voshchinnikov) for a series of works on the optics of small particles and the physics of cosmic dust.

IMSHENNIK Vladimir Sergeevich

Born 27.09.1928 in Debaltsevo. Graduated from M.V. Lomonosov Moscow State University, Physics Department. Participant of the World War II. Until now, he has been working at Alikhanov's ITEP and at Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences. Doctor of Physical and Mathematical Sciences, Professor. In 1975 he was awarded the Badge of Honor order. In 1982 he became a laureate of the State Prize of USSR. In 2001 he was awarded the Sakharov's Gold Medal of the Russian Academy of Sciences. In 2007 he received the Struve medal of the Pulkovo Astronomical Observatory of the Russian Academy of Sciences. In 2003 he was elected a corresponding member of the Russian Academy of Sciences. Honorary Professor of ITEP. Member of the International Astronomical Union.

After graduating from university, V.S. Imshennik was assigned to work on the Soviet thermonuclear weapon project. He started his professional career in Obninsk under the leadership of D. Blokhintsev and then moved to work in Chelyabinsk (Snezhinsk). While working on the project, he was fortunate enough to collaborate with such outstanding scientists as Ya. Zel'dovich, D. Frank-Kamenetsky, and A. Sakharov.

Since the early 1960s, he worked at the Institute of Applied Mathematics of the USSR Academy of Sciences and researched the structure of collisional shock waves in plasma, the theory of radiative transfer in moving media, as well as MHD cumulative processes in plasma. In particular, he worked on numerical simulations of plasma focus and Z-pinch plasma dynamics that were unique for those times. These simulations and two-dimensional magnetohydrodynamic simulations were performed within the framework of the Vlasov kinetic equations. The pioneering work done in this period had established the basis for modern computational plasma physics. It continues to inspire new ideas and suggest new lines of theoretical research.

At the same time, together with his colleagues and students, V.S. Imshennik conducted research on hydrodynamic processes and neutrino transport in stars, which laid the foundations for the hydrodynamic theory of supernova light curves (1964 – 1971) and the burst of neutrino radiation accompanying stellar core-collapse (1969 – 1978). He also established the basis for a new area of theoretical physics – neutrino hydrodynamics.

Observations of the nearby supernova SN 1987A, which exploded on February 23, 1987, in the Large Magellanic Cloud, brilliantly confirmed the theory. Underground neutrino detectors observed a neutrino burst with integral parameters close to those obtained in numerical simulations. V.S. Imshennik, together with his colleagues, developed a rotational mechanism for supernova explosion capable of describing all the features of this peculiar supernova.

Some of the scientific results obtained by V.S. Imshennik and his colleagues were published in two monographs “Radiative relativistic gas dynamics of high-temperature phenomena”, Atomizdat, Moscow, 1981 (co-authored with Yu. Morozov) and “Dynamics of collisional plasma”, Energoatomizdat, Moscow, 1997 (co-authored with N. Bobrova).

V.S. Imshennik's results in the field of magnetohydrodynamics of cosmic plasma were applied to the theory of solar flares. They entered the series of works under the leadership of S. Syrovatsky, which was awarded the State Prize in 1982.

INOGAMOV Nail Alimovich

Born 28.01.1951 in Tashkent. In 1968 he graduated from the mathematical school #110 with a silver medal. Graduated from the Moscow Institute of Physics and Technology (MIPT) in 1974. Since 1977, after completing his postgraduate studies at the Moscow Institute of Physics and Technology and defending his Ph.D. thesis in ITP in 1977 (supervisor S.I. Anisimov, corresponding member of the Russian Academy of Sciences), he constantly works at the L.D. Landau Institute for Theoretical Physics (ITP) of the Russian Academy of Sciences (RAS) at various scientific positions. Habilitation (1990), corresponding member RAS by Branch of Phys. Sciences in the specialty "Physics" (2019). For the history of works and the current state of publications, see https://www.itp.ac.ru/ru/persons/inogamov-nail-alimovich/

Scientific achievements in the field of astrophysics are associated with joint work with Academician R.A. Sunyaev and his group and with work on the preparation and subsequent analysis of the results of the flight of the Soviet space mission "Vega" to Venus and Halley's comet. Investigated the contact of the accretion disk with a neutron star (jointly with RA Sunyaev). It is shown that the accreting disk material forms a spreading layer (belt) over the stellar surface. In this belt, the radial velocity component in the disk before contact changes to the velocity component directed towards the star's pole. Of course, at high velocities of azimuthal rotation both in the disk and in the spreading belt. As it spreads to the pole, the rotation speed decreases due to turbulent friction against the star's surface.

Described the broadening of X-ray lines due to hydrodynamic turbulence of hot X-ray emitting gas in a cluster of galaxies (with R. A. Sunyaev). This work is relevant, since the energy resolution of existing and planned missions with X-ray spectrometers has reached a sensitivity of several eV. With such resolutions, it is possible to determine the speeds of turbulent motions from the line shape.

He studied the accretion onto a supermassive black hole (SMBH) in an elliptical galaxy of a turbulent gas, weakly rotating at the radius (R_B) Bondi (together with Sunyaev R.A.). Discovered the existence of a toroidal seal at a radius R_T less than R_B. The ratio R_T / R_B is the smaller, the smaller is the ratio of the angular velocity of the gas at R_B to the Keplerian velocity at R_B. In the torus, the settling stream is divided and the internal (D_in) and external (inverse D_out) disks are formed. Accretion on the SMBH is proceeding along D_in. Accretion is the source of SMBH activity. The angular momentum of the accreting material is removed thanks to the D_out. Moving outward along D_out, the substance is cooled to a dusty state and is thrown out beyond the radius R_B, thus forming dust cloud around the active galactic nucleus. The orientation of the planes of the disks D_in and D_out changes in accordance with the vector of the angular momentum of the turbulent gas arriving at the radius R_B. Estimates of the disk turn time are given, based on the theory of Kolmogorov turbulence in the gas of a galaxy far from R_B.

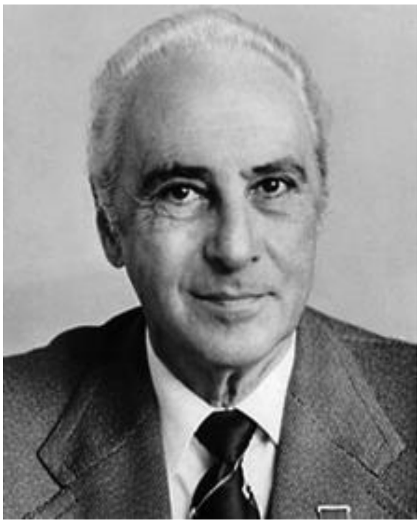
Developed a relativistic hydrodynamic approach to describing sound waves in the early Universe (jointly with R.A. Sunyaev).

Described the operation of the mass spectrometer – the main instrument of the international space stations Vega and Giotto, which flew through the coma of Halley's comet in 1986. Mass spectra found traces of organic matter in cometary dust.

A number of works on the physics of interaction of lasers with matter, on hydrodynamics and turbulence.

nailinogamov@gmail.com

IOANNISIANI Bagrat Konstantinovich



Born 23.10.1911 in Yerevan]. From 1930, worked at the Leningrad Machine-Building Plant "Krasnaya Zarya". In 1936, started to work at the State Optical and Mechanical Plant (now LOMO). From 1945—the Leading Engineer of the State Optical Institute. During 1954—1960, also worked in the Pulkovo Observatory, where in collaboration with D.D. Maksutov he began to work on implementation of meniscus systems into astronomy. Died 10.12.1985 in Leningrad.

Bagrat K. Ioannisiani is the author of a number of designs of the most important astronomical instruments in the country.

In 1936, he began to work in the optical workshop of the State Optical and Mechanical Plant (SOMP) to create astronomical instruments and in 1938 presented his first independent project—calculation of an optical scheme and installation of a school telescope.

During the Great Patriotic War, he was evacuated to Kazan, where he was engaged in the development of optical instruments for military purposes. After the Victory, being the leading designer of the Vavilov State Optical Institute, he returned to the creation of astronomical instruments .

Even his first developments made in the 1940s, the nebular spectrograph and the telescope-spectrograph with a lens diameter of 0.25 m, were distinguished by the original design. The next stage was building the first telescope of the Maksutov system with a mirror diameter of 0.66 m.

He developed the ASI-1 nebular spectrograph (1949), the ASI-2 meniscus telescope with a diameter of 500 mm (1950), a series of original though small-sized instruments (the ASI-4 mirror-lens camera, the reflective telescope with the ASI-5 slitless quartz spectrograph, the AC-31 slitless meniscus diffractive lens spectrograph), and also (in collaboration with Maksutov) mounted one of the world's largest meniscus telescopes AS-32 with an automatic control system (with a telescope aperture of 700 mm and a diameter of the main mirror of 975 mm) in the Abastuman observatory. During 1954-1960, he also worked at the Pulkovo Observatory, where in collaboration with D.D. Maksutov began to work on implementation of meniscus systems in astronomy.

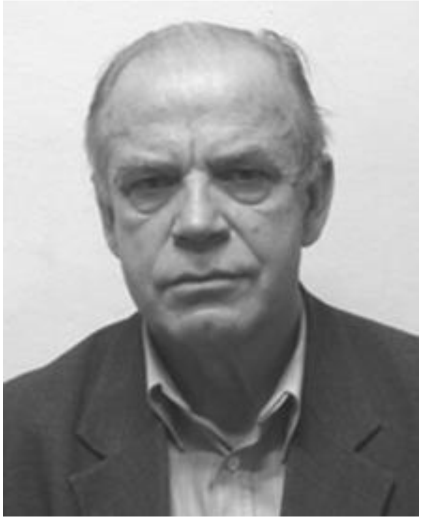
In 1957, he returned to SOMP and was appointed to a position of the Head of the Special Engineering Bureau. He was the leading engineer in the development of the Shain reflector (ZTSh) with a diameter of the main mirror of 2.6 m.

The experience he gained while creating the ZTSh was successfully applied in the process of working on a new project—the world's largest telescope BTA. When developing the design of this reflector, they managed to abandon conventional schemes, so, the principle of telescope guidance on the object in the alt-azimuth coordinate system was applied for the first time for a large optical telescope. Currently, this type of mounting is standard for telescopes with a large diameter of the main mirror.

The Academy of Sciences of the USSR awarded Bagrat K. Ioannisiani the degree of Doctor of Technical Sciences without defense of a thesis despite the absence of not only the academic degree but also higher education.

Laureate of the Lenin Prize (1957), Hero of Socialist Labour (1977). He was awarded the Order of the Badge of Honour (1945) and three Orders of Lenin (1961, 1972, and 1977). A small planet (2450 Ioannisiani) is named in his honour.

IPATOV Alexander Vasilievich



Born 14.04.1945 in the Kirova village, Rogachev district, Gomel Region, Belarus; graduated from the Leningrad Polytechnical Institute (1970); worked at the Special Astrophysical Observatory of the USSR Academy of Sciences (from 1970 to 1988) where he started as Engineer and worked up to the position of Head of Laboratory; at the Institute of Applied Astronomy of the USSR Academy of Sciences (now RAS) works as Deputy Director (from 1988), then Director (from 2011) then Scientific Supervisor. He is Doctor of Technical Sciences (1997), the Professor in Astrophysics (2005), a winner of the Russian Federation Government's Award in Science and Technology (2004), RAS and Ukrainian National Academy of Sciences Award (2012), a holder of the Government's Medals "For the Labour Valour" (1978), "The Veteran of Labour" (1990) and "The Medal of Honour" (1999).

A.V. Ipatov is a Soviet and Russian astronomer. The main fields of his scientific activity are observational radio astronomy and radio interferometry. He is also involved in the research and development of radio astronomical systems for fundamental and applied studies. He has solved the problem of increasing accuracy in determining angular coordinates of space objects (quasars, spacecraft in outer space, etc.) and observational stations on the Earth by means of increasing sensitivity of radio telescope receivers, radio interferometers and VLBI systems. Russian automatic systems to strengthen, transform, register and analyze signals in radio interferometry have been designed and developed under the guidance of A.V. Ipatov so that they demonstrate better parameters than foreign analogs.

A.V. Ipatov has been taking an active part in the development of the Russian Quasar VLBI Network since 1980. He is among the main authors of its scientific concept. He formulated technical requirements to the network's equipment, found technical solutions to build it, and realized them in practice. It was due to his personal participation that the Quasar radio telescopes were constructed and put into operation within the international VLBI network.

Being Director of IAA RAS since 2011, A.V. Ipatov has also devoted himself to developing and upgrading the Quasar VLBI Network to be able to solve such fundamental and applied problems, in particular, to provide the GLONASS satellite system with high-precision data. As a result, Quasar VLBI Network has turned into a system of geodynamic stations of the international level, equipped with the most high-precision tools for such space geodesy-based observations as VLBI, SLR and GPS/GLONASS.

A.V. Ipatov shares his extensive experience and scientific ideas with young specialists. He is the head of the department "Radio Astronomy" of the St. Petersburg State Electrotechnical University and the head of the department "Applied Radio Astronomy" of the Peter the Great St. Petersburg Polytechnic University.

A.V. Ipatov is the Vice Chairperson of the RAS Scientific Council on the Problem "Positioning, Navigation and Time Support", a Member of the RAS Scientific Councils on Space; Chief Engineering Designer for the System for the GLONASS Fundamental Support; a Member of the International Astronomical Union and the International Telecommunication Union, a Board Member of the European VLBI Network (EVN) and the International VLBI Service for Astrometry and Geodesy.

A.V. Ipatov is the author of about 400 scientific works including 2 manuals and 33 patents. Minor planet (32768) Alexandripatov is named in his honour.

IPATOV Sergey Ivanovich

Born 10.11.1952 in Moscow. Graduated from mech.-math. faculty of M.V. Lomonosov Moscow State Univ. in 1975. Worked at M.V. Keldysh Inst. of Applied Mathematics of RAS in 1975-2003, in the USA (in NASA, Carnegie Inst. for Science, Univ. of Maryland, Catholic Univ., George Mason Univ.) in 2001-2010, Qatar in 2011-2013, IKI RAN in 2011-2017. Since 2013 – at V.I. Vernadsky Inst. of Geochemistry and Analytical Chemistry of RAS. D. Sc. in phys. and math. sci. (1997). F.A. Bredikhin prize of RAS (2019).

Ipatov studied of the formation and evolution of the Solar System. Author of over 160 scientific papers, the monograph "Migration of celestial bodies in the Solar System" (URSS, 2000, 2021) and over 270 other publications on astronomy. His scientific leaders are T.M. Eneev and M. Ya. Marov.

In particular, in his paper published in 1991, i.e. a few years before foreign publications, in numerical calculations of migration of the embryos of Uranus and Neptune, Ipatov first obtained their migration from the initial distances not greater than 10 AU to the present orbits of these planets. Studies by S.I. Ipatov testify in favor of the possibility of formation of satellite systems of small bodies and embryos of the Earth and the Moon at the stage of rarefied condensations. On the basis of calculations of the orbital evolution of tens of thousands of bodies (planetesimals, comets, asteroids, trans-Neptunian objects) and dust particles, together with M.Ya. Marov, S.I. Ipatov studied the delivery of water and volatiles from various sources to the terrestrial planets. He also studied formation of Kirkwood gaps. Based on the comparison of the computer simulation results of migration of dust particles from different sources with observations (including observations of zodiacal dust spectra), S.I. Ipatov estimated the composition of the zodiacal cloud.

Analyzing photos of clouds of material ejected from Comet Tempel 1 after its collision with the impact module of the Deep Impact spacecraft, S.I. Ipatov studied variations in mass and velocity of ejected material over time and concluded that a cavity with dust and gas under pressure had been excavated after the impact. As a member of the Deep Impact team, S.I. Ipatov removed cosmic ray signatures on the images taken by space telescopes. For a few telescopes, S.I. Ipatov constructed models of sky brightness and compared the efficiency of several approaches for the search for extrasolar planets using microlensing method. Together with Alan Boss, Ipatov studied the dynamics of the processes of mixing and transport of matter in the protosolar cloud. Together with James Cho, he studied the radiative transfer in atmospheres of test extrasolar planets. S.I. Ipatov is a co-discoverer of 8 asteroids that got their numbers. In 1998 he delivered lectures at astron. department of MSU.

The main belt asteroid (14360) discovered by E. Elst in 1988 has been named Ipatov in honor of S.I. Ipatov. Website: https://siipatov.webnode.ru/

IVANCHIK Alexander Vladimirovich

Born 27.11.1971 in Leningrad. After graduating from school No. 286 (1989), he entered the Leningrad Polytechnic Institute, from which he graduated in 1995. Scientific development took place in the sector of theoretical astrophysics of the Physico-Technical Institute (FTI) of the Russian Academy of Sciences under the leadership of Academician D.A.Varshalovich. At the Physico-Technical Institute, he held positions from a student-trainee (since 1993) to a leading researcher. Doctor of Physical and Mathematical Sciences (2012). In 2016 he received the honorary academic title "Professor of the Russian Academy of Sciences" and in the same year was elected as Corresponding Member of the Russian Academy of Sciences in the Department of Physical Sciences (specialty "Astronomy"). Since 2015 he has been elected a member of the International Astronomical Union (IAU). Professor of the Peter the Great St. Petersburg Polytechnic University and the Alferov University.

A.V. Ivanchik is an expert in the field of astrophysics, theoretical and observational cosmology, a disciple of D. A. Varshalovich. He gained his first experience in astronomical observations by participating in the program of observations at the 6-meter telescope of the SAO RAS of high-resolution quasar spectra, which were carried out under the supervision of V.E. Panchuk.

In his research work, he obtained the following results. Methods for determining the upper limits for possible cosmological variations of fundamental physical constants (fine structure constant, proton-to-electron mass ratio, jointly with D.A. Varshalovich, V.E. Panchuk, A.Y.Potekhin) have been improved and applied. As a result of observations and analysis of the spectra of quasars, deuterated hydrogen HD molecules in cosmologically distant molecular clouds were identified for the first time (with D.A. Varshalovich and P. Petitjean, 2001). Various processes have been investigated during primordial nucleosynthesis (with A.V. Orlov) and primary recombination of hydrogen-helium plasma (with E.E. Kholupenko). The physical conditions and chemical composition of matter that existed at the early stages of the Universe evolution, in the intergalactic and interstellar medium of early galaxies (with S.A. Balashev) have been investigated. Estimates are obtained for the abundances of primordial deuterium D and helium 4He, which determine one of the key cosmological parameters – the baryon-to-photon ratio of the Universe. The spectrum of nonthermal relic antineutrinos of primordial nucleosynthesis, arising as a result of the decay of neutrons and tritium nuclei, was calculated for the first time (with V.Yu. Yurchenko).

A.V. Ivanchik is a co-author of over 70 publications in the world's leading scientific journals. Co-author of the monograph “Synthesis of Elements in the Universe. From the Big Bang to the Present Day”, written jointly with V.P. Chechev and D.A. Varshalovich.

A.V. Ivanchik is a member of specialized councils for the defense of doctoral dissertations at the A.F. Ioffe and GAO RAS, member of the editorial board "Astronomy Letters".

A.V. Ivanchik is a laureate of the Main Prize of the MAIK Publishing House "Nauka" for a series of works devoted to the study of fundamental physical constants in the process of cosmological evolution (1996, jointly with DA Varshalovich, VE Panchuk and AY Potekhin), Leonard Euler of the Government of St. Petersburg and St. Petersburg Scientific Center of the Russian Academy of Sciences for young scientists in the field of natural sciences for works "Spectroscopy of quasars and cosmology" (2005), Grant of the "Dynasty" foundation for young doctors of sciences (2014).

IVANOV Aleksandr Aleksandrovich

Born 16.04.1867 Saint Petersburg. In 1889, graduated from St. Petersburg University, and was appointed for preparation for the professor rank. Since 1890, with A.F.Bredikhin's invitation, worked at the Pulkovo Observatory as an observer at the big vertical circle. In 1901–11, worked at the Main Board of Weights and Measures. In 1908–29, professor at St. Petersburg (Leningrad) university. In 1913–19, director of the University Observatory, where he initiated the regular publication of the Observatory proceedings. In 1918–19, rector of Petrograd University. In 1919–30, director of the Pulkovo Observatory. Since 1930, the deputy director of the Mendeleev All-Union Scientific Research Institute of Metrology. Died 23.11.1939 in Leningrad.

A.A.Ivanov's research interests lie in the fields of celestial mechanics and practical astronomy. Based on observations at the large vertical circle at Pulkovo, A.A.Ivanov created three catalogs of absolute inclinations of stars, investigated the changeability of the Pulkovo latitude. Explored resonant cases of the motion of minor planets under the influence of the Jovian gravitational field. Studied the motion of minor planet Gerda (based on observations in 1872–1934). Investigated in detail the precession of the aspherical Earth under the influence of the Moon and Sun, obtained the value of the oblateness of the Earth, equal to 1:297.2 (close to the modern value). Based on the analysis of gravity measurements at many points of the terrestrial surface, obtained a conclusion on the asymmetry of the Northern and Southern hemispheres of the Earth. Made contribution to the establishment of the State Time Service of the USSR.

Author of textbooks on general, spherical, practical, and theoretical astronomy. One of the founders and Chairman of the Russian Astronomical Society in 1906–10, 1913–14.

IVANOV Evgeny Viktorovich

Born 17.02.1942 in Komsomolsk, Ivanovo Region. Graduated from the Physical Department of the Lomonosov Moscow State University in 1966 (specialized in astronomy). From 1966 to 1968 worked as engineer at the Central Designing Bureau "Geophysics". Since 1968 has been working at the Pushkov Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation of the Russian Academy of Sciences (IZMIRAN) (now in the position of Leading Scientist). Post-graduate course in solar physics at IZMIRAN. Candidate Sci. in Phys. and Math. since 1988. From 1982 to 2003 –Learned Secretary of the Scientific Council on Solar-Terrestrial Physics RAS. IAU member, member of the Russian Astronomical Society.

The main field of investigation is the solar and solar-terrestrial physics, in particular, the problems associated with solar cycle and large-scale organization of solar activity. A number of studies are devoted to the correlation of variations in the total solar irradiance SI and the mean absolute value of the photospheric magnetic field B with two indices I(Br) and n that characterize the field energy and structure. The characteristics of active longitudes (structure, lifetime, intensity variations) were studied separately in the northern and southern hemispheres using the Greenwich sunspot areas for 1879-2005 (cycles 12-23) in the coordinate systems corresponding to different rotation periods in the range of 26-29 days. Another series of studies was devoted to variations in the zonal-sector structure of the large-scale solar magnetic field (LSMF) during an 11-year cycle and to the relationship between variations in the typical size of LSMF structure elements (effective solar multipole) and the characteristics of solar flares and coronal mass ejections (CME). A significant correlation (r~0.8-0.9) was revealed between the maximum velocity, energy, and occurrence rate of CME, on the one hand, and the corresponding variations in the typical size of LSMF structural cells, on the other. It is argued that there is a CME energy limit determined by the product of the area of the AR complex associated with the characteristic dimensions of the LSMF structural elements and the maximum energy of the magnetic field in the complex (~4000-6000 G).

E.V.Ivanov is the author of more than 70 publications in Russian and foreign scientific journals and books of proceedings. He participated in many national and international conferences on solar and solar-terrestrial physics.

Along with the research E.V.Ivanov was actively involved in the organizational work within the framework of the Russian Scientific Council on Solar-Terrestrial Physics RAS ("Sun-Earth" Council), which is the national representative of Russia in the International Scientific Committee on Solar-Terrestrial Physics (SCOSTEP). From 1982 to 2003 E.V.Ivanov was the Learned Secretary of the "Sun-Earth" Council. He participated in the preparation and conduction of many national and international programs and conferences in the field of solar and solar-terrestrial physics and the publication of conference Proceedings. He was the editor of the bulletin of the "Sun-Earth" Council.

IVANOV Pavel Borisovich

Born 14.04.1968. In 1991 he graduated from Moscow Institute of Physics and Technology, he got his PhD in 1994 and the degree of Doctor of Sciences in 2008. He works in PN Lebedev Physical Institute as a principal research investigator.

Pavel Ivanov is an expert in theoretical astrophysics and cosmology.

Some of his main research achievements are shown below:

1) He predicted analytically a qualitatively new effect — an accretion disk with a sufficient geometrical thickness inclined at large distances with respect to the equatorial plane of a rotating black hole may have oscillatory shape at smaller distances.

2) He laid down the foundations of the theory of migration of supermassive black holes in accretion discs.

3) He constructed a theory of processes happening in an accretion disc during its penetration by a black hole, which was later applied to the explanation of periodical flares of the quasar OJ287 – the most promising candidate to supermassive binary black hole (SMBH). He showed that the presence of SMBH in a galactic centre may quite significantly amplify the rate of tidal disruption of stars.

4) He developed a general theory of dynamic tides in rigidly rotating stars and giant planets and applied this theory to the problem of formation of «Hot Jupiters». He predicted a new effect of spin-orbital resonances in the theory of quasi-static tides operating in fully convective stars and giant planets.

5) He showed that in some cosmological models the so-called procedure of third quantization can be used to formulate certain boundary conditions for a quantum state of the Universe.

IVANOV Vsevolod Vladimirovich

Born 28.01.1934 in Leningrad (now St. Petersburg). Graduated from Leningrad State Univ. (LGU) (now St. Petersburg State Univ., SPbGU) (1956); a post-graduate student in astrophysics, 1956 – 59; Ph.D. – 1962; Doctor of Sci. – 1971. In 1959 – 2013, worked at SPbGU: a researcher, then a senior researcher at Astron. Obs.; professor of the Department of astrophysics (since 1975); chair of astrophysics (1989 – 2010). In 1999 – 2001, he was awarded the Soros professorship. Member of IAU and EAS. In 2005–13, Vice-editor-in-chief of Astrofizika (Armenia).

V.V.Ivanov is a theoretical astrophysicist. His main research field is the radiative transfer theory (more than 90 papers and 4 books).

V.V.Ivanov is one of the founders of the analytical theory of multiple light scattering in spectral lines, which is the basis of the theory of line formation in stellar spectra (publications of the 1960s – 70s, the book "Transfer of Radiation in Spectral Lines", 1973). He found the asymptotic solutions of the integral equations describing multiple scattering of radiation in spectral lines and used them to formulate high-accuracy approximation to the solutions of these equations. He introduced a large-scale description of the radiation fields in spectral lines, which were rediscovered a few times later on.

His publications of the 1970s—80s were on the theory of monochromatic light scattering. He generalized the Ambartsumian invariance principle to incorporate internal radiation fields in scattering atmospheres. He showed that the basic equation of multiple light scattering (which, by that time, had been studied for more than a century) is a member of a one-parameter family of similar equations. The solution of any of these equations, with an arbitrary value of the parameter, can be used to restore the desired physical solution, by using a simple explicit restoration formula. By varying the value of the parameter, one can effectively suppress multiple scattering, thus getting an efficient iterative procedure for obtaining the solution of the usual transfer equation.

In 1994, V.V.Ivanov formulated a new version of Sobolev's resolvent method for solving the Wiener – Hopf integral equations that appear in multiple light scattering theory, among others. In a wide class of cases, this approach enables one to find the solution by elementary means, without appealing to complex variable theory. These results were later on also used outside astrophysics, in solving various random walk problems (the so-called Hopf – Ivanov formula).

In the 1990s, V.V.Ivanov turned to polarization. He suggested a new approach to problems of multiple Rayleigh and molecular scattering in atmospheres. V.V.Ivanov also developed an analytical theory of multiple resonance scattering, with polarization taken into account. Asymptotic solutions of matrix integral equations of multiple resonance scattering were studied in detail by the SPbGU team led by V.V.Ivanov. These studies were triggered by the discovery of the so-called second solar spectrum (this term, now in common use, was introduced by V.V.Ivanov).

V.V.Ivanov is a historian of astronomy at LGU – SPbGU. He compiled and published a detailed chronicle of University astronomy spanning two centuries.

V.V.Ivanov was the scientific adviser of 7 Ph.D. and 3 Dr. Sci. Asteroid 7485 is named Vsevoivanov after V.V.Ivanov.

IVANOV-KHOLODNY Gor Semenovich

Born 15.01.1928, Lenino, Moscow region. Attended school in Moscow in 1935-1941, 1941-1943 evacuated to Kazakhstan and Samarkand. Finished school in Moscow in 1945. 1945-1950 studied at the Faculty of Physics, MSU. 1950-1957 worked in the Crimean Astrophysical Observatory as a laboratory assistant, postgraduate student, scientific secretary, junior researcher. 1957-1985 worked at the Institute of Applied Geophysics of the Academy of Sciences of the USSR (now – FGBU IPG) as a junior researcher, head of laboratory, head of department. 1985-2016 worked at IZMIRAN as a deputy director, principal researcher, candidate of physical and mathematical sciences (1954), senior researcher (1958), doctor of physical and mathematical sciences (1966). Died 01.19.2016 in Moscow.

Being a world-class specialist in the study of the Sun and solar-terrestrial physics, Ivanov-Kholodny developed a new direction of research in the field of solar-terrestrial physics, studying the short-wave radiation of the Sun, the dependence of its spectrum and intensity on the phase solar cycle. He carried out a series of works on the theory of the formation of the ionosphere based on taking into account elementary processes and modeling the conditions of ionization of the Earth's upper atmosphere by ionizing radiation from the Sun. Attaching great importance to experimental data, he organized a team of IPG employees to create domestic equipment and conduct direct measurements of the short-wave ultraviolet region of the solar spectrum on rockets and satellites. A series of instruments was developed, meteorological rockets and satellites measurements were carried out, and this work is continuing. He was a member of many rocket launching expeditions as well as the head of the scientific project of the Soviet-American experiment – the JASPIC project (1978–1979) – on intercalibration of rocket measurements onboard the RV Professor Vize in the Atlantic Ocean. He was one of the organizers of the ionospheric service, which later became the heliogeophysical service of the IPG. Ivanov-Kholodny created a scientific school for the study and modeling of variations in the ionosphere not only of the Earth, but other planets as well. For his work on the ionosphere of Mars and Venus, he was awarded the title of Laureate of the USSR State Prize. Since the 80s, in cooperation with his students and colleagues, he investigated the problem of the influence of solar and eomagnetic activity both on the ionosphere and on other geophysical and biosphere processes and atmospheric dynamics. A series of works on the study and analysis of solar and ionospheric quasi-biennial variations has been completed. In particular, the heliolongitudinal effect of variations was revealed, and the spatial relationships between the solar magnetic field and heliomagnetic activity were determined. The manifestation of quasi-biennial variations of the total solar radiation flux in variations of the stratospheric wind and the Earth's rotation speed is shown. With a group of co-authors, a new approach to modelling the Earth’s upper atmosphere using satellite-based local atmospheric data was developed; the effects of solar activity on the long-range variation in the density of the Earth’s upper atmosphere were analyzed. A series of joint solar activity studies with colleagues, including nonlinear sources of acceleration and deceleration of solar activity, as well as a study of the dynamics of global manifestations of the organization of the solar cycle and the model of generation of the solar magnetic field have been carried out.

The research results are published in 6 monographs and more than 370 scientific articles. Ivanov-Kholodny created a scientific school for the study of solar-terrestrial physics. He trained 19 candidates of sciences; six of his students became doctors of physical and mathematical sciences.

Member of the Council Bureau "Propagation of Radio Waves", Chairman of the Soviet National Committee for the project "Study of Global Ionospheric-Thermospheric Bonds", member of IAS, International Association for Geomagnetism and Aeronomy. Honored Scientist of the RSFSR, Laureate of the USSR State Prize, professor.

IZMODENOV Vladislav Valerjevich

Born in 1971. Graduated from Moscow State University in 1993. Defended his PhD thesis in 1997 on the topic: "Research. interactions of interstellar atoms and galactic cosmic rays with the gas-dynamic structure of the heliosphere". He completed his doctoral dissertation in 2007 on the topic: "Research of physical processes at the heliosphere boundary". Head of the lab. in the Space Research Institute. RAS since 2005. Prof. Lomonosov Moscow State University since 2011. The title of Professor of the Russian Academy of Sciences was awarded in 2016.

Scientific activity of V.Izmodenov is associated with the development of mechanical and mathematical models for the astrophysical objects. The developed methods take into account the multi-component and non-equilibrium effects. In particular, a three-dimensional non-stationary kinetic-magnetohydrodynamic model of the interaction of the solar wind with the interstellar medium has been developed. He made a significant contribution to the description of the distribution of interstellar neutral atoms in the heliosphere. For the first time, calculations of the velocity distribution function of hydrogen atoms were performed and the differences between this function and the Maxwellian function were shown due to physical processes occurring at the heliosphere boundary. He was also the first to study the penetration of interstellar oxygen into the heliosphere. He predicted (in 1997) the existence of a secondary component of interstellar oxygen atoms inside the heliosphere, which was discovered experimentally in 2015.

The developed numerical model is successfully used to analyze various observational data on the heliosphere boundary obtained on such spacecraft as Voyager-1,2, Interstellar Boundary Explorer (IBEX), Hubble Space Telescope (HST), SOHO, and others. The main scientific results related to the interpretation and theoretical explanation of observational data are as follows: 1) the local values of the magnitude and direction of the interstellar magnetic field in the near-solar neighborhood are determined; 2) theoretically predicted and discovered (according to HST data) "hydrogen walls" in the astrospheres of some solar-type stars; 3) the discovery of the heliospheric belt of energetic particles (as part of the IBEX scientific team); 4) the discovery of galactic Lyman-alpha radiation (as part of the SOHO/SWAN scientific team).

Another important area of scientific activity is the development of a universal model of astrospheres – areas of interaction between the stellar wind and the interstellar medium. Currently, this field of science is rapidly developing due to the emergence of new unique observations of space telescopes. The developed numerical models can be used to interpret observations of astrospheres in a wide range of parameters of stellar and interstellar winds. In addition, the models take into account the dynamics of interstellar dust in the astrospheres.

He is the author of more than 150 scientific papers in leading peer-reviewed journals, as well as 5 chapters in monographs. He was awarded the Y. B. Zeldovich Medal of COSPAR and the Russian Academy of Sciences (2006), the I. I. Shuvalov Prize of the Lomonosov Moscow State University, the Scopus Award Russia (2014), and the Academician G. I. Petrov Prize of the Russian National Committee for Theoretical and Applied Mechanics (2020).

KALACHEV Pavel Dmitrievich

Born 20.06.1911. After graduating from the Moscow Airship Construction Institute, he worked in the aviation industry. Joined the Lebedev Physical Institute (LPI), laboratory of oscillations in 1948, being already a highly qualified designer. Here he held the positions of the chief designer and head of radio telescope section. He is doctor of technical sciences (1972), Laureate of the A.S. Popov's Premium of the Presidium of USSR Academy of Sciences (1977) and the USSR State Prize for participation in design of 70-meter full-steerable parabolic reflector (1982). Died in 1990-s in Moscow.

With the name of P.D. Kalachev, the first steps and the first major achievements of domestic radio telescope construction are associated. Under his leadership, the Crimean expeditions of the LPI were equipped with the radio telescopes of various types. Among them there was the antenna of the captured Bolshoy Würzburg radar with diameter of 7.5 m, the surface accuracy of which in 1949 was improved 5 times, which made possible to use it for observations at 10 cm wavelength and the diameter was increased to 10 m. There were also two 18m x 8m parabolic antennas for decimeter wavelengths as well as two spherical reflectors built into natural sinkholes just near Black See, one of which worked at meter wavelengths, but another could work at 5 cm and larger wavelengths.

In the 1950s, P.D. Kalachev designs and manages the construction at Oka Radio Astronomy Station (now PRAO ASC LPI) the full-steerable precise parabolic reflector with 22 m diameter operating at waves up to 8 mm. The results of the first observations with this radio telescope were demonstrated on May 7 ("Radio Day"), 1959, at a session of the A.S. Popov Scientific Society. In 1966, the same 22-meter radio telescope was built at the Crimean Astrophysical Observatory.

Since the mid-1950s, in parallel with the work on the creation of the RT-22, P.D. Kalachev is designing a giant meter-wavelengths cross-type radio telescope with a 1 km × 1 km arm's length (DKR-1000). The metal structures of the radio telescope designed by him were assembled in the beginning of 1960s, and the first observations with the East-West arm of this radio telescope were successfully performed in October of 1964.

In the 1970s, P.D. Kalachev takes an active part in the design of the P-2500 antennas for the Deep Space Communication Centers. Two such full-steerable antennas with 70-meter main mirrors, operating at waves up to 3 cm, were built in Yevpatoria and Ussuriisk. It is for the creation of these unique instruments that P.D. Kalachev, among a large group of designers and builders, was awarded the State Prize (1982).

P.D. Kalachev came up with the idea of creating full-steerable antennas based on a "cable-stayed construction", in which a rigid metal structure is replaced by a soft cable system. A prototype of such a radio telescope was successfully tested in the 1980s in Pushchino RAO of LPI. This idea was successfully implemented by Indian radio astronomers when creating the GMRT radio telescope, formed by thirty 45-meter paraboloids operating in the decimeter wavelength range.

KALENSKII Sergey Vladimirovich

Born 24.09.1951 in Moscow. After graduating from the Lomonosov MSU in 1975 worked in the Space Research institute of the USSR Academy of Sciences. Since 1990 Kalenskii have worked in the LPI Astro Space Center as a researcher, then as a senior researcher. In 2011 he defended a doctoral dissertation "Maser and thermal radio emission of molecules in the vicinities of protostars at early evolutionary stages".

S.V. Kalenskii is an author of about 50 scientific papers. His scientific activity is related to cosmic molecules. Jointly with his colleagues from the team of radio astronomers directed by the RAS corresponding member V.I. Slysh he published a series of papers dedicated to the exploration of maser and thermal methanol emission in space. A number of new maser transitions and maser sources have been found, making it possible to better understand under which conditions methanol masers can arise. S.V. Kalenskii developed a simple analytical model of methanol excitation, which allows analyzing the emission in a large number of maser transitions. Methanol masers in the regions of low-mass star formation were detected under his direction.

S.V. Kalenskii studied star-forming regions using lines of different molecules. He estimated the main parameters of hot cores applying methyl cyanide lines, the parameters of dense cores, applying lines of methyl acetylene, cyanoacetylene, and other molecules. He performed several wideband spectral scans of molecular clouds, including the lowest frequency scan – molecular cloud TMC-1 was scanned within the frequency range 4 – 6 GHz. The results of these scans yield much information for the physical and chemical modeling of the observed regions and are actively used for this purpose.

KAPLAN Samuil Aronovich

Born 10.10.1921 in the town of Roslavl of the Smolensk Region. 1939-1945, fought at the front during the Great Patriotic War in the acting Soviet Army. In 1945, finished externally the Leningrad Pedagogical Institute. 1945-1948, a post-graduate student of the Leningrad Order of Lenin State University (now the Saint Petersburg State University (SPbSU)). Defended his PhD thesis in 1948, D.Sc. thesis in 1957. Professor since 1964. In 1948-1961, worked at the Astronomical Observatory and the Department of theoretical physics of Lvov University. 1961-1978, a professor of N.I. Lobachevsky State University of Gorky (GSU) (now N. I. Lobachevsky State University of Nizhny Novgorod (UNN)), a senior researcher of the Radiophysical Research Institute (NIRFI). Member of the International Astronomical Union (IAU). Awarded two medals.
Died 08.06.1978 in the city of Bologoye of the Tver Region.

S.A. Kaplan's research interests are astrophysics, astronomy, and radio astronomy.

In his early research, S.A. Kaplan studied the physical processes and parameters of white dwarfs and their evolution. When developing the theory of white dwarfs, S.A. Kaplan considered the mechanical equilibrium of a completely degenerate star taking into account gravity applying the general theory of relativity equations. He was among the first to develop cosmic gas dynamics as a new branch of astronomy. He developed the theory of interstellar turbulence, its parameters, and the methods of its observational study.

His later research aimed at a new scientific field, plasma astrophysics. S.A. Kaplan and V.N. Tsytovich jointly developed the turbulence theory of nonrelativistic and relativistic cosmic plasma. In a number of research papers, they described new possible mechanisms of electromagnetic radiation in the astrophysical environment, the dynamics of the solar atmosphere. As an example, S.A. Kaplan was the first to solve the self-consistent problem of nonlinear wave propagation in the solar atmosphere, and for the first time, a possibility of forming an inversion zone in the solar atmosphere was shown. This research served as a foundation for establishing a scientific school with students working at observatories of Russia and neighboring countries from the Far East to the West of Ukraine.

Having a solid world reputation, S.A. Kaplan repeatedly participated in international conferences, including on the Search for Extraterrestrial Intelligence (SETI) project which was especially relevant in the 1960s and 1970s.

S.A. Kaplan is the author of more than a hundred and fifty scientific publications, the author of 17 books, and a scientific editor of nearly a hundred books, many of which have been translated and published abroad and for decades are the classic scientific publications in astrophysics and astronomy.

S.A. Kaplan was an active promoter of science. He read a large number of courses and gave individual lectures in almost all fields of modern astrophysics and space research at the majority of astronomical and astrophysical institutions of the country. He released several excellent popular books (“Physics of stars," "Elementary radio astronomy”), published in the United States, England and other countries. S.A. Kaplan actively helped to popularize astronomical research and achievements by participating in the projects of the Gorky Planetarium and the All-Union Society “Znanie” (“Knowledge”). He also often read popular lectures at many factories, enterprises and institutions.

KARACHENTSEV Igor Dmitrievich

Born 17.02.1940 in Kiev. From 1957 to 1962, he was a student of the Kiev State University. From 1962 to 1967, he was a post-graduate student and Researcher at the Byurakan As-trophysical Observatory of AS, ArmSSR. In 1967, he passed his Ph.D. defense on “Statistical Study of Instabilities of Galactic Systems”. From 1967 to 1971, he lectured at the Astronomy Department of the Kiev State University. From 1971, he has been working in the Special Astrophysical Observatory (since 1991 – of the Russian Academy of Sciences) occupying different posi-tions: Senior Researcher (1971-1973), Deputy Director of Scientific Research (1973-1975), Head of Department (1973-1989), Head of Laboratory (1989-2008), and from 2008 – Chief Researcher. In 1982, he defended his Dr.Sci. thesis on “Dynamics and Structure of Binary Galaxies”.

I.D. Karachentsev works in the area of research related to extragalactic astronomy and observational cosmology; he is the author of over 500 scientific papers and a monograph “Binary Galaxies”.

Being one of the first observers at the 6-m SAO RAS telescope, he measured velocities, estimates masses and angular momenta for over 1000 galaxies in binary systems, determined the character of their orbital motions, and revealed evidence of active star formation due to mutual tides.

With the 6-m telescope and largest radio telescopes, I.D. Karachentsev measured redshifts and distances to 2000 flat spiral galaxies from the catalog he compiled, determined the amplitude and direction of a giant cosmic flow, in which the galaxies surrounding us are participating.

In collaboration with V.E. Karachentseva (MAO, NAS of Ukraine), discovered several hun-dreds of nearby dwarf galaxies including two satellites of the Andromeda nebula.

With the Hubble Space Telescope, he measured distances to 250 nearest galaxies, stated that random galactic motions in the Local Complex proved much smaller than theoretically predicted. This became the first observed evidence of the presence of special medium in the Local Universe – “dark matter” with the density predominating over the other forms of matter from the outskirts of the Local Group.

Investigating the 3D structure and kinematics of the Local Universe, I.D. Karachentsev and D.I. Makarov showed that, there is less than a half of all the dark matter in gravitationally associat-ed systems.

I.D. Karachentsev was involved in organizing many international programs of observations, conferences; he is a member of a number of academic boards and astronomic editorial boards. Fif-teen Ph.D. dissertations were prepared and defended under his academic supervision.

Honored Scientist of the Russian Federation (2010). Honored Doctor of the Main Astronomi-cal Observatory of NAS of Ukraine (2014). Honored with the American Astronomical Society's Henri Chrétien Award (1999), won the Fyodor Bredikhin Prize, RAS (2004) and Viktor Ambartsu-mian International Prize (2014).

He is a Professor in Astrophysics and Radio Astronomy (2001), an IAU member, editorial board member of the “Astrophysical Bulletin” and “Astrophys-ics” journals.

KARDASHEV Nikolay Semenovich

Born 25.04.1932 in Moscow. In 1955 he graduated from the astronomical department of the Mechanics and Mathematics Fac-ulty of Moscow State University. He worked at the SAI MSU in 1959-1967, since 1967 at the Institute of Computer Science of the USSR Academy of Sciences; from 1990 to 2019 he was the head of the Astro Space Center of the Lebedev Physical Institute. Doc-tor of Physical and Mathematical Sciences (1965), full member of the Russian Academy of Sciences (1994). He was a vice-president of COSPAR and IAU, deputy academician-secretary of the Physical Sciences Division of the Russian Academy of Sci-ences, chairman of the Council on Astronomy of the Russian Academy of Sciences, a member of the European Academy of Sciences, the International Academy of Astronautics and the American Astronomical Society, the International Astronomical Union. Died 03.08.2019 in Moscow.

N.S. Kardashev predicted the possibility of observing spectral lines formed during the transitions between the upper quantum levels of excited atoms of hydrogen, helium and other elements, developed a theory of the evolution of the spectrum of synchrotron radiation from cosmic radio sources. Even before the discovery of pulsars, he predicted the presence of a neutron star in the center of the Crab Nebula.

On the initiative of N.S. Kardashev search for places for submillimeter astronomical observations were performed. As a result, a construction began of a new observatory on the Suffa plateau in Uz-bekistan with a radio telescope of 70 m in diameter. In the seventies of the last century, also on the initiative of him and his colleagues, observations were organized to search for monopulse signals using the simultaneous registration of signal from several widely spaced radio telescopes. Only in recent years has this technique, but already with large telescopes, justified itself: monopulse signals have been detected, but their nature is still not clear.

N.S. Kardashev is one of the founders of space radio astronomy. On the initiative of N.S. Kardashev and I.S. Shklovsky, the IKI employees carried out the Relikt space experiment on the Prognoz-9 satellite, which made it possible to obtain a complete map of the sky at a wavelength of 8 mm with an angular resolution of 7 degrees.

Together with V.I. Slysh, they initiated and conducted several experiments on interplanetary spacecraft to measure long-wavelength space radio emission. N.S. Kardashev with co-authors proposed the most important method of observational radio astronomy, which provides a uniquely high angular resolution – very long baseline interferometry. A specific technical scheme for the implementation of this method using digital recording of signals and atomic clock was proposed. In the summer of 1979, he and his colleagues from IKI, NPO Energia and other organizations prepared for the experiment, and cosmonauts V.A. Lyakhov and V.V. Ryumin carried out the deployment and successful tests at the Salyut-6 manned station of the first space radio telescope with a mesh surface. Scientific ideas were implemented in the international project RadioAstron, which made it possible to carry out the observations with a record angular resolution. The further development of this direction is the Millimetron space project with an operating wavelength range from 20 μm to 20 mm, which will allow to study the objects in the Universe with an even greater angular resolu-tion and very high sensitivity. N.S. Kardashev with co-authors actively developed the hypothesis of the multiverse models with a system of wormholes and worked on the preparation of experiments to detect them. He showed the possibility of the existence of very strong magnetic and electric fields near the massive black holes, which are capable of generating particles with very high energy. N.S. Kardashev is one of the world leaders in the search for extraterrestrial civilizations, including the search for communication chan-nels and astroengineering structures.

His students successfully work in many institutes and observatories in Russia and abroad. Twice laureate of the State Prize of the USSR (1980, 1988), in 2011 he was awarded the Order of Honor, the Interna-tional Medal of the Grotto Reber (2012), the Demidov Prize (2014).

KARPINSKY Vadim Nikolaevich

Born in 1931 in Moscow. 1949 to 1954 – a student in Lomonosov State University of Moscow. Post-graduate course in the Central Astronomical Observatory at Pulkovo (1954–1957), under the supervision of Professor V.A. Krat. Cand.Sci. («Methods of spectrophotometry of lines in the solar spectrum at high dispersion and resolution» (1964). Dr.Sci. («Methods and Results of Studies of the Solar Photosphere at high resolution» (1989). Senior, and later Leading Researcher at Pulkovo Observatory (1957– 1997). Member of IAU: Commission on solar physics and solar instrumentation. Died in 1997 in St. Petersburg.

V. Karpinsky's academic career was devoted to the solar physics. Developed original methods and instrumentation for obtaining new data on the solar photosphere. Built the world's first photoelectric double-diffraction monochromator with digital registration, with which at high precision determined profiles of a number of Fraunhofer lines of the solar spectrum from different regions of the solar disk. The monochromator was successfully applied to studies of profiles of the solar spectral lines within the framework of the Commission No 12 IAU Program. To study fine structure of the solar photosphere, The Central Astronomical Observatory built a telescope with two main mirrors, 0,5 and 1 m, which was ballooned to the altitude of 20 km. V. Karpinsky took part at all stages of manufacturing of the Stratospheric Telescope. Developed an efficient technique of its automated focusing and estimation of the image contrast (certified). As a result, record-quality photographs of the solar surface were obtained from the stratosphere. A twin Stratospheric Telescope with the 0,5 m mirror was mounted in the Pamirs, where under V. Karpinsky's supervision the imaging of fine structure of the solar granulation was also obtained. For precision photometric processing of large volumes of information, V. Karpinsky developed photometric technique of the measurements of photographs, and the automated scanning digital microphotometer for registration of the object's brightness. As a result, the brightness field in the center of the solar disk was found to be appreciably different from Gauss random field. The distribution of brightness inhomogeneities is asymmetrically bimodal, which indicates the presence of two different but related structure types. V. Karpinsky built a unique coherent optical analyzer-transformer for processing of negative images of solar granulation; using it, a 2D spatial spectrum of granulation at the center and the edge of the solar disk was obtained. V. Karpinsky found that inhomogeneities in granulation brightness emerge both from temperature inhomogeneities, and from fine structure of magnetic field – magnetic flux tubes. As a result, an edifice of the solar photosphere structure was created.

V. Karpinsky authored 85 scientific works. Awarded with Medals of the Exhibition of Economic Achievements.

KASCHEEV Rafael Aleksandrovich

Born 08.02.1951 in Kazan. In 1973, graduated from the Kazan State University (now the KFU). Since 1973, constantly working at Kazan University in various positions from junior researcher to professor (2002) of the Department of Astronomy and Satellite Geodesy at Kazan (Volga region) Federal University. Doctor Phys.-Math. sciences (2001).

In 1973 Kascheev R.A. graduated from the Physics Faculty of the Kazan State University, adopted to the Department of Astronomy of KSU. In 1973-1977, he participated in the scientific astronomical and geodetic expeditions. In 1978, elected to the position of assistant of the Department of astronomy at KSU. In 1984, the Council of the Kazan State University has successfully defended his PhD thesis on "Determination of the lunar gravity parameters from low-orbit artificial satellites of the Moon tracking data." In 2000, the dissertation Council of the Moscow State University successfully defended his doctoral dissertation on the topic "Satellite methods of planetary gravimetry."

His research interests related to the study of modern satellite technologies used to determine the structure of the gravitational fields of terrestrial planets and in addition also the use of satellite positioning methods for the study of the horizontal and vertical movements of the Earth's crust on the territory of the Republic of Tatarstan and provide its geodynamic safety.

He participated in the preparation of proposals for implementation of the national program "The use of space activities for socio-economic development of the Republic of Tatarstan", approved by the Government of the Republic of Tatarstan in 2008. Supervised "Geodynamic studies in the Volga region as a result of GLONASS and GPS satellite systems measurements" project. He has published more than 120 scientific and educational papers.

Kascheev R.A pays great attention to the issues of educational activities. For many years, he supervised the preparation of the educational program "Astronomy and Geodesy", currently manages the undergraduate and graduate programs in the direction of "Geodesy and Remote Sensing" of the Institute of Physics of Kazan Federal University. Since 1998, he is a member of UMO universities of Russia on geodesy and photogrammetry.

In 2005-2010 was the head of the educational program "Quality management of educational activities" and "Higher Education Management" to improve the skills of leaders and academic staff of the Volga Federal District and the Russian Federation.

From 1992 to 1996 worked as scientific secretary of the Department of Physics, Energy, and Earth sciences of the Republic of Tatarstan Academy of sciences. In 2010-2011 – Deputy Director of the Institute of Continuing Education KFU.

In 2009-2013 – a member of the commission of space toponymy of the Presidium of Russian Academy of sciences. Member of the IAU.

KATSOVA Maria Mikhailovna

Born September 25, 1947 in Moscow. Graduated from Phys. Dept. of Moscow State University (MSU) in 1971. Since 1967, she has permanent positions at the Sternberg State Astronomical Inst. of MSU (SAI), from Assistant to Leading Scientific Researcher (since 2000). PhD dissertation "Evidences for activity and features of structure of outer atmospheres of late-type stars" (1983). D.Sci. dissertation "Activity of late-type stars" (1999). The vice-head of stellar astrophysics department of SAI. Member of the International Astronomical Union since 2006. Member of the European Astronomical Society (1990) and Eurasian Astronomical Society (1990).

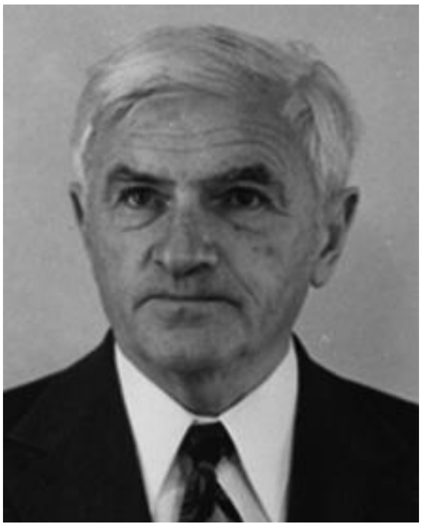
K. is a well-known expert in problems of stellar activity and one of founders of the new scientific field, solar-stellar physics. The most important results are finding the axial rotation period and the cycle of the active component of α Aur (Capella binary) from 15-year observations of the He I 10830 A line carried out at the Crimean astrophysical observatory (with A. Shcherbakov). A homogeneous model of stellar coronae was developed based on X-ray observations. A gas-dynamic model for impulsive flares on red dwarf was elaborated and allowed to explain the behavior of the C IV 1550 A resonant doublet registered with the ASTRON space observatory at the flare onset and the Balmer decrement change during these non-stationary processes were successfully explained. K. actively participated in creating the "Catalogue of the UV Ceti-type flare stars and related objects in the solar vicinity" together with Crimean colleagues led by R. Gershberg.

Since early 2000s, her work is dedicated to studying of evolution of solar-stellar activity. This process is associated with a rate of the angular momentum loss due to braking of a star. A scenario of evolution of activity is presented, where it is revealed that the lifetime of the Sun on the main sequence can be divided into several epochs. This is the early Sun – an era of the formation of the Solar system, when the Sun, with a saturated level of activity, rotated 10–20 times faster than today. Next comes the epoch of the young Sun at an age of 0.6–1 billion years, rotating 2–5 faster than the modern one, associated with the establishment of a regular cycle, and the contemporary epoch of the slowly rotating, relatively weakly active Sun. It was found at what age the saturation regime of activity is replaced by solar-type one, when a regular cycle is established. Characteristics of activity of the young Sun have been estimated for the time, when the Solar system and a life on Earth were formed. An analysis showed that during both epochs of the early and the young Sun powerful non-steady phenomena with total energies 100–1000 times greater than the strongest solar flares at present, could happened and their frequency occurrence was higher. A superflare scenario based on knowledge about solar flare physics is proposed in collaboration with M. Livshits. The maximum possible energy of the flares at the contemporary Sun is estimated, and it is shown that this value cannot exceed $3 \cdot 10^{32}$ erg. These investigations provide observational tests for further development of the dynamo theory. Besides, they are required in interdisciplinary studies in biology, paleontology, and geology for evaluation of space factors affecting the geo-sphere and bio-sphere in the epochs of their formation.

K. has above 130 scientific publications; one of them was awarded a prize of the Intern. Publ. Comp "Nauka/Interperiodika" (2012). She was awarded the title "Honoured Research Fellow of the Moscow State University" (2005), medals "In memory of the 850th anniversary of Moscow" (1997) and "Veteran of Labor" (1986).

maria@sai.msu.ru
mkatsova@mail.ru

KAYDANOVSKY Naum L'vovich



Born 26.10.1907; graduated from Physics and Mathematics Faculty of the Moscow State University (MSU) (1932); worked in the MSU Laboratory of Oscillations (from 1933); graded up during the WWII worked up from machine-gun platoon Commander to the Radio Manufactory Chief of the Armoured Troops; worked in FIAN in various positions (from 1946); got PhD degree (1948); took up radio astronomy (1949); started working in GAO of the USSR Academy of Sciences (1953), in SAO of the USSR Academy of Sciences (1964), in IAA of the USSR Academy of Sciences (1987); was Doctor of Sciences in Physics and Mathematics, Professor and the Honoured Scientis. Died 11.11.2010 in St. Petersburg.

N.L. Kaydanovsky was a Soviet and Russian radio astronomer. His main field of research was astronomical observations, propagation of waves in the space environment and the atmosphere of Earth, tools and methods of radio astronomy, engineering design of radio telescopes and radio interferometry with very long baselines (VLBI). Kaydanovsky took part in the construction of the 7.5 m mirror diameter radio telescope in the Crimea (from 1949 to 1951); measured refraction in the centimetric range, discovered the effect of the "atmospheric wave guide"; designed and improved the radiometer on the 3 cm wave, discovered (together with N.S. Kardashev) the radio emission from supernovae and thermal emission from nebulae (from 1951 to 1954); and was the first receiver of the FIAN award in 1954 for developing the methods and equipment to measure radio emission polarization. The first observations on radio telescopes inspired Kaydanovsky to construct a radio telescope with the resolution similar to optical tools. In cooperation with S.E. Khaykin, Kaydanovsky proposed a scheme of an antenna in a variable profile (AVP) to increase resolution significantly. N. L. Kaydanovsky developed this optical scheme and started his detailed AVP calculations in 1952. The engineering design and construction of the Big Pulkovo Radio Telescope (BPR) was carried out from 1953 to 1956, followed by a period of fruitful observations. Highly significant results obtained using BPR include the discovery of circular polarization of sunspots (in cooperation with N.S. Soboleva and D.V. Korolkov) and the discovery relic radiation (together with T. A. Shmaonov). From 1956, N. L. Kaydanovsky and his associates were developing projects of few variable profile antennas with a diameter of 2 and 3 km for space communication. One more project was developed at the same time to build the AVP-based radio telescope RATAN-600 with a diameter of 600 m for. N. L. Kaydanovsky, Yu. N. Pariysky and D.V. Korolkov fought hard for the RATAN-600 project, and the works on its realization started in 1964. Kaidanovsky supervises the entire range of works on the design, manufacture and construction of a radio telescope in the position of Chief Designer. The RATAN-600 was completed in 1974, with a record resolution of 4.3 seconds of arc at a wavelength of 3 mm. In 1964 Kaidanovsky put forward an idea to create an interferometer with a very long baseline with signal transmission via a geostationary satellite. In 1987 N.L. Kaydanovsky moved to the Institute of Applied Astronomy of the Russian Academy of Sciences where he actively participated in the works to create the Quasar VLBI Network.

He was the author of numerous scientific papers in the Journals "Radio Engineering and Electronics", "The Journal of Theoretical Physics", "Reports of the Academy of Sciences", "Radio Physics" and "Instruments and experimental technique", and in the books "Telescopes", "Essays on the history of radio astronomy in the USSR" and "The Invisible Universe".

KAZACHEVSKAYA Tamara Valentinovna

Born 07.01.1933, Minsk, BSSR . 1949-1950 studied in KazSU, 1950-1955 at the Faculty of Mechanics and Mathematics, Moscow State University. From 1955-1957 worked in the Crimean Astrophysical Observatory as a junior researcher, since 1958 has been working at the Institute of Applied Geophysics as a junior researcher, senior researcher (1980), leading researcher (1989), candidate of physical and mathematical sciences (1968), head of the laboratory "Geoeffective solar radiation" (1985-1989). Member of the New York Academy of Sciences (1995), Honorary Worker of the Hydrometeorological Service of Russia (2003). Awarded the Medal "For Valiant Labor in Commemoration of the 100th Anniversary of the Birth of V.I. Lenin "

Outstanding Soviet and Russian researcher of solar radiation in the short-wavelength region of the spectrum. Participant in the creation of equipment for pioneering domestic measurements of short-wave solar radiation on rockets, satellites and spacecraft.

T.V.Kazachevskaya is engaged in the study of short-wave radiation of the Sun from rockets, satellites and spacecraft. Under her leadership and with her direct participation, the original equipment for measuring short-wave radiation– solar ultraviolet radiometers – devices «Phosphorus» and SFR – was developed.

She participated in more than 20 successful rocket experiments in middle and high latitudes, on Heiss Island (Franz Josef Land), also in ones near Volgograd during the total solar eclipse of 1961 and onboard the RV Professor Vize in 1973. T.V.Kazachevskaya was also an active participant and one of organizers of rocket experiments «Sun-Atmosphere 1969 and 1971» on the investigation of flares, as well as the Soviet-American project JASPIC (1978-1979) on the intercalibration of missile measurements. She took part in solar research on satellites: series "Prognoz 7-10" (1978-1985), in the international projects "Interball-Tail Probe" (1995-1996), on the satellites CORONAS-I and CORONAS-F – 1994; (2001-2003), on the spacecraft Phobos-1 and Phobos-2 (1988-1989, studying solar radiation during a flight to Mars), as well as on the geostationary satellites "Electro-L N 1" (2011-2016) and " Electro-L N 2" (since 2015). The measurements yielded valuable information about the intensity of the ionizing radiation of the Sun. Variations in the short-wavelength radiation of the Sun at different phases of the solar activity cycle have been investigated both during quiet periods and during solar flares. The obtained experimental material is of value for further work in the field of the physics of the Sun and solar-terrestrial relations.

Author and co-author of 130 articles, 5 copyright certificates on inventions, and the monograph "Solar radiation flux" by E.A. Makarova, A.V. Kharitonov, T.V. Kazachevskaya, 1991, PH "The Science".

KAZAKOV Sergey Alekseevich

Born 24.07.1873 in Rybinsk. In 1895 he graduated from Faculty of Physics and Mathematics of MSU.

Since 1900 he was a privat-docent, since 1915 he was a senior assistant, and since 1918 he was a professor of MSU. From 1918 to 1919 he worked at Commissariat of Public Education of RSFSR. Since 1920 he was the head of the Astronomy Department, from 1927 to 1928 Kazakov was the dean of the Faculty of Physics and Mathematics, MSU. From 1934 to 1936 he was a member of the Higher Attestation Commission. Died 21.08.1936 in Moscow.

Basic S.A. Kazakov's research works relate to celestial mechanics and astrometry. He was a specialist in the field of comet and planet orbits determination. Shaping of his scientific thought was influenced by mathematicians – N.V. Bugaev, L.K. Lakhtin and V. Ya. Tsinger, physicist A.G. Stoletov and astronomer V.K. Tserasskiy.

S.A. Kazakov calculated final orbits of comet 1904 I (discovered in 1904 by an American astronomer W.R. Brooks) and comet 1907 III, he also calculated Perrine's periodic comet 1896 VII (discovered in 1896) orbit elements for 1922 year. Further work on precise determination of comet orbits required creation of star catalogue for a zone in Northern celestial hemisphere with declinations in range from +50□ до +55□. From 1914 to 1930 S.A. Kazakov defined positions of stars from this catalogue using Repsold meridian circle. He studied problems of basic differential equations integration in solving of three-body problem in celestial mechanics.

In 1903 he was the first in MSU to organize special course «Numerical theory of minor planets», since 1910 he taught a course on theoretical astronomy, since 1918 he gave lectures on celestial mechanics. S.A. Kazakov is the author of textbooks on theoretical astronomy (1913) and spherical astronomy (1935). In addition, the textbook on spherical astronomy was the first one on this subject in Russian, satisfying all requirements of definitions precisions, of theorem derivation strictness and of presentation punctuality.

KAZIMIRCHAK-POLONSKAYA Elena Ivanovna

Born 21.11.1902 in the village of Selets, Volyn province; graduated from the Lviv University (1927); worked as the University Astronomy Department Assistant (from 1928 to 1929), as off-staff Assistant at the Warsaw University Observatory (from 1932 to 1934), a Staff Member in the Astronomical Institute of the Lviv University (1940), a Teacher of Mathematics and Astronomy in Kherson Pedagogical Institute (from 1945 to 1948), a Staff Member in the Institute of Theoretical Astronomy of the USSR Academy of Sciences (ITA) (from 1948 to 1950); completed her PhD Thesis "Close Encounters of Comets with Planets" (1950); was Associate Professor in the Odessa Pedagogical Institute (from 1953 to 1956), Researcher in the ITA (from 1956); defended her Doctoral Thesis "The Theory of the Short-Periodic Comet Motion and the Problem of Their Evolution" (1968). Died 30.08.1992.

E.I. Kazimirchak-Polonskaya's main scientific works were concerned with the motion of small bodies of the Solar System, mostly comets. She published the history of studies of the comet motion and their approaches to Jupiter for 200 years. Besides, a new task was set by her to computerize the studies of the celestial body motions. She developed a new effective method for the numerical integration of the differential equations of motion of a small body with a variable step (taking into account all planetary perturbations and non-gravitational effects), on the basis of which she investigated the motion of comet Wolf in the interval 1884-1973 with high accuracy. She constructed an accurate numerical theory of Ashbrook-Jackson Comet's motion from 1949 to 1979; examined the orbit evolution of about 40 short-periodic comets with all the planetary perturbations from 1660 to 2060. She showed that comets' encounters with Jupiter and Saturn are not rare, random phenomena, as previously thought, but are subject to complex laws. She determined the general patterns of evolution and transformation of cometary orbits, proposed a new numerical theory of multistage capture of comets by outer planets over long periods of time and confirmed it with a number of examples. She was the first to explore (together with I. S. Astapovich, N. A. Belyaev and A. K. Terenteva) the perturbed motion of the Leonid meteor swarm from 1700 to 2000, found the details of their structure and predicted correctly the maximum intensity time of the Leonid swarm in 1966, as well as other swarms, revealed the details of their structure.

She was a member of the Organizing Committee of the IAU Commission No.20 in 1970. She made enormous efforts for the successful holding of the IAU Symposium No.45 "Motion, evolution of orbits and the origin of comets" (1970, Leningrad) and the publication of the Proceedings of the Symposium, of which she was one of the editors. The USSR Academy of Sciences awarded E. I. Kazimirchak-Polonskaya the F. A. Bredihin Prize (1968) for her comet research activities from 1961 to 1968. She died on August 30, 1992 and was buried at the Pulkovo Memorial Cemetery. Minor planet (2006) Polonskaya is named in her honour.

KHABIBULLIN Shaukat Taipovich

Born in 1915. He graduated from the Kazan State University (KSU, now KFU) in 1940. As a graduate student in 1941, he was drafted into the army and went through the entire war. After the war, he was restored to the post-graduate and master's thesis in 1948. In 1957, he defended his doctoral dissertation. Until 1958 he worked in the Engelhardt Astronomical Observatory. Dr. Sci. Science (1958), professor (1959). Since 1961 he headed the Department of Astronomy of KSU. During the period (1963-65) he was the dean of the newly organized faculty of Physics, and then to 1987 served as Vice-Rector for Science at KSU. Honour Scientist of Tatarstan and the Russian Federation (1970, 75). He was awarded the Order of Lenin and the October Revolution, the Red Banner, World War 1 and 2 degrees, Red Star, and medals. Died 07.03.1996 in Kazan.

Studying in the field of stellar astronomy using the method of stellar counting, he showed that there is symmetry in the distribution of stars relative to the galactic plane, the density of stars increases in the direction towards the center of the Galaxy and the Sun lies in an area of reduced stellar density.

Investigating problems of celestial mechanics, he developed an analytical theory of lunar rotation and, simulating the libration parameter, showed that the resonant buildup of the Moon, predicted by the linear theory, is impossible. The methods to consider the non-linearity in the libration equations have been developed and at this base, the new non-linear theory of lunar rotation was constructed. As a result of careful analyses of selenographic coordinate systems, he proposed a method for determining the coordinates on the Moon, using the coordinates of stars. There were also developed the basis of the theories of the rotation of the Mercury and the Venus.

Together with prof. Nefed'ev A.A. contributed to the creation of the telescope AZT-22 with a diameter of 1.5 meters. He was the initiator and organizer of the new astronomical observation stations: Nakhichivan, Zelenchukskaya, and Turkey.

He was a member of the editorial board of international journals "Earth, Moon and Planets" and "the Moon". He has prepared 15 candidates and 3 doctors.

KHAIKIN Semyon Emmanuilovich

Born 21.08.1901 in Minsk. In 1918, after graduating from a non-classical secondary school, entered Baumann Higher Technical College in Moscow and The Higher Electrotechnical courses. Served in the Red Army (1919–1924). In 1928, graduated from Dept. of Physics and Mathematics of Moscow University. 1930–1946: with Moscow University (Professor, Deputy Director in Physics Institute, Dean of Dept. of Physics, Head of Chair of General Physics, Head of Laboratory on Development of Phase Radiolocation and Radionavigation. 1945–1953: with Lebedev Institute of Physics of the Academy of Sciences, Head of Sector of Radioastronomy in Laboratory of Oscillations. Directed the creation of the first Soviet Radioastronomical Station in Crimea (1948–1949). In 1954, established in the Pulkovo Observatory Dept. of Radioastronomy. Died 30.07.1968 in Moscow.

Belonged to scientific school of L.I. Mandelshtam and N.D. Papaleksi, S.E. Khaikin greatly contributed to the theory of oscillations and theoretical radio engineering. Most known works are related to problems of self-oscillations, of the phenomenon of «capture» for minor outer external effects, of relaxation oscillations. In 1939, found the effect of over-heating of the solid body. Authored numerously reprinted books «Physical Foundations of Mechanics» (1963, 1971, 2009) and «The Theory of Oscillations» co-authored with A.A. Andronov and A.A. Witt (1937, 1959, 1981). One of the basic authors of classical three-volumed «Textbook of Elementary Physics» under the editorship of G.S .Landsberg. Was alleged of disposition toward “Machism”; as a result, was compelled to leave Moscow University and the Institute of Physics. Founder of the Soviet experimental radioastronomy. Paid great attention to implementation of radioastronomical instrumentation and development of methods of observations. In 1947, headed the expedition to Brazil, where for the first time in the world carried out observations of a total solar eclipse in radio wavelengths. In 1956, at Pulkovo Observatory following his idea and under his direction, a radio telescope with a variable profile antenna was built, with which circular polarization of the radiation from active regions on the Sun was detected, «radio-spots» were studied in detail, linear polarization of the thermal radio radiation of the Moon in centimeter wavelengths detected and studied, roughness of the lunar surface was estimated, the distribution of radio brightness over the disk of Venus was for the first time studied, the structure of the radiative belts of Jupiter were investigated, precision measurements of coordinates of extragalactic radio sources were carried out, and it was found that more than 40% of bright sources in centimeter wavelengths are of quasi-stellar nature, the structure and polarization of complex extragalactic sources was studied in detail. Directed the design project of RATAN-600 radio telescope. Outstanding physicist, renowned expert in the area of radio physics and radioastronomy, a prominent teacher, who raised a whole generation of physicists and radio astronomers. Lectured at the Department of Physics of Moscow University, in Moscow Engineering Physics Institute, Moscow Institute of Telecommunications Engineers, was one of the initiators of school “Olympics”. Head of the Commission on radioastronomy of Astronomical Council of the USSR Academy of Sciences, Member of Editorial Boards of Journals «Radio Engineering» and «Astronomical Journal». Awarded with the Order of The Red Banner of Labor (1953), A.S. Popov Gold Medal of the USSR Academy of Sciences (1965).

KHALIULLIN Habibrakhman Fayzrakhmanovich

Born 15.08.1942 in Malmyzh, Kirov region. Died on 23 December 2011 in Moscow. He graduated from Kazan State University in 1969 and finished post-graduate studies at the Faculty of Physics of MSU in 1972. His candidate thesis was "Photometric study of eclipsing Wolf-Rayet-type binary stars V444 Cyg and CQ Ser" (1973). His doctoral thesis was "Photoelectric studies of eclipsing binary stars. Methods and results" (1997). He worked at the SAI MSU since 1973. From 1986 to 2011 he was the head of the Laboratory of Astrophotometry of the SAI MSU. In 2004 he became a professor of astrophysics and radio astronomy. Died 23.12.2011 in Moscow.

Khaliullin was an expert in the study of close binary stars. He published 87 scientific papers. His works on the study of extended shells of Wolf-Rayet stars and the internal structure of stars based on the analysis of the rotation of the apse line in close binary systems (CBS), as well as on the study of synchronization and circularization processes in the CBS received international recognition. He was the first in the world who discovered the relativistic motion of the periastron of the orbits of binary stars. The new methodological developments carried out by Khaliullin in the field of fundamental heterochromic astrophotometry of stars and the analysis of the light curves of eclipsing binary systems are widely used in astrophotometric studies. His discovery of the evolutionary change in the orbital period in the V444 Cyg eclipsing system caused by the radial loss of matter by the Wolf-Raye component in the form of a stellar wind, and the first dynamic assessment of the intensity of the loss of matter by the Wolf-Raye star, are widely recognized.

The work carried out by Khaliullin together with Academician of the Russian Academy of Sciences A. M. Cherepaschuk and astrophysicist J. A. Eaton (USA) allowed us to establish the nature of Wolf-Rayet-type stars. Based on calculations of models of the atmospheres of helium stars, Khaliullin proved the inapplicability of the traditional (homogeneous) model of the shells of Wolf-Rayet stars and proposed an original model of the discrete outflow of matter, which explains all the observational features of these stars. Under the leadership and with the participation of Khaliullin, a series of works was carried out to determine the apsidal rotation rates and the orbital parameters of eclipsing binary systems. The comparison of the observed and theoretical apsidal parameters contributes significantly to the development of the theory of evolution and the internal structure of stars.

In 1984 Khaliullin was appointed scientific and technical head of work on the creation of a high-altitude astronomical observatory in the Tien Shan Mountains (Kazakhstan) (built in 1989) on the basis of the automated Zeiss-1000 and Zeiss-800 telescopes for stellar support of space flights. In 1991, a unique "Catalog of the WBVR values of the bright stars of the Northern Sky" for 13,586 objects was published, based on the original photoelectric measurements carried out at this observatory.

KHOKHLOVA Vera L'vovna

Born 25.07.1927 in Babushkin, Moscow region, died on Sept. 24, 2003, in Moscow. In 1950, graduated from M.V. Lomonosov Moscow State University (MSU), then worked at the Crimean Astrophysical Observatory of USSR Academy of Sciences (CrAO). CrAO PhD student in 1954-1956. PhD thesis «Spectroscopic study of H and K Ca II lines in quiet and faculae solar regions » in 1959. From 1961 to 2002, worked at the Astronomical Council (currently, the Institute of Astronomy of Russian Acad. Sci., INASAN) in positions from a junior to a leading researcher. D. Sci. (1987, dissertation «Surface structure and chemical abundances of the magnetic chemically-peculiar stars»). Died 24.09.2003 in Moscow.

V. L. Khokhlova's research interests were in the fields of spectroscopic analysis of solar and stellar atmospheres, spectral line formation, and atmospheric abundance determination. She also participated in the complex program of the Moon study.

V. L. Khokhlova was a pioneer and leader in the investigation of the surface abundance inhomogeneities of chemically peculiar (Ap) stars with the global magnetic fields. In cooperation with MSU mathematicians A.V. Goncharsky and A.G. Yagola, she developed a method of the reconstruction of surface structure and magnetic field geometry in Ap stars based on high-resolution spectral observations. Her research served as a foundation for the widely used modern surface, temperature, and magnetic field mapping techniques known as Doppler and Zeeman-Doppler imaging. V. L. Khokhlova published more than 100 scientific papers. She supervised a number of PhD theses.

V. L. Khokhlova was a member of the International Astronomical Union, a President of Commission 4 «Magnetic stars » of the International cooperation between the Academies of Sciences of the socialist countries, vice-editor-in-chief of the «Astronomy Letters» journal.

KHOLOPOV Pavel Nikolaevich

Born 06.06.1922 in Syktyvkar. Died on 13 April 1988 in Moscow. He studied with interruptions due to a leg disease, and moved on crutches since his youth. He graduated from the Astronomical Department of Faculty of Mechanics and Mathematics of MSU in 1946. Since 1946 he was a junior research scientist and in 1957 became a senior research scientist of the Astronomical Council of the USSR Academy of Sciences. He defended his candidate thesis in 1953 and doctoral one in 1974 (based on a set of works). In 1960 he moved to the Moscow State University as head of the Department of Variable Stars (since 1978 the Department of the study of the Galaxy and variable stars). Died 13.04.1988 in Moscow.

Kholopov was an expert in the study of variable stars and star clusters. Already in 1944, he discovered the absence of RR Lyrae stars with periods of about 0.43 days in globular clusters. He participated in the compilation of all editions of the General Catalog of Variable Stars (GCVS) and catalogues of stars suspected of brightness variability. Since 1960, he was the head of this work together with B. V. Kukarkin, and since 1977 became the head of the entire GCVS project. He developed an improved classification system for variable stars, most notably for young variable stars associated with diffuse nebulae.

Kholopov proved that both open and globular clusters have extensive crowns and argued for the unity of the structure and evolution of star clusters of different types. He showed the groundlessness of the assumptions about the mandatory expansion of stellar associations and the birth of stars in them from superdense bodies. Kholopov studied the groupings of young irregular variable stars of the T-Taurus type (T-associations) and found that they are gravitationally bound, the youngest clusters. He studied the position of the T-Taurus variable stars on the Hertzsprung-Russell diagram and found that they are concentrated in a dedicated band of the diagram, which he called the T-band (P. N. Kholopov band). Contrary to the popular belief that there are no variable stars in the open clusters, Kholopov has statistically demonstrated that classical cepheids are undoubtedly part of the open clusters of the Galaxy. Together with Yu. N. Efremov, he studied some of the most interesting cepheids – members of clusters: the bimodal cepheid V367 Shield (in NGC 6649) and the double cepheid CE Cassiopeia A and CE Cassiopeia B (in NGC 7790). Kholopov established a new position of the initial main sequence for stars with a high metal content. He is the author of the fundamental monograph "Star Clusters" (1981).

Kholopov was one of the pioneers of the introduction of computers in the study of variable stars, the author of several effective computer programs for finding periods. He actively participated in astronomical observations on the SAI telescopes, despite health problems.

Since 1960 he was a member of the editorial board, and in 1978-1988 he was an editor-in-chief of the magazine "Variable Stars", founded by B. V. Kukarkin. He was also a member of the editorial boards of the "Astronomical Circular" and a collective series of monographs " Non-stationary stars and methods of their research "(volumes I-V, 1970-1974), for which he wrote a number of sections.

He was awarded the Medal of the Astronomical Council of the USSR Academy of Sciences for the discovery of new astronomical objects (1974).

KHOLSHEVNIKOV Konstantin Vladislavovich

Born 19.01.1939 in Leningrad (now St. Petersburg). In 1956-1962, a student of the Astronomical Department of Leningrad State University. In 1962-1965, a post-graduate student of the Department of Celestial Mechanics of Leningrad State University. In 1965, defended his PhD dissertation, and, in 1971, defended his Dr. Sci. dissertation. Since 1964, worked at Leningrad State University, in positions from an assistant to a professor. In 1970-2020, Head of Department of Celestial Mechanics. Professor of the Department (1975). Died 10.01.2021 in St. Petersburg.

V.K. Kholshevnikov's research is mainly in the fields of celestial mechanics and the dynamics of the Solar system. Author and co-author of more than 250 scientific papers and 13 monographs.

Since 1965, studied the behavior of the Laplace series for the gravitational potential of celestial bodies, depending on their structure. He found the decrease rate for the terms of the series and proves that the series diverges on the surfaces of planets, asteroids, and satellites. Later on (together with V.A.Antonov and V.Sh. Shaidulin), he found the domain of asymptotic behavior of the series and showed that for planets with pointed mountains the series has accelerated convergence. In the early 1980s, determined satellites' paths and visibility bands to identify properties of perspective satellite navigation systems. Proved (with L.L. Sokolov) the applicability of the KAM theory to Solar-kind planetary systems with actual planetary masses. Established (with L.L. Sokolov) integrability of the N-body problem in the high-energy domain and presents a complete set of first integrals. Developed (with A.V. Elkin et al.) the theory of Lyapunov figures of equilibrium of celestial bodies by designing algorithms for arbitrary-precision approximations in a small parameter and finding the radius of convergence of Lyapunov series in most important special cases. Found domains of convergence of classical expansions of celestial mechanics for representing the motion of planets and satellites. Described (with A.V. Krivov, S.A. Orlov, L.L. Sokolov, V.B. Titov) the evolution of a swarm of dust particles in the vicinity of orbits of minor natural satellites, which made it possible, for example, to explain the delta-like particle size distribution in the E ring of Saturn (V.V. Dikarev). Established (with E.D. Kuznetsov) features of the dynamical evolution of the Solar system and some extrasolar planetary systems. Constructed (with V.A. Shor) the distribution of velocities of meteoroids falling on planets. Introduced (with N.N. Vasiliev) natural metrics in the space of Keplerian orbits and its most important subspaces, and applied them (with G.I.Kokhirova) to the problem of identification of parent bodies of meteoroid streams.

Supervises young scientists and is one of the organizers of the Russian wide annual winter (Kourovka) astronomical school events for young astronomers (46 school events have already been held). Among his students, there are 20 Ph.D. graduates in physics and mathematics (5 of them have Dr.Sci.).

Member of IAU (1973), member of several scientific and dissertation councils and editorial boards of astronomy journals. Awards: Prize for the best scientific work (Leningrad State University, 1986); Prize for High Pedagogical Excellence (St. Petersburg State University, 1999); Honoured Worker of the Higher School of the Russian Federation (1999); I.F.Obraztsov Silver medal "For contribution to the Russian education" (Znaniye Society, 2008); Honoured Scientist of the Russian Federation (2009); Knight of Science and Arts (RAEN, 2010); Medal "For Champion of Enlightenment" (Znaniye Society, 2011). The asteroid 3504 Kholshevnikov was named after V.K. Kholshevnikov (1991).

KHOLTYGIN Alexander Fedorovich

Born 12.04.1951 in Leningrad (now St. Petersburg). In 1973, graduated from Leningrad State University (now St. Petersburg State University) in astronomy. From 1973–1997, worked at the Astronomical Observatory of Leningrad State University firstly as a senior laboratory technician and then as a researcher. From 1977-1980, was a postgraduate student of the Department of Astrophysics. Since 1997, an associate professor of the Department of Mathematics. Since 2006, a professor of the Department of Astronomy of SPbSU. In 1981, completed his Ph.D. and in 2006, Dr. Sci. The title of his doctoral thesis is "A structure of envelopes of hot stars and gaseous nebulae". Member of IAU and EAS. Member of international scientific projects MAGORI and BOB.

A.F. Kholtygin's research interests lie in the areas of atomic spectroscopy, physics of gaseous nebulae, and physics of early-type stars. In 1970-1980, his calculation of atomic parameters and recombination spectra for C, N, and O ions provided opportunities to determine their content in planetary nebulae. He explained why the quantity of elements determined from recombination lines are of one or two orders greater than that determined from lines excited by electron impact. In 1998, developed a phenomenological model of nebulae taking into account temperature and number density fluctuations to explain this discrepancy.

Estimated the size of inhomogeneities in nebulae. In the 2000s, proposed (together with I.I. Nikiforov and V.V. Akimkin) a new method for kinematical calibration of the distance scale to planetary nebulae.

Since the 1980s, started to study the structure of moving atmospheres and the emission spectra of Wolf-Rayet stars. He developed a stochastic model for atmospheres of early-type stars. In the early 2000s, proposed a large observational program to look for rapid line profile variations in the spectra of these stars. More than 10000 spectra of stars were obtained by implementing this program at the 6-meter BTA telescope and other instruments. Investigated line profile variations by Fourier and wavelet analysis. Regular microvariations of the line profiles with an amplitude of 0.5-5% of the continuum level in the spectra of all studied stars were revealed. Since the late 2000s, spectral observations were performed with a circular polarization analyzer at the SAO 6-meter telescope and the ESO 8-meter telescope. The magnetic field was detected for more than 20 stars. Spectral observations of OBA-stars at SAO and ESO with high temporal resolution enabled the detection of ultrafast variations in the line profiles with periods of 3-5 minutes. The magnetic field measurements were used to determine the magnetic field and magnetic flux distribution for OBA-stars. It was shown that this distribution is logarithmic-normal. He developed (with A.P.Igoshev and A.S.Medvedev) the population synthesis models of the evolution of neutron stars and magnetic OBA stars on the main sequence. Proposed a phenomenological model of the magnetic field formation for OBA-stars at the pre-main sequence stage of evolution. This model allowed one to explain, for the first time, the properties of the magnetic field distribution at the main sequence. Author of the monograph “Theoretical atomic spectroscopy” (with Z.B.Rudzikas and A.A.Nikitin, 1990) and more than 200 scientific papers.

KHRUTSKAYA Eugenia Vladimirovna

Born 30.08.1939 in Babushkin, Moscow region, died on Sept. 24, 2003 in Moscow. In 1950,graduated from Lomonosov Moscow State University (MSU) , then worked in Crimean Astrophysical Observatory of USSR Academy of Sciences (CrAO). CrAO PhD student in 1954-1956. PhD thesis «Spectroscopic study of H and K Ca II lines in quiet and faculae solar regions » in 1959. From 1961 to 2002 in the Astronomical Council (currently, Institute of Astronomy of Russian Acad. Sci., INASAN) in positions from junior to leading researcher. D. Sci. (1987, dissertation «Surface structure and chemical abundances of the magnetic chemically-peculiar stars»). Died 04.10.2013 in St. Petersburg.

Scientific interests of V. L. Khokhlova were in the field of spectroscopic analysis of solar and stellar atmospheres, spectral line formation and atmospheric abundance determination. She also participated in the complex programme of the Moon study.

V. L. Khokhlova was a pioneer and a leader in the investigation of the surface abundance inhomogeneities of chemically-peculiar (Ap) stars possessed the global magnetic fields. In cooperation with MSU mathematicians A.V. Goncharsky and A.G. Yagola В.Л. she developed a method of the reconstruction of surface structure and magnetic field geometry in Ap stars based on high-resolution spectral observations. These pioneer works gave a basis for the widly used modern surface, temperature and magnetic field mapping techniques known as Doppler and Zeeman-Doppler imaging. V. L. Khokhlova published more than 100 scientific papers. She supervised PhD a number of PhD theses.

V. L. Khokhlova was a member of the International Astronomical Union, a President of Commission 4 «Magnetic stars » of the International cooperation between the Academies of Sciences of the socialist countries, vice-editor-in-chief of the «Astronomy Letters» journal.

KILPIO Elena Yuryevna

Born 14.04.1973 in Moscow. In 1996 graduated from Lomonosov Moscow State University, astronomer. From 1995 to 2018 worked at the Institute of Astronomy of the Russian Academy of Sciences (INASAN) in the following positions: engineer, junior researcher, researcher, senior researcher, head of the group, assistant director for scientific and organizational work. In 2013-2016 also occupied a position of consultant in the Federal Agency for Science Organizations (FASO). 2016– present deputy chief of staff of the Physical Department of the Russian Academy of Sciences (RAS). Defended her PhD thesis in 2006.

In 1996 defended her diploma «Study of the Interstellar Extinction in the Galaxy» that was devoted to the modeling of the interstellar extinction (supervised by prof. O. Malkov). In 2006– PhD thesis п «Study of Flare Activity in Symbiotic Stars» (supervised by prof. D. Bisikalo), where a possible mechanism of outbursts in symbiotic stars was proposed.

In 1995–2018 participated in the work on the World Space Observatory (Spektr-UF) international space project (the project is included in the Federal Space Program of Russia). Throughout all the period of her work at the INASAN, she took an active part in the scientific and organizational work of the Institute, and for some years was responsible for a significant part of it.

In parallel with her work at INASAN, from 2014 to 2016, had been also working at the Federal Agency for Science Organizations (FASO), where she was the curator of the vast majority of RAS institutes working in the field of physics and astronomy, has the rank of state civil service. Since 2016, she has been working at the Russian Academy of Sciences as Deputy Head of the Department of Physical Sciences (scientific and organizational work as well as expert activity).

Member of the International Astronomical Union (IAU), was a member of the editorial board of the «Bibliography of close binaries» (IAU Commission 42). E. Kilpio is one of the editors (jointly with B. Shustov and M. Sachkov) of the collective monograph «Ultraviolet Universe». She is scientific secretary of the Expert and Analytical Council of the Physical department of the Russian Academy of Sciences «Astronomy, Astrophysics and Space Research» and executive secretary of the Interdepartmental Council of the Complex Plan of Scientific Research «Astronomy, Astrophysics, Space Exploration». Since 2020 she is a mentor in the «Space for Women» project of the United Nations Office for Outer Space Affairs.

KIM Iraida Sergeevna

Born 30.04.1945 in Kostanay, Kazakhstan. In 1967, graduated from the Lomonosov Moscow State University (MSU). Was affili-ated to the Institute of Atmospheric Physics (USSR Acad. Sci.) in 1967–1968, Hydrometeorology Committee in 1968–1969, Institute of Terrestrial Magnetism, Ionosphere and Ra-dio Wave Propagation (IZMIRAN, USSR Acad. Sci.) as a PhD student in 1969–1972 and then in 1973–1988. Since 1988, senior researcher at the Sternberg Astronomical Insti-tute of the MSU. PhD in astronomy. Member of the IAU, of the IAU working group on eclipses, European and Eurasian astronomical societies, board member of the Sun section of the Scientific council on astronomy (Russian Acad. Sci., RAS) and of the "Solar physics" section of the RAS Space council.

K.'s scientific research is mainly related to developing astronomical equipment for recording faint objects located near bright ones. She is the author of about 150 scientific papers.

In the 1970–1980s, she worked on the design of a magnetograph for measuring magnetic fields of so-lar prominences (under the leadership of G.M. Nikolsky); after 1983, headed magnetographic studies of prominences. K. demonstrated the crucial role of the telescope's instrumental background in detection of "weak" magnetic fields, when the Zeeman splitting was below the line width by 2–3 orders of magnitude.

In the 2000s, she headed the development of a precision method of 2D linear polarimetry of light from the Sun's lower corona in the visual continuum and of prominences in emission lines, performed the first measurements of linear polarization of light for prominences during total solar eclipses, obtained observa-tional evidence for insignificant amount of neutrals and electric currents in the inner corona.

K. worked on improvement of the coronagraphy methods, in particular, or mirror coronagraphs com-bining super-smooth primary optics and Lyot's coronography method. She demonstrated the possibility of coronagraphic detection of space debris from geo-stationary orbits. Together with O.I. Bugaenko, V.V. Popov, and O.I. Evseev, she suggested the idea of an alternative "coronagraph" employing a mask with variable transparency installed in the plane of the entrance pupil. Together with L.P. Nasonova, K. suggested the idea of detection of the lower K-corona from the L2 Lagrange point of the "Sun–Mars–spacecraft" system.

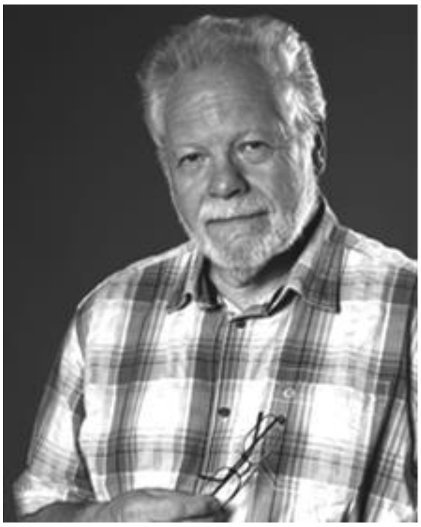
She participated in the work on developing coronagraphic methods of high-contrast imaging of stellar objects, headed by A.M. Cherepashchuk.

K. was the principal investigator of several space experiments (the Soviet–American ASTP experiment, Apollo–Soyuz project, 1975, authors A.I. Simonov and G.M. Nikolsky; the French–Soviet PCN experiment, 1982, authors G.M. Nikolsky and S. Koutchmy; the "Lyra" Russian project, 1996–2000, headed by A.M. Cherepashchuk), participant of the "Interhelioprobe" research program, 2007-2011, headed by V.D. Kuznetsov.

K. supervised several graduation studies and two PhD dissertations.

She was awarded the "Winner of the Socialist Competition" breastplate, bronze medal of the Exhibition of Achievements of National Economy, medal "Veteran of Labor", Certificates of honor from the USSR Acad. of Sci. and MSU.

KISELEV Nikolay Nikolaevich



Born in 1942. In 1961–1966 – a student of St.Petersburg (Leningrad) State University. In 1966–1994 – a researcher at the Institute of Astrophysics of the Academy of Sciences of Tad-jikistan. In 1994–2005 – a leading scientist at the Astronomi-cal Observatory of Kharkov National University. In 2006–2015 – Head of the Department at MAO of the National Academy of Sciences of Ukraine. Since 2015 – a principal scientist at the Crimean Astrophysical Observatory of the Russian Academy of Sciences, Head of the Laboratory of Small Solar System Bodies. In 1982, he defended the Ph.D. thesis "Polarimetry of comets". In 2003 – the Doctoral thesis "Light scattering by dust particles of comets, asteroids and circumstellar shells: observations and interpretation".

As Head of the Department of Variable Stars, he designed and built several polarimeters and carried out a research in the field of photoelectric and imaging polarimetry and photometry of comets, asteroids and stars. He was responsible for the building of the Sanglok Observatory (Tad-jikistan) equipped with the 1 m reflecting telescope.

N.N. Kiselev was the first to discover and investigate negative polarization and diversity of polarization maxima in comets, the polarization opposition effect for E-type asteroids, satellites of planets, and strong polarization in deep brightness minima for Herbig Ae/Be stars. Dr. Kiselev was a coordinator of the photometric and polarimetric network of the USSR component in the International Halley Watch Program. He is a recipient of the USSR Plaque of Honor (1986), the Medal of the Astronomical Council of the USSR Academy of Sciences (1984), and the Gold and two Bronze Medals of the Exhibition of Economic Achievements of the USSR (Moscow, 1987–1989). N.N. Kiselev is a member of the International Astronomical Union, the European Astro-nomical Society, the Astronomische Gesellschaft. To recognize his contribution to astronomy, the asteroid 4208 was named Kiselev.

An author and co-author of more than 260 scientific publications.

KISELYOV Alexey Alexeyevich

Born 28.02.1922 in Petrograd. Took part in the Great Patriotic War. 1946 to 1950 – student of the Dept. of Mathematics and Mechanics, the State University of Leningrad. 1950: imprisoned for 10 years (Stalin purges). 1956: released and totally rehabilitated. 1956: Diploma on Astrometry in The State University of Leningrad. Since then: permanently with the Central Astronomical Observatory at Pulkovo. Dr.Sci. (1985), Professor at the Chair of Astronomy in the State University of St.-Petersburg. Member of IAU. Died 30.11.2013 in St.-Petersburg.

Foremost authority in the area of Photographic Astrometry and Stellar Astronomy. Contributed significantly to organization of observations of artificial satellites of the Earth form the USSR territory and to processing of these observations. Composed a universal and thorough methodical textbook on satellite observations and on their astrometric reduction, which was used at all points of satellite observations and is still of value. Suggested a calibration technique for wide-angle telescopes.

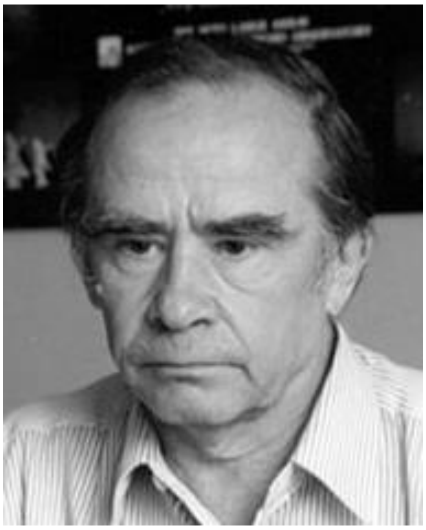
Founder of a research area related to observations and studies of binary and multiple stars and stars with invisible satellites. Developed the method of apparent motion parameters to determine orbits of celestial objects from a short arc. Was the Principal Investigator at the 26-inch Large Pulkovo Refractor, which became the leading instrument among telescopes of this type in the world and now is by far the first in the number and duration of regular series of observations of Solar system bodies and binaries. Contributed to determination of high-accuracy stellar parallaxes. Under his supervision, more than 22 thousands photographic plates and around 50 thousands CCD observations were obtained with the 26-inch Refractor within the framework of different observational programs. Observed large planets and their satellites, Halley Comet. With N.M. Bronnikova, developed one of the methods of account for the phase effect.

Authored more than 150 science works, including noted throughout the world high-precision Catalogs of positions of visual binaries. His monograph «Theoretical Grounds of Photographic Astrometry», became a table book for students and scholars in the field of Photographic and CCD-astrometry.

From 1982 to 2011, held lecture courses on Photographic and CCD astrometry.

In 1994, was awarded the title of «Soros Professor». 2002: title of Honored Scientist of Russian Federation. Commemorative Struve Medal. The minor planet 4592 discovered in 1979 was named after him: Alkissia.

KISLYAKOV Albert Grigor'evich



Born 03.06.1931 in the city of Shuya, the Ivanovo Region. 1949-1954, a student of the Radiophysical Faculty at N. I. Lobachevsky State University of Gorky (GSU) (now the Faculty of Radiophysics at N. I. Lobachevsky State University of Nizhny Novgorod (UNN)). 1954-1957, a post-graduate student of the GSU, with V.S. Troitsky as a scientific adviser. Defended his PhD thesis in 1958, defended his D.Sc. thesis in 1985. Professor since 1988. 1954-1957, worked at the Research Institute for Physics and Technology at GSU (now NIFTI at UNN). 1957-1977, worked at the Radiophysical Research Institute (NIRFI). 1977-1997, Department Head of the Institute of Applied Physics of the Russian Academy of Sciences (IAP RAS). 1997-2016, a head and professor of the Department of Radio Engineering at the UNN. Honored Science and Engineering Worker of the Russian Federation. Member of the International Astronomical Union (IAU). Died 31.12.2019 in Nizhny Novgorod.

A.G. Kislyakov's research interests are radio astronomy, radiophysics, radio engineering.

A.G. Kislyakov was one of the founders of millimeter and submillimeter radio astronomy in the USSR. He started his first investigations in this wavelength range in 1954. By 1960, the radiometric equipment for the wavelength range from 3 to 7 mm was designed and manufactured at the NIRFI. Subsequently, the range was extended up to 0.74 mm. The radio emission of the Moon and the Sun in this range was observed, as well as the cosmic microwave background (CMB) temperature at the millimeter wavelengths was measured. In 1969-1970, under A.G. Kislyakov's leadership, a new millimeter-wavelength transit radio telescope RT-25x2 was built at the NIRFI Radio astronomical station (polygon) in Zimenki with a record angular resolution at that time. This allowed him, in particular, to examine the brightness distribution across the solar disk. Using RT-25x2, as well as the radio telescopes RT-22 of the Lebedev Physical Institute of the Russian Academy of Sciences (LPI RAS) and the Crimean Astrophysical Observatory (CrAO), A.G. Kislyakov and his colleagues carried out studies of planets and Galactic dark nebulae through CO molecules observations in the isotope lines. Then, the research was continued using the radio telescope of the National Radio-astronomy Observatory (NRAO, US). In collaboration with the staff of NRAO, the new lines of molecules and the existence of cyanamide in the center of the Galaxy were discovered.

At the same time, A.G. Kislyakov actively carried out research on atmospheric emission and absorption at millimeter wavelengths, as well as research on the use of millimeter-wavelength radiometers for medical diagnostics and other applications. In 1984, due to A.G. Kislyakov and L.B. Likhterman's initiative, the Radiothermovision Center was established as part of the Nizhny Novgorod Research Institute.

KLOCHKOVA Valentina Georgievna

Born 01.04.1947 in Alexandrovsk district of Stavropol region. In 1965-1970, she was a student of the Rostov-on-Don State University (now the SFU). From 1970, she has been working at the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) in different positions, from Research Assistant to Laboratory Head (from 1996). In 1981-1984, did post-graduate studies at SAO RAS under I.M. Kopylov's academic supervision. In 1985, defended her Ph.D. dissertation on "Peculiar Bp and Ap Stars in Stellar Groups of Different Ages". In 1992, defended her Dr.Sc. dissertation on "Spectroscopic Manifestations of Evolution of Stellar Atmospheres". Professor in Astrophysics and Radio Astronomy (2007). IAU member, member of several scientific boards and editorial boards of astronomy journals.

V.G. Klochkova's research is related to stellar physics and evolution, the evolution of the Galaxy chemical composition. The author of over 380 scientific publications.

In the 1980s, under I.M. Kopylov's academic supervision, she had conducted the spectroscopy program of peculiar Bp and Ap stars from the representative sample of stellar groups of different ages to study the problem on origin and evolution of chemical abundance and magnetic field peculiarities of these stars. It was shown that these peculiarities had been acquired before the Main Sequence stage and were preserved after this stage. Discovered the correlation between the magnetic field and stellar mass.

From 1985, in collaboration with V.E. Panchuk, using the method of atmospheric models, conducted a study of detailed atmospheric chemical composition of stars sampled by an evolution stage and belonging to different galactic populations: F dwarfs in the Galactic field and open clusters, metal-poor sub-dwarfs of the halo, F supergiants at high Galactic latitudes, and stars of different types within globular clusters.

Since 1993, her main area of research was the study of a new population of high luminosity stars identified with strong IR emission sources. Developed a unified approach to determine fundamental parameters of these objects, their chemical composition, parameters of the matter outflow from extended atmospheres of these stars. In collaboration with E.L. Chentsov, V.E. Panchuk, et al., she conducted detailed studies of the sample of stars of this type observed at the evolutionary transition from AGB supergiants to planetary nebulae. In stellar atmospheres of about 30% of these stars, evolutionary changes were found in content of carbon and heavy metals due to their synthesis in the neutronization processes at the AGB stage and by rising to the stellar surface as a result of the third mixing. Long-term spectral monitoring of these selected objects resulted in the detection of heavy-metal enrichment of their circumstellar envelopes for a small number of them.

Conducted long-term spectral monitoring of rarely observed yellow hypergiants. In particular, 20-year monitoring of one of them, V1302 Aql, performed in collaboration with E.L. Chentsov, V.E. Panchuk et al., resulted in the discovery the object's shift along the Herzchshprung-Ressel diagram in the direction of the Yellow Void. Participated in the development and putting into operation of echelle-spectrographs at the 6-m SAO RAS telescope.

Supervision of 5 Ph.D and 1 D.Sc. theses were prepared. She worked as a member of the editorial boards of national and foreign journals on astrophysical topics.

Honored Scientist of the Karachay-Cherkess Republic.

KOBANOV Nikolay Illarionovich

Born 10.01.1942, Vasilyevo village, Pochinkovsky district, Smolensk oblast. Graduated from High School in the town of Tulun in 1958. Between 1959 and 1961, worked as a radio technician in remote areas of Irkutsk oblast. In 1961, admitted to study at Irkutsk State University. Between 1961 and 1964, served in the Soviet Army. Since 1969, has been working at the Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation of the SB, the USSR Academy of Sciences (since 1992, the Institute of Solar-Terrestrial Physics, ISTP SB RAS). Doctoral degree in Phys.-Math. Sciences (1995), a Member of the ISTP SB RAS Academic Council and two Dissertation Councils. A Member of Euro-Asian Astronomical Society (EAAS).
http://ru.iszf.irk.ru/Категория:Personnels
http://ru.iszf.irk.ru/Кобанов_Николай_Илларионович

N.I. Kobanov's research relates to solar physics and astrophysical instrument engineering, including studies of oscillatory and wave processes in the solar atmosphere using novel methods and instruments. Author and co-author of 180 scientific papers, 1 monograph and 24 inventions.

In 1982, V.S. Bashkirtsev, N.I. Kobanov, and G.P. Mashnich discovered the low-frequency oscillations of radial velocity in quiet prominences. The observations were carried out using the original differential method for measurements developed by Nikolay Kobanov.

In 2004, N.I. Kobanov and D.V. Makarchik for the first time observed traveling waves in a sunspot umbra and proved that these waves did not transform into traveling waves of penumbra widely known by that time.

N.I. Kobanov deals with search for the most efficient channels of wave energy transfer from the lower to the upper solar atmosphere. For this purpose, he investigates height stratification of power of the observed oscillation modes in different solar structures, namely, sunspots, facula, and coronal holes This research is conducted using both ground-based observations and data from space observatories.

N.I. Kobanov is actively working with the youth, giving lectures on experimental solar physics to postgraduate students. He was a research advisor for two candidate's dissertations.

Awards: The Medal "Veteran of Labor" (1985), honorary badges "Inventor of the USSR" (1982), "Honored Veteran of the SB RAS" (2007), Certificates of Honor from the USSR Academy of Sciences and RAS (1974, 2007).

KOBRIN Mikhail Mikhailovich

Born 14.04.1918 in Petrograd (now Saint Petersburg). 1936-1941, a student of Gorky Industrial Institute (now R.E. Alekseev Nizhny Novgorod State Technical University (NNSTU)). Defended his PhD thesis in 1947, defended his D.Sc. thesis in 1962. Professor since 1964. 1941-1956, a research engineer at M.V. Frunze Gorky plant (now M.V. Frunze Nizhny Novgorod Research and Production Association), worked at N.I. Lobachevsky State University of Gorky (GSU) (now N.I. Lobachevsky State University of Nizhny Novgorod (UNN)) and the Research Institute for Physics and Technology at GSU (now NIFTI at the UNN). 1956-1983, Department Head, Deputy Director of the Radiophysical Research Institute (NIRFI). Dean of the Radiophysical Faculty at GSU (now the Faculty of Radiophysics at the UNN) (1962-1964), Pro-rector of GSU (1967-1968).
Member of the International Union of Radio Science (URSI) and the International Astronomical Union (IAU).
Died 19.12.1983 in Moscow.

M.M. Kobrin’s research interests are radio astronomy, radiophysics, radio engineering, solar physics, and solar-terrestrial relations.

M.M. Kobrin’s early research related to the study of the propagation of HF radio waves in the ionosphere and across the Earth's surface. During the postwar years, he researched the properties of the electromagnetic radiation produced by the combustion of different substances, conducted pioneering experiments on the passive location of objects by their thermal radio emission. Under his leadership, innovative research was carried out on the application of satellite navigation and radio astronavigation and on various aspects of applied radio astronomy. In the 1950s, under his guidance, there was the development of new methods and instruments as well as the implementation of the Moon’s radar experiments in the centimeter wavelength range. These results were included in the golden fund of Soviet radio astronomy.

Since 1961, M.M. Kobrin’s activity was devoted to the study of the Sun and solar-terrestrial relations. He initiated the establishment of the Radio service of the Sun in the USSR with the head office in NIRFI. The research of M.M. Kobrin and his followers marked the beginning of two new branches of research in solar radio astronomy: the study of solar radio emission fluctuations and spectrographic studies of the solar radio emission with high-frequency resolution. The first of these areas brought the discovery of quasiperiodic components in the solar radio emission, which until now have been one of the main tools in the study of wave and oscillatory motions in the solar corona and chromosphere and the development of new solar flare forecasting methods. The spectrographic detection of narrow-band radio emission spectral structures gave rise to new methods for determining the physical conditions and the development of active regions and flare loops.

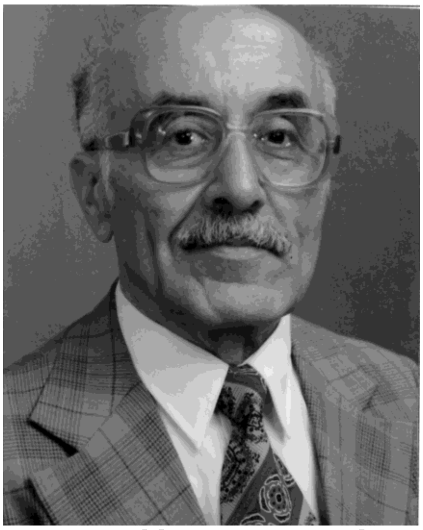
M.M. Kobrin devoted his last years to the application of radio-physical methods in medicine. The most striking results in this area were the impact of heliogeophysical factors on the biosphere and humans, the effects of low-frequency radiation on humans, and the study of the thermodynamic processes in human bodies.

M.M. Kobrin was a member of the Committee on the organization of the NIRFI, was a member of the Bureau of the Scientific Council on Radio Astronomy of the USSR Academy of Sciences (RAS), an organizer and leader of the united group "The radio emission of the Sun" of the USSR Scientific Councils on the problems of "Radio Astronomy" and "Physics of solar-terrestrial relations", the curator of the international relations of the RAS with the GDR and Cuba. He contributed to the establishment of the Institute of Geophysics and Astronomy in Cuba.

M.M. Kobrin’s research and organizational activity had always been linked to his pedagogical work. For many years since 1945, he was an employee of the Radio Wave Propagation Department of the Radiophysical Faculty at the GSU. He was a research adviser of more than 10 PhD theses, many of his students subsequently became doctors of sciences.

M.M. Kobrin is the author of more than 150 publications and 8 patents.

KOCHAROV Grant Egorovich



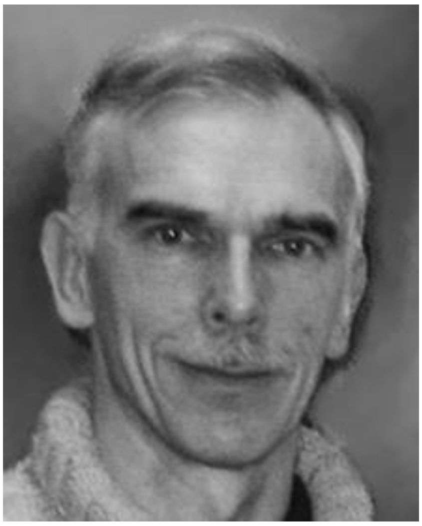
Born 21.09.1932 in Tbilisi. Graduated from the Leningrad Polytechnic Institute with a degree in technical physics. In 1960 he obtained a PhD degree, and Dr Sci in 1971. Started to work in Ioffe Physical-Technical Institute in 1956 as research associate and achieved the position of the Head of laboratory of Nuclear Cosmic Physics. Since 1978 he was the Head of the Space Research Department at the Leningrad Politechnical Institute and Professor of Physics. Member of Academy of Natural Sciences, IAU, and EAS. Died 24.11.2007 in St. Petersburg.

First publications were devoted to the study of the energy spectra of alpha-particles, and to the development of the very powerful ionizing alpha-spectrometer with high accuracy. In 1967 created the Department of Nuclear Space Physics at the Ioffe Institute and studied the problem of neutrinos in space (so-called ‘neutrinos sea’). He proposed an X-ray fluorescence method of analysis and participated in the creation of the spectrometer RIFMA for Lunohod 1 and 2 missions (1971-1972). As a result of this experiment the spectral lines, later interpreted as Si, Fe, Ca, Al, Mg were obtained. In 1969, at the suggestion of Academician B.P. Konstantinov G. Kocharov started to investigate the presence of the radiocarbon -14 isotope in tree rings on a longtime scale. A laboratory setup was created and measurements of the amount of radiocarbon were carried out in the samples. In the future, similar studies were initiated by G. Kocharov. were continued in Latvia, Lithuania, and Georgia. Special attention of G. Kocharov devoted to the study of active processes on the Sun. To solve the problem of solar neutrino deficit, together with Yu. Starbunov proposed the original idea of He-3 combustion in the center of the Sun (as opposed to the generally accepted concept of hydrogen combustion), according to which the temperature in the center of the Sun and the neutrino flux decrease. Since 1973, following the initiative of Academician S. Vernov, the experimental studies of X-ray radiation from solar flares started on the Prognoz 5-7 missions. Due to almost continuous series of observations catalogues of solar flares were created which were widely used for other studies of solar activity. The discovery of flare precursors in the range of X-rays became an important step in the investigation of solar X-ray radiation.

Being a Head of the Space Research Department at the Leningrad Politechnical Institute, G. Kocharov spent a lot of time in working with young scientists and giving lectures to students. He received the Title of a Soros Professor, and was a supervisor of 48 postdoctoral students. It can be argued that there was a Scientific School of G. Kocharov, in which new ideas were boldly proposed and the spirit of scientific creativity was reigned. G. Kocharov also organized the famous Leningrad International Seminars on Cosmo-Physics. He is the author is the author of over 200 scientific articles and 3 monographs.

He was awarded the Order of the Red Banner of Labor, the Order of the Badge of Honor, the medal "For Valiant Labor" to the 100th Anniversary of the birth of V. I. Lenin.

KOCHAROVSKY Vladimir Vladilenovich



Born 15.10.1955 in Sverdlovsk, since 1958 lives in Nizhny Novgorod (former Gorky). In 1978 graduated from N. I. Lobachevsky Gorky State University (now N. I. Lobachevsky State University of Nizhny Novgorod, UNN), Department of Radiophysics, majoring in Radiophysics and Electronics. In 1983 completed post-graduate studies at the Institute of Applied Physics (IAP) RAS, and since then has been working at the Institute, starting as an intern-researcher and then moving on to a principal scientist. Ph.D. (1986), Habilitation (Sc.) D. (1998). In 2006 V.V. Kocharovsky was elected Corresponding Member of the RAS. In 2011 he became Head of the Astrophysics and Space Plasma Physics Department at the IAP RAS and started working at UNN as a professor, where he teaches Plasma Astrophysics. Member of IAU (1999), a member of several scientific societies and councils.

V.V. Kocharovsky is a theoretician who works in several areas of physics and astrophysics, including the physics of space plasma and cosmic rays, radioastronomy, the polarization diagnostics of magnetospheres of planets and the Sun, gamma-astronomy, the astrophysics of compact objects, the physics of magnetospheres of neutron stars and white dwarfs, gravity and cosmology. Author of more than 200 scientific articles and 10 reviews.

Together with V.V. Zheleznyakov and Vit.V. Kocharovsky, he developed the theory of linear interaction of waves in inhomogeneous anisotropic media which now serves as the basis for diagnostics of inhomogeneities in space plasma. Together with A.A. Belyanin and Vit.V. Kocharovsky, he predicted the annihilation cyclotron lines of gamma radiation of neutron stars and found the transformation mechanism of primordial black holes' Hawking radiation in MeV energy range via an electromagnetic cascade in ejected plasma. Together with E.V. Derishev and Vit.V. Kocharovsky, he developed the model of a compact star collapse, induced by a primordial black hole coming inside. Also, together with E.V. Derishev and Vit.V. Kocharovsky, he developed the self-consistent synchrotron and reverse Compton radiation analytical model, which takes into account the two-photon processing and self-absorption of that radiation and gives a correct interpretation of X– and gamma-ray observational data. Furthermore, they proposed a mechanism for particle acceleration through multiple conversions between charged (protons, electrons) to neutral (neutrons, photons) states, which could explain the origin of cosmic rays of ultra high energy up to 10^{21} eV. Together with Vit.V. Kocharovsky, proved renormalizability and causality of quantum gravity with a Hamiltonian unbounded from below for the model of a conformally flat gravitational field, interacting with a massive scalar field of matter, which is of great importance for cosmology.

V.V. Kocharovsky, together with V.Yu. Martyanov and Vit.V. Kocharovsky, found and analytically described a new class of stationary solutions for the current sheets and filaments with a self-consistent magnetic field in collisionless relativistic plasma and obtained a universal criterion of the development of Weibel instability, which leads to the generation of a magnetic field in anisotropic space plasma. Together with E.V. Derishev and Vit.V. Kocharovsky, he stated the inevitable presence of significant amounts of free neutrons and predicted the important role of the latter in the dynamics and emission of relativistic shock waves and jets in the vicinity of compact astrophysical sources, and, with the participation of M.A. Garasev, created the theory of the cyclotron radiation comptonization in the atmospheres of neutron stars.

Under V.V. Kocharovsky's supervision, 9 Ph.D. theses were defended.

V.V. Kocharovsky is the editor-in-chief of the journal Izvestiya VUZ. Radiofizika (translated in English under the name "Radiophysics and Quantum Electronics"), member of the editorial board of Pis'ma v Astronomicheskii Zhurnal (Astronomy Letters), member of the editorial board of The International Journal of Modern Physics D and member of a number of scientific councils on grants of the Russian Federation.

KOLESOV Aleksandr Konstantinovich

Born 04.10.1934 in the Leninskaya Sloboda settlement of Gorky (now Nizhny Novgorod) province. Graduated from Leningrad State University (LSU, now Saint Petersburg State University) in 1957 majoring in astronomy. Completed postgraduate studies in astrophysics in 1961. Since 1960, worked as a junior research fellow at LSU and as a senior research fellow (1966-1972) at the Laboratory of theoretical astrophysics. In 1964, defended his thesis "Continuous spectra of hot white dwarfs". In 1972-1975, Director of LSU Astronomical Observatory. Then, turned to teaching. Delivered lectures and practical courses on higher mathematics at LSU. In 1982, returned to the Astronomical Observatory as a senior research fellow. In 1987, defended his Dr. Sci. dissertation "Multiple light scattering in spherically symmetrical media". Since 2001, Professor of the Department of Mathematics and Computer Science. In 2001-2008, Deputy Dean of the Mathematics and Mechanical Science Faculty at LSU. Member of IAU.

One of the members of the scientific school on theoretical astrophysics headed by academician V.V.Sobolev. Author of more than 80 scientific articles on the stellar atmospheres theory and radiation transfer theory. Developed the models of atmospheres for hydrogen and helium white dwarfs and found the energy distribution in continuous spectra of these stars. Showed that the decrease of hydrogen atoms ionization potential with pressure increase leads to a strong washout of the Balmer jump in spectra of white dwarfs with hydrogen atmospheres. Carried out investigations of light propagation in media with various geometries in case of anisotropic light scattering. In particular, calculated the radiation field in two-layer media taking into account the reflection of incoming radiation and the refraction of passing radiation at the border between the layers, as this takes place at the border between atmosphere and sea. Using the method of fundamental functions, A.K.Kolesov developed the radiation transfer theory for spherically-symmetric media taking into account the absorption and anisotropic scattering of radiation. A full system of orthogonal singular fundamental functions of the homogeneous radiation transfer equation with spherical symmetry was developed and researched. The exact, approximate, and asymptotic solutions were found to some problems of stationary and nonstationary radiation propagation in stellar atmospheres and dust nebulae.

State rewards: medal "Veteran of Labour" (1990), medal "In memory of the 300-years anniversary of Saint Petersburg" (2003), "Honorary Worker of Higher Professional Education" (2009).

KOMBERG Boris Valentinovich

Born 23.08.1934. In 1958, after the electro-mechanical technical school and 4 years of service in the Soviet Army he entered the Moscow State University at the Department of Astronomy, Physics Department. After graduation in 1964 he worked at the Institute of Applied Mathematics, USSR Academy of Sciences Department of "Astrophysics", led by Academician Ya Zeldovich. In 1974 he joined the Institute of Space Research of the USSR. Since 1985, he worked in the Astro-Space Center of Lebedev Physical Institute. Lebedev. Doctor of Physical and Mathematical Sciences (1990). Died 15.07.2016 in Moscow.

B.Komberg is the auther of more than 100 scientific papers. Most papers and reviews devoted to the study of processes in the active objects of different masses – from stellar to galactic – are interpritive. He made a number of original hypotheses and predictions some of which were subsequently confirmed by observations.

In 1967, he expressed a hypotheses about the possible dual cores in quasars. n 1971 he proposed a method to estimate the time of quasars life, in 1984 hypothesized the existence of a several their populations.

He predicted the possible existence of real couples and groups of quasars (1981), and in his work with co-workers in 1994 and 1996 years such distant groups were found. In 2002 he proposed a new model to explain the properties of the sources of cosmic gamma-ray bursts.

In 2009 he constructed a model to explain the unusually large size of some galaxies, which are perhaps the oldest long-lived quasars.

In 1989 he predicted that distant radio galaxies should have steep spectra, and it was later confirmed.

In 1976 (with G. Bisnovaty-Kogan) the rapid rotation of millisecond pulsars was explained by their spining up due to the material flow from close companion.

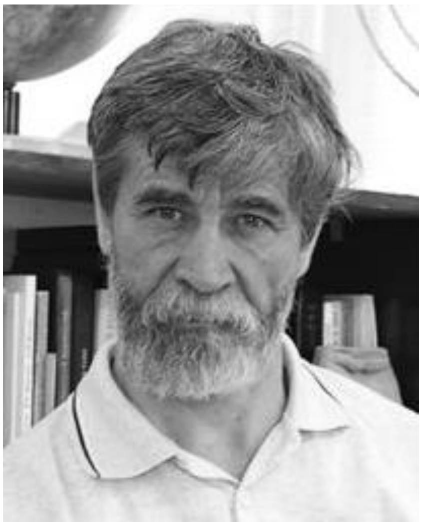
In 1999, the model of "switch" to explain the one-sided emissions from galactic nuclei. In 2003 he proposed the idea that the diversity of types of active nuclei in galaxies can be explained by their being in different states as it is observed in the active stellar systems such as microquasars.

From 1966 to 1979 he was secretary of the All-Moscow Seminar Astrophysics (OAS), which led by academitian Zel'dovich.

He collaborated with young scientists, was a superviser of five defended candidate theses, taught at Moscow University.

He was a member of the International Astronomical Society, the European Astronomical Society and the Astronomical Society of Russia.

KONDRATYEV Boris Petrovich



Born 11.06.1950 in Verkhniy Ufaley, Chelyabinsk region. In 1975, gradu¬ated from Kazan State University as an astronomer. Post-graduate course at the theoretical Department, Lebedev Physical Institute (Moscow). PhD dissertation, 1982. DSci in astrometry and celes-tial mechanics, Lomonosov Moscow State University (MSU), 1990 (dissertation based on the book "Dy-namics of ellipsoi¬dal gravitating bodies»). In 1982–1985, worked in Fesenkov Astrophysical Institute (Alma-Ata). In 1985–1990, the head of Department of theoretical physics at Glazov Teachers' Institute. Organized (1991) and headed (till 2012) the Depart-ment of astronomy and mechanics in Udmurt State University (Izhevsk). Pro¬fessor (1993). Since July 2013, professor of the De¬partment of celestial me-chanics, astrometry, and gravimetry of the MSU. Member of the IAU and the EAS.

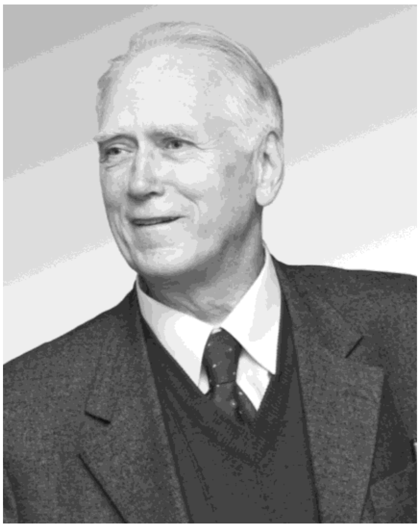
K.'s most important scientific works (about 190) relate to celestial mechanics, dy-namics and evolution of stellar systems, mathematical physics.

In the 1980s and 1990s, K. wrote a series of three books: "Dynamics of ellipsoidal gravitating bodies" (Moscow, Nauka, 1989); "The potential theory and figures of equilib-rium" (Moscow–Izhevsk, RCD, 2003); "The potential theory. New methods and problems with solutions" (Moscow, Mir, 2007), a fundamental contribution to the potential theory and figures of equilibrium. In this cycle, developed a new direction of science: the theory of equigravitating bodies, suggested original methods for finding potential and gravita-tional energy of bodies, permitting to describe, fully and accurately, a large class of phe-nomena in astronomy and solve previously inaccessible tasks. He made a large contribu-tion to studying potentials of the gravitating layered-inhomogeneous ellipsoids, circular torus and Gauss ring. K. developed a new method for solving the inverse geometric problem of reconstructing the form of a triaxial ellipsoid through its projection (limb) on to the image plane.

K. developed a vector approach to the study of physical libration of the Moon and explained the effect of the deviation of the Moon's center of mass to the East.

In 1986, K. discovered two new classes of liquid equilibrium figures with oblique rotation and zero total vorticity (or zero angular momentum). In the dynamics of stellar systems, in 1979, K. proposed two tests to solve the important problem of finding the in-trinsic spatial shape of E-type galaxies. In 1985–1995, he laid foundations of a new theory describing the dynamics and stability of self-consistent models of homogeneous colli-sionless ellipsoidal stellar systems. It is based on a deep analogy between stellar ellipsoids and Riemann liquid ellipsoids, which allowed to find new classes of models and create their exhaustively complete classification in the phase space. K. developed a new method for studies of equilibrium figures with rings of baryonic and dark matter. In 2003-2021, to study the secular evolution of the orbits of celestial bodies and, especially, exoplanets K. created new analytical models (R-ring and R-toroid), which are 2D– and 3D generaliza-tions of the Gauss ring.

KONONOVICH Edward Vladimirovich



Born 08.11.1931 in Moscow. He graduated from Lomonosov Moscow State University in 1955 and earned the doctoral degree in 1959. He had positions of a science researcher in SAI MSU in 1958 – 1961, an assistant professor of the Astrophysical Department, Division of Astronomy, Faculty of Physics in MSU from 1961, an associate professor of the Department from 1964. Distinguished educator and renowned scientist, he was known as an science popularizer and enthusiast of amateur astronomy, author of several monographs, textbooks and more than 300 publications, translator and editor of the several books on the Solar physics. He was a member of IAU, Vice President of the Commission “Astronomical Education” in 1973-1976, President of this Commission in 1976-1979, member of the Commission “Sun and Heliosphere” up to 2015. Died 26.09.2017 in Moscow.

E.V. Kononovich made a significant contribution to methodology of university education. He launched the unique introductory course for astronomy students, taught courses of General Astronomy and Solar Physics. He proposed a training computer course on modeling of Stellar Structure and Evolution. The textbook titled “Course of General Astronomy” by E.V. Kononivich, P.I. Bakulin, and V.I.Moroz has been re-issued seven times, translated into several languages, included in the golden fund of “Classical University textbook”, and had been published to the MSU anniversary. He was a thesis adviser of ten PhD students. Area of his interests included active processes in the photosphere, chromosphere, and corona; magnetic fields and their relations with cycles of solar activity; solar-terrestrial relations. He participated in almost all solar eclipse expeditions of SAI, headed expeditions in Rostov-on-Don in 1961, then atoll Manuae in 1965, Mexico in 1970 etc.

E.V. Kononovich initiated the Krasnopresnenskaya laboratory of SAI, the basic research of which are mainly focused on helioseismology. He was head of the laboratory from 1998 until 2011. He participated in development of the intensity microphotometer, narrow-band filters of Fabry-Perot, expeditionary solar telescope, echelle spectrograph and other astrophysical instruments. He worked in many observatories of the USSR and former soviet republics. He initiated an installation of 50-cm horizontal solar telescope (HSFA) from Zeiss at Tien Shan high-altitude expedition of SAI near Alma-Ata and headed observations according the program “Solar patrol”.

E.V. Kononovich gave lectures at the planetarium, recorded multimedia disk “Life of Earth in the solar atmosphere”. With A.V. Zasov, he wrote school textbooks “Astronomy” and “Astronomy 11”. With A.A. Fadeeva, D.F. Kiselev, A.V. Zasov, he published a book “Physics. Astronomy. Environment”. He wrote a book series of society “Znanie” (“The Sun is our day star” and others), formed and published the magazine “The Universe and We”.

He joined the permanent commission on astronomy at the USSR Ministry of Education, was a Chairman of Moscow branch of Astronomical-Geodesic society, was a member of MSU Academic Council and editorial board of “The Astronomical Circular”.

His teaching, scientific and popularization achievements were awarded with the Badge “Veteran of Labor”, the title of Honored Teacher of Moscow State University, and the memorable badge of Moscow State University, medal of Exhibition of Achivements of National Economy and a medal in memory of the 850th anniversary of Moscow, certificates of honor and other awards.

KONYUKOV Merkuriy Vasilyevich

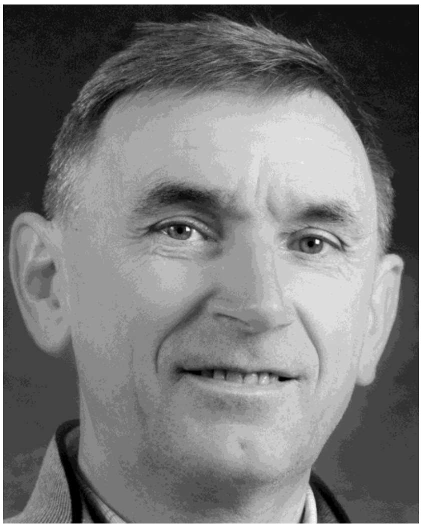
Born 29.12.1923 in Melinki, Vladimir region. World War II veteran. In 1950 he graduated from the Gorky State Pedagogical Institute with a degree in physics. In 1951-1954 postgraduate student Physics Faculty of Moscow State University. Candidate of Phys.-Math. Sciences (1954), Doctor of Phys.-Math. Sciences (1988). In 1955-1963 – Senior Lecturer, then Associate Professor in Tula Pedagogical Institute, from 1963 to 2005 – senior researcher of Lebedev Physical Institute (LPI) Radio Atronomy Station (since 1996 – LPI Pushchino Radio Astronomy Observatory). Died 07.07.2013 in Pushchino, Moscow region.

By the beginning of the Second World War M.V. Konyukov was already a second-year student at the Murom Pedagogical Institute. In February 1942 he was mobilized and, after a little military training, found him-self at the front. However, in a couple of months, he received two severe wounds in both legs, and after long-term treatment in hospitals he was demobilized as an invalid. In 1946 he entered and in 1950 successfully graduated from the Gorky State Pedagogical Institute with a degree in physics. In 1951 he entered the graduate school of the Physics Faculty of Moscow State University, from which he successfully graduated. Having successfully defend-ed his Ph.D. thesis at the end of 1954, he started to work at the Tula Pedagogical Institute, where he worked for almost 10 years. From 1963, he works at the Pushchino Radio Astronomy Observatory of the LPI (at that time the LPI Radio Astronomy Station in Pushchino).

The main works by M.V. Konyukov in the field of astrophysics are associated with studies of various types of outflows – from the solar and stellar winds to the outflow of gas from galaxies and galaxy clusters. In particu-lar, he showed that in order to implement a Parker-type solution in the case of a solar wind, an additional energy source is needed to ensure the transition from a subsonic flow in the lower layers of the solar corona to a super-sonic flow at greater distances from the Sun. From the kinetic equation of Boltzmann he derived the equations of hydrodynamics with sources of mass, momentum and energy; these equations have been used to describe quasi-stationary gas outflows from elliptical galaxies and rich, relaxed galaxy clusters.

Since the early 1990s, most of Konyukov's works have been devoted to the problem of processing and analyzing observational data obtained with aperture synthesis systems.

KOPEIKIN Sergei Mikhailovich



Born 10.04.1956 in Kashin, Russia. Graduated in 1983 г. from Moscow State Univ. (MSU). Post-graduate education (1983-86), MSU, astrophysics, advisor Ya.B. Zeldovich. Ph.D. 1986. Worked at Sternberg Astron. Institute (1986-93) and ASC of Lebedev Phys. Institute (1993-2000). D.Sci. 1991. Docent of MSU (1991-93). Professor of Hitotsubashi Univ. and Nat. Astron. Obs. of Japan, Tokyo (1993-97). Researcher at Univ. of Jena and M. Plank Institute in Bonn, Germany (1997-99). Professor of the Univ. of Missouri, USA since 2000. Visiting scholar at sci. centers in Europe, China, Australia, and Turkey. Professor of the Univ. of Geosystems and Technologies, Novosibirsk (2014-17).

In his PhD thesis S.M. Kopeikin had derived relativistic equations of motion of binary stars with accounting for the gravitational radiation rection force and predicted several observational effects that are currently used for testing general relativity. Relativistic reference frames, developed by S.M. Kopeikin in his D.Sci. thesis, was adopted in 2000 by the IAU as a standard for reductions of astrometric observations. This theory was used in processing of observations of the ESO Gaia satellite. In 2001, S.M. Kopeikin proposed a radio-interferometric experiment for measuring the speed of gravity that was carried out in 2002. It confirmed that the speed of gravity and light are equal to an accuracy of 20%. In 2005, S.M. Kopeikin made the most precise VLBI measurement of the gravitational bending of light by the Sun. In 2010-12 S.M. Kopeikin organized a series of workshops in the International Space Research Institute (ISSI) in Bern, Switzerland on the problems of testing general relativity by lunar laser ranging. Since 2014 S.M. Kopeikin is actively involved in the work on relativistic geodesy by means of atomic clocks. He developed the concept of relativistic geoid, reference-ellipsoid, and the normal gravity field of the Earth. In 2014-17. S.M. Kopeikin led a research on relativistic geodesy supported by the Russian Foundation for Basic Research. In 2015, along with group of Russian scientists, S.M. Kopeikin conducted an experiment to determine geodetic heights by measuring gravitational shift of frequency of transportable atomic clocks. S.M. Kopeikin organized two scientific schools on relativistic geodesy in ISSI-Bern in 2018-19. He continues to actively participate in the development of the Russian terrestrial system of geodetic coordinates and heights by means of quantum sensors. S.M. Kopeikin is a member of the IAU, the International Association of Geodesy (IAG) and COSPAR. He was a member of the American Association for the Advancement of Science in 2001-04, the International Society of General Relativity and Gravitation in 2004-08, a member of the IAU Working Group on Astronomical Constants (2007-09), and a Vice President of the IAU Commission 52 " The theory of relativity in fundamental astronomy" (2012-15). Member of the IAG working group Q.3 "Relativistic geodesy with clocks". Member of international associations and editorial boards of several journals on astronomy and geosciences. Published about 200 papers. Author and editor of 4 books on relativistic celestial mechanics and general relativity. S.M. Kopeikin's biography is included to the Biographical Dictionary of Notable Living Men and Women "Who is Who in America" in 2005.

KOPYLOV Ivan Mikheevich

Born 10.04.1956 in Kashin, Russia. Graduated in 1983 г. from Moscow State Univ. (MSU). Post-graduate education (1983-86), MSU, astrophysics, advisor Ya.B. Zeldovich. Ph.D. 1986. Worked at Sternberg Astron. Institute (1986-93) and ASC of Lebedev Phys. Institute (1993-2000). D.Sci. 1991. Docent of MSU (1991-93). Professor of Hitotsubashi Univ. and Nat. Astron. Obs. of Japan, Tokyo (1993-97). Researcher at Univ. of Jena and M. Plank Institute in Bonn, Germany (1997-99). Professor of the Univ. of Missouri, USA since 2000. Visiting scholar at sci. centers in Europe, China, Australia, and Turkey. Professor of the Univ. of Geosystems and Technologies, Novosibirsk (2014-17). Died 29.07.2000 in St. Petersburg.

In his PhD thesis S.K. had derived relativistic equations of motion of binary stars with accounting for the gravitational radiation rection force and predicted several observational effects that are currently used for testing general relativity. Relativistic reference frames, developed by S. K. in his D. Sci. thesis, was adopted in 2000 by the IAU as a standard for reductions of astrometric observations. This theory was used in processing of observations of the ESO Gaia satellite. In 2001, S. K. proposed a radio-interferometric experiment for measuring the speed of gravity that was carried out in 2002. It confirmed that the speed of gravity and light are equal to an accuracy of 20%. In 2005, S. K. made the most precise VLBI measurement of the gravitational bending of light by the Sun. In 2010-12 S. K. organized a series of workshops in the International Space Research Institute (ISSI) in Bern, Switzerland on the problems of testing general relativity by lunar laser ranging. Since 2014 S. K. is actively involved in the work on relativistic geodesy by means of atomic clocks. He developed the concept of relativistic geoid, reference-ellipsoid, and the normal gravity field of the Earth. In 2014-17 S. K. led a research on relativistic geodesy supported by the Russian Foundation for Basic Research. In 2015, along with group of Russian scientists, S. K. conducted an experiment to determine geodetic heights by measuring gravitational shift of frequency of transportable atomic clocks. S. K. organized two scientific schools on relativistic geodesy in ISSI-Bern in 2018-19. He continues to actively participate in the development of the Russian terrestrial system of geodetic coordinates and heights by means of quantum sensors. S. K. is a member of the IAU, the International Association of Geodesy (IAG) and COSPAR. He was a member of the American Association for the Advancement of Science in 2001-04, the International Society of General Relativity and Gravitation in 2004-08, a member of the IAU Working Group on Astronomical Constants (2007-09), and a Vice President of the IAU Commission 52 " The theory of relativity in fundamental astronomy" (2012-15). He is a member of the IAG working group Q.3 "Relativistic geodesy with clocks". His biography is included to the Biographical Dictionary of Notable Living Men and Women “Who is Who in America” in 2005. Member of international associations and editorial boards of several journals on astronomy and geosciences. Published about 200 papers. Author and editor of 4 books on relativistic celestial mechanics and general relativity.

KORABLEV Oleg Igorevich

Born 15.05.1962. In 1985 graduated from Phys. Faculty of Moscow State Lomonosov University with a degree in physics and started working at IKI RAS. In 1992 he defended candidate of science dissertation with a degree in heliophysics and physics of the Solar system. In 2003 at the IKI RAS he defended his doctoral dissertation on Mars research and space instrumentation. In 2016 he was elected Corresponding Member of RAS. At present time he works at IKI RAS

O.I. Korablev graduated from the Physics Faculty of Moscow State University in 1985. Since then, he has been working at the Space Research Institute of the Russian Academy of Sciences (IKI RAS), having worked his way up from an engineer to Deputy director and Head of the department of Planetary physics. In 1994-1999, he worked part of the time in laboratories in Belgium and France.

O.I. Korablev is a specialist in the physics of planetary atmospheres and space instrumentation. The main scientific results of O.I. Korablev obtained during the exploration of Mars and Venus in space projects Phobos (1988), MarsExpress, VenusExpress, ExoMars-2016. He is the author and co-author of over 190 scientific papers in peer-reviewed journals, editor and author of chapters in collective monographs. The spectrometers created by him operate in the ultraviolet and infrared ranges and allow achieving an unprecedentedly high spectral resolution. With them, it was possible to obtain a number of new results on the atmosphere and surface of Mars, the atmosphere of Venus. The processes of dissipation of the atmosphere, the hydrological and dust cycles of Mars, the surface of Mars, the composition and structure of the atmosphere of Venus have been investigated, the isotope ratios have been measured, and a number of new atmospheric components and emissions have been discovered. O.I. Korablev leads ongoing experiments on Mars Express, ExoMars 2016, Bepi Colombo (in flight since 2018), other experiments are being prepared for ExoMars-2022, Luna-25, 26, 27, “Geophysics” projects and for the research program on the Russian segment of ISS.

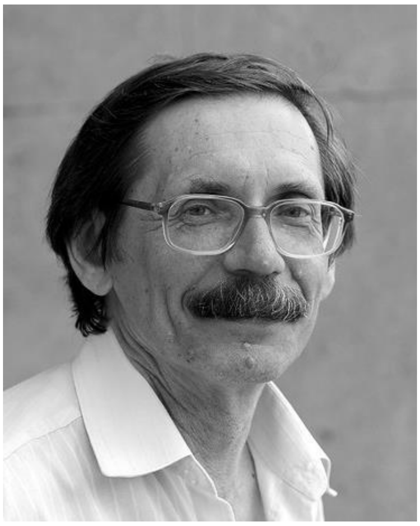
O.I. Korablev lectures courses at MIPT and at the Physics Faculty of Moscow State University, supervises the graduate school of the IKI RAS in the specialty "Planetary research", is the deputy chairman of the dissertation council D 002.113.02 at IKI. O.I. Korablev – Chairman of the Section "Planets and Small Bodies of the Solar System" of the Council of the Russian Academy of Sciences for Space, Deputy chief editor of the Solar system Research journal, Chairman of the Commission on Planetary Atmospheres of the Meteorology Section of the National Geophysical Committee, member of the Council for Astronomy of RAS, the Academic Council of the IKI RAS. Chairman of Commission B (space research of the Earth-Moon system, planets and small bodies of the solar system COSPAR (2012-2020), national representative of Russia in COSPAR, member of the International Academy of Astronautics (IAA).

KORCHAGIN Vladimir Ivanovich

Born in 1950 in Frunze, Kirghiz SSR, USSR. In 1972 graduated from Rostov-on-Don University (now Southern Federal University). In 1975 submitted his PhD thesis “Bar-like structures in central regions of galaxies as generators of the spiral density waves”. In 1991 submitted his DSci thesis “Wave and auto-oscillatory processes in galaxies” In 1976 – 2010 worked at the Institute of physics of Southern federal university. In 2010 – 2014 – the director of the Insitute of physics, SFEDU. From 2014 – to date, main research fellow of the Institute of physics, Southern federal university. Professor of the National astronomical observatory of Japan (NAOJ) (1995–1996,1998–1999), 1996, – professor of Yukawa institute of theoretical physics (YITP), research fellow of Yale university (2001 – 2008). Member of EAS and IAU.

Research interests: collective processes in gravitating systems. The author of more than 170 papers. Under his leadership has been studied different aspects of the nonlinear and the linear spiral density waves in gravitating disks: proposed a new type of the collective motions in gravitating disks, – the solitary vortices, studied the role of the nonlinear interaction in generation of the one-armed spiral density waves. Studied the influence of the nonlinear energy-, and mass-exchange processes on the development of the nonlinear oscillations of the limit cycle type, responsible for the development of bursts of star formation in galaxies. In his papers has been shown that the nonlinear interaction of the global modes in the galactic disks is the main mechanism, determining the saturation level of the unstable spiral density waves, evaluated the amount of the dark matter in the solar neighborhood of the Milky Way disk, and showed that the amount of the dark matter in the Milky Way disk is insignificant that points at the non-dissipative nature of the dark matter.

KORNILOV Victor Geraldovich



Born in 1952 in Staryi Krym town. He was the student of Lomonosov Moscow State University, physics department, astronomical devision since 1970 to 1976, and was a postgraduate student of astrophysics and stellar astronomy cathedra of MSU in 1976– 1979. He defend his PhD "Photometric studies of transient phenomena in close binary systems " in 1979, then worked as assistant at this cathedra since 1982, then as associate professor since 1992. He is associate professor of astrophysics and astronomy since 27 of September 2002. He is also the head of new photometry methos laboratory in Sternberg astronomical Institute of Lomonosov Moscow State University. He prepared 4 doctors of sciences (PhD).He publishied more then 3000 scientific papers. Kornilov scientific interests are theoretical and observational astrophysics. V.G. Kornilov is a world-famous specialist in astroclimate. He is a Honored Worker of Higher Education of Russia (2006). Died 01.05.2021 in Moscow.

Kornilov's instruments participated in the choice of the place of construction of the world's largest supertelescopes, and his works on theoretical research in the field of the influence of the atmosphere on image quality and on the permeability limit of very large telescopes are published and cited in the best astronomical world journals. Together with V.M. Lipunov, for the first time (1983), the Monte Carlo method conducted a population synthesis of massive double stars (Scenario Machine), which showed that radio pulsars should exist in tandem with blue massive stars (1984, which was confirmed in 1992), black holes with radio pulsars were predicted and anisotropy of the collapse accompanied by neutron formation was first confirmed This method was widely used in the world in the 21st century, but pioneering results were obtained in the last century and some of them have already been confirmed experimentally. Kornilov together with Lipunov designed and developed first russian robot-telescope MASTER. Kornilov is one of the leading member of MASTER Global Robotic Net for far and near space research.

Kornilov and MASTER main scientific results are the following: 1) Independent optical detection of the First LIGO/Virgo Neutron Star Binary Merger GW170817 – Kilonova MASTER OT J130948.10-232253.3/SSS17a (2017 ApJL, 850, L1; APJL, 848, 12A) and the most input in optical support of GW150914 by MASTER (2016ApJ,826L,13A). 2) First in history gravitational-wave standard siren measurement of the Hubble constant publishied in Nature, 2017, 551, 85. 3) The discovery of significant and variable linear polarization during the prompt optical flash of GRB 160625B, publishied in Nature 2017, 547, 425. 4) The discovery of gamma-ray bursts(GRB) Smooth Optical Self-similar Emission – the new type of calibration for GRB, in which some their class can be marked and share a common behavior. We name this behavior (SOS-similar Emission) and identify this subclasses of GRBs with optical light curves described by a universal scaling function. 5) MASTER Optical Observations Reveal Strong Evidence for High-energy Neutrino Progenitor of the very high-energy-neutrino event IceCube-170922A (APJL, 896, L19). 6) The discovery of optical counterpart of the GRB 161017A by MASTER and prompt and Follow-up Multi-wavelength Observations of this GRB by Lomonosov space observatory of MSU and MASTER Global Robotic Net. 7) The discovery of several dozens optical counterparts of gamma-ray bursts, including the nearest GRB 180728A: MASTER OT J165415.75-540239.27and investigate of several thousands GRB, detected by Fermi, Swift, Konus-Wind, Lomonosov, MAXI, Integral, HETE. 8) Multichannel alert observations by MASTER of 400 error-boxes of high energy neutrino sources, triggered at IceCube (including the most optical support of triplet IC160217), ANTARES, Baksan. 9) Automatically detection by MASTER own auto-detection system of potentially hazardous asteroids and comets 2013 UG1; 2013 SW24;2014 EL45;1998 SU4;2014 UR116;2011 QG21;2015 UM67;COMET C/2015 K1 (MASTER), COMET C/2015 G2 (MASTER), COMET C/2016 N4 (MASTER), COMET C/2020 F5 (MASTER). 10) MASTER Global Robotic Net made his own very effective survey up to 20m.

KOROLKOV Dmitry Viktorovich

Born in 1925 in Gomel. A student of the Leningrad Polytechnic Institute in 1949-1954. From 1954, worked in the Radio Astronomy Department of the Main (Pulkovo) Astronomical Observatory, AS of the USSR. In 1961, defended this Ph.D. dissertation on "Study of Polariza-tion of the Sun's Radio Emission in the Centimeter Wavelength Range". From 1969, had been working in the Special Astrophys-ical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) as Chief Constructor at RA-TAN-600. In 1971, defended his Dr.Sci. dissertation on "On Receiving Weak Radio Astronomical Signals with Continuous Spectrum at SHFs and Some Observed Results". Laureate of the USSR State Prize. IAU member, bureau member of the "Radio Astronomy" Board, RAS. Died 10.01.1984 in Zelenchuk.

D.V. Korolkov is the foremost authority in the area of radio astronomic instruments engi-neering. The author of over 80 scientific works including the well-known monograph by N.A. Esepkin, D.V. Korolkov, Yu.N. Parijskij "Radio Telescopes and Radiometers" which became a ref-erence book for radio astronomers and related workers.

D.V. Korolkov was one of the first researchers of the Radio Astronomy Department of the Pulkovo Observatory of the Soviet Academy of Sciences founded by S.E. Khaykin and N.L. Kaidanovskij. The first works of D.V. Korolkov were related to improvement of the entrance of the centimeter-range radio telescope, antennae noise characteristics measurements and increasing the radiometers sensitivity.

From 1960 had been creating superlow-noise radiometers for radio telescopes since 1960. They were based on parametric amplifiers allowing one to achieve the 3-4 times higher sensitivity than the sensitivity of radiometers with maser amplifiers. They were the world's best at that time. In the position of Chief Constructor in radio electronic equipment at RATAN-600, the largest re-flector radio telescope, D.V. Korolkov paid much attention to the improvement of basic parameters of this instrument: lowering the noise temperature of the radio telescope, measurements of instru-mental polarization in the large radio telescope, and development of the methods of their removal. He designed a double-beam method of suppression of atmospheric noise fluctuations which proved to be very efficient for big antennas, when the whole atmosphere is in the nearby zone of a radio telescope. Created the measurement method and studied the diffuse background of the RATAN-600 radio telescope in the range of 60 dB.

Results of his creative work had driven to great astrophysical success.

In collaboration with Yu.N. Parijskij, he organized the "Cold" program on conducting a deep sky survey, on which many publications were based afterwards (1981-1984). In collaboration with V.M. Bogod, he developed a method allowing one to detect small-scale structure of radio emission from the corona in the microwave spectrum (1975). In collaboration with N.S. Soboleva, carried out the study cycle on the translucence of the corona for extremely weak polarization (1978).

D.V. Korolkov was the initiator and encourager of the project of the specialized cross-type CCPT telescope and the national project "Poligam" on creating the national interferometric net-work "QUASAR-QUO" which was designed by his students afterwards.

Participant of the Great Patriotic War from 1942. Wounded twice. Government awards: Medal for Combat Service, Medals for the Defense of Caucasus, and for Victory over Germany 1944, 1945. Demobilized in 1948.

KORZHAVIN Anatoly Nikolaevich

Born 13.09.1943 in Leningrad. Was a student of the Leningrad State University from 1961 to 1965. Post-graduate student at the Main Astronomical Observatory from 1965 to 1968. Since 1969, has been working at the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991); he is a Leading Researcher at the Saint Petersburg branch of SAO RAS. In 1979, defended his Ph.D. thesis, "Characteristics of the structure of the local radio sources of the Sun from high-resolution observations». In 1994, defended his Dr. Sci. thesis, "Non-thermal sources of microwave radiation of active Solar regions". Died 25.12.2017 in St. Petersburg.

Korzhavin Anatoly Nikolaevich is a researcher in the field of Solar radio astronomy and the author of over 150 scientific publications. His main scientific interests are: Solar radio astrophys-ics, radio physics, physics of the Solar plasma.

He developed a theory of radioastronomical antennae using the technique of optical modeling and the computational method, determined new characteristics of the overall structure of the beam patterns for variable-profile antennae, and studied their variations depending on the type of aper-ture exposure. He described the reason for the appearance of instrumental circular polarization, developed and implemented computational techniques of correcting the instrumental polarization effects, aberration effects, as well as algorithms for computing beam patters for variable-profile antennae in the actual observing modes of the antennae. He developed the observational methods and the initial reduction of observations with small antennae (Solar eclipse observations, the Solar survey at the Havana Radio Astronomy Station, the small-baseline radio interferometer in Mexico) and with RATAN-600. The latter allowed the creation of a Solar observation catalog, and well as developing new techniques of using RATAN-600.

He studied the structure of microwave radiation of the Solar active regions (AR) based on LPRT, RATAN-600, SSRT, WSRT, and VLA observations with high spatial resolution, as well as the eclipse method using small antennae (RT-3, RT-2.5). He obtained detailed spectral, polarimet-ric, and spatial characteristics of individual structural elements of AR, which allowed the follow-ing: (1) to refine the relative role and characteristics of thermal bremsstrahlung and magnetic bremsstrahlung mechanisms of generating radiation, (2) to reveal the fundamental component of the structure of the Solar active region – a "halo" with a non-thermal spectrum, which indicates constant processes of particle acceleration, (3) to develop the concept of a new type of astrophysi-cal sources at the Sun – the "peculiar sources", which indicate a powerful and durable energy output in the AR with proton-type flare activity, and (4), to justify the concept of the AR magnetosphere as a part of the Solar atmosphere (corona), where the structure and physical processes are deter-mined by the continuation of photospheric magnetic fields, and at the same time are subject to ex-posure from the surrounding coronal plasma. As a result, he was able to facilitate technically and solve the big scientific problem of detecting long-term non-thermal processes in the Solar atmos-phere using radioastronomical techniques.

KOSOVICHEV Alexander Georgievich

Born 03.07.1953 in Ishim, Tyumen region. In 1975 he graduated from Novosibirsk Univ. After Ph.D. studies at Moscow Univ., he worked as research scientist in Crimean Astrophys. Observatory from 1979 to 1990. In 1984 and 1986 he had vis-iting positions at the N. Copernicus Astron. Center in War-saw. In 1990–1994 he worked in the Inst. of Astronomy, Univ. of Cambridge (UK), and in 1994–2013 he worked in the W.W. Hansen Exp. Physics Lab, Stanford Univ. (USA) as senior research scientist. Since 2013, he is Professor at the New Jersey Inst. of Technology (NJIT). He held position of Director of Big Bear Solar Observatory (2013–2014), and since 2015 – Director of Center for Computational Helio-physics. He holds Ph.D. (1980) and Dr. Sci. (1990) degrees. He served as President of Com. 12 of IAU (2009–2012), was elected Fellow of Amer. Geophys. Union (2014).

Primary research topics of Prof. Kosovichev are in the areas of astrophysics, solar physics, computational astrophysics, space– and ground-based astronomy. He co-authored more than 250 refereed papers.

In 1975–1980, in collaboration with V.S. Sokolov, Yu.P. Popov, M.A. Livshitz and M.M. Katsova he developed a theory of hydrodynamic and MHD processes in solar and stellar flares by using numerical simulations. The models of interaction of beam of high-energy particles with the atmospheres of the Sun and red dwarfs shed light on mechanisms of flare optical emis-sion and high-speed plasma flows, and advanced our understanding of the flare physical mecha-nisms.

Starting from 1980, in collaboration with A.B. Severny, V.A. Kotov, T.T. Tsap, W. Dziembowski, and D. Gough he worked on developing helioseismology, a new field of solar physics, which provides key measurements for the understanding of the internal structure, evolution and magnetic activity of the Sun. In 2005, for his work on the development of unique methods for solving inverse problems of helioseismology he was awarded the Johann Wempe Prize by the Leibnitz Institute for Astrophysics.

In 1994–2004, he worked on the Solar and Heliophysics Observatory (SOHO) space mis-sion, leading a helioseismology group at Stanford University. He developed a new method of solar acoustic tomography, which allowed obtaining first three-dimensional images of structures and flows of the solar interior.

Since 2004, he worked on the NASA’s Solar Dynamics Observatory (SDO) as the science lead for the Helioseismic and Magnetic Imager project. Under his leadership, the group obtained fundamental results on the interior dynamics and meridional circulation of the Sun, which play a key role for our understanding of the solar activity cycles.

Since 2013, he is Professor of the New Jersey Institute of Technology (USA). In 2013–2014 he served as Director of Big Bear Solar Observatory (BBSO), and in 2015 he established Center for Computational Heliophysics at NJIT for analysis and modeling of large data volumes obtained from modern telescopes. He participates in the NASA’s space missions Kepler, IRIS, and SDO, and in the NSF program of development of the science program for the largest solar telescope DKIST.

He successfully works with young scientists. In collaboration with the NASA Ames Re-search Center he organized summer programs for young astronomers. He supervised six success-ful PhD students.

He was elected Fellow of the American Geophysical Union in 2014, and received several NASA awards. In his honor, asteroid 8339 discovered in 1985 by N.S. Chernykh (Crimean Astro-physical Observatory) was named Kosovichia.

KOSTENKO Vladimir Ivanovich

Born 22.10.1943 in Gorky city. In 1966 Graduated as M.h.d in Astronomy from math-mechanical faculty of Leningrad State University. From 1966 till 1969 take a position of junior scientist employer of Radioastronomy department of P. N. Lebedev Physical Institute, Moscow. (Head prof. V. V. Vitkevitvh) and after receiving degree of doctor of physics and mathematic take a position of senior scientist of the laboratory of radioastronomy of Space research institute of the Academy of sciences of the USSR (Head prof. L. I. Matveyenko). During 2000 – 2009 worked as executive specialist of important projects in field of mobile communication systems in "GlobalTel" – Rostelecom-Globalstar joint venture. From 09.2009 per nowadays he takes a position of senior scientists of Astro Space Center of P.N. Lebedev Physical institute and acts as vice director of the Department of astrophysical data processing. He is a chef person of correlator processing in «Radioastron» Space VLBI Project.

The main scientific publications related to the astrophysics of compact radiosources, near star sources of maser emission, digital VLBI systems and data processing algorithms, author of about 70 publications in related fields, coauthor of translation of a number of English books into Russian language on the investigation topics.

From the 1969 he is an active participant of international VLBI experiments at intercontinental baselines with participating of domestic and foreign antennas at different continents in 1.35 – 18 cm wavelength. In 1973 at RT-22 antenna of Crimean astrophysical observatory (CRAO) he put in to operation the multifunctional digital VLBI terminal (NRAO, USA product), which has successfully operated till middle of 80-th. In 1985 under his leadership the first domestic VLBI MARK-2 terminals and correlator processor was designed and put in to operation. The system was successfully operated in many astrophysical experiments with antennas in Evpatoria, Simeiz and Puhscino, as well as in international «VEGA» project (1986) to measure aerostats motion in Venus atmosphere.

Kostenko V.I. marked by the state awards – the medal «For Labor Merit») (Aug.1986)

KOSTYAKOVA Elena Borisovna

Born 25.05.1924 in Moscow. D. 11.05.2013 in Moscow. In 1943–1948, student of the Faculty of mechanics and mathematics, Lomonosov Moscow State University (MSU). Post-graduate student of the MSU Faculty of mechanics and mathematics (1948-1951). PhD dissertation "Spectrophotometry of a bright Milky Way cloud" (1952). Senior researcher of the Sternberg Astronomical Institute (SAI) of the MSU (1952–2011). DSci dissertation "Absolute spectrophotometry of faint extended objects" (1974). Member of the International Astronomical Union, Commission 34.

Medal "In memory of the 850th anniversary of Moscow" (1997), medal "Veteran of labor" (1997), medals of the Exhibition of Economic Achievements (1968–1969). Died 11.05.2013 in Moscow.

K. contributed greatly to the construction of the new SAI building at Lenin (Vorobyovy) hills and of the SAI Crimean station (1952–1957). Together with B.A. Vorontsov-Velyaminov, she supervised production of the 50-cm Maksutov telescope and 70-cm reflector at the GOMZ factory in Leningrad, inspected construction of apartments for future observers and staff members of the Crimean station.

In 1960, K. was the first in the history of astronomy to measure light from a comet (Arend–Roland 1956h) in different parts of the spectrum using photographs taken with the 50-cm Maksutov camera and an objective prism. The results were highly appraised by experts on comets (B.Yu. Levin).

K. was the leader of the team of SAI astronomers who observed planetary nebulae (PNe) spectroscopically and photometrically using telescopes of the SAI Crimean station. As a result, in 1970, she published a catalog of absolute emission-line intensities in the spectra of 171 PNe. From these data, K. determined, together with V.P. Arkhipova, parameters of these PNe: temperatures of their nuclei, electronic temperatures, and electronic densities, for the first time in most cases. She detected special features of the PNe observed towards the galactic center, later completely confirmed by other authors. The near ultraviolet spectral range (3100-4000 Å) was studied from observations with the 125-cm telescope in Crimea; for many PNe, their electron temperatures were found, for the first time, from their Balmer continuum and Balmer jump.

Many-year uniform photographic and photoelectric observations of a large number of PN central stars obtained by K. made it possible to improve data on binary nature of some PN nuclei and to study, together with R.I. Noskova, brightness variations of these objects. Of special interest is her many-year study of the young PN IC 4997; she obtained data on parameter variations of the PN and its nucleus in the course of time.

K. repeatedly observed PNe at the Skalnaté Pleso Observatory (Slovakia). She participated in observations of artificial satellites during an ocean expedition on board "Vityaz" research vessel (1961) according to the program of the Astronomical Council (USSR Acad. Sci.). She also completed her work on the spectrophotometry of the southern Milky Way, commenced in her PhD dissertation.

She authored the book "Physics of planetary nebulae" (1982), translated the book "Planetary nebulae" by S. Pottasch (1987). K. is the author of 150 scientific papers. She lectured on planetary nebulae for MSU students, was a lecturer at the Teachers' institute in Moscow (1949–1951), supervised graduation and yearly papers of students of the MSU astronomical department.

KOSTYLEV Konstantin Vladimirovich

Born 25.11.1916 in Irkutsk. Dr. Kostilev graduated from Kazan State University (KSU) in 1941. A post-graduate student of Astrophysics at Astronomical department (KSU) in 1941. A veteran of the Second World War (1942-1945). Practical astronomer at Engelhardt Observatory (EAO) 1945-1948. Senior researcher at EAO in 1948. A head of the astrophysical department at EAO 1952-1956. A head of an astronomical expedition to observe the total solar eclipse in 1954. A head of Radar department at EAO 1956-1970. Associate professor of Radio physical department at KSU 1957. A head of radio astronomical department at KSU 1962-1987. Master's degree in physics and mathematics in 1948. Doctor's degree in physics and mathematics in 1971. Full professor in radio astronomy in 1973. Died 23.05.1990 in St. Petersburg.

Dr. Kostilev's scientific interests lied in astrophysics, radio astronomy, radiophysics, and radio electronics engineering.

Dr. Kostilev founded the Kazan school of radio astronomy. The scientist was the first in the USSR who developed the method and radio-electronic equipment to register radio reflections from meteor ionizations.

Dr. Kostilev founded the radar department at EAO in 1956. He founded the basic research radio astronomical laboratory at EAO in 1957. Pioneering researches, executed by Dr. Kostilev, initiated the founding radio astronomical department at KSU.

Dr. Kostilev performed great educational work over 40 years at KSU. He developed 16 educational courses including special ones. 12 students got Master's degrees under his supervising; nine of them got Doctor's degrees.

Dr. Kostilev is the author of the monograph "Astronomical basis of the meteor radio contact" (1970). He was a vice-president of the Comets&Meteors commission of the Astronomical Council at USSR Academy of Sciences (USSR AC) 1956-1970. Dr. Kostilev is a member of the International Astronomical Union.

Dr. Kostilev was awarded Distinguished Researcher and Engineer title of Tatarstan Republic (1977), "The Centenary of Alexander Popov's Birth" Medal by USSR AC (1977), "Veteran of Labor" Medal, several Diplomas of Merit. Konstantin Kostilev was also awarded "the Order of the Red Star" by the USSR government for heroic defense of Rzhev city during the Second World War in 1942.

KOTELNIKOV Vladimir Alexandrovich

Born 06.09.1908 in the city Kazan. 1930: was graduated at the Moscow Power Engineering Institute (MPEI). 1931 -1941: worked in the MPEI.1933:released of the sampling theorem. 1938 : recieved his candidate (PhD) degree.1941-44: worked as chief of research lab in c.Ufa and Moscow. 1944-80: Professor, Dean of the Department of the MPEI. 1947 – defence the doctoral dissertation "Theory of Potential Noise Immuni-ty".1953:selected ful member Soviet Academy of Sciences (AS).1954-2005: Director (the last 18 years – Director Emeritus) of the Institute for Radio engineering & Electronics of the Sovi-et/Russian AS.1961-89: Chairman of the Scientific Council n RadioAstronomy.1970-88:Vice-president Soviet AS. Member, honorary member of the Institute of Electrical and Electronics Engineers(IEEE);Vice-president of International Academy of Astronautics; a member of 16 different AS. Died 11.02.2005 in Moscow.

Before to turn his attention to Astronomy he was been known to the world as a prominent ra-dio engineer and one of the founders of the Theory of Informfnion and the Theory of of signals.

At 1960 it was deemed that the uncertainty of the knowledge of value of the Astronomical unit (AU) was near +/-50000km. It was complicated to realize intended approaching SpaceCraft (SC) to the planets. In order to correct the value of AU he had tasked with radar Venus. With his direction and with his participation was made to mobilize all available resources increasing the sensitivity of the radar. It had ensured the success of radar during the inferior conjunction of Venus with Earth in 1961 and allowed to correct initial value of the AU by increasing it on 72300 km and to decrease unsertaince to +/– 2000 km. During subsequent radar experiments with planets – Venus, Mercury, Mars and Jupiter – radar sensitivity continued to increase. This allowed to correct the theory of movement of inner planets and also to resolve the reflected signals in time of delay and Doppler frequency, thereby to map the reflecting surface to obtain detail information on some physical properties of surface of some planets. Such big results said about the birth of the new method in astronomy– radar astronomy – and his name became as the founder and pioneer of this field of Astronomy.

At the end of 1961 he headed the Scientific Council on Radio Astronomy of Soviet AS . The Council worked for 28 years under his leadership. This was a time of construction of radio telescopes, of which the largest is the RATAN-600 can be called the nurseling of the Council. The Decree of Russian Government on the construction of the Observatory in Uzbekistan with a radio telescope RT-70 of mm wave band was prepared also with his participation.

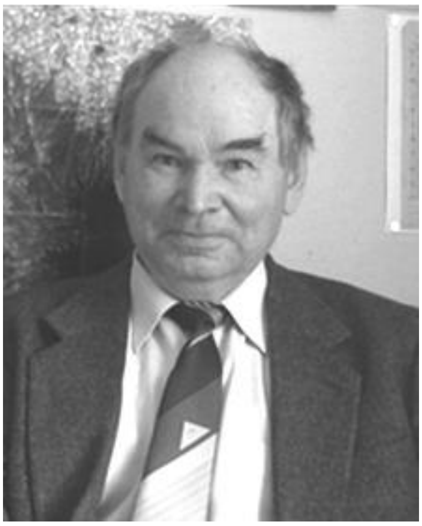
The unique "Atlas of the surface of Venus" released in 1989 under his editorship became the finale accord of his astronomical activity. Maps of 115 million km2 of the surface of the Northern hemisphere of the planet with a resolution of about 1 km was captured by the side-looking onboard radars SC "Venera15" and SC "Venera16" (1983-84). The reflected signals are transmitted to the Earth via telemetry channels, and then processing was carried out in computing centre of IRE, where the images were formed. The maps were accompanied Geological-Morfological Descriptions. He was informal leader of whole this grandiose experiment.

Awards: twice Hero of Socialist Labor, 9 Soviet orders , two Russian order "For services to the Fatherland" I and II class, Medals, Lenin and two – State Prizes & others.

Scientific awards: from Soviet AS – Grand gold medal named after M. V. Lomonosov, the Gold medal named after A. S. Popov, the Gold medal named after M. V. Keldysh ; from Interna-tional society IEEE – A.G. Bell Medal; Eropean (German) – Eduard-Rhein– Prize & others.

The name of V. A. Kotelnikov named one of the minor planet No. 2726 (IAU circular No.9214). The name of V. A. Kotelnikov are: naval vessel and Institute of radio engineering & electronics Russian AS [www.cplire.ru/rus/Kotelnikov].

KOTOV Valery Alexandrovich



Born 21.03.1943 in Nyandoma, Arkhangelsk region. In 1961–1966 – student at Moscow State University. In 1966–1969 – Ph.D. student at the Crimean Astrophysical Observa-tory (CrAO; supervisor – academician A.B. Severny). Since 1969 – researcher at CrAO. In 1973 he defended the Ph.D. thesis “The sunspot magnetic field and electric currents”, in 1994 – defended his Doctoral thesis “The study of the mean magnetic field and periodic processes on the Sun”. In 1986–1992 –Vice-director of CrAO.

The field of researches – heliophysics. Since 1965 he studied the Sun at the Solar Tower Telescope after Severny, an author of over 300 publications. In cooperation with A.B. Severny he started measurements of the solar mean magnetic field. V.A. Kotov elaborated the differential method for measuring solar global oscillations. In cooperation with A.B. Severny and T.T. Tsap he discovered pulsations of the Sun with period P0 = 9600.606(12) s. Jointly with V.I. Khaneychuk, V.A. Kotov discovered that after 1982 period P1 = 9597.929(15) s dominates.

Holder of VDNKh medals, “Mark of Honor” award (1981), member of IAU. In his honor, asteroid (8246) discovered by N.S. Chernykh in 1979 was named Kotov.

KOVAL Alexandra Nikolaevna

Born 13.11.1935 in Makeyevka, Chernigov region. In 1957, she graduated from the Faculty of Physics of Shevchenko Kiev State University with a degree in astronomy. Since 1957 – a researcher at the Crimean Astrophysical Observatory of the USSR Academy of Sciences. She worked as a senior researcher at the Solar Physics Department of CrAO until 2018. In 1971 she defended the Ph.D. thesis "The study of physical characteristics of moustaches and their relationship with the development of active regions". A.N. Koval was involved in studying the development of active regions on the Sun and non-stationary processes pro-ceeded in them based on the analysis of monochromatic, spectral, and polarization observations derived with solar telescopes of CrAO. An author and co-author of 85 scientific publications.

The main branches of investigations.

The study of fine-structure non-stationary emission formations – moustaches. She first determined physical conditions in moustaches, the height of occurrence of the emitting layer, explained asymmetry of moustaches' emission, studied motions and magnetic field structure in the place of occurrence of moustaches.

The study of morphology, evolution, energetics, and spectral characteristics of powerful solar flares. She determined conformity of the observed characteristics of the flare process in the flare's theoretical standard model.

A comparison of a series of spectral characteristics of proton and non-proton flares was carried out, a possibility of detecting low-frequency plasma turbulence was considered, dynamical processes and structure of the velocity field in the flaring volume of plasma and their correspondence to the chromospheric evaporation model were studied. There was also studied the role of thermal and non-thermal processes in the heating of the chromosphere based on investigating peculiarities of linear polarization of the flare H_α-emission. The fine structure of polarized flare elements was detected. The spectra of white flare's nuclei during the impulsive phase were acquired and studied, and a number of features unknown earlier were shown. The spectral characteristics and model calculations of the atmospheric structure of white flares point to the heating of the low chromosphere and photosphere; this is hard to agree with the standard flare model.

Variations in sunspot magnetic fields during the flare were found, strength and structure of the magnetic field in the flaring volume of plasma were determined. Rapid variations in the sunspot magnetic field during the impulsive phase of the flare and their correlation with non-thermal flare emission were detected.

The role of different parameters of the active region in forming the preflare situation was cleared up with the aim of predicting solar flares.

A.N. Koval is an active participant in observations within international programs on solar activity studies.

A holder of the Veteran of Work medal.

KOVALEV Yuri Andreevich

Born 11.11.1945 in the village Krasnokamenka, Crimea. He finishes a school in Gurzuf near Yalta, then studies at the Physics and Technology Faculty of the Polytechnic Institute in Gorky in 1963-1965 and at the Physics Faculty of the State University in Leningrad in 1965-1970. PhD student, junior scinstist, and scientist of the Space Research Institute of the USSR Acad. of Sci. in 1970-1990. Since 1990, senior and leading scientist of the Astro Space Center of the P.N. Lebedev Physical Institute of the Acad.of Sci. (the ASC of the LPI). PhD thesis in Astrophysics (1985)
and Sci. Hab. thesis (2002). In 1984-1993, a co-chair of the RadioAstron Space Radio Telescope receiver team. Since 1996, the scientific secretary of the Dissertation Council in Astrophysics of the LPI. IAU member since 2010. An expert of the Academy of Sciences since 2016.

The scientific works cover mostly the topics of the extragalactic radio astronomy, pulsars, and physics of magnetized plasmoids erupted from the Sun, published in about 100 papers.

In 1970s Yu.A. Kovalev, using the model for a superconductive Josephson junction by Aslamazov & Larkin, is among the first to calculate the conversion matrix and estimate the conversion losses. He demonstrates a possibility of practical realization of the superconductive frequency convertor using the Josephson effect as a new HF-device for mm-waves receivers. The same model underlies a new mechanism of the pulsar Josephson radio emission, suggested by Yu.A. Kovalev. The Josephson emission is generated in the magnetized superconductive mantle of a neutron star and penetrates to the magnetosphere along the magnetic field lines near the poles through cracks in the star crust. By analogy with the evolution of magnetized blobs in quasars proposed by I.S. Shklovsky in 1960, Yu.A. Kovalev has pointed out that the Sun blobs contaning chaotic magnetic field (magnetized plasmoids), due to their kinetic energy and compression along the path, can penetrate into the Earth atmosphere and be observed.

Following Shklovsky's approach to describe emission variability, Yu.A. Kovalev in collaboration with V.P. Mikhailutsa elaborates a model of a source in the external large-scale magnetic field to explain variable extragalactic radio sources, in the frame of the so-called Hedgehog model suggested by N.S. Kardashev. The model explains principal common properties of the non-stationary radio emisson from extragalactic radio sources. In continuation of that work he introduces a multi-epoch observational program and demonstrates the RATAN-600 efficacy to study long-term variability of extragalactic objects, exploiting the ability of the radio telescope to measure almost instantaneous multi-frequency broadband spectra.

The observations, carried out in collaboration with his colleagues since 1979, as well as a special software, developed by Yu.A. Kovalev with participation of V.R. Amirkhanyan and Y.Y. Kovalev for automated processing of mass measurements and model analyzing of the spectra, give the unique multi-epoch results for several thousands of extragalactic VLBI compact objects – qua-sars and galaxies – covering 75% of the sky. For the first time, the potentially variable HF-spectral component, which is produced by the continuous relativistic jet in the strong longitudinal magnetic field, has been found in 95% or more of 2800 studied VLBI compact objects. Several hundred sources with high-amplitude long-term variability have been selected for follow-up VLBI studies.

Yu.A. Kovalev is a Co-PI of the international JURRISS NASA project to study RATAN-600 spectra and VLBA structures of the active galactic nuclei in 1999-2001. He is also a member of the VSOP survey working group in 1996-2000, and the PI of the programs for collaborative spectra observations at the RATAN-600 providing ground support of the measurements with the space observatories for the projects VSOP (HALCA, in 1996-2000) and RadioAstron (SRT, since 2010).

KOVALEV Yuri Yurievich

Born in 1973 in Moscow (USSR). In 1991-1997, a student in astronomy at the Physics Faculty of the Lomonosov Moscow State University. In 1997-2000, a PhD student of the Lebedev Physics Institute (LPI) of Russian Academy of Sciences (RAS). PhD (2002) and Dr. Sci. (2011) theses were dedicated to studies of active galactic nuclei. Jansky fellow at the National Radio Astronomy Observatory (Green Bank, WV, USA, 2003-2006). Humboldt fellow at the Max Plank Institute for Radio Astronomy (Bonn, Germany, 2006-2009). Since 2000, researcher at LPI RAS (scientist, senior scientist, head of laboratory). Bredikhin prize in astronomy of RAS (2010), award of the "Dynasty" foundation for young doctors of science (2012), Medal of the Order of Merit for the Fatherland, rank II (2015), honorary degree of Professor of RAS (2016).

Main science topics: studies of Active Galactic Nuclei (AGN), the Galaxy center, interstellar media. He specializes in the area of observational astrophysics. Y.Y. Kovalev has used for his studies most of the largest radio telescopes and radio interferometers in the world as well as space telescope Halca (Japan), Spektr-R (Russia), Fermi, Swift (USA). Since 2011, he is a project scientist of the ground-space interferometer RadioAstron and PI of its key science program – the AGN survey.

As of 2016: Y. Y. Kovalev has published more than 120 scientific papers with more than 5000 citations (ADS) and the Hirsch index 38 (WoS).

Main scientific results: 1) Discovery of extreme brightness of quasars' cores with RadioAstron, which strongly affects our understanding of their emission mechanism. 2) Discovery of a new effect of radio waves propagation in the interstellar plasma – a so called scattering sub-structure – from observations of quasars, pulsars, and the Galactic center with RadioAstron and ground-based interferometers. This gives an opportunity to estimate parameters of the turbulent clouds in the interstellar media and provides a technique to recover true images of objects being blurred by the scattering. 3) Discovery and interpretation of a close relation between the synchrotron and Compton emission of compact jets in radio and gamma-ray bands of the electromagnetic spectrum. Localization of the gamma-ray emission sites near the jet bases. 4) Discovery of more than 1000 ultra compact AGNs by VLBI. This enables physical analysis of jets properties as well as developing the most accurate reference frame to date. 5) Massive measurements, astrophysical and applied application of the apparent core-shift effect in quasars due to the synchrotron self-absorption. Reconstruction of the information on the jet base geometry and magnetic field strength. 6) Discovery of a counter-jet in the galaxy M87 (Virgo A), predicted by Shklovsky. Estimation of intrinsic parameters of the parsec-scale relativistic jet in M87 on the basis of this result.

Y. Y. Kovalev is a member of the IAU, co-chair of the RadioAstron International Scientific Council, member of the Space and Astronomy councils of RAS, vice-chair of the Russian astronomy infrastructure survey panel, member of the council of professors of RAS, member of the science council for the Ministry of Education and Science of Russia, member of scientific council of the Moscow planetarium, member of the program committee of the Special Astronomical Observatory of RAS.

KOVALEVA Dana Alexandrovna

Born 14.02.1973 in Mendeleevo, Moscow Region. In 1996, she graduated from the Faculty of Physics of M.V. Lomonosov Moscow State University in astronomy. Since 1996, she has been working at the Institute of Astronomy of the Russian Academy of Sciences (INASAN), first as a junior researcher, then as a researcher and then as a senior researcher. In 2002, she defended her PhD on "Binary stars and the mass-luminosity relation for small and moderate masses".

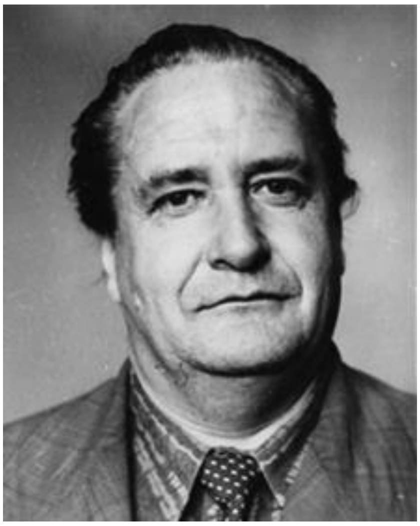
An employee of the INASAN Center for Astronomical Data, an expert in working with astronomical data. Research interests: stellar astronomy, binary and multiple stars, scattered star clusters, astronomical catalogs, and databases.

D.A. Kovaleva and co-authors obtained results for low-mass binary and multiple stars, in particular, related to the fine structure of the mass-luminosity relation. Developed the method of self-consistent determination of the ages and metallicities of the components of double and multiple systems. Investigated the problems of multiparametric cross-identification of objects. The agreement was confirmed between the photometric and trigonometric parallax-based scales of distances to open star clusters according to the Gaia space mission data. Gaia data is used to search for and study stellar systems including binary and multiple stars, stellar groups, and open star clusters.

D.A. Kovaleva is the author and co-author of a number of astronomical catalogs. In collaboration with O.Yu. Malkov and P. V. Kaygorodov, created, maintained, and developed the world's largest Database of binary and multiple systems of all observational types BDB. Author of more than 50 scientific articles.

Member of the International Astronomical Union, Scientific Secretary of the National Committee of Russian Astronomers.

KOZHEVNIKOV Nikolay Ivanovich



Born 04.01.1930, Kasimov, Ryazan region, died 16.10.1981, Moscow. In 1947 he entered the Astronomical Department of Faculty of Mechanics and Mathematics of Moscow State University (MSU). In 1952 he graduated with honors from university. From 1952 to 1955 he studied at the postgraduate school Faculty of Mechanics and Mathematics MSU. Since 1955 he worked permanently in the Department of Solar Physics of the SAI.

Ph.D. degree (1959), Senior Researcher of the Department of Solar Physics of the SAI MSU (1964). Member of the IAU.

Specialist in solar physics and solar system physics. Author of over a hundred scientific publications in domestic and foreign journals. Member of several expeditions to observe total solar eclipses. Experimenter and researcher of solar observation equipment. Ph.D. thesis on the topic "Study of the law of variation of the brightness of the solar disk from the center to the edge in the infrared region of the spectrum" (1959). The main scientific works are devoted to the problem of the structure of the solar convective zone, the dependence of the convective zone model on external influences. The range of scientific interests of K. was associated with solar formations. He was engaged in research of the structure of flares, temperature distribution and large-scale movements in flares. He was interested in the geometrical and kinematic characteristics of sunspot groups, sunspot lifetimes, intensification of the magnetic field in sunspots, and the speed of movement of sunspot groups. Arguments are given in favor of the fact that the magnetic field is located at the base of the convective zone and is carried out from there. An empirical model of the sunspot-forming activity of the Sun was proposed. K. was interested in the cyclical activity of the Sun and the impact of solar activity on the Earth, solar flares and magnetic storms. In the work "Influence of solar activity on the life expectancy of certain categories of people" (together with A.S. Sharov, 1981) came to the conclusion that solar activity affects both human health and his death.

Astroclimatic research is another area of K.'s scientific interests: the study of the surface component of the daytime astroclimate in mountainous and lowland areas; study of the structure of air flows and fluctuations of the refractive index of light waves in the surface layers of the earth's atmosphere; estimation of the average size of air irregularities; assessment of temperature fluctuations in the solar pavilion; recommendations for choosing a place for observation and improvement of work on solar telescopes.

KOZYREV Nikolay Alexandrovich

Born 20.08.1908 in St.-Petersburg. In 1928, graduated from Dept. of Physics and Mathematics of Leningrad University started a post-graduate course in the Central Astronomical Observatory of the USSR Academy of Sciences (under the supervision of Acad. A.A.Belopolsky). Held lecture courses on theory of relativity in Leningrad Pedagogical Institute, worked for Leningrad Institute of Railway Transportation. In 1931, was taken in the staff of Pulkovo Observatory as First Rank Specialist. Cand.Sci. (degree without presenting a thesis) on Astronomy and Geodesy (1932). Purged in 1936. In December, 1946 released «conditionally early», rehabilitated in 1958. After his release, with Crimean Astrophysical Observatory. 1947: Dr.Sci. Since 1957 with The Central Astronomical Observatory of the USSR Academy of Sciences. Died 27.02.1983 in Leningrad.

His basic science works are devoted to astrophysics, planetary studies and endogenous Lunar activity. Developed the theory of extended stellar atmospheres and established some characteristics of emerging radiation (1934). This theory was generalized by S. Chandrasekhar and is known as Kozyrev– Chandrasekhar theory. Based on his own observations proved that sunspots reach much deeper layers of the solar atmosphere than it had been thought. Was very skillful and experienced observer. In 1953, found a series of emission bands in the spectrum of a dark part of the disk of Venus, including two bands of molecular nitrogen. Studied a lunar crater Alphonsus and obtained spectrograms indicating gas emerging from its central peak and volcanic phenomena on the Moon (1958). Forecasted the absence of the magnetic field on the Moon a few years before the first space expeditions; his prediction was confirmed with measurements made by «Luna-1» spacecraft. From his comparative study of profiles of hydrogen lines in the spectra of Mercury and the Sun, found in 1963 hydrogen in the atmosphere of Mercury. Made a conclusion concerning high temperature (200 000°) in the center of Jupiter. Developed and tried to prove experimentally an original theory of the behavior of physical time («Causal or Non-Symmetrical Mechanics in Linear Approximation»). Treated the problem of stellar structure in a non-standard way: assuming that the interiors of stars consist of hydrogen, concluded that the internal energy of stars cannot be explained with thermonuclear reactions.

In the time of his exile in Norilsk and Dudinka worked as a land surveyor, Head of Permafrost Station, Engineer Geophysicist. From January, 1946 was allowed to do science and continued work on his Doctoral Thesis «A Theory of Inner Structure of Stars as the Basis for the Study of the Nature of Stellar Energy», which he presented 10 March 1947 to the Science Board of the Department of Mathematics and Mechanics of The State University of Leningrad.

Gold Medal of the International Astronautics Academy (1970). Asteroid 2536 Kozyrev and Lunar Crater «Kozyrev» were named after him.

KRASINSKY Georgy Albertovich

Born 19.02.1939 in Leningrad (now St. Petersburg); graduated from the Leningrad University (1961); post-graduated from the Institute of Theoretical Astronomy (ITA) of the USSR Academy of Sciences (1964); was an ITA Staff Member (from 1964); Head of Laboratory and Chief Scientist in the Institute of Applied Astronomy of the USSR Academy of Sciences (from 1988); Doctor of Sciences in Astrometry and Celestial Mechanics (1989), Professor (2000), Honorary Scientist of the Russian Federation (2011), the President of the IAU Commission No.4 “Ephemerides” (from 2003 to 2006), a Member of the IAU Commissions No.7 and No.20, ILRS and IVS WGs; was awarded the USSR State Prize (1982), the Order of the Badge of Honour (1981) and the Order of Honour (2002). Died 17.03.2011 and was buried at the Pulkovo Memorial Cemetery.

G. A. Krasinsky was a Soviet and Russian astronomer, an eminent scientist in celestial mechanics, astrodynamics, astrometry and ephemeris astronomy (more than 100 scientific papers). His first papers dealt with the development of mathematical aspects in differential equations and qualitative celestial mechanics. He advanced a trigonometric theory of secular perturbations of the major planets; suggested new effective methods to expand perturbation functions in planetary and satellite problems; and studied the resonance structure of asteroid rings. The results obtained were included in the collective monograph “Minor Planets” (1973).

G. A. Krasinsky used his extraordinary abilities to combine theoretical studies with constructing numerical ephemerides in practice and processing optical and radio observations of celestial bodies. He co-authored the Unified Relativistic Inner Planet Motion Theory (the 1982 USSR State Prize) and contributed to the release of the Astronomical Yearbook Supplements No.21A (1980). The new generation ephemerides based mainly on this work, were used for the USSR space program. This resulted in a series of high-accuracy ephemerides of planets and the Moon (EPM) which are only comparable in accuracy with the well-known DE ephemerides of the Jet Propulsion Laboratory (USA). The orbital parameters of the planets, as well as the seleno-geodynamic parameters were improved. These ephemerides form the basis of Russian astronomical yearbooks and are used for the ground-based support of the GLONASS program.

The latest years of G. A. Krasinsky’s life were devoted mainly to radio astrometry. He made an outstanding contribution to the theoretical basis and practical implementation of the Russian radio interferometry network “Quasar”. He provided proof that it was possible to construct a highly accurate inertial coordinate system using the VLBI techniques. G. A. Krasinsky was in charge of developing the universal software ERA (Ephemeris Research in Astronomy) to solve various problems of ephemeris and dynamical astronomy and creating the database of motion and rotation of the Solar system bodies. The ERA System has found a practice application in processing various types of observations of celestial bodies, calculating their ephemerides as well as carrying out some specific applied tasks.

G. A. Krasinsky founded the Laboratory of Ephemeris Astronomy and headed it for many years. Many promising young scientists from Russia and other countries were trained in this laboratory. The scientific school of his student scientists and followers includes one Doctor of Sciences and six Ph.D. scientists.

IAU gave the name of Krasinsky to the Minor planet 5714 in 1997.

KRASNIKOV Sergey Vladilenovich

Born in 1961 in Leningrad. In 1985 graduated from Leningrad State University as physicist. 1990: post-graduate studies at Pulkovo Observatory under the supervision of Prof. Yu.N. Gnedin, later with Pulkovo Observatory, Laboratory of Stellar Physics. 1993: Cand.Sci. "Astrophysical manifestations of the goldstone (arion)–photon conversion". 2014: Dr.Sci. "Spacetime with non-standard causal properties".

Introduced the concept of "Krasnikov tube" into cosmology (1995). Research interests are mainly related to General Relativity. In particular, obtained the following results:

Proved a theorem to the effect that any point of any spacetime has a pre-compact convex neighborhood, which (as spacetime by itself) is globally hyperbolic.

Formulated and proved a theorem that for any spacetime U there is a maximal extension $M_{max} \supset U$ free from new closed causal curves (i.e., leaving the chronological past of U in M_{max}).

Proved that "holes", as they are defined by Geroch, are present even in Minkowski space.

Suggested a solution for "the grandfather paradox".

Introduced the concept of "spacetime shortcut" as a geometric feature enabling one to "move faster than light". A shortcut has been suggested, which is topologically R4 (in contrast to wormholes) and which does not need tachyons (in contrast to Alcubierre bubble). This shortcut is not ruled out by "the quantum inequality".

Built a model of an empty spherically symmetric wormhole born in the early Universe; showed that some of such wormholes become traversable for macroscopic time (due to Hawking evaporation).

Published two monographs: (i) S.V. Krasnikov, Some causality problems in General Relativity: «time machines» and «superluminal travel» (Moscow, Lenand: 2015) (in Russian).

(ii) Krasnikov Serguei, Back-in-Time and Faster-than-Light Travel in General Relativity (Springer: 2018) ISBN 9783319727530.

krasnikov.xxi@gmail.com

KRAT Vladimir Alekseevich

Born 21.07.1911 in Simbirsk. In 1932, graduated from Kazan University. From 1938: with Pulkovo Observatory, Head of Dept. of Solar Physics. Since 1964: Acting Director, 1965–1979 – Director of the Pulkovo Observatory. Corresponding Member of the USSR Academy of Sciences (1972). Died 02.06.1983 in Leningrad.

His basic scientific works belong to solar physics, variable stars and cosmogony. Initiated in the USSR astronomical studies with telescopes raised to the stratosphere with balloons (1963-1966), headed the first Soviet Stratospheric Observatory. Carried out several studies of equilibrium figures of components of close binary stars (1937). Studied limb darkening on stellar disks from observations of eclipsing variables; suggested a method of determination of the coefficient of darkening based on analysis of a light curve. In 1944, developed a detailed classification of eclipsing variables. In 1958, introduced the notion of the solar chromosphere as a formation that consists of hot and cold filaments of the type of prominences. Found (1960, 1963) that chromospheric mounts observed in H and K calcium lines are located in the lower chromosphere (at the height of 0 to 1000 km) and are height-limited incorporations of hotter gas within a gas layer with kinetic temperature that does not exceed 5000 K. From the data of 1945 solar eclipse found that the energy distribution in the continuum spectrum of the corona is identical to that in the spectrum of the center of solar disk.

As far back as in 1935, hypothesized the limitedness of the Metagalaxy and the existence of other cosmic systems beyond. According to this hypothesis, the expansion of the Metagalaxy was preceded by its contraction caused by formation of condensations. Author of books «Problems of equilibrium of close binaries» (1937), «Figures of equilibrium of celestial bodies» (1950). One of the authors of «The Course of Astrophysics and Stellarой Astronomy» (1951) «Balloon Astronomy» (1972), written in cooperation with L.M. Kotlyar. Member of Editorial Board of Solar Physics (1967-1977). After V.A. Krat, the minor planet was named (3036_Krat).

KRAVTSOV Andrey Vladimirovich

Born 21.07.1972 in Krasnyi Lyman, Donetsk region. Graduated from the Physics Department of Moscow State University in 1995 specializing in Astronomy and carrying diploma research at the Astro Space Center of FIAN under supervision of B.V. Komberg and V.N. Lukash. Attended graduate school at New Mexico State University in the United States under supervision of A.A. Klypin. In 1999-2001 held NASA Hubble Postdoctoral Fellowship at the Ohio State University. Joined faculty of the Department of Astronomy and Astrophysics at the University of Chicago in 2001 as an Assistant Professor and became a full Professor in 2011. A.V. Kravtsov is also a senior member of the Kavli Institute for Cosmological Physics and Enrico Fermi Institute at the University of Chicago. Research interests range from studies of formation of the smallest dwarf galaxies to the most massive galaxy clusters using numerical simulations and analytical models.

In 1999 A.V. Kravtsov and collaborators quantified the abundance and properties of dark matter subhalos predicted in the Cold Dark Matter (CDM) scenario, highlighting the difference in the mass function of subhalos and luminosity function of galaxies that became known as the “missing satellites problem’’ and elucidating scaling relations between properties of galaxies and dark matter halos that host them. In 2005-2008 A.V. Kravtsov participated in a study led by A.A. Vikhlinin that confirmed accelerated expansion of the Universe using evolution of galaxy clusters. In 2006-2009 A.V. Kravtsov and collaborators have published a series of papers with accurate calibrations of cluster scaling relations, halo mass function and halo bias predicted in the CDM scenario, which have been widely used in studies of galaxies and galaxy clusters, in particular in the cosmological constraints with the cluster sampled detected by the PLANCK satellite.

Recent research focuses on development of realistic models of dwarf galaxy formation, investigations of physical drivers of star formation and feedback in galaxies and the origin of their low star formation efficiency, and dynamical origin and observable signatures of caustics in dark matter and shocks in gas in the outskirts of galaxy clusters. In particular, several papers in 2014-2017 on the outer caustics around dark matter halos (called splashback) has opened a new area of theoretical research. The predicted splashback feature was detected in recent years in distribution of galaxies and matter around clusters in several observational surveys. Studies of star formation in galaxy context have provided a clear theoretical explanation and physical model for the long-standing puzzle of inefficient star formation in galaxies and existence of the Kennicutt-Schmidt relation.

KROTIKOV Vyacheslav Dmitrievich

Born 12.03.1932 in Pravdinsk (now microdistrict of the town of Balakhna) of the Nizhny Novgorod Krai (now the Nizhny Novgorod Region). In 1950-1955, student of the Faculty of Radiophysics at the State University of Gorky (GSU) (now N.I. Lobachevsky State University of Nizhny Novgorod (UNN)). In 1955-1958, a research assistant at the GSU. 1958-1960, a leading engineer at MBX 430. In 1960-1963, a post-graduate student at GSU. Defended his PhD thesis in 1963. Senior Researcher since 1964. In 1962-2016, a chief designer, senior researcher, head of the department, deputy director, leading researcher, chief specialist of the Radiophysical Research Institute (NIRFI).

Awarded 4 medals, the Honorary Diploma of the Ministry of Defense of the Russian Federation, the Honorary Diploma of the Governor of Nizhny Novgorod.

V.D. Krotikov's research interests are radio astronomy, radiophysics, remote sensing of the environment.

His prime research interest was a theoretical and experimental study of the intrinsic thermal radiation of the Moon and planets with the goal of linking the measured spatial, temporal and spectral characteristics of the radiation with the physical properties of the substance of their top covers. In 1961, V.D. Krotikov together with V.S. Troitsky and V.A. Porfirev, developed a new method of measuring the radio emission of the Moon and discrete sources (the" artificial Moon" method), which allowed them to significantly increase the accuracy of measurements. Thermal and electrical parameters, the composition and structure of the upper cover of the Moon were determined by the measurement results of the lunar radio emission characteristics over a wide spectral range, through the development of the theory and the improvement of methodological approaches. A comparison was made with the corresponding parameters of terrestrial rocks as possible analogs of lunar soil. The temperature growth into the depth of the lunar subsurface porous layer of 4-6 m thickness was discovered which indicated the existence of the lunar hot subsoil and the heat flux density from it of 0.8-1 cal/cm2 sec. For the discovery of this phenomenon, V.D. Krotikov, together with V.S. Troitsky, was awarded the Diploma for scientific discovery No.43 in 1962.

The results of these studies became widely known and were used by the designers of lunar landing modules and vehicles. Later, together with O.B. Shchuko, V.D. Krotikov extended the lunar radio emission theory to include the studies of Mercury and Mars radio emission characteristics by ground-based observations and the prediction of their variations in space-based tracking observations from the spacecraft. These studies were used to process radio astronomical experimental data from the Soviet automatic interplanetary stations Mars 3, 5, 7 to obtain information on the permittivity and density of the Martian soil.

Along with the exploration of the Moon and planets, V.D. Krotikov made a significant contribution to the development of principles of design and construction of the equipment of the first domestic radio interferometer with independent reception at the operating frequency 86 MHz and its approbation on the antennas of The Lebedev Physical Institute of the Russian Academy of Sciences (LPI RAS) with the base of 230 km.

Under V.D. Krotikov's leadership, some applied studies have been carried out on the thermal radiation of the environment and its impact on the radio-wave imaging of objects against the background of the Earth's surface, water areas and the atmosphere.

KSANFOMALITY Leonid Vasilievich

Born 28.01.1932 in the city of Kerch (Crimea). He graduated with honors from the Leningrad Polytechnic Institute (1956). In 1958 he moved to the Abastumani Astrophysical Observatory of the Academy of Sciences of Georgia, where he worked until 1967 as head of the laboratory of astronomical electronics. In 1963 he defended his Ph.D. thesis on the investigation of The Moon. Since 1968 he has been working at the Space Research Institute of the USSR Academy of Sciences (RAS) as a head science team. He performed 17 space experiments, as well as ground-based studies of Mercury and The Moon. In 1977 he defended his doctoral dissertation on Venus research. In 1978–1982, he discovered the electrical activity of the Venusian atmosphere. In 2011–2016, he put forward a hypothesis about the existence of signs of life on Venus. Died 07.09.2019 in Moscow.

The works of L. Ksanfomality at the Space Research Institute of the USSR Academy of Sciences (RAS) were devoted to the study of planets, satellites, and other bodies of the solar system. He performed 17 successful space experiments. In 1969-1970 he developed a set of scientific instruments for the MARS-2, -3 vehicles, which made it possible to obtain significant scientific results. In 1974, he first applied the 2 μm CO2 altimetry method on the MARS-4, -5 satellites. As a result of these missions, about 30 scientific papers were published. Radiometric experiment on VENERA-9, -10 devices in 1975 was awarded the Republican State Prize. In 1978-1982, in experiments on the VENERA-11 – VENERA-14 spacecraft, L. Ksanfomality discovered the electrical activity of the Venusian atmosphere, which was then confirmed by the US PIONEER-VENERA spacecraft. He was the first to propose the concept of Venus volcanism, which received confirmation. In 1986, he and the Enrico Fermi Institute of the University of Chicago installed on the VEGA-1, -2 spacecraft a mass analyzer of cometary dust particles. According to the results of these studies, particle clusters and other dust phenomena were detected. A significant number of scientific papers have been published. He created a radiometer for the expedition to Phobos (1989). This experiment showed that the reflective spectrum of Phobos has a pronounced "red" character. In 1989-1996 he developed a mapping spectrophotometer for the MARS-96 apparatus (unsuccessful launch in 1996). This spectrophotometer was tested at a high-altitude observatory. In 1992–1997 he suggested a space experiment to study the regolith of celestial bodies by the holographic method.

In 1998–2010 L. Ksanfomality obtained images of the planet Mercury with the help of ground astronomical observations. In 2006 he returned to the processing of panoramas of the surface of Venus, obtained in 1975-1982 using modern methods. He discovered a significant number of objects similar to the forms of earthly life but with extremely slow movements. He hypothesized that the flora on Venus has signs of photosynthesis of a special nature.

L. Ksanfomality is the author of more than 390 scientific and popular scientific works on studying bodies of the solar system. Author of 4 books ("Planets rediscovered" – SCIENCE, Moscow, 1978; monograph "Planet Venus," FML, Moscow, 1985; "DiePlaneten" – URANIA (Germany), 1986; "Parade of planets," FML, Moscow, 1998). For the exploration of Venus, the IAS named L.V. Xanfomality to asteroid 7394 Xanthomalitia. Member of the International Astronomical Union (since 1973), COSPAR, and other international scientific organizations. Permanent member of the editorial board of Astronomical Bulletin. Government awards: Order of the Red Banner of Labor and others. Honored Scientist of the Russian Federation.

KUDRYAVTSEV Sergey Mikhailovich

Born in 1962 in Lesnoy, Sverdlovsk region. He was graduated from Leningrad (now St. Petersburg) State University in 1984 and worked in Soviet (Russian) Mission Control Center. Kudryavtsev S.M. defended his PhD thesis in 1989. He works at Sternberg Astronomical Institute of Moscow State University since 2000, a leading scientist. Dr.-habil. since 2007. A member of the Scientific Council on Astronomy of Russian Academy of Science, section "Celestial mechanics". A member of the International Astronomical Union.

The main fields of study are celestial mechanics, investigation of motion of both natural and artificial celestial bodies, geodynamics.

In 1986 Kudryavtsev S.M. with his colleagues from Mission Control Center (Kolyuka Yu.F., Tarasov V.P., Tikhonov V.F.) made an improvement of the Halley comet orbit basing on the comet observations made from two Soviet VEGA-1,-2 spacecraft. This orbit then was used for targeting European JIOTTO spacecraft at the comet close flyby.

In 1988-1989 Kudryavtsev S.M. and his co-authors (Ivanov N.M., Kolyuka Yu.F., Tarasov V.P., Tikhonov V.F.) developed a new motion theory of two Martian moons, Phobos and Deimos. This theory was used at all stages of execution of the Soviet space mission PHOBOS. Phobos mass was improved as well (1990).

Kudryavtsev S.M. (1995) first obtained the fifth-order complete analytical solution of motion equations of a non-spherical planet satellite. Kudryavtsev S.M. (2002) used this solution for the high-precision analytical calculation of the effects of all geodynamical forces on satellite motion, such as non-central Earth gravity potential, precession, nutation, polar motion, Earth irregular rotation, both ocean and solid Earth tides, etc. Kudryavtsev S.M. (1999) improved the values for C21, S21 coefficients of the geopotential expansion.

Kudryavtsev S.M. (2004) suggested a new modification of the spectral analysis method which allows one to develop ephemerides of celestial bodies and arbitrary functions of them to compact high-accurate analytical series. By using this method Kudryavtsev S.M. made a new analytical development of the tide-generating potential of the Earth (2004) and that of other terrestrial planets (2008) which are the most complete to now. He and his co-author Kudryavtseva N.S. obtained a new analytical development of Pluto ephemeris (2009). Kudryavtsev S.M. built high-accurate analytical series which first represent the modern numerical ephemerides of the Moon over 6,000 years (2007) and ephemerides of all major planets over 30,000 years (2016, 2017). He developed an effective method of autonomous predictions realized in navigation receivers for the motion of GLONASS and GPS spacecraft (2020).

Kudryavtsev S.M. is the author and a co-author of more than 60 papers.

KUIMOV Konstantin Vladislavovich

Born 13.03.1939 in Moscow. He studied in 1956-1962 at the Astronomical Department of the Faculty of Physics of Moscow State University. In 1960-1985 he worked in Sternberg astronomical institute as a senior laboratory assistant, then a junior researcher and then as a senior engineer. In 1985, he defended his PhD thesis. by topic: «The study of astronomical optical systems by mathematical modeling in order to improve the accuracy of photographic positional observations». In 1998, he defended his doctoral dissertation on the topic: «Reduction of the Astrographic catalog of «Carte du Ciel»». Since 1986 he worked as scientific employee; from 1990 as senior researcher, then from 2000 as leading researcher; from 31.03.2001 – head of the Department of Astrometry and time service of SAI. In 2003, he was awarded the title of Honored Researcher of the Moscow State University. Died 18.03.2017 in Moscow.

The teachers for the KVK at the Moscow Planetarium were K.A.Partsevsky and I.T.Zotkin, at the Moscow State University — E.Ya.Bugoslavskaya and V.V.Podobed. KVK was an outstanding astrometrist of Russia, an extraordinary scientist and a talented teacher. He worked in the field of photographic astrometry, to improve the accuracy of photographic positional observations on the topic of determining the positions and proper movements of celestial bodies. Using the method of mathematical modeling, KVK was able to significantly improve the accuracy of determining the distortion and specify maximum accuracy achievable with given telescope, which depended on a variety of factors. Having mastered computer programming, KVK was always engaged in improving programs for processing observations and reduction calculations, almost half of the observations in the department of astrometry were processed according to Kuimov's programs. Its programs have been used in other departments and in other institutions.

KVK did a lot of work with the Astrographic catalog, obtained at 19 observatories in the northern and southern hemispheres in the 1st half of the twentieth century. He organized the transfer of information (published rectangular coordinates and magnitudes of 4.6 million stars up to 12^m) from 254 books to magnetic media (1988 – 1990). Then KVK compiled a series of programs (1991-1996) for processing this huge array of data. He reduced rectangular coordinates to spherical ones (in the modern ICRS system), taking into account various systematic errors, the totality of which was described in the reduction model by 17 parameters. The result of this huge work was presented in his doctoral dissertation (1998). KVK is the author and co-author of 99 scientific papers, including reports on special contractual topics.

His teaching activities are widely known. KVK taught courses at the MSU Faculty of Physics: «General Astronomy», «Astrometry» and special courses «Ephemeris astronomy», «Methods of processing astrometric observations»; supervised summer practices of students in Moscow, the Crimea and Terskol (Caucasus). He supervised course works, produced 19 graduate students of the Astronomy departement, authored 2 methodological manuals for the workshop. KVK did not refuse to consult anyone on astrometry and other fields of astronomy, his high competence and broad erudition were appreciated by colleagues and employees of other organizations.

Since 1988, KVK worked as an associate professor of the Department of Celestial Mechanics, Astrometry and Gravimetry (part-time); was winner of the Lomonosov Prize of the Moscow State University «Astrometric Catalog of the new generation» (1999, together with A. Kuzmin and V. Nesterov). KVK was awarded the medals «Veteran of Labor», «In memory of the 850th anniversary of Moscow», 2 bronze medals of VDNH, the jubilee badge «250 years of Lomonosov Moscow State University». Since 1998 KVK was member of the IAU; was a member of the dissertation and expert councils of SAI. KVK was extremely modest.

KUKARKIN Boris Vasilievich

Born in N. Novgorod. Autodidact. PhD degree for collected publications. In the Red Army in 1941–1944; Order of Red Star, medals. Dr. of Physics and Mathematics (1947, dissertation "Variable stars and structure of stellar systems"). Professor (1951). In 1931–1932, worked in Tashkent; since 1932 in the Sternberg Institute (SAI), at faculties of mechanics and mathematics and then of physics, Moscow University (head of the stellar astronomer chair since 1960, of stellar astronomy and astrometry chair since 1965). SAI Director in 1952–1956; after that, department head. Head of the variable-star sector in the Astron. Council (USSR Acad. Sci.). F.I. Bredikhin Prize of the USSR Acad. Sci. (1950). President, IAU Commission 27 "Variable Stars" (1952–1958); IAU vice-president (1955–1961). Died 15.09 1977 in Moscow.

K.'s scientific interests were in the field of studies of variable stars, structure of stellar systems, investigations of globular star clusters. Together with P.P. Parenago, he founded the card catalog of variable-star observations, the base of the future General Catalogue of Variable Stars (GCVS) published in the USSR since 1948 on behalf of the IAU. The first GCVS edition (1946) contained data on 10912 variable stars; three editions appeared during K.'s life, the number of variable stars in the GCVS reaching 26000. K. also participated in compilation of several catalogs of stars suspected of variability, the last and most complete of them containing more than 14800 objects.

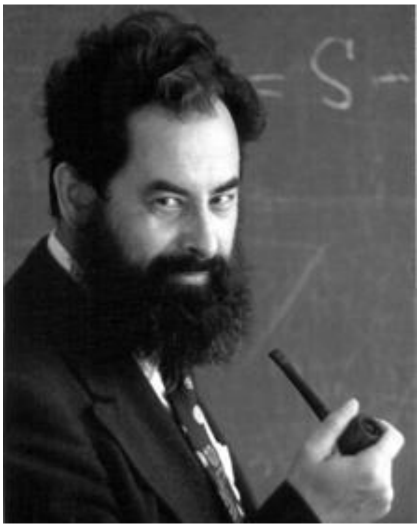
In 1934, together with P.P. Parenago, he established a statistical relation between the outburst amplitude and cycle duration for variable stars of the U Geminorum type and successfully predicted the second outburst of the recurrent Nova R Coronae Borealis. From his studies of space distribution, kinematical and physical characteristics of variable stars of different types, K. established the existence of different stellar populations in the Galaxy, non-simultaneous formation of galactic subsystems of objects belonging to different types. Together with studies performed by K. Bottlinger and W. Baade, these results obtained by K. form the basis of current notions of the Galaxy's components and subsystems. This was the contents of K.'s D.Sci. dissertation and his book "Investigations of the structure and evolution of stellar systems based on variable-star studies" (1949).

Multi-sided studies of the Galaxy's globular star clusters performed by K. resulted in his book "Globular Star Clusters" (1974) where he presented numerous characteristics of the clusters and stars populating them.

For many years at the Department of Astronomy of Moscow University, K. presented lecture courses on the history of astronomy, special courses on variable stars. He was the supervisor of several Cand.Sci. and D.Sci. dissertations.

He was the editor-in-chief of the series of collective books "Non-stationary Stars and Methods of their Studies" (Volumes 1–5, 1970–1974). In 1928, being at that time the leader of the observatory of the Nizhny Novgorod club of amateurs of physics and astronomy, he founded the journal "Variable Stars", issued, later on, by the USSR Academy of Sciences; he remained the chief editor of this journal for 49 years. In 1949–1961, he was the head of the astronomy editorial board of the Great Soviet Encyclopedia. For 28 years, he was the editorial board member of the Soviet "Priroda" ("Nature") journal of popular science; he also was editorial board member of several other journals.

KUKLIN Georgy Vyacheslavovich



Born 17.12.1935 in Dalniy, China. In 1953, graduated from High School of the USSR Consulate General in China. In 1954, obtained permission to move to the USSR and was admitted to A.A. Zhdanov Irkutsk State University. Graduated with distinction in 1959 and started working at the Irkutsk Magnetic Ionospheric Station. Since 1960, worked in different positions at the Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation of the SB, the USSR Academy of Sciences (since 1992, the Institute of Solar-Terrestrial Physics, ISTP SB RAS). From 1968 to 1999, Lab Supervisor. Doctoral degree in Phys.-Math. Sciences (1991), Professor, National Representative in the Committee of the International Program of Solar Maximum Year and observation coordinator in the USSR (1979–1985), Member of IAU (1990–1999), Member of the RAS Sun-Earth Council before 1999, Member of the Editorial Board of the "Solar Data" bulletin before 1999. Died 04.05.1999 in Irkutsk.

G.V. Kuklin’s research related to solar physics, the physics of solar-terrestrial relations, the mathematic-statistical methods of data processing. Author of about 250 scientific papers, co-author of two monographs: “Solar flares” (1982) and “Statistics of Sunspot Formation Activity” (1986), and two inventions.

At the beginning of the 1960s, active participant in the construction of the Sayan Solar Observatory and design of the vector-magnetograph (version one). G.V. Kuklin trained a group of first-class observers, took part in the establishment of the Solar Research Laboratory. With his students, conducted research on morphology and physics of sunspots, conducted innovative research on the assessment of a spot electrical conductivity. Found a connection between the slope of a sunspot penumbra base and the direction of the mean vector of the magnetic field. Investigated the visibility function effect on statistical characteristics of sunspot formation. Explicated the Wilson effect as the result of inclination of magnetic flux tubes. Developed the concept of preflare situations. Introduced the concept of datum points of the 11-year solar cycle.

Took part in many international scientific projects, such as “International Geophysical Year” (1957–1958), “International Solar Cycle Studies” (1998), “Solar Maximum Year” (1979—1985).

He was a research advisor for five PhD theses.

Awards: the Order of Badge of Honor (1975), the Medal “Veteran of Labor” (1984).

KULIKOV Konstantin Alekseevich

Born 21.10.1902 in the village of Torino, Kostroma region. In 1935 he graduated from the Astronomical Department of Faculty of Mechanics and Mathematics of MSU. His candidate thesis was «Study of the «Askania-Werke Bamberg» apparatus for astrophotography measurement» (1938). His doctoral thesis was «Determination of nutation constant from observations with the Pulkovo large zenith telescope» (1947). In 1940 Kulikov became an associate professor and in 1948 he became a professor of Faculty of Mechanics and Mathematics of MSU. From 1953 to 1965 he was the head of the Department of Astrometry and head of the Astronomical Department of MSU. From 1965 to 1976 he leaded the Department of Stellar Astronomy and Astrometry of Faculty of Physics, MSU. From 1938 to 1945 and from 1951 to 1955 Kulikov was the deputy director of the SAI MSU. Died 26.07.1987 in Moscow.

Kulikov’s main scientific works are related to fundamental astrometry. His research advisors were such Russian astronomers as S.N. Blazhko, S.A. Kazakov, A.A. Mokhailov. A number of Kulikov's works are devoted to the determination of astronomical constants from observations. Kulikov in his doctoral thesis (1947), derived several values of the nutation constant based on the analysis of latitudinal observations made in the Pulkovo observatory from 1904 to 1941. The average of them is equal to 9.2108"±0.0019", which almost doesn’t differ from the value of the nutation constant for 2000 year (N = 9.2109"), adopted by the XVI General Assembly of the IAU in 1976. He also determined the aberration constant value (20.5120" ± 0.0031"). K.A. Kulikov is the author of monographs – «Fundamental constants of astronomy» (1956), «Variability of latitudes» (1962), «New system of astronomical constants» (1969), «Foundations of lunar astrometry» (co-authored, 1972).

He devoted a lot of time and effort to teaching. From 1934 to 1935 he gave lectures on theoretical mechanics at the Military Academy of Chemical Defense. From 1947 to 1968, at the Astronomical Department of MSU, he taught a course in spherical astronomy and special courses – «Variability of latitudes and longitudes», «Fundamental astronomical constants», and «Fundamentals of lunar astrometry». Kulikov is the author of the textbook «Course of spherical astronomy» (3rd ed. 1974). Since 1968 he led groups of students-astronomers and gave lectures in advanced training courses at MSU.

K.A. Kulikov was awarded the Order of the Badge of Honor (1961) and 9 medals of the Ministry of Education of USSR. Kulikov was a member of the Presidium of the Astronomical Council of the USSR Academy of Sciences since 1950, from 1951 was the deputy chief editor of the Astronomical Journal and since 1952 the IAU member. From 1967 to 1970 he was the chairman of the All-Union Astronomical and Geodetic Society Moscow branch. More than 50 scientific and popular science works have been published by him.

KULIKOVSKY Petr Grigorievich

Born 13.06 1910 in Kiev. In1934, graduated from the Faculty of Mathematics and Mechanics of the Lomonosov Moscow University (MSU). Also finished the M.M. Ippolitov-Ivanov Moscow Musical High School. Since 1938, was affiliated to the Sternberg Astronomical Institute (SAI) of the MSU. In 1940-1986, associate professor of the Stellar astronomy chair at the Faculty of Mathematics and Mechanics, MSU (later, Chair of stellar astronomy and astrometry at the Faculty of Physics). In 1977–1978, head of the Chair of stellar astronomy and astrometry. PhD, scientific rank of Associate Professor. Died 04.11.2003 in Moscow.

K.'s scientific interests included stellar astronomy, studies of variable, double and multiple stars, photoelectric photometry, history of science.

K. was a pioneer of photoelectric photometry in the USSR. Together with V.B. Nikonov, he designed and built the first Soviet high-sensitivity photoelectric photometer and used it for stellar measurements at the Abastumani Observatory. Performed statistics of Supernovae, suggested their classification. In mid-1950s, initiated a program of systematic search for Supernovae using plates of the 40-cm astrograph at the SAI Crimean station; personally actively participated in this program for many years. During the Great patriotic war, K. worked in the SAI Time service, in evacuation to Sverdlovsk. In 1950–1951, together with B.V. Kukarkin, studied morphological properties of variable stars in relation to their space distribution and kinematics in the Galaxy. In late 1950s, together with N.E. Kurochkin and G.A. Starikova, performed positional measurements of several binary stars using a polarization micrometer. K. suggested a new method for determination of orbits of visual binary stars. On the base of kinematics of hot stars, he identified the Scorpius–Centaurus stream.

K. initiated creation of the Commission on history of astronomy of the Astronomical Council (USSR Academy of Sciences) and remained its head for many years. Since 1955, the yearly book "Studies on History of Astronomy" is being published; K. was the editor-in-chief of 11 its issues (1955-1971). In 1958–1964, he was elected President of the IAU Commission 41 "History of Astronomy". K. is the author of biography books about M.V. Lomonosov, P.K. Sternberg, articles about N. Copernicus, J. Heweliusz, S.N. Blazhko and other well-known astronomers.

For many years, K. presented lecture courses "Stellar astronomy" and "Binary stars" at the MSU Department of astronomy, supervised practical studies of students. In 1949, the first edition of K.'s "Handbook of an Amateur Astronomer" appeared; there were four editions of the book during K.'s life (the 5th, considerably revised edition was published in 2002 with V.G. Surdin as the editor). K. is the author of university textbooks "Stellar Astronomy" (Moscow, Nauka Publishers, 1978, 1985), "Practical Studies in Stellar Astronomy" (Moscow, Nauka Publishers, 1971). He published about 150 articles and books on astronomy and history of science. K. was also a brilliant pianist and composer.

KUROCHKIN Nikolay Efimovich

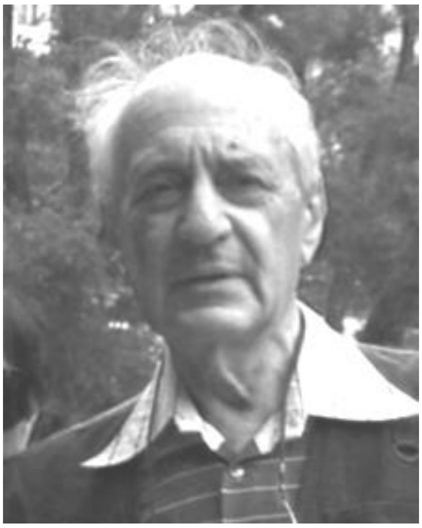
Born 01.09.1923 in Moscow. After 9 years of school, in 1940, started to work in the Moscow Planetarium, then in the library of the Higher Party School, in the Sternberg Astronomical Institute of Moscow University (SAI). After the beginning of the Great Patriotic War, volunteered to become a worker at a military plant. In late 1941, he was arrested for refusal to leave Moscow to evacuation, wrongly interpreted as his desire to stay in German occupation; in 1942–1946, stayed for enforced treatment in the NKVD mental hospital in Kazan (actually working as a medical orderly). Worked in the SAI since 1946, occupying positions from an assistant to senior researcher. Finished his secondary education in 1948. In 1956, got his astronomer's diploma from the Moscow University's Faculty of Mathematics and Mechanics. Died 28.06.2003 in Moscow.

K. was a tireless investigator of variable stars on photographic plates. He actively observed at several telescopes of the SAI. N.E. Kurochkin searched for variable stars using the so-called Harvard positive-negative method. In total, he was able to discover about 400 variable stars. In 1976, the Astronomical Council of the USSR Academy of Sciences awarded K. its medal for discoveries of new astronomical objects. He was a member of author teams of the General Catalogue of Variable Stars, of catalogs of stars suspected of brightness variability.

In 1972, K. was the first to successfully identify the source of space X-rays, Her X-1, with the variable star HZ Herculis and to demonstrate the periodic character of the star's brightness variations. Later on, he continued to pay much attention to studies of variable stars identified with X-ray sources. A series of papers by K. was devoted to searches of variable stars in wide surroundings of globular star clusters in order to estimate the fraction of stars born in globular clusters among RR Lyrae variables of the galactic field.

K. was a pioneer in applying computers to reductions of variable-star observations, compiled a computer program permitting to search for period of an eclipsing variable star on the base of a table of its brightness minima.

KURT Vladimir Gdalevich



Born 06.01.1933 in Moscow. He studied at the Astron. Dep. of Mech. Math. Faculty of the MSU from 1950 to 1955. In 1968 he got doctor degree.

From 1955 to 1967 he worked in the SAI, since 1968 in SRI RAS. In 1972 he became a Professor of the MSU. Since 1990 he is the deputy of the chief of the ASC LPI.

He was awarded with the Order of the Red Banner of Labor (1977), State prize of the USSR (1986), and the title of Honored Science Worker (2002) etc.

Vladimir Kurt was born on 6 January 1933. He studied at the Astron. Dep. of Mechanical Mathematical Faculty of the MSU from 1950 to 1955 and graduated from it in 1955 with honors degree. His teacher and scientific supervisor was an outstanding Russian scientist Joseph Shklovsky. From 1955 to 1967 he worked in the SAI first as a senior assistant, then as a researcher. In 1961 he got PhD, and in 1968 got doctor degree. In 1972 he became a Professor of the Dep. of Astroph. of the Physical faculty of the MSU.

In 1968 together with the Department of Radioastronomy he was moved from SAI to the SRI RAS. In 1990 the department of Astrophysics, SRI was moved to Lebedev Physical Institute (LPI) of RAS and was transformed into Astro Space Center (ASC). He became the deputy of the chief of this ASC and the head of the Quantum Astrophysics laboratory. He was the member of the Scientific Councils of LPI, ASC and SAI of the MSU. He is the deputy of the chief editor of Cosmic Research Journal, Presidium of the Academy of Sciences.

In 1975 -1990 V. Kurt was the chief of the Scientific Council of the Moscow Planetarium. The main works by V. Kurt are related to his observations in UV and X-ray range carried out by geophysical rockets, satellites and interplanetary automatic stations He participated in the experiment headed by Joseph Schklovsky “Artificial Sodium Comet”. Kurt discovered the effect of the Sun movement in the interstellar medium and determined its main parameters in the vicinity of the Sun. He also discovered the first soft gamma repeater in Large Magellanic Cloud and identified it with the remnant of the Supernova N 49.

He was PI of X Ray experiment carried out by the first Russian specialized Astronomical spacecraft “Astron” (1983 to 1990). He headed the researches of space gamma bursts (GRB) performed by Prognoz, Venera, Mars craft. Beginning from 2004 together with V. V. Sokolov and V. N. Komarova he headed the search of optical emission from radiopulsars and isolated neutron stars carried out by 6 m telescope (BTA) of the Special Astronomical Observatory . He was the co-author of academicians J.B. Zeldovitch and R.A. Sunyaev who developed a cosmological idea about recombination of H in early Universe at z=1600.

He was awarded with the Order of the Red Banner of Labor (1977), got State prize of the USSR (1986), and the title of Honored Science Worker (2002). He received Lomonosov prize in 1968 and an honorary S.I.Vavilov medal (1988).

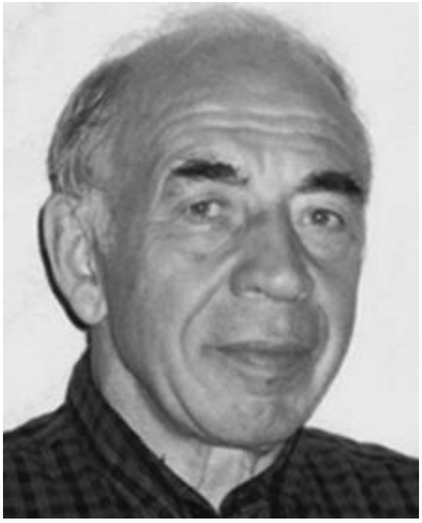
KUTUZOV Sergei Alekseevich

Born 22.04.1935 in Leningrad (now St. Petersburg). In 1959, graduated with distinction in Astronomy from the University of Tartu. In 1959-1962, a post-graduate student at the Institute of Physics and Astronomy of the Academy of Sciences of the USSR. In 1962-1970, worked there as a junior researcher and senior researcher. In 1970-2008, Associate Professor, then Professor of the Departments of Automation of Complex Systems, Numerical Analysis, Space Technologies and Applied Astrodynamics of the Faculty of Applied Mathematics and Control Processes of the Leningrad (then St. Petersburg) University. From 2000-2015, he was the first Head of the Department of STAA. In 1965, defended his PhD thesis, and in 1991 defended his Dr. Sci. thesis "Methods for constructing models of mass distribution in galaxies". Member of IAU (1970-2015), founding member of the EAO (1992-2015), Honorary Worker of the Higher Professional Education of the Russian Federation (2009).

S.A. Kutuzov's prime area of research is the development of methods for building dynamical models of galaxies. Published more than 90 articles and textbooks. By 1960 (with G.G. Kuzmin), developed the model of the galactic mass distribution with a gravitational potential allowing for three integrals of motion. Introducing an "oblateness of equidensites" variable, he proposed a new class of spheroidal models (1965) and found (with G. G. Kuzmin) a solution to the integral equation of mass distribution (1966). To estimate the parameters of the model, he proposed an interval method (1988). Constructed (with V. O. Sergeev) the model of the galaxy M31, solving the problem through regularization (1976). Found (with K. F. Ogorodnikov) the distribution of stellar population in the Solar neighborhood based on the velocity dispersion (1983). Developed (with L.P. Osipkov) the method of separate assignments of equipotentials and the law of potential (1980, 1981) and revealed the role of equidensite assignments in the model (1986). Their model of the Galaxy (1990) was used in the study of Galactic orbits of open star clusters (with K.A. Barkhatova). The orbits of globular clusters (1996) and high-velocity stars (1997) were also studied. Proposed a new triaxial model of the mass distribution in a galaxy with fourth-order equipotentials (1998). Constructed a 3D model of the gravitational field of spiral arms (2001). Revealed (with N. V. Raspopova) the dependence of properties of orbits on the relief of the field of forces in various models (2009). In the framework of biaxial models, he was able to close and numerically solve the system of hydrodynamic equations of stellar dynamics (2012). Proposed (with M. A. Mardanova) a superposition method for constructing parametric models of the luminosity distribution in galaxies (2012).

S.A. Kutuzov delivered lectures on general courses "Computers and programming languages" and "Physics. Oscillations and waves", as well as on specialized courses "Methods of invariant immersion in Applied Mathematics", "Problems of computer calculations", "Problems of simulating cosmic systems on computers". In addition, he delivered lectures on the course "Astronomy" and on its basis wrote the textbook "Mathematical Description of Astronomical Systems" (2004). Under his supervision, three PhD theses were defended.

KUTUZOV Sergey Mikhailovich



Born 01.05.1941 in the Kostroma region. Graduated from the Moscow Institute of Physics and Technology with a degree in radio physics engineering (1964). After graduation, he began working at the Pushchino Radio Astronomy Observatory (PRAO, now a branch of the Lebedev Physical Institute of RAS). From 1964 to 2015, he worked in various positions – from engineer to head of the laboratory. Candidate of Technical Sciences (1982).

The main activities were the development, design, and creation of meter-range radio telescopes. Author of more than 50 publications.

In 1965-1969, he took an active part in the development and creation of two antennas for solar wind research – near Staritsa, Tver region, and Pereyaslavl-Zalessky, Yaroslavl region. The speed of the solar wind, including at high solar latitudes, was measured for the first time from simultaneous observations of interplanetary scintillations of radio sources on these antennas and on the East-West arm of the Wide-band Cross-type antenna (DKR-1000).

In 1969-1974, he actively participated in the development, design, and construction of one of the world's largest radio telescopes in the meter range – the Large Phased Array antenna (BSA) with a geometric area of about 70 thousand square meters with a multi-beam pattern (operating frequency – 102.5 MHz).

In the 1980s and 1990s, under his direct supervision, work was carried out on the significant modernization of the meter-range radio telescopes of the Pushchino Radio Astronomy Observatory. So, a tracking system was created on the E-W DKR-1000 antenna, which allowed to increase the observation time of the studied objects by more than 15 times. The modernization of the BSA radio telescope consisted of rebuilding the antenna from the frequency of 102.5 MHz, which was presented to commercial radio stations, to the frequency of 111 MHz. In addition, a second beam-forming system was created at the BSA, which allowed simultaneous observations on two independent scientific programs to be carried out on this radio telescope.

Later, S. M. Kutuzov was engaged in the development of principles for the construction of new meter-range radio astronomy systems, including antennas with a wide field of view.

Awarded the medal "In Memory of the 850th Anniversary of Moscow" (1997), awarded with diplomas of the Moscow Region and the Russian Academy of Sciences.

KUZIN Sergey Vadimovich

Born 31.10.1964 in Moscow. In 1987 he graduated from the MSTU (Moscow). Since 1989 he has been constantly working at the LPI (FIAN) starting from the engineer position and to the head of a laboratory.
He has a degree of Doctor of Science in physics and mathematics (2011).

His main scientific activities concern the solar corona physics in the X-ray, EUV, and UV spectral ranges, the spectroscopy of solar corona, and the carrying out of space solar experiments.

In the 1990s, he together with I.A. Zhitnik and A.M. Urnov developed the method of imaging spectroscopy of the Sun in the soft X-ray and extreme ultraviolet (EUV) spectral ranges, which make it possible to provide quantitative density and temperature diagnostics of various structures in the solar corona. The method is based on the registration of the Sun's images in space with high spatial, spectral, and temporal resolutions. This method has been successfully applied in space during the CORONAS solar program in 1994-2009.

He was the leader of the RES-K science experiment onboard CORONAS-I solar space observatory (1994), the SPIRIT experiment onboard CORONAS-F spacecraft (2001-2005), and the TESIS experiment onboard CORONAS-Foton observatory (2009). He was also a member of the Hi-C rocket mission team (2012).

In addition to space researches of the Sun, he is involved in ground-based scientific programs, including spectral and imaging observations of the Sun during total solar eclipses. His interests also include the development of new methods to register space debris using space-based instruments onboard spacecraft.

He is awarded state and international prizes: the Russian Federation Government Awards in Science and Technology (2009) and the Joint Award of the Russian and Polish Academies of Sciences (2010).

KUZMIN Arkady Dmitrievich

Born 27.01.1923 in Moscow. World War II veteran. In 1950 he graduated from the Moscow Power Engineering Institute, in 1954 – graduate school at the same Institute. From 1954 to 2009 he constantly worked at the Lebedev Physical Institute (LPI) in various positions: from chief of the group to the head of the LPI Radio Astronomy Station (1972 -1988), from 1988 to 2009 – the Chief Researcher. Doctor of Physics and Mathematics (1965). He was deputy chief of Scientific Council on Astronomy of Russian Academy of Sciences, member of IAU and of a number of scientific councils. Died 31.05.2009 in Moscow.

He has published over 200 scientific articles and 4 monographs, 3 of which have been published in USA, too.

During 55 years of his work at LPI, A.Kuzmin had taken direct and very active part in the formation and development of radio astronomical research at the Institute. The main points of his scientific activity include the radio hardware developments, active participation in construction of the LPI Crimean radio astronomical stations and in creation of the LPI radiotelescope RT-22, Wideband Cross-type radio telescope (DKR-1000) and Large Phased Array antenna (BSA) in Pushchino, fruitful scientific researches of cosmic gas nebulae and radio galaxies, planets and pulsars, applied and defense researches.

He developed a technique for radio astronomical measurements of the radiation flux of space objects, developed a new method of antenna measurements, which provided the alignment of the LPI RT-22 radio telescope, as well as other antennas for radio astronomy, radar and space research. By the end of 1950s A.D. Kuzmin developed a radio astronomy technique for measuring the coordinates of the first domestic space vehicles heading to the Moon. In 1957, together with V.A. Udaltsov, he first measured the polarization of the radio emission from the Crab Nebula, which confirmed the synchrotron nature of the radio emission from this supernova remnant. He proposed a method and performed the necessary measurements at CalTech radio interferometer, which help to choose from two alternatives models of Venus's atmosphere the correct (greenhouse) model and correctly estimate the temperature and pressure on the surface of this planet. He also obtained evidence of the existence of an ice cover on Jupiter's moon Callisto. Since 1972, A.D. Kuzmin has been actively involved in the study of pulsars. Among the significant results he obtained are the establishment of the secular evolution of the orientation of the magnetic axis of pulsars, the detection of pulsed radio emission from the Geminga X-ray pulsar, the study of giant radio pulses of the pulsar in the Crab Nebula (in cooperation with colleagues from the Jodrell Bank Observatory, England). He was among those who proposed the maintenance of the pulsar timescale, using pulsars as natural timekeepers.

For more than 20 years he was a professor at the Moscow Institute of Physics and Technology, having prepared 5 candidates of sciences during this time.

A.D. Kuzmin was a veteran of the Second World War, Honored Scientist of the Russian Federation and Honorary Citizen of Pushchino town, Moscow Region. He was awarded the Order of the Red Star and the Patriotic War, as well as the medals For Victory over Germany, For the Liberation of Warsaw, For the Capture of Berlin and For the Victory over Japan.

KUZMIN Vadim Alekseevich

Born 16.04.1937 in Moscow. In 1961 graduated from the Physics Department of Moscow State University. In 1964 graduated from the P.N. Lebedev Physical Institute and defended Ph.D. thesis under the guidance of G.T. Zatsepin. From 1964 to 1971 a junior researcher at the Lebedev Institute. Since 1971 he worked in the Department of Theoretical Physics at the Institute for Nuclear Research. Corresponding Member of the Russian Academy of Sciences since 2000. Awarded the Order of the Badge of Honor (1978), laureate of the Friedmann, Markov, Pomeranchuk prizes. Died 17.09.2015 in Moscow.

Main scientific works are dedicated to astrophysics, early universe cosmology and applications of particle physics to these brunches of science. The famous Greisen-Zatsepin-Kuzmin effect, predicted by them after the discovery of relic cosmic microwave background, is associated with the name of Vadim Alekseevich. As a consequence, the sources of ultrahigh cosmic rays should be located at distances less than 100 Mpc from us. This discovery initiated the search for sources of cosmic rays and opened the door for charged particle astronomy. Theoretical and experimental studies of the GZK effect determined the direction of development of the physics of ultrahigh-energy cosmic rays for decades. By now, GZK suppression in the cosmic ray spectrum has been firmly established by specialized observatories. Vadim Alekseevich made a significant contribution to neutrino astrophysics. In 1965, V.A.Kuzmin proposed the gallium-germanium radiochemical method, which made it possible to register an almost complete flux of solar neutrinos. The idea was realized twenty-five years later in the underground SAGE experiments at the Baksan Neutron Laboratory of the INR RAS and GALLEX at the Gran Sasso National Laboratory. The physical model proposed by Kuzmin for the formation of the baryon asymmetry of the Universe in CP-noninvariant decays of heavy particles at the nonequilibrium stage of cosmological expansion, together with the works of A.D. Sakharov, served as the foundation for all modern theories and models of BAU generation. At the same time, in 1970, Vadim Alekseevich pointed out that the necessary violation of the baryon number can be observed as neutron-antineutron oscillations, developed the theory and put forward a proposal to conduct an experiment to search for this phenomenon. Such experiments are being carried out today and are planned in a number of laboratories around the world. In recent years, V.A. Kuzmin worked on the mysteries of dark energy and dark matter in the Universe. He raised a whole generation of students, many of whom became world-famous scientists.

KUZNETSOV Eduard Dmitrievich

Born 03.11.1964 in Zyryanovka, Sverdlovsk region. Graduated from Ural State University in Sverdlovsk (1989) (now – UrFU, Ekaterinburg). After completing postgraduate courses at Leningrad State University (now – St. Petersburg State University), he worked at Ural State University (UrFU) in various positions from a research assistant to a head of department (since 1999). Doctor of Phys. Math. Sciences (2011), Associate Prof. (1997). IAU member (2001), member of various scientific councils and societies.

Research interests: celestial mechanics, construction of theories of celestial bodies' motion, the study of the orbital evolution of planetary systems and Earth artificial satellites. Author of more than two hundred scientific papers.

In the 1990s E.D. Kuznetsov, in collaboration with K.V. Kholshevnikov, developed an analytical theory of a geostationary satellite motion in spherical coordinates. In the 2000s important results were obtained to study the stochastic properties of the motion of high-orbiting space objects. Determined the conditions for the exit of geosynchronous objects from libration resonance under the action of light pressure taking into account the dissipative force caused by the Poynting – Robertson effect.

In 2005–2010, he substantiated a mechanism for forming stochastic trajectories for objects in highly elliptical and medium orbits. Due to secular perturbations of the semi-major axis caused by the influence of the Poynting – Robertson effect objects pass through the regions of high-order resonances. In the resonance zone, the modulus of secular perturbations of the semi-major axis decreases. The duration of passage through the resonance depends significantly on the initial conditions, which leads to the formation of weakly stochastic trajectories.

Since 2000, in collaboration with K.V. Kholshevnikov, developed a numerical-analytical solution of the two-planetary problem. The Sun – Jupiter – Saturn system orbital evolution was investigated in the cosmogonic time interval of 10 billion years. Developed and applied a simple and universal method for describing resonance properties to known extrasolar planetary systems, using analytical estimates of the resonance values of the semi-major axes and the resonance zones' width. The method makes it possible to classify and describe the resonance properties of planetary systems depending on the values of the planets' masses, taking into account that in the overwhelming majority of cases only the lower boundaries of the possible values of the masses of the planets are known.

E. D. Kuznetsov actively works with young scientists, participates in the organization of the annual Russia-wide student astronomical conferences "Physics of Space", being Chairman of the organizing committee from 2017.

E. D. Kuznetsov is the co-author of the Astronomy calendar published by the Kourovka Astronomical Observatory of UrFU since 2001 aimed at filling in a gap in astronomical education.

E. D. Kuznetsov was awarded the Certificate of Honor of the Ministry of Education and Science of the Russian Federation (2010), the honorary title "Honorary Worker of Higher Professional Education of the Russian Federation" (2014).

KUZNETSOV Vladimir Dmitrievich

Born 23.09.1954 in Kuibyshev (now Samara). In 1978, graduated from the Moscow Physical and Technical Institute (MFTI). In 1981, completed post-graduate studies in the Department of Problems of Physics and Astrophysics of MFTI. Since 1981, has been working at the Pushkov Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation of the Russian Academy of Sciences. Since 2004 has been Director of the Institute. Dr. Sci. in Physics and Mathematics (1999), member of several international organizations (IAU, IAA, EAS, SCOSTEP) and a number of scientific councils, Editor in Chief of "Geomagnetism and Aeronomy".

The main scientific interests of V.D.Kuznetsov lay in the field of the physics of the Sun and space plasma. He is the author of more than 200 scientific publications and editor of several books.

In the 1970s and 1980s under the leadership of S.I.Syrovatsky, V.D.Kuznetsov calculated the observed manifestations of pre-flare current layers on the Sun in the radio wavelength range and formulated the requirements to observations. This initiated observations of the Sun with the RATAN-600 radio telescope, which allowed a detailed study of the structure of inter-spot radio sources.

In the 1980s, V.D.Kuznetsov and V.S.Ptuskin studied the large-scale Rayleigh-Taylor dynamics of the multi-component interstellar medium, in which galactic cosmic rays play an important part. The difference was revealed between the diffusion-convection model of cosmic-ray propagation and the conventional Parker dynamics described in many books on space electrodynamics.

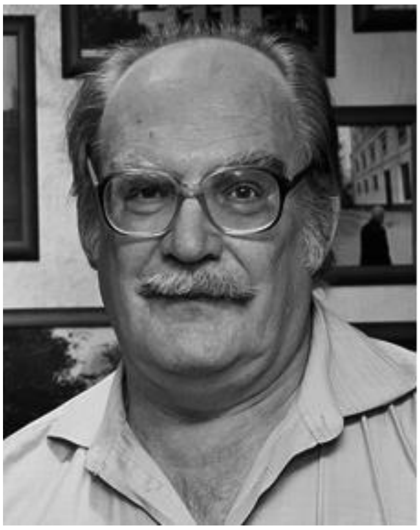
V.D.Kuznetsov separately and in collaboration with other colleagues simulated a number of phenomena in the solar atmosphere observed by astronomical methods, such as the fragmentation of the magnetic field into force tubes. He and his co-authors constructed a model of the eruptive behavior of twisted magnetic tubes; proposed a mechanism of wave heating of the solar corona due to the instability of collisionless plasma waves propagating against the heat flow; studied the fast magnetic reconnection mode for explosive energy release in solar flares; investigated the Kelvin-Helmholtz instability of the heliopause for the temperature-anisotropic plasma.

Within the frameworks of the CORONAS-F space mission (2001-2005), V.D.Kuznetsov and co-authors observed global oscillations of the Sun and determined their amplitude spectrum, as well as the abundances of minor chemical elements in the solar corona, and studied active phenomena in the Sun and their manifestations in near-Earth space. V.D Kuznetsov as the head of the CORONAS-F research team was awarded the RF Government Prize in the field of science and technology (2008) and the joint Prize of the Russian and Polish Academies of Science (2010).

V.D.Kuznetsov is the author and one of the Principal Investigators of the Interhelioprobe space project aimed at the study of the Sun and the inner heliosphere. He is also heading the work on developing the Solar Sail Project, which is intended for the study of the Sun.

V.D.Kuznetsov is the holder of the highest award of the Russian Space Agency – the Tsiolkovsky sign.

LAMZIN Sergei Anatolievich



Born 27.02.1952 in Volgograd. From 1970 to 1976, a student at the Astronomy Department of the Physics Faculty of M. V. Lomonosov Moscow State University. From 1976 to 1979, a PhD student at the same department. He worked as an engineer and then as a graduate teaching assistant at Lenin Moscow State Pedagogical Institute from 1979 to 1986. Starting from 1986, he worked at Sternberg Astronomical Institute of M. V. Lomonosov Moscow State University as an engineer, scientific researcher, and a scientific vice-director (2005-2016).

A member of Commission G3 “Stellar Evolution” of the International Astronomical Union.

S.A. Lamzin’s centre on the investigation of the origin of activity of T Tauri stars, i.e. low mass pre-main-sequence stars. He defended his Ph.D. thesis “Stars with predominant liberation of gravitation energy” in 1986 and Doctor of Science thesis “Interpretation of observed activity of classical T Tauri stars in the frame of magnetospheric accretion model” in 2005.

S.A. Lamzin was the first who calculated a spectrum of radiation of an accretion shock that arises at an accretion of a protoplanetary disk’s matter onto young stars with a strong magnetic field, which opens the possibility for an explanation of observed spectra of these objects in optical, UV and X-ray bands. He also investigated how the activity of classical T Tauri stars in binary systems depends on the phase of the orbital period. S.A. Lamzin participates in teaching and popularization of astronomy including reading lectures and writing scientific-popular papers. In 2009, under his supervision, Sternberg Astronomical Institute arranged night sky observations event for public visited by more than 15 thousand people. Published more than 60 papers in peer-reviewed journals. Supervision of 3 PhD theses.

LARIONOV Mikhail Grigorievich

Born 21.04.1941 in Moscow. In 1964, he graduated from the astronomical Department of Moscow state University (MSU). After graduating he worked at the State astronomical Institute. P. K. Sternberg. (Sternberg astronomical Institute) From 1966 to 1969 – training in postgraduate study of physical faculty of (MSU). After finishing graduate school worked constantly in the Sternberg astronomical Institute in various positions from hands. group to the head. lab. In 1975 he defended his thesis on "Discrete radio sources and background radiation". In 1998 he defended his doctoral thesis on the topic: "Search radio sources in the centimeter wavelength range. Statistical research". Since 2001 working in the Astro Space Center of the. P. N. Lebedev Physical Institute of the Acad. Of Sci. (the ASC of the LPI) as the lead researcher. From 2007 to 2012 – Deputy Director of the ASC of the LPI. Since 2012 he is chief scientific officer of ASC of the LPI.

Main scientific works belong to the field of astrophysics, experimental radio astronomy and cosmology, author of about two hundred scientific papers.

Since 1966 oversaw the development of the equipment and carrying out search sky survey at the radio telescope RT-22 of Crimean astrophysical Observatory and later at the RATAN-600 of the Special astrophysical observatory. The result was the promulgation in 1989, the World's largest catalog of radio sources and conducting statistical studies of various populations of objects in the list. We have investigated the distribution of sources over the celestial sphere and detected angular fluctuations of this distribution on the scale of first Doppler peak in the era of the formation of structures in the Universe. Based on the obtained data of the conducted construction of a model of the Friedman-Lemaitre Universe with a positive cosmological constant.

In parallel with experimental research in the field of radio astronomy dealt with the construction of a model of the Universe considering the complex data obtained in recent decades by the physical characteristics of components of the matter of the Metagalaxy.

He suggested a new interpretation of the characteristics of physical vacuum and "dark energy" on the basis of them as a set of virtual dynamic elements of space-time (EST). Was derived parameters EST via 5 microscopic and macroscopic world of constant, allowing their use to obtain all the macroscopic parameters of our Universe and its dynamic characteristics. Under the proposed model of the Universe can explain the reasons for its accelerated expansion, the emergence of the baryon asymmetry, the formation structures in the Universe and connection between the virtual baryon and lepton constituents of matter. The details of this connection led to the understanding of the possible structure of matter Universe in the evolution of its virtual lepton component.

An important element of the proposed concept is the absence of the element of "dark matter", which allows to significantly simplifying the structure of the world order. The proposed paradigm allows for experimental verification based on high-precision astrophysical observations and physical experiences that can and should be held in the future.

Since 2001 takes part in the preparation and conduct of ground-space interferometric experiments with the participation of domestic radio telescopes RT-64 in Kalyazin RT-22 in Pushchino, RT-22 Sri CrAO, RT-70 in Evpatoria. Such experiments are "Radioastron" with a 10-m radio telescope in space and the future space-ground project Millimetron.

In the ASC of the LPI he is engaged in experimental and theoretical studies of active galactic nuclei (AGNs). They proposed the model of a close binary of supermassive black holes as the primary source of energy emission in AGNs due to the dynamic losses of the companions of AGNs when driving in dense accretive environment.

LARIONOV Valery Mikhailovich

Born 17.10.1950 in Bendery (Moldavskaya SSR). In 1972, graduated from Leningrad State University (LSU, now SPbSU) in astronomy. Since 1974, he worked at the Astronomical Observatory of LSU in different positions. Prof. of the Astrophysical Department (since 2016). Head of Laboratory of Observational Astrophysics (1999-2014, and since 2016). In 1998, he defended his Ph.D. thesis "Photometric and polarimetric investigation of X-ray sources A 0535+26 and X Persei in optical and infrared bands". In 2010 he defended D.Sci. thesis "Investigation of properties of blazars from photometric and polarimetric monitoring results" Member of IAU. Died 14.12.2020 in St. Petersburg.

V.M. Larionov's field of research is observational galactic and extragalactic astrophysics. Author of more than 160 scientific papers.

Until the end of the 1990s, the focus of his research was on variable stars including X-ray binary systems and extragalactic supernovae. Since the beginning of the 2000s, his main area of research related to active galactic nuclei, first of all blazars. He designed photometer-polarimeters, which are in active use at AZT-8 (CrAO) and LX-200 (the telescope of the Astronomical Institute of SPbSU in Peterhoff). He developed and worked on regular modifications of software for the treatment of observational data. As a result of many intensive multi-wavelength campaigns in optical and infrared bands, a unique (in duration and frequency of observations) series of observational data were obtained. The analysis of obtained data enabled, in certain cases, the localization of zones of optical flares at distances of about dozens pc from the central black hole. The synchronism of the flares in optical and gamma-ray bands proved similar localization of these events. The polarimetric observations enabled discovering the spiral structure of blazar jets. The obtained data on dynamics of variations of the photometric and polarimetric parameters made it possible to specify the structure of jets and their evolution in detail. V.M. Larionov developed a new method of searching for periodic components in parameters of planar polarization of radiation of blazars, which allowed him, based on long-term observational data, to identify periods of regular rotation against the chaotic variability background.

His series of works "Investigation of activity of galactic nuclei" was awarded the SPbSU Premium for scientific works (with D.F. Morozova and D.A. Blinov) in 2014.

LAVROV Mikhail Ivanovich

Born 01.11.1927 in the village of Panovo, Nurlatsky (since 1963 Zelenodolsky) region of the Tatar ASSR. Graduated from high school with honors. In 1944 he entered the Kazan State University at the Faculty of Physics and Mathematics, specializing in astronomy. Graduated from the university in 1949, entered graduate school. He worked as an assistant at the Department of Astronomy. In 1957 he defended his Ph.D. thesis. Since 1958 – Associate Professor of the Department of Astronomy. Since 1959, at the same time he was the deputy director of the AEO for scientific issues. In 1957, he headed the satellite observation station. Disciple of D.Ya. Martynov. In 1979 M. I. Lavrov defended his doctoral dissertation. He worked as a professor at KSU since 1980. Died 19.09.2002. Buried in the memorial cemetery in the AOE.

Dr. Lavrov’s scientific interests lied in Astrophysics. He studied eclipsing binary stars. Dr. Lavrov built models of the binary systems and calculated their orbit parameters. He was one of the first astrophysicists to apply a spectrophotometer to determine star brightness. He, together with Roksana Bocula and Nadejda Lavrova, obtained the two-color observations of binary stars applying photometry.

Dr. Lavrov developed software to determine the orbit parameters of the eclipsing binary stars by the Russell-Merrill method and to make these parameters more precise by the method of differential corrections. It was the only software mean in the USSR to solve the classic problem of analyzing the curves of the binary stars. Despite being busy with astrophysical observations, since 1957, Mikhail Ivanovich headed the AOE station for visual observation of the satellite.

In the 70s M.I.Lavrov created on a computer "Nairi" a set of programs to solve the problems of determining the parameters of the orbits of eclipsing binary stars by Russell-Merrill and refinement of these parameters by differential corrections (which was the subject of his doctoral dissertation M.I.Lavrova). Later, the program was adapted to IBM computers. The computer programs developed by M.I. Lavrov were the only software products in the USSR for solving the classical problem of analyzing the light curves of binary stars, and were used not only by KSU employees, but also by astronomers of other observatories of the USSR: Kourovskaya (T.S.Polushina), Astrophysical Institute of Uzbekistan (M.M. Zakirov) and others. In mid-60s took part in the economic agreements M.I.Lavrov AEO and hypo to create stellar globe for astronauts.

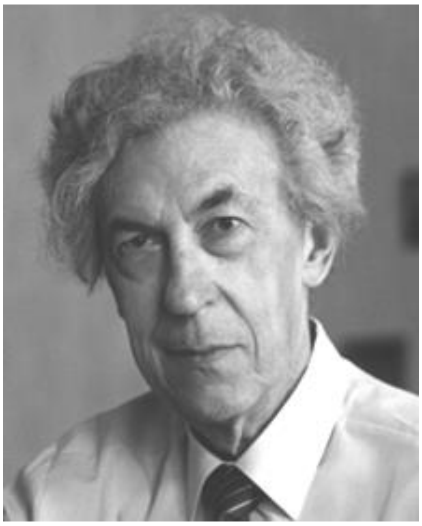
Dr. Lavrov, together with some other researchers, built the bibliographic catalog of eclipsing binary stars (in 6 volumes). He is the author of more than 250 scientific articles. Dr. Lavrov also wrote general astrophysics and spherical astronomy textbooks for students of the astronomical department.

For a long time after the departure of D.Ya. Martynov from Kazan, his collaboration with M.I.Lavrov continued. D.Ya. Martynov regularly sent to Kazan, his observations of double stars with the rotation of the apsidal line for their M.I.Lavrovym analysis.

As one of the private, but important problems in the field of stellar astrophysics, M.I. Lavrov was interested in comparing the theoretical definitions of the stellar disk darkening coefficients to the edge with the darkening parameters that were obtained from high-precision photoelectric observations.

MI Lavrov led the great teaching job at the Department of Astronomy, lectured on general astronomy, "General Astrophysics", "spherical astronomy," "History of Astronomy", supervised projects, and dissertations. Two graduate students of Mikhail Ivanovich defended their candidate dissertations. Asteroid 2009 SW267 MIKHAILLAVROV was named after M.I. Lavrov.

LAVROV Svyatoslav Sergeevich



Born 12.03.1923 in Petrograd; studied at the Leningrad State University Faculty (LSU) of Mathematics and Mechanics (from 1939) and the Leningrad Air Force Academy (from 1941); served in the army (from 1944) and worked in S. P. Korolev's office heading the Measurement Service, the Group of Ballistics and Special Engineering Bureau No.1 (from 1947 to 1966); graduated from the Moscow State University (MSU, 1954); was the MSU Professor at the Mathematics and Mechanics Faculty (1963); headed a department in the Computing Center of the USSR Academy of Sciences (1966), the MSU Department of Program Languages (1970), the LSU Department of Computer Software (1972); was Director of the Institute of Theoretical Astronomy (ITA) of the USSR Academy of Sciences (1977) and Director Advisor of IAA RAS (from 1987 to the end of his life). Died 18.06.2004 in St. Petersburg.

S.S. Lavrov's main research interests were in the field of computer science; computational mathematics; high-level programming systems and languages, and their practical implementation; in mechanics, automatic control of flight dynamics, and ballistics of long-range guided missiles.

He worked in the S.P. Korolev's Engineering Bureau where he was engaged in the research concerning the mechanics of changed mass bodies and ballistic calculations of the rocket movement including the choice of optimal ways to place the spacecraft into orbit, dispersion parameters, flight range control which would take into account for its necessary guaranteed fuel reserves. He took an active part in the Korolev Engineering Bureau's flight tests starting in 1947 from the missiles A-4 to the R-7 intercontinental missile in 1957. S.S. Lavrov's and his collaborators' activities made a great contribution to the launch of the first artificial Earth satellite, exploration of near-earth space and flights of the first Russian cosmonauts. The results of his studies at that period were delivered by him in the form of closed technical reports, and later were partly published in open sources. For example, the monograph "Ballistics of the Long-Range Guided Missiles" was written by R.F. Appazov, S.S. Lavrov, and V.P. Mishin in 1950 and published in the open press in 1966.

Since 1960, S.S. Lavrov began active research in the field of programming. He wrote: "This activity explored some deep strings of my soul; it responded to the inner calling of my whole personality." Translators from several high-level programming languages were developed under his leadership including the first Russian-made translator from the Algol-60 language (1962). He studied a number of fundamental theoretical and practical issues, and published several monographs.

The SPORA project (Software System for Works in Astronomy) created in ITA and IAA RAS under S.S. Lavrov's guidance deserves special attention among other works with his participation, as it further developed his previous studies based on concepts of data basis, declarative descriptions and automatic synthesis of programs. The experience and results obtained while working on the SPORA project were later applied to the ERA (Ephemeris Research in Astronomy) System which has been successfully developed and used for more than 30 years.

S.S. Lavrov is the author of more than 100 scientific papers. Asteroid (2354) Lavrov is named in his honour.

He was Doctor of Technical Sciences (1959), a USSR Academy of Sciences Corresponding Member (1966), was awarded the Lenin Price (1957) and Zander Price (1977), two Orders of Lenin, Order of the October Revolution, of the Red Banner of Labour, and many medals.

LEBEDINSKY Aleksandr Ignatievich

Born 07.01.13 in Geneva (Switzerland). In 1932 he graduated from the Crimea Pedagogical Institute. Completed postgraduate studies at the Dept. of Astrophysics of Leningrad State University (LGU, 1932-35). Worked at the Astr. Obs. of LGU since 1935 (since 1939, Director of Lab. of spectroscopy). Since 1938 he worked at the Dept. of Astrophysics, as an associate professor and since 1943, as a professor. Obtained his Ph.D. in 1937. Doctor of Sci. in 1941 (during the siege of Leningrad). Since 1943, Head of Dept. of Astrophysics in Saratov, where LGU had been evacuated. Moved to Moscow in 1953 to work at the Dept. of Physics of M.V. Lomonosov Moscow State Univ. Died 08.09.1967 in Simeiz (Crimea).

A.I. Lebedinsky's early research deals with convection in atmospheres. He studied regimes of the convective energy transport both by small (transparent to radiation) and by large (non-transparent) elements of convection. While researching turbulent convection, he introduced the concept of anisotropic turbulent viscosity. By investigating the role of magnetic fields in the sunspots, he essentially anticipated some ideas of magnetic fluid dynamics.

In his research of the 1940s (with L.E. Gurevich), he provided a proof for the proposition that the cause of Novae flares was a thermonuclear explosion of a dwarf star (the idea was corroborated later on); however, the explosion initiation was erroneously attributed to gravitational contraction. For his research, A.I. Lebedinsky was awarded the LSU Prize (1946).

A large number of his publications (with L.E. Gurevich) related to problems of planet formation in gas/dust stellar envelopes which was inspired by the well-known cosmogonical hypothesis of O.Yu. Schmidt. A.I. Lebedinsky also investigated physical aspects of the process of star formation in interstellar gas/dust clouds and studied the process of sublimation of dust particles by UV radiation in diffuse nebulae.

From the end of the 1940s up to the beginning of the 1950s, he studied the Aurora Borealis phenomenon. Due to his initiative and leadership, in the workshops of the LSU Department of Mathematics and Mechanics, photographic equipment was manufactured that was designed for automatic, simultaneous, and continuous registration of whole-sky images from zenith to horizon, as well as spectra of Aurora Borealis. The images and spectra were obtained with short time intervals. A.I. Lebedinsky organized testing of the equipment in a few expeditions beyond the Polar circle (to Kola Peninsular and other sites). These expeditions delivered rich scientific data. Later, during the International Geophysical Year (1957-1958) and the International Year of the Quiet Sun (1964-1965), the equipment of this kind was used to monitor Aurora Borealis at many Arctic and Antarctic stations and provided valuable observational material.

A.I. Lebedinsky's research direction changed considerably after his transfer to M.V. Lomonosov Moscow University (1953). He took part in the design of equipment for spectrophotometric studies of planets in several space missions, as well as in the reduction and interpretation of the obtained data.

A.I. Lebedinsky had a tragic death when he was still in his prime.

LEJKIN Grigorij Alexandrovich

Born 06.04.1923. In 1948 he graduated from M.V. Lomonosov Moscow State University (MSU). PhD student of the Sternberg Astronomical Institute (SAI MSU) in 1948-1951. PhD thesis «Investigation of the hypotheses of the solar corona heating» in 1952. In 1952-56 a scientific editor of the Russian journal «Nature». In 1956-1986 worked at the Astronomical Council (currently, the Institute of Astronomy of Russian Acad. Sci., INASAN). Died 03.03.2010 in Moscow.

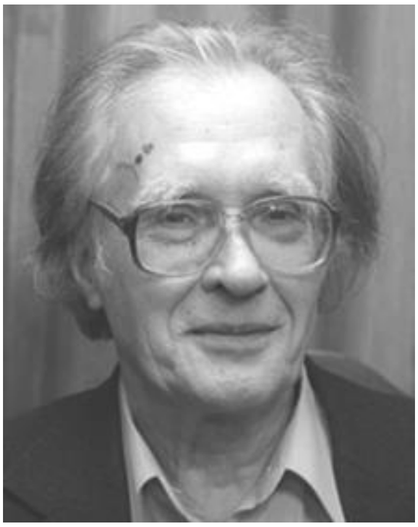
G. A. Lejkin's research interests were in the field of the Sun and solar system investigations. He showed that under certain conditions, solar-like coronas might be developed in stars. In 1956 he became a member of the Commission on inter-planet communications.

G. A. Lejkin did theoretical studies on artificial satellites slow down (deacceleration) and on temperature and density measurements of the upper ionosphere using the satellite measuring probe. He participated in the organization and implementation of the optical observations of the first artificial Earth satellites (AES). He was a member of the team that got a patent for the development of the first cameras for AES observations.

G. A. Lejkin participated in the study of solar system bodies using spacecraft including research on the development, evolution, and origin of impact craters. G. A. Lejkin showed that hydrogen in the lunar soil has a solar origin and proposed a hypothesis on the presence of the significant reservoir of the volatile matter in the remnants of Lunar lava tubes. G. A. Lejkin participated in the publications of the «First surface images of the Moon's hidden side» (1966, 1969) and «First surface images of the Venus» (1979). He put forward a hypothesis about the asteroid rubble pile consisting of numerous pieces of rock coalesced by self-gravitation and surrounded by a common dust-gas atmosphere. G. A. Lejkin published about one hundred scientific papers.

G. A. Lejkin gave a series of lectures in astronomy as a part of the cosmonaut preparation program in 1959.

LEKHT Evgenii Evgenievich



Born 18.12.1939 in Moscow. In 1964 graduated in astronomy from the Physics Faculty of M.V. Lomonosov Moscow State University (MSU). In 1969 completed postgraduate studies at the MSU Physics Faculty. Since then, held different positions at the Sternberg Astronomical Institute of MSU (SAI). Since 1995 was a leading researcher at the Radio Astronomy Department. In 1974 defended his PhD thesis "The study of sources of maser emission at 18 cm with a high spectral resolution". In 1995 defended his doctoral thesis "The study of the variability of the H_2O maser emission associated with star-forming regions".

E.E.Lekht's fields of research are astrophysics, physics of the interstellar medium, and the spectroscopy of cosmic masers. Author of more than 150 scientific articles, co-author of the textbook for students "Practical Radio Astronomy (MSU Press, 2011).

E.E.Lekht is a renowned expert in spectral radio astronomy, experienced observer, and a designer of unique spectrometers for the study of radio spectral lines. Since 1970, in collaboration with M.I.Pashchenko and G.M.Rudnitskij, jointly with French radio astronomers, has been carrying out extensive work on the Large Radio Telescope at Nançay (France) on the study of sources of maser radio emission in hydroxyl molecule lines at a wavelength of 18 cm. The observations reveal strong polarization of OH maser emission, which suggests the presence of magnetic fields. Since 1979, he has been taking part in long-term monitoring of water-vapor maser emission sources at the wavelength of 1.35 cm associated with regions of active star formation and with late-type giant stars on the RT-22 radio telescope in Pushchino. Compiled catalogs of H2O maser emission spectra for a large number of sources for more than 30 years of monitoring. Studied the evolution and structure of stellar envelopes; it was shown that circumstellar envelopes have a complicated hierarchical structure.

With his participation, jointly with R.L.Sorochenko and G.T.Smirnov, successful experiments on searching for low-frequency radio recombination lines of highly-excited atoms in the interstellar medium were carried out on the DKR-1000 radio telescope in Pushchino using instruments designed by E.E.Lekht. In 1988, E.E.Lekht and his coauthors were awarded the State Prize of the USSR for this research.

For a few years, E.E.Lekht had been working at the Institute of Astrophysics, Optics, and Electronics at Tonantzintla (Mexico) maintaining his connection to SAI and contributing significantly to the collaboration between Russian and Mexican astronomers.

E.E.Lekht supervised undergraduate and postgraduate students' research, with supervision of two PhD theses.

LEMAN-BALANOVSKAYA Inna Nikolaevna

Born 29.06.1881 in Pavlovsk near St.-Petersburg. In 1903, graduated from Department of Physics and Mathematics of the Higher Women's Bestuzhev Courses in St.-Petersburg, in 1910 from Goettingen University in Germany. 1903 to 1906: with The Chief Hydrographical Directorate; 1911 to 1913: lectured in Bestuzhev Courses; 1913 to 1937 and 1943 to 1945, with the Main (Pulkovo) astronomical observatory at the positions of Extraordinary Astronomer, Associate Astronomer, Senior Researcher. 1911: Doctor of Philosophy (Goettingen University); 1935: Cand.Sci. (Phys.-Math); Member of Russian Astronomical Society (since 1903), Astronomische Gesellschaft, IAU, and All-Russia Astronomical Union. Married to astronomer I.A.Balanovsky. Died 25.04.1945 of camp fever while in evacuation in Tashkent (Uzbekistan).

Basic works belong to astronomical photometry and photography. Authored about 20 works.

In 1906 – 1911, studied and worked under supervision of Carl Schwarzschild. In 1911-1913, assisted Prof.A.A.Belopolsky and carried out scientific and teaching activities at the Bestuzhev Courses. In 1914 – 1917, assisted her husband in his calculations and photometric studies in Nikolaev Branch of Pulkovo observatory. Processed spectrograms obtained at Pulkovo.

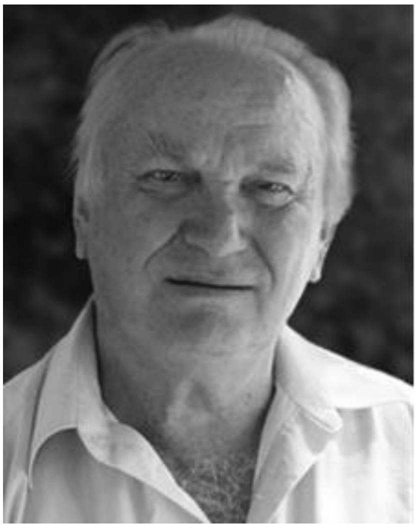
In Pulkovo observatory, took part in processing of photographic images of Kapteyn Selected Areas and other observations. For many years, observed variable stars in selected areas of the sky, studied atmospheric absorption and stellar scintillation. Took short-focus photographic images of nebulae, minor planets, and comets; processed and measured photographs of Saturn's satellites and globular clusters. Obtained important results in stellar spectroscopy and photometry.

In 1936, took part in an expedition for observations of a total solar eclipse.

In 1943-1945, started work on the theory of motion of the Comet Neuymin II. Observed and studied variable stars.

In 1937 – 1942, was imprisoned in the time of Stalin's purges.

LEUSHIN Valery Vladimirovich



Born 31.10.1940 in Undurkhaan, Mongolia. From 1959 to 1964 he was a student of the Rostov State University. From 1965 to 1968 he was a post-graduate student at Crimean Astrophysical Observatory. He defended his Ph.D. thesis on «Quantitative research of Ap stars peculiarities based on the spectral classification» in 1971. From 1969 to 1972 worked as Junior Researcher at the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991). Since 1972, he had been teaching in Rostov State University: Senior Lector (1972-1978), Associate Professor (1978-1990), Professor (1990-2015). In 1989 he defended a Dr. Sci. thesis on «Evolutional changes of the chemical composition of binary stars». Leading Researcher, Head of Moscow Branch osf the SAO RAS from 1995 to 2015. Died 03.07.2015 in Moscow.

V. Leushin is responsible for significant number of fundamental results, many of which quoted actively thus far. Generally, they lie in the field of stellar spectroscopy with anomalous chemical composition and magnetic stars. He is the author of more than 120 scientific publications.

In 1977 he put into practice a spectroscopic parameter of peculiarity which up to now is using widely in the field of peculiar stars' spectroscopy. From 1984 to 1988 V. Leushin had been carrying out pioneer systematic studies of chemical composition peculiarities of massive stars in close binary systems. V. Leushin was the first who noted abnormally high abundance of helium in the atmospheres of such stars. In 1988 he conducted challenging pioneer research (using relatively low resolution detectors) of relative abundance of carbon and nitrogen in these stars and confirmed a lack of C and overabundance of N expected in double CNO cycle.

V. Leushin was a Professor of the Department of Space Physics in RSU (now Southern Federal University) till his last days. «Physics of stellar atmospheres», «Nuclear astrophysics» courses were always associated with the name of V. Leushin. All the graduates of the Department of Stellar physics were his students – it is more than half of a thousand people total, about 50 of them now are working in astrophysics or related spheres of science.

LEVIN Boris Yulievich

Born 26.10.1912. In 1937 he graduated from the Astronomical Department of Faculty of Mechanics and Mathematics of MSU. From 1936 to 1941 he taught astronomy at Moscow Pedagogical Institute named after K. Liebknecht, from 1944 to 1949 he worked at the SAI MSU and from 1945 to 1973 – at the Institute of Physics of the Earth of the Academy of Sciences of the USSR. From 1974 until the end of his life he worked at the Astronomical Council of the USSR Academy of Sciences (now INASAN of the Russian Academy of Sciences). He was a doctor of Physics and Mathematics and professor. Died 10.04.1989 in Moscow.

The main scientific works are devoted to planetary cosmogony and the physics of Solar system bodies. Initially he was mainly working on the physics of meteors and comets. He proposed a formula describing the dependence of comet brightness on its heliocentric distance, which was the impetus for the cometary nucleus ice model development. Since 1945 he was actively involved in the development of O.Yu. Schmidt's cosmogonic theory. He studied the structure, composition and thermal history of the Earth and the Moon based on ideas about their formation by accumulation of a solid component of the protoplanetary cloud. Studying the question of the nature of the Earth's core, he came out as a supporter of the hypothesis that it consists of a metallized substance. He expressed the idea of a significant ejection of solid matter from the giant planet formation region and the important role of this ejection in the evolution of protoplanetary cloud outer part, as well as in the Oort comet cloud formation. B. Yu. Levin showed the existence of an upper limit on the geocentric velocity of meteorites and studied their orbits. He studied the origin of meteorites in the framework of general ideas about the planetary system formation. Based on the analysis of meteor observations, he determined the spatial density of meteoric matter in the vicinity of the Earth's orbit and estimated the meteor danger level for spaceships. A number of Levin's works are related to stellar dynamics. In 1950, together with L.E. Gurevich, he showed the possibility of wide binary system formation by capture during triple encounters in star clusters. Levin is the author of the monograph «The physical theory of meteors and meteoric matter in the Solar System» (1956, German translation in 1961). Since 1974 he was the editor-in-chief of the «Astronomy Letters – A Journal of Astronomy and Space Astrophysics».

B.Y. Levin was awarded the I. Kepler gold medal of the American Association for the Advancement of Science for his contribution to understanding the origin of the Solar system and planets (1971), the F. Leonard medal. of the American Meteorite Society (1984).

LEVITSKAYA Tatiana Iosifovna

B. 25.01.45 in the Kumak mine, Adamovsky district, Orenburg region. In 1968 graduated from Ural State University in Sverdlovsk (now – Ural Federal University, UrFU, Ekaterinburg). From 1970 till present, has been working at the Department of Astronomy and Geodesy of Ural State University in positions from Laboratory Assistant to Associate Professor. In 1973-1977, did postgraduate studies by correspondence at the Main Astronomical Observatory of the USSR Ac. Sci. in Pulkovo. PhD in Phys. Math. Sciences (1982).

T.I. Levitskaya's research interests centre on the positional observations of major planets and their satellites, asteroids, comets, and geostationary satellites for their exact positions identification, as well as on the studies of visual binaries in the centers of open star clusters. Of particular interest is her research on the history and methodology of astronomical and geodesic science in Russia and Ural. She has published more than 100 papers, 4 educational and 7 methodological manuals.

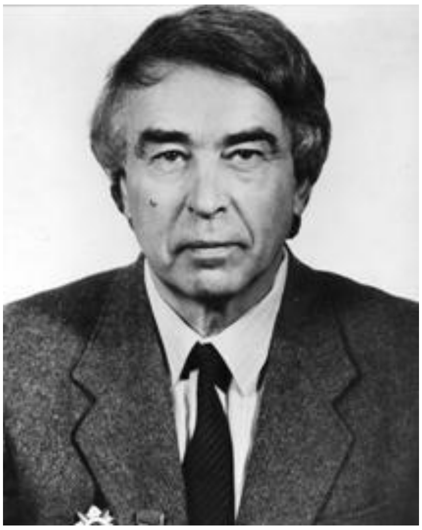
T.I. Levitskaya has developed more than 14 lecture courses and specialized courses on the geodesic and astronomical fundamentals in professional activity, laboratory workshop programs, Bachelor's programs, and Master's research programs.

For her great contribution to the training of specialists, she was awarded the "Certificate of Honor of the Ministry of Education of the Russian Federation" (2000).

In 2002 by the decision of the Board of the Federal Service for Geodesy and Cartography of Russia, she was awarded the Badge "Excellence in Geodesy and Cartography".

For participation in preparation and carrying out observations of the Halley comet, she was awarded the Silver Medal of the Exhibition of Economic Achievements of the USSR and the "Certificate of Honor of the Sverdlovsk Branch of USSR Astronomy and Geodesy Society". In 2019, for significant achievements in the field of education and many years of successful work, the Ministry of Science and Higher Education of the Russian Federation awarded T.I. Levitskaya the title "Honorary Worker of Education of the Russian Federation".

LIDOV Mikhail L'vovich



Born 04.10.1926 in Cherkassy of Kiev region. Graduated from M.V. Lomonosov Moscow State University (MSU) in 1954. From 1955, worked at the Interdepartmental Commission for Coordination and Control of scientific and theoretical works in the field of organization and implementation of interplanetary communication at the Astronomical Council of the Academy of Sciences USSR. From 1957, worked at the Department of Applied Mathematics of Steklov Mathematical Institute, Acad. of Sci. of the USSR (now – Keldysh Institute of Applied Mathematics RAS) in various positions: from junior to chief scientific officer. Dr. Phys.-Math. Sci. (1965), Professor of the Department of Theoretical Mechanics of MSU (1966), a member of the National Committee on Theoretical and Applied Mechanics, and a member of Editorial Board of magazines "Space Research" and "Astronomy Letters". Died 30.12.1993 in Moscow.

M.L. Lidov's areas of research relate to celestial mechanics and space flight dynamics. The author of over 120 scientific papers in national and international journals, a monograph and textbook.

In 1954, he carried out a study of a special class of solutions of gas dynamics equations, which allowed him to obtain a fairly complete picture of the temperature regime of artificial Earth satellite. At the end of the 1950s, he conducted pioneering research on the characterization of the Earth's upper atmosphere from observations of the motion of its satellites and showed the effect of diurnal variations in atmospheric density.

In the following years, he was one of the leaders in research related to the problems of the ballistic design and management of spacecraft flight (SC). His work on the analysis of the flight trajectory to the Moon, as well as developed SC control schemes were directly used in solving many problems of the national lunar program (orbiting the Moon and photographing its reverse side, a soft landing on the Moon, delivering the rover to its surface, launching the first artificial satellite of the Moon, and transfering the lunar soil samples to the Earth). In 1960, M.L. Lidov was awarded the Lenin Prize for substantial research done under this program.

In 1961, he founded a new direction in celestial mechanics – the theory of orbit evolution. This led, in particular, to the discovery of previously unknown effect – a satellite falling on the surface of a planet for a finite time under the influence of gravitational perturbations from a distant celestial body with a sufficiently high inclination of the satellite orbit to the plane of its movement and any values of the rest initial parameters. This was introduced in the world literature on celestial mechanics as the Lidov-Kozai mechanism or effect. This resonance is manifested in different satellite, planetary and stellar systems.

Since the late 1960s, together with his students, M.L. Lidov developed a number of numerical-analytical methods for calculating the motion of artificial celestial bodies. These methods were introduced and widely used in the design of the orbits of satellites "Elektron","Pro-prognos", and communications satellites in geostationary and high-apogee orbits. Based on his work on the detection and practical construction of special classes of trajectories in classical restricted three-body problem, M.L. Lidov offered the variant of a stable three-dimensional periodic orbit for space radio interferometer. Under his supervision, eight PhD and three doctoral dissertations were defended.

M.L. Lidov is the veteran of World War II. Recipient of state awards: The Order of the Red Banner of Labor (1970), Order of the Patriotic War II degree (1985). The International Astronomical Union named the asteroid of the Main belt (4236) discovered in 1979 by N.S. Chernykh (Crimean Astrophysical Observatory) Lidov in his honor.

LINDE Andrei Dmitrievich

Born 02.03.1948 in Moscow. Graduated from the Physics Department of M.V. Lomonosov Moscow State University (1971). Completed his PhD at the Lebedev Physical Institute of the Russian Academy of Sciences in Moscow. In 1989, he joined the Theory Division at CERN, Switzerland. In 1990 he became Professor of Physics at Stanford University, USA. Habilitation (1975), Professor of Phys.–Math. Sciences (1983).

In 1972-1974, A.D. Linde, together with David Kirzhnits, developed the theory of cosmological phase transitions, which was the topic of his PhD. He is one of the authors of the inflationary universe scenario, which is gradually becoming the standard paradigm of modern cosmology, replacing previous versions of the Big Bang theory. In 1974, he pointed out that the energy density of a scalar field plays the role of the vacuum energy density (cosmological constant) in the Einstein equations. In 1976-1978, he demonstrated that the energy released during the cosmological phase transitions may be sufficient to heat up the universe. These observations became the basic ingredients of the inflationary scenario proposed by Alan Guth in 1981. In 1982 Andrei Linde suggested the new inflationary universe scenario, which resolved the problems of the original model proposed by Guth, while preserving most of its important features. In 1983, he proposed the chaotic inflationary universe scenario, which became the prototype for the new generation of inflationary models. Published in 1986, his theory of an eternal chaotic inflation suggests that our universe is one of many inflationary universes that sprout from an eternal cosmic tree. In this scenario, the universe becomes the multiverse consisting of infinitely many universes of all possible types. A.D. Linde is one of the authors of the first mechanism of vacuum stabilization in string theory. It serves as a basis for many recent attempts to construct realistic models of elementary particle physics, inflationary cosmology, the theory of dark energy, and the theory of inflationary multiverse based on the string theory. At present, he continues his work on inflation, creation of matter in the universe, the theory of the inflationary multiverse, and cosmological consequences of supergravity and string theory.

A.D. Linde is the author of more than 300 research papers and two books on particle physics and cosmology. He is a member of the National Academy of Sciences of the USA and of the American Academy of Arts and Sciences. In 1978, he was awarded the Lomonosov Prize of the Academy of Sciences of the USSR for the theory of cosmological phase transitions. Among his other awards are the Oskar Klein Medal (2001), the Dirac Medal (2002), the Peter Gruber Cosmology Prize (2004), the Robinson Prize for Cosmology (2005), the Medal of the Institute of Astrophysics in Paris (2006), the Fundamental Physics Prize (2012), the Kavli Prize in Astrophysics (2014), and the Gamow Prize (2018).

LIPOVETSKIJ Valentin Alexandrovich

Born 10.06.1945. In 1968 graduated from Kyiv State University. From 1968 to 1970 had been working at Astronomical Observatory of Kyiv State University. From 1970 to 1996 was working at the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) at different positions: from Junior Researcher to Head of Laboratory. Defended his Ph.D. thesis on “The First Byurakan Spectral Sky Survey” in 1986. He was a member of International Astronomical Union. Died 22.09.1996 in Zelenchuk.

The main areas of research are related to extragalactic astronomy: objective prism skysurveys; studies of QSOs and AGN, galaxies with active star formation, heavy element abundances in galaxies; determination of primary helium abundance. He is a (co)-author of about 250 scientific papers which are widely recognized in astronomical society.

From 1969 to 1985, under the supervision of B. Markarian, V.A. Lipovetskii actively participated in the survey of galaxies with UV excess. Slitless spectral survey was carrying out on the Byurakan 1-m Schmidt telescope equipped with objective prisms. As a result, the first catalog of 1500 galaxies with UV excess (known today as Markarian galaxies) was created. As a continuation, in collaboration with Markarian, Stepanian and Erastova he conducted much more deeper The Second Byurakan Survey. V.A. Lipovetskii with colleagues did a formidable slit spectroscopy research of selected candidates to classify them and determine their properties. The objects from these two surveys formed a “golden capital” for many researches in several fields of extragalactic and stellar astronomy.

V.A. Lipovetskii was enthusiastically using brand new observational capabilities associated with the progress of CCDs and computer hardware. He actively implemented new spectroscopic observation techniques on 6-m telescope. From the middle of 1990s he initiated a systematic search of galaxies with active star formation using scanned spectral plates database of Hamburg Quasar Survey. Slit spectroscopy of selected candidates on 6-m and other telescopes led to the creation of the largest sample of 500 galaxies of such type (Hamburg-SAO Survey). He also was the one of initiators an a co-author of the fundamentally new international survey named KISS (Kitt Peak Observatory), where prism spectra were registered using large-area CCDs.

In 1990s, with Yu. Izotov (Kiyv) and T.X. Thuan (USA) and SAO collaborators, he conducted deeper studies of blue compact dwarf galaxies found in course of mentioned above surveys. He was studying their heavy element abundances and gas content. He also was using the most metal-poor galaxies to estimate the primary helium abundance. With his active participation a unique galaxy with the record low-metallicity (Z ~0.02 Zo) – an analog of Early Universe galaxies – was discovered and studied. One of the major tasks of this research was understanding the relattion of galaxy evolution and its local and global surroundings.

V.L. Lipovetskii established a new major direction of extragalactic research in SAO and Russia which, for 20 year after his passing, is actively developed by his colleagues and followers.

LIPSKY Yuri Naumovich

Born 22.11.1909 in the m. Dubrovno, Goretsky district (now – Vitebsk region. Belarus). In 1933, after graduating from the workers' faculty, he entered the physics department of Moscow State University. In 1938 Yu.N. Lipsky was admitted to the postgraduate study of the Faculty of Physics. In 1941 he was appointed head of Kuchin Astrophysical Observatory of SAI. In 1948 he defended the candidate dissertation. In 1953 Yu.N. Lipsky was appointed head of Laboratory of photometry and spectroscopy of SAI. Doctor Phys.-Math. Sciences (1963). Since 1964 he was head of the newly formed Department of Physics of the Moon and Planets of the SAI. Died 01.24.1978 in Moscow.

The main scientific works relate to the study of the Moon, planets and the solar corona using new methods of planetary astrophysics, as well as pioneering work in the field of studying the Moon by space methods. Yu.N. Lipsky conducted teaching work, giving a course in theoretical physics for astronomers. Yu.N. Lipsky and his co-workers carried out studies of the spectro-polarization features of the daytime and twilight sky under the program of the International Geophysical Year (1958). At this time, Yu.N. Lipsky developed new methods of spectrophotometric research, including a method based on polarization-spectrophotometric measurements. Under his supervision, a graduate student M.M. Pospergelis designed an electronic polarimeter that made it possible to measure the total Stokes vectors. As a result of these studies, the elliptical polarization of many lunar features and the cloud cover of Jupiter and Saturn were studied for the first time. With the beginning of the space era, Yu.N. Lipsky took an active part in lunar exploration using spacecraft. At the suggestion of the Chief Designer S.P. Korolev he was entrusted with processing the first results of surveying the far side of the Moon (1959). Yu.N. Lipsky developed and applied an original method of analyzing the first space images of the Moon, thanks to which it was possible to identify many features of the lunar relief. He supervised the creation of the first map of the far side of the Moon and the world's first globe of the Moon, as well as the publication of the Atlas of the far side of the Moon (1st part, 1960). Since the mid-60s, he headed complex work on the study of space images of the Moon and global mapping of the surface of the lunar sphere based on these data. Based on the results of the studies carried out in 1967 and 1975, the 2nd and 3rd parts of the Atlas of the Far Side of the Moon, selenodetic catalogs covering the visible and far sides of the Moon were published, and several editions of lunar maps of the entire surface of the Moon were prepared. Together with V.V. Shevchenko, he carried out a photometric experiment directly on the lunar surface during the operation of the Lunokhod-2 rover spacecraft (1972). Under the leadership of Yu.N. Lipsky a comparative statistical analysis of the distribution of crater forms on the Moon, Mercury and Mars was carried out and published the "Catalog of craters of Mercury and the Moon" and "Catalog of craters of Mars, Mercury and the Moon" (1977). Yu.N. Lipsky published more than 100 scientific works. He prepared 6 candidates of science who continued and developed the research he had begun in the field of the Moon and planets. By the decision of the International Astronomical Union, the crater in the center of the Moon's far side was named after Lipsky.

From Feb. 1942 to Sept. 1945 he was in the active army, awarded with military orders and medals. He was a veteran of The Great Patriotic War.

LIPUNOV Vladimir Mikhailovich

Born in 1952 in Raichikhinsk, Amur Region. Student of Moscow State University named after M.V. Lomonosov from 1970 to 1976. Post-graduate student of the Department of Astrophysics and Stellar Astronomy of Moscow State University from 1979 to 1982. He defended his candidate thesis in 1982 on the topic "Accretion on Magnetic Compact Stars". Assistant of the Department of Astrophysics of Moscow State University since 1982. Professor of the same department since 1992. He defended his doctoral thesis in 1991 on the topic "Evolution and observational manifestations of neutron stars."

Research interests: theoretical and observational relativistic astrophysics. He developed a complete classification of neutron stars as magnetized rotating gravitational bodies (gravimagnetic rotators), developed the theory of their evolution in line with the ideas of V.F. Schwartzman. He put forward the idea (1982) and directed the creation of the "Scenario Machine", which allows to numerically simulate the joint evolution of relativistic and ordinary stars. Together with V.G. Kornilov he was the first (1983) to carry out a population synthesis of massive binary stars using the Monte Carlo method, which showed that radio pulsars should exist in pairs with blue massive stars (1984, confirmed in 1992). This method has become widespread throughout the world in the 21st century. However, pioneering results were obtained in the last century, and some of them have already been confirmed experimentally. In collaboration with K.A. Postnov and M.E. Prokhorov he was the first to calculate the stochastic gravitational-wave spectrum generated by the binary stars of our Galaxy (1987), and in the same year a similar spectrum of the Universe was calculated. In 1987, together with K.A. Postnov and M.E. Prokhorov, for the first time they calculated the frequency of merging of neutron stars (once every ~ 10,000 years) in a galaxy like ours. In 1997, together with M.E. Prokhorov and K.A. Postnov, discovered the dominant contribution of black holes on future detectors of the LIGO type, which was fully confirmed in 2015, when the first gravitational waves generated by the merger of black holes were discovered. In 1995, the existence of radio pulsars paired with black holes was predicted.

Together with V.G. Kornilov and A.V. Krylov he created the first robotic telescope in Russia for observing cosmic gamma-ray bursts in the optical range – "MASTER" (2002). He led the creation of the Global Network of Robotic Telescopes MASTER (2002–2016), which discovered more than 1000 optical explosions in the Universe, discovered the earliest linear polarization of gamma-ray bursts, which made a decisive contribution to the observation of the square of errors of the first gravitational-wave burst discovered on September 14, 2015 by LIGO detectors. The global MASTER network now provides the world's fastest view of the sky up to magnitude 20.

He prepared 11 candidates of science and published more than 1400 scientific papers.

Laureate of the All-Union Competition of the Knowledge Society (1987). Laureate of the M.V. Lomonosov Moscow State University (2002). Honored Worker of Higher Education of Russia (2006). Laureate of the F. Bredikhin RAS (2016).

Member of the Writers' Union of the Russian Federation (2000).

LITVAK Maxim Leonidovich

Born 21.07.1973. In 1996, he graduated from the Moscow Engineering Physics Institute (MEPhI) specializing in nuclear physics, entered the post-graduate fellowship in IKI RAS, which he graduated in 1998 with a PhD in astrophysics and radio astronomy and continued his scientific career at the IKI RAS. In 2005, he defended his doctoral dissertation at the Moscow State University devoted to Mars exploration studies. In 2015, he was honored to the title of Professor of the Russian Academy of Sciences. Currently, he works at the IKI RAS.

M.L. Litvak is a professor of the Russian Academy of Sciences (RAS) since 2015 and he is working as a head of the Laboratory of neutron and gamma-ray spectroscopy at the Space Research Institute of RAS (IKI RAS). M.L. Litvak has started his scientific career in 1996 after graduating from the Moscow Engineering Physics Institute with a degree in nuclear physics. He entered to post-graduate fellowship in IKI RAS and finished it with the early defense of his PhD thesis in astrophysics in 1998. After that he got a permanent position at the IKI RAS. From 1998 to the present, M.L. Litvak took an active part in the preparation, implementation and interpretation of the results of various space nuclear physics experiments related to the exploration of the Moon and Mars on board robotic missions (the HEND neutron spectrometer on board Mars Odyssey spacecraft, the LEND neutron spectrometer on board Lunar Reconnaissance Orbiter spacecraft, and the active neutron spectrometer DAN on board Mars Curiosity rover). M.L. Litvak is the author and co-author of about two hundred publications in distinguished Russian and foreign peer-reviewed journals, including publications in Science magazine devoted to the detection of water ice on Mars and the Moon.

In 2005, he got the degree of doctor of physical and mathematical sciences. His doctoral dissertation was based on the discovery of large area subsurface water ice deposits and the observation of seasonal cycle at polar latitudes of Mars from HEND neutron spectrometer data. Since the 2010s, he has been actively involved in the preparation of the Russian lunar program, focusing on lunar polar regolith studies using robotic arms, drilling and sample acquisition instrumentation. For his scientific activity M.L. Litvak was honored by NASA group achievement awards, got prizes for the best publications. His research also won various grants supported by President program for young scientist, by the Ministry of Education of the Russian Federation, by the Russian Foundation for Basic Research and special programs of the Russian Academy of Sciences. Scientific and organizational activities of M.L. Litvak included membership in the Scientific Council of the IKI RAS, accreditation in the Federal Register of Experts in the scientific and technical area, participation in the working group of the Council for Science by the President of the Russian Federation, work in the Expert council of the Higher Attestation Commission for Physics and work in the Coordinating council of Professors of the Russian Academy of Sciences.

M.L. Litvak is one of the initiators and founders of the new scientific research area named as “nuclear planetology” and based on the implementation of neutron and gamma-ray spectroscopy methods for determining elemental composition and conducting geochemical analysis of the subsurface of the Solar System planets and bodies. It has been created and being developed in the IKI RAS in the 2000s.

LIVSHITS Moisey Aizikovich

Born 07.10.1938 in Moscow. In 1962 graduated the Faculty of Physics of Lomonosov Moscow State University. In 1962 entered the PhD programme in Pushkov Institute of the Terrestrial Magnetism, Ionosphere and Radiowaves Propagation of Russian Academy of Sciences (IZMIRAN) and then has a permanent position there. Finished the PhD programme in 1965. PhD thesis "The energy balance and formation of active regions on the Sun". Sci.Hab. thesis "The X-ray radiation of arch systems and the structure of the solar corona" (1986). A chief scientist in IZMIRAN since 2008. The professor since 2008. A member of IAU since 1967. A member of the editorial board of the "Astronomy Reports" journal since 1988. Died 27.09.2017 in Moscow.

The field of activity spans a wide range of problems of the Sun, solar-stellar and solar-terrestrial physics. In 1960-70s under the guidance and in collaboration with S.B. Pikelner, M.A.Livshits fulfilled first investigations on physical processes on the Sun, where MHD-processes were involved. They obtained several original findings on interaction of waves, motions, and fine structure of spiculae, the mechanism of the Helium emission in the chromosphere. Elaborating the Kostyuk-Pikelner' model of the gas-dynamical response of the chromosphere to an impulsive heating, M.A.Livshits developed a method for taking into account of radiative losses, and jointly with A. G. Kosovichev carried out numerical modeling of impulsive flares on the Sun and red dwarf stars (1981). This work is still relevant and numerous of its consequences are verified by multiwavelength observations.

In 1970-1980s M.A.Livshits took part in the interpretation of the first results of the X-ray observations of the Sun obtained in the laboratory of S.L.Mandelshtam in FIAN (Lebedev Physical Institute of the Academy of Sciences). In particular, an idea by M.A.Livshits allowed to get reliable evidence for an existence of the X-ray radiation polarization in flares which indicates the presence of the downward directed beams of accelerated electrons (in cooperation with I.P.Tindo).

In 1983-2000 a large series of works on the physics of the solar corona was carried out by M.A.Livshits jointly with O.G.Badalyan and J.Sykora in which the classical ideas by I.S.Shklovskii were developed, and the fine structure of the corona was studied via the polarization images in spectral lines and white light, and also the connection of the radiation sources with the magnetic fields of various scales is investigated. These results were published in the "Coronal streamers" review, written in cooperation with S.Koutchmy, and widely used in the analysis of the SoHO data. M. Livshits applied his experience in study of the corona for investigation of relationship between the large-scale magnetic field of the Sun and the sector structure of interplanetary field and a forecast of geomagnetic disturbances during 11– and 22-year cycles (together with Ya.I.Feldstein).

Since 2000, M.A.Livshits has been paying more attention to solar-stellar physics. General problems of the evolution of low-mass stars and physics of stellar flares are considered in the works accomplished jointly with M.M.Katsova. An idea about the connection of effective particle acceleration in solar flares with spots, suggested earlier by M.A.Livshits, has been confirmed by subsequent observations. He considers a possibility of generation of the powerful optical radiation and high energy phenomena during superflares on stars in the magnetic fields of the Sun and late-type stars.

M.A.Livshits is the author of 255 scientific works on solar physics and adjacent astrophysical problems. Since 1975 up to now he has been teaching the lecture course "Cosmic Magnetic Gasdynamics" to the students of the Faculty of Physics in MSU. M.A.Livshits is awarded the "MAIK/Interperiodika" prize for the best publication in the "Astronomy Reports" journal in 2011.

Since 1975 has been teaching the course "Cosmic magnetic gasdynamics" to the students of the Faculty of Physics in MSU.

LOGVINENKO Sergey Valentinovich

Born 11.04.1956 in Makeyevka, Donetsk region. After graduating from high school in 1973, he entered the Moscow Institute of Transport Engineers, the Faculty of "Automation and Computer Engineering". After graduating from the institute in 1978, he joined the Pushchino Radio Astronomy Observatory of the Lebedev Physical Institute (LPI RAS) (at that time the Radio Astronomy Station of the LPI), where he worked in positions from electronics engineer to head of the laboratory. Candidate of Technical Sciences (1997), member of the Scientific Councils of the PRAO and ASC, member of the Scientific Council for Astronomy of the Russian Academy of Sciences (section "Radio Telescopes and Methods").

The main area of his activity is the work on the creation of radio telescope control systems, the work on the development of digital receiving equipment and its integration into the control and data collection systems of radio telescopes of the PRAO LPI. He is the author of more than 30 scientific papers. Constantly participates in the operation and modernization of radio telescopes.

Since the 1980s, S. V. Logvinenko has led several stages of modernization of the RT-22 radio telescope automation system. He participated in the creation of the first system based on the M-6000 computer, then transferred this system to the SM-2M computer line. In 1997, he defended his thesis for the degree of Candidate of Technical Sciences "Automation of spectral radio astronomy studies on the RT-22 radio telescope based on distributed control structures". Later, using the ideology of distributed systems, he created a radio telescope control system based on an IBM PC computer. In 2010, S. V. Logvinenko supplemented the control system of the RT-22 radio telescope with the possibility of working in the international project "Radioastron" as a ground tracking station (in this status, the radio telescope has been working successfully for more than 7 years). In recent years, S. V. Logvinenko has paid much attention to the development of digital receiving devices for observations on various radio telescopes. Thus, the RT-22 radio telescope uses a 2048-channel digital spectrum analyzer (SA) of the autocorrelation type with a 50 MHz band, a 2048-channel FFT type with a 50 MHz band with two independent inputs, and an 8192-channel digital SA with two independent inputs. The Large Phased Array antenna (BSA) is equipped with a digital receiver for pulsar observations, as well as a multi-channel digital receiver for the 128-beam radiation pattern of this radio telescope; two digital pulsar receivers are used on the Wide-band Cross-type radio telescope (DKR-1000) for observations in two frequency bands. Since 2007, the RATAN-600 radio telescope of the Special Astrophysical Observatory has been using a spectrum analyzer with a 60 MHz band made by S. V. Logvinenko. He also developed a number of programs for processing the results of scientific observations, servicing and monitoring the operation of radio telescopes.

He was awarded a number of certificates of honor of the Russian Academy of Sciences and a Certificate of Honor of the Moscow Regional Duma.

LOSKUTOV Victor Mihailovich

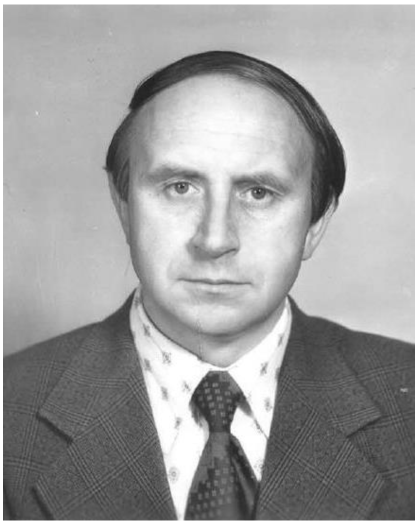
Born 12.05.1938 in Kronshtadt. Graduated from the Astronomy Department of Math. -Mech. Faculty of LSU (now SPbGU) in 1961; in 1961–1964, a post-graduate student at LSU. Defended his Ph.D. thesis in 1971, and defended his D.Sci. thesis in 2006. Worked at the LSU Astronomical Observatory as a researcher, senior researcher, and Head of Laboratory of Theoretical Astrophysics (2000), professor (2007). Died 25.01.2014 in St. Petersburg.

V.M.Loskutov's early research deals with the laboratory measurements of reflective properties of various materials (in continuation of research by V.V.Sharonov and his group). Later on, he turned to problems of multiple light scattering. He calculated the radiation regime in deep layers of semi-infinite atmospheres with various phase functions applying for the first time continued fractions. to the corresponding characteristic equation solution. He calculated polarization characteristics of single scattering by spherical particles of various sizes and refraction indices and used these results to determine parameters of particles in Jupiter's atmosphere from photometric and polarimetric observations.

In the 1980s, he calculated (with V.V.Sobolev) the polarization parameters of radiation fields in planar layers with Rayleigh scattering for various values of single scattering albedo and various distributions of embedded sources, and used the results to interpret observational data on Cyg X-1, Sco X-1, and quasars. V.M.Loskutov also performed calculations of polarization due to multiple scattering in non-homogeneous atmospheres. The aim was to reproduce the center-to-limb variation of polarization, both in hot stars (where it is caused by scattering on free electrons) and in cool stars (molecular scattering). Polarization characteristics were also calculated using realistic models of stellar atmospheres and stellar dust envelopes. In the 1990s, he found numerical solutions to the Kompaneets equation (with D.I.Nagirner). He found the extinction coefficient due to Compton scattering on Maxwellian electrons, the absorption coefficient caused by two-photon production of electron-positron pairs, and the emission coefficient due to pair annihilation. As a member of the team led by V.V.Ivanov, V.M.Loskutov participated in a detailed investigation of multiple molecular and Rayleigh monochromatic scattering and resonance scattering in spectral lines, for several types of the line absorption profile. In particular, he calculated the limiting limb polarization in a spectral line formed in a purely scattering atmosphere, for the cases of Doppler and Lorentz absorption profiles (9.443% and 5.421%, respectively).

V.M.Loskutov developed an elegant novel formalism for treating multiple Rayleigh scattering, which is simpler than Chandrasekhar's canonical formalism. The full phase matrix of Rayleigh scattering, with azimuth components taken into account, was represented as a product of two 3x6 matrices. This enabled one to separate angular variables of the incident and scattered radiation. If in treating resonance scattering, one assumes separation of frequency and angular variables, one can get a non-linear integral equation for the matrix that is a far generalization of the Ambartsumian–Chandrasekhar H-function. By solving this equation, Loskutov calculated polarization characteristics of the spectral line radiation reflected from semi-infinite atmosphere irradiated from outside.

LOSOVSKY Boris Yakovlevich



Born on 01.05.1938 in Bogimovo, Tula region. Graduated from mech. – mat.fac. MSU (1960). Since 1960 he has been constantly working at the Radio Astronomy Station LPI (now – PRAO ASC LPI) in various positions: from major laboratory assistant to senior researcher. Ph.D. (1968). COSPAR Associate (2014). Author of more than 100 scientific papers.

At the first stage of the work B.Ya. Losovsky's scientific interests were focused on the study of the Moon, the Sun and the planets of the Solar System with the RT-22 FIAN radio telescope in the millimeter wave range. Radio astronomy observations of the Sun were carried out jointly with colleagues from LSU (now – SPb SU), NIRFI Nijnii Novgorod) and Heinrich-Hertz-Institute, Germany. With his active participation the pioneering observations of the Mercury, Venus, Mars, Saturn and Uranus planets, the Callisto (Jupiter's satellite) and Halley's comet were carried out.

In 1968 he wrote his candidate’s thesis for the degree of Candidate of Physical and Mathematical Sciences on the topic "Investigation of some physical characteristics of the Moon by its radio emission in the millimeter wave range". Analysis of measurements of the Moon's radio emission in the millimeter wave range showed that the lunar "seas" and "continents" differ in their thermal and electrical parameters.

Since 1990 the interests of B.Ya. Losovsky have switched to the study of the radio emission of pulsars in the meter range of radio waves. A number of new results were obtained using the Large Phased Array antenna (BSA) and the East-West arm of Wide-band Cross-type radio telescope (DKR-1000) with his participation. These results includes the difference in the frequency dependence of the profile width in second and millisecond pulsars, the absence of low-frequency turn-over in spectra of millisecond pulsars and the detection of radio emission from the gamma-X-ray pulsar Geminga. It should be noted also the studies of giant pulses of a number of pulsars, monitoring of the time variations of the interstellar medium parameters in the direction of the Crab Nebula pulsar and establishing of correlation between the dispersion measure and scattering effects of the pulsar’s radio emission. In 2009-2011 Losovsky headed the RFBR project "Search and study of anomalous phenomena of radio emission of pulsars and radio transmitters". He awarded with medals "In memory of the 850th anniversary of Moscow" (1997), "Labour Veteran" (1989), with Honorary diploma of Russian Academy of Sciences (2014) and Diploma of the international publishing company "Nauka" (1998).

LOZINSKAYA Tatyana Alexandrovna

Born 15.11.1936 in Moscow. Graduated from the Faculty of Physics of M.V. Lomonosov Moscow State University in 1960. Since 1960, she has been working at Sternberg Astronomical Institute of M.V.Lomonosov State University as a research technician (till 1962), junior research fellow (1962 – 1978), senior research fellow (1978 - 1986), and leading research fellow (1986 – present). Defended her Ph.D. on «Interferometric and spectrophotometric investigation of several fine-filamented nebulae» in 1969 and Doctor of Physics and Mathematics thesis on the «Study of supernova remnants and nebulae produced by stellar wind» in 1981. Awarded the title of professor in Astrophysics and Stellar Astronomy in 2012.

During her work at Sternberg Astronomical Institute of M.V.Lomonosov Moscow State University, T.A. Lozinskaya became a leading expert in such cutting-edge fields of modern astrophysics as the study of supernovae, stellar wind, and their influence on the interstellar medium. She was the first to study the kinematics of most of the old supernova remnant nebulae in the Northern sky – based on interferometric and spectroscopic observations made with the 125-cm telescope of the Crimean Station of Sternberg Astronomical Institute as well as made pioneering observations of the ring nebulae around WR stars. In 1982, she identified a new class of ring nebulae around Of-type stars. In recent years, T.A. Lozinskaya has been studying the complex influence of supernovae and stellar wind on the interstellar medium. T.A. Lozinskaya is currently directing extensive research on supergiant shells with complexes on ongoing star formation in walls both in nearby irregular galaxies and in our Galaxy based on original spectroscopic and interferometric observations made with the 6-m telescope of the Special Astrophysical Observatory of the Russian Academy of Sciences, as well as on optical and IR archive data from HST, IRAS, Hersell space observatories, and publicly available VLA radio observations. T.A.Lozinskaya supervises undergraduate and postgraduate students at the Astronomy Department of the Faculty of Physics of M.V.Lomonosov Moscow State University, with 5 Ph.D. theses defended under her supervision. From 1990 to 2013, T.A.Lozinskaya delivered a course of lectures on "Supernovae and stellar wind in the interstellar medium" for 4-th and 5-th year students of M.V.Lomonosov Moscow State University. T.A.Lozinskaya authored more than 170 papers in refereed journals and three monographs: "Supernovae and stellar wind: interaction with the gas of the galaxy", Nauka: Moscow, 1986 (in Russian); "Supernovae and stellar wind in the interstellar medium" Book, American Institute of Physics, New York 1992; "Stellar explosions and stellar wind in galaxies", URRS Krasand: Moscow, 2012 (in Russian). Past member of the Research Council of Sternberg Astronomical Institute of M.V.Lomonosov Moscow State University and past member of two dissertation councils: D501.001.86 dissertation council of M.V.Lomonosov Moscow State University and D002.023.01 dissertation council of P.N.Lebedev Physical Institute of the Russian Academy of Sciences. Member of the Scientific Council for Astronomy of the Russian Academy of Sciences, Commission 34 of the International Astronomical Union, European Astronomical Union, and American Astronomical Society.

LOZINSKY Alexander Markovich

Born 30.12.1911 in Munich, Germany. In 1940, he graduated from mech. – math. fac. MSU, majoring in astronomy, in 1940-1946 he studied at the post-graduate school at the Moscow State University (Sternberg Astronomical Institute, SAI). Ph. D. (1947), associate professor (1949), senior researcher (1956). In 1946-1952 he worked in the SAI of the Moscow State University of Science. Since 1956-in the Astronomical Council of the USSR Academy of Sciences (now INASAN). Specialist in the field of photography astrometry and astronomical telescopes. Together with A. G. Masevich engaged in the creation of a network of optical observation of artificial satellites and Zvenigorodskaya experimental station of observations of the satellite of artificial satellites of Earth, where he worked as a Director from 1957 to 1991. Died 21.04.2005.

Specialist in the field of photographic astrometry and astronomical telescopes. In 1947, he completed a postgraduate course at Moscow State University and joined the Traffic Police Department in the Department of Variable Stars and Astrometry. From 1957 to 1992, he worked as the head of the Zvenigorod Station of the Astrosovet of the USSR Academy of Sciences. The Zvenigorod station was created as an experimental station, where all the most advanced methods of observing satellites were developed and applied, about the movement of which almost nothing was known. Even before the launch of the first satellite, the ISS prepared equipment for detecting future satellites, trained the first observers, and gave lectures on astronomy to the first cosmonaut squad. The techniques were then transmitted to other observation stations, which by the time the first satellite was launched were already about fifty. For 35 years, he has repeatedly updated the station's equipment due to the development of Russian designers (the WOW camera) and the appearance of new types of satellite observations (laser, Doppler, etc.). Under his leadership, a huge amount of visual, photographic, and later laser and Doppler observations of the satellite were made to solve the problems of space geodesy, geophysics,ephemeris service, and space control. Author of more than 60 published works in the field of photographic astrometry, astronomical telescope construction and optical observations of the satellite.

He was awarded state awards: the medal "800th Anniversary of Moscow" (1948), the medal "For Valiant Labor in commemoration of the 100th anniversary of the birth of V. I. Lenin" (1970), the medal "For Labor Valor" (1974), the medal "30 years of victory in the Great Patriotic War 1941-1945", the badge "Inventor of the USSR".

LUKASH Vladimir Nikolaevich

Born 11.02.47 in Elektrostal of Moscow region. In 1965 he finished school № 2 in Moscow with gold medal. In 1971 he graduated with honors Moscow Institute for Physics and Technology (MIPT), became post-graduate student ibid, in 1974 he got his PhD. Doctor of physical and mathematical sciences (1984), professor in astrophysics and radioastronomy (2004). Since 1974 till 1990 research (later, senior research) scientist in Space Research Institute of Academy of Sciences of the USSR. Since 1990 till now in Astro Space Center of the P.N. Lebedev Physical Institute of the Russian Academy of Sciences (LPI), since 1993 a head of the Theoretical astrophysics and cosmology department. Since 2004 untill 2013 professor in the chair of problems of physics and astrophysics of Department of general and applied physics of MIPT.

Main scientific topics are related to astrophysics, cosmology and a junction of cosmology, gravitation and theory of field. He published about 200 papers, including the monograph "Physical cosmology".

In 1980 V.N. Lukash created a theory of quantum-gravitational parametric generation of cosmological density perturbation in the early Universe and predicted that the effect results in formation of initial fluctuations and, consequently, formation of the large scale structure of the Universe. This theory was supported by observations, nowadays this theory is a cornerstone for the modern large scale structure of the Universe.

In 1980 V.N. Lukash with B.S.Novosyadlyj suggested and developped a model of the Great Attractor, which presents it as a large scale peak of density perturbations of cosmic dark matter. The model successfully described the observed coherent motion of galaxies nearby the Virgo galaxy cluster relatively to cosmic microwave background radiation. V.N. Lukash and B.S. Novosyadlyj predicted that the Great Attractor is typical one in the Universe. To prove it they suggested a cosmological test, based on the observational abundance of great attractor seeds in the Universe related with hot and cold spots numbers on the map of cosmic microwave background radiation at 1 angular degree scale. Later this idea was brightly confirmed in observations.

In 1990 V.N. Lukash suggested and developed a method to study an early formation of dark matter structure in the Universe by means of observations of spatial distribution of distant quasars. For the first time applying cluster analysis to observational data of spatial quasar distribution, V.N. Lukash with B.V.Komberg and A.V. Kravtsov discovered twelve large groups of quasars (only one such a group has been found before) at redshifts □ 1.

Among scientific achievements of V.N. Lukash are: physical interpretation of Bianchi cosmological models as perturbed friedmannian universes, a theory of cosmic background radiation in friedmannian universe with a curvature, prediction of ratio between a scalar and tensor modes of cosmological perturbations, a reliable restriction on the mass of neutrino derived from cosmological observational data, a theory of large scale structure formation of the Universe and dark matter density profile of galactic halos, models of black-and-white holes and their relationship with cosmogenesis.

For a series of works related to the formation of structure in the Universe V.N. Lukash was awarded the A.A. Friedman prize of the Physical Sciences Division of the Russian Academy of Sciences (2008) "for outstanding works on cosmology and gravitation".

LUTOVINOV Alexander Anatolyevich

Born 26.11.1971 in Korenovsk Krasnodarsky reg. Graduate from Moscow Institute of Physics and Technology in 1994. Worked at the Space Research Institute of RAS (IKI RAS) in various roles since 1992. Deputy director for Science (2018). Habilitation (2013), Professor of Russian Academy of Sciences (2015). Member of IAU, member of Space Council of RAS, chairman of the Coordinating council of professors of RAS.

Specialist in the high-energy astrophysics, relativistic compact objects and accretion, author of more than two hundred and fifty scientific papers, including two monographs.

Main scientific results: discovery and study of the nature of fast X-ray transients – a new population of X-ray binaries with unique properties; measuring the density of the spatial distribution of massive X-ray binaries in the Galaxy and determining their kinematic age; the prediction of the total number of such systems in the Galaxy – a result of fundamental importance in calculating the evolution of binary systems; development of a model explaining the properties of binary systems with neutron stars accreting from the wind; discovery and determination of the nature of dozens of hard X-ray sources; measurement of magnetic fields of neutron stars, development of a model for the formation of cyclotron lines in the spectra of X-ray pulsars; detection of the "propeller effect" in binary systems with neutron stars; the first registration of electromagnetic radiation from merging neutron stars with the INTEGRAL observatory. A.A. Lutovinov is one of the authors of the discovery of gamma radiation in the line of radioactive titanium 44Ti from SN1987A and ultra-weak gamma-ray bursts.

In 2013, for the cycle "Discovery and study of the nature of fast X-ray transients – a new population of massive X-ray binary systems" Lutovinov A.A. in collaboration with Grebenev S.A. and Molkov S.V. were awarded the RAS F.A. Bredikhin Prize in Astronomy.

Since 2018, he has held the post of Deputy Director for Science of the IKI RAS. Since October 2020 – Principal Investigator of the ART-XC Telescope named after M.N. Pavlinsky aboard the Spektr-RG observatory. He continues to head the Laboratory of Relativistic Compact Objects and X-ray Navigation of the IKI RAS, which is working on the development of a spacecraft navigation system based on signals from X-ray pulsars.

Supervisor of three Ph.D. theses and more than a dozen master's degrees, professor at Moscow Institute of Physics and Technology and the Faculty of Physics of the Higher School of Economics.

Member of the Scientific Council of the IKI RAS, the dissertation council of the IKI RAS, expert of the Russian Science Foundation and the Russian Academy of Sciences, member of the editorial board of the journals Galaxies and Earth and Universe, reviewer of leading scientific journals in astronomy and astrophysics.

Awarded with a medal of the Federation of Cosmonautics of the Russian Federation, a Certificate of Merit of the Ministry of Science and Higher Education of the Russian Federation.

LYUBIMKOV Leonid Sergeevich

Born in 1943 in Vologda, Russia. In 1960–1965 – a student of Leningrad University. In 1965–1968 – a postgraduate student in the Department of Astrophysics of Leningrad University. Since 1969 and up to now – a researcher at the Crimean Astrophysical Observatory (starting from a junior researcher to the Head of the Laboratory). In 1977 he defended the Ph.D. thesis "Some methods of studying stellar atmospheres and their applying for helium abundance determination". In 1989 he defended the Doctor thesis "Study of chemical composition of B– to G-type stars by the model atmosphere method".

An expert in the field of stellar chemical composition. L. Lyubimkov studied physical parameters and chemical composition of hundreds of stars of various spectral types from O to K. Along with normal stars he studied chemically peculiar stars of Ap, Am, δ Sct, HgMn types and others. The following phenomena of fundamental importance for stellar astrophysics were discovered by him: 1) empirical evidences of early mixing in rather massive stars on the first and longest stage of their evolution – the main sequence (MS) stage that was one of the stimuli for constructing stellar models with rotation as a source of mixing; 2) the observed sodium excess in atmospheres of F and G supergiants as an evidence of the NeNa-cycle predicted by the theory; 3) unexpectedly early (from a viewpoint of the adopted theory) occurring in the envelope of the famous Supernova 1987A products of the explosive nucleosynthesis found from the analysis of ultraviolet spectra obtained at the space station Astron. He initiated two large international projects having been carried out for about 20 years (1996-2016) between the Crimean Astrophysical Observatory and the McDonald Observatory of the University of Texas. These projects obtained a number of international grants including the Chretien International Research Grant of the American Astronomical Society (1997).

He studied stars on two sequential stages of evolution, namely B-type MS stars and the follow-up stage of supergiants and giants of A-K types. Using the high resolved spectra observed with his participation at the McDonald Observatory and the Crimean Astrophysical Observatory, he determined with high accuracy the fundamental parameters of about 200 stars of both types and analyzed their chemical composition. Main attention was given to evolutionary changes in abundances of light elements that play a key role in stellar evolution. He found a number of new effects concerned with evolutionary changes in abundances of such elements as lithium, carbon, nitrogen and oxygen. By comparing with models of rotating stars he explained quantitatively the known anticorrelation "nitrogen-carbon" for late-type giants and supergiants, as well as the lithium absence for most of these stars.

The author of about 130 research papers including the monograph "Chemical Composition of Stars: Method and Results of Analysis", Odessa, Astroprint, 1995. A member of the International Astronomical Union.

LYUTY Victor Mikhailovich

Born 30.06.1940 in a working-class family in Novorossiysk in the Krasnodar Region of the USSR. He graduated from High School with a silver medal in 1958 and in the same year entered the Astronomy Department of the Physical Faculty of M.V. Lomonosov Moscow State University (MSU). On completion of his undergraduate course in 1964, he was invited to do postgraduate studies at SAI by Professor B.V. Kukarkin. In 1967, V.M. Lyuty started working at the SAI South Station in Nauchny in Crimea. He began his career as a junior research scientist and progressed to a principal scientist. In 1972, he obtained his Ph.D. with the thesis «Photometric features of Seyfert galaxies and the optical variability of their nuclei». In 1977, he recieved a Habilitation Doctoral degree with the dissertation «The optical variability of X-ray binaries and galactic nuclei». V.M. Lyuty was awarded the title of the Honored Researcher of MSU in 1999 and in 2004, awarded the title of a Professor at MSU. Died 14.04.2009 in Nauchnyy.

V.M. Lyuty's main scientific interests and discoveries were focused on the study of active galactic nuclei (AGNs) and X-ray sources in binary stars. Also, together with A.S. Sharov and V.F. Esipov, he carried out deep photometric research of the Andromeda Nebula and the globular clusters in this galaxy. He was a skilled at and enjoyed making things with his hands. Even during his school years, he built an amateur telescope. In 1961, while a student, he made an electronic keyboard instrument – an electrophone that can be played even nowadays. While a postgraduate student at the SAI South Station, he designed, and in 1967, built an electrophotometer with UBV filters based on photon counting. This photometer has been used by researchers at SAI for already half a century. Using this photometer, V.M. Lyuty obtained observational data for his PhD and doctoral research. While investigating SyGs and QSOs, he noticed the unusual blue color of their inner structure, noted the two-component mode of their variability (the long-term variability lasting for years and short-term variability lasting for days), and proved the presence of a large proportion of thermal radiation in them. In 1970, together with A.M. Cherepashchuk and Kh. F. Khaliullin, he designed a narrow band photometer with wedge interference filter. Together with A.M. Cherepashchuk, he was the first to find the several days delay between variations in continuum and Hα emission line. Their proposed interpretation of this effect – the photoionization and the light echo – was fully confirmed by observations with the IUE in 1978. At present, the technique of reverberation mapping in AGNs has evolved into a separate new branch of the extragalactic astrophysics and allowed the calculation of the masses of black holes in the center of the AGNs and determining the character of the gas movement within the Broad Line Region. In 1971, following the director of SAI Prof. D.Ya. Martynov's proposal, V.M. Lyuty started observations of the X-ray source Cyg X-1 just identified with a star at that time. His further observations of X-ray sources (Cyg X-1, Her X-1, Cyg X-2, Sco X-1) contributed significantly to the explanation of the nature of their variability. In 1972, he first established the photometric periodic variability of Cyg X-1 and, together with R.A. Sunyaev and A.M. Cherepashchuk (in 1973), explained this variability by the ellipsoidal effect of the optical star due to the tidal action of the compact object – a black hole.

In 2001, V.M. Lyuty built a spectrophotometer with an acousto-optic tunable filter for image photometry. This filter was designed by the researchers of the Moscow Institute of Steel and Alloys under V.Ya. Molchanov's supervision. The CCD camera was used as a receiver. The successful tests of the photometer were carried out, but V.M. Lyuty had no time to finish it for practical use.

Five PhD theses were successfully defended under V. M. Lyuty's supervision. For many years V.M. Lyuty was an Editorial Board member of the scientific journal «Astronomy Letters».

V.M. Lyuty is the author and co-author of more than 250 scientific publications, with many widely cited by the scientific community. For his research on active galactic nuclei, awarded the Bronze Medal VDNH.

MAKAROV Dmitry Igorevich

Born 05.01.1971 in Krasnodar. Graduated from M.V. Lomonosov Moscow State University, Sternberg Astronomical Institute, in 1994. Postgraduate student of the Special Astrophysical Observatory of the Russian Academy of Sciences (SAO RAS) from 1994 to 1997. Has been working at SAO RAS since 1997: Junior Researcher (1997-2000), Researcher (2000-2006), Senior Researcher (2006-2008), as of 2008 – Head of Laboratory "Extragalactic Astrophysics and Cosmology".
He defended his Ph.D. thesis "Motion of galaxies on small and large scales" in 2000, and his DSc thesis on "Mapping the nearby Universe" in 2016.
Professor of RAS. Member of IAU.

D.I. Makarov's area of research is mainly related to extragalactic astronomy. He is the author of over 100 publications.

From the middle 1990s, D.I. Makarov, together with I. Karachentsev, studied the distribution and motion of nearby galaxies with a distance less than 10 Mpc, so-called Local Volume. Solar apex concerning nearby galaxies, found during that work, is accepted as a standard in extragalactic research. It was shown that the radial velocity of nearby galaxies shows clear signs of coherence and anisotropy. The tidal influence of the Virgo cluster is seen in the distribution of peculiar velocities in the supergalactic plane. Moreover, cosmological expansion of the local sheet occurs at about 30% slower than in his plane.

During 2006-2007, together with L. Makarova, R.B. Tully, and L. Rizzi, he improved a methodology of extragalactic distance determination using the tip of the red giant branch of the stellar population of galaxies. The accuracy of the method is comparable or even better than the classical period-luminosity relation of Cepheids. About 400 precise distances were measured with this approach using data from the Hubble Space Telescope.

Using new high-precision data, he built a detailed map of galaxy motion in close groups and around them. Unexpected behavior of Hubble flow on a scale of 1–3 Mpc was found. The Hubble flow around the Local Group is very cold and the scatter of the radial velocities is only ~30 km/s. The gravity of the Local Group decreases the rate of recession of the surrounding galaxies. We can observe this effect because of the very low chaotic motions of nearby galaxies and high precision distance measurements. High precision data allowed D.I. Makarov to estimate the total mass of nearby galaxy groups with accuracy ~30% using turn-around radius, which separates the galaxy group from the expanding Universe.

In 2010's, D.I. Makarov, together with I. Karachentsev, studied the distribution of galaxies in the Local Supercluster. They derived the mean mass density of the matter of $\Omega m=0.08$. It is about three times less than the global value determined from CMB. The discrepancy between local and global matter density in the Universe, Ωm, may be due to the existence of dark matter components not related to the virial mass of galactic systems.

MAKAROV Valentin Ivanovich

Born 15.01.1935 in Ploskiye Nivy village in Vologda Region. After graduating from Dept. of Mathematics and Mechanics of the State University of Leningrad in 1959 started work at Kislovodsk Mountain Astronomical Station of The Central Astronomical Observatory of RAS. 1969: Cand.Sci. (study of sunspots), 1989: Dr.Sci. «Studies of characteristics of the solar activity as a global process». Took positions from Senior Laboratory Assistant to Chief Researcher. 1984 to 2000: Head of Kislovodsk Mountain Station, 1985 to 2004: Head of Dept. of Solar Physics in The Central Astronomical Observatory. Member of IAU and European Association of Solar Observatories. Initiated International Long-term Time Series of Solar Observations at the Mountain Station and in Observatories Kodaikanal (India), Medon (France), Kitt Peak (USA). Died 07.08.2006 in St. Petersburg.

His area of expertise embraces a wide circle of studies of the solar activity: the solar cycle, polar activity, large-scale magnetic field of the Sun, coronal heating, and solar-terrestrial connections. Published more than 200 works on solar physics.

In his doctoral thesis (1989), developed a new direction in the studies of the solar cycle as a global process on all latitudes of the Sun from the poles to equator. His three-component model of the solar cycle as a global process starting in polar areas of the Sun after the reverse of magnetic polarity, explains characteristic features of solar cyclicity. The first wave of the global cycle is represented by small-scale activity in the form of polar mounts that migrates to the pole roughly from the latitude of 60°. The second wave migrates to the equator in the form of spots from the latitude of around 15°. The third wave if the magnetic flux migrates to the pole from the latitude of around 60°.

The basic results are related to studies of characteristics of the reversal of the polar large-scale magnetic field of the Sun. These studies are based on H-alpha synoptic maps covering the period of 130 years (1885–2004) and the records of the activity in polar zones from 1960 to 2004. The basic part of the H– alpha maps was made by the author himself in cooperation with K.R. Shivaraman (Kodaikanal Observatory) and with the staff of Kislovodsk Mountain Station. The same is true for the polar activity data derived from observations of polar mounts carried out by V.V. Makarova.

In 1987, for the first time obtained evidence for the existence of a high-latitude zone of activity of toroidal component of the solar magnetic field, related to polar mounts and bright X-ray dots. In 1996, in cooperation with A.G. Tlatov, for the first time isolated torsional oscillations in variations of the brightness of the corona, from Fe XIV and Fe X lines. In 1996, with D.K. Callebaut (Belgium), new characteristics of torsional oscillations in large-scale magnetic field were obtained for the period 1915 to 1993, while for differential rotation of the corona – 1940 to 1993. In the late 1990-ies, published works on North-South asymmetry of the rotationя of the corona and large-scale magnetic field, on the zone of generation of the field, on the periods of rotation of the sector structure from sunspot groups. In 2000-ies, studied the temperature of the polar corona for the time from 1952 to 2001, and published a work on the solar cycle as a global process on the basis of optical and radio observations. In cooperation with A.G. Tlatov, for the first time showed the pivotal role of the large-scale magnetic field of the Sun in the development of the 11-year solar activity cycle. The cycle of weak large-scale field outstrips the sunspot cycle by 5.5 years and determines the latter's intensity.

For several years, V.I. Makarov was in the list of outstanding scientists of Russia, presented by The Presidium of RAS.

MAKAROVA Elena Aleksandrovna

Born 25.12.1917 in Tbilisi. D. 19.12.1995 in Kuchino (the Moscow region). In 1941, she graduated from the Faculty of Mathematics and Mechanics of M.V. Lomonosov Moscow State University (MSU). In 1941, she moved to Ashkhabad. In 1943–1949, a junior researcher in the Central Institute of Forecasts. In October 1949, she started working at the Sternberg Astronomical Institute (SAI) of MSU and since then, worked at the SAI Department of Solar Physics as a senior researcher. PhD (1956). Member of the International Astronomical Union (since 1970), member of the European Astronomical Society (since 1992). E.A. Makarova is one of the initiators and organizers of the Tian Shan High-Altitude Expedition (HAE, 1957, Alma-Ata). She became the first head of the expedition and had been working there for 15 years. During that time, the expedition became a well-known permanent observing base of SAI. Died 19.12.1995 in Kuchino, Moscow region.

E.A. Makarova is a world-class expert in spectroscopic and integrated measurements of the solar flux. She participated in the first measurements of this kind in the USSR. In Russia and abroad, she is well-known for her research in the field of spectroscopic solar-flux measurements and the solar constant, the physics of the Sun and solar corona, and active formations on the Sun. E.A. Makarova is the author of more than 120 scientific publications in Soviet and foreign journals and two monographs (“Distribution of energy in the solar spectrum and the solar constant”, 1972, with A.V. Kharitonov, translated into English in the USA; “The flux of solar light”, 1991, authored together with A.V. Kharitonov and T.V. Kazachevskaya). Among E.A. Makarova’s pioneering research is the application of interferometric methods to the study of physical conditions in the solar corona during total solar eclipses. She was the organizer and participant of 10 scientific expeditions aimed at observations of total solar eclipses in Middle Asia, Caucasus, Far East, Siberia, Chukotka, Kuril Islands, Pacific Ocean, and Mexico. These expeditions brought a large amount of observational data, new results on the motion of matter and distribution of energy in the solar corona. They were used to demonstrate that the solar corona was inhomogeneous and unstable. Profiles of coronal emission lines revealed the presence of minor (within 2000 km) inhomogeneities with relatively high radial velocities, from 30 to 100 km/s.

Following E.A. Makarova’s initiative, in 1968, SAI purchased the Opton Solar Coude refractor telescope, SAI’s most effective solar telescope until the 1990s. E.A. Makarova was one of the organizers of the SAI expeditions in the Tian Shan Mountains. Under E.A. Makarova’s leadership, regular observations were made during the expeditions and international programs, including the observations of dynamic phenomena in the photosphere and chromosphere of the Sun (flares, filaments, matter ejections after flares). The results of those observations served as a basis for many publications by SAI and other Russian research institutes.

E.A. Makarova was awarded medals “For the Victory over Germany in the Great Patriotic War”, “For Valiant Labor during the Great Patriotic War”, “Thirty Years of Victory in the Great Patriotic War”, “Forty Years of Victory in the Great Patriotic War”, “Fifty Years of the victory in the Great Patriotic War”, “For Success in the National Economy of the USSR”.

MAKSUTOV Dmitry Dmitrievich

Born 23.04.1896 in Odessa. Graduated from Nicolas College of Military Engineering in Petersburg (1914), and then Officer School on Electrical Technique and Radio Telephony in Tomsk (1915). In 1920, entered Tomsk Technological Institute (Dept. of Chemistry). 1930–1952: with the State Optical Institute in Leningrad, in which organized and headed The Laboratory of Astronomical Optics (1944–1946). Dr.Sci. (Technical Sciences) (1941), Professor (1944), Corresponding Member of the USSR Academy of Sciences (1946). Inventor of named after him Изобретатель meniscus optical system, which currently is widely used in telescope building. Since 1952, with Pulkovo Observatory, Head of Dept. of Astronomical Instrumentation. Died 12.08.1964 in Leningrad.

Expert in the field of astronomical optics. Basic studies refer to problems of knife-edge and other techniques of optical testing, to technology of manufacturing of large optical instruments, to the theory and practical methods of producing aspherical surfaces. In 1924, was the first to suggest the so-called compensation technique of mirror testing, which was successfully applied to fabrication of the 2.6-meter main mirror for Shain Reflecting Telescope in Crimean Observatory. In 1941, invented meniscus systems for optical instruments. On the basis of a meniscus optical system, created a new-type telescope, which combines many advantages of both a refractor and parabolic reflector, displays simple design, and offers a high image quality. Provided several astronomical instruments with his optics. In Pulkovo Observatory, directed design and calculations for the prime focus system of the 6-meter Azimuthal Telescope, which was later mounted in the Special Astronomical Observatory of the USSR Academy of Sciences; supervised calculations for the 700-mm planet meniscus telescope, etc. Some of the world's largest Maksutov telescopes were mounted in Abastumani Astrophysical Observatory (Georgia, with the meniscus diameter 700 mm) and in Observatory Cerro El Roble (Chile, AZT-16).

The invention of meniscus telescopes propelled D.D.Maksutov into the ranks of world class scientists. He greatly contributed to methods of mirror testing. Produced now widely used in optical industry instruments for high-precision testing of the quality of optical glass at the initial stage of its processing. In person manufactured a huge number of camera lenses, mirrors, object-glasses and prisms of various sizes and functions; he was a first-rank technologist and expert optician. For the first time, he developed the technology of manufacturing of metal mirrors, which he greatly valued, and made several of these; in particular, in Pulkovo under his supervision a fast lightweight metal paraboloidal mirror with the diameter 720 mm was made (1950–1955). Along with astronomical optics, he created a photo-gastrograph – a device for photographing the stomach, a microscope-needle, knife-edge facilities for wind-tunnels, telescopic glasses, and other devices. Authored a multitude of books: «The minimum and maximum enlargement of a telescope» (1920–1930), «Aberration-free reflecting surfaces and systems, and new ways of their testing» (1932), «Knife-edge methods of testing of optical systems» (1934), «Astronomical Optics» (1946), «Fabrication and Testing of Astronomical Optics» (1948) and others.

Two State Prizes of the USSR (1941, 1946) for producing optical and astronomical instrumentation, and for inventing new optical systems.

MALKIN Zinovy Meerovich

Born 06.10.1950 in Leningrad. In 1972, graduated from The State University of Leningrad. In 1971–1972, worked in the Central Astronomical Observatory at Pulkovo. After graduating from the University: with Mendeleev Research Institute of Metrology (1972–1975), with the Central Astronomical Observatory at Pulkovo (1975–1990), with the Institute for Applied Astronomy of RAS (1990–2006). Since August, 2006 with the Pulkovo Observatory: Leading Researcher, Head of Laboratory, Chief Researcher (2015,). Dr.Sci. (1998), Member of IAU (1997), Member of Organizing Committee of Commission 19 IAU (2000–2006, 2009–2015), Fellow of International Association of Geodesy (IAG), member of several other International organizations, Member and Chairman of several local and International Boards, Working Groups, Commissions and Committees.

Basic works belong to astrometry, studies of the Earth rotation, geodesy, positioning and timing services. Authored about 400 scientific works.

In 1970–1980-ies organized observations with photographic zenith tube FZT-2 at the International Latitude Station in Kitab (Uzbekistan) and Kitab Time Service. With V.A. Vytnov organized Time Service in the Pulkovo Observatory. Obtained the Catalog of right ascensions for stars of the FZT Program. Developed the theory of FZT, suggested new techniques for determination, analysis and taking into account some instrumental errors. In the Institute for Applied Astronomy of RAS, organized the Service for determination of the parameters of Earth rotation. Developed GROSS Software Package for processing of laser observations of artificial Earth satellites. With E.A. Skurikhina, updated OCCAM Software Package for processing of VLBI observations and developed an original method of rotation parameters forecasting. As a result, the accuracy of these parameters' determinations in the Institute for Applied Astronomy of RAS reached the level of leading world centers of studies of the Earth rotation. Obtained several important results in the studies of the motion of the Earth's pole, in particular, a new estimate for the leading nutation coefficient from observations with the ZTF-135 zenith telescope. Along with N.O. Miller, from the processing of the 163-year series of the pole coordinates, for the first time found appreciable phase discontinuities in Chandler component of the pole motion in 1850-ies and 2000-ies. Contributed to geodynamics of European Region. Organized observations within the framework of the International Project «Baltic Sea Level», and their processing. In cooperation with N.A. Panafidina, obtained uniform series of coordinates of European GPS-stations of EPN Network. Studied the impact of non-linear motion of the stations on determinations of Earth rotation parameters from VLBI-observations. Contributed significantly to studies of free nutation of the Earth core (FCN) and of the motion of the celestial pole. Suggested several new FCN models. Developed the most accurate in the world methodology of forecasts of the celestial pole motion. Found the connection between FCN and rapid variations of geomagnetic field (jerks). In collaboration with Yu.R. Sokolova, developed methods of comparison and combination of Catalogs of radio-source coordinates; obtained two joint Catalogs in 2007 and 2014, tor the first time studied systematic high-order errors in the International sky system ICRF and I other Catalogs. Studied the impact of galactic aberration on the celestial reference frame, and suggested a practical algorithm of its account for processing of VLBI-observations. Suggested several modified statistics for processing unequal measurements, such as calculations for the error of mean, Allan variation and correlation.

Member of Editorial Board of International Journals: «Journal of Geodesy» and «Frontiers in Astronomy and Space Sciences». State Awards: Medal of the Order «For Merit to the Fatherland» of II Degree and Medal «In Memory of The 300-year Anniversary of St.-Petersburg».

MALKOV Oleg Yuryevich

Born 14.09.1961 in Moscow. In 1978, he was admitted the Physics Faculty of M.V. Lomonosov Moscow State University (the Astronomy Department) and graduated in 1984. From March 1984, he has been working at the Institute of Astronomy (prior to December 1990, the Astronomical Council of the Soviet Acad. Sci.) starting as an intern and junior researcher and progressing to Head of Department of Physics of Stellar Systems. He also conducted scientific research and taught at academic institutions and observatories in France, Germany, Italy, Spain, China, South Africa and several developing countries. In 2004, obtained DSc with the thesis in astrophysics titled "Binary stars and the initial mass function".

O.Y. Malkov is the author of about 250 scientific papers most published in the area of astrophysics and stellar astronomy. Participant of about 120 international conferences.

In the 1980s and 1990s, in collaboration with A.Piskunov, he improved the methods of determination of star formation history in the Galaxy. He revised the current views on the initial mass function and showed, in particular, that the correct application of the mass-luminosity relation as well as consideration of binary stars' components leads to the conclusion that IMF of subsolar mass stars could be power-low. The obtained results made it possible to get closer to a solution of one of the most fundamental astrophysical problems, the origin of the stellar mass spectrum.

From the mid-2000s, together with his colleagues, O.Y. Malkov has been developing a complex scientific approach to the study of binary stars of different observational types. He has proposed another source of local missing mass and has shown that correct registration of photometrically unresolved binary systems can significantly increase the amount of visible matter. He has found (and explained by evolution and selection effects) a noticeable difference in radii and temperatures for components of eclipsing binaries and single stars of the corresponding spectral type. As a result, he has developed a modern mass-luminosity relation for intermediate-mass stars. He has participated in the development of the Gaia space mission photometric system and estimated Gaia's possibility to discover binary stars. Twelve stellar catalogs have been created under his leadership or with his participation. In collaboration with D.Kovaleva and P.Kaygorodov, he designed the world's largest database on binary and multiple systems of all observational types, BDB.

O.Y. Malkov is a professor of astronomy at M.V. Lomonosov Moscow State University. He has developed university courses "Astronomical Data", "Binary Stars", "Stellar Evolution" and teaches them at universities and observatories around the world.

He is a member of the European Astronomical Society, International Astronomical Union, Euro-Asian Astronomical Society, Scientific Council on Astronomy of the Russian Acad. Sci., International Astrostatistics Association, and American Physical Society. He is an executive member of the International Virtual Observatory Alliance and a council member of the Russian Virtual Observatory.

He is the head of the Russian Regional Science Operation Center in the international space project WSO-UV (Spektr-UF) included in the federal space program of Russia. The principal goal of the project is to construct, by 2021, a large space ultraviolet observatory to solve fundamental problems of astrophysics, cosmology and physics.

O.Y. Malkov is a permanent member of scientific organizing committees of several Russian and international conferences and a reviewer of scientific journals and scientific foundations. He has been active in scientific popularization and often gives interviews on television and in the print media.

MALOFEEV Valery Mikhailovich

Born 13.01.1946 in the village of Umal'ta of the Khabarovsk region. In 1969, he graduated from Kazan State University in Kazan (now KFU). Since 1969, he has been constantly working at the Pushchino Radio Astronomy Observatory of the P. N. Lebedev Physical Institute of the Russian Academy of Sciences (PRAO ASC FIAN) in various positions from senior laboratory assistant to head of laboratory. Doctor of Physics-Mat. (1999), Professor of Astrophysics, member of the International Astronomical Union, member of a number of scientific and qualification councils.

Scientific interests: astrophysics, study of pulsars. Author of more than 110 scientific papers.

In the early 1970s, V. M. Malofeev began regular observations of a large number of pulsars, first at low frequencies (Pushchino), and in the late 1980s at very high radio frequencies (Bonn, Germany). In collaboration with Yu.P. Shitov, V.A. Izvekova, A.D. Kuzmin, I.F. Malov, O.I. Malov, and several German, Greek, and Polish colleagues, the main parameters of the radio emission of more than 200 pulsars, including the flux density, spectrum, luminosity, and shape of the average pulses, were measured for the first time. He compiled the most extensive catalog of pulsar spectra (335 objects), and carried out their classification.

In the late 1990s, together with O.I. Malov, D.A. Teplykh, and S.V. Logvinenko, he discovered radio emission from a number of pecular gamma-and X-ray pulsars, including the famous Geminga pulsar, which is very important for identifying the energy source and radiation mechanisms of these space objects.

Since 2005 the investigations of pecular pulsars and magnetars has been continued, and later the search for new pulsars has begun together with S. A. Tyulbashev and others on the base of multi-month monitoring of most part of the northern hemisphere using the BSA radio telescope stationary multi-beamforming system.

V. M. Malofeev conducts teaching work at the Pushchino State Natural Science Institute, he is the head of undergraduates and postgraduates. Under his leadership, two dissertations for the degree of Candidate of Physical and Mathematical Sciences were prepared and successfully defended.

MALOV Igor Fedorovich

Born 08.04.1941 in Orekhovo-Zuevo, Moscow region, graduated from Kharkov University in 1963, works at the Pushchino Radioastronomy Observatory since 1963 in various positions. Current position is Chief Researcher, Doctor of Physical and Mathematical Sciences (1992), Professor of the Pushchino State Institute for Natural Sciences, member of the Board of the Euroasian Astronomical Society, member of the International Astronomical Union.

The main scientific interests are astrophysics, pulsars, stellar winds. I.F. Malov is the author of more than 200 scientific papers, author and co-author of 4 monographs.

During 1963-1975 I.F. Malov investigated acceleration mechanisms of matter in hot stars and especially in Wolf-Rayet stars. He showed that the main acceleration mechanism in these stars is the Thomson scattering of radiation on free electrons.

From the 70-th up to now I.F. Malov works on the problems of the structure of pulsar magnetospheres using all observational data in different electromagnetic ranges. He proposed explanations of some features in pulsar spectra (low-frequency turn-overs, linear parts of their spectra, high-frequency breaks and possible reasons of increasing of intensities in some pulsar’s spectra at frequencies about of tenths GHz).

I.F. Malov put forward an idea to divide radio pulsars into two types, depending on the scales of their magnetospheres, namely, pulsars with short periods and with long ones. I.F. Malov developed several methods for estimations of angles between rotation axes and magnetic moments in neutron stars, co-authored with G.Z. Machabeli put forward and worked out the drift model to explain the observed peculiarities of anomalous X-ray pulsars and soft gamma-ray repeaters, and also pulsars with giant pulses.

In the beginning of this century I.F. Malov took an active part in the creation of the faculty of astrophysics and radio astronomy in the Pushchino State University (the current name is Pushchino State Institute for Natural Sciences). This faculty operates on the base of Pushchino Radioastronomy Observatory of the Lebedev Physical Institute of the Russian Academy of Sciences. Students may study here in masters and doctoral degree programs. I.F. Malov reads there two courses “Cosmic radiation mechanisms” and “Physics of stars and pulsars”. Two PhD and several master's theses were prepared under his supervision.

MANDELSHTAM Sergey Leonidovich

Born 02.22.1910 in Odessa. In 1931, he graduated from Moscow State University (MSU). From 1931 to 1935 he worked at the Institute of Physics of MSU, and since 1935 he is the head of a laboratory in the LPI (FIAN). Since 1968, he became the director of the Institute of Spectroscopy of the Academy of Sciences (AS) of the USSR (ISAN), created with his direct participation. In 1944-1947, he was a lecturer in the Institute of Steel (now, MISiS), since 1947 – professor, since 1957 – head of the department "Optics" (now – "Quantum optics") in MIPT. Since 1957, he was the Chairman of the Commission (later the Council) on Spectroscopy of the AS USSR. In 1979 he became the corresponding member of the AS USSR. He was a member of the German National Academy of Sciences Leopoldina (1966) and a corresponding member of the International Academy of Astronautics – IAA (1985). He died 11.26.1990 in Moscow.

His primary scientific activity was associated with atomic spectroscopy. In 1936-1941 he developed new spectral methods to quantitatively analyze metals, alloys, and minerals, which were especially important for the development of the Soviet industry during war and post-war years. In the 1940s, his scientific interests were focused on the fundamental problems of atomic spectroscopy, including the development of new methods for diagnostics of laboratory and astrophysical plasma.

From the very beginning of the space era, he became the scientific leader of the study the solar radiation in the EUV and X-ray spectral ranges, carried out in the Laboratory of spectroscopy of the LPI (FIAN). He took an active part in the design of the first soviet solar satellites, in the development of scientific equipment for these missions as well as in the interpretation of their results. New important scientific results were obtained during these missions: the thermal nature of the "quiet" Sun X-ray radiation was established (1962); a method was developed for the solar X-ray flux prediction using radio data (1963); a new class of X-ray solar flares was discovered which is not accompanied by chromospheric signatures (1965); the fine structure of X-ray flares was found and investigated (1968); polarization of X-ray emission from flares was discovered (1969); the satellite spectral lines excited by dielectronic recombination were experimentally discovered in the solar corona (1971); the long-term electron acceleration with the duration of tens of minutes was found in solar flares (1975).

With his active participation and leadership, the science experiments were carried out on the 2nd and 3rd artificial earth satellites, on space stations "Electron-2, -3", on the "Venera-2" observatory, on solar spacecraft "Kosmos-166, -230", on international observatories "Interkosmos -1, -4, -7, -11, -16 ", on geophysical rockets" Vertical-1, -2, -7, -8, -9, -11 ", on orbital stations" Salyut-4, -6, – 7 "and on station "MIR ". His activity became the basis to develop a new scientific direction (X-ray astronomy) in solar physics, and his laboratory in LPI (FIAN) took one of the leading positions in the USSR and the world.

He was awarded multiple state awards: the Order of Lenin (1989); two Orders of the Red Banner of Labor (1971, 1975), three Orders of the Badge of Honor (1945, 1950, 1975), the State Prize of the III degree (1946) – for the development and implementation of equipment for spectral analysis of ferrous and non-ferrous metals and alloys, USSR State Prize (1977) – for a series of works on X-ray radiation from the Sun.

MARKEVITCH Maxim Leonidovich

Born in 1967 in Kuybyshev, USSR. In 1990, graduated with Distinction from the Moscow Institute of Physics and Technology. In 1993, received PhD (thesis title “Hot gas in clusters of galaxies and at the Center of our Galaxy”). Since 1991, worked at the Space Research Institute of the Russian Acad. of Sci., Institute of Space and Aeronautical Studies (Japan), University of Virginia (USA), Harvard-Smithsonian Center for Astrophysics (USA). Since 2011, an astrophysicist at NASA Goddard Space Flight Center (USA).

M.L. Markevitch studies galaxy clusters in the X-ray, microwave and radio wavebands, models hot gas in galaxy clusters, and studies properties of Dark Matter using cluster observations. Worked with data from many X-ray observatories including Granat, ASCA, ROSAT, Chandra, XMM-Newton, and Hitomi. Currently working on prospective X-ray missions.

As an undergraduate and doctoral student at the Space Research Institute (Russian Acad. of Sci.), he modeled the Sunyaev-Zeldovich effect in galaxy clusters and compared them with observations in order to constrain the cosmological parameters. He developed an algorithm for reconstructing images of extended X-ray sources using the data from the Granat / ART-P telescope and used it to map the diffuse emission from the Galactic Center for the first time. These maps revealed an X-ray echo of the past explosions of the central supermassive black hole on the molecular clouds around the Galactic Center. Using an algorithm for the analysis of the ASCA X-ray spectra that he developed, he discovered non-isothemality of the gas in galaxy clusters and self-similarity of their temperature profiles. Among his Chandra results are the discovery of shock fronts and contact discontinuities in the cluster gas and the explanation for the latter phenomenon; an upper limit on the Dark Matter self-interaction cross-section, and the connection between thermal plasma and the population of cosmic rays in clusters. He supervised a series of works to determine the brightness of the diffuse component of the Cosmic X-ray Background using Chandra data. He was the co-author of the study that proved the existence of Dark Matter using X-ray and optical observations of the Bullet Cluster, and co-author of the first direct measurement of the velocities of the intracluster plasma with Hitomi.

M.L. Markevitch is the author and co-author of over 300 publications. According to NASA ADS, as of 2021, he has over 17000 citations with h-index 68. Recipient of the 1995 Main Award of the Eurasian Astronomical Society (jointly with R. A. Sunyaev and M. N. Pavlinsky) for the discovery of the X-ray echo in the Galactic Center, and of the 2008 Bruno Rossi Prize of the American Astronomical Society (jointly with S. Allen, A. Vikhlinin and J. P. Henry) for results on cosmology and physics of galaxy clusters. M.L. Markevitch is a Fellow of the American Astronomical Society.

MARKOV Alexander Vladimirovich

Born 10.09.1897 in the village of Chernyanka of Novooskol uyezd, Kursk Province (now, Belgorod Region). In 1924, graduated from Dept. of Physics and Math. of the State University of Leningrad. Up to 1929 – post-graduate course at the Central Astronomical Observatory at Pulkovo. Worked with The State Lesgaft Natural Science Institute, The Central Research Institute of Geodesy and Mapping (Leningrad Branch), 1930 to 1944 – Head of Astrophysical Department in Astronomical Institute (now, the Institute for Applied Astronomy of RAS), 1944 to 1968 – Senior Researcher at The Central Astronomical Observatory at Pulkovo. Dr.Sci. (1951), Senior Researcher (1940), Member of Commissions of the Astro-Council of the USSR Academy of Sciences on Physics of Planets, Stellar Astronomy, Astronomical Instrumentations and Interplanetary Communication. Died 19.11.1968.

His basic scientific works belong to areas of lunar and planetary studies, astronomical photometry, astronomical instrumentation, radiometry, polarimetry. Authored more than 70 science works, coauthored several monographs.

Created the first Soviet visual microphotometer for measurements of photographic plates (1934). Developed the general theory of microphotometers (1950). Authored five original instruments and inventions, including MF-6 microphotometer, produced in the USSR in 1954.

Contributed significantly to the studies of the Moon surface, in particular, for the first time in the USSR measured the temperature of some areas on the lunar surface. Took part in interpreting photographs of the dark side of the Moon. One of the authors of «The Atlas of the Dark Side of the Moon» (1960). Editor and one of the authors of the monographic compendium «The Moon» (1960).

Known for his works on photometric studies of nebulae, stars and comets, spectroscopic works and works on aerial photography. In 1942–1943, carried out studies on film light filters (for defense purposes). Came up with the idea of the uprising of science equipment using a stratosphere balloon to measure the temperature of the lunar surface and for observations of planets.

Took part in expeditions for observations of total solar eclipses (1936, 1941, 1945, 1954). Carried out wide-scale organizational work as Member of Praesidium of the Commission on Physics of Planets of Astronomical Council. Participated in organization of Abastumani Astrophysical Observatory (1932); encouraged planetary studies in the Central Astronomical Observatory of the Academy of Sciences of Ukraine, Shemakha Astrophysical Observatory, and other Institutes and Observatories of the USSR.

Supervised 9 Cand.Sci.Theses in the Pulkovo Observatory and in other Institutes. Popularized science; consulted popular science films.

State Awards: Medal «For Valorous Labor in The Great Patriotic War 1941–1945».

The name of a lunar crater on the visible side of the Moon «Markov» was approved by the IAU after A.V. Markov and mathematician Andrew A. Markov (1856–1922) in 1964. Was purged (1934, 1936–1940) in the time of Stalin oppressions.

MAROCHNIK Leonid Samoilovich

Born 12.03.1934 in Odessa.
Alma matter: Rostov State University (1957).
Positions held: Head of the department at the Institute of Astrophysics of Tajik Socialistic Republic' Academy of Sciences (1965-1969), Head of the astrophysics department at Rostov State University (1970-1980), senior researcher at the Institute for Space Research, Moscow (1980-1992), Computer Sciences Corporation (1992-2006), visiting professor at University of Maryland (2007–2009).
PhD thesis: "Interaction of solar corpuscular streams with atmospheres of comets".
Doctor thesis: "Non-stationary processes in stellar systems".
Author and co-author of more than 180 publications and 8 books.

He explained the origin of recurrent magnetic storms by the passage of the Earth through magnetic "tubes" in the solar wind, rotating with the Sun (Soviet Astronomy (SA) 5, 304, 1961). He showed (together with E. Korchevsky) that strong magnetic fields affect the movement of blood in the human body (Biophysics 10, 371, 1965).

He showed that cometary shells in the form of a catenary are the result of their interaction with the magnetic field of the solar wind and that the waves in ionized cometary tails are Alfven waves (SA 4, 480, 1960; 7, 218, 1965). He predicted that the magnetic field of the solar wind should penetrate into the cometary atmosphere (Moon and Planets, 26, 353, 1982), which was later confirmed by the Vega mission in 1986. He proposed (together with L. Mukhin and R. Sagdeev) the concept of a massive cometary Oort cloud (Science 242, 547, 1988), leading to a non-standard distribution of angular momentum in the solar system (and an alternative path of its evolution).

He constructed the hydrodynamical model of rotating collisionless stellar systems (SA 10, 738, 1967) and determined (together with M. Maksumov) the critical Jeans length in collisionless stellar systems (DAN 164, 1019, 1965). He showed (together with V. Korchagin) that the central bars in galaxies are the generators of the spiral structure (SA 19, 8; 19, 428, 1975).

He showed (together with Y. Mishurov and A. Suchkov) that the long-wave mode of the density wave is responsible for the spiral structure of the Milky Way (Ap.Space.Sci 19, 285, 1972; 79, 337, 1981).

He showed that the solar system is located in the corotational zone, that is, in a special position where conditions are favorable for the emergence of life. (Ap. Space. Sci. 89, 61, 1983)

He put forward (together with L. Mukhin) the concept of a galactic "belt of life" in our and other galaxies (Space Research Inst, Preprint 761, 1983; Bioastronomy-The Next Steps, p. 49, 1988).

He constructed (together with G. Vereshkov, A. Krymsky, P. Naselsky and N. Pelikhov) a stochastic theory of the inverse influence of cosmological fluctuations on the expansion of an isotropic and homogeneous Universe (Ap. Space. Sci 34, 249; 34, 281, 1975; 55, 325, 1978; 67; 261, 1979). Together with G. Vereshkov and D. Usikov, he showed that virtual gravitons form a coherent quantum condensate in the modern Universe (Found.Phys. 38, 546, 2008). He proposed an instanton theory of the origin of inflation and dark energy, in which gravitational waves are responsible for these effects (Grav. Cosmol. 19, 178, 2013; 21, 118, 2015).

MAROV Mikhail Yakovlevich

Born 28.07.1933 in Moscow. Graduated from the Moscow Technical University in 1958 in the field Mechanics. Received his Ph.D. in 1964, full Doctorate degree in Physics and Mathematics in 1970 and full Professor in 1977. Scientific career includes RSC "Energia" (1958-62), Keldysh Institute of Applied Mathematics (1962 – 2008), and Vernadsky Institute of Geochemistry and Analytical Chemistry (2008 – present). Served as Scientific Secretary and Chair Deputy of Space Council of the Soviet Academy of Science (1966-1978). Elected in many national and international scientific organizations and has numerous national and international awards. Elected Corresponding Member of the Russian Academy of Science (RAS) in 1990 and full member (Academician) in 2008. Academician of the International Academy of Astronautics.

Principal scientific interests are focused on the fundamental problems of space physics, astrophysics, planetary sciences and cosmochemistry, as well as on general problems of hydrodynamics and gas kinetics with application to solar system exploration and planetary cosmogony, along with experimental studies of planets with space vehicles. He has been deeply involved in many major endeavors of the Russian space program beginning from the first space flights to the Moon and planets up to the present. He worked as Project Scientist and/or Principal Investigator on the VENERA and MARS lander series and made the first in situ measurements in the Venus and Mars atmospheres that have been world recognized. He also participated in many others Soviet lunar and planetary missions. Developed basic theoretical approach to the problems of planetary aeronomy, mechanics of multicomponent turbulent reactive media and non-uniform multiphase gases, as well as to the study of non-equilibrium kinetic processes. He contributed to the development of the original methods of mathematical modeling of the planetary and cometary atmospheres and migration of minor bodies in the solar system. Authored above 250 publications in refereed journals and has published 18 books and monographs dealing with the study of outer space, planets, space mechanics and astrophysics. He is Professor of Moscow State University and the International Space University (ISU). He served as faculty and co-Chair of the ISU Space Physical Sciences Department and he taught in the USA North Carolina State University. He has occupied a number of distinguished positions in several Russian and International scientific organizations including International Astronomical Union (IAU) and COSPAR. He was elected President of the Commission 16 and then President of the Division III (Planetary Sciences) of the IAU (1994-2000), Chairman of WG C2 of the COSPAR Commission C. He now serves as representative of IAU in the COSPAR WG B. He is Editor–in-Chief of the International scientific magazine Solar System Research and he has served as co-Editor for a number of other distinguished magazines. Currently he is a Chairman of Tsiolkovsky Scientific Heritage Commission of RAS, Member of RAS Space Council Bureau, and Deputy of the Chair of Astrobiology Council. Received two distinguished National (Lenin and State) Awards, Labor Red Banner, Alexandre Nevsky, and Friendship Awards and medals. Received International Galabert award for Astronautics, International Alwin Seiff Award for the pioneering planetary explorations, NASA Diploma for outstanding space achievements, W. Nordberg COSPAR Medal for space studies and applications. Recently he was awarded with the distinguished national Demidov Prize for Science and Gold Keldysh Medal of RAS for outstanding contribution in space research, applied mathematics and mechanics. His name is assigned to minor planet 10264 Marov (1978 PH3).

MARSAKOV Vladimir Andreevich

Born 09.05.1947 in Zaporozhye, Ukraine. In 1970 he graduated from Rostov State University in Rostov-on-Don (RSU, now Southern Federal University, SFedU). After serving in the army, since 1972, he has been constantly working at the Research Institute of Physics of Rostov State University, first as a Junior, then as a Senior Researcher, and since 2006 as a Leading Researcher. Since 2003, he was part-time Associate Professor, and from 2008 to 2015 – Professor at the department of Space Physics, Faculty of Physics of the SFedU. PhD thesis "Statistical study of the chemical and kinematic properties of the Galaxy populations" (1981). Doctoral diss. "Structure and Evolution of Subsystems of the Galaxy" (2007). The title of Professor was awarded in 2010.

Field of activity is a comprehensive statistical study of the chemical and spatial-kinematic properties of stellar populations in order to reconstruct the history of star formation and the formation of subsystems in the Galaxy. He is author of over a hundred scientific papers, the monograph and co-author (with A.V. Loktin) of the textbook on Stellar Astronomy.

In the mid-1970s, in collaboration with A.A. Suchkov he was proposed a model of active phases in the evolution of the Galaxy, which explains the formation of its multicomponent structure and the distribution of heavy elements in the stars of its various subsystems. They were the first to find evidence of the existence of a subsystem later called the "thick disk" in the Galaxy.

In the 1980s-90s, V. Marsakov showed that, contrary to the opinion prevailing at that time, the relationship between metallicity and age in the thin disk of the Galaxy is not unambiguous, and there is a real dispersion of the chemical composition among stars of the same age. In addition, he found indications that the abundances of heavy elements in the stars of the thin disk began to increase sharply 4-5 billion years ago, whereas before that the enrichment of the interstellar medium took place only at the stage of formation of the halo and thick disk of the Galaxy, that is, more than 10-12 billion years ago.

Since the 2000s, V. Marsakov has been studying the history of star formation in the Galaxy based on data on the abundances of chemical elements produced in various processes of nuclear fusion in stellar objects of different subsystems of the Milky Way Galaxy. He found evidence that a significant number of metal-poor objects currently belonging to our Galaxy were formed outside and that the properties of stellar populations of both disk and spherical subsystems of the Galaxy are largely due to the influence of nearby satellite galaxies that are losing interstellar matter, stars and globular clusters under the influence of tidal forces of the Galaxy. He found evidence that some of the open clusters in the Galaxy were formed as a result of the interaction of high-velocity clouds with the interstellar matter of the thin disk and, as a result, they obtained metallicity that was anomalously low for field stars in the thin disk and/or galactic orbits, which are more characteristic of objects of older subsystems of the Galaxy. V. Marsakov also showed that, despite the usually declared large age for field RR Lyrae stars, among them there are representatives of the youngest Galaxy subsystem – the thin disk. He suggested that the appearance of such young, metal-rich RR Lyrae stars is possibly due to high initial helium abundances of their progenitors.

Over the years, he created and posted in the Strasbourg Astronomical Data Center more than ten unique compiled catalogs of the abundances of several chemical elements, fundamental astrophysical parameters and elements of galactic orbits for stellar objects in the Galaxy.

Five PhD theses were defended under his scientific supervision.

MARTYNOV Dmitry Yakovlevich

Born 07.04.1906 in Kerch, passed away on 22 October 1989 in Moscow. Graduated from the Department of Physics and Mathematics of Kazan State University in 1926. Director of V. P. Engelhardt Astronomical Observatory (1931-1951), rector of Kazan State University (1951-1954), director of P. K. Sternberg Astronomical Institute (SAI) of M. V. Lomonosov Moscow State University (MSU) in 1956-76, head of the stellar astrophysics department of SAI MSU (1976-1978), head of the astrophysics department of the Faculty of Physics of MSU (1978-1989). Doctor of Physical and Mathematical Sciences (1943), professor (1954), member of the expert board of Higher Attestation Commission (1964-1976). Chairman of the commission of cosmic toponyms of the Academy of Sciences of the USSR (AS USSR) in 1977-1989. Chairman of the All-Union Astro-Geodetic Society (1960-1975). Died 22.10.1989 in Moscow.

Scientific interests: astrophysics, physics of close binary stars, planetary physics. Author of about 300 scientific papers and more than 10 monographs.

In 1937 D. Ya. Martynov discovered the “period-spectrum” correlation for close binary systems (CBS) and interpreted it in terms of evolution. In 1957 he suggested the possibility of the mass exchange between components in CBS. He discovered and investigated processes of the mass transfer in the close binary system RX Cas laying the basis for the future concepts of CBS evolution and studied the physics of ellipsoidal and reflection effects in CBS. D. Ya. Martynov analyzed periodic inequalities in epochs of minima of eclipsing binary systems. He was among the earliest researches who studied the rotation of semi-major axis of elliptic orbits in eclipsing binary stars in order to calculate the mass concentration in stellar interiors, which later became an observational basis for the modern theory of the stellar evolution and internal structure of stars.

D. Ya. Martynov is the author of two widely popular textbooks: “A Course of General Astrophysics” and “A Course of Practical Astrophysics”. These books brought him the Bredikhin Prize of the AS USSR (1986). Raised dozens of PhDs and Doctors of Sciences.

As the director of SAI MSU D. Ya. Martynov founded two observational bases: the Crimean Station of SAI MSU and the high-mountain expedition of SAI MSU in Almaty. During the period of his directorship SAI MSU also was actively involved in the space exploration.

D. Ya. Martynov was the head of the Central Bureau for Astronomical Telegrams (1942-1988), chairman of the Commission of planetary physics (1964-1976), chairman of the Commission 5 of the International Astronomical Union (1955-1961), vice-chairman of the “Astronomy and Cosmonautics” section of the All-Union Society “Znanie” (“Knowledge”) (1960-1989). Chief editor of the Astronomical Circular of the AS USSR (1942-1962), chief editor of “Zemlya I Vselennaya” (“Earth and Universe”) journal (1965-1988).

D. Ya. Martynov was awarded the Order of Lenin (1954), three Orders of the Red Banner of Labour (1945, 1948, 1961), the Order of the Badge of Honour (1975), the Medal of the Astronomical Council of the AS USSR “For the discovery of new astronomical objects” (1976), the golden medal of VDNKh (1978). Also he was awarded

the F. A. Bredikhin Prize of the AS USSR (1986). Honoured Scientist of Russian Soviet Federal Socialist Republic (1966) and of Tatarian Autonomous Soviet Republic (1945).

Minor planet 2376 has the name “Martynov”.

Foreign member of the Royal Astronomical Society (London, 1969), member of many of research and editorial boards of astronomical journals.

MASEVICH Alla Genrikhovna

Born 09.10.1918 in Tbilisi. In 1941 graduated from the Moscow Industrial Pedagogical Institute named after Karl Liebknecht. 1941–1945 – postgraduate student at Moscow State University (with a break for evacuation). Candidate of Physical and Mathematical Sciences (1946). In 1945–1957 worked at the Moscow State University SAI, initially – as a scientific secretary, later – as a senior researcher. Doctor of Physical and Mathematical Sciences (1956), Professor. Deputy Chairman of the Astronomical Council of the USSR Academy of Sciences (1957-1987). From 1987 to 2003 – an employee of the Astronomical Council of the Academy of Sciences of the USSR (now – INASAN). Honored Scientist of the RSFSR (1978). Valid member of the International Academy of Astronautics, foreign member of the Royal Astronomical Island (1963), Indian National Academy of Sciences (1980), Austrian Academy of Sciences (1985), etc. Died on 05/06/2008 in Moscow.

Specialist in the field of evolution and internal structure of stars, space geodesy, geophysics. Research topics: numerical modeling of stellar evolution, space geodesy, observations of artificial satellites of the Earth. Author of more than 150 scientific publications and co-author of four monographs.

Outstanding science organizer. She was responsible for organizing optical observations of satellites and headed the work on the creation of national and then foreign network of observation stations. Based on these observations, she also organized scientific research in the field of space geodesy, geodynamics, and geophysics. She is the founder of the Russian school of research on the structure and evolution of stars. For many years, she was the head of international cooperation on "Using optical observations of satellites for scientific purposes" issue and Multilateral cooperation of the academies of sciences of socialist countries on "Physics and evolution of stars" (1974-1989) problem, as well as bilateral cooperation with scientists from France, Finland and India on the same question. President of the IAU Commission 35 "The internal structure of stars" (1967 – 1970), Chairman of the COSPAR working group "Observations of artificial satellites and telemetry" (1961-1970). Member of the editorial board of the journals "Astrophysics" (1984-2008) and "Astrophysics and Space Science" (1985-1991), executive editor of the series of collections "Actual problems of astronomy" (1989-2008).

For many years she was actively involved in community work. From 1964 – Member of the Management Board, and from 1979 to 1991 – Deputy Chairman of the Soviet Peace Committee. Since 1975, she was a member of the World Peace Council, since 1968 – Vice-President of the USSR-USA Society, since 1972 – a member of the Board of Founders of the APN, since 1985 – a member of the Board of the Committee of Soviet Scientists Against Nuclear War. From 1981 to 1983, she was the Deputy Secretary General of the UN Organizing Committee for the International Conference "Peaceful Uses of Space" (Vienna, 1982), as well as a member of a number of other domestic and international organizations.

International Prize in Astronautics (1963), Galaber International Prize for Excellence in Space Exploration. State Prize of the USSR (1975), Order of the Red Banner of Labor (1975), "Badge of Honor" (1961), 2 medals, as well as 2 medals of the Exhibition of Economic Achievements, anniversary medals and various departmental awards. Commander's Cross and Star of Poland (1998), medals of Bulgaria, Czechoslovakia, Mongolian People's Republic and France.

The minor planet 1904 Masevich (1904 Massevitch), discovered by T.M. Smirnova on May 9, 1972 at the Crimean Astrophysical Observatory, is named in her honor.

MASHONKINA Lyudmila Ivanovna

Born 03.04.1952 in Preobrazhenie, Primorskii area. In 1975-1987, her family name was Solov'eva. In 1974, graduated from Kazan State University (KSU). In 1981-1984, a PhD student at the Astronomy Department of KSU. In 1974-2003, Junior Scientific Researcher, Assistant Lecturer, Assistant Professor at the Astronomy Department of KSU. PhD Thesis “Investigation of O-type stellar atmospheres based on non-LTE line formation for N III-N IV” (1985). DSc dissertation “Non-LTE analysis of important chemical elements for galactic chemical evolution studies “(2003). Since 2004, has been working at the Institute of Astronomy of Russian Acad. Sci. (INASAN). Since 2015, Head of the Department of Non-Stationary Stars and Stellar Spectroscopy at INASAN. President of the IAU Commission 14 in 2012-2015.

L.I. Mashonkina’s research interests are in the fields of stellar atmospheres, spectral line formation, stellar atmosphere parameters and chemical abundances, and Galactic chemical evolution. She developed the methods of numerical modeling of the non-local thermodynamic equilibrium (non-LTE) line formation for 17 chemical elements, from hydrogen to thorium, with eight of them, using the multi-level atom models for the first time, and for the neutral iron, taking into account not only the laboratory energy levels but also those predicted by the atom structure calculations. L.I. Mashonkina, together with S.A. Alexeeva, explained the formation mechanism of the neutral carbon emission lines observed by T.A. Ryabchikova in spectra of B-type dwarf stars. Based on T.A. Ryabchikova’s observations and the non-LTE calculations for Pr II-Pr III and Nd II-Nd III, L.I. Mashonkina determined for the first time a vertical distribution of praseodymium and neodymium content in the atmospheres of rapidly oscillating and chemically peculiar A-type stars. L.I. Mashonkina found that the galactic thick disk and thin disk stellar populations reveal a different chemical history concerning the neutron-capture elements. In the thick disk stars, europium is overabundant relative to iron and relative to barium, and a step-like change in the [Eu/Fe] and [Eu/Ba] ratios occurs at the thick to thin disk transition; nearly solar ratios [Eu/Fe] and [Eu/Ba] are found for the thin disk stars. These data suggest that during thick disk formation evolved low-mass stars started to enrich the interstellar gas by s-nuclei of barium. Based on the chemical evolution calculations (C. Travaglio), L.I. Mashonkina estimated that the thick disk stellar population formed on a timescale between 1.1 to 1.6 Gyr from the beginning of the protogalactic collapse, and duration of the halo formation is about 1.5 Gyr. L.I. Mashonkina published more than 100 scientific papers.

In 1986-2003, L.I. Mashonkina was actively involved in teaching students and is currently teaching. She read lectures on theoretical astrophysics, the physics of the interstellar medium, general astronomy, mathematical cartography, and topography for students at KSU, MSU, and MPTU. She supervised three PhD dissertations.

MATKEVICH Leopol'd Lucianovich

Born 17.12.1878 in St.-Petersburg. In 1908, graduated from Dept. pf Physics and Mathematics of Petersburg University (now, The State University of St.-Petersburg). In 1908–1917, 1920–1938, 1945–1949: with The Central Astronomical Observatory at Pulkovo, taking positions of Extraordinary Astronomer, Senior Researcher, Academic Secretary, Head of Theoretical Department; in 1917–1920, was in charge of the International Latitude Station in Chardzhou (Turkmenia); from 1938 to 1945, with Tashkent Astronomical Observatory. Dr.Sci. (1936), Professor of Astronomy (1947). Died 24.12.1949, buried at the Memorial cemetery of the Pulkovo Observatory

Scientific works belong primarily to the area of theoretical astronomy and fundamental astrometry. Authored more than 30 science papers.

Carried out the analysis of all observations of Enke Comet, published ephemerides for each of its appearances. Calculated the orbit of Halley Comet and a number of minor planets.

In Pulkovo, extensively observed right ascensions of stars with the Major Passage Instrument, took part in processing of fundamental Pulkovo Catalogs for epochs 1925.0 and 1930.0. In 1920–1924, carried out observations for the Fundamental Catalog of declinations 1925.0 with the Vertical Circle. In 1937–1938, supervised processing of observations obtained with Zonal Astrograph in 1927–1935. The last years of his life were devoted to composing the Faint Stars Catalog.

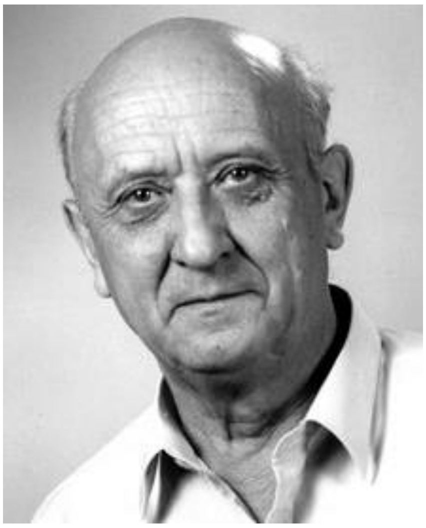
In 1917–1920, during the I World War, was drafted and sent by the Military Topographic Department of the Head Office of the General Staff to the city of Chardzhou (Turkmenia), where he headed the International Latitude Station. There he observed oscillations of the Earth axis with the use of Zenith Telescope.

Carried out a number of precise latitude determinations: the difference between latitudes of Moscow and Pulkovo (1929), the latitudes of astronomical points in the locations of solar eclipse observations (1912, 1936, 1941, 1945), in Byelorussia and on the coast of The Barents Sea.

In Tashkent Astronomical Observatory, rearranged temporarily stopped observations of geodetic stars. This collective work was finished and published in 1939. Established observations of faint stars with the Meridian Circle, first according to Pulkovo Program, and later according to that worked out by the Commission on Faint Stars at the Astronomical Council of the USSR Academy of Sciences.

Honored by State Awards: Order of «Badge of Honor» (1945), Medal «For Valorous Labour in The Great Patriotic War 1941–1945» (1945).

MATVEENKO Leonid Ivanovich



Born 20.12.1929 in village Rossoshentsy (Chigirinsky district, Kirovograd region). Since 1956 after graduating faculty of physical and mechanical engineering in Leningrad Polytechnic Institute worked in the radio astronomy laboratory in the P.N. Lebedev Physical Institute of the Russian Academy of Sciences. Since 1969 he has been working at the Space Research Institute. He was Doctor of Physical and Mathematical Sciences (1979), Professor (1987). He was Deputy Chief Editor of the journal "Astronomy Letters", member of International Astronomical Union. State USSR Prize Laureate (1999), Honored Scientist of the Russian Federation (2001). Died 13.10.2019 in Moscow.

The main works of L.I. Matveyenko are associated with the development of equipment, methods for studying radio sources with high and ultra-high angular resolution, studies of the hyperfine structure of astronomical objects. He is author of about 400 scientific papers, one monograph and a patent for a precision mirror space antenna.

In 1956-1959 at the Crimean station of the Lebedev Physical Institute, he explored active regions on the Sun, detected and measured the trajectories of plasma ejections. He participated in the creation of a radio interferometer and in determining the trajectories of the space rockets Lunnik. In 1960-1965 he took part in the creation of a radio interferometer of the Center for Long-Range Space Communication (DSN), developed methods for measuring and determining the parameters of large antennas.He organized and conducted observations of the Crab Nebula coverage by the Moon in the entire spectrum of radio waves, separates the envelope and amorphous mass, detects a compact variable radio source, participates in observations of the coverage of the quasar 3C 273, and determines the spectra of the nucleus and jet.

He proposed a method of very long based radio interferometry (VLBI) for precision space navigation in 1962 (DSN), preserving the coherence of recorded signals by introducing a "pilot signal". Application of the method in astrophysics L.I. Matveenko, N.S. Kardashev and G.B. Sholomitsky was published in Izvestiya VUZov "Radiofizika" in 1965. The method was implemented by Canadian and, independently, American radio astronomers in 1967.

In 1969 he carried out VLBI observations of quasars on the basis of the Crimea – Green Bank, detected superluminal velocities of movement and in 1971 – sources in the lines of the Crimea – Haystack water vapor, established maser emission.

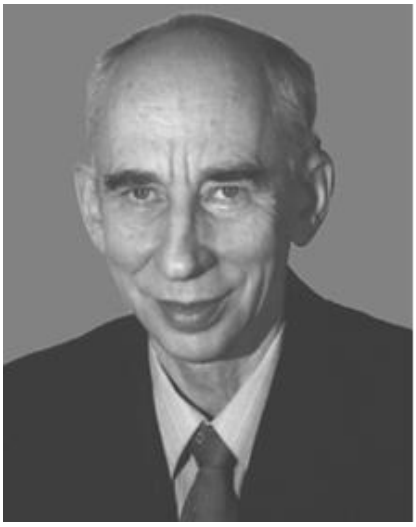
Participated in the development and commissioning of 70-meter precision antennas. A VLBI network of 6 domestic radio telescopes, which supplemented the global network, was created in connection with the VEGA project (Venus-Halley) in 1985 under his leadership. The trajectories of balloons floating in the atmosphere of Venus were measured with an accuracy of 100 m.

In recent years, he improved methods for studying the fine structure of astronomical objects, obtained the hyperfine structure of a number of active galactic nuclei, in the maser emission of star-forming regions with microsecond precision. A single self-consistent vortex nature was established, accompanied by the ejection of bipolar jets, self-focusing, and excitation of magnetic fields.

10 candidates and one doctoral dissertation were defended under his supervision.

He was awarded of the President of the Russian Federation Gratitude for participation in the creation of the KVAZAR-KVO system, (2006), the Labor Veteran medal (1989), departmental awards of domestic and foreign organizations.

MAZETS Evgeny Pavlovich



Born 14.08.1929 in Kalinin. In 1954 he graduated from Leningrad Polytechnical Institute and was enrolled in the laboratory of nuclear isomerism at the Leningrad Physical-Technical Institute (the Ioffe Institute). Candidate of Physical and Mathematical Sciences (1972), Doctor of Physical and Mathematical Sciences (1986), Head of the Laboratory of Experimental Astrophysics (1982-2013), Corresponding Member of the Russian Academy of Sciences (1991), member of the COSPAR commissions on space dust and extra-atmospheric astronomy, member of the RAS Council on Space Research, principal investigator of 24 Soviet/Russian space experiments and of the Russian-American gamma-ray burst experiment Konus-Wind. Died 02.06.2013 in St. Petersburg.

Since 1961, at the invitation of academician B.P. Konstantinov, E.P. Mazets was involved in research in astrophysics and space science at Ioffe Institute. Under his leadership, studies of cosmic dust in the vicinity of the Earth were performed and for the first time reliable data on the flux and mass spectrum of cosmic dust particles together with the full inflow of cosmic matter on Earth had been obtained by direct measurements. In the project "Vega" E.P. Mazets with colleagues performed exceptionally successful study of the dust coma of Halley's comet in a wide range of particle masses from 10^{-6} to 10^{-16} g. The completeness and reliability of these unique data significantly exceeded the results of measurements obtained by the European mission "Giotto".

Outstanding progress in modern high-energy astrophysics and gamma-ray astronomy resulted from a series of cosmic gamma-ray burst (GRB) experiments leaded by E.P. Mazets. In early 1970’s, one of the first independent confirmations of this exciting phenomenon came from the Ioffe Institute detector onboard the Kosmos-461 satellite. In 1978-1983, using highly sensitive instruments onboard interplanetary probes "Venera 11-14", the basic observational characteristics of GRBs were established. In 1979, a new type of astrophysical sources was discovered – Soft gamma repeaters (SGRs), which were associated later with highly-magnetized neutron stars (magnetars).

In 1994-2013, under the leadership of E.P.Mazets, a large-scale international project was carried out, in which the study of GRBs was conducted simultaneously by the Russian scientific instrument “Konus” onboard the NASA "Wind" spacecraft and by similar detectors onboard Russian “Kosmos" and "Coronas" spacecraft series. In these studies, a number of important results were obtained. In 2004, the Ioffe Institute detectors Konus-Wind and Helikon (onboard Coronas-F) made unique observations of a giant flare from SGR 1806-20 and of its reflection from the Moon. For the first time, the light curve, the energy spectrum and the huge energy of the initial pulse of an SGR giant flare had been measured with the high confidence. Later, in 2005-2007, the first extragalactic magnetar giant flares were detected from M81/M82 and M31. These results are extremely important for understanding the nature of these unique objects and the physical processes occurring in them. Results from the Konus-Wind experiment, which have been continuously operating for more than 25 years, are widely used by the international scientific community as an important part of modern multiwavelength and multimessenger astronomy.

E.P. Mazets was awarded the Lenin Prize for his work in the field of space research (1986). He was awarded the Order "Badge of Honor" (1983) and the Order of "Friendship" (2008). For the discovery of gamma-ray repeaters he was awarded the Academician Belopolsky Prize.

MEDVEDEV Yuri Dmitrievich

Born 13.06.1955 in Moscow; graduated from the Mathematics and Mechanics Faculty of the Leningrad University with a Ph. degree in astronomy (1980); worked at the Institute of Theoretical Astronomy (ITA) of the USSR Academy of Sciences (1980); completed his PhD studies in 1985 and his doctoral studies in 1994 at the ITA under the guidance of Professor Yu. V. Batrakov; became Head of Laboratory (1998 until now) in the Institute of Applied Astronomy of the Russian Academy of Sciences, Doctor of Sciences in Physics and Mathematics (1995), Professor in Astronomy (2011), a Member of IAU and a number of scientific councils and editorial boards in Russian and international astronomical journals. Asteroid (375832) Yurijmedvedev is named in his honour.

At the beginning of his scientific career, Yu.D. Medvedev paid much attention to the development of determining the orbits of celestial bodies from the optical positional observations. He developed a number of original methods to improve comet orbits. They were used afterwards to define the Halley Comet's orbit more precisely and to forecast its motion during the "Vega" project in which he actively participated. A new scientific task was taken up by Yu. D. Medvedev in 1987 that of determining the rotation parameters and the nucleus shape of Halley's Comet as a result of the positional observations of this comet from 1985 to 1987 (the SOPROG Observation Program). Thus, he developed a method to calculate sublimation of gas from the comet nucleus taking the following facts into account: thermal conductivity of the nucleus surface layers; the arising non-gravitational forces which disturbed and affected the comet's orbital motion; and non-gravitational moments which disturbed the nucleus rotation. Subsequent calculations of the Halley Comet's perturbed orbital motion and its nucleus perturbed rotation were based by Yu. D. Medvedev on these developments. He compared the calculations with the observational data and obtained the rotation parameters and the nucleus shape. The exploration of the perturbed comet nucleus rotation brought up a new task, that of considering simultaneous impact of both of non-gravitational changes in the nucleus rotation and sublimation changes in the nucleus shape. These calculations showed that the sublimation of a comet's material could cause the formation of elongated comet nuclei, which were rotating around short axes of the nucleus shapes. Studying the movement of dust particles in the comet comas allowed Yu.D. Medvedev to prove the existence of equilibrium concentrations of dust particles in the comet-to-Sun line, which could under certain conditions perform as a photo center, thus producing a systematic bias in the positional observations of the comet.

In recent years, Yu. D. Medvedev has been actively developing the problem of asteroid and comet hazard. He has improved the data on the Shoemaker-Levy 9 comet orbit, obtained reliable values of the mother body size and the moments when its fragments fell on Jupiter. Together with his student D. E. Vavilov has developed a new linear method which is based on an original curved coordinate system and makes it possible to reliably estimate the probability of asteroid collision with the Earth. In association with Yu. S. Bondarenko, Yu. D. Medvedev has developed and tested the methods to process radio echo coming from the asteroid surface, which allows to assess the asteroid speed, its visible size and rotation period.

Yu. D. Medvedev has published more than 150 scientific papers, with 2 monographs included. Six theses have been defended under his supervision.

MELNIK Anna Maratovna

Born 18.09.1964 in Москве. In 1987 graduated from Astronomical division of Faculty of Physics of Lomonosov Moscow State University. In1996 defended a Ph.D. thesis «Kinematics of high-luminosity stars», in 2011 defended a doctoral thesis «Kinematics of outer pseudorings and the spiral structure of the Galaxy». Since 1987 she works in SAI MSU (as engineer, junior researcher, researcher, senior researcher, leading researcher).

Specialist in the field of galactic astronomy. Her main research interests are the kinematics and dynamics of the Galaxy, the influence of the bar on the kinematics of the stellar population, numerical models, the kinematics of OB associations, spiral structure of the Galaxy.

In 1995 she together with Yu.N. Efremov presented a new division of high-luminosity stars into OB associations. In the late 1990s and early 2000s, she developed the concept of the Galactic spiral structure, published a series of papers in which the observed velocities of young stars are compared with the velocities caused by the motion of gas clouds in a spiral density wave.

Since 2005 A.M. Melnik has been developing an alternative model of the Galaxy, which includes a bar and the elliptical resonance rings that appear due to the resonance between the epicyclic motion of stars and their orbital rotation with respect to the bar. According to this concept, the structure and kinematics of the Galaxy in the Solar neighborhood are determined by the presence of a two-component outer ring R1R2. A.M. Melnik together with the Finnish astronomer P. Rautiainen (University of Oulu) and the Russian colleagues: A.K. Dambis, L.N. Berdnikov, A.S. Rastorguev and E.V. Glushkova (SAI MSU), showed that the model of the Galaxy with the outer ring R1R2 reproduces many features of the motion of young objects (OB associations, young stellar clusters and Cepheids) in the wide Solar neighborhood. A series of papers on the two-component outer ring in the Galaxy has been published.

In 2009-2021 A.M. Melnik together with A.K. Dambis studied the motions of OB associations in the Galaxy, refined the Galactic rotation curve and calculated the systematic non-circular motions of young stars in various star-gas complexes. High-precision proper motions obtained from the Gaia satellite gave a possibility to detect the expansion in some OB associations. A series of papers (2017–2021) has been published which presents estimates of the stellar and virial masses of OB associations, the values of the efficiency of star formation in giant molecular clouds and the contribution of binary systems into the velocity dispersion inside OB associations.

She has published about 70 articles.

Member of the IAU and member of the European Astronomical Society.

MELNIKOV Alexander Viktorovich

Born 18.05.1974 in Leningrad. In 1997, graduated from the Faculty of Mathematics and Mechanics of St. Petersburg State University with a degree in Astronomy. 1997 to 1998: Intern Researcher at the Institute of Theoretical Astronomy of Russian Academy. Since 1998: with The Central Astronomical Observatory at Pulkovo (Intern Researcher, Junior Researcher, Research Assistant, Senior Researcher). 2002: Ph.D. (Cand.Sci.) ("Resonant rotational dynamics of small satellites of planets"). 2016: Dr.Sci. ("Resonant and chaotic phenomena in the dynamics of celestial bodies"). Member of IAU.

A.V. Melnikov's scientific interests are related to celestial mechanics and dynamic astronomy. The main scientific results were obtained in studies of resonant and chaotic rotational dynamics of small satellites of the planets of the Solar system. Showed, together with I.I. Shevchenko, that satellites of planets with still undetermined states of rotation, as well as not yet discovered small satellites, in the overwhelming majority cannot rotate synchronously with their orbital motion. They rotate either significantly faster than synchronously or, much less likely, chaotically. Developed algorithms and performed simulations for the rotational dynamics and observed light curves (obtained at Pulkovo Observatory by a group led by A.V. Devyatkin) of the seventh satellite of Saturn, Hyperion. For the first time, proved by modeling the chaotic character of Hyperion's rotation. Obtained, together with V.V. Orlov and I.I. Shevchenko, important results regarding the stability of long-term orbital dynamics of multiple stellar systems and exoplanetary systems.

MELNIKOV Oleg Alexandrovich

Born 20.03.1912 in Khvalynsk (now Saratov Region). In 1933, graduated from Kharkiv University. From 1933, with Pulkovo Observatory (Deputy Director, Head of the Astrophysical Laboratory, Head of the Department of Stellar Physics). In 1946, also Professor of Leningrad State University. Corresponding Member of the Academy of Sciences of the USSR (1960). The first Director of the Special Astrophysical Observatory (in the time of its construction). Died 12.05.1982 in Leningrad.

Scientific works of O.A. Melnikov were devoted to spectral studies of the Sun, stars, and the interstellar medium, to astronomical instrumentation, and to the history of astronomy. Performed detailed spectrophotometry of absorption lines in the spectra of sunspots, torches, chromosphere. Together with E.Ya. Perepelkin, found turbulent motions in the solar chromosphere. In cooperation with S.S. Zhuravlev, proposed a method for determining the strength of magnetic fields of sunspots from contours of selected lines in the spectra of sunspots. Studied spectra of cepheids in detail. Determined chemical composition of the atmospheres of δ Cep and η Aqu and established the presence of turbulence in them; revised the zero-point of the relationship between their period and luminosity.

Built, along with B.K. Ioannisiani, ASI-5 astronomical spectrograph for studying ultraviolet stellar spectra. Observations with this instrument, carried out under his supervision on Mount Aragats, Armenia, were used to determine physical parameters of stellar atmospheres, refine the stellar temperature scale, etc.

In the 1950-ies, completed a series of studies of physical conditions in the atmospheres of A-type stars: determined the parameters of atmospheres of these stars, refined the scale of their temperatures. Set the zero point of the spectrophotometric temperature scale. In a number of works, considered interstellar absorption and determined some characteristics of interstellar gas. Determined the strength of oscillators of forbidden transitions in iron and the shifts of spectral lines related to variation of pressure in the light source.

Authored the study "On the history of the development of astrospectroscopy in Russia and the USSR" (1957), as well as a number of other works on the history of astronomy.

Took part in the construction of the 6-meter reflector, then the world's largest telescope.

President of Commission No. 9 "Astronomical Instruments" of the International Astronomical Union (1964-1967). Participated in The Committee for Lenin and State Prizes of the USSR for science and technology.

Winner of F.A. Bredikhin Prize of the Academy of Sciences of the USSR (1950).

MELNIKOV Victor Fedorovich

Born 24.08.1953 in Zhigalovo village, Irkutsk Region. 1970-1975, a student at the Faculty of Physics of Saratov State University. 1975 – 2008, worked at the Radiophysical Research Institute, starting as an engineer and moving on to leading scientist. Defended his PhD thesis in 1990 and D.Sc. thesis in 2006. Associate Professor since 2007. Joined the Central Astronomical Observatory at Pulkovo, RAS, as a leading scientist in November 2008; a principal scientist since 2014. Worked as a visiting professor at observatories and universities of the USA, Japan, China, and Brazil. A member of the Bureau of the Solar Physics Division of the European Physical Society (ESPD), a member of the Community of European Solar Radio Astronomers (CESRA). Awarded the S.P. Korolev Medal from the Russian Cosmonautics Federation for Services to State Cosmonautics in 2011.

V.F. Melnikov's research interests are radio astronomy and astrophysics. His main scientific research is in the field of solar flare physics and solar radio astronomy. Together with his colleagues and students, he obtained new results of fundamental importance for the problem of acceleration and transport of particles in solar flares. Among these results is the discovery of a new class of microwave flaring loops with the radio brightness peak at the top of the loop in the optically thin part of the frequency spectrum (with K. Shibasaki and V.E. Reznikova). This discovery laid the basis to prove a strong increase of the relativistic electron density and a substantial transverse anisotropy of the electron pitch-angle distribution at the top of the flaring loops. He developed (together with G.D. Fleishman) the gyrosynchrotron radiation theory, established a significant effect of the anisotropic pitch-angle distribution of radiating electrons on the slope of the microwave spectrum, polarization, and other characteristics of the gyrosynchrotron radiation. Based on the analysis of the spatial structure of quasi-periodic pulsations of microwave loops, he developed (together with V.M. Nakariakov) new observational and theoretical methods to diagnose the magnetic field and plasma density inside the flaring magnetic loops.

The obtained results gave rise to the new rapidly developing field of solar flare physics that comprises the development of new diagnostic methods of energy, pitch-angle, and spatial distributions of accelerated electrons in the flaring magnetic loops using their observed spatial, spectral and polarization characteristics in microwave, hard X-ray and gamma radiation spectra based on the modeling and numerical solution of the kinetic Fokker-Planck equation. These methods provide important new constraints on the mechanisms of electron acceleration in solar flares.

V.F. Melnikov successfully works with young scientists, postgraduate and undergraduate students. He is one of the initiators of the annual All-Russian school contests in the field of space physics and astrophysics (in honor of S.A. Kaplan). He is a founder of the Youth Center for Solar Radio Physics at the Consortium of Lobachevsky State University and Radiophysical Research Institute in Nizhny Novgorod. He is one of the organizers of All-European youth summer schools on solar physics, coronal seismology and astronomy. He lectured in Japan (2009) and China (2012), and is a member of the Scientific Board of Trustees of Nizhny Novgorod Planetarium.

In 2007, he was a recipient of the Letter of Thanks for the support and education of young talented researchers from the Nizhny Novgorod Region Governor.

He is the author of more than 70 articles in leading Russian and international scientific journals and co-author of a monograph.

MENTSIN Yuliy Lvovich

Born 30.07.1952 in Chernivtsi, Ukraine. In 1975 graduated from Gorky State University, Faculty of Radiophysics. In 1980 1983 was a full-time graduate student at the Institute for the History of Science and Technology (IHST) of the Academy of Sciences of the Soviet Union. PhD in Physics and Mathematics (1987). From 1986 has been working in the Sternberg Astronomical Institute of Moscow State University, also known as GAISH: started as an engineer, and was promoted up to Senior Researcher (1998). Since 2001 is Head of Museum of History of GAISH University Observatory.

Research interests: history and sociology of science. The main research areas: the history of astronomy in Russia; the history of classical field theory; the scientific revolution of the 16th 17th centuries. In 1987 (in IHST) successfully defended a Ph.D. thesis on the topic: "The genesis of the concept of a field in Maxwell's electrodynamics", dedicated to the analysis of the processes of formation of fundamentally new ideas about the structure of physical reality in the works of Faraday and Maxwell.

The main scientific results:

In the archives of the Russian Federation, a number of materials related to the history of astronomy at Moscow University were discovered and investigated. The results of the research were published in a number of issues of the yearbook "Historical and Astronomical Studies" and in the collective monograph "On the Study of the Phenomenon of Soviet Physics of the 1950s 1960s. Sociocultural and interdisciplinary aspects". St. Petersburg, 2014. (Chapter "GAISH of Moscow State University in the 1950s-1960s. (Chronicle of the major events)".)

Some social aspects of the Western European scientific revolution of the 16th 17th centuries have been studied. In particular, the role of the Royal Society of London in the development of political philosophy in the 2nd half of the 17th century, and the role of Isaac Newton in the preparation and implementation of financial reform at the turn of the 17th and 18th centuries.

Author of more than 100 scientific and popular science publications.

Since 2017 for the students of Moscow State University has been teaching the inter-faculty course "Scientific Revolution of the 16th 17th Centuries: Scientists, Power, Society".

Member of the editorial board of the yearbook "Historical and Astronomical Studies."

MIKHAILOV Alexander Alexandrovich

Born 26.04.1888. in Morshansk (now, Tambov Region). In 1911, graduated from Moscow University. In 1918–1948 – Professor of Moscow University, 1919–1947 – Professor and Head of Chair in Moscow Institute of Engineering Geodesy, Aerial Photography and Mapping. 1941–1942 – Director of Science in Tashkent Observatory. Since 1947 with Pulkovo Observatory (1947 to 1964 – Director; organized reconstruction of the Pulkovo Observatory, destroyed during the war; 1964 to 1977 – Head of Dept. of Astronomical Constants, from 1977 – Adviser). Astronomer and Gravimetrist, Dr.Sci., Corresponding Member of the USSR Academy of Sciences (1943), Academician (1964). 1939 to 1962 – Chairman of Astronomical Council of the USSR Academy of Sciences; 1946 to 1948 – Vice President of IAU, 1932 to 1950 – Chairman of All-Union Astronomical and Geodetical Society. Died 29.09.1983 in Leningrad.

Science studies belong to practical and theoretical gravimetry, theory of eclipses, stellar astronomy, astrometry, history of science.

Took part in numerous gravimetric studies and в astronomical expeditions for observations of solar eclipses. Carried out a series of works on determination of the force of gravity in the area of Kursk Magnetic Anomaly (1920). To determine the figure of the Earth, developed a method or reduction of the gravity force via out mass condensation. Suggested and implemented the method of mathematical modeling to testing of different ways of regularization of the Earth in the course of determination of its shape with the use of Stokes theory and Vening-Meynes formula. Gravimetric works of A.A. Mikhailov were generalized in his «Course of Gravimetry and Theory of the Figure of the Earth» (2-nd edition, 1939). Developed the theory of solar eclipses, precomputed the circumstances of the eclipses, and also of transits of planets across the solar disk and stellar occultations by the Moon. Developed an original instrument and new technique of observations of Einstein effect (deflection of stellar light in the gravitational field of the Sun, which can be detected during solar eclipses), and implemented them during the eclipse of 1936. His monograph «Theory of Eclipses» (2-nd edition, 1954) is widely known. Developed the theory of equirectangular cylindrical and conical projections with error equations, composed stellar Atlases with different degree of detail, including The Major Atlas, which includes all stars up to 8.25 stellar magnitude. Suggested a new telescopic mounting, in which the tube is statically directed towards the celestial pole – the so-called polar tube. Observations with this instrument made it possible to refine the aberration constant. Interpreted results of lunar studies with the use of space probes. Under his direction, in Pulkovo Observatory new Departments were opened: of Radio Astronomy, Instrumentation etc.), The Solar Station near Kislovodsk and Blagoveshchensk latitude Laboratory were built. Popularized astronomy, authoring a series of works on the history of astronomy, including a biography of Copernicus. Carried out the general editorship of the Russian translation of Copernicus' book «On revolutions of celestial spheres».

Corresponding Member of Bureau des Longitudes in Paris (1946), Member of German National Academy of Natural Sciences «Leopoldina» (1959), Member of International Academy of Astronautics, its Vice President (1967–1979), Chairman of All-Union Astronomical and Geodetical Society (1932–1950), Vice President of the International Astronomical Union (1946–1948). Hero of Socialist Labor (1978), Honored Scientist of Russian Federation (1959).

The minor planet 1910 was named Mikhailov.

MIKHELSON Nikolay Nikolaevich

Born 01.12.1918 in Moscow. In 1941, graduated from the State University of Leningrad. From 1942, in the Soviet Army. In 1943 graduated from Military Surveying College; served as Surveyor up to his discharge in 1946. 1951: finished the post-graduate course at the Pulkovo Observatory. Since May, 1951: Junior Researcher at the Pulkovo Observatory; 1958 – Senior Researcher; 1963–1971 – Head of Dept. of Astronomical Instrumentation; 1971–1986 – Senior Researcher; 1986–1996 – Leading Researcher– Advisor. Dr.Sci. (Technical Sciences) (1984). Senior Researcher in Astronomical Instrumentation (1957). Expert in the area of Astronomical Optics. Chairman of the Commission on Astronomical Instrumentation of Astronomical Council of the USSR Academy of Sciences, Member of IAU, Member of Organizational Bureau of IAU Commission No 9 «Astronomical Instrumentation». Died 16.10.1996 in St. Petersburg.

His basic science studies are related to Astronomical Instrumentation. From 1951, took part in design works for the 6-meter Telescope (BTA). Tested ideas for BTA control systems. Directed the construction of the electronic digital controlling machine for RM-700 Telescope, telescope control device for lunar and planet observations (lunar and planetary telescope gear), specialized electron-beam commuters, flow-charts and other devices. Made several inventions in automation and telemetry.

Expert in Astronomical Optics, brilliant experimentalist in the area of electronics and automation. Advised different local and foreign organizations on telescope optics. Cooperated with Karl Zeiss Company.

Authored more than more than 140 publications on astronomical instrumentation and history of science, including two monographs: «Optical Telescopes (theory and design)» (1976) and «Optics of Astronomical Telescopes and Methods of its Calculations» (1995). Has two invention certificates.

Honored with State Awards: Order of Red Star (1945), Medals «For Defence of Stalingrad» (1942), «For Defeat of Germany in the Great Patriotic War 1941–1945».

MILYUKOV Vadim Konstantinovich

Born 03.12.1945 in the Chita region. Graduated from Phys. Fac. of Lomonosov Moscow State University (1970). Worked at MSU Sternberg Astronomical Institute in various positions (1970 – present). Head of the Laboratory of Laser Interferometry (1992 – present). Doctor of Sciences in Physics and Mathematics (2006). Visiting Research Fellow at Sun Yat sen University, Guangzhou, China (1985-1987). Visiting professor at Istituto di Fisica dello Spazio Interplanetario CNR, Rome, Italy (1994-2008). Top-Notch Foreign Expert, Professor at Sun Yat sen University, China (2014-present). Member of Russian Gravitational Society (1988). Member of the European Geosciences Union (2001). Honored Scientist of Moscow State University (2012).

The principal scientific works are related to experimental gravity (including terrestrial and space experiments) and experimental geodynamics; he is the author of about two hundred scientific papers, and the co-author of eight monographs.

In the 1970s, V. Milyukov was involved in experimental work under the leadership of M. Sagitov at measuring the Newtonian gravitational constant. The result obtained was one of the best in the world and was used to determine the value of G in CODATA-1986 system. In the 2010s, V. Milyukov, in cooperation with the Huazhong University of Science and Technology (China), took part in two independent experiments to measure Newtonian gravitational constant, which provided a new value of G. At present, the achieved accuracy of the G value is the best in the world.

In the early 1990s under the leadership of V. Milyukov, the geodynamic complex, based on the long base broadband laser interferometer-strainmeter, was implemented in the Elbrus region (the Northern Caucasus). Based on of continuous monitoring lithosphere strains, a number of important scientific results in the area of both global and regional geodynamics, such as the fluid core resonance and free oscillations of the Earth, dynamics of the magmatic structures of the Elbrus volcano, were obtained. Since 2005, under the leadership of V. Milyukov the Northern Caucasus regional network of GNSS stations is developed. Based on the data of these stations, the study of contemporary tectonic movements of the North Caucasus is carried out.

For many years, in the 1990s-2000s, in collaboration with Istituto di Fisica dello Spazio Interplanetario (Italy), he participated in the International programs for space gravitational experiments, including the development and construction of an onboard accelerometer for the Beppi Colombo mission (European Space Agency).

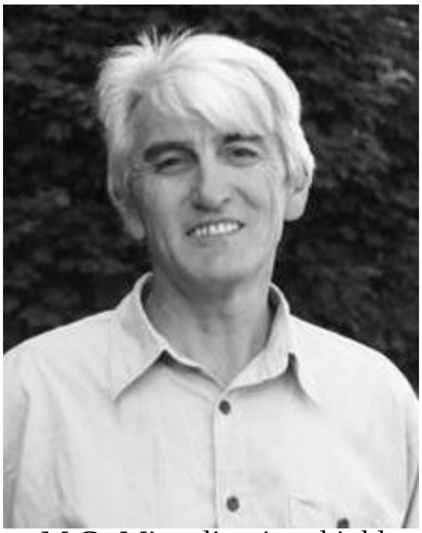
Since 2012, a new research area has been launched – the development of concepts and schemes for fundamental gravitational experiments using the cluster satellite system orbiting the Earth. This new research area also includes the work on the International project of the space borne gravitational-wave detector TianQin, which involves the deployment of a space-based laser interferometer in a high geocentric orbit. The project is being developed within the framework of a cooperation agreement between Lomonosov Moscow University and Sun Yat Sen University.

Foreign collaboration member of the KAGRA project (Kamioka Gravitational Wave Detector, Japan).

Foreign collaboration member of the “Galileo Galilei” project (Test of the Principle of Equivalence in space, Italy).

Chairman of the International Advisory Committee of the TianQin project.

MINGALIEV Marat Gabdullovich



Born 28.03.1953 in Urazgildino village, Uljanovsk region. In 1975, he graduated from Kazan State University, Physics Department; from 1975, has been working at the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) in positions from Intern Researcher (1975-1977) to Deputy Director for Science (1994-2015), from 2015, Head of Scientific Research. Defended his Ph.D. dissertation 1985 in “Study of Radio Emission of Some Solar-System Bodies with the RATAN-600 Radio Telescope”. In 2002, defended his Dr.Sci. dissertation on “Multi-frequency in-vestigations of extragalactic objects at RATAN-600”.

M.G. Mingaliev is a highly qualified professional in observational radio astronomy. He started his career almost at the very beginning of the RATAN-600 radio telescope operation; was directly involved in implementation of basic operating modes of the radio telescope.

In his first years at SAO RAS, he studied radio emission of some Solar-system bodies: radio emission from Galilean satellites; and for the first time ever, the radio emission was detected for the smallest (Europe) and nearest to Jupiter (Io) of them. From these studies, the special properties of the Io satellite were revealed, which was proved 10 years later with direct investigations. For the first time, penetration of Solar wind to the Jupiter’s orbit was detected from deformations of decimeter radiation belts. In the high angular resolution (6 arcsec) studies of Jupiter at 1-cm wavelength, high-energy electrons in radiation belts requiring their origin explanation.

Over the last years, his scientific interests are connected with the studies of extragalactic objects, the search of cosmic microwave background. Under his supervision, joint international programs were implemented at RATAN-600: detection of compact radio sources for further observations with the space radio telescope (SRT) of the RadioAstron project (2005-2010); monitoring of bright radio sources simultaneously with the Planck space telescope (2009-2012); multi-frequency investigation of blazars at RATAN-600 and the Metsähovi Radio Observatory (Finland) during 2006-2012; study of radio emission of galaxies of the NLS1 (Narrow Line Seyfert 1) type during 2013-2016, and others.

The author of about 200 scientific papers on observational radio astronomy, instrument-guidance papers in modernization and development of the receiving and measuring system, improvement of observation modes, and enhancement of the RATAN-600 parameters. Carries out great scientific and organizational work: main astrophysical problems are determined and solved with his valuable and active contribution at RATAN-600.

Carries out the work on training students and post graduates; two Ph.D. dissertations have been defended under his scientific supervision

M.G. Mingaliev is a member of the Observatory Academic Council, EAS member, IAU member, CRAF member (Committee on Radio Astronomy Frequencies) – Expert Commitee of the European Science Foundation (ESF), a bureau member of the Scientific Council on Astronomy, RAS, a member of Large Telescopes Program Committee, RAS Division of General Physics and Astronomy.

MININ Igor Nikolaevich

Born in 1928. Graduated from the Mathematics and Mechanics Faculty of Leningrad State University (LGU, now Saint Petersburg State University) in 1951. Competed postgraduate studies in astrophysics at LGU in 1954. Worked at the Main Geophysical Observatory (1954--1957) as a junior research fellow. In 1957--1960, worked at the Leningrad Electrotechnical Institute as a senior lecturer. Since 1960, a senior research fellow at the Mathematics and Mechanics Faculty of LGU. Since 1967, worked at the Department of Atmosphere Physics of the Physics Faculty at LGU (as Professor since 1972). In 1979--1994, Head of the Department. Since 1954, Ph.D. Since 1967, DSc in Physics and Mathematics. In 1982, obtained the title of a professor. Member of IAU. Died in 1999 in Saint Petersburg.

I.N.Minin's early research related to the dynamics of planetary nebulae and expansion of envelopes of Novae stars taking into account the raking of interstellar matter and influence of the stellar wind flowing on the envelope from the other side. Obtained the solution of the motion equation in the explicit form. He showed that the stellar wind substantially influences the expansion process. Developing Ambartsumian's theory of disruption of stellar clusters, I.N.Minin found that the stellar dissipation from globular clusters leads to their self-similar contraction so that the cluster structure remains unchanged.

Later, I.N.Minin's research was fully focused on the theory of radiation transfer. He derived equations and developed a method of radiation transfer calculations in media with the slowly varying refraction coefficient. In a series of works (with V.V.Sobolev), he investigated light scattering in planetary atmospheres using various approximations (single scattering, diffusion approximation, planar and spherical symmetry, etc.). The results were used for the interpretation of observations of Venus. An important result was his prediction of polarization of the skylight of Venus in various spectral bands at different zenith distances. I.N.Minin considered in detail the nonstationary radiation transfer for monochromatic scattering. The nonstationary transfer equation is made stationary by means of the Laplace transformation in time. This allows one, in particular, based on the asymptotics of stationary radiation fields at nearly conservative scattering, to find asymptotics of nonstationary radiation fields on large timescales.

Many characteristics of the nonstationary radiation field in the semi-infinite medium were expressed by I.N.Minin through an auxiliary function depending on time and an angular variable and related to the photon escape probability from the medium boundary at a fixed angle upon a given time. An equation characterizing this function was obtained. I.N.Minin also investigated classic stationary problems for anisotropic scattering in a semi-infinite medium and a planar layer with finite thickness. A generalization of Sobolev's probability of photon escape from medium (considered earlier in case of isotropic scattering only) was obtained.

He described the planetary spectrum in molecular absorption bands. Wrote several reviews (on nonstationary radiation scattering) and two monographs: 'Nonstationary stars' (with V.G.Gorbatsky, 1963) and 'Theory of radiation transfer in planetary atmospheres (1988). These books received the Leningrad State University Prize.

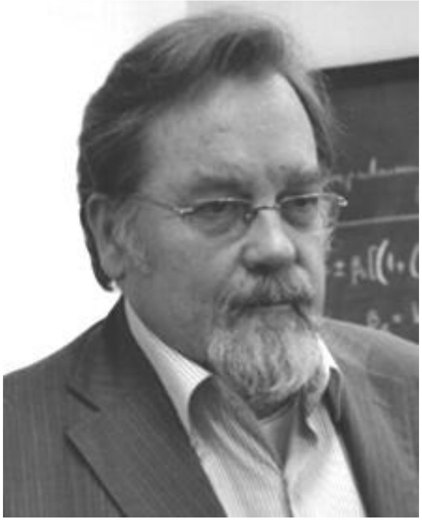
MIROLYUBOVA Anna Sergeevna

Born in 1886 in Moscow. Astronomer at the Astronomical Observatory (AO) of Moscow State University (1919), a researcher of the AO Time Service (1920–1931). Since 1931, a researcher of the Sternberg Astronomical Institute (SAI), M.V. Lomonosov Moscow State University (MSU). Died in 1978 in Moscow.

A.S. Mirolyubova was one of P.K. Sternberg's students at Girls' Academy, where Sternberg lectured on theoretical and practical astronomy as well as geodesy (1901–1917). Active participant of the Moscow Society of Amateur Astronomers, board member (after the revolution in 1917). Since 1920, A.S. Mirolyubova worked at the AO Time Service, and since 1931, worked at SAI. In the 1930s, the SAI Time Service provided time signals for all important events in the USSR including the first non-stop flight to the Far East (flyers V.S. Grizodubova, M.M. Raskova, and P.D. Osipenko), V.P. Chkalov's flight to America above the North Pole and geology field trips. Later, the SAI Time Service joined the network of similar newly established services, with the main organization located in Pulkovo. All the organizations (two of them in Pulkovo and Leningrad, three in Moscow and one in Tashkent) formed the Interdepartmental Time Commission headed by Director of Pulkovo Observatory. After the evacuation of SAI during the war (October 1941), A.S. Mirolyubova and another SAI scientist M.A. Smirnova stayed in Moscow to ensure reliability and stability of the SAI Time Service during the war years until the return of the main SAI Time Service from Sverdlovsk (August 1943). Both of them often had to work during air raids. Nevertheless, they continued regular (six times a day) broadcasts of time signals, with an additional special signal at midnight for tuning the main Kremlin clock. Besides, at any moment, they had to be ready to answer phone questions from military commanders concerning time.

For their heroic work during the war, A.S. Mirolyubova and M.A. Smirnova were awarded the Orders of Lenin (1951).

MIRONOV Alexey Vasilevich



Born 22.01.1945 in Kalinin (now Tver). After graduating from M. V. Lomonosov Moscow University (MSU) in 1968, he did postgraduate studies at the Department of Stellar Astronomy and Astrometry of MSU until 1971. In 1985, completed his PhD with the thesis "The chemical composition and the evolution of stars in globular clusters". From 1971 until 1984, he worked as a research assistant at Sternberg Astronomical Institute of MSU (SAI). From 1984 until present, he has been working as a senior researcher at SAI. DSc in 2014 with the thesis "Broadband WBVR and "Lyra-B" photometric systems for high-precision stellar photometry". In 2005, received the title of an associate professor (the specialty "Astrophysics and Radio Astronomy"). In 2016, Honored Researcher of MSU.

A.V. Mironov's field of research deals with the theoretical and practical issues on the use of high-precision stellar photometry and understanding the structure and evolution of old stellar clusters and their stars. In the 1980s, A.V. Mironov, along with N. Samus, was able to prove that the subsystem of globular clusters in our galaxy consists of at least two populations: the ancient, characteristic by extremely low metallicity, and intermediate-age clusters, characterized by greater than 10 times heavy elements content, which show obvious dependence of the metallicity on Galactocentric distance.

In 1985, based on multi-color photoelectric measurements and Straižys' ideas, A.V. Mironov, along with Khaliullin and Moshkalyov, created a new WBVR broadband system and accompanying observation and processing methods, which allows acquiring high precision photometric data. Using the WBVR system in 1985-89, a group of scientists at SAI, under V.Kornilov's leadership and A.Mironov's active involvement, acquired observational photometric data in the high altitude observatory in the northern Tien-Shan mountains, which later, in 1991, served as the basis for the high precision "Catalogue WBVR-magnitudes of the Brightest Stars in Northern Sky".

Using the WBVR system, A.V. Mironov and his colleagues conducted research on variable stars of different types. In addition, they accurately determined the color indices of the Sun and stars in the "Hyades" star cluster. This helped deduce the existence of at least two subsystems of G spectral type stars of different metallicity and age.

Being a member of the SAI spatial scientific group in 1997-2014, A.V. Mironov took an active role in the preparation of a global space multicolor photometric survey of the sky for stars brighter than the visual magnitude 16 (the Lyra-B project). He developed a new 10-color photometric system that allows effective three-dimensional spectral classification of stars and determines the amount of interstellar absorption. A.V. Mironov estimated the number of stars of different spectral types for use in measurements in the Lyra-B project. Through comparison, he founds systematic errors of vast modern spectrophotometric libraries. Along with Krusanova, he created and explored a new photometric standards system for the WBVR system, containing more than 6,000 stars.

A.V. Mironov, with his co-authors, has published 125 scientific papers in Russian and international journals. In 2008, he published a monograph "Fundamentals astrophotometry" (FIZMATLIT, 2008).

MISHUROV Yuri Nikolaevich

Born in 1947. Graduated from Rostov State University (now Southern Federal University) in 1971. In 1971-1974 was a postgraduate student of the chair of astrophysics at RSU. In 1974 defended his candidate dissertation (PhD Thesis) devoted to: "Theory of the galactic density waves. 'Fine' structure of spiral arms". In 1976-1983 Senior researcher at the Scientific Research Institute at RSU. 1983 – 2007 associated professor, full professor and chairman of the Astrophysical Department at the Faculty of Physics at RSU. Since 2007 – professor at SFU. Since 1993 – a member of UAS.

Activity area: studies of the Galactic spiral structure, evolutionary processes which lead to the structure formation, kinematic, dynamical and chemical manifestations of spiral structure. Author of more than hundred scientific works.

In collaboration with Marochnik L.S. and Suchkov A.A. he suggested an interpretation of the observed neutral hydrogen distribution in the Galactic disk in the framework of the galactic density waves. This research has led to a concept that the corotation is located close to the Sun (1972).

By means of developed statistical analysis of the observed stellar velocities in collaboration with Pavlovskaya E.D. and Suchkov A.A., Lepine J.R.D. (SPU, Brasilia) and others he determined parameters of the Galactic disk and spiral wave pattern rotation and supported that the corotation resonance is located near the Sun.

In collaboration with Lepine J.R.D. and Amores E.B. he explained the nature of the observed ring like gap in distribution of atomic neutral hydrogen in the Galactic disk (the gap lies in the disk plane and its center coincides with the disk's one and its radius is approximately equal to the solar Galactocentric distance) as a consequence of the interstellar gas outflow from the corotation resonance. This new Galactic structure was called as "The Galactic Cassini division".

In collaboration with Lepine J.R.D., Acharova I.A., Gibson B.K. (GB), Tkachenko R.V. and others he explained the formation of the observed wriggling radial distrbution of several chemical elements by means of the corotation resonance influence on the rate of the elements synthesis. In the papers, the mean mass of the heavy elements, ejected per supernovae event, was also estimated; these results supported the observed inference that 'stars', whose initial masses exceed about 20 solar mass, transform into black holes escaping the normal stars phase. These results also supported the new representation that supernovae stars Type Ia consist of two sub-types: prompt and tardy ones.

In his work it was shown that it is unlikely to meet solar siblings (stars which were born in the same Sun's open cluster) in the close solar vicinity (~100 pc) since they are disperse over a huge region of the Galactic disk under the influence of spiral arms.

In collaboration with Berman V.G., Marochnik L.S. and Suchkov A.A it was shown that, if we take into account thermal processes in the interstellar gas, the galactic spiral shocks lead to phase transition in the interstellar gas which result in the formation of the diffuse clouds. As a consequence, this explains the observed anticorrelation between the galactic gaseous disk width and its density.

MITROFANOVA Ludmila Arefievna

Born 29.11.1914 in Ol'shanki village, Elets District, Lipetsk Region. In 1939, graduated from Dept. of Physics and Math. of the State Middle Asia University (now, The National University of Uzbekistan Tashkent). 1948: finished the post-graduate course at The Central (Pulkovo) Astronomical Observatory of the USSR Academy of Sciences. 1934– 1945: with Middle Asia University, 1949–1980: with The Central Astronomical Observatory, at the positions of Junior Researcher, Senior Researcher, Head of Astrophysical Laboratory. Cand.Sci. (1951), Senior Researcher (1955), Member of the IAU (1961). Died 21.12.2002 in St. Petersburg.

Expert in the area of applied spectroscopy, authored about 30 scientific works.

Her studies were devoted to practical spectroscopy of solar and stellar phenomena. Combined astrophysical observations with laboratory experiments. Carried out Занималась laboratory determination of physical values for astrophysics: obtained different characteristics of atomic transitions, studied absorption spectra of molecules, presenting interest for studies of planetary atmospheres. In a cycle of unique papers, determined relative oscillator strengths for iron, chromium and titan. In her papers on the analysis of photoelectric records of solar spectra, an important result concerning periodical variations of the depths of Fraunhofer lines was obtained.

Took part in two expeditions for observations of total solar eclipses (1945, 1954). Was instrumental in organization, activation and equipping of the Astrophysical Laboratory in The Central Astronomical Observatory (1960–1962). Participated in ordering, testing and mounting of the equipment: vacuum diffraction spectrograph, major concave diffraction grate of Pashen–Runge type, and underground optical vacuum cuvette.

Studied the history of The Central Astronomical Observatory. Co-author of the unique photo album «150 Years of Pulkovo Observatory».

MOGILEVSKY Emmanuil Izrailevich (Mendel Azrilevich)

Born 17.10.1918, In 1941, graduated from the Kharkov State University. Since 1943 and until his death worked at the Pushkov Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation (IZMIRAN). Dr Sci. in Phys. and Math. (1965), Professor. In 1999 was awarded the title "Honored Scientist". Died 22.12.2014 in Moscow.

The scientific interests of E.I.Mogilevsky were mainly focused on the physics of the Sun and space plasma. He is the author of more than 200 scientific papers and a monograph, editor of a number of books.

Together with N.V.Pushkov, he founded the Heliophysical Laboratory of IZMIRAN and headed it permanently during 45 years.

The team under his supervision at IZMIRAN created the first photoelectric magnetograph, a tower telescope, and a full-vector magnetograph, which is still in working condition. Throughout his long and fruitful scientific activity E.I.Mogilevsky worked at the forefront of solar research, proposed and successfully developed the pioneering new ideas and approaches to solar physics. E.I.Mogilevsky put forward the concepts of force-free fields in the Sun, plasma clouds with inherent magnetic field propagating from the Sun, oscillation spectra of various solar features as their actual physical passport, filament structure of sunspot magnetic fields, continuous energy supply from subphotospheric layers in the form of solitons during a flare, and many others.

The last decades of his work he devoted mainly to substantiating the synergetic approach to the study of the Sun and developing ideas about the fractal cluster nature of the magnetized solar plasma and evolution of solar flares on the basis of the self-organized criticality model.

E.I.Mogilevsky is righteously considered to be the founder of the IZMIRAN scientific school of heliophysicists, which received, the world recognition. He was supervisor of 14 post-graduate students. Three of his disciples defended their Dr. Sci. dissertations. E.I.Mogilevsky had a great influence on solar studied in Irkutsk, Ussuriisk, Alma-Ata, Tashkent, and Azerbaijan.

MOISEENKO Sergey Grigorievich

Born in 1962 in Kishinev, Study in Odessa State University from 1980 to 1985 graduate student of the department. numerical methods VMiK MSU from 1987 to 1993. He defended his thesis. in 1995 on the topic "Modeling problems of two-dimensional gravitational magnetic gas dynamics and their astrophysical applications." Employee of the Institute for Space Research RAS from 1990 to the present. He defended his doctoral dissertation. in 2006 "Modeling the collapse of rotating astrophysical objects and magnetorotational processes in protostellar clouds and collapsing supernovae".

S.G. Moiseenko is engaged in mathematical modeling of astrophysical MHD processes. To simulate astrophysical MHD problems, an implicit operator-difference completely conservative method is used on a triangular grid of variable structure. Two-dimensional numerical calculations of the problem of the collapse of a rapidly rotating cold protostellar cloud were carried out, and the processes occurring during the collapse of a magnetized protostellar cloud were numerically investigated. For the first time, a magnetorotational supernova explosion was obtained in a two-dimensional setting. It was shown that the magnetorotational mechanism of a supernova explosion makes it possible to obtain the energy of a collapsing supernova explosion, which corresponds to observational data. The results of studying the magnetorotational explosion of collapsing supernovae show that the shape of the explosion depends qualitatively on the initial configuration of the magnetic field. S.G. Moiseenko was the first to discover Magneto-Differential-Rotational instability in the explosion of a collapsing supernova in numerical calculations. Currently, the magnetorotational mechanism of core-collapsing supernovae is one of the most realistic. Together with G.S. Bisnovaty-Kogan, proposed a mechanism for breaking the mirror symmetry of the magnetic field in rotating stars. The proposed mechanism makes it possible to explain the emergence of fast-flying radio pulsars, as well as the formation of asymmetric (including one-sided) directed jet emissions (jets).

MOISEEV Alexey Valerievich

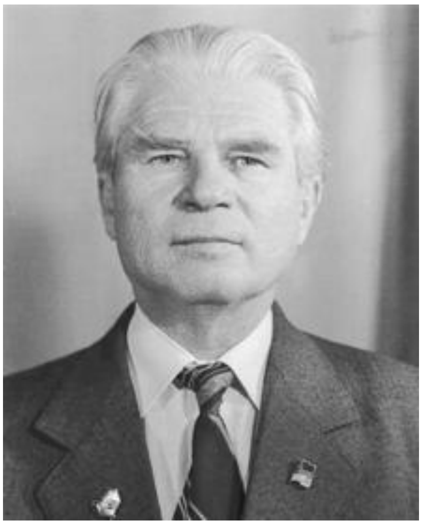
Born 13.11.1976 in Moscow, USSR. Graduated from Lomonosov Moscow State University in 1999. In 1999-2002 he was a postgraduate student in the Special Astrophysical Observatory of Russian Academy of Sciences (SAO RAS). Works in the SAO RAS since 2002 to the present. He defended Ph.D. thesis on "Morphology kinematics of stars and gas in barred galaxes" (2002), and obtained Dr.Sci. degree with thesis "Structure and evolution of galaxies from observations of their internal kinematics" (2012). He is a member of editorial board of Astrophysical Bulletin journal, member of International Astronomical Union (2006), and member of European Astronomical Society (2010). A member of council of Russian Scientists Association.

Scientific interests: extragalactic astronomy and physics of galaxies, spectral observations technique. The most of his scientific results are based on his own observations at the SAO RAS 6-m telescope by means of integral-field (3D) spectroscopic methods. Subjects of the main study: kinematics of gas and stars in different types of galaxies, star formation and stellar feedback, peculiar and interacting galaxies, active galactic nuclei. Among the published results, both personally and in collaboration: the discovery of circumnuclear polar discs and external polar rings in galaxies (2002-2015); the discovery (spectral confirmation) of an unique gravitational lens system the Cosmic Horseshoe; the observational evidences for the explosion of a supermassive hypernova star in the galaxy IC 10 (2007); the creation of a new catalog of polar-ring galaxies (SPRC, Sloan-based Polar Ring Catalog), measuring the shape of a dark matter halo in such galaxies (2011-2014).

He has published over 100 peer-reviewed articles in Russian and international journals.

He has Gold medal and Alferov Foundation Prize for young Russian scientists for the series of papers "The photometric and kinematic studies of circumnuclear regions of active and interacting galaxies" (2007).

MOISEEV Ivan Grigorievich



Born 31.07.1921 in Sidorovskoye, Moscow region. In 1953 he graduated from Moscow Energetic Institute with a degree in radio technique and was directed to the Crimean Astrophysical Observatory (CrAO) of the USSR Acad. of Sci. He advanced from junior researcher to Head of the Department. In 1963 he defended his Ph.D. thesis (Moscow, Moscow State University). Died 16.10.2008 in Katsiveli, Crimea.

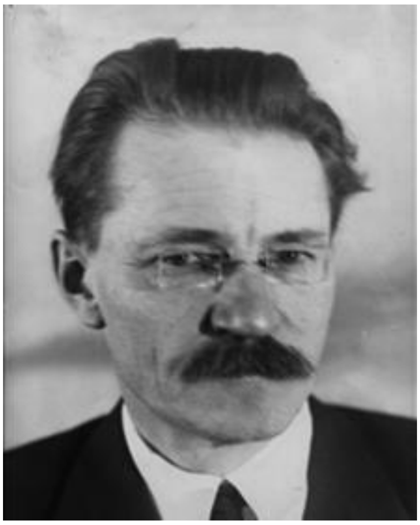
The basic researches relate to the fields of astrophysics and solar physics. I.G. Moiseev is one of the founders of radio astronomy at the Crimean Astrophysical Observatory (CrAO). In 1955 he participated in constructing the first in CrAO radio telescope that operated in the meter wave-length range. The regular solar observations were started at it. I.G. Moiseev headed the first radio astronomy group in CrAO (1957). In 1956 the second radio telescope at 10 cm wavelength was elaborated to study lower layers of the solar atmosphere. The test observations were carried out as early as in 1957. The radio astronomy methods of observations provided new, unknown earlier data on the upper layers of the solar atmosphere, limitedly accessible for observations in the optical range. In 1957 the next radio astronomy instrument in CrAO was a radio spectrograph that operated in the 2–3 m range. I.G. Moiseev ascertained that isolated bursts of solar radio emission related mainly to the fast drift bursts (type III) are associated with not only chromospheric bursts of standard power but subflares and other fast changing optical processes on the Sun.

In 1962 I.G. Moiseev headed the Department of Radio Astronomy. In 1966 he took part in constructing and putting into operation the 22-m radio telescope RT-22 in Simeiz which was among the top five instruments in the world. The following investigations were started: a) study of solar radio emission in the wide wavelength range up to millimeter, b) observations of variability of galactic and extragalactic radio emission sources, c) measurement of the hyperfine structure of compact cosmic radio emission sources by the method of very long baseline radio interferometry.

In 1969 I.G. Moiseev took part in organization and implementation of the first intercontinental observations at RT-22 by the method of very long baseline radio interferometry to study sizes and fine structure of cosmic radio emission sources. The experiments were carried out successfully, on the base Crimea-Haystack (USA) a record angular resolution of 0.0004" was derived.

In 1987 I.G. Moiseev was awarded the USSR State Prize for contribution to the field of radio technique. He authored about 50 scientific publications.

MOISEEV Nikolay Dmitrievich



Born 16.12.1902 in Perm. In 1924 he graduated from Faculty of Physics and Mathematics of MSU. In 1929 he defended the candidate thesis on the origin of comets and cosmic dust. In 1935 Moiseev became a Doctor of Physical and Mathematical Sciences (without defending a thesis) and a professor of MSU. During 1922-1931 he was working at the State Astrophysical Institute in Moscow. Between 1931 and 1955 he worked at the SAI MSU. From 1938 to 1955 he was the head of the Department of Celestial Mechanics of Faculty of Mechanics and Mathematics, MSU. From 1939 to 1943 he was the director of the SAI. From 1929 to 1947 Moiseev was a professor of the Department of Mathematics of the N.E. Zhukovsky Air Force Academy. Died 06.12.1955 in Moscow

The main scientific works are related to celestial mechanics, dynamical cosmogony, the theory of differential equations, and the history of science. Moiseev was engaged in dynamic cosmogony, worked at stability of celestial bodies motion problems, space ballistics and aeronautics. His research advisor was S.V. Orlov. N.D. Moiseev founded the Moscow School of Celestial Mechanics. He developed qualitative methods of celestial mechanics, introducing generalizing characteristics of trajectories. A large cycle of his works is devoted to the study of secular and long-period perturbations of the movements of natural celestial bodies, especially minor planets (now they are called small Solar system bodies). Important results of these studies were obtained with the help of averaged, including interpolation-averaged, theoretical schemes that he introduced for the first time. In a series of works on dynamical cosmogony, he gave a critical analysis of cosmogonic hypotheses. In his works on stability theory, he studied orbital stability (investigated Hill's variation curves), introduced new concepts into the theory of technical stability, which are of great applied importance. In 1938 Moiseev founded the Department of Celestial Mechanics at the Faculty of Mechanics and Mathematics, MSU, which he supervised until the end of his life. He taught the main courses: «Theoretical Astronomy», «Celestial Mechanics», «Qualitative Methods of Celestial Mechanics», etc. From 1947 to 1955 Moiseev worked on a part-time as the head of the ballistics department in S.P. Korolev’s Design Bureau. He is the author of more than 120 scientific papers. Moiseev’s main scientific works are the monographs «Essays on the development of stability theory» (1949), «Essays on the development of mechanics» (1961). Since 1946 Moiseev was the IAU member. Asteroid with № 3080 is named after him – «Moiseev».

MOLCHANOV Andrey Pavlovich

Born 14.01.1918 in Petrograd (now St. Petersburg). After graduating from the Leningrad Polytechnical Institute (now St. Petersburg Polytechnical University), worked at an aircraft plant. In 1949, under his guidance, one of the first measurements of the Solar flux in the radiowave band was carried out in the USSR. He headed the Solar research at the Pulkovo Observatory. Since 1960, worked at the Leningrad State University (now St. Petersburg State University) in various positions. In 1964, defended his Dr.Sci. dissertation. Since 1966 until the end of his life, he headed the Laboratory of cosmic radio emission that he created. Headed the Section "Applied Radio Astronomy" at the Scientific Council for Radio Astronomy of the USSR Academy of Sciences. Professor, Honorary Worker of Science and Technology of RSFSR. Author of almost two hundred scientific papers. Died 14.11.1996 in St. Petersburg.

Working in the field of radio astronomy, A.P.Molchanov designed an equipment for receiving radio emission from the Sun, and, as early as in 1949, measurements of the Solar radio emission were carried out under his guidance, first ever in the USSR (along with similar measurements at the Gorky Institute of Physics and Technology). His Ph.D. thesis, defended in early 1950s, was one of the first on Solar radio astronomy in the USSR.

Headed the Solar research at the Radio astronomy department of the Pulkovo Observatory, organized by S.E.Khaikin. He became an enthusiast for conducting radio astronomical observations of Solar eclipses, during which it is possible to obtain high angular resolution. He organized and successfully conducted more than 20 expeditions to various regions of the world. One of remarkable results of these observations was the construction of the emission spectrum of individual active regions in the microwave range, which had a strongly pronounced maximum radiation flux density at about 5 cm wavelength. His paper published in 1961 radically changed the concept of physical nature of the radio emission from Solar active regions, indicating an essential role of magnetic field in generation of the radio waves.

In 1960, he was invited to the Faculty of Mathematics and Mechanics of Leningrad State University, where he began to lecture on radio astronomy and organized the Laboratory of radio astronomy at the Astronomical Institute. In 1966, he moved to the Faculty of Physics of Leningrad State University, and created there the Laboratory of cosmic radio emission, which he headed until the end of his life.

He was engaged in various applied problems. Used a circular scanning method to determine the effective center of the Solar radio emission for radio navigation purposes. Based on these works, an especial "Sun service" was created in the USSR, equipped with unique radio telescopes. The creators of the telescopes were awarded the State Prize of Russia in 1999.

Together with P.N. Zanadvorov he wrote the popular "Course in Electrical and Radio Engineering", which was published many times in several languages.

MORDVINOV Alexander Veniaminovich

Born 21.09.1951, Svetly village, Irkutsk Region. In 1974, graduated from Kazan State University with a degree in Astronomy. Since 1974, has been working in the Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation, the USSR Academy of Sciences (since 1992, the Institute of Solar-Terrestrial Physics, ISTP SB RAS) in different positions, starting as a laboratory assistant and progressing to a supervisor at the Solar Activity Lab (1974–2016). D.Sc. with specialization in solar physics (2009), Member of the Editorial Board of the journal "Solar-terrestrial Physics" (2015), Member of the International Astronomical Society (1995).

V.A. Mordvinov’s main area of research relates to solar-terrestrial physics. Author of over a hundred scientific papers, co-author of two monographs.

V.A. Mordvinov’s research has made a substantial contribution to the detection of space and time regularities of solar magnetic activity. He developed a quantitative model of the solar magnetic activity effect on the integral flux of its radiation. Using this model, solar magnetic activity was reconstructed along with solar radiation flux on a large time scale. In 2010–2016, V.A. Mordvinov studied the evolution of active regions, large-scale magnetic fields, and coronal holes in their cause-and-effect relationship. This showed that the north-south asymmetry of sunspot formation led to a significant asynchrony of magnetic field inversion at the Sun's poles. Discovered ensembles of coronal holes formed in unipolar magnetic regions associated with the disintegrating activity complexes and found that further evolution of high-latitude coronal hole ensembles results in the formation of coronal holes at the poles of the Sun.

V.A. Mordvinov participated in Russian and international scientific projects on studies of solar activity and solar-terrestrial relations, was one of the leaders of the USA NASA International Project for processing and interpretation of exoatmospheric measurements of the integral solar radiation flux.

Awards: The Certificate of Acknowledgement from the President of the Russian Academy of Sciences (1999), the honorary badge “Honored Veteran of the SB RAS” (1999), Certificates of Honor from RAS (2010), SB RAS (2007).

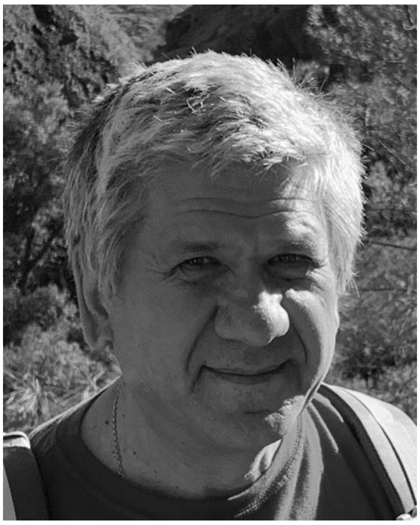
MOROZ Vasily Ivanovich

Born 20.05.1931 in Moscow (USSR). He graduated from the Faculty of Mechanics and Mathematics of Moscow State University in 1954. In 1954–1956 he worked as a junior researcher at the Astrophysical Institute of the Kazakh Academy of Sciences in Alma-Ata. In 1956 he returned to Moscow and in 1956-1969, worked as a junior and senior researcher in Sternberg Astronomical Institute of MSU. He defended his Ph.D. thesis in 1958, his doctoral dissertation in 1964. Both theses are devoted to astronomical planetary observations in the IR spectral region. In 1969 he became a professor at Moscow State University. From 1969 to 1974, he was also in charge of a laboratory at IKI RAS. In 1974 he wholly transferred to IKI. Until the end of his days, he worked as the head of the department of "Physics of planets and small bodies of the Solar system", remaining a professor at the physics department of Moscow State University. Died 23.06.2004 in Moscow.

Vasily I. Moroz, outstanding planetary scientist, is a pioneer in infrared astronomy, including infrared spectrometry of planets and satellites. He identified water ice on the surface of Jupiter's Galilean moons (1966), discovered bound water in minerals on Mars (1964) and estimated Martian atmospheric pressure. Since 1967 he was actively involved in exploring planets from spacecraft and became one of the leaders in this field. Vasily I. Moroz, participated in many Soviet space missions as the head of scientific experiments. In spectrometric experiments on the MARS-3, MARS-5, and FOBOS spacecraft, he determined the content of water vapor in the atmosphere of Mars, the optical characteristics of dust and surface properties, and obtained other pioneering results summarized in his monograph (1978). He made a significant contribution to the Soviet space exploration of Venus. He was the first to carry out an experiment on spectrometric measurements of solar and self-radiation of the planet in the lower atmosphere of Venus and obtained a vertical profile of water vapor abundance. He investigated the properties of aerosols and the greenhouse effect on Venus. On the VENERA-15 and VENERA-16 spacecraft, V. Moroz was a leader of the experiment on Fourier spectrometry (GDR-USSR) and obtained important data about the middle atmosphere of Venus. He supervised the preparation of the planetary Fourier spectrometer at MARS-96. The launch was unsuccessful, but a new version of spectrometer was installed aboard two ESA missions, to Mars and to Venus, MARS-EXPRESS, and VENERA-EXPRESS. On the MARS-EXPRESS apparatus, he also supervised the SPICAM and OMEGA experiments. In the VEGA project, V. Moroz participated in most of the experiments and was a co-investigator of the IKS experiment, where the parent molecules in the inner coma of Halley's comet were first identified.

V. Moroz created the Moscow School of Planetary Studies and trained a team of world-class researchers who successfully participate in international planetary programs. He is the author of over 260 scientific articles and two monographs: Physics of the Planets (1967) and Physics of the Planet Mars (1978) and, in co-authorship, the textbook Course in General Astronomy (1966), latest edition 1986, translated into several languages. He proposed several projects for future missions. Vasily Moroz honored Scientist (1999), awarded state awards and prizes, including the Order of the Red Banner of Labor (1976), USSR State Prize (1985), the Main Prize COSPAR 2004 for outstanding contribution to space research. The name of V.I. Moroz is assigned to a crater on Mars and to asteroid 16036.

MOSKALENKO Igor Vladimirovich



Born 04.05.1962 in Moscow. In 1985, graduated from the Physics Department of M.V. Lomonosov Moscow State University (MSU) with a M.Sc. degree in theoretical nuclear and particle physics. In 1985-2000, a junior researcher, research scientist, senior scientist at the Institute for Nuclear Physics, MSU. In 1994-1995, worked at the Centre d'Etude Spatiale des Rayonnements (France). In 1996-1999, worked at the Max-Planck-Institut für extraterrestrische Physik (Germany). In 1999-2005, worked at the Goddard Space Flight Center (NASA) and the University of Maryland (USA). Since 2005, has been working as a senior staff scientist at Stanford University (USA). Ph.D. (1990) in nuclear and particle physics, Habil. (2017) in astrophysics and stellar astronomy. Associate editor of the "Advances in Space Research" journal (Elsevier, the Netherlands).

Scientific interests cover a wide range of topics in such areas as astrophysics of cosmic rays (CRs), gamma-ray astronomy, CR transport in the heliosphere and interactions of CRs with the solar system bodies, search for signatures of dark matter (DM) etc. Author of more than 300 scientific papers in professional journals and the editor of several special issues dedicated to astrophysics of CRs. A student of V.V. Balashov, one of the few theoreticians who passed the famous theoretical minimum exam developed by L.D. Landau (in 1954) and made a significant contribution to theoretical atomic and nuclear physics. I.V. Moskalenko is a co-author of the self-consistent framework and a code for propagation of Galactic CRs and generation of the diffuse emission called GalProp (I.V. Moskalenko & A.W. Strong 1998), which has become a de facto standard in astrophysics of CRs and gamma-ray astronomy. GalProp is often updated and includes all types of interactions of CR particles and nuclei with the interstellar medium and the model of the interstellar medium itself. The latter combines 3D distributions of gas (H2, H I, H+), radiation and magnetic fields in the Galaxy. I.V. Moskalenko is the author of many pioneering works in high energy astrophysics. In particular, he showed (1991) that the Sun is a source of high-energy neutrinos that arise as a result of CR interactions with its atmosphere. He predicted (2006) the existence of gamma-ray emission due to the inverse Compton scattering of solar photons off CR electrons, which soon was discovered by the Fermi-LAT telescope (2011). This radiation has a wide distribution on the sky with a maximum brightness in directions close to the direction to the Sun. He predicted the existence of stars, luminosity of which due to annihilation of captured DM particles in their cores may be comparable to or even exceed the luminosity of the stars due to thermonuclear burning. The model predicts the existence of unusual white dwarfs, essentially "DM burners," in the central regions of DM-rich galaxies. One of his recent studies (2019) is devoted to the detection of gamma-ray emission from a huge 400-kpc-diameter halo around M31 Andromeda galaxy, and another is discussing a possible DM origin of this emission (2021). Most recent research papers deal with the presence of primary lithium in CRs (2020), with a surprising excess in the spectrum of iron at energies below 1 GeV/nucleon (2021), which is apparently associated with a past supernova explosion in the Local Bubble, and with the effect of a shock wave around ε Eri star on the observed spectrum of very-high-energy CRs (2021). I.V. Moskalenko is a member (since 2005) of the Fermi-LAT Collaboration (Fermi Large Area space Telescope), a recipient of the Bruno Rossi Prize (2011) awarded by the American Astronomical Society to the Fermi-LAT team, a fellow of the American Physical Society (2010), and a recipient of NASA's honorary awards (2008, 2010). He is a member of the Yodh Prize Committee (2017-2023), a member of the "CR Physics" section of the RAS Space Council, and an organizer of numerous conferences on astrophysics of CRs and gamma-ray astronomy (including dedicated sessions at COSPAR).

Email: imos@stanford.edu

MUKHANOV Viacheslav Fedorovich

Born 02.10.1956 in Kanash, Chvashia. Graduated from MIPT in 1979 in nuclear physics. Ph.D in 1982 (MIPT). Worked at the Institute for Nuclear Research, Moscow, from 1982 to 1991. Habilitation 1989 in Lebedev Physical Institute. Since 1991 to 1997, Associate Professor at ETH, Zurich. Since 1997, Professor at Ludwig-Maximilian University, Munich. Head of the the Division of Astroparticle Physics and Cosmology. Co-founder and Scientific Director of the Journal of Cosmology and Astroparticle Physics (JCAP).

V.F. Mukhanov's research interests centered on the theory of Quantum Origin of the Universe Structure. Working in 1980-1981 with Gennady Chibisov at Lebedev Physical Institute in Moscow, he predicted the spectrum of inhomogeneities in the Universe that originate from the initial quantum fluctuations. The numerous experiments results with measured temperature fluctuations of the Cosmic Microwave Background Radiation were in excellent agreement with this theoretical prediction, thus confirming that the galaxies and their clusters originated from the initial quantum fluctuations. Later on, V.F. Mukhanov proved that his results, obtained together with G. Chibisov in 1981, can be generalized and developed the general consistent quantum cosmological perturbation theory.

V.F. Mukhanov also proposed (with Bekenstein) the quantization of the black holes and calculated their spectrum. Among other results are the theories of k-inflation, k-essence, Mimetic gravity.

For his achievements V.F. Mukhanov was awarded: Oskar Klein Medal, Stockholm University, Sweden (2006), Tomalla Prize, Switzerland (2009), Blaise Pascal Chair, ENS, Paris, France (2011), Amaldi Medal (2012), Gruber Prize in Cosmology (2013), Friedrich Wilhelm Joseph von Schelling-Preis, Bavarian Academy of Sciences and Humanities, Germany (2014) Max Planck Medal (2015), BBVA Foundation Frontiers of Knowledge Award (2015) in Basic Sciences Dirac Medal, (ICTP) (2019), and Sakharov Gold Medal of the Russian Academy of Sciences (2021).

V.F. Mukhanov is Distinguished Professor at New York University, at Korea Institute for Advanced Study and Sackler Professor at Tel Aviv University.

MUSTEL Evald Rudolfovich

Born 03.06.1911 in Sevastopol. Died on Apr. 10, 1988, in Moscow. In 1935, graduated from M.V. Lomonosov Moscow State University (at that time Moscow State University). PhD student at MSU in 1935-1938, then worked at Sternberg Astronomical Institute MSU. PhD thesis «Problem of the radiative equilibrium for the absorption coefficient dependent on frequency» (1939). The staff of Crimean Astrophysical Observatory in 1946-1960. Head of Astronomical Council of Academy of Science of USSR in 1960-1987. D.Sc. (1944, dissertation «Study of physical processes occurring during matter ejection by novae stars and masses of novae stars»). Corresponding member of AS of USSR (1953). Vice-president of IAU in 1970-1976. Died 10.04.1988 in Moscow.

E. R. Mustel's research interests were in the field of stellar atmospheres, novae and supernova stars, the Sun and solar-terrestrial physics. In the late 1930s, E. R. Mustel developed the theory of continuum spectra of A-B stars. The theory resolved a problem of a discrepancy between a high stellar color temperature describing a shape of the radiation spectrum and a relatively low effective temperature determined by the radiation flux through the unit area of the stellar surface. These studies provided a basis for the book «Stellar atmospheres» remaining the best manual on stellar spectroscopy until now. In 1951, E. R. Mustel, in collaboration with A. B. Severny, studied a strong solar flare of 1949 and for the first time obtained a realistic estimate of the electron number density in the emission region of hydrogen lines. Around that time, E. R. Mustel put forward a conjecture that the continuum of strong solar flares is due to the heating of the photosphere. In the early 1950s, E. R. Mustel suggested a possibility of the existence of shells formed due to the sweeping of the interstellar gas by the matter outflow from O-stars. He showed that these shells can be detected in the hydrogen H-alpha emission line. This conjecture anticipated their discovery and a surge of interest to the study of shells blown by stellar winds of O-stars by 15 years. In the 1950s, E. R. Mustel came to the conclusion that the abundance of carbon, nitrogen, and oxygen in shells of novae stars significantly (10-100 times) exceeds the cosmic abundance of these elements. Later on, this fact became a decisive argument in favor of the theory of a thermonuclear flash on the white dwarf surface, currently a generally accepted mechanism of novae outbursts. In 1970, E. R. Mustel and A. A. Boyarchuk established a remarkable fact that the novae shells have a shape of a prolate spheroid, in which principal structure components are polar caps along the major axis and equatorial belt. This fact is nowadays confirmed for all well-studied novae and is associated with processes occurring during the white dwarf outburst in a binary system. In the early 1970s, E. R. Mustel proved a thermal nature of the spectra of type I supernovae at the light maximum. E. R. Mustel explored different aspects of solar-terrestrial physics and published many articles on this issue. In total, he published 178 scientific papers.

E. R. Mustel was awarded the Order of Lenin, Order of the October Revolution, and two Orders of the Red Banner of Labour. He was a Laureate of Stalin prize (1952).

NADYOZHIN Dmitrij Konstantinovich

Born on June 04, 1937, in the Crimea. Graduated from Moscow Institute of Physics and Technology. He worked at the Keldysh Institute of Applied Mathematics and at A.I. Alikhanov Institute of Theoretical and Experimental Physics. Doctor of Physical and Mathematical Sciences. Veteran of labor, veteran of nuclear power and industry, member of the International Astronomical Union and the European Astronomical Society. Died 04.11.2020 in Moscow from complications related to COVID-19.

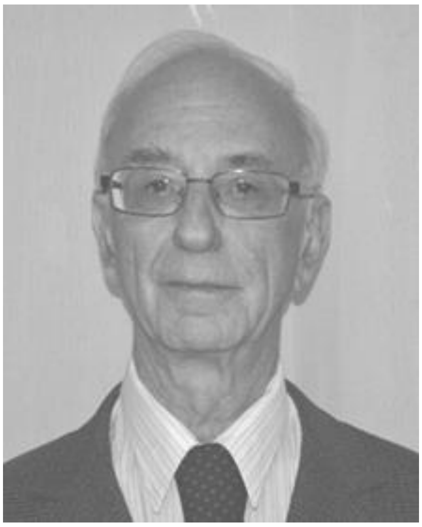
D.K. Nadyozhin established the basis for the radiation-hydrodynamic theory of supernova explosions that for the first time explained consistently the temporal and spectral dependencies of electromagnetic radiation fluxes (light curves) measured in astronomical observations. This theory also made it possible to calculate the hydrodynamic parameters of the ejected supernova shells – the total energy of the explosion, the velocity distribution of the ejected shell material, etc. The observed evidence of a long plateau phase (with almost constant luminosity) in the light curves of type II supernovae was explained by the formation of a cooling and recombination wave, similar to those observed during cooling of a fireball created by nuclear explosions in the Earth's atmosphere.

In 1970-1980, D.K. Nadyozhin and V.S. Imshennik were the first to develop the theory of neutrino thermal conductivity in supernovae. This approach allowed them to predict the temporal and spectral characteristics of the neutrino fluxes expected from supernovae. In 1978 D.K. Nadyozhin showed that the duration of a neutrino signal from a core-collapse supernova should lie in the range of 10-20 seconds (contrary to the estimates of 1-3 seconds widespread in foreign literature), and the energies of the emitted electron neutrinos and antineutrinos should be close to 8 and 12 MeV, respectively. This prediction was brilliantly confirmed by neutrinos observed from supernova SN1987A.

In 1980, in collaboration with G.V. Domogatsky, he discovered a new direction in the theory of the origin of chemical elements – neutrino nucleosynthesis. Further development of this area provided an opportunity to explain some of the features observed in the cosmic abundance for several isotopes of light chemical elements (lithium, beryllium, boron, etc.), as well as heavy elements (bypassed isotopes and isotopes attributed to the "weak component" of the rapid neutron-capture process).

D.K. Nadyozhin found several important self-similar solutions applicable for collapses and explosions of stars. He was the first to understand the origin and the nature of superluminous supernovae, discovered the relationship between the properties of the supernova light curves and presupernovae parameters, as well as proposed a method for determining cosmological distances based on type II supernovae.

NAGIRNER Dmitry Isidorovich



Born 19.04.1938 in Leningrad (now St. Petersburg). In 1960, graduated with distinction in astronomy from Leningrad State University (LGU). In 1960 – 1963, did postgraduate studies in astrophysics at LGU (with acad. V.V. Sobolev as a supervisor). Assistant (since 1963), Associate Professor (since 1967) at LGU’s Department of Mathematics and Mechanics. In 1971, became a senior researcher, and in 1988, a leading researcher at the Astronomical Observatory of LGU (now V.V. Sobolev Astronomical Institute of SPbGU). Since 1997, a professor at SPbGU's Department of Astrophysics. D.Sc. (1984). Member of IAU (since 1976) and EAS (since 1991).

In the 1960s to the mid-1980s, D.I. Nagirner’s area of research was the analytical theory of multiple scattering of spectral line radiation. He obtained the exact and asymptotic solutions of the main problems of this theory. Thus, he essentially finalized the development of the theory of multiple light scattering with complete frequency redistribution (CFR). D.I. Nagirner wrote several review papers on the theory of spectral line formation in scattering atmospheres, both with CFR and with partial frequency redistribution, as well as with polarization taken into account. In 1971, he received the University award for studies on radiative transfer (with V.V. Ivanov). Since the mid-1980s, he turned to high-energy astrophysics and cosmology. He derived relativistic kinetic equations describing the scattering of polarized radiation on free electrons. In these equations, both radiation frequency and electron energies are arbitrary, and the degeneracy of particles in super-strong magnetic fields is taken into account. Obtained numerical solutions of a number of problems related to high-energy objects (bremsstrahlung, pair production, and annihilation, etc.).

D.I. Nagirner published about 70 papers. In 2006, his monography “Analytical Methods in Radiative Transfer Theory” was published in the “Astrophysics and Space Physics Reviews” series. In 1960, he discovered that if the extinction in a hot stellar atmosphere is produced by a combination of Thompson scattering and true absorption, then the limb degree of polarization of the emergent radiation is smaller than that given by the Chandrasekhar–Sobolev limit (obtained for purely scattering atmosphere). He found that there is a point on the stellar disk where the plane of polarization rotates by 90 degrees (the "Nagirner effect").

For more than 20 years, D.I. Nagirner has been reading lectures on theoretical physics for students in astronomy at Saint Petersburg State University. He wrote 7 textbooks: “Lectures on Radiative Transfer Theory”, “Elements of Cosmology”, “Quantum Mechanics and Statistical Physics for Astronomers”, “Radiation Mechanisms in Astrophysics”, “Compton Scattering in Astrophysical Objects”, “Cosmic Microwave Background and its Distortions”, “Electrodynamics for Astronomers”. They were published by Leningrad (St. Petersburg) University Press in 2001–2016. Nine students defended their Ph.D.s under his supervision. His former student J.Poutanen is now a professor at the University of Turku (Finland).

The reference has been provided by St. Petersburg State University.

NAGOVITSYN Yuri Anatolievich

Born 01.07.1955 in Nizhny Tagil (Sverdlovsk Region). On graduation of the Department of Mathematics and Mechanics of Leningrad State University, worked as Observer at Kislovodsk Mountain Astronomical Station (1978-1987). 1987-2000: Researcher, Senior Researcher and Leading Researcher at the Central Astronomical Observatory at Pulkovo. 2000-2007: Scientific Secretary of Pulkovo Observatory. 2006: Dr.Sci. ("Quasi-periodic manifestations of solar activity on various time scales"). 2005 to 2016 and since 2016: Deputy Director for Science. Since 2009: Head of the Department of Solar Physics and the Laboratory of Problems of Space Weather. 2015 to 2016: Acting Director of Pulkovo Observatory.

Specialist in the field of solar physics, solar-terrestrial links, and variations of the terrestrial climate. Authored more than 270 papers.

In 1980-ies – 1990-ies, jointly with E.Yu. Nagovitsyna, published the first studies on long-term oscillations of sunspots (in recent years, this phenomenon was investigated by space probes).

The main works relate to investigation of solar activity on various timescales ("the space climate problem"). Formulated a new approach to solar activity reconstructions in the past and proposed new methods for this purpose: multi-scale regression and decomposition in pseudo-phase space, and "the principle of witnesses". Proposed a non-linear (Duffing type) mathematical model of solar cyclicity. Jointly with E.V. Miletsky and V.G. Ivanov, he reconstructed the behavior of main physical parameters of the space weather on a 400-year scale. In cooperation with the latter authors and D.M. Volobuev, created a set of databases on long-term variations of solar activity and studied the activity during the Maunder minimum. Along with A.A. Pevtsov, showed that sunspots form two populations with different properties. For the first time, qualitatively estimated the influence of solar activity on the Earth climate, and showed that its total contribution to the variations of the global terrestrial temperature is small but not negligible (~20%) and highly depends on the timescale.

The obtained results were repeatedly included to the list of the most important results of scientific councils of RAS; the works were supported by grants of the INTAS, RFBR, Federal purpose-oriented Programs, Programs of the Praesidium of RAS, and those of the President of the RF within the Program of Support of Scientific Schools.

Yu.A.Nagovitsyn actively works with young scientists, having supervised five Cand.Sci. and one Dr.Sci. theses.

Yu.A. Nagovitsyn is an organizer of Pulkovo Conferences on Solar Physics, the main annual event of the Solar Section of the Scientific Council on Astronomy. Member of IAU and the multidisciplinary "Sun – Earth" Council; Deputy Editor-in-Chief of the journal "Geomagnetism and Aeronomy", Guest Editor of the Supplement of this journal.

nag-yuri@yandex.ru

NAKARIAKOV Valery Mikhailovich

Born 20.10.1965 in Gorky (now Nizhny Novgorod). In 1989, graduated from the Department of Radiophysics of N.I. Lobachevsky State University of Gorky (now N.I. Lobachevsky State University of Nizhny Novgorod). B 1989-1995, he was a teaching assistant (from 1993 – an associate professor) at the Applied Mathematics Department of R.E. Alekseev Nizhny Novgorod State Technical University. Defended his PhD thesis in plasma physics at the Applied Physics Institute of RAS in 1993. In 1995-1999, he was a postdoctoral researcher at the University of St. Andrews, UK. In 1999, he became a lecturer (a professor from 2007) and the Head of the Solar Physics Laboratory of the Physics Department at the University of Warwick, UK. Obtained his DSc degree at the University of Warwick, UK, in 2007. In 2011-2016, he was a leading researcher at the Central (Pulkovo) Astronomical Observatory of RAS. Since 2016, Nakariakov is a leading researcher at the Special Astrophysical Observatory of RAS.

V.M. Nakariakov's area of research is related to the observational study and theoretical modeling of magnetohydrodynamic (MHD) oscillations and waves in plasma structures of the corona of the Sun, new methods of plasma diagnostics, radiophysics of the Sun, and quasi-periodic processes in solar and stellar flares. He published more than 250 scientific papers in refereed scientific journals, and one monograph ("Coronal Seismology" by A.V. Stepanov, V.V. Zaitsev, V.M. Nakariakov, 2012).

His main research results include the development and application of the method of the coronal MHD seismology with the use of the observed data obtained in the EUV and radio bands including diagnostics of the magnetic field and fine spatial filamentation; empirical estimation of the coronal heating function; establishing the similarity of quasi-periodic pulsations in solar and stellar flares; development of the coronal MHD wave theory and its observational validation.

He was the Principal Investigator in the international network "Radiophysics of the Sun" (2012-2016), co-founder of the Heliospheric Working Group in the international project the Square Kilometre Array, an international coordinator in the BRICS project "Superflares on the Sun and stars", and has been participating in the Solar Orbiter and Proba-3 projects of the European Space Agency and the Korean Coronagraph at the International Space Station.

V.M. Nakariakov has supervised sixteen successful PhD projects.

He is a member of the IAU, the European Physical Society, and the Royal Astronomical Society. In 2007-2009, V.M. Nakariakov became a council member of the Royal Astronomical Society; the Chair of the UK Solar Physics in 2010-2013; and the President of the European Solar Physics Division of the European Physical Society in 2011-2014. He is a member of several research councils and editorial boards of several international and Russian scientific journals.

He has been a recipient of the Payne-Gaposchkin Medal and Prize of the Institute of Physics, UK.

NASELSKY Pavel Davidovich

Born in 1953, graduated the Rostov State Univ. (SFedU now) in 1975. PhD in Astrophysics (1979): «Several cosmological consequences of the existance of low-massive primordial black holes». Doctor of Sciences (1990, Habilitation): «Cosmic microwave radiation and ionization history of the Universe». Professor (1993). Head of the department (1994-2000). Staff Member of Niels Bohr Institute since 2000. Member of the Planck collaboration (ESA). Professor of Niels Bohr Institute since 2005. Member of the Board of Directors of «Discovery Center». PI of the «DeepSpace» project. Member of the IAU.

Main scientific achievements:

His main achivements are concerned the statistical properties of the cosmic microwave background, the characteristics of primordial black holes and the recombination kinetics of hydrogen and heliysm in the early Universe.

He has over 300 published papers, several monographs, including «The Physics of the Cosmic Microwave Background» together with D. Novikov and I. Novikov.

NAYDENOV Ivan Dmitrievich

Born 01.01.1947. In 1966-1971 was a student of the Kabardino-Balkarian State University (Nalchik). From 1972 to 2012, he had been working in the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) at different positions: beginning from an engineer to a Leading Researcher (from 2005).

Defended his Ph.D. thesis in 1989 on "Development and Improvement of Instruments and Methods for Stellar Magnetic Field Measurements with the 6-m SAO RAS telescope" (1989). Defended his Dr. Sci. dissertation in 2004 on "Instruments and Methods for Spectropolarimetric Studies with the 6-m SAO RAS telescope" (2004). Died 26.12.2015 in Zelenchuk.

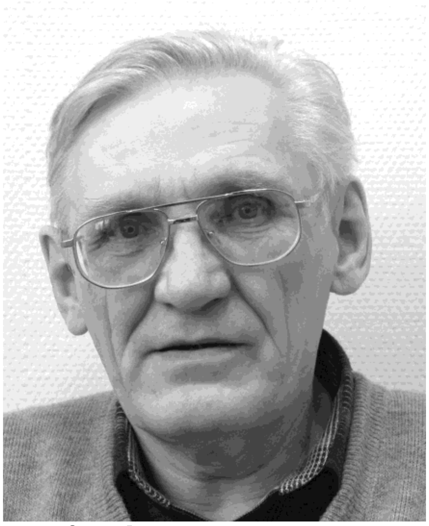
His main area of research is related to astronomical instrument engineering and methods of signal processing; he is the author and co-author of 60 publications, inventions, and patents.

In 1975, in collaboration with G.A. Chuntonov, he developed the first circular polarization analyzer, using which long-term spectropolarimetric surveys were conducted at the Main Stellar Spectrograph of 6-m telescope.

I.D. Naidenov had designed and made (together with G.A. Chuntonov) a stellar magnetometer with a Fabry-Perot interferometer forming the basis for interferometric spectroscopy techniques at the 6-m telescope. Designed and made a series of original polarimetric and spectropolarimetric instruments providing the experimental background for stellar magnetism school at SAO. He made polarization analyzers for other telescopes. Designed (in collaboration with N.N. Somov) the method of high-velocity spectropolarimetry and conducted original studies of polars. Designed and made (in collaboration with V.E. Panchuk) the Nesmith Echelle Spectrograph (NES) which is the main high resolution instrument at the 6-m telescope for 20 years. Designed an original image slicer which increased the resolving power of NES by a magnitude. Reconstructed (together with V.E. Panchuk) the Main Stellar Spectrograph (MSS) which increased the resolving power of the MSS by a magnitude in the spectroscopy and spectropolarimetry modes. Designed and made (in collaboration with V.E. Panchuk) the first echelle spectropolarimeter for the 6-m telescope primary focus. Designed and made linear and circular polarization analyzer for high and medium resolution echelle spectrographs.

Most of dissertations of SAO astronomers in the stellar magnetism and spectropolarimetry research areas were written using I.D. Naidenov's inventions and developments.

NAZAROV Mikhail Alexandrovich



Born (13.01.1949 – 08.06.2016) was an outstanding scientist in the area of mineralogy and geochemistry of an extraterrestrial matter. He was graduated in 1972 at the institute of mineralogy of the geological faculty of Moscow State University. The scientific career he continued at V.I. Vernadsky Institute of geochemistry and analytical chemistry RAS where he started to work in a scientific branch dealt with studying lunar soil returned by Soviet automate missions Luna-16, Luna-20, and Luna-24. During this studies he got important data on an origin of lunar rocks that were published in fundamental papers. This work was a base for the defending of the doctoral thesis in 1982.

After that M.A. Nazarov started to study catastrophic events in the Earth history especially concerning geochemical anomalies in peat layers at the Tunguska even area and at stratigraphical boundaries. It was shown that a 1908 layer is anomaly enriched in Ir and contains cosmic spherules. The work at Maastrichtian – Danian (MD) sections of Middle Asia confirmed a global distribution of ejecta enriched in cosmogenic matter from an impact crater. Especial attention was paid to the unique Sumbar section where the bounadary layer contains up to 10 % of an extraterrestrial matter. This allowed to reconstruct paramaters of the MD event and changing in environments immediately of it. He proposed that the formation of the Kara crater was responsible for the MD biota crisis. Unfortunately, thod point of view was not supported by data but the MD age was established for the 20-km Boltysh crater. Other geological boundaries did not demonstrate any enriccment in cosmogenic matter.

From 1990 Mikhail Aleksandrovich studied different meteorites. He discovered a new class of compounds in car bonaceous chondrites, investigated the Dho 019 martian meteorite as well as many others meteorites. In last years of his life he studied lunar meteorites. Results of this work are an estimation of the flux of lunar meteorites on the Earth, the find of deep lunar rocks and estimation of parameters of their formation, the discovery of native silicon and ascertaining of details of their formation, the find of proposed products of mantle serpentine disproportion and many others.

Mikhail Aleksandrovich paid great attention to popularization of meteoritics, he organized the Museum of extraterrestrial matter at Vernadsky Institute, many years he was the chief of the laboratory of meteoritics at Vetnadsky Institute, was the curater of the Meteorite collection of RAS and the National collection of lunar soil, took the position of the deputy director of Committee on meteoritics, was the chief of commissions for extraterrestrial samples loan. Dr Nazarov organized a work with peoples who bring samples of rocks in the laboratiory for expert estimation of proposed extraterrestrial origin that is main source of meteorites found in Russia.

NEFED’EV Anatoly Alekseevich

Born 10.11.1910 in Kamen on Ob’, Altay region. Graduated from Tomsk State University with a degree in astronomy in 1936. In the same year joined Engelhardt astronomical observatory (EAO). Since then his life inextricably linked to EAO activity (1944-1958 – Deputy Science Director; from 1958 – head of EAO). Nefedyev became a professor of Kazan University in 1958; he was also a lecturer at Kazan Pedagogical Institute. Candidate of Physico-Mathematical sciences (1941), Doctor of Physico-Mathematical sciences (1959), Professor (1959). Nefedyev A.A. was a member of the International Astronomical Union, a chairman of the lunar board of USSR Academy of Sciences Astronomical Union. Died 14.09.1976 in Kazan.

The main works of Nefedyev relate to the fields of selenodesy and solar system’s bodies investigation. He is the author of 49 scientific works. The results of Nefedyev’s activity were “The maps of the lunar marginal zone at the general zero level”; the long-term heliometric observations of the lunar physical libration were conducted, its parameters were obtained. In the field of the solar system bodies investigation, the figures of Mars and Venus were studied; under the guidance of Nefedyev the observations of stars at the meridian circle within the International and Russian programs were conducted; the issues of dynamics and kinematics of the solar system bodies were considered; the spectrophotometric observations at the chosen Kapteyn’s areas were conducted; in association with the Institute of Space Researches the photographs of the lunar far side were processed; a number of other important projects were implemented.

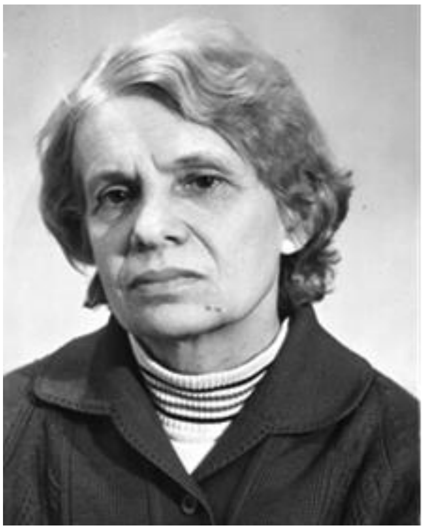
During Nefedyev’s time as a head of EAO, the following telescopes were launched: ZTL-180, AZT-14, Meniscus telescope, Horizontal telescope; an engineering team whose tasks were development and implementation in practice of astronomical observations of new instruments and methods based on the latest achievements of computer technology was formed; a lot of young professionals joined EAO; Engelhard astronomical observatory became one of the world’s leading observatories. Personal scientific communications of A.A. Nefedyev with the most famous world’s and USSR astronomers allowed the implementation of collaborative scientific programs. In 1972 Nefedyev obtained funding and construction of the 1,5-meter reflector at LOMO, Leningrad. With an effort of Kazan astronomers, this telescope was set at TUBITAK (Turkey) and was named “RTT-150” (Russian-Turkish 1,5 meter Telescope).

As a head of the EAO Nefedyev took great care of the observatory’s staff; the following objects were built: 2 apartment houses, a dormitory, grocery shop, canteen.

A.A. Nefedyev was a great lecturer, conducted an important educational activity, prepared a constellation of Candidates and Doctors of Physico-Mathematical Sciences, his students became large chiefs, professors, and academicians; he was also an active popularizer of astronomy.

Nefedyev received the Badge of Honor. On January 22, 2009, by the decision of the International Astronomical Union a crater 40.2 km in diameter at the lunar South Pole was named after Nefedyev (Nefed’ev), on July 10, 2010, during the International conference “Space horizons of astronomy and geodesy” a Memorial plaque dedicated to A.A. Nefedyev was opened.

NEFED'EVA Antonina Ivanovna



Born 29.05.1921 in Saransk, Penza province. In 1921 graduated with honors from Kazan State University (KSU) with a degree in astronomy. In 1942 joined Engelhardt astronomical observatory (EAO) as Junior Researcher, then was a graduate student (1944-1946), worked as Senior Researcher, head of astrometric department (1956-2007), Leading Researcher (2008-2014). In 1947 A.I. Nefedyeva defended her candidate thesis on "Investigation of declination systematic errors", in 1974 defended her doctoral thesis on "Astronomical refraction", in 1983 she received the title of professor, and in 1985 – the title of Honoured Scientist of Tatarstan Republic. Nefedyeva was a member of the International Astronomical Union. Died 15.10.2014 in Kazan.

The main works of Nefed'eva relate to the field of fundamental astrometry. Antonina Ivanovna wrote and published 6 monographs and textbooks, 120 articles in Russian and foreign editions, she was also awarded KSU certificates for the best scientific works.

A.I.Nefed'eva developed a new theory of astronomical refraction and created a table of that; defined the inclines of air slopes of equal density at atmosphere's different altitudes and for different areas on the Earth's surface. Nefedyeva discovered "non-exclusion" bending of the meridian circle, developed a method to define vertical bending. Under the direction of A.I. Nefedyeva the following works were executed: the meridian circle automation and the development of a machine for the meridian circle reference photograph measurements. As a result, the most accurate tables of astronomical refraction for that moment were made.

A.I. Nefed'eva controlled the works within international and Russian programs of stars coordinates determination and star catalogs formation. A large number of studies were conducted within the Russian latitude service, from 1961 to 1971 under the guidance of Nefed'eva 21000 observations of 2900 stars were carried out and in 1977 a differential declination catalog of 2890 stars was published. In 1976 an 18.6-year latitude series of observations was obtained which is equal in duration to the period of the main term in forced nutation of the Earth's axis. In EAO under the guidance of Nefed'eva, a working group for taking part in the international program of double stars, high luminosity stars, and stars close to the quasar observations was established. About 5000 observations were made. In 1992 the following catalogs were published: the differential declination catalog of 788 visual double stars and the differential declination catalog of 158 high luminosity stars.

All her life Antonina Ivanovna was conducting great educational work and considered an excellent lecturer with an oratorical voice. Nefedyeva had trained 12 apprentices who became Candidates of science. She was also a lecturer at KSU and Kazan State Pedagogical University (KSPU).

Nefed'eva had several state awards: Honored Scientist of the Tatarstan Republic, Distinguished Professor of Kazan State University (2006), multiple medals of home front workers during the Great Patriotic War.

NEFEDYEV Yury Anatolievich

Born 06.06.1955 in Kazan. Graduated from Kazan State University (KSU) in 1977 with a degree in astronomy. In 1977 joined Engelhardt astronomical observatory of KSU, worked there as an engineer, later became Deputy Director of science (1991-2008) and director (from 2008). Nefedyev is a professor at Kazan Federal University Institute of physics. Candidate of Physico-Mathematical Sciences (1986), Doctor of Physico-Mathematical Sciences (2007). Member of Bureau of the Scientific Council on astronomy of Russian academy of sciences, member of the International Astronomical Union, member of the American Astronomical Society (IMIS ID:52605), board member of the International Astronomical Society.

His main works relate to the fields of space astrometry, selenodesy, geophysics, and celestial bodies of the solar system. Nefedyev is an author of over 500 scientific works including 16 monographs, 5 textbooks. Yury Nefedyev has 8 certificates of authorship, he also set up 3 electronic resources. Composite authors under the guidance of Nefedyev with a series of works on a selenodesy took first place in the list of the most important achievements of the Russian Academy of sciences in the field of astrometry and celestial mechanics in 2013.

Nefedyev set up a selenocentric reference system covering the entire surface of the Moon; set up and analyzed the database containing 430000 occultations. One of the modern directions of Nefedyev's scientific activity involves building the space selenocentric reference system using the data from modern space missions for 1) the GLONASS system expansion to the circumlunar orbit; 2) a manned lunar base simulation; 3) the physical libration of the Moon and celestial bodies investigation including the space flight safety systems from space debris and meteoroid component.

During his time as EAO head, the Center of Space Investigations and Technologies was established, the territory of EAO was reconstructed, a unique telescope for automated search for galloping processes on the celestial sphere Mini MegaTortora was created, a complex of the Planetarium named after pilot-cosmonaut A.A. Leonov, and the Metrological satellite landfill were created, the educational and research technopark was built, the project of the innovative Astropark was developed and launched.

Nefedyev Y.A. is a scientific adviser of Kazan Federal University scientific direction "Selenodesy". This project aims to build a navigational dynamical selenocentric coordinate system and construction lunar digital maps according to space observations.

Nefedyev was in charge of the State Defense Order, Russian Science Foundation, RFFI, and AVCP "Scientific potential of higher school development" grants. Currently, he is in charge of "Space navigation and planetary investigation Laboratory".

He actively works with young scientists, under the guidance of Nefedyev Candidate's and Master's theses have been defended, new courses in fields of astronomy and the Natural Sciences for Kazan Federal University have been developed and implemented, electronic educational resources have been launched.

Y.A. Nefedyev received the following state awards: Honorary worker of RF Ministry of Education; order "For the sake of life on the Earth" for personal contribution to the development of Russian cosmonautics; diploma of the Union of Space Forces veterans.

NEMIRO Andrey Antonovich

Born 17.03.1909 in Korets, Rovno Region. In 1934, graduated from Leningrad University.1934–1937: post-graduate at Pulkovo Observatory. Since 1937, with Pulkovo Observatory. 1941 to 1944 – took part in The Great Patriotic War, with battle honors. Since 1964 – Head of Dept. of Fundamental Astrometry of the Pulkovo Observatory. 1964–1970 – Head of Chair of Astronomy in the State University of Leningrad (since 1966 – Professor). 1969–1971 – Head of Astrometry expedition to Chile. Member of Presidium of Astrometric Commission (Section of Astrometry) of Astronomical Council, in 1960-ies and 1970-ies, its Chairman. Since 1948 – Member of IAU, Member of Organizational Committee of Commission No 8 (Position Astronomy) IAU, 1967–1970 – its President. Died 30.10.1995 in St. Petersburg.

Scientific activities were related to fundamental astrometric studies in Pulkovo Observatory and aimed at preservation and further development of traditions of Pulkovo school of astrometry.

1938: post-graduate course; Cand.Sci. («Application of chain method of observations to derivation of self-levelled system of right ascensions of stars in the +40-+65° declination zone»). June 1941: recalled to active duty; 1944: returned to Pulkovo and took part in reconstruction of the ruined Observatory.

1952–1956: along with colleagues, composed the first Soviet Fundamental Catalog of right ascensions, which contained not only positions, but also proper motions of stars, determined from 100-year series of absolute Catalogs of right ascensions obtained with The Pulkovo Major Passage Instrument. Suggested a new метод of processing of observations to determine right ascensions of stars. Studies systematic errors of fundamental systems, improved methods of refinement of zero-points of Catalogs, developed new design of instruments to determine positions of stars. Organized and carried out composing the Fundamental Catalog of faint stars, and also absolute determinations of right ascensions of stars of the South hemisphere. To this end, organized the Astrometric expedition in Chile and observed positions of stars of SRS (South Reference Stars) Catalog.

Under his supervision, in The Central Astronomical Observatory, Astronomical Observatory of the State University of Leningrad, and other Observatories, more than 20 Cand.Sci. Theses were prepared. Authored more than 100 scientific works.

In 1963–1970, held the Lecture Course on Astrometry in Leningrad University.

The minor planet (4228) Nemiro was named after him. Awarded with the Order of the Red Banner of Labor (1967), Medals «For Defence of Leningrad» (1942), «For Defeat of Germany» (1946), «For Labor Merit» (1954).

NESHPOR Yuri Iosifovich

Born 22.11.1932 in Gorky. In 1950–1955 – student at Gorky Politechnical Institute with a degree in radio tech-nique. Since 1955 and up to now – researcher at the Crimean Astrophysical Observatory. In 1965 he defended the Ph.D. thesis "The study of X-ray radiation of solar flares by the ra-dio astronomy method". In 2006 – appointed to the rank of senior researcher.

Soviet and Russian astrophysicist, expert in the field of ultrahigh-energy radiation. In 1950–1970 he was among the first scientists in the world to study X-ray radiation of solar flares by the radio astronomy method. It was shown that the ionizing radiation of solar flares is not identical to the radiation causing the quiet ionosphere. The X-ray flux of solar flares that triggers additional ionization in the ionosphere exceeds by a factor of 10 and more the flux from the whole quiet Sun. The solar flares are distinguished by not only the intensity of X-ray radiation but a spectrum. During some flares a significant increase in X-ray radiation is observed in the region of 100 keV. This was at the onset of X-ray astronomy. A series of works on this topic formed the basis for his Ph.D. thesis.

Since 1973 Yu.I. Neshpor was engaged in issues related to ultrahigh-energy gamma-ray astronomy. He participated in constructing the first in the world double gamma-telescope of the second generation (GT-48). In cooperation with researchers of the laboratory Yu.I. Neshpor first discovered five new ultrahigh-energy gamma-ray sources. He was involved in searching for a periodicity in emission of ultrahigh-energy gamma-ray sources. Jointly with colleagues he showed the presence of periods of 4.8 hours and 323 days in emission from the binary system Cygnus X-3. A periodic emission from the Geminga pulsar was detected and a period of 23 days in gamma-ray emission from the Mk 501 galaxy was confirmed. The new ultrahigh-energy gamma-ray source Cyg OB2 was discovered in the system Cygnus X-3, as well as gamma-ray emission from active galactic nuclei 3C 66A и BL Lac. The detected positive correlation between ultrahigh-energy gamma-ray fluxes and optical emission from blazars 3C 66A и BL Lac allows assuming that a source of both types of emission is one and the same population of high and ultrahigh-energy electron particles. The spectrum of electromagnetic radiation from the 3C 66A galaxy was shown to be similar to the spectrum of the well-studied Mk 501 galaxy but the absolute value of luminosity is by two orders greater. According to the published data it was shown that HBL-type blazars with high frequency of maximum emission in X-rays can be the most probable ultrahigh-energy gamma-ray extragalactic sources.

Yu.I. Neshpor authored over 140 scientific publications

NESTEROV Nikolay Semyonovich

Born on September 13, 1947 and died on December 2, 2002. In 1971 he graduated from Moscow State University and in 1973 entered the Department of Radio Astronomy at the Crimean Astrophysical Observatory (CrAO) of the USSR Acad. of Sci. N.S. Nesterov advanced from engineer to Head of the Laboratory. In 1987 he gained the Ph.D. degree in Phys. and Math. Sci. A member of the International Astronomical Union and European Astronomical Society. Died 02.12.2002 in Simeiz.

The major researches relate to astrophysics and solar physics. N.S. Nesterov authored 150 scientific publications. In 1970s and 1980s he carried out millimeter radio astronomy studies. Under his leadership RT-22 was modernized to increase its efficiency in the millimeter range. The observations of extragalactic radio sources were carried out to study variability of their radio emission and relation with emission in other spectrum regions. Spectral observations in the 3 mm range were organized at RT-22 and radio emission from the Sun and active processes were studied. Observations were developed by the method of very long baseline radio interferometry (VLBI) with the aim of advancing them at mm-wavelengths.

Within the framework of the mentioned directions the results are as follows: data on variability in millimeter radio emission from several dozen of active galactic nuclei were obtained for over 25 years; according to data on radio and optical variability of the NGC 1275 galaxy for about 25 years it was assumed that its nucleus is located at 3 ms from the component which earlier was supposed to be a galactic nucleus; a high brightness of the solar polar regions was detected that varies in opposition with Wolf numbers: in minimum of the pole's activity – it is hotter, in maximum – colder; the solar radio radius increases about 3 thousand km to the activity maximum; the relationship between millimeter radiation and soft X-rays was studied for solar flares and it was found that radio emission at 10 mm is a result of acceleration and magneto-acceleration radiation; the relationship was explored between millimeter radiation of outbursts and X-ray bursts in solar active regions. It was found that in bursts having thermal radio spectra a ratio of radio to X-ray luminosities can be reasonably explained if the difference of emitting volumes in radio and X-ray ranges is taken into account.

Since the 1990s N.S. Nesterov introduced a new direction at RT-22 – geodynamics. The coordinates of RT-22 were measured with an accuracy of about several millimeters. A basis for advancing VLBI-observations to the millimeter spectrum region was developed. For a series of works on studying spectra and variability of cosmic radio emission in the mm range at the radio telescope RT-22 in 2001 N.S. Nesterov took the NASU Barabashov Award. He supervised young scientists and as a result 3 Ph.D. theses were defended. In his honor, main belt asteroid (7978) discovered by L.I. Chernykh in 1978 was named Niknesterov.

NESTEROV Vilen Valentinovich

Born 08.11.1935 in Moscow. In 1957 he graduated from the Astronomical Department of Faculty of Mechanics and Mathematics, MSU. Since 1957 he worked at the SAI MSU. He defended his candidate thesis in 1963 and doctoral one in 1984. From 1969 to 1988 he was an associate professor of the Department of Stellar Astronomy and Astrometry of the Astronomical Department, MSU. Since 1995 Nesterov was a professor of MSU. From 1988 to 2000 he was the head of the Department of Astrometry of the SAI MSU. Died 16.04.2000 in Moscow.

Nesterov's main scientific works relate to the field of astrometry, namely such topics as the study of the Earth's rotation, laser ranging of artificial Earth satellites, the celestial coordinate system. His research advisor was V.V. Podobed. In 1963 he defended his candidate thesis on the topic: «V. Struve's method for latitude determining in the first vertical and its study on the example of a series of observations with the passage instrument of the Pulkovo Observatory made by A.S. Vasiliev from 1925 to 1939». In 1984 he defended his doctoral thesis on the topic: «Parameters of the Earth's rotation according to the data of laser ranging of artificial satellites». In the same year he was awarded the VDNKh gold medal for the development of a new direction in the Earth's rotation study. He created original computing programs that were used in a number of specialized organizations in the USSR. Since 1988, under his leadership, the Lomonosov space project was developed. It was intended for high-precision determination of positions and velocity vectors of stars. Efforts were also made to process observations made within the international enterprise «Carte du Ciel» («Map of the Sky») – the first photographic survey of the sky in the history of astronomy (1891-1950). Nesterov's work «Astrometric catalog of a new generation» (co-authors – A.V. Kuzmin and K.V. Kuimov) was awarded the Lomonosov Prize of MSU in 1999.

At MSU Nesterov taught courses: «General Astrometry», «Rotation of the Earth», «Space Geodesy», «Standard for Basic Calculations of Astronomy» and «Fundamental Astrometry». He wrote 51 scientific papers and the textbook «General Astrometry» (in co-authorship with V.V. Podobed, 1982). 6 candidate theses were defended under Nesterov's supervision. He was a member of the Scientific Council on extra-atmospheric astronomy of the Russian Academy of Sciences, Dissertation Councils of the SAI MSU and of the Institute of Applied Astronomy of the Russian Academy of Sciences. V.V. Nesterov was also a member of the IAU. Asteroid № 4514 «Vilen» is named in honor of Nesterov.

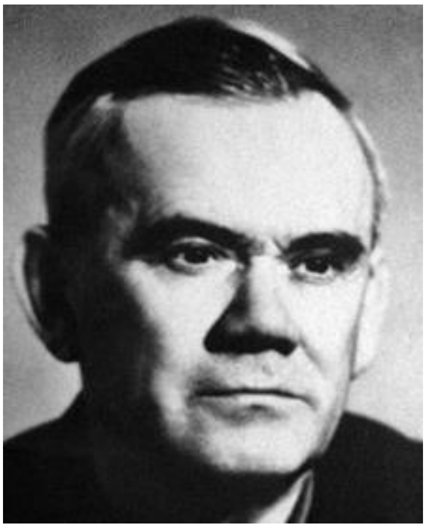
NEUJMIN Grigory Nikolaevich

Born 22.12.1885 (03.01.1886) in Tbilisi. After graduation from Petrograd University in 1910 he was taken on to the staff of the Pulkovo Observatory. In 1912 G.N. Neujmin started to work at the Simeiz Division and was the first in our country to organize systematic observations of minor planets. In 1925–1931 and 1936–1941 he was Head of the Simeiz Observatory, headed its staff in the years of evacuation (1941–1943) at the Kitab Latitude Station. In 1944–1946 – Director of the Pulkovo Observatory. Died 17.12.1946 in Leningrad.

G.N. Neujmin is an expert in the field of astrophotography, celestial body dynamics, studying minor bodies of the Solar System. The major contribution in astronomy is associated with discoveries of new objects – asteroids, comets, variable stars. In 1912 he first in our country organized systematic observations of minor planets at the Simeiz Observatory and in succeeding years the observatory became wide-known within the international program on minor planet patrol taking the first places on the numbers of discoveries. G.N. Neujmin discovered 74 asteroids, the first one was named Simeiz, the last one discovered in 1939 was named in honor of N.A. Kozyrev. In 1913–1941 he discovered 7 short-period comets and 13 variable stars. He also developed a method of accounting members of higher orders when calculating perturbations of comet orbits, carried out micrometric measurements of Neptune satellites, micrometric observations of binary stars, was involved in determining proper stellar motions. On his initiative the Pulkovo Observatory took part in the international work on preparing fundamental catalogues of the German Astronomical Society (Astronomische Gesellschaft or AG).

G.N. Neujmin took awards of the Russian Astronomical Society, six medals of the Pacific Astronomical Society for discoveries of comets, Order of the Red Banner of Labour. A lunar crater Neujmin, a minor planet 1129 Neujmina and a plain of Neujmin on the minor planet 951 Gaspra discovered by him at the Simeiz Observatory in 1916 were named in his honor.

NIKITIN Alexey Alekseevich



Born 12.03.1918 in Smolensk province. In 1937, was admitted to the Mathematics Faculty of Leningrad State University (now St. Petersburg State University). He took part in World War II as a volunteer and was seriously wounded in 1941. In 1944, returned to the Faculty. In 1945, graduated in astronomy. In 1945-1948, a postgraduate student at the Department of Astrophysics; defended his Ph.D. in astronomy in 1948. Worked as a senior researcher at the Astronomical Observatory of Leningrad State University, then as an associate and professor at the Department of General Mathematics. D.Sc. (1964), Professor (1974) at the Faculty of Mathematics and Mechanics. Member of IAU since 1958. Member of several scientific councils. Awarded numerous orders and medals, including the 1st degree order of the Great Patriotic War. Died 17.05.2003 in St. Petersburg.

A.A. Nikitin's research interests are in the areas of atomic spectroscopy, spectroscopy of planetary nebulae, and Wolf-Rayet stars. Author of more than 70 scientific publications.

In the late 1950s, A.A. Nikitin suggested that faint unidentified lines in the Solar spectrum could be technetium lines. In the 1960s and early 1970s, he calculated the transition probabilities and photorecombination rates to exciting levels of carbon, nitrogen, and oxygen ions that he used to calculate line intensities in recombination spectra. He used these results to estimate the C, N, and O content in the planetary nebulae and envelopes of novae (with V.G.Gorbatsky). He showed that the content determined from the recombination line intensities can be 1–2 orders of magnitude higher than that found from the intensities of the lines excited by electron impact. He was one of the first who drew attention to the role of states with two excited electrons and, in particular, autoionization states in spectra of gaseous nebulae and stellar envelopes. He calculated the oscillator strengths for lines of transitions between states with one and two excited electrons (the lines observed in spectra of planetary nebulae). In the 1990s, he demonstrated the efficiency of the line formation mechanism due to photodetachment of electrons from inner shells of atoms and ions, in spectra of gaseous nebulae and active galactic nuclei.

Author of 4 monographs. "Guide to Theoretical Calculation of Line Intensities in Atomic Spectra" (with I.B.Levinson, 1962) was translated into English. "Fundamentals of the Theory of Spectra of Atoms and Ions" (with Z.B.Rudzikas, 1973) is one of the most cited books in this field of research.

NIKOLSKY Gennady Mikhailovich

Born 28.09.1929 in Rostov-on-Don. In 1953, graduated in Astronomy from the Kiev State University. In 1953-1956, he was the senior laboratory assistant at the Astronomy Department of Kiev University, in 1956-1958, – the Junior Scientist of Astrophysical Institute of Kazakhstan Academy of Sciences, in 1958-1969, – the Senior Scientist of the Pushkov Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation of the Russian Academy of Sciences (IZMIRAN), in 1969-1982, – Head of the Solar Activity Laboratory of IZMIRAN. Dr. Sci. in Astrophysics (1964), Professor (1971). Member of IAU. Died 20.12.1982.

The main scientific interests of G.M.Nilolsky lay in the field of the solar atmosphere and interplanetary medium. He is the author of 150 scientific publications, the author and co-author of several books, designer of new astronomical instruments.

New results on the solar corona have been obtained from the total solar eclipse observations (1952-1981): regions of anomalously high polarization in the corona are detected, bending of coronal streamers along the line-of-sight has been revealed, dust clouds are discovered in the close circumsolar space.

In the early sixties G.M.Nikolsky made major contribution, jointly with G.S.Ivanov-Kholodny, in research on the EUV solar emission. A new concept of the generalized emission measure was introduced. It was shown that the main source of the EUV solar radiation is the chromosphere – corona transition zone, i.e. those regions of the solar atmosphere where the plasma temperature varies in between the chromosphere (~104 K) and coronal (~106 K) values.

In 1965-1966, G.M.Nikolsky designed, jointly with A.A.Sazanov, the world largest non-eclipse coronagraph with a 535 mm objective diameter and 8 m focal length. The series of 12 similar instruments have been produced for observatories of the USSR, Hungary and Poland. Lately he had been actively involved in the design of other devices for solar observations, in particular, a new coronal magnetograph based on a Fabry-Perot interferometer.

Efforts by G.M.Nikolsky in promoting space research nave been also remarkable. He had been, jointly with A.I.Simonov, the promoter of the Artificial Solar Eclipse Experiment realized at the joint Soviet – American mission Apollo – Soyuz in 1975. A part of an artificial moon should play the Apollo spaceship moving back from Soyuz towards the Sun. The experiment has been successfully executed on 19.07.1975; the photography of the “eclipse” has been made by cosmonaut V.N.Kubasov.

In 1982, with the Soviet – French crew aboard the Salyut-7 station, G.M.Nikolsky and S.Koutchmy (France) had been advisers of the PCN experiment. In the course of experiment unique color photographs of the zodiacal light, the night ionosphere glow and other objects were obtained by cosmonaut V.A.Dzhanibekov. The reduction of observations allowed estimating a tilt of the invariant plane of the solar system against the ecliptic plane.

G.M.Nikolsky is the Honorary Citizen of the Troitsk town. He is awarded by the State medal “For the valiant labour”. The minor planet No. 4010 discovered by N.S.Chernykh in 1977 has been named as “Nikol′skij” after his honor.

NIKONOV Vladimir Borisovich

Born 05.11.1905 in St.Petersburg. In 1920–1925 – student at Leningrad Univ. In 1925–1926 – calculationalist at the Main Geophys. Obs., Leningrad. In 1926–1929 – Ph.D. student at the Inst. of Astronomy. In 1927 he worked on probation at the Simeiz Obs. In 1929 – Ph.D. In 1929–1936 – senior researcher at the Inst. of Astronomy. In 1936–1944 – Head of the Department of Astrophysics there. Since 1944 – researcher at CrAO of the USSR Acad. of Sci. In 1945–1955 – senior scientist there. In 1953 – the Dr. Sci. degree "Experience in constructing a fundamental catalogue of photoelectric magnitudes of colored counterparts of B8 and B9 spectral-type stars" (F.A. Bredikhin State Prize of the USSR). In 1955–1984 – Head of the Department of Stellar Physics and Nebulae. In 1984–1987 – scientific consultant. In 1961–1967 – President of IAU Com. 25 (stellar photometry); in 1967–70 – Vice-president, in 1970–73 – President of IAU Com. 9. Died 09.06.1987 in Nauchnyy.

Vladimir Borisovich Nikonov, Dr. Sci., Professor. In 1930 he participated in searching for a place to build the Shamakhi Observatory. He developed and led the construction of the first in the USSR stellar electrophotometer to observe stars and electromicrophotometer for the precise reduction of stellar photographic images. A participant in solar eclipse expeditions (1936, 1941 and 1945). V.B. Nikonov participated in searching for a place to build the Abastumani Astrophysical Observatory of the GSSR Academy of Sciences (Kanobili, Caucasus Minor), in its foundation and development. A method for accounting stellar light attenuation in the terrestrial atmosphere was elaborated. In 1939 in cooperation with P.G. Kulikovsky he designed the first Soviet photoelectric photometer. He developed a microphotometer with the automated negative adjustment, coronal electrophotometer by means of which the 11-year period of variations in the integral brightness of the solar corona was revealed. In 1948 in cooperation with A.A. Kalinyak and V.I. Krasovsky he acquired the first images of the central regions of the Galaxy in infrared rays. He took part in searching for a place and foundation of CrAO of the USSR Academy of Sciences (Nauchny). V.B. Nikonov elaborated a method of fundamental photometry, method of applying image tubes to take pictures of the Galaxy nuclei that allowed detecting its angular sizes. The technical requirements were worked out for the 50 cm meniscus telescope with a coude focus only. He designed stellar electrophotometers with photomultiplier tubes. In 1966–1967 headed the astrophysical expedition in Chile and work on creating spectrophotometric catalogue of southern stars. In the 70s on the initiative of V.B. Nikonov in the All-Russian Research Institute for Optical and Physical Measurements an image tube EPI-1 (spectrakon) was developed. In the 60s–70s – elaboration of technical requirements (1959) and leadership in designing the authomated stellar telescope (AXT-11); 60s–80s – foundation and development of Russian television astronomy. V.B. Nikonov authored 77 scientific publications, 67 of them – in periodical editions (including 12 in foreign languages) and 10 – in monographs.

State awards: "Mark of Honor" for development of photoelectric studies in the USSR, "Mark of Honor" for perfect implementation of the important government task (supervision of the first expedition in Chile), "Red Banner of Labor" for many-year work in the system of USSR Acad. of Sci., Lenin Order for the leadership in constructing ZTSh telescope. Medals: "For Valorous Labor in the Great Patriotic War" (2 medals), "For Valorous Labor", "In commemoration of the 100th anniversary from the birth of V.I. Lenin", "For the detection of new space objects", "Veteran of Labor", "For Labor Valour", "In Commemoration of the 250th anniversary of Leningrad", "To participant of the labor front. XXX years since the victory in the Great Patriotic War", "To participant of the labor front. 40 years since the victory in the Great Patriotic War", F.A. Bredikhin State Prize of the USSR (1971).

NOVIKOV Dmitry Igorevich

Born 29.01.1968 in Moscow. He graduated from Moscow Institute of Physics and Technology in 1991. From 1991 to 1993 worked at the Institute of Mathematical Modeling of the Russian Academy of Sciences. Starting from 1993 he works as a researcher and a senior researcher at the Astro-Space Center of Lebedev Physical Institute. He completed his PhD in 1997. Doctor of science since 2003. Professor of the Russian Academy of Sciences since 2015. Between 1997 and 2015 he worked at the Universities of USA, Germany, Norway and United Kingdom. He has a Certificate of Recognition from the UK Space Agency.

Most of the scientific interests of Dmitry Novikov lie in the fields of cosmology. He is one of the leading specialists in the physics of Cosmic Microwave Background and the Large Scale Structure of the Universe. He is an author of more than 200 scientific papers and 2 monographs.

The most interesting scientific results of Dmitry Novikov are connected with investigation of the nature of the initial perturbations in the Universe: establishing Gaussianity or non-Gaussianity, statistical properties of $\Delta T/T$ anisotropy, statistics of peaks, Minkowski Functionals, skeleton, higher order correlations etc. He predicted general statistical properties of CMB polarization field.

He also contributed to the theoretical investigation of different scenarios of inflation, nature of dark matter and ionization history of the Universe. He designed a new methods for the multifrequency analysis of CMB maps, methods for the separation of different components of the signal, point sources detection, detection of Sunyaev-Zel'dovich effect and E-B components separation for CMB polarization. He contributed to the analysis of the real CMB data, including time stream data processing, calibration of the instrument. He also developed a new algorithms for large data sets analysis for Planck mission and fast simulation of full sky CMB maps.

He designed a new methods for the analysis of 2D and 3D random fields.

He took part in the international projects Radioastron and Millimetron.

Dmitry Novikov has a Certificate of Recognition from the British Space Agency for dedication and commitment to the Planck mission to map the Cosmic Microwave Background and the work to help answer some of the most fundamental questions in modern science.

NOVIKOV Igor Dmitrievich

Born 10.11.1935 in Moscow. In 1959 he graduat-ed from the Moscow State University, in 1962 graduated from the postgraduate study of the State Astronomical Institute named after Sternberg. In 1963–1990 he worked at the Institu-te of Applied Mathematics of the USSR Academy of Sciences and at the Institute of Space Research of the USSR Academy of Sciences. Since 1991 he has been working at FIAN at the Astrospace Center. In 1991-2005 worked as prof. Copenhagen University in Denmark. In 1994-2004 he headed the Center for Theor. astrophysics Danish Acad. sciences. Since 2019 he has become the Scientific Director of the Astrospace Center. Since 2019, he has been in charge of the scientific program of the MILLIMETRON international space project. Dr. f.-m. sci. (1970), prof. (1985). Corresponding member RAS (2000).

The main scientific works are related to relativistic astrophysics, cosmology, the theory of gravitation. Author of more than six hundred scientific works, including 12 monographs and 29 popular books, most of which have been translated into many languages of the world.

He is one of the founders of modern relativistic cosmology and the world's leading expert in the physics and astrophysics of black holes, gravitational waves and gravitational physics.

He has made seminal contribution to the theories underpinning the origin, characteristics and properties of black holes and theorized about the existence and behavior of wormholes.

He (together with A.G. Doroshkevich) predicted the possibility of discovering the cosmological microwave background of the Universe, which was then discovered with the help of the radio telescope indicated in the article in which this prediction was made. Together with Ya.B. Zel'dovich he was the first to determine the masses of quasars. He indicated methods for detecting black holes in the Universe (together with Ya B Zel'dovich). According to this work, a black hole in a binary system paired with a normal star causes accretion of matter from a companion and becomes a powerful source of X-rays. Black holes, as powerful sources of X-ray radiation in binary systems, were first discovered in 1972. Together with K. Thorne, he created the relativistic theory of disk accretion of gas onto black holes. He created the foundations of the physical theory of black holes, their internal structure and developed new methods in the numerical theory of collisions of black holes.

He was one of the coordinators of the PLANK international space project to measure the angular anisotropy of the cosmological microwave background. He took part in the international space projects "RADIOASTRON" and "MILLIMETRON".

He, together with co-authors, developed many aspects of the physics of relic radiation and methods of its observation.

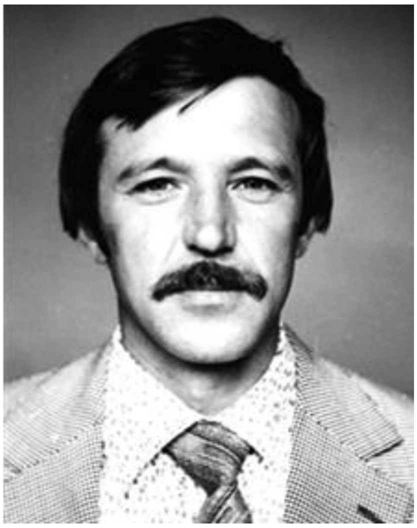
I.D. Novikov is one of the leading experts on the theory of the possibility of creating a time machine and expanding the possible laws of nature if such a theory is created.

He conducted many years of pedagogical work at Moscow State University, Moscow State Pedagogical Institute, Copenhagen University. Many of his former students and postgraduates occupy leading positions in scientific institutions of our country and foreign universities.

Awarded the Order of the National Banner of Denmark for achievements in science.

A member of a number of foreign academies, a laureate of a number of foreign and national prizes, a member of a number of scientific councils and editorial boards of international and national scientific journals.

NOVIKOV Sergey Borisovich



Born 16.11.1944 in Sovetskaya Gavan in the Khabarovsk Territory. Died 08.07.2010 in Moscow. Graduated from Lomonosov Moscow State University in 1967. In 1967 – 1970 – a senior laboratory assistant of the Astronomical Department of the Physical Faculty of MSU. In 1970 – 1996 he worked at SAI MSU in positions from a research assistant to a head of a department. In 1996 – 2010 he worked as a chief researcher at the Stock Company “Scientific and Production Corporation “Precision Instrumentation Systems” of the Federal Space Agency (SC “NPK “SPP” ROSCOSMOS). Habilitation (1989) with a degree in astronomy. A member of the IAU, a member of the Bureau of the Instrument Engineering section of the Astronomical Council of the Academy of Sciences of the USSR. Died 08.07.2010 in Moscow.

The main scientific works are related to the study of astroclimate, a choice of a site for observatories, telescopic construction, monitoring of near-Earth space, the author of 120 scientific papers, co-author of one monograph, co-author of 5 certificates of authorship.

Developed and manufactured the first photoelectric recorder of atmospheric tremors in the USSR, which makes it possible to measure the amplitude of an atmospheric tremor of a star in an absolute scale. He proposed active and passive methods of optimization of a temperature regime of a dome space, implemented in the design of telescope housing of a number of telescopes. He put into operation the first adaptive system of the 1st order on Mount Maidanak. In 1988 precise positional observations of the Martian satellites were carried out under his leadership using the 1-m telescope on Mount Maidanak, 856 images of Phobos were obtained with the root-mean-square error of a single observation four times higher than the accuracy of previous ground-based observations. He contributed to the choice of the site for the Terskol Observatory, where students of MSU underwent practical training.

Since 1974, he led the High-Mountain Central Asian Expedition of SAI MSU and the creation of a ground-based research center on Mount Maidanak in Uzbekistan, where under his guidance the SAI observatory was built, and in December 1992 AZT-22 was put into operation, and it remains to be one of the best in its class to this day.

In 2005–2010 he carried out a scientific guidance on the creation of a modern observatory in the branch of SC "NPK" SPP ": G.S. Titov "Altai Optical-Laser Center" in Zmeinogorsk region of the Altai Territory.

Conducted work with youth. Undergraduate works and one postgraduate work were defended under his supervision.

He was awarded the Prize of the Ministry of Higher Education of the USSR for creation and implementation of new equipment.

NUMEROV Boris Vasilievich

Born 29.01.1891 in Novgorod; graduated from the St. Petersburg University (1913); worked in its Astronomy Department and at the Pulkovo Observatory (from 1913 to 1915); was appointed Astronomer-observer to the Petrograd (Leningrad) University Observatory (from 1915 to 1925); Lecturer (Professor from 1924) at the University (from 1917 to 1936) and Professor in the Mining Institute (from 1923); the first Director (1920) of the Main Computing Institute of the All-Russian Astronomical Union which he had founded a year before; headed a department in the Astronomical and Geodetic Institute which was established under him the same year (1920); Director (from 1924 to 1936) of the Astronomical Institute (founded in 1923 by merging the Computing Institute and the Astronomical and Geodetic Institute, which in 1942 was renamed the Institute of Theoretical Astronomy of the USSR Academy of Sciences). Was arrested (due to unreasonable repressions in 1936); died in prison (1941).

The main subjects of B. V. Numerov‘s scientific work were astrometry, celestial mechanics and geophysics. He proposed a new observational program and a new method for processing Zenith telescope observations. He developed the Zenith Telescope Theory; proposed a new Method to study Transit Instrument Pins, developed the Universal Instrument Theory and the Photographic Transit Instrument Theory; studied the Theory of Refraction and organized computing activities to set up the Russian Astronomical Yearbook (1921).

The merits of Numerov in the field of celestial mechanics should be especially noted. On his initiative, an ephemeris service of minor planets was organized. He proposed an original method to integrate differential equations in celestial mechanics (“The Method of Extrapolation”) for calculating ephemerides of minor planets. This method was used to calculate the ephemeris of the eighth satellite of Jupiter, lost in 1923, by which it was found in 1930 at the Lick Observatory. He proposed a plan to observe ten selected minor planets in order to determine the vernal equinox point and the equator of the Catalogue of Faint Stars. According to the Numerov-Brouwer plan, several tens of thousands of high-precision observations of minor planets were obtained at 19 observatories of the world from 1956 to 1975, which were used in a number of works to determine the systematic errors of stellar catalogs. B. V. Numerov worked actively on implementing the idea that the pendular gravimetric observations and the variometric observations had to be taken into account while studying the oscillations of the Earth’s upper layers. Under his leadership, gravimetric observations were carried out in many regions of the country.

An Experimental Engineering Workshop (1928) and later Engineering Design Office were proposed by B. V. Numerov and created in the Astronomical Institute. The workshop produced a 13-inch reflector for the Abastumani Observatory, a new pattern of the laboratory visual microphotometer, unified-type coronagraphs to observe the Sun eclipses, and other equipment. The Special Astronomical Device Commission was created in 1931 within the All Union Optical and Mechanical Production Association, and B. V. Numerov became its first Chairperson.

B. V. Numerov was the author of 219 scientific papers and Vice-President of the IAU Commission No.20 (1935). Minor planet (1206) Numerowia and crater Numerov on the Moon were named in his honour.

Director of the A. I. Voeikov Main Geophysical Observatory (from 1926 to 1927); a Correspondent Member of the USSR Academy of Sciences (1929); Head of the Applied Mathematics Department in the State Optical Institute (from 1931 to 1933). was arrested (due to unreasonable repressions in 1936); died in prison (1941).

NUSINOV Anatoly Abramovich

Born 28.06.1942 in Achinsk. Graduated from MEPhI, Faculty of Theoretical and Experimental Physics in 1965. From 1965-1968 worked in Research Institute of Vacuum Technology as an engineer. In 1968 entered the graduate school of the Institute of Space Research RAS (IKI), after graduation worked at IKI until 1974. Candidate of physical and mathematical sciences (1973), senior researcher (1993), doctor of physical and mathematical sciences and head of laboratory (1989). Since 1974 has been working at the Institute of Applied Geophysics of Roshydromet (IPG) as a junior researcher, senior researcher, principal researcher, head of laboratory. Laureate of the Russian Government Award. Honored Meteorologist of Russia.

A well-known specialist in the field of short-wave (extreme ultraviolet and X-ray) radiation of the Sun, its variations and impact on the upper atmosphere and ionosphere of the Earth.

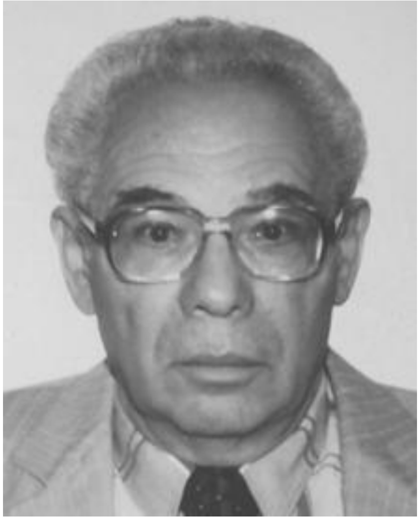
While working at IKI A. A. Nusinov investigated (co) magnetohydrodynamic oscillations and stability of the tails of type 1 comets in the solar wind. The result of this work was a new conclusion that MHD instability could develop when comets moved in the solar wind. He developed models of spectral variation of ultraviolet and soft X-ray radiation of the Sun, allowing to calculate spectral intensity of radiation in these ranges based on experimental flux data in the reference spectral range (flux of radiation of a bright ultraviolet line or narrow X-ray spectrum). These models serve as a methodical base of short-wave solar radiation monitoring. On their basis, GOSTs have been developed to standardize aeronomic calculations in the ionosphere and the Earth’s upper atmosphere modelling, as well as to solve the problems of space materials science. He is a co-author of a number of other GOSTs on various types of cosmic radiation.

He developed efficient methods for long-term (1 solar cycle) and short-term (up to 10 days) forecasting of the major indices of solar activity – numbers of sunspots and solar radio emission flux at a wavelength of 10.7 cm – based on the joint observations of solar and geomagnetic observatories of the heliogeophysical service. He is the author of a method for determining UV radiation streams from observations of the E layer of the ionosphere.

A. A. Nusinov participated in the development of satellite spectrophotometric equipment and then led the experiments on long-term monitoring of X-ray and ultraviolet radiation of the Sun in the international project CORONAS. The most striking results of these experiments are the observation of flares and multiple orbital observations of solar eclipses in the extreme ultraviolet range. The results of this work are currently used as a methodological and hardware basis for monitoring short-wave solar radiation on geostationary satellites. For carrying out these works and the results obtained in them he is awarded by the Russian Government. He has the title of «Honored Meteorologist of Russia».

A. A. Nusinov is the author of three monographs (in co-authorship), in which the regularities of variations in the fluxes of short-wave solar radiation, their influence on the Earth's upper atmosphere and manifestation in the behavior of the ionospheric parameters are investigated. He is the author of over 150 articles published in domestic and foreign journals.

OBRIDKO Vladimir Nukhimovich



Born 31.12.1937 in Odessa. In 1960, graduated from the Moscow Lomonosov State University, Faculty of Mechanics and Mathematics, Department of Astronomy. Since 1960, has been working at the Pushkov Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation RAS. Dr. Sci. in Phys. and Math. (since 1982), Professor (since 2006). Co-chairman and Board member of the Astronomical Society, Editorial Board member of "Astronomical and Astrophysical Transactions", Vice-Chairman of the Sun-Earth Council and the Section on Geoeffective Processes in the Sun, Bureau member of the Astronomic Council, member of several international science organizations (IAU, IAA , EAS, SCOSTEP).

The scientific interests of V.N.Obridko are mainly focused on heliophysics and space plasma physics. He is the author of 3 monographs and more than 250 publications in refereed scientific journals.

V.N.Obridko was one of the authors of the world's first instrument for simultaneous measurements of all three components of the magnetic field in the Sun (1963-1965). At present, the full-vector magnetograph is being upgraded, and its flight prototype is designed. The device will be installed on board the Interplanetary Space Station and the future Interhelioprobe space mission.

V.N.Obridko continued to develop the theory of spectral-line radiation transfer in a medium with the randomly oriented magnetic field (1968-1970); suggested the concept of fine structure as the basic property of the solar plasma (1968); constructed the first multi-component sunspot model (1975), demonstrated the non-potential nature of the magnetic field; resolved, in collaboration with S.B.Pickelner and M.A.Livshits, the contradiction between the commonly accepted height of the corona over a sunspot and the location of radio sources; discovered 3-minute oscillations of sunspot magnetic fields (1972) and the tendency of various events of solar activity to cluster near the sector boundaries (1968). He proposed an explanation of the broad-band polarization in magnetic stars as the summary effect of the Zeeman polarization in optically thick spectral lines (1972); developed the concept of reference points of the solar cycle (1968-1980); and put forward and substantiated the idea that the coronal holes and active regions form a single complex (2006). A series of publications by V.N.Obridko are devoted to the evolution of the large-scale solar magnetic field (1998-2010). A multi-parameter scheme was developed for calculating magnetic and velocity fields in the heliosphere on the basis of the author's concept of different contribution of large-scale and local fields. In 1966, V.N.Obridko took part in establishing the Scientific Council on Solar-Terrestrial Physics (Sun-Earth Council) under the leadership of N.V.Pushkov and has been since its permanent member rising from the position of senior research fellow to Vice-Chairman (1981). As such, he coordinated a number of international research projects, in particular, the International Solar Cycle Studies (1998-2003), of which he was initiator and co-chairman.

V.N.Obridko is heading a leading scientific school, is a scientific adviser of the Solar-Terrestrial Department of the Shemakha Astrophysical Observatory (Azerbaijan), a holder of scholarship for the leading Russian scientists, Principal Investigator of the Integration and RFBR projects and cooperative programs with China, Ukraine, and Bulgaria. Awarded MAIK prize for the best series of publications in 2000-2001. Eight PhD theses were defended under his supervision.

In 2018, V.N.Obridko was awarded a commemorative plaque of the Scientific Committee on Solar-Terrestrial Physics in recognition and appreciation of his eminent contribution to SCOSTEP science and in celebration of his 80th anniversary.

OCHELKOV Yuri Pavlovich

Born 14.08.1947 in Sokolskoye, Ivanovo region. Graduated from MEPhI, Faculty of Theoretical and Experimental Physics in 1971. From 1971-1974 studied in the graduate school of the Institute of Space Research RAS (IKI), USSR Academy of Sciences. R&D: "Study of the interaction of radiation and ultrarelativistic electrons in intense space sources such as quasars and pulsars". On the same topic in 1979 at IKI defended his thesis for the degree of candidate of physical and mathematical sciences. Since 1974 has been working at the Institute of Applied Geophysics (IPG) as a leading researcher.

Y.P.Ochelkov is the author of 70 scientific papers published in Soviet, Russian and foreign journals, such as: Nature, Astrophysics and Space Science, Monthly Notices of The Royal Astronomical Society, Astronomy Letters (Pisma v Astronomicheskii Zhurnal), Astronomy Reports (Astronomicheskii Zhurnal), Cosmic Research (Kosmicheskiye Issledovaniya). In 1979, together with O.F. Prilutsky, I.L. Rosenthal and V.V. Usov, he published the monograph "Relativistic kinetics and hydrodynamics" (Moscow: Atomizdat, 1979, 200 p.). He was the first to carry out calculations on the induced Compton scattering of radiation by ultrarelativistic electrons in intense space sources.

At the IPG, his work is related to the study of solar activity in order to develop the physical foundations for predicting solar proton events (SPE). Y.P.Ochelkov was the first to propose a method for studying the distribution functions of events of various types related to solar flares and their relationship. Using this method, he discovered a nonlinear relationship between the number of electrons and protons accelerated in a flare.

He was the one to propose a new approach to the problem of forecasting the development of SPE – the rejection of the use of mathematical models of the development of SPE and the use of a statistical approach to forecasting. Using this approach, a method for predicting the integral flow of protons for SPE according to the maximum event phase was proposed and an SPE event class with a large-scale similarity at different development phases was defined.

Y.P.Ochelkov has also proposed a method for determining the heliolongitudinal dependence of the maximum intensity of proton fluxes in solar proton events based on an analysis of the heliolongitudinal distribution of solar flares preceding the SPE and the SPE intensity distributions. Recently, an improved method has been proposed, based on the consideration of two-dimensional flux distribution of flares at the maximum of soft X-rays and protons in the SPE. In 2016, when studying the temporal development of soft X-ray bursts of the Sun, he discovered the phenomenon of large-scale similarity (scaling) of the temporal development of soft X-ray bursts of the Sun during the growth phase and for the first time found a universal dependence describing the time course of soft X-ray bursts during the growth phase.

OGORODNIKOV Kirill Fedorovich

Born 30.07.1900 in Pavlovsk (near St. Petersburg). Graduated from Moscow University (now M.V. Lomonosov Moscow State University) in 1923. In 1922-1934, he worked at the State Astrophysical Institute (in 1931 it became part of the Sternberg Astronomical Institute). Since 1931, a professor and since 1936, Doctor of Phys.-Math. Sciences (without a thesis defense). In 1934-1938, a research fellow at Pulkovo Astronomical Observatory. In 1939-1985, worked at Leningrad State University (now St. Petersburg State University). In 1941-1950, Director of the Astronomical Observatory of Leningrad State University. In 1941-1942, participant of the People's Militia of the Leningrad Front. In 1942-1948, Dean of the Faculty of Mathematics and Mechanics at Leningrad State University; in 1944-1963, Head of the Department of Stellar Astronomy, founded by him at Leningrad State University. Died 29.06.1985 in Leningrad.

K.F.Ogorodnikov’s areas of research are related to stellar and extragalactic astronomy.

His early research (1923–1926) was centred on determining the apex and speed of the Sun from the radial and spatial velocities of stars. Developed the theory of the differential velocity field in the Galaxy and in 1932, developed a method for determining the characteristics of this field from radial velocities and proper motions of stars obtained from observations (later on, this approach was called the «Ogorodnikov – Milne model»).

In 1938-1940, performed a theoretical analysis of stellar counts in dark regions of the sky; this made it possible to develop and widely apply a method for determining physical characteristics of dark nebulae in the Galaxy. Built a stellar-dynamical theory that successfully combined the statistical approach to the problem with the hydrodynamical one; formulated general dynamical properties of stellar systems.

Examined equilibrium figures of rotating stellar systems and found that some theoretical figures complied to the observed forms of galaxies; predicted the possibility of existence of spindle-shaped galaxies and galaxies with a pear-shaped equilibrium figure. Showed the gravitational instability of rigidly rotating galaxies and thereby explained some features of spiral systems’ structure.

Developed a dynamical classification of galaxies and proposed possible sequences of their evolution. Presented the main results of his stellar-dynamical research in monographs «Foundations of the Dynamics of Rotating Stellar Systems» (1948) and «Dynamics of Stellar Systems» (1958). The latter monograph was translated into English in 1965 and was widely cited throughout the world.

A number of publications by K.F.Ogorodnikov are dedicated to the history of astronomy, in particular, to the dawn of modern astronomy in Copernicus’ works.

In 1932-1937, K.F.Ogorodnikov worked as an editor of the journal «Soviet Astronomy» (now «Astronomy Reports»). He was also an editor of the journal «Earth and Universe». In 1932, became a member of the Astronomical Committee of the People's Commissariat for Education (later on transformed into the Astronomical Council of the USSR Academy of Sciences), where he worked until 1972. Until 1985, Editor-in-Chief of the abstract journal «Astronomy» (published by the All-Russian Scientific and Technical Information Institute of Russian Academy of Sciences) since its foundation in 1953. Member of International Academy of Astronautics (1960).

Recipient of the state awards: Order of the October Revolution, Order of the Red Banner of Labour, Honoured Scientist of RSFSR (1968).

OKHOTSIMSKY Dmitry Yevgenyevich

Born 26.02.1921 in Moscow. In 1946, he graduated from M.V. Lomonosov Moscow State University (MSU). Since 1946, worked at the Applied Mathematics Department of the Steklov Mathematical Institute of the USSR Academy of Sciences (now the Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences) in different positions, starting as a junior researcher and progressing to a principal researcher. Doctor of Physico-Mathematical sciences (1957), Corresponding Member of the USSR Academy of Sciences (1960), Full Member of the Russian Academy of Sciences (1991), Honored Professor of MSU (1995), Foreign Member of the Serbian Academy of Sciences and Arts (2000), the Keldysh Gold Medal of the Russian Academy of Sciences (2001), Chairman of Theoretical Mechanics Department (1961), Member of National Committee of Theoretical and Applied Mechanics. Died 18.12.2005 in Moscow.

D.Y. Okhotsimsky's primary research interests are in the fields of celestial mechanics and space flight dynamics. He has over 200 publications in national and foreign scientific journals including three monographs.

D.Y. Okhotsimsky has greatly contributed to the development of the modern theory of artificial Earth satellites' motion and to motion control methods. D.Y. Okhotsimsky and his research group conducted comprehensive research on spacecraft flight dynamics and control. They developed the methods and algorithms of operational ballistic support and flight control, completed studies on manned and unmanned spacecraft flight control. Developed the general theory and performed analysis of Lunar trajectories including flyby and return trajectories. Devised a method of flight control strategy computation. The results of their work were used in the ballistic design of the first Lunar missions and 'Zond' series spacecraft that returned to Earth after Lunar flyby with motion control in Earth atmosphere as well as provided a solution of Lunar soil return problem. His research on planetary flight dynamics was widely used for Venus and Mars missions planning and implementation ('Venera' and 'Mars' spacecraft series). D.Y. Okhotsimsky founded and headed the Ballistic Center of the Institute of Applied Mathematics of the USSR Academy of Sciences. The Ballistic Center has been successfully providing the ballistic support and spacecraft motion control of all Soviet and Russian unmanned missions ('Luna', 'Venera', 'Mars', 'Vega' spacecraft) and some manned missions ('Soyuz', 'Soyuz-T', 'Soyuz-TM', orbital stations 'Salut' and 'Mir'), cargo spacecraft 'Progress', etc in close collaboration with major organizations in the space industry for more than 50 years. D.Y. Okhotsimsky conducted research on low thrust flight dynamics and control where he obtained a number of fundamental results. He achieved some important results in the field of autonomous spacecraft flight control.

D.Y. Okhotsimsky was World War II veteran.

D.Y. Okhotsimsky was awarded the following state prizes: the Medal for the Defence of Moscow (1945), Lenin Order (1956, 1961), Lenin Prize (1957), Hero of Socialist Labour (1961), State Prize (1970), Order of the Red Banner of Labour (1970, 1981), Order of the October Revolution (1975), Medal for 40 years of Victory in the Great Patriotic War of 1941-1845 (1985). The small planet № 8061 'Okhotsimsky' was named by the International Astronomical Union after D.Y. Okhotsimsky.

ORESHKO Vasily Vasilievich

Born 22.12.1962 in Starodubsky district, Bryansk Region. In 1986, he graduated with honors from the Ryazan Radio Engineering Institute. After graduating from the Institute, he began working at the Radio Astronomy Station (since 1996 – Pushchino Radio Astronomy Observatory). He worked in various positions – from engineer to senior researcher, Deputy Director of the observatory. Ph. D. thesis in Engineering, was defended in 2002 on the basis of many years of research in the field of radio astronomy equipment and methods of pulsar research. Deputy Chairman and academic Secretary of the section "Radio Telescopes and Methods" of the Scientific Council for Astronomy of the Russian Academy of Sciences.

The main areas of work relate to the creation and upgrading of the radio astronomy tools and methods, the study of pulsars and the creation of a new astronomical Pulsar time scale. The author of more than 80 scientific papers.

In 1992-1995, with his very active participation, together with Yu.P. Ilyasov, Yu.I. Belov, B.A. Poperechenko and O.V. Doroshenko, the unique complex "Facility the Pulsar Time Scale" was created at the RT-64 radio telescope in Kalyazin. Since 1996, a 10-year cycle of high-precision timing of millisecond pulsars had been carried out at this complex. In 1995-2001, together with colleagues from CRL (Japan), the first VLBI observations of pulsars in the Russian Federation were carried out using the VLBI equipment, created with his leading participation at the RT-64 radio telescope

V. V. Oreshko took an active part in the Radioastron ground-space project – he supervised the modernization of the electromechanical drive of the RT-22 radio telescope of the project's ground-based tracking station and the creation of the station's metrological complex based on hydrogen frequency and time standards.

In 2009-2012, under his leadership, a new multipath (128 beams) beam-forming system of the Large Phased Array antenna (BSA) was created. In fact, on the basis of the same BSA antennae, the second radio telescope was created, which along with studies of pulsars, quasars and radio galaxies, allows for systematic monitoring of the state of near-solar and interplanetary plasma in order to predict "space weather".

Since 2010, V. V. Oreshko has been the head of department of the unique facilities – the Large Phased Array antenna (BSA), Wide-band Cross-type DKR-1000 radio telescope, and radiotelescope RT-22, he ensuring their effective participation in radio astronomy research at the request of Russian astronomers.

ORLOV Alexander Alexandrovich

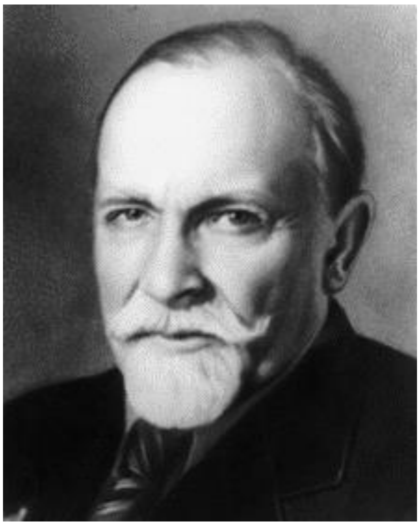
Born 22.11.1915 in Odessa. In 1934–1938, a student of the Astronomy Department of the Mechanics and Mathematics Faculty of M.V. Lomonosov Moscow State University. In 1938–1941, a post-graduate student of the same Faculty. In 1941 he went to the army and was sent to the front. He was in the ranks of the army till June 1946 and then returned to the University. PhD dissertation on periodic solutions of the limited three-body problem (1947). D.Sci. dissertation on the motion of Jupiter's outer satellites (1971).
Since 1946, junior researcher, then senior researcher at the Sternberg Astronomical Institute, M.V. Lomonosov Moscow University.
Member of the IAU (Commission No. 17).
A.A. Orlov was awarded two Orders of the Red Star, Order of the Patriotic War (2nd degree), medals "For the capture of Königsberg" and "For the victory over Germany".
Died 22.02.1986 in Moscow.

Alexander Alexandrovich Orlov was one of the brightest representatives of the Moscow school of celestial mechanics, hereditary astronomer (son of A. Ya.Orlov), participant of the Great Patriotic War, Doctor of Sci. (Physics and Mathematics), a major expert in the study of motion of artificial satellites of the Earth, natural satellites of planets, and in stellar triple systems. He published over 60 scientific papers on these and related branches of science. A.A. Orlov was an excellent teacher, he delivered several basic special lecture courses at the Department of Celestial Mechanics and Gravimetry, supervised scientific work of students and graduate students. He held the position of Senior Research Fellow.

A.A. Orlov’s main contribution to science lies in the following fields of research:

1. Investigation of Lagrangian particular solutions to the problem with variable masses.
2. Study of periodic spatial solutions in the restricted three-body problem.
3. Investigation of the stability of solutions of linear differential equations with variable coefficients.
4. Construction of a new non-Keplerian elliptical intermediate orbit taking into account solar disturbances (Orlov's intermediate orbit).
5. Study of the motion of artificial earth satellites taking into account various kinds of disturbances.
6. Study of the motion of the outer satellites of Jupiter.
7. Study of intermediate motions in triple star systems.

ORLOV Sergey Vladimirovich



Born 06.08.1880 in Moscow. Died 12.01.1958 in Moscow. Graduated from Moscow University (1904). A teacher of astronomy and physics at Perm University (1920–1922). A deputy director and then a director of State Astrophysical Institute (GAFI) in Moscow. Since 1926 a professor at Moscow University. A deputy director of P.C. Sternberg State Astronomical Institute (SAI) of MSU (1931-1934). A member of the IAU (1934). Habilitation (1936). A director of SAI (1943-1952). A chairman of the Commission for Study of Comets and Meteors attached to the Astronomical Council of the Academy of Sciences of the USSR (1936-1956). A corresponding member of the Academy of Sciences of the USSR (1943). Died 12.01.1958 in Moscow.

O.'s main scientific works are devoted to the study of comets. Developing the works of F. Bessel and F.A. Bredikhin, O. significantly improved the mechanical theory of cometary forms. A founder of the Moscow School for the Study of Comets. In 1902-1904 he worked as a freelance assistant at the observatory of Moscow University. In 1906-1914, 1917-1920 he taught mathematics at the 1st Moscow Gymnasium, at the same time he was independently engaged in scientific work, making observations in a private observatory. In 1910-1914 he found an empirical law for a brightness of a comet as a function of a distance from the Sun and the Earth, and proposed a method for separating reflected and proper light of a comet's nucleus. In the works "A Mechanical Theory of Cometary Forms" (1928), "Comets" (1935), "The Origin of Comets" (1941), "The Nature of Comets" (1944), "A Head of a Comet and a New Classification of Comet Forms" (1945) developed a unified comets theory, in which their mechanical and physical features found a connection. He studied photometric characteristics of comets, a relationship between brightness and solar activity, a relationship between comets and small bodies of the Solar System, and the origin of comets. Investigated causes of repulsive accelerations in comet tails. He performed spectral studies of comets, created instruments for photographing comets and obtaining their spectra. The new "fountain" theory of a structure of a head of a comet developed by O. made it possible to strictly classify cometary forms. O. determined types of tails of 37 comets, types of heads of 30 comets, registered anomalous tails of two comets, halos of five comets.

From 1926 O. taught general and special astronomical courses at Moscow University, and from 1936 – the course "The Theory of Cometary Forms." Rendered a great help to amateur astronomers, observers of meteors. Over the years, he was a scientific secretary of the Astronomical Committee of the People's Commissariat for Education of the RSFSR, a member of the editorial board of the Astronomical Journal. A laureate of the Glavnauka Prize (1927), the Stalin Prize of the 2nd degree (1943), the F.A. Bredikhin Prize of the Academy of Sciences of the USSR (1959, posthumously). He was awarded the Order of Lenin, twice – the Order of the Red Banner of Labor. A crater on the far side of the Moon and the minor planet №2724 are named after O.

ORLOV Victor Vladimirovich

Born 03.10.1956 in Belomorsk, Karelian Autonomous Soviet Socialist Republic. In 1979, graduated from the Faculty of Mathematics and Mechanics of Leningrad State University (now St. Petersburg State University). Since 1979, held different positions at Leningrad State University. In 2000-2006, a senior researcher and then a leading researcher at the Astronomical Institute of St. Petersburg State University. Professor T.A. Agekian was his PhD supervisor. Since 1994, Associate Professor at the Department of Celestial Mechanics of St. Petersburg State University. From 2006, Professor at this department. Doctor of Physical and Mathematical Sciences (2005). Honorary Worker of Higher Professional Education of the Russian Federation (2014). Died 23.05.2016 in St. Petersburg.

V.V. Orlov's main areas of research include galactic astronomy, studies of structure, kinematics and dynamics of stellar systems, and celestial mechanics. Author and co-author of about 300 publications, including three textbooks, co-author of "The Three-Body Problem from Pythagoras to Hawking" (2016).

V.V. Orlov was involved in numerical experiments in stellar dynamics to study the properties of stellar systems, focusing mainly on the dynamics of three bodies and systems of higher multiplicity. Proposed criteria for triple approaches and ejections for rotating systems on a plane and in three-dimensional space. Discovered several new statistical regularities of the decay process of unstable triple systems, in particular, found distributions of decay parameters characterizing the final states. Identified a new class of states in the dynamical evolution of unstable triple systems (metastable motions in the vicinity of stable periodic orbits). Presented the classification of orbits in planar isosceles and rectilinear three-body problems, according to the number of passages of the central body through the center of mass of the triple system, preceding the departure of one of the bodies. Determined the parameters of the dynamical stability of several dozens of known hierarchical triple stars. Developed possible scenarios for the dynamical evolution of selected triple and multiple stars. Obtained new results in numerical-experimental studies of the dynamical evolution of galaxy groups, dynamical modeling of the Galaxy, studies of the spatial distribution of extragalactic objects, and in the field of observational cosmology.

V.V. Orlov was actively involved in teaching and supervised many undergraduate and postgraduate students. Supervisor of six completed Ph.D. theses and informal research advisor for three completed Ph.D. theses. He read lectures for schoolchildren interested in astronomy and was engaged in the popularization of astronomy at various forums.

V.V. Orlov was a prominent organizer in the field of science. Member of the Bureau of Section No. 1 "Structure and Dynamics of the Galaxy" of the Scientific Council for Astronomy of the Russian Academy of Sciences, member of the Board of the International Public Organization "Astronomical Society". Participant in organizing and hosting many Russia-wide and international scientific conferences.

OSIPKOV Leonid Petrovich

Born 19.10.1945 in Leningrad (now St. Petersburg). In 1968, graduated from the Mathematics and Mechanics Faculty of Leningrad State University (LGU, now St. Petersburg State University, SPbU). In 1968-1971, was a post-graduate student at the same faculty. In 1971-1997, a junior researcher and then a senior researcher at the Research Institute of Computational Mathematics and Control Processes of LGU. PhD (1973). In 1995, worked at Christ Church College, Oxford University. From 1997 until his death, an Assoc. Prof. at the Faculty of Applied Mathematics and Control Processes at SPbU. Awarded the Bronze Medal VDNH for research on open clusters (1986). In 1989, his results were regarded as the most important achievements of the year in the field of astronomy. A prominent representative of the Leningrad-Petersburg scientific school of stellar astronomy.
Died 22.08.2015 in St. Petersburg.

L.P. Osipkov's main areas of research include the dynamical theory of stationary stellar systems, phase models of galaxies, theory of relaxation and stability of stellar systems, structure and dynamics of the Galaxy, and applied hydrodynamics. Author and co-author of 194 publications (84 of them without co-authors), including 9 books and 10 reviews.

In 1971-1972, applied methods of ergodic theory and averaging methods in nonlinear mechanics to gravitating systems (problems of phase mixing and the third integral of motion). Having considered small vertical oscillations in the field of a rotationally symmetric potential, he showed that the introduction of canonical action-angle variables makes it possible to significantly simplify the equations that turn out to be integrable in all orders of smallness (1975).

Proposed new classes of stationary models of gravitating systems, in particular, the models of spherical systems with ellipsoidal velocity distribution (1979). Later on, such models, independently introduced by the American astronomer D. Merritt, were called "Osipkov–Merritt models".

In the 1980s, together with S. A. Kutuzov, he developed a general method of equipotentials for modeling the mass distribution in stellar systems and built a new model of the Galaxy using this method; the model was later used by various research teams. He applied this method to model galaxies.

For many years, he studied the orbits of various objects in the Galaxy. Together with K. A. Barkhatova et al., he confirmed the existence of complexes of open star clusters and obtained indications of the existence of a higher-order system, a "Supercomplex" of open clusters (1980-1990).

Since the 1980s, continuing G. G. Kuzmin's ideas, he worked on developing a gross-dynamical approach to studies of stellar systems. He used a tensor generalization of the virial theorem, which enabled describing oscillatory processes in galaxies. Developed new approaches to describe relaxation and stability in stellar systems and obtained new results in modeling of phase mixing, as well as in other fields of research.

L.P. Osipkov was actively involved in research on the history and methodology of astronomy and physics. He was a prominent organizer in the filed of science. One of the founders of the Department of Space Technologies and Applied Astrodynamics of SPbSU AM&CP (2000). Member of organizing committees of many national and international scientific conferences. Deputy Chairman of the "Structure and Dynamics of the Galaxy" division of the Scientific Council for Astronomy of the Russian Academy of Sciences, where he headed the "Galactic Dynamics" subdivision. Member of the Editorial Board of the journal "Bulletin of the Udmurt University. Series Physics, Chemistry".

PAMYATNYKH Alexey Alekseevich

Born 05.11.1946 in Sverdlovsk. In 1970, graduated from Ural State University (USU). In 1970-1973, a PhD student at the Astronomical Council of the USSR Academy of Sciences. PhD thesis “Pulsational Stability of Delta Scuti Stars and Helium Diffusion in Stellar Envelopes” (1975). In 1973-2012, a researcher at the Astronomical Council (currently, the Institute of Astronomy of Russian Acad. Sci.). Since 1998, a researcher at Nicolaus Copernicus Astronomical Center, Polish Academy of Sci. D.Sc. (1999, dissertation “Pulsations of Main-Sequence Stars”, nostrification of the Polish diploma in Russia in 2001), Professor (2016). Awarded Silver Badge of the Order of Merit of the Republic of Poland (2003) and Officer’s Cross of the Order of Polonia Restituta (2010).

A.A. Pamyatnykh’s research interests are in the fields of stellar evolution, physical processes in stellar interiors, and asteroseismology of the main-sequence stars including the Sun. His main results have been obtained in collaboration with colleagues from Moscow (S.V. Vorontsov, V.A. Baturin), Poland (W.A. Dziembowski, R. Sienkiewicz, P. Moskalik, J. Daszynska-Daszkiewicz, T. Zdravkov), and Austria (M. Breger, G. Handler, P. Lenz).

A.A. Pamyatnykh obtained one of the first helioseismic estimates of helium abundance in the solar convection zone (1990-91). Using new data on the opacity of the stellar matter, the new instability strip of pulsating stars in the upper part of the main sequence was determined, which made it possible to explain the observed variability of Beta Cephei type stars and slowly pulsating stars of the SPB-type (1993). The features of pulsations of Delta Scuti type variables were studied in detail: period changes, multiperiodicity, evolutionary status (1998-2013). A new method of the pulsation mode identification was developed and applied to specific stars using observational data from multicolor photometry and radial velocity measurements (2002 and later). The seismic models of some bright well-studied variable stars were constructed (2004 and later). In particular, it was shown that the convective core of the star Nu Eridani rotates ap-proximately five times faster than the outer layers (2004). The asteroseismic tests for bright multi-periodic variables show that the existing stellar opacity data still need to be modified – probably, the opacity in the deep layers of the stellar envelope should be higher than estimated now (2008 and later).

A.A. Pamyatnykh published more than 130 scientific papers.

PANCHUK Vladimir Evgenievich

Born 03.08.1946 in Siauliai, Lithuanian SSR. In 1964-1969, a student of Odessa State University. In 1969-1970, served in the Soviet Army. In 1971-1973, he pursued postgraduate studies at Odessa State University. Since 1974, he has been working at the Special Astrophysical Observatory of the USSR Academy of Sciences (since 1991, the Russian Academy of Sciences) holding various positions: Junior Researcher (1974-1982), Academic Secretary (1982-1985), Senior Researcher (1985-1989), Leading Researcher (1989-1998), Chief Researcher (since 1998). In 1978, he defended his Ph.D. thesis "Model atmospheres of cool stars". In 1990, he defended his D.Sc. thesis "Methods and results of the spectrophotometric study of the chemical composition of stellar atmospheres". Professor in "Astrophysics and radio astronomy" (2003).

V.E. Panchuk's research interests are in the areas of the physics of stellar atmospheres, spectroscopy, and astronomical instrumentation. He is the author and co-author of over 310 publications, inventions, and patents.

In 1968, he calculated the luminescence spectra behind the shock front in the atmospheres of RR Lyrae-type stars. At the beginning of the 1970s, he performed the calculations of model atmospheres of cool stars accounting for the formation of more than 300 molecules. For the first time, he made the calculations of the titanium oxide optical absorption spectra in view of about 1.5 million rotational transitions, calculated the profiles of the absorption and emission spectra of Mira-type variables.

Since 1975, under E.L.Chentsov's guidance, V.E. Panchuk participated in the acceptance of the standard spectral instruments of the 6-m BTA telescope and carried out the first observations. Since 1979, he is the astronomer responsible for one of the methods of spectroscopic observations.

Since 1980, he developed and put into operation the instruments of high and intermediate spectral resolution with different signal registration methods at the 6-m BTA telescope. In 1986, together with V.G. Klochkova, he developed the method of "Echelle spectrograph with a two-dimensional TV photon counter." Since 1990, he developed the use of CCDs in spectroscopy with BTA as well as developed and implemented several crossed dispersion spectrographs. As part of a small team (S.V. Ermakov, V.G. Klochkova, M.V. Yushkin) he provided for about two thousand scheduled and technical observational nights with BTA. In 1991, he held a regular reconstruction of the Main Stellar Spectrograph, resulting in observations of the absorptions of cosmological origin in the spectra of bright quasars (in collaboration with D.A. Varshalovich and A.V. Ivanchikov, the main prize of the IAPC, 1996). At the beginning of the 2000s, he completed a program of transferring the high-resolution spectroscopy with BTA to the large-diameter collimated beams (with I.D. Naidenov). Together with M.V. Yushkin, V.E. Panchuk developed the optical layouts for the orbital observatory spectrographs. Developed several spectrographs for the medium and small diameter telescopes (in collaboration with M.V. Yushkin, G.V. Yakopov, M.V. Yakopov, et al.).

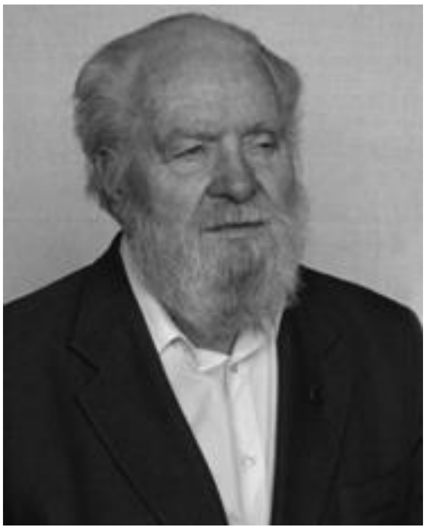
Since 1976, based on the results of observations with BTA V.E. Panchuk performed investigations of the spectra of stars of different types (with V.G. Klochkova et al.). Almost all the spectra were analyzed by the model atmosphere method, repeatedly adapted for different generations of computer technology.

Professor of ITMO University (St. Petersburg) and Stavropol State University (since 2012 – North-Caucasus Federal University, NCFU). Supervisor of six completed Ph.D. degrees and two Doctors of Science degrees.

He was awarded state prizes: a medal "For Military Merit" (1970), "Honored Scientist of Russia" (1998).

IAU member, a member of the editorial boards of national and international journals on astronomy.

PANTELEEV Valery Leontievich



Born 04.08.1931 in Novo-Spassk, Zainsk region of the Tatar ASSR. Graduated from the Faculty of Physics and Mathematics of Kazan State University. The thesis was devoted to the theory of the motion of the minor planet Nausikaa. Candidate and doctoral dissertations – to the methods of determining strength of the gravitational field in motion. A candidate of Physical and Mathematical Sciences (1958), a doctor of Physical and Mathematical Sciences (1976), a professor of the Department of Celestial Mechanics, Astrometry and Gravimetry. For several years he held positions: a head of the Department of Celestial Mechanics, Astrometry and Gravimetry and a head of the laboratory of gravimetry of SAI MSU. Died 06.03.2021 in Moscow.

A student of Professor A.D. Dubyago. Research interests – methods and equipment for determining strength of the gravitational field of the Earth and other planets.

For many years he taught courses at the astronomy department, he is an honored professor at Moscow University, prepared 6 candidates of sciences, published more than 100 scientific papers. Namely: “Mathematical Processing of Observations”, “Physics of the Earth and Planets”, “The Theory of Random Functions”, “The Theory of Automatic Control and Regulation”.

He developed a theory of resonant perturbations in motion of gravimetric pendulums, built a theory of perturbations in readings of a marine gravimeter, showed systematic errors of a marine gravimeter associated with a coherence of horizontal and vertical accelerations. He was the first to point out the existence of an effect that the Americans later called the crosscoupling effect. In his doctoral dissertation, methods of dynamic synthesis of optimal systems designed to determine strength of the gravitational field on mobile carriers of measuring equipment are considered. He wrote the monograph "Foundations of the Marine Gravimetry" (1983), which is the first foundational book in scientific literature on the marine gravimetry. In addition, “Marine Gravity Prospecting” (co-authored) (1991), the study guide “Measurement of Gravity on a Movable Base” (2003) were published.

P. is a member of 5 long-term underwater gravimetric expeditions to the World Ocean, a member of expeditions on the surface research vessels "Vityaz", "Ak. Kurchatov” and others.

Was awarded with badges “For a long trip” (for a heroic underwater expedition), “Excellent worker in geodesy and cartography”.

V.L. Panteleev held a position of a Head of the Department of Celestial Mechanics, Astrometry and Gravimetry for several years and was a head of the laboratory of gravimetry of SAI.

PAPUSHEV Pavel Georgievich

Born 16.10.1949, Rubtsovsk, Altai Krai. Studied at the physics and mathematics high school of Novosibirsk State University (1965–1968), and at Novosibirsk State University (1968–1971). Since 1971, held different positions at the SB RAS Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation, the USSR Academy of Sciences (since 1992, the Institute of Solar-Terrestrial Physics SB RAS), starting as an intern researcher and progressing to a lab supervisor. PhD (1982). Member of the International Astronomical Union. Died 31.01.2012, Irkutsk.

P.G. Papushev's primary areas of research relate to solar physics, space control and astrophysical instrument engineering. Author and co-author of more than 70 research publications, including one patent. Conducted a comprehensive research on the evolution of chromospheric spicules — the principal element of the solar chromosphere fine structure and developed a model of spicules as underextended plasma jets. Using this model, it was possible to explain the height of spicule rise, the width of spectral lines, and the mechanism of line profile evolution. P.G. Papushev, together with V. Grigoryev, developed a plan for the solar stereoscopic observatory and proposed a new type of extra eclipse coronagraph for exoatmospheric corona observations with significantly increased spatial resolution.

P.G. Papushev developed an original system of photoelectric monitoring and corona image scanning for the Large Solar Coronagraph, proposed the method to correct a rotating image in coronagraph Coudé system and a technique to register the height of observed spectra above the solar limb.

Significantly contributed to the development of research methods of both radiative and reflective characteristics of spacecraft and space debris using the ground-based astronomical instruments in the visible and infrared spectra.

In 1986, with his direct participation, an automated complex of photometric instruments was designed for high-precision measurements of light curves and signatures of moving space objects. The measurement results were employed when creating a model of a target object map in space.

In 1989, P.G. Papushev began work on getting coordinates and photometry information about space objects in the infrared range. The research facilitated the development and creation of the first Russian infrared AZT-33 IK telescope. P.G. Papushev was directly involved in the telescope development and putting it into operation.

Together with LOMO JSC, St-Petersburg, he completed the design of AZT-33VM wide-angle telescope with the 10 sq. degrees field of view for fast sky survey and for solving the important problems of near-Earth space monitoring and asteroid and comet impact hazards.

Awards: the Medal of the Order "For Merit to the Fatherland", 2nd Class (1999), Certificates of Honor from RAS and SB RAS.

PARENAGO Pavel Petrovich

Born 20.03.1906 in Yekaterinodar (now Krasnodar). He graduated from the MSU Faculty of Mechanics and Mathematics in 1929. In 1927-1932 he worked at Astronomical and Geodetic Institute (AGNII) in Moscow. From 1932 to 1960 he worked at P.C. Sternberg State Astronomical Institute (SAI) of MSU. Since 1935 – a doctor of Physical and Mathematical Sciences (without a defense). Since 1938 – a professor at MSU. From 1940 until the end of his life he headed the Department of Stellar Astronomy of MSU, which he created. Since 1953 – a corresponding member of the Academy of Sciences of the USSR. In 1953-1960 he headed the Stellar Astronomy Commission attached to the Astronomical Council of the Academy of Sciences of the USSR, which he created. Died 05.01.1960 in Moscow.

A founder of the Moscow School of Stellar Astronomy. P.'s scientific works are devoted to the study of the structure of the Galaxy, the study of the structure and the dynamics of stellar systems, the study of variable stars. P. used results of studying variable stars for solving general problems of the structure of the Galaxy. Compiled a union catalog of the main characteristics of stars – parallaxes, proper motions, radial velocities, spectral types, etc. Based on the analysis of the material he collected, P. substantiated an existence of the sequence of subdwarfs located on the Hertzsprung – Russell diagram under the main sequence. Together with B.V. Kukarkin developed the concept of stellar subsystems of the Galaxy and studied the structure and kinematics of various subsystems. Together with A.G. Masevich found (1949–1950) that each sequence on the Hertzsprung – Russell diagram corresponds to its own form of relationship between mass and luminosity of stars. He developed methods for determining a luminosity function and estimating a total number of stars in galactic subsystems, built a theory of the gravitational potential of the Galaxy. In 1940 he developed a theory of light absorption by dark nebulae and proposed methods for accounting for this effect. He studied the motion of the Sun relative to 591 stars in a sphere with a radius of 20 pc and determined the galactic orbit of the Sun has a form of an ellipse with an eccentricity of 0.30 and a semi-major axis of 10 kpc. In 1947 he became the first to determine a speed and a direction of the Galaxy in relation to its neighbors. In 1955 he proposed a comprehensive plan for the study of selected sections of the Milky Way, in the implementation of which many observatories took part.

In 1934 he began to teach a course in stellar astronomy at MSU. In 1938 he wrote the first in world literature textbook on stellar astronomy, which was reprinted several times. P. was one of the authors of the "General Catalog of Variable Stars", as well as the monograph "Variable Stars" (vols. 1-3, 1937-1947). Together with B.V. Kukarkin wrote the book "Variable Stars and Methods of Observing Them" (1938). The author of several hundred scientific papers and a number of popular science books. The first laureate of the F.A. Bredikhin Prize of the Academy of Sciences of the USSR (1948). The minor planet № 2484 and a crater on the far side of the moon are named after P.

PARFINENKO Leonid Danilovich

Born in 1946 in Leningrad. In 1969, graduated from the State University of Leningrad (Observational Astrophysics). Post-graduate student at the Central Astronomical Observatory at Pulkovo (1969-1972). Cand.Sci.("Investigation of the fine structure of the solar atmosphere on different time and space scales" (1973). With the Laboratory of Solar Physics of the Pulkovo Observatory. Developed electronic equipment for solar instruments. Participated and headed a number of expeditions for solar observations: Cuba, Caucasus, Pamirs. Participated in launches of stratospheric solar telescopes. Dr.Sci. ("Structures of the solar atmosphere at different time and space scales") (2011). Member of the IAU.

The main research topic: experimental studies of the fine structure of the photosphere and of the elements of solar activity: sunspots, faculae, chromospheric filaments. Developed and manufactured electronic equipment for the studies of fine-structured elements of the solar atmosphere. Took part in a number of long-term expeditions for solar observations, in the launch of unique solar telescopes on stratospheric balloons, carried out in the 70-ies under the direction of Prof. V.A. Krat. In recent years, in cooperation with Prof. A.A. Solovyev and Dr.V.I. Efremov, studied the long-period (with periods 10 to 35 hours) oscillations of sunspots, facular knots, and chromospheric filaments using the data from ground-based and space observatories. Authored over 150 scientific papers on solar physics and two popular science books. High activity in astronomical outreach.

parfinenko@mail.ru

PARIJSKIJ Yuri Nikolaevich

Born 23.05.1932 in Moscow. Studied at the Moscow State University from 1951 to 1955. Junior Researcher at the Main (Pulkovo) Astronomical Observatory from 1955. Headed the Radio Astronomy Department of the Pulkovo Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) from 1960 to 1969. From 1969 – Vice-Director of scientific research at the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991). From 1979 – Corresponding Member of RAS, from 1992 – Full Member of RAS. Chief Researcher at SAO RAS since 1997. Defended his Ph.D. thesis on "Investigation of several radio nebulae based on their continuous radio emission" in 1962. Defended his Dr. Sci. thesis, "Results of investigating one-dimensional images of bright radio sources at Pulkovo and prospects of two– and three-dimensional radio astronomy", in 1969. Died 31.07.2021.

His main area of research is related to observational radio astronomy, physics of cosmic radio sources, and methods of building large radio telescopes. He is the author of over 250 scientific papers and two monographs, "Radio telescopes and radiometers" (N.A. Esepkina, D.V. Korolkov, Yu.N. Parijskij, 1973) and "Radio galaxies and cosmology" (O.V. Verkhodanov, Yu.N. Parijskij, 2009).

Yuri Nikolaevich had actively participated in building the Large Pulkovo Radio Telescope and in the first radio source observations. He conducted high-accuracy cosmological observations, determined a new lower limit for the cosmic background anisotropy level in the 1970's-1980's, which led to a revision of the galaxy formation theory. He studied the fine structure of the Galaxy and created a morphological catalog of its radio sources. He also considered problems related to the evolution of radio sources.

Under the direction of Yu.N. Parijskij, observations of Venus and Jupiter were carried out in 1962 with the Large Pulkovo Radio Telescope. He determined the decrease in radio brightness towards the limb of Venus, which indicates that the observed radio emission originates from the dense hot surface of the planet and is partially absorbed in its atmosphere. This result was con-firmed by the data obtained by the American "Mariner-II" mission during its Venus flyby.

Yu.N. Parijsky is one of the creators of the RATAN-600 radio telescope. In 1965, by the decision of the Soviet Academy of Sciences, he became the scientist responsible for RATAN-600.

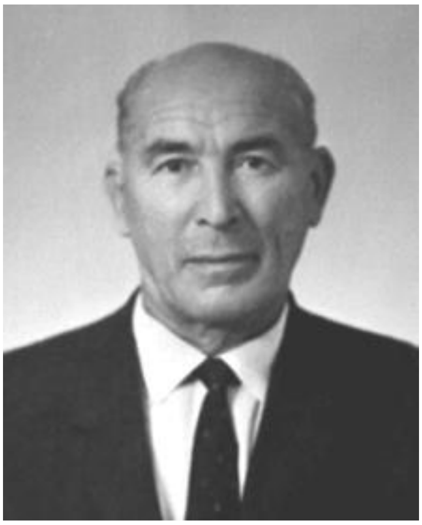
Under his supervision, two long-term programs were carried out at RATAN-600: "COLD" and "Genetic Code of the Universe". He also headed the "The Big Trio" (BTA-RATAN-600– VLA) program, which lead to the first discovery of one of the most distant radio galaxies in the Universe, RCJ0311+0507, with a redshift of z=4.514. This object is unique, and is considered to have a giant black hole with the mass > $10^{10}M_{\odot}$ in the center of the host galaxy. The age of the stellar population of the host galaxy is estimated as ~ 0.8 billion years.

Within the scope of the "Genetic Code of the Universe" program, the contribution of synchrotron, free-free, and dust radiation to the sky background radiation has been estimated. Estimates on rotating dust were also obtained. A catalog of radio sources based on the Zenith survey of RATAN-600 was compiled (RZF-catalog). Also, a 16-channel (32 inputs) matrix radiometer system, "MARS-3”, was created.

He is a member of the radio astronomical Council, a member of the IAU, and had been elect-ed president of the IAU Commission 40 for radio astronomy and president of URSI.

He has been honored by the medal "For Valiant Work" (1970), the Order of "Badge of Honor" (1975), the Order of Lenin (1978), and the IV degree order "For Merit to the Fatherland" (1999).

PARIYSKIY Nikolay Nikolaevich



Born 30.09.1900 in St. Petersburg. In 1924 he graduated from Moscow University. He worked there from 1924 to 1960. From 1935 until the end of his life he worked at the O.Yu. Schmidt Institute of Physics of the Earth of the Academy of Sciences of the USSR (since 1956 – a head of the department). A doctor of Physical and Mathematical Sciences, a professor, a corresponding member of the Academy of Sciences of the USSR (1968). Died 03.29.1996 in Moscow.

His scientific works in the field of astronomy are devoted to cosmogony, the rotation of the Earth and the nature of the solar corona questions. In the field of geophysics, he was engaged in studying tidal deformations of the Earth and gravimetry. In 1943 he argued away J.H. Jeans' hypothesis of the origin of the solar system: together with V.G. Fesenkov calculated orbits of bodies torn out of the Sun by the action of a nearby star, and found no correspondence with the solar system. Critically examined various reasons for the seasonal irregularity of the Earth's rotation and showed that neither the movement of the poles, nor the seasonal movements of air masses, nor changes in temperature of the oceans can explain the observed effect. He pointed out that the most likely reason for the annual variations in the speed of rotation of the Earth is an influence of the circulation of the Earth's atmosphere, accompanied by a transfer of an angular momentum from the atmosphere to the Earth. Received an estimate of the secular deceleration of the Earth's rotation speed.

The author of about 120 scientific papers. He was awarded the Order of Lenin (1953) and the Orders of the Red Banner of Labor (1970, 1975, 1981).

PAVLENKO Elena Petrovna

Born in 1951. In 1969–1974 – a student of Tomsk State University. Since 1975 she has been working at CrAO. Since 2015 – Head of the Laboratory of Binary Stars. In 1993 she defended the Ph.D. thesis "Photometric studies of some magnetic and X-ray novae". In 2010 defended her Doctoral thesis "Cataclysmic variables and related systems with low mass ratio of components". An Honored Worker of Science and Technology of the Republic of Crimea (2011). A laureate of the M.P. Barabashov award of the National Academy of Sciences of Ukraine (2009). The number of scientific publications – 283.

The main direction of scientific researches is photometric study of cataclysmic variable stars and related objects. Up to 1998 investigations were carried out with high-sensitive TV tubes as light detectors, and later on – using CCDs. During 1980–1990 in collaboration with scientists from Spain, UK and Russia studied the low-mass X-ray binary systems including black holes. Particularly together with Ph.D. student of CrAO A.A. Shlyapnikov and Spanish colleague A. Castro-Tirado an optical counterpart in V518 Per was first discovered, that afterwards provided possibility to study this object in different spectral regions; during the outburst in QZ Vul the orbital period was found. Studying the photometric behavior of the magnetic Nova V1500 Cyg over scale more than 10 years, E.P. Pavlenko discovered asynchronous spin-orbital rotation of the white dwarf and its fast synchronization. She estimated time of synchronization and showed its non-linear nature that is consistent with theoretical prediction by I. Andronov (1987) and J. Katz (1991) that such a peculiar synchronization could be caused by both action of the strong magnetic field of the white dwarf and interaction of the magnetic field with "ultraviolet wind" from the secondary component. In another asynchronous polar BY Cam the accretion geometry onto the white dwarf's magnetic poles was defined for different orientation of the complex magnetic field (dipole+quadrupole type). It was found that BY Cam was at a slow spin-orbital synchronization state. As a result of studies of about two dozen of the SU UMa-type dwarf novae, non-radial pulsations of the accreting white dwarf in EZ Lyn were first detected and the evolution of pulsations was studied. It was found that the white dwarf in EZ Lyn entered the instability strip twice over ten years. In two dwarf novae MN Dra and 1RXS J0038 a nodal precession of the accretion disk was first found. The studies of cataclysmic variables have been carried out in close collaboration with colleagues from CrAO, SAI, Astronomical Institute of the Slovak Academy of Sciences, Kyoto University.

PAVLINSKY Mikhail Nikolaevich

Born 08.12.1959 in Kremlev (now – Sarov, Nizhny Novgorod region). After graduating in 1983 from the Moscow Engineering Physics Institute worked at the Space Research Institute of the Russian Academy of Sciences (IKI RAS), passing the way from an engineer to head of the High Energy Astrophysics department and Deputy Director. Since 1991– PhD in Physics and Mathematics, since 2000 – Doctor of Sciences in Physics and Mathematics. Member of the IAU, the Space Council of the Russian Academy of Sciences and the section for Extra-Atmospheric Astronomy of this Council, member of the Scientific Council for Astronomy of the Russian Academy of Sciences, member of the Editorial Board of Experimental Astronomy. Died 01.07.2020 in Moscow.

Specialist in the field of X-ray astronomy and instrumentation, developer of unique X-ray telescopes, leader of a number of space projects. Author of over 300 scientific publications.

He made a great contribution to the development and calibration of the ART-P telescope of the GRANAT astrophysical observatory (one of the first X-ray telescopes with a coding aperture), led the work on the processing and analysis of its data, was one of the inspirers and developers (Deputy Project Scientist) of the Spectrum-X (SRG) observatory designated for carring out a highly sensitive sky survey in X-rays. He was responsible for the development and calibration of the ART-XC telescope of this project (the first Russian X-ray telescope with grazing incidence mirrors), organized the laboratory of modern X-ray detectors and a test facility at IKI RAS. After lunching the SRG observatory into orbit on July 13, 2019, he organized flight tests and verification of alignment of the ART-XC telescope, compiled its first X-ray map of the sky (based on the results of the first six months of the sky survey). He initiated a number of other projects in the field of X-ray astronomy: all-sky monitors MVN and MVN-2 for the orbital station, an X-ray telescope for the GAMMA-400 project.

He did a lot for the commissioning and organization of uninterrupted operation of the 1.5-m optical telescope RTT-150 in Turkey, for equipping the 1.6-m telescope AZT-33IK of the Sayan Observatory with a modern spectrograph. These telescopes are actively used for optical identification of X-ray sources discovered by the INTEGRAL, SWIFT, and SRG observatories.

The main scientific results were obtained using the ART-P telescope and are associated with the study of X-ray radiation from neutron stars and black holes in the vicinity of the Galactic center: he played a key role in mapping this area in X-rays with good (a few arcmin) resolution and the discovery of a number of new X-ray sources here, in the conclusion about a very low current X-ray luminosity of the central supermassive black hole and detection of an "X-ray echo" of an intense outburst of its hard radiation that occurred hundreds of years ago (the X-ray emission from the outburst reflected by giant molecular clouds surrounding the Galactic nucleus). He participated in the optical identification of many X-ray sources, primarily cataclysmic variables, active galactic nuclei, and clusters of galaxies.

He was awarded the prize of the European Academy for young scientists, the first prize of the Eurasian Astronomical Society, medals of the Russian Federation of Cosmonautics. The ART-XC telescope of the SRG observatory, developed under his leadership, is named after him.

PAVLOV Georgy Georgievich

Born 27.11.1944 in Moscow. Graduated from Physico--Mechanical Dept. of the Leningrad Polytechnical Instutute in 1967. Worked at the Dept. of Theoretical Astrophysics of the Ioffe Institute of Physics and Technology (1967-1996), Dept. of Astronomy & Astrophysics of the Pennsylvania State University (1992-current; Research Professor), St.-Petersburg Polytechnical University (2010-2012; Head of Laboratory of Astrophysics of Objects with Extreme Energy Release, supported by the "megagrant program" of the government of the Russian Federation). Leads astrophysical investigations with X-ray and optical space observatories as well as theoretical programs. Member and chair of various scientific committees and panels, including peer review panels for Chandra, XMM-Newton, Hubble Space Telescope, and several NASA programs.

G. G. Pavlov works on observational and theoretical investigations of neutron stars and related objects as well as radiative processes in compact astrophysical objects. The main fields of research are the following: (1) Thermal emission from neutron stars, modeling neutron star atmospheres; (2) X-ray observations of neutron stars, pulsar wind nebulae and supernova remnants; (3) Observation of UV, optical and IR emission from neutron stars; (4) Atomic physics and quantum electrodynamics in strong magnetic fields, transfer of radiation in strongly magnetized plasmas.

The most significant scientific results are the following:

1. Derivation of radiative transfer equations and absorption/emission coefficients in media with strong magnetic fields; radiative transfer with account for birefringence of strongly magnetized vacuum (with Yu.A. Shibanov, Yu.N. Gnedin, D.G. Yakovlev).
2. Development of first neutron star atmosphere models, including modeling of polarization of X-ray emission from neutron stars (with V.E. Zavlin, Yu.A. Shibanov).
3. New approach to studying the equation of state of superdense matter in the neutron star interiors by analyzing the shapes of pulse profiles of millisecond pulsars (with V.E. Zavlin).
4. Discovery of first absorption lines in the spectrum of an isolated neutron star; discovery and investigations of a new class of neutron stars – Central Compact Objects (CCOs) in supernova remnants (with D. Sanwal, V.E. Zavlin, B. Posselt, O. Kargaltsev).
5. Discovery of thermal UV emission and investigation of thermal evolution of old neutron stars (with O. Kargaltsev).
6. Investigations of thermal and magnetospheric X-ray emission from various types of neutron stars; discovery and systematization of many pulsar wind nebulae (with V.E. Zavlin, O. Kargaltsev, B. Posselt).
7. Discovery of UV-emitting bow shocks created by millisecond pulsars (with M. Durant, O. Kargaltsev, B. Rangelov).
8. Establishing the connection between X-ray pulsar wind nebulae and sources of TeV emission (with B. Rangelov, O. Kargaltsev).
9. Discovery of "misaligned outflows" of relativistic plasma from several pulsar wind nebulae (with O. Kargaltsev, N. Klingler).
10. Discovery of fast-moving clouds of relativistic plasma ejected from high-mass binaries with neutron star companions (with O. Kargaltsev, J. Hare).

The results are published in 250+ papers, in various astrophysical and physical journals (over 8900+ citations, Hirsch index = 50, as of July 2021).

The works of 1994-2021 were supported by 116 grants from NASA, NSF, STScI, SAO, JPL, and a "megagrant" from the government of the Russian Federation.

PAVLOV Nikolay Nikiforovich

Born 25.10.1902 in St.-Petersburg. In 1926–1930, being a post-graduate at Pulkovo Observatory, took part in the work of Time Service, under the supervision of N.I. Dneprovsky. In 1936 – 1973, Head of Dept. of Time Service at Pulkovo Observatory. In 1936–1947 – Academic Secretary of Interdepartmental Time Committee at Pulkovo Observatory. October, 1946 to November, 1947 – Acting Director of the Pulkovo Observatory. In 1944–1955 – Head of Chair of Astrometry of Leningrad University, since 1946 – Professor. In 1974: Permanent Representative of Presidium of the USSR Academy of Sciences in the Interdepartmental Committee of the Joint Time Service of USSR, Chairman of the Commission on Time Determination at AstroCouncil. Since 1936, Member of IAU, in Commissions No 19 and No 31. Honoured Master of Sciences and Engineering. Died 26.08.1985 in Leningrad.

His basic scientific works belong to astrometry, in particular, to the problem of increase in the accuracy of astronomical determination of time and right ascensions of stars, to improvement of astronomical instruments, and also to studies of motion of continental plates, deformations of the Earth core and irregularities in the Earth rotation. His scientific heritage includes about a hundred of works on mathematics, astrometry, astronomical geodesy and electronics.

Starting from 1934, suggested a number of new methods, which gained wide international recognition. Among them, a method of photoelectric registration of stellar passages for observations with passage instruments (the theory of the method, the equipment, appliances for determination of delays, the mirror viewing grate). Up to mid-1970-ies, actively observed in person with photoelectric passage instruments. In 1937, designed a horizontal passage instrument of large optical strength.

In October, 1941, along with A.N. Deutsch, Acting Director of the Observatory, took part in rescuing books from destroyed Observatory Library. From September, 1943, to February, 1944 worked in Moscow as Academic Secretary of The Time Committee and as Time Service Advisor at Central Scientific Research Institute of Geodesy, Air Surveying, and Cartography. In February, 1944, was the first of "Pulkovers" who returned to Leningrad to revive the ruined Observatory. In 1944, in co-operation with D.D. Maksutov, designed a meniscus passage instrument. Since 1951, in calculations of the USSR reference time, method of calculations of consolidated moments suggested by him was accepted.

In 1944–1969, held lectures in the State University of Leningrad, in 1944 – 1955 headed the Chair of astrometry in the University, since 1946 – Professor of Chair of Stellar Astronomy of the State University of Leningrad. Supervised a number of post-graduates at The Central Astronomical Observatory.

The minor planet (7008) Pavlov was named after him.

Honored with State Awards: Mendeleyev Prize of The USSR Academy of Sciences (1940), Medals «For Defence of Leningrad» (1945), «For Valorous Labor in The Great Patriotic War 1941–1945» (1946), National Prize of the USSR (1947), Stalin Prize of II Degree (1947) for the development of photoelectric technique of registration of stellar passages, providing a substantial increase in the accuracy of astronomical observations, two Orders of the Red Banner of Labor (1945, 1953). Distinguished Academic of RF (1974). Bronze Medal of the All-Union Exhibition of Achievements of National Economy for composing of the Aggregated Catalog of the USSR Time Services (1969).

PAVLOVSKAYA Elizaveta Dmitrievna

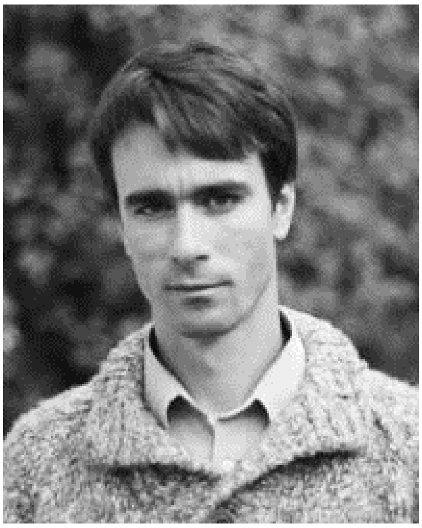
Born 29.12.1926 in Moscow. Student of the Faculty of Mathematics and Mechanics, M.V. Lomonosov Moscow State University (MSU) (1944–1949). PhD student at the Department of Stellar Astronomy (1949–1952). PhD thesis «Spatial motion of RR Lyrae stars» (1952). Junior researcher (1953), senior researcher (1957) at the Sternberg Astronomical Institute (SAI) of MSU. Head of Research Team «Structure, Kinematics, and Dynamics of Stellar Systems" at SAI (1960). IAU Member (Commission 33 «Structure and Dynamics of the Galactic System", 1958). Head of Research Team "Galactic Structure" at the Stellar Astronomy Commission of the Astronomical Council (USSR Acad. Sci.), 1960. Her D.Sc. defense was canceled due to her death 20.02.1992 in Moscow.

E.D. Pavlovskaya's areas of research include the galactic structure, stellar systems structure and dynamics, and variable stars (related to the research goals of P.P. Parenago, the founder of the Moscow stellar astronomy scientific school). In her PhD thesis, she improved the mean absolute magnitude of RR Lyrae stars (short-period Cepheids) and found it to be larger by 0.5m than that adopted at that time (i.e. their luminosities were found fainter). The result determined the distance scale in the Galaxy for more than 40 years. From her studies of Cepheid motions, she improved the zero point of their period-luminosity relation. E.D. Pavlovskaya established the relation between the kinematics of stars and their spectral types and luminosities, researched galactic rotation for different subsystems of the Galaxy. She determined and improved proper motions for several hundred young stars.

Considering the Galaxy's spiral structure and its spiral arms as density waves forming a specific velocity field, E.D. Pavlovskaya suggested a new method for determining spiral pattern parameters from the kinematics of young stars, which proved to be a promising line of research confirmed by her together with Yu.N. Mishurov and A.A. Suchkov (1979). The "kinematical" method developed by them became classics of stellar astronomy. Many E.D. Pavlovskaya's students continue to develop this method.

E.D. Pavlovskaya's achievement of special significance is her method of dating ancient star catalogs based on stellar proper motions and her proof that the famous Ptolemy's Almagest (2nd century B.C.) was created in ancient, Hellenic Greece. The latter result was confirmed using E.D. Pavlovskaya's method in 2001 when new, high-accuracy measurements of stellar proper motions from the HIPPARCOS space mission had become available (Yu.N. Efremov, A.K. Dambis).

PAVLYUCHENKOV Yaroslav Nikolaevich



Born 13.06.1978 in Zlatoust, Chelyabinsk province. In 2001, he graduated with distinction from the Department of Physics at Chelyabinsk State University. During 2001-2004, a postgraduate student at the Institute of Astronomy of the Russian Academy of Sciences in Moscow. In 2005, defended his Ph.D. thesis «Chemo-dynamical diagnostics of protostellar objects".
During 2005-2008, he worked at the Max-Planck Institute for Astronomy in Heidelberg, Germany. Since 2008, he has been working at the Institute of Astronomy of the RAS. In 2016, he defended his doctoral dissertation "Emission of molecules and dust in prestellar and protostellar objects." Member of the Academic Council of the Institute of Astronomy of the RAS.

Y.N. Pavlyuchenkov's research interests lie in the fields of astrophysics, physics of the interstellar medium, and problems of the formation of stars and planets. Author of over forty research publications. In collaboration with B. M. Shustov and D. S. Wiebe, Y.N. Pavlyuchenkov contributed to the development of self-consistent chemo-dynamical models of protostellar clouds. He was the first to carry out a systematic analysis of factors determining the observational manifestations of protostellar clouds in molecular lines, with the key factors being the inhomogeneous density distribution, features of the thermal and chemical structure, and kinematics of the cloud.

To calculate the transfer of dust and molecular radiation, he developed a number of effective numerical methods. These methods are optimized for numerical modeling of prestellar and protostellar clouds, protoplanetary disks, and regions of ionized hydrogen around young stars. The developed methods include acceleration algorithms for the existing approaches, as well as modifications of approximate methods, which make it possible to speed up calculations tenfold while maintaining accuracy.

Using the developed models and methods, together with his colleagues from the Institute of Astronomy of the RAS and Max-Planck Institute for Astronomy, he obtained new results on the physical structure of objects of various nature: prestellar nuclei, protoplanetary disks, and the regions of ionized hydrogen. Important new results are the detailed reconstruction of the chemical and kinematic properties of the prestellar core in the CB 17 globule; predictions of the morphological features of spectral maps of protoplanetary disks confirmed by observations at ALMA; the discovery of a wide extended outflow near the protoplanetary disk CB 26; quantitative reproduction and explanation of the observational distributions of IR and mm-radiation in the ionized hydrogen region RCW 120.

PEREPELKIN Eugene Yakovlevich

Born 04.03.1906 in Petersburg. In 1925, graduated from Leningrad University, then took a post-graduate course at Pulkovo Observatory. Since 1929, with Pulkovo Observatory. Since 1934: Professor, Head of Laboratory in Astrophysical Section. Arrested on 11 May 1937 within the framework of the so-called «Pulkovo Case», sentenced to 5 years in prison. Undergoing the sentence in Mariinsky Corrective Labor Camp in Krasnoyarsk Territory, sentenced to capital punishment by an "NCVD troika" (13.01.1938). Rehabilitated in 1956.

His basic science works are devoted to solar physics: studies of the rotation of the Suna, determination of the height of flocculi, studies of the origin of solar prominences and the structure of the chromosphere. Suggested a new index of far-UV solar radiation, which accounts for ionization of the upper layers of the Earth's atmosphere; carried out a number of observations aimed at obtaining of long-time series of this index. Originated systematic solar studies both at Pulkovo Observatory and in the USSR in general. In 1931, initiated organization of the Sun Service in the USSR. After establishment of this Service in 1932, took charge of it, planned it, composed manuals for observations and data processing.

Took part in creation of the first solar instruments in the USSR, in particular, the double spectroheliograph and The Major Solar Telescope. One of main organizers of observations of the total solar eclipse in 1936; took part in the expedition to Sweden for observations of the solar eclipse in 1927. Studied also variable stars, meteor showers, Mars (during its Great Perihelic Opposition in 1924). Studied the parallax and proper motion of Barnard star. In cooperation with A.N. Deutsch, in 1931–1932 carried out measurements and processing of photographs of Kapteyn Selected Areas, aiming at the study of proper motions of stars.

A Lunar crater and a crater on Mars are named after him.

PETROV Alexander Nikolaevich

Born 01.01.1955 in village Kitoy near Angarsk of Irkutsk province in Russia. Graduated from the Physics Department of M.V. Lomonosov Moscow State University in 1979. PhD thesis: “The Lagrangian and the Hamiltonian Description of the Relativistic Gravitational Field” (1988). Sci. Hab. thesis: “The Theory of non-Linear Perturbations in
Metric Models of Gravity and Its Applications in Cosmology and Astrophysics” (2007). Since 1979, he has been working at the Sternberg Astronomical Institute MSU (from 2008, Leading Researcher). A vising researcher at IUCAA (Pune, India) from 1995 to 1996 and at University of Missouri-Columbia (Columbia, USA) from 2005 to 2006.

A.N. Petrov’s research interests include the theory of gravitational field, conservation laws in metric theories of gravity and their applications for the study of the solutions of these theories in cosmology and astrophysics. The author of over 80 research publications and the popular book “Gravitation. From crystal spheres to wormholes”.

In his PhD thesis, provided the foundation for the field-theoretical formulation of general relativity. In this approach, perturbations, including metric ones, are propagated on fixed arbitrary curved backgrounds. In his Sci. Hab. thesis, in the framework of the most effective approaches – the canonical, Belinfante symmetrized and field-theoretical approaches – developed the methods of constructing conserved quantities, currents, and superpotentials, for perturbations (not only infinitesimal) on arbitrarily curved backgrounds in the metric theories of gravity. The theoretical results have been used for analyzing known solutions to general relativity and other metric theories, for interpreting exotic solutions in modifications of general relativity, for study cosmological perturbations on the Friedmann and (anti-)de Sitter backgrounds. Together with A.D. Popova, developed the idea of quantum gravity with self-interaction; together with V.A. Gusev, studied the possibility of gravitational waves detection using squeezed states.

The membership: the Russian Gravitational Society; the American Mathematical Society.

PETROV Petr Petrovich

Born 24.04.1945. In 1963–1968 – a student of Ural State University. In 1968–1971 – a PhD student at the Crimean Astrophysical Observatory (CrAO). In 1977, he defended the Ph.D. thesis "The photometric studies of T Tauri stars". Since 1971, he has been working at CrAO. In 1987–1996 – a Vice Director of CrAO. In 2005, he defended his Doctoral thesis "Activity of young solar-mass stars". A member of IAU, a Founding Member of EAS. An Honored Worker of Science and Technology of Crimea (2008) and Ukraine (2009).

The basic area of researches is non-stationary processes in the solar-mass young stars. In 1975, jointly with A.G. Scherbakov, he put forward a concept of magnetic activity in T Tauri stars. In the 1980s, he participated in the development of the orbital observatory Astron, in designing new devices for spectral observations, and in introducing electronic image-detectors in astronomy. In the 80s and 90s, jointly with Swedish and Finnish colleagues, he carried out long-term series of high-resolution spectroscopic observations of the selected T Tauri stars. As a result of these studies it was shown how magnetic fields control the motion of gas in the vicinity of a T Tauri star. It was also found that the magnetosphere of T Tauri stars is generally non-axisymmetric; this causes the rotational modulation of radial velocities of emission lines. Jointly with Swedish and American colleagues, he first acquired a spectrum of gas accreting onto the star and determined its physical parameters. He investigated the effect of veiling of a photospheric spectrum of T Tauri stars with accretion disks. Jointly with G.H. Herbig, he carried out a detailed spectroscopic study of the FUors FU Ori and V1057 Cyg. Thus, the optical spectrum was shown to belong to the central fast rotating object, while the infrared radiation indicates the presence of an accretion disk of high luminosity. He also studied the wind dynamics in FUors and classical T Tauri stars.

PETROVSKAYA Irina Vladimirovna

Born 01.05.1938 in Leningrad (now St. Petersburg). In 1960, graduated from the Faculty of Mathematics and Mechanics of Leningrad State University (LGU, now St. Petersburg State University). From 1959 until her death, worked at LGU. In 1966-1995, Senior Researcher at the Astronomical Observatory of LGU, then Senior Researcher at the Astronomical Institute of St. Petersburg State University. Since 1995, Leading Researcher at the Astronomical Institute of St. Petersburg State University. Later on, Professor at the Department of Celestial Mechanics of St. Petersburg State University. Senior Researcher (1973), Doctor of Physical and Mathematical Sciences (1995). A prominent representative of the Leningrad-St. Petersburg scientific school of stellar astronomy. Died 11.09.1999 in St. Petersburg.

I. V. Petrovskaya's research interests are in the areas of the dynamics of spherical stellar systems, the theory of irregular forces in stellar systems, and the Galaxy structure and kinematics based on observations of neutral hydrogen. Author and co-author of 82 research publications, including 5 reviews.

Developed models of spherical systems at various stages of evolution. In particular, together with her research supervisor T. A. Agekian, found a generalization of the well-known isothermal model with the non-spherical velocity distribution of stars. In 1965-1966, developed a family of models of a star cluster with a quasi-stationary core and showed that the quasi-stationarity domain grows during the evolution. Based on this result, proposed a new (dynamical) method for estimating the age of globular clusters.

Research on the evolution of star clusters under the influence of irregular forces served as a continuation of those research results. I. V. Petrovskaya developed the theory of stellar approaches as a purely discontinuous random process, which enabled obtaining the correct description of the mass and energy loss process in clusters. In 1969, derived a form of the Kolmogorov–Feller equations with the presence of an absorbing screen, suitable for application in the theory of irregular forces. Developed algorithms for solving these equations, first by the Fourier method, and in 1983, by the method of integral transformations. For open clusters, investigated the evolution of the velocity distribution function of stars of various masses and obtained quasi-stationary final velocity distributions. In 1986, determined the distribution of the random force acting on a star in homogeneous stellar field, generalizing the known Holzmark distribution for close approaches.

In her pioneering works of 1964-65, proposed (together with T. A. Agekian and B. I. Fesenko) a new method for studying the rotation of the neutral hydrogen subsystem (HI), which uses the entire 21 cm line profile. This, for the first time, enabled studying not only the internal but also the external in relation to the Sun Galactic regions as well as to finding how the law of rotation changes with the distance from the Galactic equatorial plane. Later on, to construct the rotation curve, she took into account the warp of the HI layer, studied the density distribution in the HI subsystem, and determined the parameters of the spiral pattern of the Galaxy, concluding that it is four-armed.

Her last research was focused on developing a multicomponent model of the Galaxy describing the "deflection" of the rotation curve in the vicinity of the Sun.

In the 1960s, I. V. Petrovskaya was the Scientific Secretary of the Working Group "Dynamics of Stellar Systems" at the Astronomical Council of the USSR Academy of Sciences. She was among the first members of the International Public Organization "Astronomical Society", and since 1991, was the Head of the Control Commission of the Society.

PETROVSKAYA Margarita Sergeevna

Born 17.01.1933 in Leningrad (now St. Petersburg). In 1956, graduated with distinction in astronomy from the Mathematics and Mechanics Faculty of Leningrad State University (now St. Petersburg State University). In 1962, presented her Ph.D. thesis, and in 1971, defended her doctoral dissertation "Convergence of Expansions of the Perturbing Function in Celestial Mechanics." In 1960-1998, worked at the Institute of Theoretical Astronomy of the Russian Academy of Sciences in various positions, first as a junior researcher and then progressing to a department head. Since 1998, worked at the Central Astronomical Observatory at Pulkovo of the Russian Academy of Sciences (Pulkovo Observatory). In 1976, was awarded the title of Leading Researcher and in 2004, awarded the title of Professor in Astrometry and Celestial Mechanics" Died 08.06.2019 in St. Petersburg.

M.S. Petrovskaya was one of the leading experts in celestial mechanics and mathematical geodesy. Obtained several fundamental scientific results in the classical celestial mechanics, including establishing the regions of the convergence of series representing periodic solutions in problems of celestial mechanics; refined the value of the convergence radius of the Hill series in the theory of the motion of the Moon; obtained new expansions of the perturbing function, which made it possible to creat analytical theories of the disturbed motion of the planets of the Solar system with any eccentricities and inclinations of the orbits. Obtained a number of fundamental scientific results in the field of the theory of the gravitational potential and the shape of the Earth, taking into account its non-spherical structure and surface topography. She was the first to obtain expansions for the Earth's gravitational potential converging in the entire space. Developed a principle for accelerating the convergence of the Laplace series for the external potential of the Earth. Derived new compact formulas to determine the planetary figure of the Earth (geoid) from gravimetric data. Developed a new analytical method for determining the dynamical constants of the Earth's gravitational potential (Stokes constants) through the joint use of ground gravimetric measurements, satellite tracking data, and satellite altimetry. Together with A.N. Vershkov, developed a new high-precision theory of modeling and computer mapping of gravitational potential gradients based on data from the first satellite gradiometer mission of the European Space Agency (GOCE). M.S. Petrovskaya published 162 research papers.

M.S. Petrovskaya’s research results received international recognition. Member of the IAS, Member of the Special Working Group of the International Association of Geodesy (IAG) “Functional Analysis, Field Theory and Differential Equations” and Member of the IAG Commission “Spatial and Temporal Characteristics of the Gravitational Field”. In 1986-1995, a member of the Editorial boards of two international journals "Manuscripta Geodaetica" and "Bulletin Geodesique". Member of the Expert Council for Doctoral Theses at the Royal Institute of Technology in Stockholm. Conducted joint research with the Space Center of the Polish Academy of Sciences (PAS) as part of scientific collaboration between the Academies of Sciences of Russia and Poland.

The minor planet No.5319 "Petrovskaya" discovered in 1985 was named in honor of M.S. Petrovskaya.

PETRUKOVICH Anatoly Alekseevich

Born 29.06.1967 in Moscow. In 1990 graduated from the space physics department of Moscow Institute of Physics and Technology (Moscow PhysTech). Works at IKI since 1990, since 2018 – director of the Institute. In 2003 received Doctor of Sciences in Solar Physics. Since 2011 – Corresponding Member of the Russian Academy of Sciences. Since 2019 – Editor-in-Chief of the RAS Presidium Journal «Cosmic Research». Laureate of the Zeldovich Medal of COSPAR and RAS to young scientists (2002).

Petrukovich Anatoly is a leading Russian scientist in the field of space plasma physics, solar and geophysics, has more than 200 publications in peer-reviewed national and foreign journals (h-index WoS 32). Editor of the collective monograph "Modern Achievements in Plasma Heliogeophysics" (2018). He is a professor at the Department of Space Physics at the Moscow Institute of Physics and Technology.

While completing his undergraduate and graduate thesis, A.A. Petrukovich solved a number of problems important for an adequate description of whistler waves responsible for the dissipation of energy on shocks in space plasma. Since 1995 A.A. Petrukovich focused on the Russian Interball space project and research on the dynamics of the magnetosphere. One of the main problems in the physics of space plasma was solved, namely the quantitative identification of the global instability of the structure such as the tail of the magnetosphere. These are one of the most famous results obtained by the Interball project.

In recent years, with a team of experimenters and theorists, he has been actively working on a number of universal problems in the physics of collisionless space plasma related to wave-particle interactions on shock waves and fast plasma flows. The important results were obtained in the field of applied solar and geophysics, which significantly refined the geomagnetic activity forecasts, based on interplanetary medium observations.

A.A. Petrukovich is the head of several space projects of the Federal space program of Russia, the head of a number of sections in the specialized councils of the Russian Academy of Sciences. As the director of the IKI, he takes an active part in the formation of the Russian space research program.

PIKEL’NER Solomon Borisovich

Born 06.02.1921 in Baku. In 1938−1942 – a student in the Department of Astronomy, Faculty of Mechanics and Mathematics, Moscow University. In 1942−1945 – a post-graduate student in Moscow State University. In 1946 he defended the Ph.D. thesis “On the ejection of atoms out of the Sun and stars by radiation pressure”. In 1945−1946 – a member of Commission on Astrophysics of the USSR Academy of Sciences. In 1946−1959 – a researcher in the Crimean As-trophysical Observatory. In 1954 he defended the Doctoral thesis “The study of motion and glow of interstellar gas”. Since 1959 – a Professor in the Department of Astrophysics of SAI MSU. In 1964–1967 – the president of IAU Com-mission on interstellar medium. In 1971 − an honored member of London Royal Astronomical Society. In 1964−1975 – an Associate Editor in the Editorial Board of the Astronomical Journal. Died 19.11.1975 in Moscow.

Solomon Borisovich Pikel’ner was one of the outstanding astrophysicists in the middle XX century. He derived fundamental results in many fields of solar physics, physics of stars, interstellar medium and stellar systems.

S.B. Pikel’ner developed a theory of solar corona evaporation and jointly with I.S. Shklovsky carried out a theory of thermal radio emission from the solar corona. He constructed magnetohydrodynamic models of the solar chromospheric network, chromospheric active regions and solar flares, spicules, faculae, coronal condensations, prominences, bright short-term X-ray point sources. It is impossible to imagine the present-day state of solar physics without magnetohydrodynamics of solar formations developed by S.B. Pikel’ner.

S.B. Pikel’ner proposed an analogue of Stroemgren’s zone theory for circumstellar regions with helium emission, participated in putting forward an idea about physical identity of solar activity and flare red dwarf stars. He developed a concept of magnetism of the Crab Nebula and gas-dynamic structure of nova remnants. He constructed a theory of gas-dynamic interaction between supersonic stellar winds and surrounding circumstellar medium.

Jointly with G.A. Shajn and V.F. Gaze, S.B. Pikel’ner determined a mechanism of continuous spectrum of nebula emission and detected the presence of dust either in reflective or in emission objects. And jointly with G.A. Shajn and R.N. Ikhsanov, he performed polarimetric studies of the Crab Nebula which proved the synchrotron nature of optical emission of supernova remnants.

S.B. Pikel’ner put into operation the first Soviet nebular spectrograph, obtained excellent spectra of the filamentary nebula in Cygnus and developed a theory of shock waves in sharply non-equilibrium medium laying the groundwork for cosmical gas dynamics. He put forward an idea about unbroken dynamic interstellar medium – galactic halo and estimated it in the frame of characteristics of interstellar clouds and intercloud medium.

S.B. Pikel’ner carried out a series of works which laid the groundwork for the present-day concept of stellar formation. He calculated the temperature condition of interstellar gas taking into account heating by cosmic rays. Jointly with Ya.B. Zeldovich, he analyzed for-mations of interstellar clouds due to thermal instability and having considered the process of forming massive gaseous complexes he showed the possibility of gravitational gas condensation in a star inside these complexes. He considered a role of the spiral galaxy structure in the process of star formation and the discrete structure of spiral arms.

The contribution of S.B. Pikel’ner is invaluable in transformation of theoretical astrophysics as a science, predominantly in transferring radiation into the science that is charged with physical notions about magnetism and processes in plasma.

In honour of S.B. Pikel’ner the minor planet 1975 was named Pikelner and a crater on the far side of the Moon. An author of more than 240 publications, including 8 monographs.

PILNIK Grigory Petrovich

Born 23.10 1916 in Chernihiv province, Ukraine.
In 1939, graduated from university in Khabarovsk. In February 1940, was recruited by the army. First, he served in the Far East, and later in 1945, he participated in the conquer of Warsaw and attack of Berlin. Since 1946, he worked at Sternberg Astronomical Institute (SAI MSU), first as an observer, then as a research associate and since 1957, a research associate at the Time Service Department. In 1954, he received his PhD. In 1979, received D.Sc. with the dissertation "Universal Time and Problems of Physics of Earth». Awards: The Order of the Red Star and 2 Orders of the Patriotic War (class II). Died 12.09.2000 in Moscow.

At the beginning of the Great Patriotic War, G.P. Pilnik served in the Far East in the 184th Howitzer Artillery Crew.

During the Berlin battle, G.P. Pilnik was involved in military topographical investigation and participated in fire control of the suburbs of Berlin, the imperial office and the Reichstag.

In April 1946, G.P. Pilnik was involved in the examination of the debris of the German weapons, the V-2 ballistic missiles.

After his military discharge in 1946, G.P. Pilnik worked at the Time Service Department of SAI MSU. For many years, he had been carrying out observations with the transit instrument as well as examining and improving the transit instrument operation.

G.P. Pilnik was especially interested in researching the geophysical parameters of Earth rotation and in calculating Lyava numbers based on observational data from the Russian Time Services organisations. G.P. Pilnik published several articles on this subject and defended his D.Sc. thesis on "Universal Time and Problems of Physics of Earth".

G.P. Pilnik is the author of more than 100 articles and conference reports.

G.P. Pilnik died on September 12, 2000. He is buried at the Vagankovo Cemetery (grave No. 15) in Moscow.

PIPIN Valery Viktorovich

Born 18.10.1963, Angarsk, Irkutsk province. In 1986, graduated from Ural State University in Sverdlovsk (now UrFU, Yekaterinburg). After graduation, he had been working in a joint integrated expedition No. 1 of the Geodesy and Cartography Enterprise in the Severomuysky geodynamic site (the Baikal–Amur Mainline) for 3 years. Since 1989, has been working at the SB RAS Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation, the USSR Academy of Sciences (since 1992, the Institute of Solar-Terrestrial Physics SB RAS) in different positions, first as an engineer and then progressing to a senior researcher. Doctoral degree in Phys.-Math. Sciences (2005), Professor of National Astronomical Observatories of China (2009–2011).

V.V. Pipin' field of research relates to the theory of the origin of magnetic fields and solar differential rotation. Author of more than seventy research publications.

In the 1990s, V.V. Pipin, together with L. Kichatinov and Professor Rüdiger (Potsdam), developed the analytical theory of turbulent processes of angular moment transfer in stellar convective envelopes. Application of this theory to solar dynamo nonlinear numerical models provided a consistent explanation of a magnetic cycle and cyclic large-scale variations of angular speed of solar rotation for the first time.

In the 2000s, V.V. Pipin, together with D.D. Sokolov, K.M. Kuzanyan, and Chinese scientists, reconsidered the role of magnetic helicity in mechanisms of turbulence generation of magnetic fields.

Based on the developed theory, built the numerical models of solar and stellar dynamo that, for the first time, succeeded in demonstrating the common features of turbulence mechanisms of magnetic field generation in late-type stars.

At present, V.V. Pipin is involved with the development of non-axisymmetric models of a solar and stellar dynamo.

Awards: the Certificate of Honor from the RAS (2010), the honorary badge "Honored Veteran of the SB RAS" (2013).

PIROGOV Lev Evgenyevich

Born 04.09.1959 in the city of Gorky (now – Nizhny Novgorod). In 1976-1981, a student at Lobachevsky State University. From 1981 until present, he has been working at the Institute of Applied Physics of the Russian Academy of Sciences in various positions, first as an intern researcher and then progressing to a leading researcher. In 1999, he defended his PhD on "Diagnostics of dense interstellar gas in the regions of massive star formation from observations of J = 1-0 HCN". In 2014, he defended his D.Sc. thesis on "Studies of the structure and characteristics of dense cores in the regions of massive star formation".

L.E. Pirogov's research interests relate to the physics of interstellar molecular gas-dust clouds and star-forming regions.

L.E. Pirogov took an active part in the development of an automated system of receiving instruments for spectral studies in the mm wavelength range. Using this system, in the mid-1980s, regular molecular line studies of dense molecular cloud cores associated with the regions of massive star formation began with the RT-22 radio telescope of the Crimean Astrophysical Observatory under I.I. Zinchenko's leadership. Later, these studies continued with a number of foreign radio telescopes. Together with I.I. Zinchenko, L.E. Pirogov determined physical parameters and chemical composition of representative samples of cores associated with the regions of massive star formation. He estimated the internal structure and kinematics of cores and their degree of rotation and discovered the effects of chemical differentiation. He calculated radial density profiles in cores from observations of dust emission in the continuum. He investigated the kinematics, physical and chemical properties of a num ber of interstellar filaments associated with the regions of massive star formation.

L.E. Pirogov developed original computer programs for calculating the excitation of rotational levels of various molecules, indicators of physical conditions in the dense molecular cloud cores. Together with P.M. Zemlyanukha, he developed an algorithm for fitting model spectral maps into observed ones to estimate the parameters of the structure and kinematics of cores. L.E. Pirogov developed a fragmentary model of a core that explained the anomalies of the HCN molecular line hyperfine structure observed in the regions of massive star formation. He developed a method for estimating the parameters of a probable small-scale fragmentary structure of cores, which cannot be resolved directly in observations, based on the analysis of residual intensity fluctuations on the profiles of molecular lines.

He is the author of more than 50 articles in Russian and foreign scientific journals and article collections.

PISKUNOV Anatoly Eduardovich

Born 12.12.1947 in Kaliningrad. In 1971, graduated from Ural State University (now UrFU, Yekaterinburg). After graduation, worked at Kourovka Observatory of Ural State University. From 1972 to 1975, a PhD student at the Astronomical Council of the USSR Academy of Sciences (Astro Council, now INASAN). Afterwards, worked at INASAN occupying different positions. In 1977, defended his PhD thesis "Star formation function of some objects of the flat population of the Galaxy". In 1998, defended his D.Sc. dissertation "Evolution of the stellar population of the galactic disk". Currently, he is a leading researcher at the Department of Physics of Stellar Systems at INASAN. Has the title of a professor of astrophysics and radio astronomy (specialty 01.03.02).

A.E. Piskunov's research interests lie in the area of the structure, dynamics, physical properties, and evolution of the stellar population of the Galaxy's disk and open star clusters. He developed methods for determining the individual and integral parameters of stars in open clusters as well as the masses, ages, and initial mass functions of the clusters as a whole. Investigated the parameters of the star formation function of field stars and stars in open clusters. Carried out the study of the relation between the spatial velocity of the field stars and their age. Together with S.V. Vereshchagin, he conducted research on the chemical evolution of the Galaxy's disk. Together with O.Yu. Malkov and A.N. Belikov, developed methods for studying the fine structure of the luminosity function of field stars and stars in open clusters. Together with V.I. Myakutin, developed a technique for calibrating photometric diagrams by age and mass. In collaboration with Indian astronomers, studied in detail selected young open clusters. In collaboration with N.V. Kharchenko (GAO Kiev) and a group of German colleagues, made a breakthrough in the study of the population of open clusters of the Galaxy. During a large-scale survey, carried out an exhaustive census of galaxy clusters, including both known and previously unknown objects. As a result of this survey, the number of Galaxy's open clusters studied in detail has doubled (from 1500 to 3000). For each of them, determined a complete multifactorial set of parameters, including the combined cluster membership probability for separate stars and integral cluster parameters such as the coordinates of the center, angular size, proper motion, distance, color excesses, age, and tidal parameters. Based on these data, investigated the contents, structure, and evolution of the Galactic population of open clusters. The study of photometric evolution of integrated parameters of these objects showed that the observed cluster parameters cannot be adequately described by models with continuous IMF and require assumptions about its discreteness. This leads to jumps in the integrated luminosities and colors of the clusters at the moments when the most massive members flare up like red supergiants or giants, and then just as quickly go out, which makes it possible to use the observed statistics of red giant flares to estimate the lower limit of stellar masses in galactic clusters.

By the end of 2020, A.E. Piskunov published 210 research papers with over 3300 citations in scientific literature. He supervised five PhD theses.

Participates in the international project "Spectrum-UF" included in the Federal Space Program of Russia. The goal of the project is to create a large space observatory in the ultraviolet range to solve fundamental problems of astrophysics, cosmology, and physics.

PISKUNOV Nikolai Evgenyevich

Born 24.10.1957 in Moscow. In 1980, graduated from M.V. Lomonosov Moscow State University (MSU). In 1980-1985, PhD student and until 1991, a researcher at the the Astronomical Council of the Academy of Sciences USSR. PhD thesis «Magnetic fields of Peculiar Stars» (1985). Researcher at the University of Helsinki (Finland) in 1991-1993, a fellow at Joint Institute for Lab Astrophysics (JILA, Boulder, USA) in 1994-1996. Since 1996, an astronomy professor at Uppsala University (Sweden). Member of the Swedish Royal Academy (2015). President of IAU Commission 29 (2009-2012).

N.E. Piskunov's research interests span a wide range of astrophysical problems. He made a significant contribution to research on surface structures for stars of various spectral types. In particular, he proposed and implemented a novel methodology for mapping the distribution of chemical composition across the surfaces of peculiar stars based on spectral synthesis and models of stellar atmospheres. Later on, N.E. Piskunov generalized this methodology for the mapping of temperature inhomogeneities on the surface of solar-type stars and the mapping of magnetic fields. The results led to a substantial revision of the theory of chemical stratification in stellar atmospheres and opened the possibility for direct studies of magnetic activity in cool stars. N.E. Piskunov developed new methods for solving the equation of radiative energy transport including the effects of polarization and Zeeman splitting in the presence of magnetic fields. From the early 2000s, N.E. Piskunov has been studying exoplanets with the goal to measure their physical parameters and the chemical composition of their atmospheres. These efforts led to the discovery of several planets outside the Solar system. He is developing and testing methodology for the detection and analysis of atmospheres around low-mass planets.

N.E. Piskunov designed and built unique instruments for optical and infrared spectropolarimetry. Under his leadership, an international consortium is working on the construction of a specialized infrared spectrometer CRIRES+ for the 8-meter VLT European Sothern Observatory telescope in Chile. N.E. Piskunov created a popular database for astronomical spectroscopy VALD (Vienna Atomic Line Database).

N.E. Piskunov published nearly 300 research papers with over 7000 citations in scientific literature.

N.E. Piskunov spends has been Dean of the Physics Faculty at Uppsala University (Sweden) for many years. He was a Swedish representative at the Science and Technical Council of the European Southern Observatory, served as a chairman of the Nordic Optical Telescope Science Association Council.

PITJEVA Elena Vladimirovna

Born 04.04.1950 in Gorky (now Nizhniy Novgorod); graduated from the Leningrad State University (LSU, in 1972); held a position of Engineer and Observer at the LSU Observatory (from 1972 to 1974) in Byurakan (Armenia); researcher at the Institute of Theoretical Astronomy of the USSR Academy of Sciences (from 1974 to 1988), researcher (from 1988) at the new Institute of Applied Astronomy (IAA) of the USSR Academy of Sciences (now RAS), Head of Laboratory (from 2005 until now); defended her PhD thesis "Construction of Major Planet High-Precision Ephemerides and Determination of Some Astronomical Constants" (2005); a Member of the IAU Commission No.4 (Ephemerides) Organizing Committee (from 2006 to 2015); the IAU Commission X2 of Solar System Ephemerides (from 2015 until now), the IAU NSFA WG (from 2006 until now) and Commissions A3 and A4 (from 2015 until now).

E. V. Pitjeva is a Soviet and Russian astronomer, whose scientific papers (more than 100) deal mainly with those celestial mechanics and ephemeris astronomy areas which are related to the motion of major planets. E.V. Pit'eva was one of the authors of the unified relativistic theory of the motion of inner planets and the Supplements to the Astronomical Yearbook of the USSR for 1980-1990, which were the basis for planning Soviet experiments in deep space.

E. V. Pitjeva has expanded her investigations of the planet motion by processing the ranging data from the Martian landers Viking and Pathfinder and from space vehicles which are orbiting Mars (Mariner-9, MGS, Odyssey, MRO and MEX), Venus (VEX), Mercury (MESSENGER), and Saturn (Cassini). She was one of developers of the ERA Software (the Ephemeris Research in Astronomy). In recent years E. V. Pitjeva has undertaken a development of high accuracy planet ephemerides based on radar observations of the highest quality. The Ephemerides of the Planets and the Moon (EPM) constructed in the IAA RAS are only comparable in accuracy with the new versions of the DE/LE ephemerides developed at the Jet Propulsion Laboratory (USA). These IAA RAS ephemerides have found wide application in the Russian Astronomical Yearbooks and the Federal GLONASS Program.

The latest versions of the EPM ephemeris include mutual perturbations of the planets, the Sun, the Moon, main belt asteroids and trans-Neptunian objects, the solar oblateness, and the figures of the Earth and the Moon. These ephemerides provide new opportunities for refining the values of a number of astronomical constants: estimates of the solar oblateness have been derived, the rotation parameters of Mars have been determined with high accuracy, including the rate of precession of its rotation axis, the masses of a number of asteroids, and the total masses of asteroids in the main belt and trans-Neptunian objects. The investigation of secular changes in some astronomical constants is of particular interest because it gives the opportunity to test some effects of general relativity and the alternative gravitation theories, and to estimate a possible change of the gravitational constant which characterizes the fundamental properties of space and time.

E. V. Pitjeva is the first to obtain the value of the heliocentric gravitational constant (GM□) secular change, as well as the constraint values for the mass and density of the dark matter in the Solar System. She obtained these values from processing more than 800,000 positional observations of planets (from 1913 to 2014) and spacecraft of various types.

E. V. Pitjeva was the Editorial Staff Member of the "Celestial Mechanics and Dynamical Astronomy" Journal (from 1995 to 2000). She is an Editorial Staff Member of the "IAA RAS Transactions" Journal (from 2006) and has earned a number of awards, namely, The RAS President's Certificate of Honour (1999) and The State Medal (2003).

PLOKHOTNICHENKO Vladimir Leonidovich

Born 08.08.1951 in the Krasnoyarsk province. After completing his studies at Kharkov State University in 1973 and serving in the Soviet Army in 1975, he received the position of a chief laboratory assistant at the Special Astrophysical Observatory of the Academy of Sciences USSR (now SAO RAS). Started working at the Department of Relativistic Astrophysics in 1976, where he held different positions: a software engineer, senior software engineer, researcher, and senior researcher. In 1993, he completed his PhD with the thesis "Hardware-software complex of the MANIA experiment and the results of an investigation of several astrophysical sources". In 2020, he defended his DSc thesis on "Instruments and methods of searching for optical variability in astrophysical objects with high temporal resolution".

V. L. Plokhotnichenko's research interests centre on the development of means of investigation of faint and rapidly variable astrophysical sources. He significantly contributed to the future development of the MANIA experiment dedicated to searching for stellar-mass black holes started by V.F. Shvartsman in 1972 and continued to improve its mathematical and technical methods. He developed and put into practice the optimal algorithms for searching for stochastic variability, as well as searching for and analyzing periodic signals under strong noise. Under his supervision, the third and fourth-generation chronometric devices were developed that were designed to study the emission of pulsars and other faint non-stationary objects. He developed the conceptual design of the fifth-generation chronometric grabber for registering the intense fluxes of multidimensional stochastic signals from panoramic photon detectors and their application in a network of telescopes.

V. L. Plokhotnichenko introduced photo-receiving equipment based on coordinate-sensitive photon detectors as a regular astrophysical observational practice. Using those devices, he developed a series of multibeam photopolarimeters of high temporal resolution that enable one to determine spatial, spectral, and polarization characteristics of individual quanta with microsecond accuracy.

Using the methods developed by V. L. Plokhotnichenko (the digital synchronous detection of accumulated time series of quantum fluxes), the periodic emission of the pulsar in the Crab Nebula was studied with the world`s best temporal resolution of 3.3 microseconds. Using his methods of searching for stochastic variations, many stellar-mass black hole candidates have been studied and constraints on their density in the vicinity of the Sun have been obtained. The limits were determined for the amplitudes of the flares in the course of accretion onto a possible black hole – the gravitational lens in MACHO-99-BLG-22. Large-scale observations of UV Ceti-type stars that exhibit flares have been made, and the polarization of sub-second spikes of a giant flare has been detected. The instruments and methods developed by V. L. Plokhotnichenko made it possible to study in detail the non-stationary manifestations of a unique transient pulsar PSR J1023+038 with a period of 1.69 milliseconds. They also enabled, for the first time, detecting the sub-second stochastic variations in its emission intensity as well as finding a brightness variability in two color bands synchronous to the rotation of the neutron star.

V. L. Plokhotnichenko is the author and co-author of more than 100 papers published in Soviet, Russian, and foreign journals. Four PhD dissertations and two DSc dissertations have been defended using the results of his research. The hardware complex designed by V. L. Plokhotnichenko has no analogs in the world. It operates at the request of the SAO staff and other astronomers in routine 6-m telescope observations of compact regions with extreme energy and matter densities, as well as other objects, where rapid brightness variations can be expected.

PODGORNY Igor Maximovich

Born 11.05.1925 in Krasnodar. Participant of the Second World War. After graduating from Kharkov State University in 1951, worked as a head of the laboratory at the Kurchatov Institute of Atomic Energy until 1967. From 1967 to 1992, he worked at the Institute of Space Research, first as a senior research fellow and then a department head. Since 1992, he was a leading researcher at the Institute of Astronomy RAS. Dr. of Physics and Mathematics (1969), Professor (1990). Lectured at M.V. Lomonosov Moscow State University and the Moscow Institute of Physics and Technology. His students are well-known scientists working in Russia, the USA, Poland, Czech Republic, Israel, and other countries. Died 04.10.2018 in Moscow.

I.M. Podgorny is the author of about three hundred research publications on the physics of laboratory and space plasma, solar physics, and solar cosmic rays. He published four books, including "Topics in Plasma Diagnostics" (Plenum Press, 1967). Together with L.A. Artsimovich and S.Yu. Lukyanov, he was the first to obtain plasma with a temperature of 1,000,000 degrees in laboratory conditions and discovered the effect of particle acceleration in a powerful pulsed discharge.

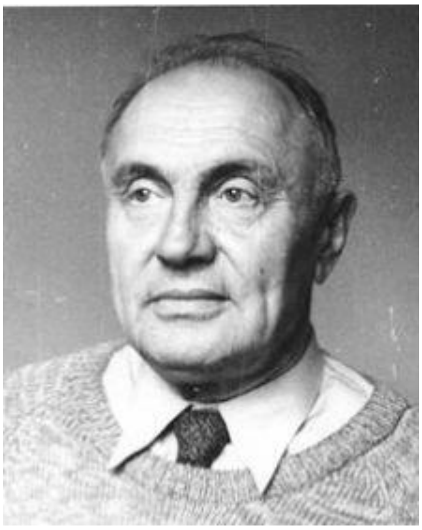
Together with L. A. Artsimovich and S. Yu. Lukyanov, he formulated and implemented the idea of electrodynamic acceleration of plasma bunches. Currently, such accelerators are used as engines for spacecraft and are the basis for the development of new military equipment.

The plasma flow from the electrodynamic accelerator allows simulating the interaction of solar wind with the Earth and various planets in laboratory conditions. I. M. Podgorny formulated the principle of limited simulation of space phenomena. He was the first who simulated the geomagnetic tail in laboratory conditions and showed the correctness of the Birman hypothesis on the magnetic nature of the comet tails. The flight of the Comet Explorer spacecraft to the Jacobini-Zinner comet confirmed data obtained in this laboratory experiment.

The results of laboratory simulation allowed I. M. Podgorny, Sh. Sh. Dolginov and their team to establish that the Venus magnetosphere is formed by the magnetic field of the solar wind.

Based on the results of numerical three-dimensional MHD simulation and analysis of a current sheet in the geomagnetic tail obtained on the spacecraft IKB-1300, I.M. Podgorny, together with A.I. Podgorny, developed the model of solar flares. This model explains the main manifestations of solar flares, including the generation of solar cosmic rays. It was shown that the flare energy accumulated in the magnetic field of the current sheet appeared in the corona over the active re-gion. I. M. Podgorny was awarded the Lenin Prize, the gold medal VDNH and two silver medals VDNH. He was awarded the Orders of the Patriotic War First Class, the Order of Glory Third Class and ten military medals.

PODOBED Vladimir Vladimirovich

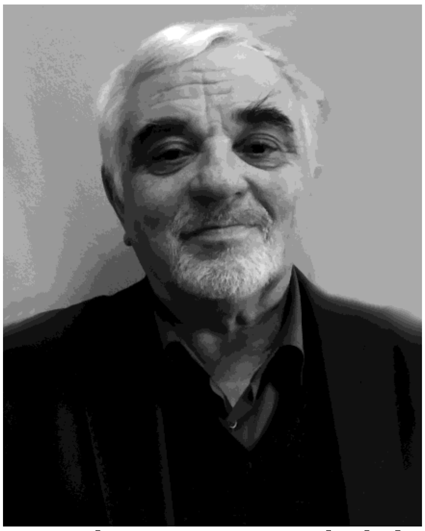


Born 06.11.1918 in Moscow. In 1946, graduated in astronomy from the Faculty of Mechanics and Mathematics, M.V. Lomonosov Moscow State University (MSU). PhD thesis "A study of the instrument for measuring astronomical photographs" (1949). D.Sc. dissertation "Fundamental astrometry" (based on combined publications) (1970). Assistant Professor (1949–1953), Associate Professor at the Astrometry Department of MSU (1953–1954). Deputy Director at Sternberg Astronomical Institute (SAI MSU) (1952–1957). Head of Department of Astrometry at SAI MSU (1972–1988). Professor of MSU (since 1977). Died 10.01.1992 in Moscow.

V.V. Podobed's field of research is meridian and photographic astrometry. His mentors were professors S.N. Blazhko and M.S. Zverev. In 1953–1958, V.V. Podobed organized and personally participated in observations with the Repsold Meridian Circle under the program "Catalog of Faint Stars". He initiated and participated in building the first Soviet meridian circle (1959). V.V. Podobed introduced several new concepts of the theory of astrometric observations and theory of their reductions. He suggested new methods of investigating instruments (their pivots and divided circles), later called "Podobed's methods". V.V. Podobed published more than 60 research papers. He is the author of the university textbook «Fundamental Astrometry. Determination of Stellar Coordinates" (1962) and the manual "General Astrometry" (with V.V. Nesterov, 1975).

Since 1952, V.V. Podobed was a member of two IAU Commissions and chairman of the Astronomy and Astronomical Geodesy Division of the Science and Methodology Council of the USSR Ministry for Higher Education. He was a deputy head of the Astrometry Division of the Astronomical Council (the USSR Acad. Sci.), a member of the Commission of Astronomers' Training created by the Astronomical Council. Awards: two orders and seven medals. In 1991, the asteroid No. 3311 was named after V.V. Podobed.

POGODIN Mikhail Alexandrovich



Born 11.04.1948 in Leningrad. In 1971, graduated from The State University of Leningrad (now, the State University of St.-Petersburg). Since 1974, after the post-graduate course at the Central Astronomical Observatory at Pulkovo in different positions with Observatory: from Junior to Chief Researcher. Dr.Sci. (Phys.,Math., 2001). Head of Sector of Stellar Evolution (2016). IAU Member.

His basic science works belong to the area of physics of stars. Authored more than 150 science publications. In 1970-ies, took part in Pamirs Expedition (1974-–1975) and Argus Expedition in Armenia (1977–1979), where introduced science program of astro-climatic studies and IR photometry.

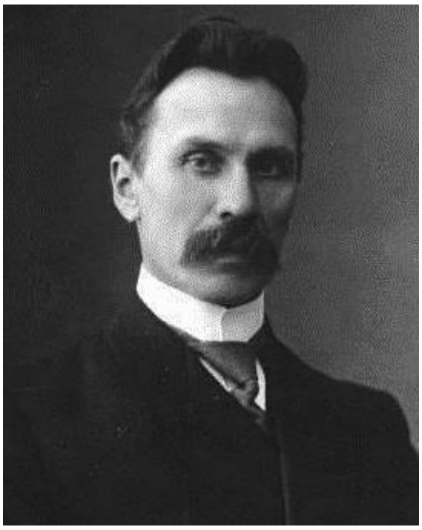
In mid-1970-ies, in The Central Astronomical Observatory initiated the Program of studies of early-type stars with circumstellar envelopes. In 1977–1979, in Byurakan Astrophysical Observatory (Armenia) with the 2,6-m ZTA Telescope, carried out the first observations of young Ae/Be Herbig-type stars in near-IR spectral range.

In 1980, started regular annual spectroscopic and photometric observations of young stars with telescopes of Crimean Astrophysical Observatory (CrAO), including the 2.6-m Shain Telescope. Up to now, the circle of observatories in which observations initiated by him are regularly carried out, has been substantially widened: it includes European Southern Observatory (ESO) in Chile, LNA Observatory (Brazil), and many others.

Developed a software package to calculate theoretical line profiles of stellar envelopes and parameters of polarization; this software in still widely used all over the world for analysis and interpretation of observational data. His most valuable science results refer to spatial-kinematical structure of circumstellar medium. Member of the Committee on Time Allocation for Large Telescopes of RAS (since 2016).

pogodin@gaoran.ru

POKROVSKY Constantine Dorimedontovich



Born 23.05.1868 in Nizhny Novgorod. D. 5.11.1944 in Kiev. Graduated from the Physics and Mathematics Faculty of Moscow University (MU) in 1891. Assistant at the Astronomical Observatory (AO) of MU (1891-1894). Since 1896 to 1916 he worked at the University in Yuryev (now Tartu, Estonia). He defended his master's thesis in 1902 and his doctoral dissertation in 1915. Extraordinary professor (1907). Director of the Yuryevskaya AO since 1908, ordinary professor (1916). Head of the Perm University since 1916 to 1918. Since 1920 to 1934 employee and since 1930 to 1932 vice-principal of Pulkovo Observatory. Corresponding Member of the USSR Academy of Sciences (1927). From 1934 to 1944 head of Odessa University AO. Died 05.11.1944 in Kiev.

A student of V.K. Tserasky. His main scientific works are devoted to the study of large and small planets, comets, the relationship between comets and meteor showers and the physical explanation of the matter motion in the tails of comets. He provided observations of periodic comets and meteor showers while working in Yuryevskaya AO. Based on observation materials, the master's thesis "The origin of periodic comets" (1902) and the doctoral thesis "The structure of the tail of a comet in 1910" (1915) were successfully defended. Both dissertations were defended at Moscow University. He was engaged in the problem of capturing comets from almost parabolic orbits with their subsequent transfer to short-period orbits. He showed that a short-period cometary orbit is the result of more than a single flyby of a comet in the gravitational field of Jupiter. He took part in organizing and providing expeditions to observe total solar eclipses in 1914 (Feodosia) and 1936 (Western Siberia). At the 3rd (1924) and 4th (1928) All-Russian Astronomical Congresses, he was elected chairman, respectively, of the All-Russian Astronomical Union and the Association of Astronomers of the RSFSR. In 1927 he was elected a corresponding member of the USSR Academy of Sciences in the Department of Physical and Mathematical Sciences.

He devoted a lot of time and effort to scientific and organizational activities. He made an important contribution to the expansion and modernization of Yuryevskaya AO and Odessa AO. One of the founders of Perm University (1916) and its first rector (1916-1918). He founded the Department of Astronomy and Geodesy at Tomsk University (1920). In 1936 he restored the Department of Astronomy at Odessa University. In 1937–38 he was dean of the Faculty of Physics and Mathematics at Odessa University.

He is an author of the "Course of Practical Astronomy" (1932) and a number of other workbooks on astronomy for secondary schools and universities. Many dozens of popular science and historical scientific works on astronomy belong to him, including passed several editions "Guide to the sky: a practical guide" (1894, 1897, 1907, 1923) and "Star Atlas: for general acquaintance with the sky and systematic observations" (1905).

After the liberation of Odessa in 1944, he was arrested and falsely accused of collaboration. Died in a prison hospital in Kiev (1944). He was rehabilitated in 1991. A scholarship named after K.D. Pokrovsky was established in 1992.

POLAK Iosif Fedorovich

Born 25.10.1881 in the city of Ananiev, Kherson province. In 1899-1906, studied at the Faculty of Physics and Mathematics of Imperial Moscow University (later renamed to Moscow University and then Moscow State University). In 1907, worked at the Department of Astronomy. In 1908-1909, was in charge of the public observatory in Tryndin's house. In 1912-1918, worked as a lecturer (privatim docens) at Moscow University; also lectured at the Pedagogical Institute and at the Prechistinsky courses for the working class; acted as a secretary of the popular journal "Nature".
Elected as a professor at Saratov University, where he was in charge of the Department of Astronomy (1919-1930). Professor at the Moscow Engineering Institute of Geodesy, Cartography and Aerial Photography (1930-1946). Professor at the Celestial Mechanics Department at Moscow State University (since 1938).
Died in Moscow in 1954.

Since 1905, I.F. Polak worked at the Moscow University Astronomical Observatory (an assistant in photographic observations, a measurer, and an observer on the meridian circle). From the third year of his studies, he was involved in astronomical calculations under Professor V.K. Tserasky and Lecturer (privatim docens) S.A. Kazakov’s guidance.

I.F. Polak was awarded the prize of the Russian Astronomical Society for two research papers on cometary orbits published in the German journal "Astronomische Nachrichten" in 1910 and 1912. With academician A.A. Belopolskii’s recommendation, I.F. Polak's research paper "The Halley's Comet Tail in May 1910. Preliminary Report" was accepted for publication in the journal “Proceedings of the Russian Academy of Sciences" at the meeting of the Division of Physical and Mathematical Sciences of the Russian Academy of Sciences in 1918. His Master's thesis "The Halley's Comet Tail in May 1910" was submitted for defense in February 1918 (the defense did not take place due to the abolition of academic degrees and titles in the country).

In 1909-1914, he published notes in the chapter "Achievements of Astronomy" for the Russian Astronomical Calendar issued by members of the Nizhny Novgorod Society for Astronomy Amateurs. Since 1913, he was an active member of the Moscow Society of Astronomy Amateurs.

In 1919, I.F. Polak was elected as a professor at Saratov State University, where he was in charge of the Department of Astronomy for 11 years. During his work at Saratov State University, he published "The Halley's Comet Tail Structure of the of 1910 II: 1: The Main Tail Shape 2: It's Approaching the Earth May 18-21, 1910" (1923) and "On the Motion of Holmes Comet " (1929).

In 1930, he returned to Moscow. In 1932-1937, he was a member of the first board of the Moscow branch of the All-Union Astronomy and Geodetic Society. In the post-war years, he taught courses on the history of astronomy at Sternberg Astronomical Institute.

I.F. Polak was the author of many textbooks and best-sellers on astronomy, with 2 million copies published, including "General Astronomy Course" (7 editions), "The Origin of the Universe", "How the Universe Works", "The Sun", "Time and Calendar", etc.

The name of I.F. Polak is associated with the history of leading astronomical institutions, history of astronomy education and popularization of astronomy in Russia.

Information provided by Saratov State University.

POLISCHUK Rostislav Feofanovich

Born 12.03.1938 in the city of Perm. In 1960 he graduated from the Faculty of Mechanics and Mathematics of Moscow State University, in 1963 he finished his postgraduate study at the Physics Department of Moscow State University. He taught mathematics at Moscow Technological Institute of Light Industry (1963) and at Peoples' Friendship University of USSR (1964-1966), and then he taught physics at MIPT (2015-2016). He worked in the Gosstandart (1967-1992). He is Doctor of Science in Physics and Mathematics from 1997. Since 1992 he has been working at the Astro Space Center of the Lebedev Physical Institute.

For the first time in 1971 he proposed a formalism of dyadic algebra in application to 2 + 2 splitting of the four dimensional space time (a similar formalism since 1973 is known as GHP formalism). He described the orbits of free movement of clocks in a centrally symmetric gravitational field (1967). In 1969 he for the first time gave a physical interpretation of the type III gravitational fields (according to Petrov classification) as octupole gravitational waves (1969). His idea of an optical cable for metrological purposes (1988) was implemented at VNIIFTRI. He proposed the concept of tetrad currents in the Einstein-Cartan gravitational theory (1996) and the concept of nonlocal integral conservation laws in gravity (2003). He proposed using the Keldysh diagram technique for quantum cosmology (1996), the hypothesis of friedmons as dark matter particles (2012, 2017).

He awarded with medal "Defender of a Free Russia", medal "In Commemoration of the 850th Anniversary of Moscow", commemorative medal "For Merit in Scientific Activity" of the Mari El Republic (Russia). He has published over 170 scientific papers.

He is a member of the European Society for the Study of Science and Theology, Scientific Secretary of the RAS Commission on Pseudoscience, a member of the editorial board of the Bulletin "In Defense of Science" and a member of the board of the international public organization Astronomical Society. He is the honorary lecturer of the international scientific school "Science and Innovation" and a member of the editorial board of the journal “Social time”.

POLOSUKHINA-CHUVAEVA Nina Savelievna

Born 27.09.1931 in Krasnyi Holm, Russia. In 1949–1954 – a student of Leningrad University. In 1954–2015 – a researcher at the Crimean Astrophysical Observatory (advanced from laboratory assistant to senior researcher). In 1975 she defended the Ph.D. thesis "Some results of polarimetric and spectral observations of magnetically variable stars". Died 08.04.2016 in Nauchnyy.

The main field of her interest is the magnetic chemically peculiar stars; she studied these stars using polarimetric and spectral observations derived with Shain's telescope (ZTSh) at the Crimean astrophysical observatory (CrAO). She participated in compiling a unique spectral atlas of Babcock's star with extremely strong magnetic field, as well as in compiling a catalogue of rapid variability of chemically peculiar stars and in detailed studies of such stars. The most important her result is a detection of direct evidences of the non-uniform lithium distribution on the surface of some chemically peculiar magnetic stars. This discovery excited great interest in astronomical circles, so in middle 1990s she initiated the international project "Lithium in the cool magnetic chemically peculiar stars". Within the framework of this project (among participants are astronomers from Russia, Ukraine and other countries of West Europe and Australia) a great observational program was implemented at several observatories on both hemispheres of the Earth, including CrAO and SAO in Russia, Mount Stromlo in Australia and ESO in Chile. During these researches new stars with lithium spots were discovered, and there was found a correlation between intensity of lithium lines, magnetic field magnitude and a phenomenon of rapid oscillations.

An author of more than 100 publications. In the last years she studied history of the Crimean Astrophysical Observatory and her book "Crimean Astrophysical Observatory: foundation, development and prosperity" was published in 2011.

POLOZHENTSEV Dmitry Dmitrievich

Born 08.05.1928. In 1947, graduated from Leningrad Industrial College, in 1952, from Dept. of Mathematics and Mechanics of the State University of Leningrad. Since 1952: with the Central Astronomical Observatory of the USSR Academy of Sciences (now, The Central Astronomical Observatory of RAS). 1967–1985: Head of Calculation Laboratory, 1985–1988: Head of Laboratory of Fundamental Astrometry, 1964 and 1969–1970: Head of Astrometric Expedition to Chile, 1988–1991: Head of Expedition to Bolivia. Dr.Sci. (1977), Member of IAU, Corresponding Member of the National Academy of Bolivia, Member of Scientific Board of the Pulkovo Observatory. Died 28.02.2009 in St. Petersburg.

His basic scientific works belong to ground-based meridian and photographic astrometry, space astrometry, astronomical software.

Observed with Meridian Circle, Passage Instrument, Expedition Astrograph and other telescopes in The Central Astronomical Observatory of RAS, Chile, Bolivia.

Under his direction, absolute, differential and joint Catalogs of stellar positions were composed; among these, «The Preliminary Joint Catalog of Positions and Proper Motions of Faint Stars (PFCSZ)» (in cooperation with M.S. Zverev), «Catalog of 200 thousand stars of the Southern sky (FOCAT)», «Pulkovo Version of the Joint Catalog of International Southern Stars», and many others. Developed methods of reduction of astrometric meridian observations. Coordinated The All-Union FONCAT Target Program.

Introduced modern computational instrumentation in astronomy, founded the Calculational Laboratory of Pulkovo Observatory. Contributed significantly to telescope modernization, including Zverev FVK.

Member of Organizational Committees of Commissions of IAU: No 8 (Positional Astronomy), No 24 (Photographic Astrometry), and No 41; Member of Bureau of the Section of Astrometry of the AstroCounsil of RAS.

Lectured in The State University of St.-Petersburg, was a prominent science organizer. Honored with numerous State Awards. Authored more than 200 scientific works, including two textbooks, and numerous popular papers.

POLYACHENKO Evgeny Valerievich

Born 18.07.1974 in Irkutsk. In 1991, after completing High School N2 specializing in physics and mathematics (now, Lyceum "The Second School") in Moscow and was admitted to the Physics Faculty of M.V. Lomonosov Moscow State University. In 1997, graduated from the Department of Theoretical Physics and started his post-graduate studies at Steklov Mathematical Institute. Since 1999, has been working at the Institute of Astronomy RAS. In 2000, defended his PhD thesis "The new structures in spiral galaxies: giant cyclones and slow bars". In 2005, defended his DSc thesis "Collective phenomena and structures in spiral galaxies". In 2014, awarded the title of an Honorary Doctor of the Main Astronomical Observatory of the National Academy of Sciences of Ukraine.

E.V. Polyachenko's main fields of research is stability theory and numerical simulations of stellar systems.

During his student years, in 1994 and 1996, his research was focused on the development of a concept of slow bars (in collaboration with his father, V.L.Polyachenko), with the bars of disc galaxies formed due to the coalescence of elongated orbits and rotating slowly with the pattern speed of the order of precession speed of stellar orbits.

In 2004 (MNRAS 348, 345), he formulated a unified theory of spiral structures with bars and spirals as unstable modes of the stellar disk. Showed that the instability occurs due to a specific interaction of the modes with resonant stars and can be explained mainly by the inverse Landau damping mechanism.

In 2005 (MNRAS 357, 559), he obtained analogs of Kalnajs matrix equations (1977), in the form of a linear eigen-value problem, to find the eigen-oscillations of arbitrary integrable systems and, in particular, axisymmetric flat disc of stars.

Together with V.L.Polyachenko and I.G.Shukhman (2007), he obtained analogs of linear matrix equations for spherical systems and found a possibility of gravitational loss-cone instability, similar to instability in plasma mirror traps. Such instability may lead to increased activity in active galactic nuclei.

In 2016 (together with P. Berczik and A. Just), he demonstrated the possibility of bar formation in galaxies with cusps and formulated a 'young bar' hypothesis: an axially symmetric galactic disc remained stable (i.e., there was no spontaneous formation of the bar) until the disc mass is less than about 80% of the current mass. After achieving this level (about 3-4 billion years ago), the bar begins to form and finishes the formation only 1-2 billion years ago.

From 1999 to 2006, he was involved in research on different hydrodynamic instabilities in relation to the theory of the spiral arm formation in galaxies and manifestations of chaos in the gaseous disks of spiral galaxies (with A.M.Fridman et al.). In 2006, he performed a theoretical calculation of the setup for the experimental detection of over-reflection instability in shallow water, which leads to the formation of leading spiral arms.

The author of 71 research publications.

POLYACHENKO Valery L'vovich

Born 31.12.1940 in Moscow.
Graduated from the Faculty of Physics of M.V. Lomonosov Moscow State University in 1963. In 1972, he defended his PhD thesis "The theory of stability of plane gravitating systems". In 1986, defended his DSc thesis "Stability of collisionless gravitating systems." Laureate of the State Prize of the Russian Federation ("for the study of the dynamical properties of galaxies", 2003). Died 12.09.2014 in Moscow.

V.L. Polyachenko is the author of over 200 publications on stability theory of gravitating systems.

Worked at the Institute of Control Sciences until 1969 and afterwards, was invited by A.M. Fridman to join a newly established research team at the Novosibirsk INP to apply and develop plasma physics methods to instability theory of gravitating systems. There and later at SibIZMir in Irkutsk, he developed (together with I.G. Shukhman) a linear stability theory of the rigidly rotating disc (now known as the Kalnajs model) and various spherical models. In 1972, they were the first to identify a possibility of the radial orbit instability – the primary instability type of the spherical systems leading to a loss of spherical symmetry and the formation of triaxial elliptical configurations. In 1981, simulated this instability in numerical N-body simulations.

V.L. Polyachenko, in collaboration with I.G. Shukhman, obtained a criterion for the stabilization of the bending instability of a flat layer (1977) and then explained the absence of elliptical galaxies with a flattening exceeding E7. Also, they obtained matrix Kalnajs-type equations for spherical systems, gave examples of solutions, and suggested a criterion of stability of spherical systems in terms of the ratio of the average velocity dispersion in the radial and transverse directions (1981).

Their findings on the stability theory for layer, disc, sphere, and cylinder were published in the monograph (together with A.M. Fridman) "Equilibrium and Stability of Gravitating Systems" in 1976 – the first modern book on stellar and galactic dynamics.

Some latest results (stability of generalized polytropes, non-Jeans instabilities, etc.) were included in the two-volume monograph (together with A.M. Fridman) «Physics of Gravitating Systems» published in English in «Springer» in 1984.

Since 1990, V.L. Polyachenko developed a theory of the slow bar formed due to the radial orbit instability in the disk (with I.I. Pasha and E.V. Polyachenko). He is known as the author of the "spoke" approximation in the linear stability theory of discs and spheres (1989, 2009, 2010). Together with E.V. Polyachenko and I.G. Shukhman, he received the analogs of linear matrix equations for spherical systems and showed the possibility of gravitational loss cone instability, similar to instability in the plasma mirror traps (2007).

In 2003, he was awarded the State Prize of the Russian Federation as a member of A.M. Fridman's research group.

POLYAKHOVA Elena Nikolaevna

Born 16.12.1935 in Leningrad (now St. Petersburg). Graduated from the Mathematics and Mechanics Faculty (the Astronomy Department) at Leningrad State University (now St. Petersburg State University, SPbU) in 1957 and completed postgraduate studies at the Institute of Theoretical Astronomy of the USSR Academy of Sciences (1957-1960). Since 1960, worked at the School of Celestial Mechanics at the Astronomy Department SPbU. In 1969, defended her PhD thesis "Solar Radiation Pressure Impact on the Motion of the Earth Artificial Satellites". Member of the International Astronomical Union, Commission 41. Minor planet 4619 "Polyakhova" is named after her.

E.N. Polyakhova is the author of more than 250 research publications including six monographs and six textbooks. Among them is the first-ever published monograph on Solar sailing "Spaceflight with Solar Sail" (1986, 2009, 2018). In 2005, the Russian Academy of Sciences awarded her the Zander Prize for this monograph. This award carries the name of Friedrich Arturovitch Zander (1887-1933), an outstanding Soviet scientist and engineer, one of the pioneers and founders of the Russian theoretical astronautics and astrodynamics. E.N. Polyakhova was awarded the gold medal "For Enlightenment" by the Princess Ekaterina Dashkova's International Society in 2012. Received the title of "Veteran of Labour" (1996), the title "The Great Patriotic War Veteran" (2003), the "275 Years of the St. Petersburg University" Medal and Memorial Plaque for her outstanding achievements in research and teaching (1997), Memorial Medal "50 Years at St. Petersburg University" (2013).

As a survivor of the Siege of Leningrad in 1941-1945, E.N.Polyakhova is a recipient of many state awards, including the "The complete liberation of Leningrad from the fascist blockade 70th anniversary " Memorial Sign (2014), "The Great Patriotic War Victory Day 70th Anniversary" Medal (2015), "Complete liberation of the fascist blockade of Leningrad 75th Anniversary" Memorial Sign (2019), "The Great Patriotic War Victory Day 75th Anniversary" Medal (2020) and other honours. Member of the "Children of the Siege 900 days" Union.

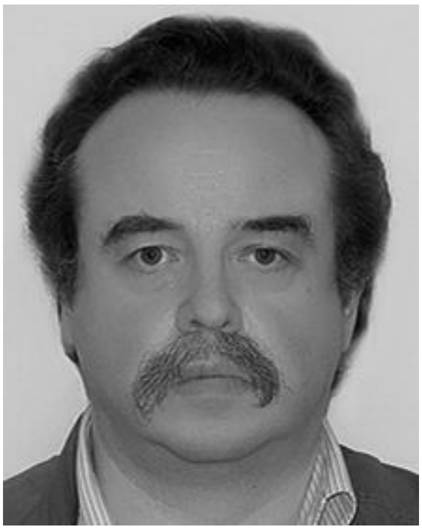
E.N. Polyakhova's research interests include celestial mechanics, spaceflight astrodynamics, solar sailing theory (in particular the solar sail as a screen against global warming of the Earth), and cometary-asteroidal hazard mitigation (in particular on dynamics of Near-Earth-Objects such as the hazardous asteroid Apophis). In addition, she publishes articles and books on history of natural sciences, including biographies and scientific legacies of prominent Russian scientists (Euler, Kovalevskaya, Ostrogradsky, Tchebyshev, Lyapunov, and Krylov). Her book "Leonhard Euler's Letters to a German Princess" (USA, UK, 2019) addresses the topic of women in science.

PONOMAREV Dmitry Nikolaevich

Born 23.05.1931 in Moscow. In 1954, he graduated from the Astronomy Department of the Faculty of Mechanics and Mathematics of Moscow State University. Post-graduate student of Moscow State University (1957-1960).
Worked at Sternberg Astronomical Institute of Moscow State University (SAI MSU): senior laboratory assistant, junior researcher, senior researcher (1984). Candidate of Physical and Mathematical Sciences dissertation (1969) entitled «Organization of latitude determination on the Moscow photographic zenith tube»). In 1989-1994, he headed the working group on the history of astronomy at SAI MSU. Died 13.12.1998 in Moscow.

D.N.Ponomarev's research focused on photographic astrometry and history of astronomy. He was a student of V.V. Podobed. Since 1960, D.N.Ponomarev supervised the installation and adjustment of a new domestic telescope – a photographic zenith tube (FZT). He automated (together with E.M. Lapkin) the operation of the telescope, which allowed observations to be performed remotely from the neighboring tower. D.N.Ponomarev studied FZT (together with A.A. Volchkov), and carried out observations used to compile the catalog of declination of 226 stars, which became the basis for regular latitude observations. Since 1962, the results of these observations have been sent to the International Time Bureau. In 1971– 1972 D.N.Ponomarev worked in East Germany as a research intern, and during that time he arranged an agreement between SAI MSU and Lohrmann Observatory (Dresden) to study latitude. In 1977 he published an article (jointly with S.Wächter) in German entitled "Analyse der Dresdner Breitenbeobachtungen auf systematische Deklinationskorrektionen" ("Analysis of Dresden latitude observations for the derivation of systematic declination corrections"). In 1983-1986 D.N.Ponomarev was the principal investigator of the program "Support of acquisition of observations of Comet Halley". The positions of 68 stars along the path of Comet Halley were determined and a chart was prepared for the field to be observed with the 6-m telescope of the Special Astrophysical Observatory of the Russian Academy of Sciences (together with Yu. A. Shokin). Observations produced 19 positions of the comet, which were included in the final list of publications of the SOPROG Center. D.N.Ponomarev participated in the creation of the atlas catalogue of reference stars in the -2º to -8º declination zone (together with Yu. A. Shokin and N. M. Evstigneeva) for televiewed determinations of angular coordinates of the stationary satellites. Every year, D.N.Ponomarev taught a specialized course on "Photographic Astrometry", headed the special practical training course on astrometry. Since 1981 he served as the scientific secretary of the Astronomy and Astronomy and Geodesy Section of the Scientific-Methodological Council of the Ministry of Higher Education of the USSR. D.N.Ponomarev also worked with "Znanie" society. In 1984 he was elected the Chairman of the Moscow Branch of the All-Union Astronomy and Geodesy Society. In 1989 – 1994 he was the editor-in-chief of "Astronomical Calendar". D.N. Ponomarev coauthored 57 scientific and popular scientific publications, including 10 publications on the history of Soviet and Russian astronomy, such as: "Development of Photographic Astrometry in Russia (Moscow Works)" in the collection "History of Domestic Astronomy" edited by Academician V.A.Ambartsumyan and "Astronomical Observatories of the Soviet Union" (Nauka Publishing House, 1987, 180 pp.). D.N.Ponomarev was awarded by the Medal "For Valorous Labor in commemoration of 100th Anniversary of V.I.Lenin" (1970) and the Medal "Veteran of Labor" (1983).

POPEL Sergey Igorevich



Born 14.04.1965 in Bostandyk of Tashkent Region of the USSR. Graduated (with honors) from the Moscow Institute of Physics & Technology in 1988. Studied at the post-graduate courses of the above institute from 1988 to 1991. Defended his PhD (candidate of sciences) thesis in 1991. Worked permanently at the Institute for Dynamics of Geospheres of the Russian Academy of Sciences (RAS) from 1991 to 2014 filling different positions: from junior to principal research scientist and head of laboratory. Head of laboratory of the Space Research Institute of the RAS from July 2014. Doctor of physical and mathematical sciences (1998), professor (2010), member of different scientific councils and editorial boards of international scientific journals. Decorated with the Gagarin Medal of the Russian Cosmonautics Federation.

The main scientific works are related to plasma physics, astrophysics, planetary sciences, small-scale particles and dust in nature. He is an author and coauthor of more than six hundred scientific publications including four books. Among the main results obtained by S.I. Popel in the fields of astrophysics and planetary sciences, there are the following those:

In the first half of 1990s (in collaboration with I.V. Nemtchinov, I.B. Kosarev, and T.V. Loseva), a model of evolution of Local Interstellar Medium was developed which takes into account interactions of its constituents and also dynamical effects, plasma nonequilibrium processes, thermal conductivity effects, radiation effects, as well as processes of evaporation of dense and cold layers. It was shown on the basis of this model that the interaction of the supernova remnant Loop I with the Sancini-van Woerden Fibre can influence significantly the position of the heliopause in the Solar System.

In 1990s and 2000s a theory of nonlinear wave structures in dusty plasmas (including space dusty plasmas) was developed. On the basis of this theory, a new kind of shocks was discovered which are associated with anomalous dissipation on the charged dust particles. Such shocks can be of interest from the viewpoint of consideration of star formation in shocks, supernova explosions, bow shock formation as a result of interaction of the solar wind with a dusty cometary coma, etc.

Beginning from 2000s, S.I. Popel creates theory basis for the description of natural systems containing nano– and microscale particles. In particular, he developed a theory of cavitation formation of microspherules in Earth's crust, numerical model of atmospheric brown clouds in the troposphere, theories of dusty-plasma structures, including noctilucent clouds, in Earth's mesosphere and ionosphere as well as of dusty-plasma space systems including environments of the Moon and Mars (in collaboration with L.M. Zelenyi et al.).

He combines successfully scientific work with science-organizational and teaching activities. He participated in organizing and program committees of different leading international conferences on plasma physics, was a leader/coordinator of international team "Dusty Plasma Effects in the System Earth-Moon" at the International Space Science Institute (Bern, Switzerland), etc. S.I. Popel is full professor of the Moscow Institute of Physics & Technology and HSE University. Among his pupils, there are five PhDs (candidates of sciences).

S.I. Popel is a Humboldt fellow (Germany), Soros Professor, prize-winner of the Awards of the Moscow Government "Grant of Moscow" (for professors), of the Prize of the International Academic Publishing Company MAIK "Nauka/Interperiodica" for the best publication in the journal Solar System Research (Astronomicheskii Vestnik), of the Dynasty Foundation Award nomination for Doctor of Science, of the Award within the Program "Mikhail Lomonosov" of the Ministry of Education and Science of the Russian Federation and of the DAAD (Germany), etc.

POPOV Mikhail Vasilievich

Born 21.01.1942 in the village Dolskoe, Kaluga region, USSR. In 1965 he graduated from the Moscow State University (MSU), Faculty of Physics, department of astronomy. In 1965-1969. PhD student, of Shternberg Astronomical Institute MSU. In 1970-1990 junior scientist, senior scientist, chief of laboratory of the Space Research Institute of the USSR Acad. of Science. Since 1990 chief of department at Astro Space Center of the P.N. Lebedev Physical Institute of the Acad.of Sci. (the ASC of the LPI). PhD thesis in Astrophysics "Close binary systems and problems of stellar evolution" (1969), and Sci. Hab. thesis "Observational constraints on pulsar radio emission" (1991).

The scientific works cover mostly the topics of the stellar astronomy and radio astronomy, pulsars, and radio wave scattering in the interstellar medium, published in about 100 papers.

The main stream of study are concerned with data reduction of raw observational data. In 1970s M. Popov took part in fast sky survey at 8500 MHz with 22-m radio telescope in Simeiz. Later on he switched to pulsar study measuring parameters of single pulse microstructure by coherent removal technique of dispersion smearing. This study was based on the observations conducted with the BSA transit telescope of Pushchino Radio Astronomical Observatory. In 1990s observations were carried out with the 64-m radio telescope in Kalyazin. A particular attention was devoted to the study of giant pulses from the Crab pulsar and from the original millisecond pulsar B1937+21. In this study large foreign radio telescopes also were used (Titbinbilla, Green Bank, Effelsberg, Westerbork, Parkes). It was found that brightness temperature of emitting sources, located in the magnetosphere of neutron star may reach very high values up to 10^{39}K. Thus, the brightest emitters in the Universe were discovered. It was also shown that such radio emission propagates through neutron star magnetosphere in a regime of super strong wave, accelerating surrounding plasma.

M. Popov takes active part in the development and operations of RadioAstron project. In 2012-2016 he was a member of Program Evaluation Committee, created to evaluate scientific proposals for RadioAstron project. M.Popov is a co-chairman of RadioAstron Pulsar Science Team. Pulsar studies with RadioAstron discovered substructure in the scatter-broadened image of pulsar radio emission. With the assumption of turbulent and large-scale irregularities in the interstellar plasma, the effective scattering screens were detected in the direction to several pulsars. In some cases these screens were identified with the physical plasma layers, located in the direction to several pulsars.

In 1981 he was awarded the Order of Honor for his work on the implementation of the first space radio telescope SRT-10, on board the space station Salyut-6.

POPOV Sergey Borisovich

Born 08.12.1971 in Moscow. In 1995 graduated from the department of physics of Lomonosov Moscow State university. Since finishing his PhD in 1998, works at SAI MSU. Since 2012 – leading researcher. In 2002-2004 worked as a postdoc at the University of Padua (Italy). Doctor of science (2012). Professor of the Russian Academy of Science (2015). IAU member since 2009.

Main scientific results are related to studies of evolution and observational appearance of neutron stars. With population synthesis models it was shown that a population of near-by cooling neutron stars (aka the Magnificent Seven) is genetically linked with the Gould Belt. The first unified population model for isolated neutron stars was constructed. It successfully describes radio pulsars, cooling neutron stars, and magnetars in the framework of decaying magnetic field. Hypothesis that magnetar flares are responsible for fast radio bursts was proposed (together with K.A. Postnov) in 2007.

S. Popov is the author of more than 150 scientific publications. He is giving lectures at the Lomonosov Moscow state university (department of physics and department of space research) and at Higher School of Economics (Department of physics). He actively participates in public outreach activity and is the author of several popular science books (in Russian).

POSTNOV Konstantin Alexandrovich

Born 19.08.1959 in Orekhovo-Zuevo Moscow reg. Graduated from Faculty of Physics of Moscow State Univ. in 1983. Ph. D. Thes. «Evolution of magnetized compact stars in low-mass binary systems» (1987). Sci. Hab. Thes. «Astrophysical sources of gravitational waves» (1998). Since 1986 works at Faculty of Physics of MSU (full prof. since 1998) and at Sternberg Astron. Inst. MSU. Since 2018 the director of SAI MSU. Short-term visits as post-doc and visiting prof. at Univ. of Oulu (Finland), Tuebingen Univ. (Germany), RIKEN Inst. (Japan), Max-Planck Institut fuer Astrophysik (Germany), etc.

Field of interests: evolution of binary stars, high-energy astrophysics, relativistic astrophysics, gravitational-wave astronomy, cosmology. Published about 300 papers (h-index 34 NASA ADS) and several monographs.

In PhD. Thes. developed the population synthesis method for low-mass binary systems with compact stars (neutron stars, white dwarfs, black holes). In Sci. Hab. Thes. showed (jointly with V.M.Lipunov and M.E. Prokhorov) that based on very general principles of binary star evolution, the first astrophysical sources of gravitational waves to be discovered by ground-based laser interferometers should be coalescing binary black holes with masses 10-20 solar masses. This prediction has been excellently confirmed by advanced LIGO observations in 2015-2020. Since 2000s works in high-energy astrophysics. Jointly with R. Statubert, N. Shakura et al. discovered and explained the cyclotron line's positive correlation in the X-ray spectrum of Her X-1 and other X-ray pulsars. Since 2012 in collaboration with N.Shakura has developed a theory of quasi-spherical accretion onto magnetized neutron stars and its astrophysical manifestations.

Postnov K.A. was awarded the Lomonosov Prize of MSU in 2003. Member of IAU. Supervisor of 4 PhD Theses. Member of Editorial Board of Astronomy Letters (since 2000), Physics-Uspekhi (since 2016), Zemlya I Vselennaya (since 2017), Priroda (since 2020). Head of the National Committee of Large Russian Telescopes (since 2017).

PRODAN Yuri Ivanovich

Born 12.06.1922 in the village of Ust-Labinskaya in the Krasnodar Territory. After graduating school 205 in Moscow he was admitted to the Faculty of Mechanics and Mathematics of MSU, where he studied from 1940 to 1941. Was a participant and veteran of Great Patriotic War (1942-1946) serving as a military clerk of the 193rd Garrison Veterinary Infirmary (Moscow – Smolensk) and the 47th Reserve Rifle Regiment (Kozelsk); quality inspector of 119th Mobile Tank Repair Plant (Lithuania, East Prussia, Far East). He was a student of the Astronomy Department of the Faculty of Mechanics and Mathematics (1946-1950). Since 1950 Worked at SAI MSU: senior laboratory assistant (1952), junior researcher. (1953), senior researcher (1967-2005). Defended his Candidate of Physical and Mathematical Sciences dissertation on the subject of astrometric tasks of navigation based on bright stars and operation of a rover on the lunar surface (1967). Died 24.01.2005 in Moscow.

Prodan's astronomy professors at SAI MSU were S.N. Blazhko, S.V. Orlov, M.S. Zverev, and K.A. Kulikov. Yu.I.Prodan is a renown astrometrist who specialized in the study of the Earth's rotation. While working at the astrometry division of SAI MSU, Yu.I.Prodan was appointed the head of the latitude working group (1967-1978). However, much earlier and he personally organized and took part in the 6-year cycle of observations of Moscow latitude variations with the zenith telescope (1959-1966). Yu.I.Prodan also supervised a number of other studies including the compilation of the precision declination catalog for stars of latitude programs based on observations performed with the zenith telescope (1964-1969), observations of zenith-zone stars (1970-1977) , and continuous photographic latitude and time-correction observations with the zenith tube carried out starting from 1963 whose results were regularly sent to the International Time Bureau since 1971. Yu.I.Prodan paid much attention to automating and processing astronomical observations. With also took part in the development of a kit of instruments for automatic recording of the temperature properties of the surface air layer to study refraction anomalies (together with A.O. Mogilin and K.B. Shchigolev). Yu.I.Prodan worked much to ensure the uninterrupted operation of “Ascorecord” coordinate-measuring machines. He was also engaged for many years in contract-based astrometric research programs (1965-1978). Yu.I.Prodan was an active participant of many All-Union astrometric and latitude conferences. He coauthored 53 research papers including reports on restricted programs. Yu.I.Prodan developed “PARSEC” automatic facility for measuring astronomical negatives and used it at SAI MSU. Since 1989, the coordinates of more than 630000 objects have been measured, including southern-hemisphere stars and minor planets. Yu.I.Prodan was a member of commission no. 19 of the International Astronomical Union (IAU); a member of the problem-solving thematic group of the Astrometry Section of the Astronomical Council of the USSR Academy of Sciences. In 1968, while on a scientific trip to Cuba, Yu.I.Prodan performed observations of the Earth's satellites. He took part in the 31.07.1981 solar-eclipse expedition, providing astrometric support for observations. Yu.I.Prodan popularized scientific knowledge by delivering lectures. In 1959, he published popular-science booklet "Time and Calendar" (Izd. "Znanie", Ser. 9, vol. 23). Yu.I.Prodan was involved in teaching work at SAI MSU since 1950: he supervised astrometric training program for 1st-3rd year students, conducted a special seminar for 4th-5th year students, supervised term papers of astronomy students of Moscow State University, and students of Moscow State Institute of Geodesy and Cartography defended their theses with him as a supervisor. Yu.I.Prodan was awarded the Badge "For Excellent Achievements in Work" from the Ministry of Higher Education of the USSR (1978) and medals Medal "For the Victory over Germany in the Great Patriotic War 1941–1945" (1945), "For the victory over Japan" (1945), "For the Capture of Königsberg" (1945), "For the 20th anniversary of the victory over Germany" (1965), "60 Years of the Armed Forces of the USSR" (1978) and others, as well as a bronze medal of the “All-Union Exhibition of Achievements of National Economy”(1983) and a "Veteran of Labor" medal (1984).

Yu.I.Prodan was awarded the academic rank of senior research fellow in 1975.

PROKHOROV Mikhail Evgenievich

Born in 1961 in Moscow. In 1978–1979 he worked as an operator of the Space Research Institute of the USSR Academy of Sciences. Student of the Physics Faculty of M.V. Lomonosov MSU since 1979 till 1985. Post-graduate student of the Department of Astrophysics, Moscow State University from 1985 to 1988. Defended Ph.D. thesis "Analysis of evolutionary scenarios of binary stars" in 1991. An employee of SAI MSU (from junior to leading researcher, later head of the laboratory) from 1988 to the present. He obtains a Doctor of Science Degree in 2000 on the topic "Population synthesis of relativistic stars". Taught at the Department of MIPT at ITEP from 1998 to 2013. The title of Associate Professor in 2010. Since 2011 – Associate Professor, since 2015 – Professor at the Physics Faculty of Moscow State University. Since 2011 – Head of the Laboratory of Space Projects at SAI MSU, Witter of Shuvalov's Award of MSU in 2000, and Bredikhin's Award of RAS in 2016. Member of IAU.

The main scientific works are related to astrophysics, cosmology, orientation and navigation in space, space experiments. In the 1980s and 1990s, together with V.M. Lipunov and K.A. Postnov developed a method for the population synthesis of binary stars (program complex "Scenario Machine"). With the help of the program, the set has investigated the properties of neutron stars, black holes, their connection with gamma-ray bursts, the spectrum of gravitational radiation from binary and merging stars. It was shown that the moderate asymmetry of the supernova explosion leads to a significant increase in the merging frequency of relativistic stars. It was predicted that the merging black holes are the first sources of gravitational waves, which will be registered by ground-based detectors. For these works, the Shuvalov's prize of MSU was awarded to them in 2000, and in 2016, after the discovery of merging black holes, the Bredikhin's prize of RAS.

In the 1990s, together with the group of N.I. Shakura investigated the unique binary system and X-ray source Her X-1. In the 2000s, together with S.B. Popov developed methods of population synthesis of single neutron stars in the Galaxy. A large-scale study of the properties of radio pulsars and old single neutron stars was carried out. In 1994, together with Yu.E. Lyubarsky and K.A. Postnov was the first to construct a hydrodynamic model of an elliptical accretion disk. Since 2011 he has been working on the problem of asteroid-comet hazard.

Scientific supervisor of the Lira-B space project included in the Long-term program of scientific and applied experiments planned on the Russian segment of the ISS. The goal of the project is to carry out a multicolor high-precision photometric survey of all-sky stars up to 16m-17m in the range of 0.2-1.0 μm using a 0.5-meter telescope installed onboard the ISS to solve fundamental problems of astrophysics, stellar astronomy, solar systems physics, and applied tasks. Since 2010, his laboratory has proposed new methods for reducing photometric measurements outside the atmosphere, methods for processing super-large stellar catalogs, and developed a number of instruments for high-precision orientation in space. On the basis of a high-precision star tracker, the space experiment "Kachka" for ISS is proposed.

Author of over two hundred scientific papers, co-author of fourteen books and twenty-eight patents. Three theses and two Doctor of Science dissertations were defended under his scientific supervision. Member of the editorial board of "Variable Star". Witter of Shuvalov's Award of MSU in 2000, and Bredikhin's Award of RAS in 2016. Member of IAU.

PROKOFIEV Vladimir Konstantinovich

Born 16.02.1898 in Verebye Malovishersky district, Novgorod region. He graduated from the Physics Department at St.Petersburg State University in 1924. He became Ph.D. in 1935 and Professor of Physics in 1944. An author of 170 papers and books. Since 1959 V.K. Prokofiev worked as senior researcher at CrAO.
In 1962–1970 – Head of the Department of Experimental Astrophysics. In 1967–1970 – Vice-president of IAU Commission 44, in 1970–1973 – President. A holder of two State Prizes, 6 awards and medals. In his honor, minor planet 3159 was named Prokof'ev. Died 03.01.1993 in Nauchnyy.

V.K. Prokofiev worked at State Optical Institute (SOI) in 1919–1959, since 1937 – Head of the Laboratory of spectral analysis, since 1951 – Head of the research department. He organized laboratories of spectral analysis in the aircraft industry, mechanical engineering, metallurgy, geology. He studied solar radiation from the high-altitude rockets by SOI devices in August 1951. In 1925–1932 – lecturer at Leningrad State University, in 1930–1937 – worked at the Artillery Academy, in 1946–1958 – at the Leningrad Institute of Precision Mechanics and Optics.

The second scientific life of V.K. Prokofiev was started in CrAO. The basic researches relate to exo-atmospheric studies of the Sun, stars and other bodies. In 1960, a device designed by V.K. Prokofiev for solar investigations in the ionized helium He II $\lambda = 304$ Å line was mounted on the 3rd satellite. The similar device was used on the Cosmos-166 satellite in 1967. By means of this device, there was discovered an increase in ultraviolet radiation with increase of the area of active formations on the Sun. The astrophotometers manufactured at CrAO were mounted on the Cosmos-51 satellite in 1964 and on the Cosmos-215 satellite in 1968. Two telescopes D = 50 mm, F = 180 mm with quartz lenses and filters for wavelengths of 2300 and 2750 Å were mounted on the Cosmos-215 satellite. The UV fluxes were measured for 36 stars. In 1973 a strong glow in the Moon's dusty atmosphere was detected by the astrophotometer manufactured in CrAO and mounted on Lunokhod-2. The Solar Telescope OST-1 was installed on the Salyut-4 station in 1975. V.K. Prokofiev developed an optical layout of the "Galaxy" ultraviolet spectrometer that operated at the Prognoz-6 satellite in 1977–1978 and Prognoz-7 satellite in 1978. Over 4000 spectra were derived in the 1150–1900 Å range. V.K. Prokofiev participated in developing spectral devices for the Astron satellite telescope to study spectra of stars and galaxies in the range of 1150–3500 Å in 1983. Since 1961 – a member of IAU, in 1967–1970 – Vice-president of IAU, in 1970–1973 – President of Commission 44 on Space Researches of IAU. He was honored by the Order of the Red Banner of Labor in 1943,1951,1954,1963, Lenin Order in 1953, the Order of the Red Star in 1967, Stalin Prize in 1950, and the State Prize in 1971. An Honored Worker of Science and Technology of the RSFSR in 1958.

PROKOFIEVA-MIKHAILOVSKAYA Valentina Vladimirovna

Born 21.04.1929 in Leningrad. In 1948–1953 – a student of the Department of Physics in Leningrad State University. In 1953 – a Ph.D. student at CrAO. In 1962, she defended the Ph.D. thesis “Astrophysics”. A member of IAU. In 1983, she defended her Doctoral thesis “Television in astronomy”. Since 1984 – a leading researcher at CrAO. Since 2005 – Professor. An author of 150 publications and book Television astronomy. In 1996 – a laureate of Barabashov Prize of the National Academy of Sciences of Ukraine. A holder of 10 medals. In 1995, a minor planet No. 6172 was named Prokofeana in her honor. Died 20.04.2020.

V.V. Prokofieva is a founder of television astronomy. She has shown that features of the television method of observations define its application in astronomy. She supervised a team from Moscow, headed by V.F. Anisimov and engineer from CrAO A.N. Abramenko. The television was used for studying light curves of variable stars with very fast changes in brightness. The observations were carried out with the 0.5 m Maksutov telescope. The three-chamber electro-optical converter (EOC) served as a receiver, then an image was transferred to the television tube. From the screen located at the front of the device pictures were taken and then processed. The American journal Sky and Telescope reprinted data obtained by V.V. Prokofieva (light curve of the 442 Cas star eclipse). A value of data acquired by this method was recognized internationally.

A further increase in the accuracy of measurements occurred after the appearance of a superizokon developed by N.D. Galinsky in 1976. He had EOCs arranged in cascade, connected in a flask with izokon. The resulting accuracy was better than 1 arc second. Mars was observed for three confrontation years 1969–1971–1974. There were obtained about 80000 images in 4 and 10 spectrum regions. For the first time the correct explanation of blue clearings on Mars has been given. The Atlas of television pictures of Mars was compiled.

Between 1957 and 2014 researches of the solar system bodies were carried out. V.V. Prokofieva’s team first detected the appearance of Halley comet at the level of about 19th stellar magnitude. V.V. Prokofieva first discovered asteroid satellites. The first observations of the asteroid 87 Sylvia were carried out simultaneously in several regions of the spectrum. The data reduction showed a double asteroid. This was 2 years before the Galileo spacecraft in 1993 took a picture of the asteroid Ida's satellite. Together with V.V. Busarev, she developed a method for determining sizes of the spots on the surfaces of small bodies of the solar system that has been done for the first time in the world.

V.V. Prokofieva participated in television observations of artificial satellites and spacecrafts going to the Moon, Venus, and other planets for the purpose of remote controlling their conditions by the scattered radiation of the Sun.

The studies were carried out in cooperation with researchers from other institutions. Under the supervision of V.V. Prokofieva more than 30 people had practical training, and based on the obtained observations more than 10 Ph.D. theses were defended.

PRONIK Iraida Ivanovna

Born 17.01.1928 in Balashov, Saratov region. After graduation from Moscow University in 1950 she was directed to the Simeiz Division of the Pulkovo Observatory. In 1963 I.I. Pronik defended the Ph.D. thesis "Study of the inner close to the Sun spiral arm of the Galaxy on two areas in Milky Way" (Moscow). In 1989 she defended the Doctoral thesis "Photometric and spectral studies of the central regions and nuclei of normal and peculiar galaxies" (Byurakan). She spent all her professional life at the Crimean Astrophysical Observatory. Died 08.10.2014 in Nauchnyy.

I.I. Pronik was the first assistant of A.B. Severny in observations at the coronagraph in Nauchny but a short time later she became a researcher at the Department of Stellar and Nebular Physics and under the supervision of academician G.A. Shajn she was engaged in studying stars. I.I. Pronik was one of the most active performers of the Shajn's Plan. During her many-year work she classified spectra and measured brightness of over 5400 stars in Sagittarius and Aquila constellations and studied the spatial distribution of density in the interstellar medium, determined the distance and interstellar absorption for each star. A significant part of these results formed the basis for her Ph.D. thesis. Many years later I.I. Pronik thoroughly summarized extensive investigations of the Galaxy structure carried out within the Shajn's Plan by Soviet scientists in the 1950s-1960s and in a series of publications she restored the priority of G.A. Shajn in the experimental substantiating of the concept on the formation of stars from the diffuse medium, that became generally accepted just after discovery of giant molecular clouds in the 1970s.

For the last four decades the basic direction of her researches was extragalactic astronomy. I.I. Pronik studied and analyzed a large amount of observational data obtained at the Shajn telescope in Crimea and 6-m telescope of SAO, studied morphology, photometric and kinematic peculiarities of many active galaxies and detected a relationship between emission power in the H_α line and color indices of the central galactic regions, found systematic discrepancy in the content of stellar population of central regions and other morphological structures of normal and Seyfert galaxies, discovered blue condensations in the central regions of some active galaxies which during spectral investigations proved to be massive clumps of hot stars and gas, detected and studied emission line variability in a series of Seyfert galaxies. Some results of I.I. Pronik particularly concerned with variability of active galactic nuclei at small time scales were pioneer ones and were accepted skeptically but later were proven by many foreign researchers and formed the basis for her Doctoral thesis. I.I. Pronik actively participated in the analysis of unique data acquired with Astron station which led to detecting early morphological types of noticeable UV excess in galaxy spectra.

I.I. Pronik authored over 180 scientific publications.

PRONIK Vladimir Ivanovich

Born 29.04.1932 in the Verbovtsy village, Ternopol region. In 1949−1954 − student at the Department of Physics, Lvov State University (LSU). In 1954 he was directed to the Crimean Astrophysical Observatory (CrAO), where he spent all his professional life. He started his work in the Simeiz Observatory on Koshka (Cat) mountain. In 1954 − Ph.D. student supervised by S.B. Pikel'ner. In 1962 he defended his Ph.D. thesis "Energy balance of free electrons and electron temperature in the gaseous nebulae". In 1962 he moved with his family to Nauchny. And since 1962 to 2014 V.I. Pronik worked at CrAO advanc-ing from junior researcher to leading scientist. Died 26.02.2016 in Nauchnyy.

Research interests relate to planetary nebulae, elaboration of optical systems and instruments for astronomical observations, active galactic nuclei (AGNs).

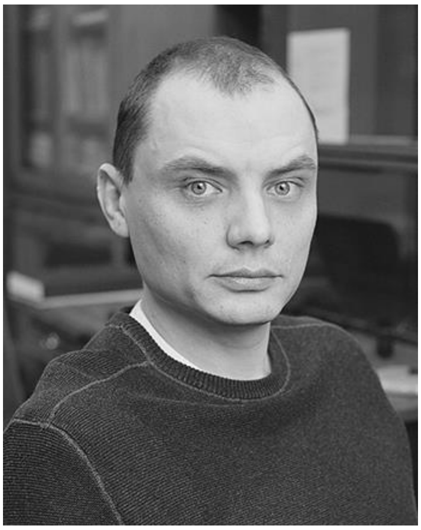
Being post-graduate student he acquired experience in observations with the "nebular" spectrograph as well as in obtaining maps of diffuse nebulae in the hydrogen and oxygen spectral lines by using the high-aperture 640-mm camera to evaluate the electron temperature in a number of positions. As a result, he found the temperature gradient on the surface of the Lagoon Nebula and based on this he defended his Ph.D. thesis. V.I. Pronik was the first who initiated the study of AGNs in CrAO, so he is actually a founder of the new scientific school, which is represented by the Department of Extragalactic Research and Gamma-Ray Astronomy since 2011. In cooperation with E.A. Dibai (Crimean Station of GAISh) he established the existence of two physically distinct regions in AGNs with narrow and broad emission lines.

In 1987 for the first time in the USSR, V.I. Pronik and his Ph.D. student obtained spectra of several AGNs using a new detector – CCD-camera. In the early 1990s, a close-knit research team under the leadership of V.I. Pronik appeared in CrAO. They obtained a number of important results: (1) There were proposed two models to explain the long-term evolution of broad emission lines in spectra of AGNs: a multi-component model of BLR and a disk-like model of BLR with inhomogeneous surface brightness of the disk; (2) By the reverberation mapping technique there were determined the BLR sizes and the central black hole masses for a number of AGNs; (3) The structure and kinematics of gas in the BLR was shown to be complex and diverse, although the rotation is probably the predominant type of kinematics. Under the leadership of V.I.Pronik, V.V. Golovaty continued (after Pikel'ner's studies) the analysis of hot stars with helium emission lines and parameters of ultraviolet radiation of the nucleus of the Crab Nebula were substantially improved. Over the years, V.I. Pronik was a principal organizer of the Soviet and International conferences on AGNs held in CrAO. For about ten years from 1985 to 1994 six conferences were held. He took part in the scientific expedition to Pamir. About a year he worked on a work trip in Chile.

In cooperation with Lagutin and Popov V.I. Pronik continued to develop and construct spectrographs. One of the spectrographs was constructed with N.P. Nekhaev and was used at the Cassegrain focus of the 2.6-m telescope (ZTSh). Now, the so-called Pronik-Lagutin's echelle spectrograph is among the most used equipment at ZTSh. V.I. Pronik took active part in elaborating and manufacturing the ASTRON Space Telescope, as well as in observations, processing and analysis of extragalactic data acquired with this telescope. V.I. Pronik designed the "Sofin" spectrograph that was used for observations at the Nordic Optical Telescope (Canary Islands) by both European and Crimean astronomers.

V.I. Pronik authored 148 scientific publications.

PSHIRKOV Maxim Sergeevich



Born 14.09.1981 in Minsk, Belorussia. Graduated from Faculty of Physics of Moscow State Univ. in 2002. Ph. D. Thes. «Nonuniformity of the space-time in the Galaxy and stability of celestial reference frame» (2006). Sci. Hab. Thes. «Radioastronomical constraints on models in fundamental physics and astophysics» (2016). Since 2012 works at Sternberg Astron. Inst. MSU.

Field of interests: astroparticle physics, high-energy astrophysics, pulsar astronomy, ultra-high energy cosmic rays. Author in more than 100 papers.

In his PhD. Thes. he studied the influence of moving masses in the Galaxy on high-precision astrometric observations. In his Sci. Hab. Thes. he built a model of the magnetic field of the Galaxy (together with P.G. Tinyakov), which is actively used in various fields of astrophysics and also obtained the most stringent constraints on the strength of the intergalactic magnetic field. Since the 2010s he has been working in the field of high energy astrophysics. He discovered gamma rays from a system with powerful colliding stellar winds γ Vel2, which together with the well-known η Car confirmed the existence of a new class of gamma-ray sources. An extended gamma-ray halo of the M31 galaxy was detected, which may be the extragalactic counterpart of the well-known "Fermi bubbles" (jointly with K.A. Postnov and V.V. Vasiliev). Since 2012 together with P.G. Tinyakov (Université Libre de Bruxelles) he searches for new observational constraints on the abundance of primordial black holes in the Universe.

PSKOVSKIY Yuri Pavlovich

Born 01.02.1926 in Noginsk, Moscow region. Died on 07.21.2004. Graduated from Lomonosov Moscow State University. in 1954. Since 1956 worked at the SAI MSU in various roles: from junior researcher to Deputy Director of the Institute for Scientific Work (1977-1996). Since 1979, worked as Head of Department of Emission stars and Galaxies Physics, since 1996 – chief scientist. Doctor of Physical and Mathematical Sciences (1977), professor of astronomy. Died 21.07.2004 in Moscow.

In 1943 he was mobilized and went through the entire Great Patriotic War as a sergeant in an infantry battalion in the Baltic, Karelian and 2nd Belorussian fronts. He was awarded the Order of the Patriotic War of the first degree and had 14 medals as a veteran of the Great Patriotic War.

P.'s scientific interests lay in the field of astrophysics and stellar astronomy. He was the author of the first works on establishing the zero-point dependence of the period – luminosity for Cepheids, on the study of new stars as indicators of distances in the Universe, he was the first to obtain the mass-luminosity relation for galaxies, and constructed the function of the radio luminosity of galaxies. For a number of years in the department of the Moon and planets he participated in the development of the principles of lunar cartography, in the creation of an atlas of the far side of the Moon.

Special merit of P. – the study of supernovae, where he was a recognized authority and pioneer in solving many problems.

He owns one of the greatest achievements of astronomy in the second half of the twentieth century – deciphering the spectra of type I supernovae, which for many years remained a mystery to spectroscopists. This discovery was registered by the State Patent in 1990.

In addition to identifying supernova spectra, he developed a morphological classification of light curves, studied pulsars as remnants of supernova explosions and studied supernovae as indicators of distances in the Metagalaxy. He published about 200 scientific and popular scientific articles on many problems of astronomy, participated in writing 5 monographs.

P. gave a special course "Supernovae" for students-astronomers for many years, under his supervision 5 Ph.D. theses were defended. For his successes in teaching, he was repeatedly awarded with diplomas and medals of the Ministry of Higher Education.

He was a member of the expert council of the Higher Attestation Commission, a member of the IAU (he was a member of two of its commissions), for a number of years he was a member of the Academic Council of Moscow State University.

PTITSYN Dimitry Alexandrovich

Born 19.11.1949 in Moscow, Russia. In 1972, graduated from the Astronomy Department of the Physics Faculty, M.V. Lomonosov Moscow State University. Since 1972, occupied position at the Astronomical Council of the Academy of Sciences USSR (now, the Institute of Astronomy of the Russian Academy of Sciences). Had been working as the Scientific Secretary for 29 years (1987 to 2015). One of the founders of the European Astronomical Society. Died 26.12.2018 in Moscow.

D.A. Ptitsyn's research interests include chemical abundances of Ap stars, nucleosynthesis at the iron peak and heavy elements beyond the iron peak as well as application of the electronographic image tube to astronomy.

Analyzed chemical abundances beyond the iron peak in the Ia type supernova model taking into account the (g, p) and (p,g) reactions in addition to the usual approach. Obtained the distribution matching the observed one (in cooperation with V.M. Chechetkin, I.V. Panov and S.I. Blinnikov). Showed that elements abundances between subsequent neutron peaks can be described by standard sequences.

Calculated abundances of a number of elements in Ap stars (in collaboration with T.A. Ryabchikova). Found that abundances of elements in different Ap, Am, and normal stars match (in collaboration with V.L. Khokhlova).

D.A. Ptitsyn also showed that there is no need to use an extremely fragile electronographic image tube in astronomy and CCDs can be successfully used (in collaboration with V.L. Khokhlova).

For many years, working with Academician A.A. Boyarcyuk, was Assistant Coordinator of the Program for Fundamental Research of Presidium of the Russian Academy of Sciences (2000-2015). Also, working with Academicians A.M. Fridman and D.A. Varshalovich, was Assistant Coordinator of the Program for Fundamental Research of the Physical Sciences Department of the Russian Academy of Sciences (2001-2015).

D.A. Ptitsyn worked as Scientific Editor at “Nauka”, the Russian publisher of academic books and journals: «Astronomy Letters» (1975-1986), «Astronomy Reports» (1992-2015).

Awards: Certificate of Honor of the Russian Academy of Sciences, the Medal "In Commemoration of the 850th Anniversary of Moscow", the title «Veteran of Labour».

PUSHKAREV Alexander Borisovich

Born in 1975 in Simferopol. Student of astronomical department of physical faculty of Lomonosov Moscow State University since 1992 through 1998. PhD student of Astro Space Center of Lebedev Physical Institute from 1998 to 2001. Obtained his PhD in 2001. Since 2002 through 2015 worked in Pulkovo Observatory. Leading researcher in Crimean Astrophysical Observatory since 2004. Postdoctoral fellow in Max Planck Institute for Radio Astronomy (Germany) from 2007 to 2010. Defended his Doctoral thesis in Pulkovo Observatory in 2015. Professor of the Russian Academy of Sciences since 2016. A member of IAU

An expert in the field of studying active galactic nuclei (AGN) studied with Very Long Base-line Interferometry (VLBI) technique using the aperture synthesis systems, such as VLBA, VLA, and EVN. The first scientific works were focused on investigating polarization properties of BL Lacertae objects by restoring Faraday screen. It was shown that rotation measure distribution is non-uniform on parsec scales, proving the presence of the thermal plasma in the immediate vicinity of the source. Indications of a helical and highly twisted magnetic field associated with the relativistic jets of BL Lacs were found, as well as spine-sheath structure, suggesting a shear interaction with a surrounding medium.

Later, using rich observational material of the largest AGN VLBI programs (MOJAVE, RDV), ground-space VLBI observations with VSOP, as well as data of the Fermi gamma-ray space observatory, the following results were obtained: (i) measured opening angles of relativistic jets showed their high degree of collimation (~1°), (ii) the theoretically predicted effect of spectral aging of outflows was experimentally detected, (iii) a method of measuring frequency-dependent absolute position of VLBI core was developed and massively applied to determine the magnetic field in the jet as well as in the vicinity of the central supermassive black hole, (iv) gamma-ray emission zone in active galactic nuclei was localized at distances of a few parsecs from the central engine.

In 2009 Alexander Pushkarev was leading an experimental discovery of the theoretically-predicted extremely rare phenomenon of multiple parsec-scale quasar images induced by anisotropic refractive scattering at the turbulent inhomogeneities of the interstellar Galaxy medium. The maximum manifestation of the effect was recorded during an especially short phase of extreme scattering event that corresponds to a passage of the lens (screen) edge of high scattering capability on the background compact radio source. The investigations of scattering properties of the interstellar Galaxy medium were carried out using data of VLBI observations of more than 3 thousand compact extragalactic sources. It was detected that objects observed through the Galactic plane ($|b|<10°$) at 2, 5, and 8 GHz showed an increase in angular sizes, and about one third of them – a significant scattering. These objects were predominantly detected in the direction of the Galactic bar, Cygnus region and Fitzgerald window.

A total number of publications exceeds 100.

RACHKOVSKY Dmitry Nikolaevich

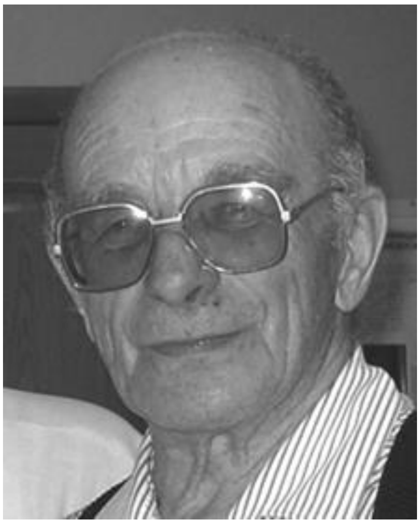
Born 26.08.1928 in Leningrad. In 1948 he entered Leningrad University and graduated from it with a degree in astronomy. Since 1953 to 2013 he worked at the Crimean Astrophysical Observatory advancing from junior to leading researcher. In 1955–1958 he was Ph.D. student there. In 1980–1989 D.N. Rachkovsky was Head of the Laboratory "Mathematical methods for processing astrophysical observations". In 1964 he defended the Ph.D. thesis "The formation of absorption lines in the magnetic field", in 1996 – the Doctoral thesis "The formation of absorption lines in the magnetic field. Some issues on the Raileigh-type scattering". Died 14.08.2013 in Nauchnyy.

The basic research publications relate to the field of theoretical astrophysics. An author of a new direction in the theory of polarized emission transfer in spectral lines of the magnetic field. He correctly formulized a vector equation of emission transfer in the spectral line in plasma with the magnetic field taking into account polarization, abnormal dispersion and scattering on the assumption about a full redistribution in frequency. This equation was named Uno-Rachkovsky. D.N. Rachkovsky proposed and implemented by means of computer programs methods of solving the equation and calculating Stokes parameters of emission emerging from the atmosphere and inner emission. He executed numerous applications for studying solar magnetic fields particularly on observations carried out at the Crimean Astrophysical Observatory. A favorable factorization of the matrix of molecular (Raileigh with depolarization) scattering was found; based on this an effective method for calculating source functions and outward emission at different primary sources was put forward. He developed a method for calculating and estimated emission polarization in wings of the Fraunhofer lines. D.N. Rachkovsky carried out a theoretical study of the Hanle effect that allows estimating the weak magnetic field inaccessible for measuring with a magnetograph. He proposed a new formulation of the matrix of emission scattering in the weak magnetic field. It was shown that while observing scattered light in the solar atmosphere with the magnetic field directed perpendicular to the atmosphere, the Hanle effect is absent. A phase matrix in the strong magnetic fields was shown to depend on the direction of the magnetic field relative to the basic coordinate system.

D.N. Rachkovsky executed a series of works on calculating and ground-based studying the optical systems of space telescopes. Being Head of the Laboratory he developed and introduced methods for computer processing of observational data. A series of programs were developed to analyze periodic processes occurring in the solar and stellar atmospheres.

D.N. Rachkovsky was honored "For scientific achievements" award of the Ministry of Education and Science of Ukraine.

RAPOPORT Viktor Ovseevich



Born 28.10.1929 in the city of Khabarovsk. 1946-1952, studied at the Faculty of Radiophysics at the State University of Gorky (now, N. I. Lobachevsky State University of Nizhny Novgorod). Completed his PhD in 1965 and D.Sc. in 1986. Professor since 1989.
1957-2016, occupied different positions at the Radiophysical Research Institute (NIRFI), including an engineer, senior engineer, leading engineer, senior researcher, laboratory head, department head, and division head. Awarded the certificate of honor of the Ministry of Education and Science of the Russian Federation. Died 25.11.2020 in Nizhny Novgorod.

V.O. Rapoport’s field of research is physical processes in space and ionospheric plasma. He is the author of more than 150 research publications.

In his research on the dynamics of fast electron-beam expansion in the solar corona, he demonstrated that the concomitant wave processes are completely analogous to the plasma turbulence generation processes in the ionosphere when it is heated by powerful HF signals.

This conclusion was made based on observations with the world's largest Ukrainian decametre radio telescope UTR-2 equipped with a dynamic spectrograph and a set of special receiving and recording equipment designed under V.O. Rapoport’s direction. Over many years of observations with UTR-2, he had been studying the discovered by him phenomenon of collisionless braking of sub-relativistic electron beams. Showed that this deceleration was due to energy losses in the excitation of plasma waves in the solar atmosphere at heights of 1 – 3, 5R☼. Based on his examination of solar decameter type III bursts, V.O. Rapoport researched the features of high-energy electron beam interactions with the coronal plasma. V.O. Rapoport obtained two-dimensional images of the quiet Sun in the long-wavelength range for the first time, which showed a sharp asymmetric structure of the solar corona outer layers. Showed that the magnitude and stability of the corona temperature is linked to the features of plasma waves generation and propagation and to the energy exchange between the electron beam and maternal plasma.

RASTORGUEV Alexey Sergeevich

Born on 07.26.1951 in the vil. of Novaya Pustyn’, Shilovo distr., Ryazan reg. In 1974 graduated from the astron. dept. of phys. fac. at Lomonosov MSU; in 1977 – postgraduate study at LMSU. In 1979 defended PhD thesis “Dynamics of globular star clusters”, in 1995 – Dr.Sci. thesis “Radial velocities of stars and the determination of structural and kinematical characteristics of the Galaxy". Yun. fellow at SAI LMSU in 1974–1983. From 1983 – professor at LMSU phys. fac. (in posit. of the assistant, associate and full professor). Acad. professor title since 2002. Head of the experimental astronomy dept. at LMSU phys. fac. since 2015. Head. of the Galaxy and variable stars study dept. at SAI LMSU since 2000

Specialist in the field of stellar astronomy. Main research interests: structure, kinematics and dynamics of the Milky Way populations; star clusters; the universal distance scale; the physics of Cepheids; the physical foundations of the stellar dynamics.

Since 1987, together with SAI LMSU and INASAN observers, he performed radial velocity monitoring of northern stars, including 170 Milky Way Cepheids, with a correlation spectrograph. Based on these data, together with N.A. Gorynya and N.N. Samus, he determined the orbital parameters of spectroscopic binary Cepheids and estimated the minimum masses of their companions. He invented a new version of the Baade-Wesselink method, based on multiphase effective temperature measurements of Cepheids, which enables to independently determine their color excess, radii and luminosities. Using new technique, together with Ya.A. Lazovik he derived new period – luminosity relation for MW Cepheids. He also realized the most detailed variant of the statistical parallax method and applied it to the study of MW kinematics and to the refinement of the distance scales of different stellar populations. Together with A.K. Dambis, M.V. Zabolotskikh, E.V. Glushkova, A.M. Melnik, V.V. Bobylev, A.T. Baikova and N.D. Utkin he performed detailed studies of the kinematics of young and old populations of the MW and determined the kinematical parameters of the MW disk, the parameters of its spiral pattern and the distance to the MW center. The parameters of the period – luminosity – metallicity relations for of RR Lyrae variables in optics and IR were also improved.

Together with Ya.O. Chumak and S. Aarset he investigated the process of tidal disruption of open star clusters. Together with V.N. Sementsov, O.V. Chumak and N.D. Utkin he performed the study of the physical nature of random (irregular) forces in stellar systems, calculated the stochastization time in the stellar field, and showed that the anisotropy of stellar velocity distribution, as well as the fractal structure of the stellar field leads to significant reduction of the relaxation time. He proposed a new method of the calculation of diffusion coefficients in the velocity space, which takes into account the multiplicity of stellar encounters, to completely eliminate the effect of classical logarithmic divergence in stellar collisions.

For many years he gives the lecture courses "Galactic Astronomy", "Dynamics of Stellar Systems", "Universal Distance Scale" for undergraduate, graduate and postgraduate students of the astronomical dept. at the LMSU phys. faculty. Four PhD and two Dr.Sci. theses were defended under his supervision. He published more 170 papers. In 2007, together with L.N. Berdnikov and N.N. Samus he was awarded by the RAS F.A. Bredikhin prize for a series of works devoted to Cepheids.

Awarded as "Honorary educator of higher professional education of the Russian Federation" by the Ministry of Education and Science of the Russian Federation and by the Certificate of Honor from Lomonosov Moscow State University.

RAZIN Vladimir Andreevich

Born 15.11.1930 in the work settlement of Ardatov of the Nizhny Novgorod province. 1948-1953, a student at the Radiophysics Faculty of the State University of Gorky (now, N. I. Lobachevsky State University of Nizhny Novgorod). 1953-1956, a postgraduate student at the State University of Gorky, with V.L. Ginzburg as his PhD supervisor. Defended his PhD thesis in 1957. Defended his D.Sc. thesis in 1972. Professor since 1990. 1956-2012, a senior researcher, head of the laboratory, head of the department, director (1980-1990) at the Radiophysical Research Institute (NIRFI). Honored Science Worker of the Russian Federation.
Member of the International Astronomical Union (IAU), the International Union of Radio Science (URSI, Chairman of Commission J of the Russian National Committee), the European Astronomical Society (EAS), the Euro-Asian Astronomical Society (EAAS). Awarded the Order of the Badge of Honor, and a number of medals, the Russian Federation Presidential Certificate of Gratitude (2006). Died 30.12.2012 in Nizhny Novgorod.

V.A. Razin's research interests are radiophysics, radio astronomy, and astrophysics.

V.A. Razin won his reputation and recognition in the scientific community when he discovered partial linear polarization of the Galactic radio emission in 1955-1956. His finding was a decisive proof of the synchrotron nature of the nonthermal Galactic radio emission, and, therefore, direct evidence of the existence of relativistic electrons and magnetic fields in the interstellar space. For his discovery, V.A. Razin was awarded the Diploma for Scientific Discovery No.26 with a priority of June 1956. This was the beginning of a new direction in the study of the Galaxy's ionized interstellar medium and magnetic field by the radio-polarization method.

In the 1950s, V.A. Razin was the first in the radio astronomical practice to make measurements of the radio emission flux densities of certain cosmic sources and their long-term dynamics as well as the linear polarization measurements of the radio emission of a number of galactic and extragalactic sources in the decimeter wavelength band. Based on these measurements, he developed the statistical theory of linear polarization of the synchrotron radio emission of discrete cosmic sources as well as the theory of their low-frequency spectra.

V.A. Razin generalized the theory of synchrotron radiation in vacuum in case of radiation generation in a highly rarefied plasma and showed that at low frequencies, there was the quasi exponential cut-off in the spectrum. This phenomenon is called the Razin effect in the scientific literature. He first pointed out the necessity to account for the Faraday rotation of the polarization plane of linearly polarized radio emission in radio wave propagation inside the cosmic sources and in the interstellar medium. V.A. Razin wrote a number of research papers on cosmic-ray astrophysics and radio wave propagation as well as on the development of several new methods of radio astronomical measurements: He and his collaborators patented the radio astronomy Faraday-polarization method of measuring the total electron content of the ionosphere.

V.A. Razin was a leader and co-leader of the Leading Scientific School "Galactic and extragalactic radio astronomy. The interstellar medium."

In 1963-1964, V.A. Razin initiated and directly headed the establishment of the Staraya Pustyn Radioastronomical Observatory (SPRAO) at the NIRFI with fundamental and applied experiments conducted until the present day.

V.A. Razin is the author of more than 200 research publications. He was awarded the V.Y. Struve Commemoration Medal "For outstanding contribution to the development of radio astronomy".

RESHETNIKOV Vladimir Petrovich

Born 14.12.1959 in Leningrad (now St. Petersburg). After graduating from the Mathematics and Mechanics Faculty of Leningrad State University (LGU, now St. Petersburg State University SPbU) in 1982, he worked at the Astronomical Institute and then at the Mathematics and Mechanics Faculty of SPbU.
Since 2004, a professor at the Department of Astrophysics. In 1991-1992, a visiting researcher at the Special Astrophysical Observatory (Russia). In 1992-1993, worked as a postdoctoral researcher at the Paris Observatory. D.Sc. in Physical and Mathematical Sciences (1999) ("Photometric and Spectral Study of Interacting Galaxies"). Member of IAU.

V.P. Reshetnikov's field of research is extragalactic astronomy. Author of more than 150 research publications and several textbooks.

In the 1980s and 1990s, conducted a systematic observational survey of large-scale components interacting galaxies including their disks, bulges, and tidal structures. Discovered the effect of tidal thickening of the disks of spiral galaxies.

V.P. Reshetnikov performed the first-ever photometric and spectral survey of a unique class of extragalactic objects, namely the galaxies with polar rings. Together with N. Ya. Sotnikova, based on gas-dynamic modeling, showed that such objects can be formed during gravitational interaction due to the accretion of matter from a nearby galaxy. He also showed that the velocity fields and the structure of polar rings require the existence of a dark matter halo around these objects.

In the 2000s, using data from the Hubble Space Telescope, V.P. Reshetnikov investigated interacting galaxies at redshift z ~ 1. He was the first to show that the statistics of galaxies with tidal structures, as well as distant galaxies with polar rings, indicate a rapid increase in the rate of galaxy interactions and mergers with increasing redshift. When studying the structure of edge-on spiral galaxies at z ~ 1, V.P. Reshetnikov discovered an enhanced relative thickness of stellar disks and anomalously high frequency of their vertical deformations (warps). V.P. Reshetnikov was involved in compiling several catalogs of various types of extragalactic objects such as galaxies with polar rings, galaxies with warped stellar disks, and edge-on galaxies.

Supervisor of several completed Ph.D. theses.

His popular science book "Why the Sky is Dark. The Structure of the Universe" (Fryazino, Vek-2, 2012) became a finalist of the Enlightener Prize in 2012 and a laureate of the Alexander Belyaev Prize in 2013.

REVNIVTSEV Mikhail Gennadievich

Born 03.05.1974 in Tolyatti. 1997 – graduated from the Moscow Institute of Physics and Technology (MIPT) and entered the graduate school of the Space Research Institute (IKI) of the Russian Academy of Sciences. 1999 – PhD, 2006 – doctor of science. 2016 – elected a professor of the Russian Academy of Sciences. Since 1995 worked at IKI, with the latest position being head of the experimental astrophysics laboratory. In 2002-2008 also worked at the Max-Planck Institute for Astrophysics (Germany). Member of the International Astronomical Union, the Extraterrestrial Astronomy section of RAS Space Council. Died 23.11.2016 in Moscow.

M.G. Revnivstev is an expert in X-ray astronomy and high-energy astrophysics, author of 320 scientific papers.

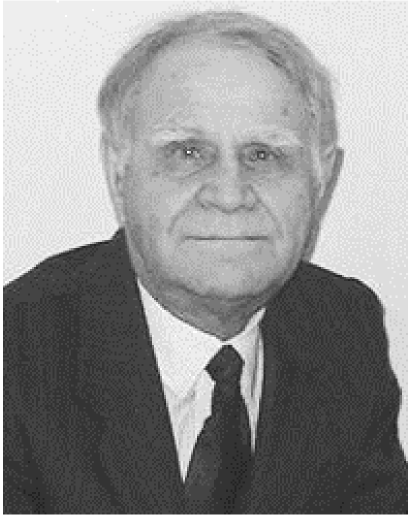
His scientific carrier began with analysis of data from the orbital X-ray observatories Mit/Kvant, GRANAT and RXTE; he played an important role in the success of the International Gamma-Ray Laboratory (INTEGRAL) and preparation to the all-sky X-ray survey by the Russian-German Spectrum-RG observatory; inspired the All-Sky Monitor (MVN) project for the International Space Station.

His main results and discoveries are related to studies of accreting neutron stars, black holes, white dwarfs, cosmic X-ray background and Galactic diffuse X-ray emission. In particular, he solved the long-term puzzle of the origin of the Galactic X-ray Background. Having constructed an all-sky map based on data from the RXTE orbital observatory, he proved that the diffuse X-ray emission of the Milky Way is composed of emission from numerous unresolved accreting white dwarfs and coronally active stars. He conducted pioneering studies of the X-ray emission from the layer of accreting matter spreading over the surface of neutron stars, using the Fourier-resolved method allowing rapidly variable emission components to be separated from the total X-ray spectrum. Widely known is his series of papers devoted to studies of the X-ray and optical variability of close X-ray binaries in which accretion of matter occurs onto white dwarfs and neutron stars; he demonstrated that the break in the power spectrum of the light curves of these objects corresponds to the Kepler frequency at the inner radius of the accretion disk.

For his scientific achievements he got the Ya.B. Zeldovich medal in astrophysics from the International Committee on Space Research (COSPAR, 2006) and became one of the first laureates of the Prize of the President of the Russian Federation in science and innovations for young scientists (2008). His (with co-authors) series of works “Hard X-ray survey of the Galactic Center region by the INTEGRAL orbital observatory: discovery of new accreting neutron stars and black holes”, published in Astronomy Letters, was awarded the main prize of Nauka/Interperiodika for the best publication in physics and astronomy (2006). An international prize for the best paper within the INTEGRAL project among young scientists is named after him.

He supervised 4 PhDs, read astrophysics courses at MIPT and lectures at several summer schools for young astrophysicists.

RIZVANOV Naufal Gayazovich



Born 15.01.1930 in Kazan. Graduated from Kazan State University (KSU) in 1954. Research assistant at the department of the Solar Physics of Alma-Ata Astrophysical Institute of Kazakhstan Academy of Sciences 1955–1958. Practical astronomer at Engelhardt Observatory (EAO) in 1958. Senior researcher in 1971. Ahead of the Moon and Planets department (reorganized into the department of Photographic Astrometry) at EAO in 1974. At the same time Research Director of EAO 1983–1992. Director of EAO 1990-1991. Master's degree in physics and mathematics in 1961. Doctor's degree in physics and mathematics in 1987. Full professor in Astrometry and Celestial Mechanics in 2001. Died 09.04.2012 in Kazan.

Dr. Rizvanov's scientific interests lied in photographic astrometry, positional astrometry, selenodezy, ephemeris astronomy, astroinstrument engineering.

Dr. Rizvanov founded the Kazan school of photographic astrometry. He was the first in the world who developed the method to obtain largescale photographs of the Moon with stars. Dr. Rizvanov built a new model of the Moon figure and an Absolute Catalogue of positions of Lunar craters. He developed several original methods of reduction in selenodezy and dynamical astronomy.

Dr. Rizvanov was the main initiator and organizer to build high-mount observatories for KSU, which are "Nakhichevan" in 1960 and "Zelenchuk" in 1971. For the first time in the USSR Dr. Rizvanov, together with Stanislav Tohtasev, executed Spectorcinematography of the total solar eclipse near the second and third contacts in 1961. Dr. Rizvanov, together with Pharid Garaev, Margarita Kibardina, and Zoya Tutishkina, successfully photographed the solar corona during the total solar eclipse near Baikal Lake in 1981.

ROMANYUK Iosif Ivanovich

Born 15.03.1952 the Zakarpatskaya Region of the Ukrainian SSR. Graduated from Uzhgorod State University in 1974. Since 1975 he has been working at the Special Astrophysical Observa-tory of the Academy of Sciences of the USSR (since 1991 the Russian Academy of Sciences), holding different positions: Sen-ior Research Assistant (1975-1979), Junior Researcher (1979-1986), Researcher (1986-1989), Senior Researcher (1989-2005), Leading Researcher (2005-2011), Head of the Stellar Magnetism Laboratory (since 2011). In 1986 he defended a PhD thesis on ``Investigation of the Magnetic Field Fine Structure in Spectra of Chemically Peculiar Stars'', and in 2004 a Dr. Sci. thesis on ``Magnetic Fields in Chemically Peculiar Stars on the Main Sequence.'' A member of the International Astronomical Union (IAU), Deputy Editor-in-Chief of Astrophysical Bulletin (since 2006).

The main studies of I.I. Romanyuk concern stellar magnetism investigation. He is an author of over 180 papers.

In the mid-80s I.I. Romanyuk proposed and headed an ambitious project on search for new magnetic chemically peculiar stars with the Russian 6-m telescope (BTA). As a criterion for the selection of candidate stars for observations, he used the effect of anomaly in the spectral energy distribution of these objects. The criterion turned to be effective, about 75% of stars selected for observations with the BTA proved to be magnetic. As for the end of 2015, about 180 new magnetic stars have been found, which is over 1/3 of all the known such objects. For stars with most strong magnetic fields, a detailed analysis has been provided, which allowed new relations between magnetic field configuration and the distribution of chemical elements over their surface to be revealed.

Since the end of '90s I.I. Romanyuk and his colleagues have been studying very slowly rotating magnetic stars. They succeeded in increasing the number of these objects from 5 (in 1995) to 18 (at present). Among the discovered stars, in particular, are 2 new objects with rotation periods of over 20 years. Very long periods (over 5 years) are proved for still other 12 such stars. I.I. Romanyuk has shown that fields with complex topology are only observed in relatively young stars with ages no greater than 20 Myr. In old stars, only simple dipole field configurations are observed. The above observational data is hard evidence in favor of the fossil-field theory for the origin of magnetic fields in these objects.

I.I. Romanyuk has been successfully teaching post graduate students and young scientists. Three PhD theses were fulfilled and defended under his supervision. He is the initiator and organizer of 9 international astronomical conferences on magnetic stars at SAO RAS and an editor of the proceedings of these conferences.

The secretary of the Large Telescopes Program Committee during 1993-2015.

Honored Scientist of the Karachay-Cherkess Republic (2016).

RUBAKOV Valery Anatolievich

Born 16.02.55 in Moscow, Russia. Graduated from Physics Faculty of M.V. Lomonosov Moscow State University (1978), from 1978 to 1981 graduate student, since 1981 member of Institute for Nuclear Research of the Russian Academy of Sciences, since 1994 Chief Scientist of INR RAS. Doctor of Sciences (1989), academician of the Russian Academy of Sciences (1997). Professor (since 1990), Chair of Department of Particle Physics and Cosmology (since 2010), Physics Faculty, M.V. Lomonosov Moscow State University. Editor-in-Chief of «Physics Uspekhi» journal (since 2016), member of various Scientific Councils and Editorial Boards of Russian and international physics journals.

Scientific interests belong to theoretical cosmology, astroparticle physics, theory of gravity, as well as theory of elementary particles and quantum field theory. Studied the generation of tensor perturbations in inflationary Universe, obtained the first estimate of their effect of Cosmic Microwave Background anisotropy (in collaboration with M.V. Sazhin and A.V. Veryaskin). Theoretically discovered the effect of intense baryon number non-conservation in electroweak processes in the early Universe, which is crucial for the explanation of the baryon asymmetry (in collaboration with V.A. Kuzmin and M.E. Shaposhnikov). Introduced the idea and constructed first «brane world» models in theories with extra spatial dimensions (in collaboration with M.E. Shaposhnikov). Works on astrophysical manifestations of light and super-light dark matter (in collaboration with D.S. Gorbunov and A.A. Khmelnitsky), on generation of the baryon asymmetry of the Universe due to neutrino oscillations (in collaboration with E.Kh. Akhmedov and A.Yu. Smirnov), on classical and quantum gravity, models of inflation and its alternatives. Co-author (with D.S. Gorbunov) of books «Introduction to the Theory of the Early Universe. Hot Big Bang Theory» and «Introduction to the Theory of the Early Universe. Cosmological Perturbations and Inflationary Theory» (published in Russian by URSS and in English by World Scientific). Author and co-author of popular articles and books. Winner of Russian and International scientific awards.

rubakov@inr.ac.ru

RUBLEV Sergey Vladimirovich

Born 26.02.1930 in Verkhny, Donetsk region. In 1953, graduated from the Odessa National University (ONU). From 1953 to 1956—a PG student in ONU. In 1956, he was appointed the head of the Mayaky Astronomical Station being built near Odessa; simultaneously he was the senior lecturer of the astronomy and theoretical mechanics faculty of ONU. From 1960 to 1966, he worked at the Research Institute of Physics and Mathematics of the Rostov State University at positions from an engineer to the Head of the laboratory. In 1966 defended his PhD dissertation on "Temperatures and Luminosities of Wolf-Rayet Stars". In 1966, he moved to work at the Special Astrophysical Observatory, AS of the USSR (now SAO RAS) as a Senior Researcher; since 1968, he was a Deputy Director for Science at SAO of the USSR Academy of Sciences. A member of a number of commissions of the Astronomical Council of the USSR Academy of Sciences. Died 14.11.1974 in Odessa

During his short life, Sergey Rublev had done surprisingly much. His scientific interests were in the field of nonstationary phenomena in stars and their atmospheres. He investigated the matter outflow from supergiant stars of late spectral types, the nature of hydrogen emissions in the spectra of long-period variables. Sergey Rublev developed a method of the extended approximate solution of the transfer equation for the case of a flat photosphere, created the theory of Balmer decrements in planetary nebulae. Working in the Research Institute of Physics and Mathematics of the RSU, he theoretically studied the issue of formation of emission line profiles arising in moving shells of stars. His main scientific field was the study of Wolf-Rayet stars (WR). Sergey Rublev studied the dynamic state of stellar atmospheres, the He II emission as well as moving shells of WR stars and how speed in shells varies with distance.

Sergey Vladimirovich was a theorist by avocation, although, he was very successful in practical research. He was the head of construction of the Mayaki Astronomical Station of the Odessa National University which was built for observations within the program of the International Year of Geophysics. The astronomical station was successfully built and the main instruments were installed with the direct participation of Sergey Rublev. He observed with a seven-chamber astrograph and simultaneously gave three courses of lectures at the university. In the period from 1960 to 1966, while working at the Research Institute of Physics and Mathematics of the RSU, he supervised the construction and installation of astronomical equipment at the Nedvigovka Observational Station of the RSU Astronomical Observatory.

In 1966 Sergey Rublev started to work at the Special Astrophysical Observatory, AS of the USSR, and began to deal with the problems of the observatory under construction as a Deputy Director, without leaving his scientific work.

RUDENKO Valentin Nikolaevich

Born 1939 in Moscow; graduated from high school there in 1956, admitted to the Faculty of Physics of Moscow State University, a graduate of the department Radiophysics, 1962. Assistant of the Department of Physics, Moscow State Technical University until 1964. Postgraduate student of the Physics Department of Moscow State University, 1964-1967. PhD, 1968. Assistant, associate professor of the Faculty of Physics, Moscow State University 1969-1987, Doctor of Sci., 1982. Since 1988, Head of the Division of Gravitational Measurements at the SAI of Moscow State University; prof. (0.5 staff) for the Chair of Astrophysics and Stellar Astronomy of the Physics Department, professor's certificate in the specialty "Astrophysics, Radio Astronomy", 1992.

Research interests are focused on ground and space gravity experiments. Since 1968, the search for gravitational waves from astrophysical objects has been chosen as a priority area of research, including the development of principles and the creation of the first gravitational-wave antennas. The teachers-mentors were acad. Zeldovich Ya.B. and corr-member Braginsky V.B. In the early 1970s, V.N. Rudenko was a co-author and participant of the first experiments (MSU – RAS) with attempts to register bursts of gravitational radiation from the center of the Galaxy using solid-state resonance detectors. These works helped to formulate a long-term program of gravitational-wave research, accepted for implementation by the world community, which 45 years later led to the first registration (discovery) of gravitational radiation. \\

In 1988, he headed the Department of Gravitational Measurements at the Sternberg Astronomical Institute, focused on the development of gravitational-wave astronomy. Established close collaboration with the Baksan Neutrino Observatory, INR RAS. Under his leadership, geophysical installations were created: – the Baksan laser strainmeter and the Ulitka gravitational gradiometer as intermediate tools on the way to setting the astrophysical sensitivity level – the OGRAN antenna. The latter, combining the principles of solid-state and laser gravitational detectors, is designed to register relativistic catastrophes in our Galaxy. The OGRAN project was successfully implemented in the framework of the SAI collaboration with two other institutes – nuclear and laser physics: INR RAS and ILP SB RAS. \\

In addition to underground projects, Rudenko V.N. was the head of the gravitational experiment in the comic mission "Radioastron". The technique developed by him was used to measure the relativistic effect of gravitational time dilation with the accumulation of a three-year data bank; results have been obtained that confirm the validity of the general relativity formulas at the level of hundredths of a percent. \\

For many years Rudenko V.N. carried out close collaboration with the European Gravitational Observatory (EGO). For the Virgo gravitational interferometer, he developed a program for registering oscillations of the inner earth's core based on a new principle of mutual deviation of plumb lines of test masses of mirrors, which is currently accepted for implementation. He was the scientific leader of the Russian group that carried out research on third-generation gravitational detectors – the Einstein Telescope project. \\

The list of publications includes 320 articles in WOS and SCOPUS journals, 2 monographs and 8 books in a team of authors. Has 56 years of teaching experience. Author of over 15 general and special lecture courses for students of Moscow State University, Moscow State Technical University and Moscow Institute of Physics and Technology.

Member of the Academic Councils at Moscow State University, European VESF, EGO, member of the IAS. Honored Researcher of Moscow State University; diplomas of the Ministry of Education and Science; Honorary Worker of Science and Technology of the Russian Federation (Order No. 406 / kH dated 20.06.2017

RUDNEVA Evgenia Maksimovna

Born 24.12.1920 in Berdyansk. Since 1938, a student at the Astronomy Department of Faculty of Mechanics and Mathematics at Moscow State University (MSU). Since 1939, worked at Sternberg Astronomical Institute (SAI MSU). Air navigator of the 46th Guards Night Bomber Aviation Regiment, 325th Guards Night Bomber Air Division, three-star lieutenant. Hero of the Soviet Union (1944, posthumously). Died 09.04.1944 in Kerch.

E.M. Rudneva developed her interest in astronomy already when she was a schoolgirl. Since 1937, a member of the observing team of the Moscow department of the All-Union Astronomy and Geodesy Society. Since 1938, studied at the Astronomiy Department of Faculty of Mechanics and Mathematics at Moscow State University. Since 1939, worked as a research assistant at Sternberg Astronomical Institute of Moscow State University (SAI MSU). E.M. Rudneva assisted in observations and data reduction at the School of Solar Physics (E.Ya. Bugoslavskaya as her supervisor) and the School of Variable Stars (P.P. Parenago as her supervisor) at SAI MSU. Prof. S.N. Blazhko's student. In October 1941, followed an appeal of the Young Communist League's Central Committee and joined the army as a volunteer. Completed the air navigators' course at the Engels Military Aviation Pilot School and in May 1942, went to the front. Appointed as an air navigator of the 46th Guards Night Bomber Aviation Regiment, 325th Guards Night Bomber Air Division. A three-star lieutenant of the Guards. Heroically died during her 645th combat flight near Kerch on the night of April 8/9 1944. Awarded the title of Hero of the Soviet Union (posthumously) by the decree of 26.10.1944. A street in Moscow near the school where she studied is named after E.M. Rudneva and a monument is erected in her honor. There is a monument to E.M. Rudneva at her grave in Kerch. The asteroid No. 1907 was named after E.M. Rudneva in 1946.

RUDNITSKIJ Georgij Mikhailovich

Born 13.08.1946 in Leningrad. In 1964-1970 student at the Lomonosov Moscow State University (Physics Faculty, Astronomy Division). In 1970-1973 post-graduate student of the Physics Faculty, chair of astrophysics and stellar astronomy. Since 1973 held various positions at the Sternberg Astronomical Institute. In 1974 defended his candidacy dissertation (PhD) "Galactic sources of molecular radio lines". In 2010 defended his doctoral dissertation "Physical processes in long-period variable stars". Since 2012 head of the Radio Astronomy Department at the Sternberg Astronomical Institute. Member of the International Astronomical Union since 1994. Honored science researcher of the Lomonosov Moscow State University since 2013. Died 13.08.2020 in Moscow.

His science works refer to the following branches of astrophysics: physics of the interstellar medium, interstellar molecules, maser radio sources, long-period variable stars, circumstellar envelopes.

Rudnitskij G.M. is a well-known expert in spectral radio astronomy, experienced radio astronomer-observer. Since 1974 he has been taking part in an international project jointly with French radio astronomers at the radio telescope of the Nançay Radio Astronomy Station (France) on the study of sources of maser radio emission in the lines of hydroxyl molecule at a wavelength of 18 cm. Since 1979 has been participating in the observations of sources of maser radio emission in the water vapor line at 1.35 cm at the RT-22 radio telescope of the Pushchino Radio Astronomy Observatory, Astrospace Center, Lebedev Institute of Physics, Russian Academy of Sciences. Maser radio sources studied for decades at the Nançay and Pushchino radio telescopes belong to two types of objects: star-forming regions (vicinities of protostellar and young stellar objects) and circumstellar envelopes of long-period variable stars – red giants and supergiants. On the basis of the obtained long-term series of variability of the sources of maser radio emission in the hydroxyl and water-vapor lines, conclusions about the nature of the sources have been drawn. The long-term evolution of the maser radio emission has been traced. Using the data on the polarization of the hydroxyl radio emission the magnetic field intensities in the masering regions have been estimated. A number of powerful flares of water-vapor masers in star-forming regions have been recorded. For the water-vapor maser emission sources in circumstellar envelopes correlation of the maser variability with stars' optical light curves has been revealed. Radio continuum emission of long-period variable stars produced by shock waves in their atmospheres has been studied. A model of brightness variations of long-period variables associated with a nearby planetary-mass companion has been proposed.

Since 1977 Rudnitskij G.M. has been teaching the course of radio astronomy for students of the Astronomy Division, Physics Faculty, Lomonosov Moscow State University. An educational manual in radio astronomy has been published (Cygnus Publishing House, 2001).

Rudnitskij G.M. has published more than 150 articles in Russian and international science journals and conference proceedings as well as the review monograph "Molecules in Astrophysics" (VINITI Publishing House, 1983).

RUSKOL Evgeniya Leonidovna

Born 13.02.1927 in Lugansk. Died in 29.08.2017 in Moscow. Student of Astronomical Department of Faculty of Mechanics and Mathematics of Lomonosov Moscow State University (1944 – 1949). Post-graduate student of the GEOFIAN USSR (1950 – 1953). PhD thesis (1953, theme: "Compression of dense gas and dust clouds). Scientific researcher in Schmidt Institute of Physics of the Earth Academy of Sciences of the USSR (RAS) – junior researcher (1954 – 1975), senior researcher (1975-1997), chief scientist (since 1997). Doctoral dissertation (1977, topic: "Investigation of the origin and tidal history of the Earth-Moon system"). Member of the IAU (1967). Died 29.08.2017 in Moscow.

She studied physical processes in interstellar gas-dust clouds of the globule type, as well as in a preplanetary gas and dust cloud. She developed a model for the formation of planets and satellites that grow together in a preplanetary cloud around the embryo of a planet (the so-called co-accretion). The tidal history of the Earth-Moon system was studied and the thermal effects of their tidal interaction for both bodies have been estimated. The formation of satellites near giant planets in their near-planetary gas and dust disks has been investigated.

She has published 105 scientific works, including 2 monographs. As scientific secretary of the Cosmogony Commission of the Astro Council of the USSR Academy of Sciences (1955 – 1972), she contributed to the development of planetary cosmogony in the USSR. As a member of the Academic Council of the Moscow Planetarium, she participated in the promotion of the advanced achievements of astronomy and space technology in the USSR and abroad (USA, Italy, Austria, etc.).

She was awarded with silver and bronze medals at the Exhibition of Economic Achievements (70s, for the design of the Space Pavilion). Member of the international program "Formation of the Planets" at the University of California (Santa Barbara, USA, 1992). Labor Veteran (1987). Member of the Academic Council of the Moscow Planetarium (1979-1989).

RYABCHIKOVA Tatiana Alexandrovna

Born 04.11.1946 in Ivanovo. In 1970, graduated from M.V. Lomonosov Moscow State University (MSU). In 1970-1973, a PhD student at the Astronomical Council of the USSR Academy of Sciences. PhD thesis "Spectroscopic study of the surface inhomogeneities of the strontium Ap star HD 140160" in 1975 (V.L. Khokhlova as her supervisor). Since 1973, worked at the Astronomical Council (currently, the Institute of Astronomy of Russian Acad. Sci., INASAN) in positions from junior researcher to leading researcher. D.Sc. (2014, dissertation "Chemical structure of the atmospheres of magnetic peculiar stars").

T.A. Ryabchikova's field of research is the analysis of the atmospheres of the Main Sequence stars, with a particular interest in chemically peculiar (Ap) magnetic and non-magnetic stars in a wide effective temperature range. T. A. Ryabchikova proposed an empirical model of chemical stratification in the atmospheres of cool rapidly-oscillating magnetic peculiar (roAp) stars which provided a basis for the explanation of the observed amplitude and phases distributions of the radial velocity pulsations in the atmospheres of roAp stars. A long and productive collaboration with astronomers from the Institute of Astronomy of the University of Vienna (Austria) resulted in the discovery of some specific characteristics of the group of roAp stars, which allowed predicting pulsations in the atmosphere based on the observed spectrum. T. A. Ryabchikova investigated the surface chemical inhomogeneity in Ap stars, in cooperation with V.L. Khokhlova, N.E. Piskunov, O.P. Kochukhov.

Because the precision of the spectroscopic analysis of stellar atmospheres strongly depends on the accuracy of the atomic and molecular line parameters, T. A. Ryabchikova is actively involved in creating atomic and molecular line databases for stellar spectroscopy. In 1995, together with astrophysicists from Austria, Russia, and Sweden, she created the Vienna Atomic Line Database (VALD), which is widely used by the astronomical community over the world. In 2010, VALD was included as a part of the Virtual Atomic and Molecular Data Centre (VAMDC), with T.A. Ryabchikova being an official representative of INASAN in the VAMDC consortium.

T. A. Ryabchikova published more than 200 research papers.

Since 2014, T. A. Ryabchikova has been giving lectures on "Practical Aspects of Stellar Spectroscopy" for students studying at the Astronomy Department of the Physics Faculty, MSU. Supervisor of PhD and Master theses.

T. A. Ryabchikova is a member of the International Astronomical Union. For a number of years, she was a member of the Organising Committee of the IAU Commission 14 "Atomic and Molecular Data"and Commission 36 "Theory of stellar atmospheres". She is a member of the Organising Committee of International Conferences on Atomic and Molecular Data and Their Application (ICAMDATA).

RYABOVA Galina Olegovna

Born 15.12.1955 in Norilsk, principal researcher in Research Institute of Applied Mathematics and Mechanics of Tomsk State University (TSU), professor (2002–) of Physics Faculty TSU. Graduated from TSU in 1977. Cand. Sci. dis. "Mathematical model of the Geminid meteoroid stream formation and evolution" (1990, Leningrad university), D. Sci. dis. "Mathematical modelling of meteoroid streams formation and evolution" (2002, SPtb university).

The most significant studies of Ryabova are related to mathematical modelling of meteoroid streams. One of the primal problems of meteor astronomy is to gain some insight into the distribution of meteoroid matter and dust in the Solar system. Restoration of the picture of a meteoroid stream formation is a task of high complexity that generally is solved statistically, because of large number of uncertain parameters. That is why the mathematical modelling is a convenient technique for its solution. There are only three relatively complete mathematical models of meteoroid streams, namely Perseid, Geminid and Leonid stream's models. Ryabova developed the Geminid's model on the base of the original method of nested polynomials and numerical methods. Other models (for Quadrantid, eta-Aquariid, Orionid and the asteroid 1620 Geographos' streams) used numerical methods. Important sidelines worthy of mentioning are a probabilistic method to simulate the flux of dust particles from the comet's nucleus to the trajectory of a spacecraft, and the study of rotational properties and inelastic relaxation of asteroid 1620 Geographos.

IAU member (2003–), member of Organizing Committee IAU C.F1 (previously com. № 22) "Meteors, Meteorites and Interplanetary Dust" (2012–2018). Chair of IAU Division F Commission 22 WG Professional-Amateur Cooperation in Meteors (2006–2012). Editor in chief of "Meteoroids: Sources of Meteors on Earth and Beyond" (Cambridge University Press, 2019), the project under the auspices of C.F1. Member of International Meteor Organization (1991–). TSU deputy in the EUROPLANET Community Consortium (2016–2019). Awarded the RF Astronautic Federation medal of academician Makeev (1995), asteroid 17859 named Galinaryabova (2005).

Ryabova is an author of more than 90 scientific publications, including a handbook «Mathematical modelling of meteoroid streams» (Springer Internat. Pub., 2020).

RYKHLOVA Lidia Vasilievna

Born 08.04.1937 in Moscow. In 1960, having graduated from the Moscow Institute of Geodesy, Aerial Photography & Cartography, she joined Sternberg Astronomical Institute, M.V. Lomonosov Moscow State University (SAI MSU). In 1964-1967, did postgraduate studies at MSU. In 1969, obtained her PhD in Physics & Mathematics, and in 1991, her D.Sc. in Celestial Mechanics & Astrometry. Since 1973, she has been working at the Astronomical Council of the USSR Academy of Sciences (in 1991, renamed to the Institute of Astronomy at the Russian Academy of Sciences (RAN), INASAN). Since 1987, the head of Geodynamics & Applied Geophysics Department at INASAN (in 1998, renamed to the Space Astrometry Department, INASAN).

L.V. Rykhlova's primary areas of research relate to the Earth's rotation and near-Earth environment. She proposed and developed a hypothesis that various geo-dynamic processes, including the polar motion, rotational irregularities and crust deformations, might all have a common cause. She was the first to apply the iterative quasi-polynomial spectral analysis to astrometry. In contrast to the traditional approaches, she suggested considering the barycentric Earth rotation vector instead of the geocentric vector thus, eliminating many inconsistencies suffered by the early theories and linking the observable geophysical phenomena to the whole set of processes including processes within the Earth's interior, upon its surface and in the near space. Supervisor of two completed PhDs projects related to this topic.

With the development of such research areas as space debris and asteroid hazards in the mid-1990s, L.V. Rykhlova became a leader in those research fields by organizing annual conferences on near-earth astronomy that soon attracted international participation.

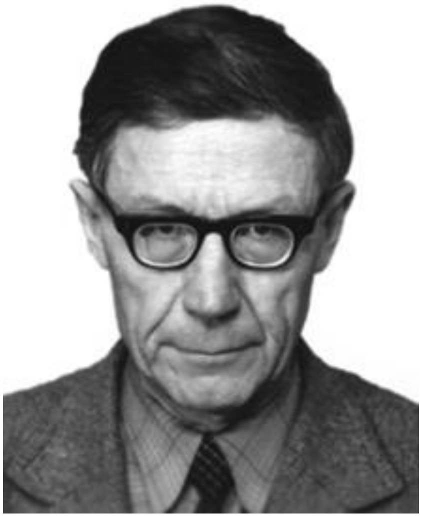
As a member of the Expert Panel on Space Hazards at the Space Council of the Russian Academy of Sciences (RAS), she was actively involved in the development of the National Space Hazards Mitigation Program. Supervision of one competed and one submitted PhD projects in space debris and one completed PhD in asteroid hazards.

From 1993, she has been supervising research under several grants from the Russian Fund for Physical Research. Since 2011, responsible for the implementation of the Minor Bodies of the Solar System Program Nr.22 initiated by the RAN's Presidium.

From 1993 to 2014, she was in the Experts Panel of the High Attestation Commission the Ministry of Education and Science of the RF.

L.V. Rykhlova is a member of the International Astronomical Union (for many years a member of the Organisational Committee of N.19 Rotation of the Earth Division). In addition, she is a member of the Thesis Assessment Board at SAI and Scientific Secretary of the Exoatmospherical Astronomy Division at the Space Council RAS. In 1986, awarded the Medal for Labour Merits, in 1996 the Title of the Honorary Scientist of the Russian Federation. Recipient of awards from the Roscosmos Agency and from the Spacecraft Control Service. A main-belt asteroid 9566 discovered on September 18, 1987 by L.I. Chernykh at the Crimea Astrophysical Observatory is named after L.V. Rykhlova.

RYLOV Valery Stepanovich



Born 05.09.1923 in Kirov region. In 1941, on high school graduation, he was called up for military service. Served as a military interpreter in intelligence divisions of different units of the field army. Participated in breaking the Siege of Leningrad. After demobilization in 1946, entered Leningrad Polytechnic Institute and in 1951 graduated from it in specialty on applied physics (qualified as a research engineer). From 1951, worked in Ioffe Institute on isotope separation. In 1958, defended his Ph.D. dissertation. From 1967, worked in the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences as from 1991) as Head of Laboratory of astronomical light detectors. Died 15.07.1989 in Zelenchuk.

V.S. Rylov's main operating and scientific activity was connected with establishment and development of the Special Astrophysical Observatory, with creation of resource and technology bases to equip the 6-m SAO RAS optical telescope (BTA). V.S. Rylov was the author of 62 papers and one invention.

He put great efforts in arrangement, composition, and reasoning of detailed terms of references for standard spectral instruments. In the course of design, production, and testing of the instruments, he was a customer on behalf of SAO. The Main Stellar Spectrograph, high aperture spectrograph for the primary focus, and echelle spectrograph were the basis for implementation of many observation programs. Creation of the echelle spectrograph caused criticism of some astronomers. V.S. answered that they were instruments for the future and there were no receivers for them so far, but it was a matter of the near future. At the present time, echelle spectrographs are widely used in observatories all over the world.

He created and headed the Laboratory of astronomical light detectors (LALD), where they worked on the improvement of spectral observation efficiency. For that purpose, work on the creation of high-quality electronic-optical image intensifiers (EOIIs) had been performed with the assistance of Department of the DPhA, AS of the USSR and participation of the VNIIOFI (Moscow).

Various bench models for the study of properties of light detectors were developed in LALD. In the first stage, a single-chambered EOII of the UMK type was created which was operating in the range of 3300-12000 Å, contained a fiber disk at the output, had low noises and high resolution. In the second stage – a two-chambered EOII with the same high-performance characteristics. The EOIIs were used in observations. For new EOIIs, the system of focusing by permanent magnets was developed which ensured high image stability and reduced the screen background. Such focusing was designed for the first time in the world. These EOIIs were implemented at several telescopes in our country and abroad. Simultaneously, the first samples of the digital EOII (diokon) were developed. Creation of the diokon was the first step in multi-channel system evolution based on CCDs. Unfortunately, the further course of events ruined these plans.

V.S. Rylov also created spectrum calibration sources, supported a delivery of the automatic densitometer (AMD) at SAO, which served for many years for spectrum processing at the observatory, designed plastic pavilions for the 6-m telescope balconies, etc.

Honored with state awards: Order of “Red Star”, Order of “Red Banner of Labour”, medal for “Valorous Labour”, etc.

RYZHKOV Nikolay Fedoseevich

Born 19.05.1923 in Saratov.

In July 1941 Ryzhkov was drafted into the Red Army and sent to Kuibyshev Military School of Communications. From 1942 to 1943 he fought on the Voronezh Front, in 1943 was discharged from the army due to injury and transferred to the reserve. From 1944 to 1950 Ryzhkov studied at Moscow Power Engineering Institute. After graduation he worked at the Crimean expedition of the Lebedev Physical Institute of the Academy of Sciences of the USSR (1950-1952), Main Astronomical Observatory (1952-1969), and Leningrad branch of the Special Astrophysical Ob-servatory (1969-1985), where in 1973 he became the head of ra-dio spectroscopy laboratory . In 1971 Ryzhkov presented his Ph.D. thesis "Methods of radio spectroscopy of the interstellar medium", for which he was awarded the Dr. Sci. degree. Died 12.08.1985 in Leningrad.

For Ryzhkov the purpose his entire life was the development and introduction of equipment for radio astronomy research. Ryzhkov published 90 scientific papers over his career.

In 1950 radio emission from Taurus-A radio source was detected for the first time in the Soviet Union during observations made at the Crimean Station of Lebedev Physical Institute using equipment set up with the involvement of Ryzhkov, and in 1951 he took part in the first attempt to «trans-illuminate» the solar corona with the emission of this radio source. In 1954-55 Ryzhkov developed and installed a radio interferometer for the Mountain station of the Main Astronomical Observatory, and then began to develop equipment for detecting radio lines of deuterium (91.6 cm) and excited hydrogen (91.2 cm). Experience gained allowed Ryzhkov and his team to rapidly produce equipment for observing the HI line at 21 cm and begin regular observations with the Large Pulkovo Radio Telescope. A that same time he also developed new radio spectrometers with low-noise input amplifiers: masers and liquid-nitrogen cooled parametric amplifiers. In 1978 three spectral detectors were put into operation on RATAN-600 under the direction of Ryzhkov: SP-21 (HI line), SP-18 (OH line), and SP-6.2 (H2CO line), and SP-1.35 detector for the H2O line was put into operation in 1981. Extensive work has been done to automate the control of and data acquisition from new detectors.

In 1984 a new class of low-noise amplifiers – liquid-nitrogen cooled transistor amplifiers – was put into regular operation for the first time under the direction of Ryzhkov, resulting in a substantial improvement of the stability of the operation of the radio-spectrometric facility.

It is also important to point out an extensive scientific organizational activity of N.F. Ryzhkov. Before 1954 he took part in organizing radio-astronomical laboratory at the Solar Research Division of the Main Astronomical Observatory, which served as the base for setting up the Radio Astronomy Division at the Main Astronomical Observatory. After the Radio Astronomy Division was transferred in 1969 to the Special Astrophysical Observatory N.F. Ryzhkov was nominated the Deputy Chief Designer of RATAN-600 radio telescope for electronic equipment, and in 1972 he became the head of radio-spectroscopy laboratory. More than 10 researchers defended their theses using on the data acquired with direct involvement of N.F. Ryzhkov.

N.F. Ryzhkov was awarded the Order of the Badge of Honor (1978) and seven medals.

SACHKOV Mikhail Evgenievich

Born 26.08.1971 in Zavolzhsk, Ivanovo province. In 1994, graduated in astronomy from the Physics Faculty of M.V. Lomonosov Moscow State University (MSU). In 1994-1997, a postgraduate student at the Astronomy Department of MSU. Since 1997, he has been working at the Institute of Astronomy of the Russian Academy of Sciences (INASAN) holding different positions: a junior researcher, researcher, senior researcher, leading researcher, head of the Department of Experimental Astronomy. Since 2014, Deputy Director at INASAN. DSc (2011). Prof. RAS at the Department of Physics (Astronomy specialization) (2015).

M. E. Sachkov is an expert in astrophysics and space research, in particular, spectroscopy, asteroseismology, ultraviolet astronomy, and space instrumentation. M. E. Sachkov leads and active participates in the design of ground-based and space-based instrumentation. The author of 2 monographs and more than 200 research publications in leading Russian and international journals

M. E. Sachkov's research findings have received international recognition, have been repeatedly noted as the best annual scientific results of INASAN and RAS and are widely cited in scientific literature. Awarded Honorary Diplomas of the Russian Academy of Sciences (2011 and 2016). He is the chairman of regular international conferences series "Bredikhin Readings".

M. E. Sachkov's main research results:

– developed a method for determining the pulsation modes of classical Cepheids, that is the most reliable method for determining this fundamental parameter;

– proposed a method for studying a pulsation wave propagation in the atmospheres of rapidly oscillating chemically peculiar stars;

– applied and developed new methods of ground-based Doppler measurements, that are free from instrumental errors characteristic of diffraction spectroscopy, characterized by increased spectral resolution and light intensity, which makes it possible to use telescopes with a diameter of 1-2 meters to solve observational tasks that are currently performed only with the largest telescopes;

– developed a new method of orbital Doppler measurements based on single-time spectroscopic and positional observations;

– developed several spectrographs for telescopes of different diameters (together with the specialists from the SAO RAS), which, in particular, is the basis for the ground support system for the Spektr-UF project of the Federal Space Program of Russia.

M. E. Sachkov supervises student research projects at the Physics Faculty of MSU, PhD projects at INASAN. He reads lecture courses at the Faculty of Physics of MSU and INASAN.

M.E. Sachkov is a CO-PI of the international space project "Spectr – UF" (World Space Observatory – Ultraviolet), implemented within the framework of the Federal Space Program of Russia, head of a number of research programs of the Federal Space Program of Russia; editor of special issues of the journal “Astrophysics and Space Science” on ultraviolet astronomy; member of the Space Council of the Russian Academy of Sciences; member of the International Astronomical Union, member of the European Astronomical Society.

SAFRONOV Victor Sergeevich

Born 11.10.1917 in Velikiye Luki. Died in 18.09.1999 in Moscow. Student of Astronomical Department of Faculty of Mechanics and Mathematics of Lomonosov Moscow State University (1935-1941). Member of the Great Patriotic War (1941-1944). Postgraduate student of the Astro Council of the Academy of Sciences of the USSR (1945 – 1948). PhD thesis (1948, topic: "On the kinematics of long-period variable stars"). Junior researcher GEOFIAN USSR (1949 – 1957). Scientific secretary Astro Council (1951 – 1957, part-time). Scientific researcher Schmidt Institute of Physics of the Earth RAS: senior researcher (1957 – 1983), head of the laboratory (1983 – 1989), chief scientist (1989 – 1999). Doctoral dissertation (1967, theme: "On the origin and initial state of the Earth"). Died 18.09.1999 in Moscow.

During his studies at Moscow State University, S. passed military training in the specialty of an aircraft navigator, and in June 1941 entered the Air Force. From the spring of 1942 to the end of 1944 – navigator of the reconnaissance seaplane of the White Sea military flotilla of the Northern Front. At the end of 1944 he was demobilized due to a serious blood disease.

After the defense of PhD thesis in 1949 he went to work at the Institute of Physics of the Earth of the Academy of Sciences of the USSR (GEOFIAN). O. Yu. Schmidt's student. S. investigated the main stages of the transformation of the gas-dust cloud that surrounded the early Sun into a system of planets, as well as the formation of the Earth, with its subsequent evolution. He found a criterion for the gravitational instability of a dust layer with Keplerian rotation around the Sun, studied the formation of dust clusters, their transformation into compact planetesimals, and the predominant growth of the largest of them. It was found that the growth of the gas giant planets Jupiter and Saturn should occur in two stages – (1) the growth of nuclei from condensed elements and (2) gas accretion on them. When studying the cold accumulation of the Earth from solid planetesimals, data from the physics of impact crater formation were used, and the primary heating of the Earth due to impacts was estimated. In 1969, S.'s monograph "The Evolution of the Preplanetary Cloud and the Formation of the Earth and Planets" (translated into English, 1972) was published. His model of the formation of planets from a preplanetary cloud was recognized after young stars like the Sun gas and dust disks were discovered with the same dimensions, masses and temperatures as those of the preplanetary cloud he described. Together with colleagues and graduate students, he studied the features of the formation of small bodies in the solar system – asteroids, comets and planetary satellites.

He has published over 150 scientific papers, including two monographs. Co-author of 7 collective monographs published by Arizona University (USA).

S. were awarded: prizes – named after O.Yu. Schmidt of the USSR Academy of Sciences (1974) and named after J.P. Kuiper of the US Astronomical Society (1990), International Meteorite Society Leonard medal (1989). On the initiative of American astronomers in 1989, asteroid No. 3615, discovered by E. Bowell (USA), was named after S.

Labor Veteran (1985). Honored Scientist of the Russian Federation (1998). He was awarded the Order of the Patriotic War of the II degree, the medal "For Victory over Germany", the medal "For Labor Valor", ten jubilee military medals.

V.S.Safronov published more than 150 scientific works, including 2 monographs. He is a co-author of 7 collective monographs published by Arizona University in the USA, one of these monographs, "Protostars and Planets V", 2000 is dedicated to him.

SAGDEEV Roald Zinnurovich

Born 26.12.1932 in Moscow. In 1955 he graduated from the Physics Department of Moscow State University. Doctor of Physical and Mathematical Sciences (1963), Professor. In 1964 he was elected a corresponding member of the Russian Academy of Sciences, and in 1968 became a full member of RAS. In 1956-1961, he worked at the Institute of Atomic Energy (now the I.V. Kurchatov Institute of Atomic Energy). In 1961-1970 – Head of the laboratory of the Institute of Nuclear Physics of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk). In 1970-1973, he worked at the Institute of High Temperature Physics of the USSR Academy of Sciences. In 1973-1988 – he was Director of the Space Research Institute of the USSR Academy of Sciences. Now he is Director of the East-West Center at the University of Maryland, USA, NASA expert.

Prof. Sagdeev is one of the founders of modern plasma physics. In 1984 he was awarded the Lenin Prize for the creation of a neoclassical theory of transport processes in toroidal plasma.

Participated in and worked as a director of fundamental scientific research on space problems, as well as on scientific and applied areas, such as research of the Earth from space, space technology and active impact on the Earth's magnetosphere. He was one of the initiators of the creation of the International Space Station (ISS).

Many unique research programs were implemented under the leadership of R. Sagdeev on the spacecraft of the Kosmos, Prognoz, Intercosmos, Meteor, Astron, Mars, Venus series, the Soyuz and Salyut orbital complexes, as well as a number of important applied works.

He led many important projects, including the joint Soviet-American Soyuz-Apollo, the Venus series for the exploration of the planet, as well as international missions to Halley's Comet, later to Phobos, the satellite of Mars. In those same years intensive work on the most important Soviet (and later Russian) space projects in the interests of astrophysics and cosmology: the international X-ray Observatory on the KVANT module of the MIR space station, the Gamma, Relict, Granat, Radioastron, and Spectrum-X-Ray-Gamma satellites, had been conducted by IKI.

In 1986, he was awarded the title of Hero of Socialist Labor for leading the international program for the Halley's Comet studies.

In 1987-1991 he was People's Deputy of the Supreme Soviet of the USSR. R. Sagdeev was an adviser to Mikhail Gorbachev on issues related to civil space systems and military space weapons systems.

From 1989 to the present, he is Professor of physics at the University of Maryland (USA), astronomical research director, carried out with the help of space aircraft. Lives in America.

Prof. Sagdeev is a member of many foreign academies (USA, UK, Sweden, Germany, Czech Republic, Vatican, TWAS, etc.). Honorary Doctor of a number of prestigious universities (of Los Angeles, New York, Michigan, Toulouse (France), Graz (Austria), etc.), member of the Max Planck Society.

He was awarded two Orders of Lenin, the Order of the October Revolution and the Red Banner of Labor.

Winner of the Lenin Prize (1984), the George Kennan Prize (1989, USA), the Ettore Majorana Prize (1993, Italy), the Leo Szilard Prize (1995, USA), the James Maxwell Prize (2001, USA). Awarded the Tate Medal (1992, USA). Recognized as the "Person of the Year" in France (1988).

SAGITOV Marat Usmanovich

Born 08.07.1925 in the village Argoyash (Chelyabinsk region). D. 15.11.1988 in Moscow. In January 1943 he was drafted into the Red Army for courses at the Anti-Aircraft Artillery School in Ufa. In the same year he was sent to the war. Served as platoon commander of an artillery regiment. Demobilized in 1946. In 1951 he graduated from the Astronomical Department of the Faculty of Mechanics and Mathematics at Moscow State University (MSU). In 1951-1954 – postgraduate student of the Gravimetry Department. Candidate of Physical and Mathematical Sciences (1954), Doctor of Physical and Mathematical Sciences (1975). Since 1967 to 1973 – vice-principal of Sternberg Astronomical Institute (SAI). Since 1973 to 1988 – head of Gravimetry Department of SAI. Professor of MSU. Died 15.11.1988 in Moscow.

Under the leadership of M.U. Sagitov, for the first time in Russia, the experiment to determine Newton's gravitational constant was provided in SAI. Preparations were carried out since 1963, the experiment ended in 1975. As a result, the value of Newton's constant was obtained, which was the best among the values available in those years. For this work M.U. Sagitov was awarded the degree of Doctor of Physical and Mathematical Sciences. On this topic he wrote the monograph "Gravitational constant, mass and average density of the Earth" (1969), a monograph in Hungarian in Budapest (with L. Stegen), an article in German in Potsdam (1970).

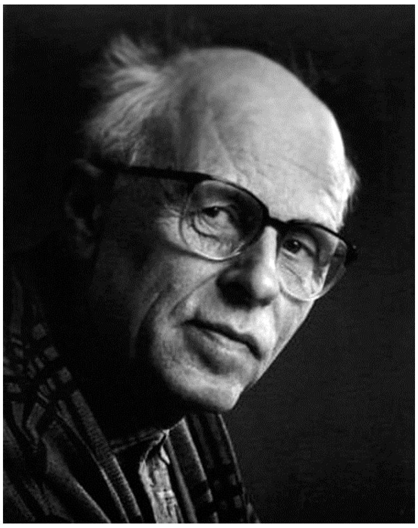
Having discovered the influence of the local gravitational field in the experiment to determine the constant of gravitation, M.U. Sagitov began to study the problems of measurements and changes in gravitational fields in small spaces. The author of the concept "chamber gravimetry".

Working in the SAI, M.U. Sagitov studied the gravitational fields of the Moon, Mars, Venus and their internal structure. He wrote the book "Lunar Gravimetry" (1979). The monograph is the first on this topic in the world scientific literature. In this work, the author points to some selenographic applications of gravimetry – determining the mass of the Moon, assessing the non-hydrostatic shape of the Moon and stresses in its body, assessing the level of isostatic compensation, etc. The book has been translated into English. Total M.U. Sagitov published 117 works, including 4 inventions.

Professor M.U. Sagitov actively participated in the training of specialists, provided lectures on general and special courses, prepared 10 candidates of sciences, wrote a textbook for universities "Gravimetric exploration" (co-authored with K.E. Veselov) (1968).

Awards: Order of the Red Star (1944), two Orders of the Patriotic War, 2nd degree (1945, 1985), medal "For Labor Valor", honorary badge "High School Excellence", badge "Excellent Geodesy and Cartography". In 1985 M.U. Sagitov was awarded the title "Honored Scientist".

SAKHAROV Andrey Dmitrievich



Born 21.05.1921. Student of Faculty of physics, Lomonosov Moscow State University (MSU), 1938 till 1942.
PhD student of Lebedev Physical Institute (LPI) 1944 till 1947.
PhD dissertation in 1947, doctor of sciences in 1953, member of Soviet Academy of sciences from 1953.
Worked on thermonuclear weapons from 1948 till 1968.
Worked as researcher at LPI from 1969 till his end.
Was sent to Gorky because of his human rights defending activity from 1980 till 1986.
Granted by the Stalin Prize at 1953.
Granted as the hero of socialist labor at 1954.
Granted by the Lenin Prize at 1956.
Granted by the Nobel Peace Prize at 1975.
Died 14.12.1989 in Moscow.

Andrey Sakharov was one of the leaders of Soviet thermonuclear weapons. In addition he gave an idea that the thermonuclear reaction could be controlled and used as energy source, not only as dangerous weapons.

In the field of astrophysics and cosmology Andrey Sakharov suggested the explanation of baryonic asymmetry in hot expanding Universe. He extended the consideration by the CP invariance as this phenomenon was yet proved in high energy physics. These considerations result in the modern discussions about the proton life deadline (Pisma v ZHETF, v.5, p.32 (1967)). His idea to take into accont the photons gravitational interaction resulted in the constraints on maximal temperature of cosmic microwave background radiation (Pisma v ZHETF, v.3, p.439 (1966)). Further he studied the quantum fluctuations in curved space-time, the result of his study is well-known as Sakharov osculations (ZHETF v.49, p.345 (1965)). A.Sakharov suggested an idea to consider the curvature expansions (analogously to the electrodynamics) as the possibility to develop the quantum theory of gravity (DAN USSR, v.177, p.70 (1967)). He suggested to consider the cosmological models with time arrow turning (ZHETF, v. 83, p. 1233 (1982)). He formulated the hypothesis of cosmological CPT invariance and the one of the Universe as the set of lists with negative curvature, with possible violation of CPT invariance by the combined charge... The entropy density value (as the character of average curvature) is explained as the result of Universe evolution during the expanding-compressing cycles» (ZHETF, v.79, p.689 (1980)). A.Sakharov suggested the hypothesis about the physical continuum state, which includes the spaces with different metrics signatures. As a result our Universe and another ones appear because of quantum shifts ... Also he supposed the existence of additional compactified time dimensions (with the number proportional to 2) (ZHETF, v. 87, p.375 (1984)). His idea also was that the observation of last stage of mini black hole evaporation (Pisma v ZHETF, v.44, p.295 (1986)).

All these Andrey Sakharov ideas had a great influence of theoretical astrophysics and cosmology. The active discussion on them continues nowadays.

SAKHIBULLIN Nail Abdullovich

Born in Kazan in 1940. Doctor of Physical and Mathematical Sciences (1987), Professor (1998), Academician of the Academy of the Republic of Tatarstan (1992), Honored Worker of Science and Technology of the Republic of Tatarstan (2000), Honored Worker of Science and Technology of Russia (2005). He graduated with honors from Kazan University (KSU, now KFU). He defended his PhD thesis in 1969, doctorate – in 1997. He was Head of the Department of Astronomy at KSU (1998-2005), Dean of the Faculty of Physics at KSU (1988-91), and Director of the V. P. Engelhardt Astronomical Observatory (1991-2008).

After graduating from Kazan University, he entered the graduate school and later worked as an assistant at the Department of Astronomy. In 1987, in Leningrad, he defended his doctoral dissertation. He applied a new method for analyzing stellar spectra without assuming a local thermodynamic equilibrium. He found that this method is more efficient and more physically justified for calculating the line intensities in the spectra of stars. Based on this method, N. A. Sakhibullin explained those astrophysical data that was not interpreted by the traditional approach, for example, he predicted new astrophysical phenomena in the spectra of single stars, for example, emissions in some spectral lines, which allowed us to establish important regularities in the chemical evolution of matter in our Galaxy. In recent years, N. A. Sakhibullin and his students have successfully applied this method to the study of other astrophysical objects: accretion disks, binary systems with externally irradiated atmospheres, etc. Some of these studies were carried out in collaboration with scientists from the United States, the Netherlands, England, and the Czech Republic. At the same time, data from international space projects were used.

N. A. Sakhibullin carried out a great deal of scientific and organizational work to ensure the functioning of the scientific astronomical units of the KFU. Under his leadership, a scientific and technical project was successfully implemented to create and install the RTT-150 telescope with a diameter of 1.5 meters. This extensive work was carried out jointly with the Space Research Institute (Moscow) and the Turkish National Observatory. This telescope allowed Kazan astronomers to participate in a number of space projects.

For more than fifty years, N. A. Sakhibullin has been conducting extensive pedagogical work at Kazan University. They give lectures on general astronomy and theoretical astrophysics. He has published several monographs and a number of methodological manuals on the theory of stellar atmospheres. At the Academy of Sciences of the Republic of Tatarstan, he headed the Department of Physics, Energy, and Earth Sciences for more than 20 years, for which he was awarded a Gold Medal. For his scientific achievements, N. A. Sahibullin was awarded the A. A. Belopolsky Prize of the Russian Academy of Sciences for the best works in astrophysics in Russia, the MAIK Prize. He was awarded the State Prize of the Republic of Tatarstan in the field of science and technology.

SALOMONOVICH Alexander Efimovich

Born 31.12.1916 in Moscow. In 1939 he graduated from Physics Faculty of the Moscow State University. In 1939-1945 he served in the Red Army, participated in the Second World War, was awarded the Order of the Red Star and three medals. 1945-1949 – post-graduate student of the Lebedev Physical Institute (LPI) of the USSR Academy of Sciences. From 1949 – junior, then senior researcher of the LPI laboratory of oscillations, and from 1960 – the laboratory of radio astronomy. In 1965-1969 he was the chief engineer of the LPI, and since 1969 – the head of the sector of extra-atmospheric submillimeter research at the spectroscopy laboratory of the same institute. Ph.D. in physics and mathematics since 1949, since 1965 – doctor of physics and mathematics. Died 08.03.1989 in Moscow.

Starting to work at LPI in the group headed by S.E. Khaikin at the end of 1945, A.E. Salomonovich was appointed head of the LPI Crimean expedition already in 1946. He performed these duties until 1952. From the second half of 1947, after a group of scientists of the Oscillations Laboratory returned from Brazil, who successfully carried out the first domestic radio observations of a total solar eclipse, all the teams of the LPI Crimean expedition were oriented to study the propagation of radio waves in the Earth's atmosphere and ionosphere by radio astronomy methods. In 1948, together with P.D. Kalachev and N.L. Kaidanovsky, he developed a technology for manufacturing the reflecting surface of the country's first full-steerable radio telescope with 7,5m diameter. The work was successfully completed in July 1949, and after equipping the radio telescope with 10cm-radiometer, this radio telescope has long been used to measure the brightness of radio emission from the Sun and the Moon.

From the beginning of 1952 A.E. Salomonovich headed the development, design, and construction of a centimeter and millimeter-wave radio telescope for investigation solar radio emission. The technical design of this unique tool for that time was carried out by P.D. Kalachev. In 1956, a Resolution of the Ministers Council of the USSR was issued, authorizing the LPI to build such a radio telescope on the right bank of the Oka river, and already in May 1959 A.E. Salomonovich demonstrated the first results of observations of the Sun at a wavelength of 8 mm performed with the new 22-meters radio telescope. The angular resolution was 2 arc minutes. The experience gained during the creation of the LPI RT-22 was subsequently used in the construction of a similar radio telescope RT-22 at the Crimean Astrophysical Observatory in 1966. For work on the creation of these radio telescopes, the Presidium of the USSR Academy of Sciences awarded A.E. Salomonovich and P.D. Kalachev in 1977 the A.S. Popov’s Premium.

Already the first observations of the Sun with LPI RT-22 allowed A.E. Salomonovich to identify local radio sources on the Sun with coronal condensations above sunspots, to measure not only their brightness, but also polarization (together with U.V. Khangildin), to study the phase behavior of the radio brightness distribution over the lunar disk (together with B.Ya. Losovsky). The experience gained in the creation of the RT-22, and then in the alignment of this radio telescope and the determination of its parameters, was summarized in the doctoral dissertation of A.E. Salomonovich, and then in the monograph "Radio astronomical methods for measuring antenna parameters", written jointly with A. Kuzmin, which went through several editions and translated into English.

SAMOJLOVA-YAKHONTOVA Natalia Sergeevna

Born 14.08.1896 in Kharkov; studied at the Bestuzhev Women Higher Courses in Petrograd (now St. Petersburg); moved to the Kharkov University (1917) and graduated from it (1919); worked at the Astronomical Institute in Petrograd (from 1922); headed its Theoretical Astronomy and Celestial Mechanics sector (from 1936 to 1942); the Astronomical Institute was reorganized into ITA — the Institute of Theoretical Astronomy of the USSR Academy of Sciences (1942); worked in the State Optical Institute (during World War II); was in charge of the ITA Minor Planet and Comet Department (from 1946 to 1963); became Professor (1946) and Scientific Advisor (from 1963 to 1974). Died 02.05.1994 in St. Petersburg.

N.S. Samoylova-Yakhontova made her research mainly in the field of celestial mechanics and theoretical astronomy solving the three-body problem and determining the orbits of minor planets and comets. She devoted a number of her works to one of the most important problem in celestial mechanics, namely, improving the convergence of the disturbing function expansions in trigonometric series and of using the so-called regularizing variable in this case. She showed that her methods to determine the motion of asteroids could be effectively used in practice and improved the previous differential correction methods of the planetary and cometary orbits. A great deal of work to calculate ephemerides of all numbered minor planets was undertaken under her guidance.

N. S. Samoylova-Yakhontova supervised the preparation of the "Ephemerides of Minor Planets" Yearbook which was published by the Institute of Theoretical Astronomy at the request of the IAU General Secretary since 1948. She was Editor-in-Chief of the "Ephemerides of Minor planets" from 1948 to 1964 and Deputy Editor from 1972 to 1976. N.S. Samoilova-Yakhontova’s supervision brought the Minor Planet Ephemerides Service to play an important role in the global observation system and cataloging the celestial objects.

She worked hard to calculate a variety of mathematical, ballistic and other kinds of tables. The collective monograph "Minor Planets" was published in 1973 under her editorship. One of the papers in this book was written by her.

N. S. Samoylova-Yakhontova was a scientific advisor for a number of postgraduate theses.

She was awarded the Medal "For Valiant Labor During the Great Patriotic War from 1941 to 1945" (1946) and The Order of Lenin (1954). Minor planet (1653) Yakhontova was named in her honour. She died on February 05, 1994.

SAMUS Nikolay Nikolaevich

Born 08.12.1949 in Kiev, Ukraine. In 1973, graduated from M.V. Lomonosov Moscow State University (MSU). PhD student at the School Stellar Astronomy and Astrometry MSU in 1973–1976. Completed his PhD in 1977 (B.V. Kukarkin as his supervisor). Since 1981, has been working at the Astronomical Council of the Academy of Sciences USSR (currently, the Institute of Astronomy of the Russian Academy of Sciences, INASAN) occupying positions from a junior researcher to a leading researcher. D.Sc. (1996, dissertation "Multi-approach Studies of Stellar Contents of Globular Clusters"). Professor (2012). Head of the Variable-Star research group at INASAN. Co-chairman of the Eurasian Astronomical Society (since 2005). Recipient of the F.I. Bredikhin Prize of the Russian Academy of Sciences (2007).

N.N. Samus' research interests are in the fields of observational studies of variable stars (first of all, pulsating stars), photometry of globular-cluster stars, and compiling catalogs of variable stars. Since 1981, he has been the editor of the General Catalogue of Variable Stars (GCVS) (until 1988, together with P.N. Kholopov). This catalog compilation and support was the international project of Soviet astronomers on behalf of the IAU since 1946. After completion of the 4th GCVS edition, the catalog has been supported in the electronic form.

N.N. Samus' was actively involved in measuring radial velocities of Cepheids using a correlation spectrometer. These observations were used to determine Cepheid radii on the base of the Baade–Wesselink technique. Several spectroscopic binary Cepheids were also identified for the first time from these observations. His research, together with photometric observations of Cepheids (L.N. Berdnikov) and studies of their physical and kinematical characteristics (A.S. Rastorguev) were awarded the F.I. Bredikhin Prize of the Russian Academy of Sciences. Since 2009, he has been participating in the program aimed at discovering and studying variable stars from the digitized Moscow stacks of astronomical sky photographs. N.N. Samus' has published more than 350 scientific papers.

N.N. Samus' is actively involved in teaching. Since 1976, he has been reading lectures on variable stars for students at the Astronomy Department of the Physics Faculty MSU. Supervisor of six PhD theses. In the field of popular science, N.N. Samus' regularly delivers lectures in planetaria and other popular-science facilities. He is an honoris causa member of the Planetarium Association of Russia.

Since 1982, N.N. Samus' is a member of the International Astronomical Union; for three years, he was the President of the IAU Commission "Astronomical Telegrams". He is the chief editor of the electronic journal "Variable Stars", a member of editorial boards of several scientific journals.

SAVANOV Igor Spartakovich

Born in 1956 in Moscow. From 1973 to 1978, a student of Leningrad State University (LGU, now St. Petersburg State University SPbU). From 1978 to 1991, worked in the CrAO first as an intern researcher, then a junior researcher, and then a scientific secretary. From 1991 to 2005, Deputy Scientific Director of the CrAO. From 2008 until present, a leading researcher at the Institute of Astronomy RAS (INASAN). In 1987, completed his PhD with the thesis "Study of Atmospheres of Metallic Stars". In 1999, obtained his D.Sc. ("Atmospheres of "Metallic" Stars: Physical Conditions and Chemical Composition"). Member of the International Astronomical Union. Author of more than 100 scientific publications.

I.S. Savanov's main field of research relates to the physics and activity of stars. In the 1980s, he participated in observations with the Astron UV Orbital Observatory. From 2001 to 2008, he worked at the Astronomical Institute of Potsdam, Germany; the Armagh Observatory, Northern Ireland, Great Britain; and the Southern European Observatory, Chile.

Research interests: physics of stellar atmospheres, stellar activity and magnetism, high-resolution spectroscopy, UV studies, spectropolarimetry, analysis of observational data from the FUSE, GALEX, and KEPLER space telescopes.

SAVICH Nikolay Alexandrovich

Born 22.04.1926. In 1951, graduated from Moscow State University. In 1952–1961, worked at the Crimean Astrophysical Observatory. In 1961–2013, a staff member at V.I. Kotelnikov Institute of Radio Engineering and Electronics (Fryazino Branch). In 1960, defended his PhD thesis. In 1975, defended his Doctoral thesis. In 1991 – Professor. A laureate of State Awards of the USSR "For the Investigation of Radio Wave Distribution in Far Space by Means of Instruments of the Type of Venera, Mars, and Luna" (1974) and "For the Investigation of the Atmosphere and Ionosphere of Venus by Means of Landing Vehicles and Planet Satellites" (1985). Authored more than 200 scientific publications. Died 10.03.2013 in Fryazino, Moscow region.

N.A. Savich was born in 1926 in Simferopol in the family of employees. His father was a land surveyor, mother was an accountant. In 1934, he entered the secondary school. During the War stayed in Simferopol. In 1944–1945, served in the Soviet Army. N.A. Savich was awarded the Medal "For the Victory Over Germany". In 1945, entered the Faculty of Physics and Mathematics of Crimean Pedagogical Institute. In 1947, he was transferred to the Faculty of Physics of MSU. In 1951, graduated it with honors, a specialist in radio physics. In 1952, N.A. Savich was employed at the Crimean Astrophysical Observatory. Throughout two years, under his supervision, a unique then ionospheric station was created. In 1954 – Head of the Department of Radio Astronomy and Ionosphere.

In September 1961, N.A. Savich moved to the Fryazino Branch of the Institute of Radio Engineering and Electronics AS USSR (now V.I. Kotelnikov Institute of Radio Engineering and Electronics RAS). Here he worked until his death in March 2013.

N.A. Savich made a significant contribution to the study of space plasma by radio physical methods. During the first five years of his working at FIRE, he performed a large volume of organizational and technical works on creating a unique instrument – the dispersion interferometer of the space basing for studying characteristics of interplanetary plasma, the ionosphere of planets, plasma envelopes of the Moon, planets and minor bodies of the Solar system. Due to this, in 1971–1972, the plasma envelope on the day side of Earth's natural satellite was first detected with the dispersion interferometer mounted onboard lunar satellites Luna 19 and Luna 22. In 1972, when the satellite Mars-2 was landing the planet Mars, a radial profile of electron concentration of the day ionosphere of Mars was derived. In 1974, when the spacecraft Mars 4 was flying near Mars, the dependence of electron concentration on the altitude above the planet surface for the unilluminated side was first obtained. In 1975 and 1983, the group of N.A. Savich carried out fundamental investigations of the day and night ionosphere of Venus within the Soviet projects Venera 9, 10, and Venera 15, 16. In 1976 and 1984, using these instruments, the physical characteristics of the circumsolar plasma were determined. In 1986, in the course of the mission consisted of spacecrafts Vega, the dependences of the electron concentration on the distance to the nucleus of Comet Halley were first acquired. In the 1990s, N.A. Savich took part in the formation of the scientific program on studying circumlunar plasma with the lunar satellite SELENE. Since 2000, N.A. Savich worked on a perspective problem concerning electrodynamics of restrained space systems.

SAZHIN Mikhail Vasilievich

Born 28.11.1951, Miass. Graduated from Physics Department of M.V.Lomonosov Moscow State University (1975). Staff at Sternberg State Astronomical Institute (SAI) of M.V. Lomonosov Moscow state University since 1978; as a head researcher in the Department of relativistic astrophysics since 2013. Doctor of Physics and Mathematics (1990), Professor (2007), foreign member of the Accademia di Scienze Fisiche e Matematiche della Società Nazionale di Scienze Lettere e Arti in Napoli (2013), member of the scientific councils and editorial boards of the international and russian journals in astronomy. Awarded Lomonosov prize for the cycle of works "The CMB and modern cosmology" (2012) and Shklovsky prize for the cycle of works " The first detection of anisotropy of relic radiation on the Russian satellite Relict" (2020) . Co-chairman of the A. L. Zelmanov Moscow Seminar on gravitation and cosmology.

Research interests: cosmology, General relativity.

Participator of the discovery of CMB (space experiment Relikt, 1992). Recent data on the CMB form the Standard cosmological model (which is the basis of modern cosmology), determining the quantitative characteristics of the early Universe. Founder of the methodology of the pulsar timing as detector of gravitational waves. Founder of the methodology of study of the nonstationarity of space-time through gravitational microlensing as applied to the problems of astrometry. Together with O. S. Sazhina author of new scientific direction for the search of cosmic strings.

Author and lecturer of courses for students of Lomonosov Moscow state University: "General theory of relativity for astronomers" (2008), "Modern cosmology" (2008). Supervisor of 6 PhD, and 5 theses. Advisor of 3 DHDR theses.

Author more than 200 scientific and popular scientific papers, including author and coauthor of 6 books and monographs, including: "Modern cosmology in the popular presentation" Sazhin M. V. Izd-vo URSS, Moscow, 2002; "Basics of Modern Cosmology" A. D. Dolgov, Zeldovich Y. B., Sazhin M. V. Editions Frontieres, Gif-sur-Yvette-France, 1990; "Astronomy: century XXI" ed. by V. G. Surdin Izd-vo Vek-2, Fryazino, 2015; "Multichannel Astronomy" ed. by A. M. Cherepashchuk, Izd-vo Vek-2, Fryazino, 2019.

Main publications:

1) Graviton creation in the inflationary universe and the grand unification scale. Rubakov, V.A., Sazhin, M.V., Veryaskin, A.V. Physics Letters B, Vol. 115, Iss. 3, p. 189-192 (1982);

2) CSL-1: chance projection effect or serendipitous discovery of a gravitational lens induced by a cosmic string? Sazhin M. et al. Monthly Notice of the Royal Astronomical Society, Vol. 343, Iss. 2, pp. 353-359 (2003);

3) The Relikt-1experiment – New results. Strukov, I.A., Brukhanov, A.A., Skulachev, D.P., Sazhin, M.V., Monthly Notices of Royal Astronomical Society, Vol. 258, No. 2, pp. 37-40 (1992);

4) Opportunities for detecting ultralong gravitational waves. Sazhin M.V. Soviet Astronomy, Vol. 22, pp. 36-38 (1978);

5) Microarcsecond instability of the celestial reference frame. Sazhin, M.V. et al. Monthly Notices of the Royal Astronomical Society, Volume 300, Issue 1, pp. 287-291, 1998.

SAZHINA Olga Sergeevna

Born 23.04.1977 in Moscow, Russian Federation. Graduated from the Applied mathematics Department of Moscow Aviation Institute (2000). Staff at the Sternberg State Astronomical Institute (SAI) of M.V. Lomonosov Moscow state University since 2003; as a leading researcher in the Department of relativistic astrophysics since 2014. In 2003 graduated the PhD thesis "Possible observation of strong gravitational fields". In 2013 graduated the DHDR thesis "Study of dark energy by the methods of astronomy".

O.S. Sazhina is the specialist in the field of cosmology, relativistic astrophysics, and data processing, author of more than 80 scientific works, including popular scientific works, coauthor of 3 monographs ("Space astrometric experiment OZIRIS" Boyarchuk A. A., et al. Izd-vo Vek-2, Fryazino, 2005; "Astronomy: century XXI" ed. by V. G. Surdin Izd-vo Vek-2, Fryazino, 2015; "Multichannel Astronomy" ed. by A.M. Cherepashchuk Izd-vo Vek-2, Fryazino, 2019), the author of two courses for students of astronomical Department of the Physical faculty of M.V. Lomonosov Moscow state University: "The mathematical processing of observations" (starting in 2015) and "The mathematical processing of observational and experimental data" (2014).

O.S. Sazhina (in collaboration with M. V. Sazhin and S. O. Alexeyev) created and developed a model of evaporation relic black holes, putting the observational constraints.

O.S. (in collaboration with M. V. Sazhin) created a new scientific direction for the search of cosmic strings by methods of modern astrophysics:

1) in the optical range (search of chains of the gravitational-lens events with a special structure) for astrophysical instruments with high angular resolution, including the space-based telescopes (it was conducted observation time on the space telescope Hubble);

2) in the radio range with respect to space observatories (WMAP and Planck).

O.S. Sazhina has been the head for three Grants of the President RF for young scientists, “Inegratsiya”, and by the Grant INTAS. Awarded prize P. Gruber on cosmology for young scientists for the study of relic black holes (2002) and prize I. I. Shuvalov II for the establishment of new methods for the study of cosmic strings and dark energy (2013). O.S. Sazhina is the scientific secretary of the Moscow seminar on gravitation and cosmology (in mem. of A. L. Zelmanov), and conducts the research work with students of M.V. Lomonosov Moscow State University and with foreign students (University Federico II, Naples, Italy).

Main scientific works:

1) CSL-1: chance projection effect or serendipitous discovery of a gravitational lens induced by a cosmic string? Sazhin M. et al. MNRAS, vol. 343, iss. 2, pp. 353-359 (2003);

2) Black-hole relics in string gravity: last stages of Hawking evaporation. Alexeyev et al. Class. and Quant. Grav., vol. 19, iss.16, pp. 4431-4443 (2002);

3) Cosmic microwave background anisotropy induced by a moving straight cosmic string. Sazhina et al. J. of Exp. and Theor. Phys., vol. 106, iss. 5, pp. 878-887 (2008);

4) Optical analysis of a CMB cosmic string candidate. Sazhina O.S. et al. MNRAS, vol. 485, iss. 2, pp. 1876-1885 (2019).

SAZONOV Sergey Yurievich

Born 31.07.1971 in Klimovsk. In 1994 graduated with honors from the Moscow Institute of Physics and Technology (MIPT) and in 1997 the MIPT graduate school. Doctor of phys.-math. sciences (2006), professor of the Russian Academy of Sciences (RAS, 2016). Since 1992 has been working at the Space Research Institute of RAS (since 2018, head of the experimental astrophysics laboratory). In 2001-2009 also worked at the Max-Planck Institute for Astrophysics (Germany). Professor at MIPT and the Higher School of Economics (HSE). Member of RAS Space Council, the National Committee for the Russian Telescopes, the Russian-German Committee of the Spectrum-RG observatory, the INTEGRAL Observatory Users Group, the Expert Council of the Russian Science Foundation, the Editorial Board of the Astronomy Letters, and the International Astronomical Union.

S.Yu. Sazonov is an expert in theoretical astrophysics and astronomy, a representative of the renowned scientific school of Ya.B. Zeldovich and R.A. Sunyaev, author of more than 150 publications in refereed journals. Provided a major contribution to the success of the space X-ray and gamma-ray observatories GRANAT and INTEGRAL. Co-chair of two working groups of the Russian Consortium of the Spectrum-RG X-ray observatory.

Has a number of widely known works on feedback mechanisms during the growth of supermassive black holes in galactic nuclei. Together with M.G. Revnivtsev solved the long-standing puzzle of the Galactic X-ray Ridge Emission, having proved that this extended X-ray emission is produced by numerous accreting white dwarfs and hot stellar coronae. Played a key role in the discovery of low-luminosity gamma-ray bursts. Calculated relativistic spectral corrections and polarization for the Sunyaev-Zeldovich effect in clusters of galaxies. Played a major role in obtaining a number of important scientific results with the INTEGRAL space observatory: determination of the properties of the interstellar medium in which electron-positron annihilation takes place in the Galactic Center region; measurement of the broad-band spectrum of the cosmic X-ray background; exploration of the population properties of active galactic nuclei, low-mass X-ray binaries and cataclysmic variables; study of the past activity of the supermassive black hole in the Galactic Center. Demonstrated (together with M.G. Revnivstev and R.A. Sunyaev) that the faint X-ray emission observed from the vicinity of the supermassive black hole in the Galactic Center can be produced by hot coronae of tidally spun-up stars in the central cluster. Demonstrated (together with R.A. Sunyaev) that low-energy cosmic rays ejected by the first supernovae could have significantly heated up the early Universe. Played a key role in the discovery of the two most luminous X-ray quasars in the early Universe based on data from the Spectrum-RG observatory.

Prize for young astrophysicists from the Gruber Foundation and the International Astronomical Union (2001), main prize of Nauka/Interperiodika for the best publication in physics and mathematics (2007), winner of the Dynasty Foundation's competition among young doctors of science (2009). Regular leader of projects supported by the Russian Science Foundation and Russian Foundation for Basic Research. Referee for leading astrophysical journals. Regular superviser of students and PhD students, reader of astrophysics courses at MIPT and HSE.

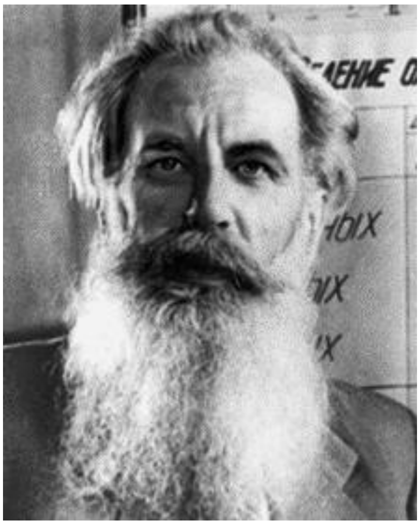
SCHIGOLEV Boris Mikhailovich

Born in 1891 in Warsaw. In 1917 Shch. graduated from Faculty of Physics and Mathematics of Warsaw University, evacuated in 1916 to Rostov-on-Don. Since 1921 – researcher at the State Astrophysical Institute, since 1931 – at the State Astronomical Institute named after Sternberg of Moscow State University (MSU). In 1938-1969 – professor of the Department of Celestial Mechanics and Gravimetry (MSU). Since 1949 – Doctor of Physical and Mathematical Sciences (without defending). Head of Department of Computational Mathematics of the Faculty of Mechanics and Mathematics at Moscow State University (since 1949). Died in 1976 in Moscow.

Shch. research interests: mathematical analysis, mathematical statistics, computational mathematics, stellar astronomy, celestial mechanics. He was engaged in statistical analysis of the distributions of stars, including binaries, and investigated the correlation coefficients. One of the fundamental results in this area is the refutation of the previously prevailing theory of two colliding stellar streams by Ya.K. Kaptein. Shch. also dealt with dynamical cosmogony, the theory of errors, intermediate orbits (from the point of view of studying and comparing their accuracy), calculating orbits, the theory of the motion of the Moon, and developing methods for mathematical processing of observation results.

At the Astronomical Department of MSU Shch. lectured general courses: "Theoretical astronomy" and "Mathematical processing of observations"; special courses: "Theory of Moon motion", "Theory of planetary figures", "Numerical methods of celestial mechanics". Under his supervision, 2 doctoral and 6 master's theses were defended. He worked concurrently as an assistant professor (1930–1937) and professor (1937–1941) of the Department of Mathematics of the Moscow Geological Prospecting Institute (MGPI); associate professor (1931-1937), professor (1937-1939) and Head of Department of Mathematics and Mechanics (1939-1941) of the Moscow Hydrometeorological Institute; in 1942-1945 – professor of mathematics at the Institute of Foreign Trade. In the late 1940s, he was one of the initiators of the organization of the Department of Computational Mathematics at the Faculty of Mechanics and Mathematics of Moscow State University, became the first head of Department of Computational Mathematics, Faculty of Mechanics and Mathematics, Moscow State University. In 1942-1949 – scientific consultant of the Institute of Mechanical Engineering of the USSR Academy of Sciences and the Institute of Precision Mechanics and Computer Engineering of the USSR Academy of Sciences. Author of more than 50 scientific papers published incl. in international journals. Author of the monographs "Theory of Probability and Mathematical Statistics" (co-authored, 1937) and "Mathematical processing of observations" (1960), (1962, 1969, 2nd and 3rd ed. Translations published in New York and London). Shch. was awarded the Order of Lenin and several medals.

SCHMIDT Otto Yulyevich



Russian and Soviet mathematician, geographer, geophysicist, polar explorer, astronomer. Born 18.09.1891 in Mogilyov. Graduated from Kiev University (1913). Lecturer (privatim docens) at Kiev University (1913–1917). Worked in different industries in Moscow, including academia, finance, and publishing (1917–1923). Founder and editor-in-chief of the 1st edition of the Great Soviet Encyclopedia (1924–1942). Professor of Moscow State University (MSU), Head of several departments and schools at MSU (1924–1954). Director of the Arctic Research Institute (1930–1932). Head of the Chief Directorate of the Northern Sea Route (1932–1938). Founder and Director of the Institute of Theoretical Geophysics (now, Schmidt Institute of Physics of the Earth RAS) (1937–1949). Editor-in-chief of "Priroda" ("Nature") journal (1951–1956). Academician (1935), First Vice-President of the USSR Ac. Sc. (1939–1942). Hero of the Soviet Union (1937). Died 07.09.1956 in Moscow.

O.Yu. Schmidt's prominent achievement in mathematics is the "Schmidt theorem" in the field of group theory (1927). As a geographer, O.Yu. Schmidt studied Pamir mountains (1928) and Far North (expeditions to Franz Josef Land, 1929 and 1930). The first successful crossing of the Northern Sea Route without wintering ("Sibiryakov" icebreaker, 1932). Commanded the world-famous expedition of "Chelyuskin" ship (1933/34; "Schmidt's camp"). Established the "North Pole-1" manned drifting station (1937; awarded the Hero of the Soviet Union) and organized the rescue campaign of Papanin's expedition (1938).

O.Yu. Schmidt made a fundamental contribution to modern planetary cosmogony, being the first to link it to geophysics. Starting from Kant's hypothesis, he was the first to formulate (in May 1937) a new approach to planetary cosmogony (the formation of planets from a cool gas and dust cloud). Based on the results on the properties of diffuse matter in the Galaxy (Lindblad, 1935) and the determination of the Sun's galactic orbit (Parenago, 1939), he came to the "meteorite hypothesis" assuming a capture of part of this matter by the Sun (1942, published in.1944). O.Yu. Schmidt established a scientific school "Schmidt's school" (L.E. Gurevich, A.I. Lebedinsky, B.Yu. Levin, V.S. Safronov, etc.). Stimulated by astrophysicists' criticism (V.G. Fesenkov et al., 1951), Schmidt's school considerably improved the theory, now being the basis of the world modern "standard" planetary cosmogony.

O.Yu. Schmidt's effective methodology broke the problem down into three parts: the origin of the circumsolar cloud, its evolution into protoplanets and the evolution of the Earth as a planet. Being a strong mathematician, he was able to overcome celestial mechanics experts' criticism and prove the possibility of capture in principle but postponed further studies. In the 1970s, R. Larson (Canada, USA) proved the capture being a real possibility, already as a part of the general process of diffuse group star formation. O.Yu. Schmidt concentrated his effort on the two last problems, appended the dust protoplanetary cloud with a considerable gas component, and formulated the problem of studying the the Earth's structure and evolution taking into account its radioactive heating (V.I. Vernadsky) and gravitational differentiation (V.V. Belousov, O.Yu. Schmidt). In the 1990s, this hypothesis developed by his students and followers from a theoretical perspective was confirmed by observations, in particular by the discoveries of protoplanetary gas, dust, and planetesimal disks around thousands of young stars. The 21st century has given the discoveries of thousands of proper exoplanet systems around stars, including the first Earth-line planets.

His name is carried by many places including an island in the Cara Sea, peninsula in Chukotka, peak and track in the Pamir Mountains, under-ice plain in Antarctica, exploration icebreaker, district in Magadan region, asteroid No. 2108, craters on Mars and the lunar visible side, and the Institute of Physics of the Earth RAS. The Faculty of Physics at MSU established a scholarship named after O.Yu. Schmidt. The Russian Academy of Sciences established the Schmidt Prize, an award issued for outstanding fundamental research in geophysics.

SEIFINA Elena Viktorovna

Born 11.07.1965 in Simferopol. In 1988 she graduated from the astronomical department of Phys. fac. of M.V. Lomonosov Moscow State University. In 1989 she studied at the postgraduate course of Moscow State University (supervised by A.M. Cherepashchuk). From 1991 to the present, she is a researcher at Moscow State University. Cand. of Phys.-Math. Sciences (1996). Doct. of Phys.-Math. Sciences (2017)

Her main research interests lie in astrophysics, X-ray astronomy, the evolution of accreting neutron stars and black holes, and extragalactic astronomy. Author and co-author of about 50 scientific papers, both in domestic and foreign publications.

The scientific work of E.V. Seifina is based on the use of extensive X-ray observations obtained from numerous space missions. She actively develops and tests methods of spectral and timing analysis of X-ray emission from sources belonging to different classes (candidates for black holes of stellar and intermediate masses, microquasars, neutron star low-mass X-ray binaries and supermassive black holes).

Based on the systematization of these observations, E.V. Seifina discovered fundamental spectral features of accreting neutron stars and black holes. She demonstrated that black holes are characterized by a monotonic increase in the spectral index with the mass accretion rate, culminating in the index saturation at high mass accretion rates during transitions between spectral states, while neutron stars demonstrate a unique constancy of the spectral index regardless of the mass accretion rate up to the near Eddington regime.

She was the first to detect the unique high-hardness phase in the spectra of a number of neutron stars reaching the Eddington mass accretion rate.

E.V. Seifina proposed and tested a new technique for observational diagnostics of a compact object type using X-ray data in application to both galactic and extragalactic sources with a controversial compact object type. She also proposed and implemented a fundamentally new method for measuring the masses of black holes in binaries using exclusively X-ray observations.

Using original methods E.V. Seifina estimated the mass of central objects in ultraluminous X-ray sources, which makes it possible to clarify their evolutionary status. She put forward the hypothesis that the spectral and timing characteristics of disk accretion processes in Galactic and extragalactic BH sources are similar during transitions between different spectral states, which was subsequently confirmed in many publications, and was successfully used to estimate the mass of black holes in extragalactic sources.

She (with L.G. Titarchuk) was the first to detect a gravitationally red-shifted annihilation line in galactic sources with black holes.

In 2015–2016 Seifina was a member of the Time Allocation Committee of the international gamma-ray observatory INTEGRAL. Since 2020, she has been a member of the Coordination Research Council for Astrophysics of the Sternberg Astronomical Institute of Moscow State University. She is a reviewer in the leading foreign astronomical publications Nature Astronomy, MNRAS and Astrophysical Journal.

SERGEEV Sergey Gennadievich

Born 30.05.1964 in Schigry, Kursk region (Russia). In 1981−1986 − student at the Department of Astronomy (Faculty of Physics), Kazan State University. In 1986−1987 − engineer, Mordovia State University (Saransk, Russia). In 1987−1990 − post-graduate student under the supervision of V.I. Pronik, Crimean Astrophysical Observatory (CrAO). In 1990−1992 − junior researcher. In 1992−2002 − research scientist. In 2002−2005 – senior scientist. Since 2005 − leading scientist. 2011 – Head of the Department of Extragalactic Research and Gamma-Ray Astronomy, CrAO. In 2012 he defended his Doctoral thesis "Emission line − continuum correlation in active galactic nuclei". Died 29.09.2021.

S.G. Sergeev is an expert in the field of active galactic nuclei (AGNs) and supermassive black holes. He greatly contributed to the development of observational techniques for both spectral and photometric observations of AGNs at CrAO using CCD detectors. Since the late 1980s, S.G. Sergeev has coordinated the participation of CrAO in large international projects on AGN research. Since 2005, he is head of scientific projects on the study of AGNs and since 2011 he is Head of Extragalactic Research and Gamma-Ray Astronomy Department at CrAO.

S.G. Sergeev significantly contributed to the determination of masses of the central black holes and sizes of BLR by the so-called reverberation method. The estimates of these important parameters were obtained for 16 AGNs. Substantial progress has been made in determination of the BLR kinematics from the variability of the broad emission lines and continuum. The obtained results demonstrate the diversity and probable complexity of kinematics in this region.

He found that NLS1 galaxies are located on the bottom edge of the "mass-luminosity" diagram. Such positions correspond to extremely high accretion rate onto a black hole for this type of AGNs, which is close to the maximum possible rate for a given mass (the Eddington limit). In contrast, the AGNs with the broad double-peaked profiles of the hydrogen lines (such as 3C 390.3) lie on the upper edge of this diagram and their accretion rate is very low.

A statistical approach to analyze the variability of the broad line profiles in AGNs has been first applied by S.G. Sergeev. In particular, to explain the broad-line profile variability in the Arp 102B nucleus it was proposed a disk-like BLR model with inhomogeneity of its surface brightness. Also, a two-component BLR model was put forward. It is found that the variability patterns of the Balmer line profiles are strongly different from those of the He II lines.

He detected changes in the relationship between the flux of the Balmer lines and the flux of the optical continuum for several AGNs. It is concluded that these changes are caused by changes in the spectral energy distribution. He discovered the so-called Baldwin effect in the H_β line and its magnitude has been determined.

S.G. Sergeev contributed significantly to the development of the "reprocessing model". For the first time it has been shown that there are inter-band lags and these lags are in agreement with the reprocessing model. By modeling the observed spectrum and from the measured inter-band lags it is possible to obtain redshift-independent luminosity ("standard candles" for cosmology!).

S.G. Sergeev authored 123 scientific publications.

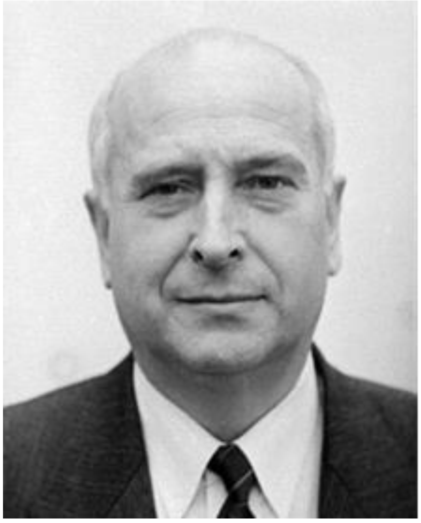
SEVERNY Andrey Borisovich

Born 05.05.1913. In 1931−1935 – a student in Lomonosov Moscow State University. In 1935−1939 – a post-graduate student in the USSR Academy of Sciences. In 1939 he defended the Ph.D. thesis "On the theory of gravitational instability". In 1939−1943 – a Doctoral candidate. In 1943 he defended the Doctoral thesis "On the instability and vibration of gaseous spheres and stars". In 1943−1946 – a vice-chairman of the Commission on Astrophysics of the USSR Academy of Sciences. In 1944 – a Professor. In 1946−1952 – a senior researcher, Deputy Director of CrAO. In 1958 – a Corresponding Member of the USSR Academy of Sciences. In 1968 – an Academician of the USSR Academy of Sciences. A corresponding member of the Heidelberg Academy of Sciences, Academician of the International Academy of Astronomy. Died 04.04.1987 in Simferopol.

The first researches of A.B. Severny are concerned with the theory of inner stellar structure. Since 1952 he switched to the study of the Sun. His papers discovered such new branches in solar physics as helioseismology, spectropolarimetry, vector magnetometry, study of fine structure of magnetic fields at different scales – from the sunspots and chromospheric network to the large-scale ield in the polar regions of the Sun. Here are several pioneer papers of Severny: Detection of deuterium abundance on the Sun. Detection of continuous emission nuclei and "moustaches" during the non-stationary processes on the Sun. Detection of the fine structure of flare emission spectrum and prominences of <0.5" in size. Measurement of electric currents in active regions and transversal magnetic field. Study of magnetic field variations related with flares. Detection of a relationship between flares and variations in sunspot magnetic energy and development of methods for operative flare prediction. Detection of global solar oscillations with a period of 160 minutes. Recording of the weak magnetic fields of bright stars and their variations with time. Measurement of the circular polarization of peculiar objects' optical emission. A significant contribution of Severny was a participation of CrAO in international projects: Solar Maximum Year, Solar Minimum Year, Solar Patrol, and designing ground-based telescopes and devices. In the late 40s Severny and Gilvarg designed the first in the USSR Hα interference-polarization filter subsequently mounted on the coronagraph KG-1. In 1954 the Tower Solar Telescope BST-1 developed by Severny was put into operation. In 1958 it was equipped with a magnetograph developed under the supervision of Severny. In the early 70s the telescope was upgraded. Until 1978 two more telescopes were developed. In the late 50s under the supervision of Severny the developing of devices for space observations was started at CrAO. Among them spectrometers and photometers on space satellites "Kosmos", "Lunochod-2", "Prognoz-6" etc. The solar telescope OST onboard orbital station "Salyut-4" carried out successive observations of solar active formations in the UV spectrum region. In 1983 the Astron station with the 80-cm telescope was launched into the low earth orbit. In 1988 a book "Some problems of solar physics" by Severny was published. It summarized his many-year unique solar studies. The total number of publications exceeds 270.

A Hero of socialist labour, Stalin (1952) and State (1984) Prize Winner of the USSR. A winner of the "Mark of Honor" award, twice winner of the "Red Banner of Labour" award, twice winner of the "October revolution" award, Lenin award, "Cyril and Methodius" award of the 1-st degree (Bulgaria) and seven medals. The president of IAU Commission 10 (1958−1964). A member of the Royal Astronomical Society (England, 1958). The vice-president of IAU (1964−1970). An Honored Doctor of Universities in Newcastle and Wroclaw.

SCHAEFFER Evgeniy Karlovich



Born 06.07.1942 in the village of Balishery of the Kuibyshev district of the Tajik SSR. Died on 6 December 2012 in Moscow. In 1965 he graduated from the Astronomical Department of Faculty of Physics of the Lomonosov Moscow State University. In 1971 Schaeffer became a Candidate of Physical and Mathematical Sciences. His candidate thesis was «Results of the study of the scattering of ultraviolet radiation in the upper atmosphere of the Earth». Since 1964 he worked at the SAI MSU as a senior assistant, a junior research scientist and a senior research scientist (1975). From 1990 to 2012, Schaeffer was the deputy director of the SAI for research and prospective development. Died 06.12.2012 in Moscow.

Scheffer's main works are devoted to extra-atmospheric astronomy. He studied the ultraviolet glow of the Earth's upper atmosphere in the resonant lines of hydrogen and oxygen from the board of the artificial Earth satellites, and for the first time discovered the twilight and night glow of oxygen in a narrow band along the Earth's geomagnetic torus. Schaeffer took an active part in conducting X-ray and ultraviolet observations from the High-Altitude Space Probe and the «Kosmos-215», «Kosmos-335» spacecrafts, the «ASTRON» observatory, and others. For the first time in the world, Schaeffer studied the vertical distribution of hydrogen density in the Earth's atmosphere at altitudes from 1000 to 4500 km by changing the intensity of hydrogen emission with distance from the Earth. Thus, a new method was introduced for determining the temperature of the Earth's upper atmosphere and calculating the amount of water vapor and methane evaporating from the earth's atmosphere. Schaeffer was one of the first in the USSR who started to develop a new scientific direction — experimental X-ray research in astronomy. The spectral distribution and variability of the radiation flux of a number of X-ray sources in the Galaxy were studied using the X-ray spectrometers developed by him on board of the Earth artificial satellites, the orbital pilot-controlled stations «Salyut-4», «Salyut-7», and the «Astron» astrophysical station. He performed a number of important works on the study of X-ray binary systems, including Hercules X-1. These works are well known to the world astronomical community, and are actively cited. Schaeffer is the author of 83 scientific papers. He was a member of the IAU.

Among the main tasks facing Schaeffer, was the organization of the functioning of the observation bases of the SAI in the Crimea, Uzbekistan and Kazakhstan. Since 2005, Schaeffer has been actively involved in the creation of a new high-altitude observatory of SAI – the Caucasian mountain observatory (CMO) of the SAI MSU.

He was awarded the Silver Medal of the VDNH (1985), «For valorous labour. In commemoration of the 100th anniversary of the birth of Vladimir Ilyich Lenin» (1970), «In memory of the 850th anniversary of Moscow» (1997). For his important contribution to the development of astronomy at the MSU, Schaeffer was awarded the Medal of the Order of «For Merit to the Fatherland, II degree» (2010).

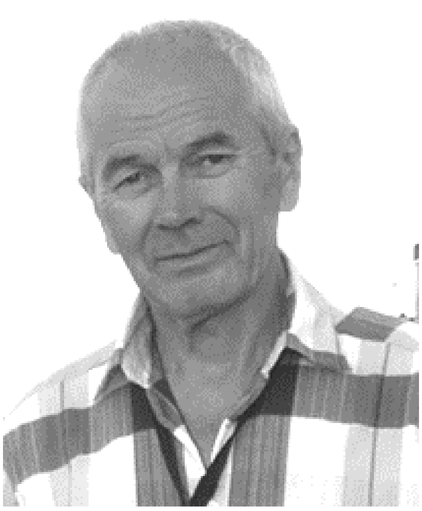
SCHEGLOV Petr Vladimirovich

Born 04.09.1932 in Tashkent. Graduated from the mechanical-mathematical faculty of MSU in 1954. PhD (1958, “Studies of selected astronomical objects in the infrared”), Dr.Sci (1970, “Interferometric study of some gaseous nebulae and night-sky glow using image intensifiers”). Worked at GAISH (1960: senior sci., 1987: lead sci., 1993: chief sci., 1993: professor). Member of the IAU (OC member of the IAU General Assembly in 1958, Moscow). Died 09.12.2001 in Moscow.

PS worked mostly on the development of new astronomical instruments and on improving the efficiency of astronomical observations. A student of I.S.Shklovsky and V.I.Krasovsky. PS made pioneering observations of space objects using electronic image intensifiers (EII). In the 1970-s, together with V.F.Esipov, he developed a contact EII which amplified radiation by hundreds of times, enabling observations of weak cosmic sources and artificial satellites; this device enabled a new generation of astronomical instruments. Using EII, PS discovered supersonic motions in some planetary nebulae and, jointly with S.B.Pikelner, explained them by the effects of the stellar wind of their central stars. PS discovered the metastable emission of FeX (6374A) in the Cygnus supernova remnant nebula and constructed a special spectrometer for its study. Concentration of the geocoronal H-alpha emission to the ecliptic plane that he discovered in the 1960s, and the strong variation of this emission in the terrestrial polar zones, were explained by PS by the variation of the solar wind and solar activity. These effects were monitored at the Abastumani Observatory for 3 decades using his equipment and produced a unique data set covering three 11-yr solar activity cycles. PS also studied motion of dust particles near the Sun using an original Fabry-Perot spectrometer that he developed for this program; no analogous works exist in the literature. PS participated in more than 10 expeditions for observations of solar eclipses.

PS initiated the program to search for new observatory sites with a good astro-climate in the Central Asia (including Maidanak in Uzbekistan and Sanglok in Tadzhikistan), developed new methods and instruments for these studies, and organized a wide collaboration on astro-climate within the USSR and beyond. He actively contributed to teaching new specialists in this area.

SCHEKINOV Yuri Andreevich



Born 20.07.1948, Chlebodarnyi, Rostov Area
Alma matter: Rostov State University (1972)
Positions held: Institute of Physics, Rostov State University (1972-1983), Assistant professor at Volgograd State University (1983-1986), professor head of department of space physics at Rostov State University, principal researcher at Astro Space Center Lebedev Physical Institute of RAS.

Main scientific achievements:

The main works relate to the physics of the interstellar and intergalactic medium. He is the author of more than 200 scientific papers, including the co-author of two monographs.

In the 1970s, Yu.A. Shchekinov developed the theory of heating the interstellar medium by the photoelectric effect on dust particles. Later, this mechanism was recognized as dominant in the thermodynamics of interstellar and intergalactic gas. In the same period, together with A.A. Suchkov he was the first to propose the concept of stellar "feedbacks", that is, the influence of the activity of massive stars on the process of star formation in galaxies. The action of such feedbacks is manifested both locally and on a galactic scale. Subsequently, this concept was backed up by observations and became generally accepted.

In the mid-1980s, Yu.A. Shchekinov described the expected characteristics of the emission spectrum in the rotational and vibrational-rotational lines of molecular hydrogen arising at the pre-stellar stage of the evolution of the Universe and predicted the possibility of its observational registration in the far infrared. Subsequently, this direction was developed in numerous works of other authors, and molecular hydrogen has been recognized as one of the main diagnostic tools for the very first episodes of star formation in the Universe.

In the mid-1990s, together with B. Nath, S.K. Sethi and A. Ferrara, he proposed a hypothesis of the existence of dust in intergalactic space and predicted its physical properties and observational characteristics. Subsequently, the existence of intergalactic dust has been confirmed by many observational data; its influence is taken into account in cosmological projects of observations of distant supernovae to determine the acceleration of the Universe. Numerous modern studies have been devoted to refine the characteristics of intergalactic dust and its total mass.

Since the late 1990s, using numerical simulations, he, first with A. Ferrara and M. Pettini, and later with E.O. Vasiliev and S.Yu. Dedikov, showed that chemical elements are distributed in the intergalactic medium extremely inhomogeneously due to their ineffective mixing. This results in underestimated mass of heavy elements in the Universe. Later, this result was confirmed in a number of observations. Since 2010 Yu.A. Shchekinov develops theoretical frameworks to describe the physical properties and emission characteristics of gas and dust during their transport from the central regions of galaxies with active star formation into the intergalactic medium, as well as in the reverse process – the accretion of extragalactic matter onto galaxies. Among his students there are 5 candidates and 2 doctors of sciences.

SHAJN Grigory Abramovich

Born 19.04.1892. In 1912−1914 – a student in Yuryevsky (Derptsky) University. In 1914−1917 he was in the army as a volunteer. In 1917−1919 – a student in Perm University where in 1919 he started his research work. In 1921−1925 – a researcher at the Pulkovo Observatory. In 1925−1945 – a Head of the Simeiz Division of the Pulkovo Observatory. Since 1944 he was actively involved in reconstruction of the destructed Simeiz Observatory and organization of the Crimea Astrophysical Observatory of the USSR Academy of Sciences where he was a director until 1952. For the last 4 years of his life – a Head of the Department of Stellar and Nebular Physics at the Crimean Astrophysical Observatory of the USSR Academy of Sciences. Died 04.08.1956 in Moscow.

Based on observations with the normal astrograph and 30-inch refractor at the Pulkovo Observatory G.A. Shajn studied components' masses in binary systems, measured color indices in many binary systems, detected spectroscopic parallaxes, luminosities of eclipsing variables and spatial orbit orientation.

In 1924 the Simeiz Division of the Pulkovo Observatory got the 40-inch reflector from the British firm of Grubb-Parsons. Jointly with V.A. Albitsky, G.A. Shajn mounted the telescope and put it into regular operation. It was equipped with a prism spectrograph made in Geneva and over 15 years till the Great Patriotic War, with no any clear night missed, they gathered extensive spectral observation data. G.A. Shajn and V.A. Albitsky detected the radial velocities of more than 800 stars reaching an exceptionally high accuracy. In the late 20s jointly with Otto Struve G.A. Shajn elaborated an algorithm to detect stellar rotation velocities – a qualitatively new and very important characteristic. The systematic applying of the proposed techniques led to the determination of rotation velocities of all spectral type stars and detection of significant differences in rotation velocities of hot O-B-A and cooler G-K stars. The physical meaning of this difference became clear in 30 years, after discovery of the stellar wind, and the stellar rotation proved to be closely related with stellar magnetism that determines, as it is known now, numerous phenomena of stellar nonstationarity.

Being evacuated to Abastumani during the Great Patriotic War, based on spectrograms derived with the 40-inch telescope G.A. Shajn carried out two high-class investigations. Firstly, he resolved the problem of long-term variables with anomalies of emission spectra. The proposed physical screening model in which the selectively absorbing titanium oxide molecules are above layers responsible for hydrogen emission explained both the abruptly anomalous Balmer decrement of hydrogen emission and its rapid time variations. Secondly, jointly with V.F. Gaze, G.A. Shajn studied the carbon isotope abundance in cool stars of N and R spectral types and found out that 13C abundance in these stars is 2-3 times lower than 12C abundance, whereas an occurrence of 13C on Earth is approximately 100 times less than 12C. In 1950 this investigation – revealing the stellar chemical evolution – was awarded the State prize.

Under G.A. Shajn's supervision two captured Richter-Slevogt optical systems were converted into the fast 450 and 640 mm telescopes and by their means the wide known studies of gaseous nebulae were carried out.

G.A. Shajn discovered about 150 new nebulae, detected a particular type of nebulae in which a significant part of matter is concentrated at the periphery, and a type of very prolonged nebulae of filamentary structure. The prolonged nebulae were interpreted as a result of expansion occurring controlled by the outside magnetic field. The comparison with data on light polarization proved the hypothesis about the presence of regular magnetic field of the Galaxy and turned

SHAJN Pelageya Fedorovna

Born 1894 in Popovo-Ostanino (Usolsky District, Perm Krai). In 1918 she graduated from the Phys.-Math. Department of female (Bestuzhevsky) courses in Petersburg. In 1920 she entered Tomsk University but did not graduate because of moving with G.A. Shajn to the Pulkovo Observatory in 1921. Since 1925 the Shajns worked at the Simeiz Observatory, since 1945 – at the Crimean Astrophysical Observatory. Died 27.08.1956 in Moscow.

The major contribution to astronomy is in her works on studying minor planets and variable stars. She discovered over 150 new variable stars, about 50 of them were studied and designated. She is the first woman in the world to discover a minor planet in 1928, which was introduced into catalogues with the number 1112 and named Polonia. Totally, P.F. Shajn discovered about 40 minor planets and more than 10 of them were formally designated. In 1949 she discovered a short-period comet that was independently discovered by Robert D. Schaldach at the Lowell Observatory (Arizona, USA) and named Shajn – Schaldach. Her several papers are concerned with spectral classification of stars by methods of photometry and colorimetry and issues on light absorption in different regions of the Milky Way.

An author of more than 20 publications, Ph.D. in Phys. and Math., a holder of the medal “For meritorious labour during the Great Patriotic War” and Lenin Order (1953).

A minor planet (1190 Pelagia) discovered by G.N. Neujmin on September 20, 1930 at the Simeiz Observatory was named in her honor.

SHAKHOVSKAYA Nadezhda Ivanovna

Born 30.06.1938. In 1955–1960 – student at the Faculty of Physics and Mathematics, Stalinabad (Dushanbe) State Uni-versity. In 1960–1965 – laboratory assistant at the Dushanbe Observatory of the Academy of Sciences of Tajikistan. In 1967–1970 – Ph.D. student at CrAO of the USSR Acad. of Sci. In 1973 she defended the Ph.D. thesis "Flaring activity of red dwarf stars in the vicinity of the Sun". In 1965–2013 – researcher at CrAO. In 2000–2013 – head of the editing group of the journal "Izvestiya Krymskoi Astrofizicheskoi Observatorii".

Being a post-graduate student under the supervision of R.E. Gershberg and later N.I. Shakhovskaya was engaged in studying photometric and spectral observations of the UV Cet star flares. Based on spectral observations it was established that the constancy of Balmer decrement in the quiet state is independent on the absolute stellar magnitude and chromospheric luminosity. A sufficient amount of photometric data allowed the frequency flare spectrum to be determined and its power-law character to be shown. Apart from flaring stars N.I. Shakhovskaya took part in observations of different non-stationary objects: Novas, T Tauri type stars, ε Aur; participated in compiling the Crimean catalogue of flaring stars GKL99. N.I. Shakhovskaya authored about 90 scientific publications. Being the Academic Secretary of CrAO for a long time she was actively involved in the popularization of scientific knowledge.

SHAKHOVSKOY Nikolay Mikhailovich

Born 23.04.1931 in Moscow. In 1949–1954 – student at the Faculty of Mechanics and Mathematics, Lomonosov Moscow State University, graduated with honor. In 1954–1957, 1960–1965 – researcher at the Stalinabad (Dushanbe) Observatory of the Academy of Sciences of Tajikistan. In 1957–1960 – Ph.D. student at CrAO of the USSR Acad. of Sci. In 1965 he defended the Ph.D. thesis "Study of the polarization of radiation of variable stars". Since 1965 to 2011 N.M. Shakhovskoy worked at CrAO advancing from junior to leading scientist. Laureate of the State Prize of Ukraine (2010). Died 31.01.2011 in Nauchny.

In 1957–1960 in cooperation with N.A. Dimov and A.F. Lagutin N.M. Shakhovskoy elaborated an integrating electropolarimeter, the first device of such type in the USSR, and carried out observations of several dozen variable stars. He first elaborated the fundamentally reasoned method for polarization observations, their processing, interpretation, and the first in the world modeling of polarization in eclipsing systems. His Ph.D. thesis based on these observations was 10–15 years ahead of analogous foreign researches and is still used as a reference book on the technique of polarization observations. In the 60s–70s in cooperation with Yu.S. Efimov he continued modernization of equipment and technique of polarization observations. The most sufficient results are as follows: detection of variable polarization of quasars and BL Lac objects, detection of absence of sufficient polarization in flares of the UV Cet-type stars that proved their thermal nature. N.M. Shakhovskoy headed the mounting and adjustment of the 1.25-m telescope AZT-11 which was put into operation in 1981. In the 80s he headed the elaboration and construction of a new-type polarimeter with acousto-optical modulator for which he got the author's certificate. His observations of cyclotron radiation from polars (in cooperation with V. Piirola, P. Masone, etc.) in 1985–2000 advanced in understanding this type of cataclysmic variables. N.M. Shakhovskoy greatly contributed to works on polarimetry of solar system bodies (in collaboration with Yu.S. Efimov, N.N. Kiselev, V.K. Rozenbush) for which in 2011 this team of authors was awarded the State Prize of Ukraine in the field of science and technology.

SHAKHT Natalia Andreevna

Born in 1936 in Leningrad. In 1954-1959 – a student of Mathematics and Mechanics Faculty of Leningrad State University. In 1959 graduated from University and was accepted to work in the state of Pulkovo observatory as senior laboratory assistant. Since 1966 – junior researcher, since 1989 – senior researcher , since 2003 up to now– leading scientific researcher. In 1977 she defended her thesis: "Astrometric study of stars Lalande 21185, and ADS 7251 with the possible invisible companions ". In 2002 she defended doctoral thesis: "Astrometric study of selected nearby stars with possible invisible companions according to the observations at Pulkovo". Member of IAU, member of the European Astronomical Union, member of St. Petersburg Union of scientists

The main areas of scientific interests of N.A.Shakht include the photographic astrometry, stellar astronomy, astrometric double stars, stars with dark companions, the stellar proper motions, and the motions of Solar system bodies. She is the author of 104 scientific publications.

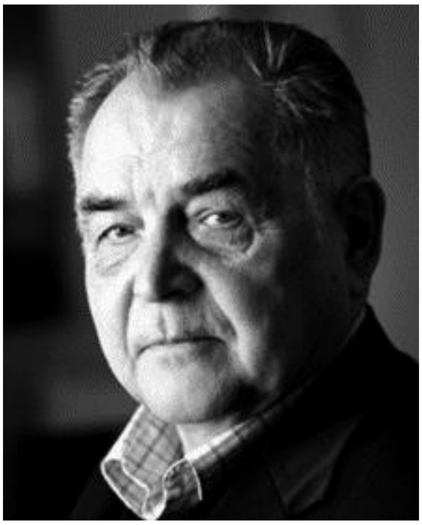
In 1960 she participated in the expeditions to lake Sevan on the choice of space for a large (6-meter) telescope. In 1985-1988, she was involved in observations of comet Halley and in observations of Mars during its great opposition in the expedition of Pulkovo observatory at Ordubad. From 1968 to 2007 she served as permanent observer on 26-inch Pulkovo refractor and got about 2300 astronegatives of double and multiple stars, of major planets and their satellites and other objects.

N.A. Shakht together with N. M. Bronnikova and V.V. Bobylev was a creator of the catalog of proper motions stars with respect to galaxies, executed according to the plan of A. N. Deutsch. ("The proper motions 59 646 stars absolutized using galaxies in 149 selected areas of the sky (Pul2)" Astron. Letters, 2004) and one of the authors of the Pulkovo catalog of relative positions and motions of double stars on the observations in 1960-2007 at Pulkovo (with A.A.Kiselev, O.V. Kiyaeva, etc. – Astronomy Reports, 2014). Jointly with co-authors took part in researching the double star 61 Cygni on long-term observations. Received a new orbit and mass of the components. N.A.Shakht was the head of the candidate dissertation of D. L. Gorshanov devoted to the study of this star (D. L. Gorshanov, N.A.Shakht, A. A. Kiselev, "Observations of the binary star 61 Cyg on the 26 inch refractor at the Pulkovo observatory" Astrophysics, 2006).

In collaboration with A. A. Kiselev, Yu. N. Gnedin, etc. participated in evaluation of the mass of a supermassive black hole at the center of our Galaxy (Astron.Reports., 2006) and the mass of central bodies of a number of globular clusters. On the basis of Pulkovo observations 1979-1995 years of the star Gliese 623 the presence of a dark companion with a mass close to substellar one was confirmed and the orbit of the photocenter was obtained. (Shakht, AApTr.,1997). For selected stars of Pulkovo program,that possible possess by the exoplanets , the boundaries of habitable zones were estimated (2013, 2015)

For teaching astronomy in expeditions of the youth ecological club "Neposeda" received gratitude from the government of St. Petersburg (2008), Committee on youth policy and the Russian Geographical society (2015).

SHAKURA Nikolay Ivanovich



Born 07.10.1945 in the Danilovka vil., Svetlogorsk dist., Gomel reg., the BSSR. In 1969 graduated from Faculty of Physics of Lomonosov Moscow State University. Since 1972, after graduate studies in the Department of Astrophysics and Stellar Astronomy of the Physics Department of the Moscow State University, he permanently works at Sternberg Astron. Inst. of Moscow State University (SAI MSU). PhD thesis "The physical processes in the vicinity of neutron stars and frozen stars" (1972). Sci. Hab. thesis "The theory of disk accretion and some of its astrophysical applications" (1988). Since 1995 the head of the Relativistic Astrophysics Department of SAI MSU. Professor since 2010.

In the early 1970s, N.I.Shakura in collaboration with R.A.Sunyaev developed fundamental theory of disk accretion onto relativistic compact stars. Even before the era of systematic X-ray observations, these authors predicted almost all observational manifestations of accreting neutron stars and black holes, which are brilliantly confirmed by later observations from UHURU satellite and other space X-ray observatories.

Main scientific results: study of the apsidal motion of the close binary system with eccentric orbit DI Her. For a long time there was contradiction between the observed value of the apsidal motion and its value calculated using general relativity effects. In 1985 N.I.Shakura showed that the rapid rotation of a binary component with angular momentum lying in the orbital plane of the binary system can solve the problem. Later this prediction was fully confirmed by the spectroscopic observations .

In papers with G.V.Lipunova in the early 2000s, it is shown that the solution of diffusion-type problems for non-stationary accretion disk with its applications to X-ray novae allows determination of the basic phenomenological parameter (alpha-parameter) of the disk accretion theory.

The most recent prominent works of N.I.Shakura made with K.A.Postnov and other co-authors build the theory of quasi-spherical accretion onto magnetized neutron stars (X-ray pulsars) in close binary systems. The theory relates the magnetic field of neutron star with its luminosity, rotation period, and the characteristic spin-up/spin-down time.

N.I. Shakura is a member of an international collaborations processing data from X-rya space observatories (INTEGRAL, RXTE, etc.), which discovered in particular the positive correlation between the cyclotron line and X-ray luminosity is discovered in some-ray pulsars.

In 1995 Nikolai Shakura was awarded the title of Eminent Scientist by the RIKEN Institute (Japan). He was awarded the medal "In memory of the 850 anniversary of Moscow" (1997) and the title of "Honorary Researcher in Higher Professional Education" (2005). He is a winner of the Lomonosov Prize of the Moscow State University of 2003. The International Astronomical Union has named minor planet number 14322 of the solar system as «Shakura».

SHANDARIN Sergey Fedorovich

Born 07.04.1947 in Uskovo Village in Moscow Territory. Completed High School N2 specializing in physics and mathematics (now, Lyceum "The Second School") in Moscow (1965). Graduated from Moscow Institute of Physics and Technology (MIPT) (1971). Obtained his PhD at MIPT (1974). Since then, he had been working in close collaboration with Ya.B. Zeldovich, academician of the Russian Academy of Sciences (RAN), first as a junior researcher at the Institute of Applied Mathematics RAN and then as a senior researcher at the Theoretical Department of the Kapitsa Institute of Physical Problems RAN (1975-86); Habilitation (1985). From 1989, a visiting professor, and since 1991, a professor at the Department of Physics and Astronomy of the University of Kansas Lawrence KS. Since 2001, a fellow of American Physical Society ("For seminal work in the theory of gravitational instability, particularly our understanding of the formation of superclusters in the Universe.") Member of the International Astronomical Union.

S.F. Shandarin's research interests relate to the nonlinear theory of the origin and evolution of the Large-scale Cosmic Web (LCW) observed in the distribution of galaxies in the Universe. Theoretically, it was envisioned in the analytical Zeldovich Approximation (ZA) of the nonlinear stage of gravitational instability (1970). S.F. Shandarin suggested an analytical estimate of the accuracy of the ZA in the general case of random smooth initial density perturbations in three-dimensional space (1971). He obtained the first realistic illustration of the LCW in the numerical simulation of the nonlinear stage of the gravitational instability for this case (1975). Followed by Ya.B. Zeldovich's request, the result was published in a review by A.G. Doroshkevich, Ya.B. Zeldovich and R.A. Sunyaev in research series edited by Prof. S.B. Pikelner and published in 1976. The two and three–dimensional simulations (by S.F. Shandarin with co-authors as well as by other theoreticians) with the full numerical evaluation of gravitational forces have confirmed the existence of four principal components of the LCW: (1) halos, (2) filaments, (3) walls, and (4) voids for a wide range of initial perturbations.

S.F. Shandarin with A.G. Doroshkevich were the first who correctly generated initial conditions for cosmological N-body simulations by applying the ZA (1973). A similar method first used in USA was published only in 1983. Eventually, this method for N-body simulations of LCW was adopted worldwide. S.F. Shandarin and his collaborators initiated and conducted exhaustive tests of the ZA as the computer power was growing with time. In particular, V.I. Arnold, S.F. Shandarin and Ya.B. Zeldovich applied the theory of Lagrangian singularities to the analysis of the geometrical and topological properties of LCW (1982). Based on the percolation theory, S.F. Shandarin developed a new method of the analysis of the LCW topology (1983). It has been applied to both simulated and observed LCW. A.N. Gurbatov, A.I. Saichev and S.F. Shandarin developed an analytical model – the adhesion approximation – based on Burgers equation (1985-2012). It enabled the analysis of the nonlinear stage of gravitational instability beyond the applicability of the ZA. Recently, the model was applied to the adhesion reconstruction of the local LCW implied by 2MRS galaxy redshift survey (2016). It demonstrated the intricate filamentary structure around the Pisces-Perseus supercluster. S.F. Shandarin and his collaborators applied the described methods to a number of galaxy surveys: the compilation by H. Rood and J. Huchra (1982), IRAS 1.2 (1977, 1978), Las Campanas (1998, 2000), the optical sample of 208 clusters ACO (2006), and 2MASS (2003, 2012). The results of the above studies are published in more than 150 refereed papers and in about 80 articles of various conferences and workshops proceedings.

sergei@ku.edu

SHAPOSHNIKOV Vladimir Evgenievich

Born 15.01.1947 in the city of Gorky (now Nizhny Novgorod). In 1970, graduated from the Radiophysics Department of the State University of Gorky (currently, N. I. Lobachevsky State University of Nizhny Novgorod). He held different positions, first at the Radiophysical Research Institute (NIRFI) and since 1977, at the Institute of Applied Physics of the Russian Academy of Sciences. An associate professor at the Gorky Polytechnic Institute in 1983-1998. From 2014 until the present, a professor at the Higher School of Economics, Nizhny Novgorod campus. In 1982, obtained his Ph.D. In 2003, obtained DSc. In 1993, awarded the title of a senior researcher. Member of the International Astronomical Union.

V.E. Shaposhnikov is an expert in radio astronomy and space plasma physics. Author of over 100 research publications. His research interests mainly relate to the study of generation mechanisms and conditions of radiation propagation in the magnetospheres of the giant planets Jupiter and Saturn, as well as neutron stars, including the mechanisms of acceleration of emitting particles and generation of plasma and electromagnetic waves, and the formation of fine structure in the emission spectra. V.E. Shaposhnikov, in collaboration with V.V. Zheleznyakov, developed a model of the optical and X-ray radiation source of the pulsar in the Crab Nebula, gave an interpretation of a fine time-frequency structure that is observed in its high-frequency interpulse, and determined the conditions for the appearance of this structure. Investigated, in collaboration with V.V. Zaitsev, the problem of electron cyclotron maser radiation escape from hot stellar coronas.

In collaboration with V.V. Zaitsev and E.Ya. Zlotnik, V.E. Shaposhnikov proposed and developed in detail a theory of Jupiter's narrow-band Io-dependent decameter radio emission, including an explanation of the spectral and polarization features of millisecond S-bursts. He proposed and developed a theory of generation of powerful ultraviolet emission observed on the flanks of Io. Based on the effect of linear mode coupling, in collaboration with Vl.V. Kocharovsky and V.V. Kocharovsky, he developed a theory of the formation of polarization characteristics of Jovian decameter radio emission, which allowed for the first time to explain the formation of elliptical polarization, including specific polarization of emission in the great arc. In collaboration with V.V. Zaitsev and E.Ya. Zlotnik, he developed the theory of the double plasma resonance effect at ion cyclotron harmonics in detail, which makes it possible to explain the formation of quasi-harmonic emission bands ("zebra patterns") in the dynamic spectra of a Jovian kilometer and decameter radio emission and to clarify the plasma parameters in the region of their generation.

SHAPOVALOVA Alla Ivanovna

Born 16.05.1947 in the village of Kislyakovskaya, Krasnodar territory. In 1965, graduated from the Physics Faculty of Taras Shevchenko National University of Kyiv, Ukraine (KNU). Since 1968, after completing postgraduate studies at the Department of Astronomy of KNU, worked at the Byurakan Observatory in Armenia. Since 1972, worked at the Special Astrophysical Observatory of the Russian Academy of Sciences (SAO RAS), starting as a junior researcher and progressing to a senior researcher. In 1975, defended her PhD thesis "Detailed Colorimetry of Galaxies in the Vicinity of NGC1068 and Irregular Galaxies". Awarded the VDNH Bronze Medal for her participation in research at the 6-m BTA telescope. A member of the International Astronomical Union since 1996. Died 28.01.2019 in Nizhnij Arkhyz, the Republic of Karachay–Cherkessia.

A.I. Shapovalova's main field of research was active galactic nuclei (AGN). Author of more than 200 research papers, with more than 140 published in peer-reviewed journals. She studied galaxies with active nuclei using different methods: surface photometry and colorimetry (1972-1978), spectrophotometry, photometry and spectrum analysis for the study of gas kinematics (1979-1984), spectroscopy of galaxies with an ultraviolet continuum from the Byurakan Sky Surveys (1985-1993, in a group led by B.E. Markaryan), and spectral and photometric monitoring under the international AGN Watch program (1988-2004). In 1986, together with N. G. Bochkarev and on his initiative, A.I. Shapovalova began monitoring observations of the spectra of 2 Seyfert galaxies (NGC 4151 and NGC3516) at the 6-m SAO telescope.

In 1995, she initiated the implementation of the program for monitoring 10 Seyfert galaxies. Under her leadership, regular observations were conducted first at the BTA, and since 1998 – at the 1-m SAO telescope, with many employees of the SAO RAS participating in the observations.

In 1997-2007, A.I. Shapovalova organized observations at two 2.1-m telescopes at the Institute of Astrophysics, Optics, and Electronics (INAOE) in Mexico. Since 2006, actively participated in a collaboration on the analysis of the long-term AGN monitoring between the Belgrade Astronomical Observatory (led by L.Popovic) and the Institute of Astrophysics of the University of Göttingen (led by W. Kollatschny; Institut für Astrophysik, Georg-August-Universität Göttingen, Germany).

A.I. Shapovalova studied structural, kinematic, and physical characteristics of broad emission line regions and their changes on a long-time scale, estimated the response delays in broad lines relative to the continuum, determined the masses of supermassive black holes in these objects, studied the periodicity in the light curves, etc. Her research results are published in 30 leading astronomical peer-reviewed journals (A&A, ApJ, ApJS, MNRAS, etc.) and are presented at more than 15 astronomy conferences.

SHARONOV Vsevolod Vasil´evich

Born 10.03.1901 in Petersburg. In 1926, graduated from Leningrad State University (LGU, now St. Petersburg State University SPbU). In 1926-1929, a post-graduate student at the Astronomical Institute (formerly, the Institute of Theoretical Astronomy of the USSR Academy of Sciences). Ph.D. in Physical and Mathematical Sciences (1929). In 1929-1944, worked at the Tashkent and Pulkovo Observatories, Associate Professor at the LGU. In 1932, organized the Photometric Laboratory (formerly, the Laboratory of Planetary Astronomy) at LGU. D.Sc. in Physical and Mathematical Sciences. Since 1944, Professor at LGU. In 1950-1961, Director of the Astronomical Observatory of LGU. Member of editorial boards in several astronomical journals. Died 27.11.1964 in Leningrad.

V.V. Sharonov's primary research interests were in the fields of planetary research, solar eclipse observations, and studies of visibility conditions of distant objects. Author of dozens of scientific articles and several monographs.

In the 1920s, he organized the first-ever "Sun Service" in Russia. Supervised photometric observations during solar eclipses. Determined the brightness and color of the solar corona using his method of absolute photometry. In photometric observations, he determined reflective characteristics of the surfaces of Mars and the Moon. Comparing them with characteristics of terrestrial rocks obtained in a laboratory that he directed, he showed that the Moon's surface does not consist of dust, as previously assumed. He proposed a meteoric-slag theory for the structure of the Moon's surface. Proposed that on the surface of Mars, by contrast, there is a layer of dust responsible for the dust storms observed on Mars. A clear confirmation of these conclusions was obtained during space missions to Mars and the Moon. The results of investigations of Mars and other planets were summarized in his monographs "Mars" (1947) and "Nature of Planets" (1958).

V.V. Sharonov developed a theory to measure visibility and designed a device for this purpose, a "smokemeter". During the Great Patriotic War, he designed a device to measure the horizontal transparency, the "diaphanoscope". His results on the visibility problems contributed to his DSc dissertation and also to his monograph "Measurement and Calculation of Visibility of Distant Objects" (1947).

V.V. Sharonov made a great effort to popularize astronomy. The astronomical community highly appreciated his work. His name is carried by the asteroid 2416 Sharonov, the Sharonov crater (100 km in size) on Mars, and the Sharonov crater (75 km in size) on the dark side of the Moon.

SHAROV Alexander Sergeevich

Born 22.01.1929 in Moscow. Died on 19 April 1999 in Moscow. From 1948 to 1952 he was a student and from 1952 to 1955 he was a postgraduate student of the Astronomical Department of Faculty of Mechanics and Mathematics of Lomonosov Moscow State University.

In 1955 he became a senior research scientist of the SAI MSU. From 1988 to 1994 he was the head of the Department for the Study of the Galaxy and Variable Stars at the MSU. From 1994 to 1999 he was chief research scientist at the SAI MSU. His candidate thesis was «Color-luminosity diagram of stars in the vicinity of the Sun» (1955). His doctoral thesis was «Studies of the Galaxy and the Andromeda nebula" (1975). He was a member of the IAS. Died 19.04.1999 in Moscow.

He was a expert in stellar astronomy and the study of the population of galaxies. His broadest research interests included observations of variable stars of various types, including New ones; the study of star clusters, the structure and kinematics of galaxies, stellar photometry, and interstellar light absorption. He was one of the pioneers of photoelectric photometry in the USSR and the author of a number of important observational programs.

Since 1967, he and A. K. Alksnis have been monitoring the outbursts of New stars in the Andromeda Nebula (M31), during which more than 60 objects were discovered. This work was awarded the medal of the Astronomical Council of the USSR Academy of Sciences "For the discovery of new astronomical objects" and became the basis for studying the structure of the subsystem of New stars in M31. On the basis of this, the frequency of New flashes was established and the relationship of their luminosity at the maximum with the rate of falling brightness was studied. Another object of such research was the Triangle Nebula (M33). Sharov found a number of bright variable stars in these galaxies.

Together with V. M. Lyutyy and V. F. Esipov, in the 1970s and 1980s, Sharov conducted many years of multi-color photoelectric observations and the search for new globular clusters in M31. Based on these observations, the features of interstellar light absorption in M31 were studied and the luminosity function of the system of its globular clusters was determined. At the same time, he studied the structure and kinematics of the system of globular clusters of the Galaxy and estimated their total number taking into account the effects of observational selection.

One of the most famous works of Sharov was the map of interstellar light absorption in the Galaxy, built by him in 1963, which based on photoelectric data on the excess color of a large number of stars. Sharov made a great contribution to the creation of the Crimean station of the SAI and the implementation of its main observation programs. At the beginning of the space age, on behalf of the Astronomical Council of the USSR Academy of Sciences, he led the observations of the artificial Earth satellites, and in from 1962 to 1964 at the Tien-Shan station of the SAI, he led the contractual photometric work on the calibration of astronomical orientation instruments on Soviet artificial satellites.

He has published more than 200 articles. Sharov was best known for his monographs "The Andromeda Nebula" (Moscow: Nauka, 1982) and "The Spiral galaxy Messier 33" (Moscow: Nauka, 1988), which provide comprehensive information about these close galaxies, including reflecting the author's great contribution to their study. In collaboration with I. D. Novikov, he published a biographical book "The man who discovered the explosion of the Universe: The life and work of Edwin Hubble" (Moscow: Nauka, 1989).

He was awarded the medal " For the Discovery of new Astronomical Objects»

SHATSKY Nikolay Ivanovich

Born 13.01.1973 in Moscow. Graduated from Lomonosov Moscow State University in 1996, employed by the Radioastronomy dept of Sternberg astron. inst. of MSU, Ph. D. (1999), later hired by the department of Experimental Astronomy of physical faculty of MSU, IAU member. Since 2016, head of the MSU Caucasus Mountain Observatory and its dept. at SAI.

Research interests – automation of astronomical observations, accurate radial velocities of stars and multiple star systems, lectures on instrumental astrospectroscopy. In 2005-2021, as part of the development team of the SAI MSU, he led a project for the construction of the University observatory in the Caucasus, the design, installation, instrumentation and software of its main instrument – the 2.5-meter Ritchie-Chretien reflector.

SHCHERBAKOV Alexander Grigorievich

Born 01.01.1941 in Melitopol. From 1962 to 1967, he was studying at the Leningrad State University. He worked at the Crimean Astrophysical Observatory from 1967 to 1998. In 1979 he defended the PhD thesis Near-infrared spectroscopy of variable stars. From 1984 to 1991 – a senior researcher, from 1991 to 1998 – a leading researcher. He has about 60 scientific publications. Died 05.07.1998 in Nauchny.

The main research area is studying variable stars of various types in the near-infrared region: the sun activity and magnetism and cool stars, chromospheres of active binaries, and cool giants. These studies were carried out with the image intensifier mounted on the 50-inch telescope of the Crimean Astrophysical Observatory. He was directly involved in the design and maintenance of this equipment. He has obtained on this equipment numerous spectroscopic data of active young stars of T Tau type, flaring red dwarfs of UV Cet type, Be shell stars, and other types of non-stationary objects. He studied the chromospheric activity of stars in the HeI 10830 Å line.

He was an author of over 60 research papers in national and international scientific journals. He took part in the international scientific conferences, workshops, and schools of astrophysics in European countries (Czechoslovakia, Germany, Austria, France, the Netherlands, Finland, Spain). He fruitfully collaborated with Moscow astrophysicists M.M. Katsova and M.A. Lifshitz on the research area of the red giant stars' chromospheric activity. With the high-resolution CCD observations with coudé spectrometer of the Crimean Observatory 2.6-m reflector, he also collaborated with the University of Helsinki scientists in the research field of solar activity and magnetism and cool stars, and with Dr. Maria Jose Fernandez-Figueroa (Complutense University of Madrid) in the area of the chromospheric activity of binary stars research.

SHCHUKO Oleg Borisovich

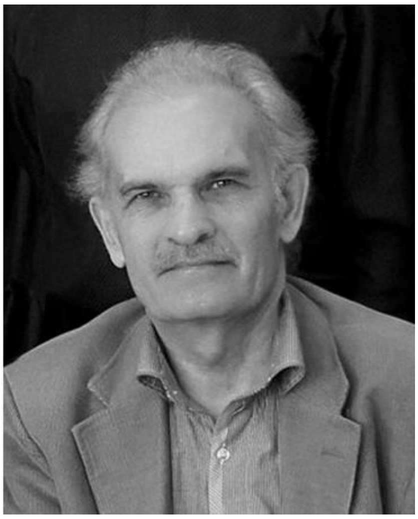
Born 06.03.1933 in Leningrad (now, St. Petersburg). 1951-1953, studied at the Leningrad State Mining Institute (now Saint Petersburg Mining University). 1953-1957, studied at Leningrad State University (LGU, now St. Petersburg State University SPbU). Obtained his PhD in 1981. In 1957-1960, a research assistant at Yakutsk State University (now, Ammosov North-Eastern Federal University). In 1960-1964, a junior researcher at the Radiophysical Research Institute (NIRFI). In 1964-1966, a senior engineer at MBX 446. In 1966-2016, a senior engineer, deputy head of department, scientific secretary (1982-1994), leading researcher, scientific advisor and the director (2008-2016) at NIRFI. Member of the European Geosciences Union (EGU).

O.B. Shchuko's research interests are radiophysics, radio astronomy, and mathematical modeling of dynamic processes in astrophysics.

A special place in O.B. Shchuko's research of the 1960s was the theoretical study of intrinsic thermal radio emission from the Moon, Mars and Mercury obtained from both ground-based and spacecraft observational data (together with V.D. Krotikov and V.I. Aleshin under V.S. Troitsky's leadership). His research results were used in radioastronomical experiments conducted at the soviet automatic interplanetary stations Mars 3, 5, 7. Under the international program MARSIS, he participated in the investigation of the radar signal intensity dependence of the Mars Express satellite on the structure and composition of the Martian surface material for water detection in different phases. Since the 2000s, O.B. Shchuko's research interests centered on mathematical modeling of the formation and thermal evolution of Kuiper belt objects (KBOs). He studied (together with R. Orosei (Istituto di Radioastronomia, Istituto Nazionale di Astrofisica, Bologna, Italy) and D.V. Kartashov (Friedrich-Schiller University Jena, Germany)) the dependence of the body's subsurface temperature distribution on its size, density, structure, formation time and the specific content of radioactive elements taking into account water phase changes. Analyzed the existence of cryovolcanism conditions for KBOs explaining the presence of crystalline ice on their surfaces detected by the modern spectroscopic methods. O.B. Shchuko and his colleagues found a significant dependence of thermal processes on the content of short-lived radionuclides in the celestial body's substance.

O.B. Shchuko published his research in international scientific journals and regularly presented at international scientific congresses and conferences.

SHEFER Vladimir Alexandrovich



Born 21.12.1951 in the village Ispisar of Leninabad district, Leninabad region, Tajik SSR (now-Rep. Tajikistan). In 1976, he graduated from Tomsk State University (TSU) with a degree in mechanics. In 1976-1979 he studied at the graduate school of TSU, in 1986 he received his candidate's degree and in 2004 – a doctoral degree in astrometry and celestial mechanics. Since 1979, he constantly worked at TSU. Since 1989-Head of the laboratory. Research Institute of Applied Mathematics and Mechanics at TSU, since 2005 – Professor of the Department of Astronomy and Space Geodesy of the Faculty of Physics. Died 08.06.2019 in Tomsk.

V. A. Schaefer's research interests are related to the dynamics of small bodies of the Solar system and exoplanets, numerical and numerical-analytical methods of celestial mechanics. The most important results of V. A. Schaefer's research are as follows.

A generalized approach to the linearization and regularization of the equations of motion of the two-body problem using integrals is developed. All independent integrals of motion are included in the linearization and regularization procedure.

On the basis of the regularized equations of motion of the perturbed two-body problem, the equations in variations of the Sperling-Bode and Kustaanheimo-Stiefel variables are derived and the corresponding formulas for determining the partial derivatives of the current motion parameters from their initial values are obtained. A numerical theory of motion is constructed and the long-term evolution of the orbit of the near-Earth asteroid Icarus is investigated.

The idea of a fictitious attracting center with a variable mass is proposed, on the basis of which a new theory of intermediate motion is developed, generalizing the approach of Yu.V. Batrakov. Within the framework of this theory, new classes of intermediate orbits are constructed that have tangents from the first to the fourth order to the trajectories of real motion. These orbits better approximate the perturbed motion in the initial part of the trajectory than the osculating Kepler orbit and similar orbits of other authors. Methods for determining intermediate perturbed orbits from two and three position vectors and corresponding time points are developed. New methods are proposed for determining the initial orbit from three or more observations of a small body, taking into account the main part of the perturbations. It is shown that the methodological errors of the proposed methods are two and three orders of magnitude less than the errors of traditional methods using the Kepler orbit.

A modification of the MEGNO method is proposed, which makes it possible to distinguish periodic orbits among the regular orbits of a dynamical system.

According to the results of the research, more than 80 scientific papers have been published.

V.A. Shefer was a founder and a board member of the International Public Organization "Astronomical Society" (1990-1999), and later a member of this organization. He was a member of the Scientific Council for Astronomy of the Russian Academy of Sciences since 2012 and a member of the Astronomical Society of German-speaking States "Astronomische Gesellschaft" since 2001. V.A. Shefer was awarded the Yuri Gagarin Medal of the Russian Cosmonautics Federation (2001).

SHEINER Olga Aleksandrovna

Born 10.09.1951 in the city of Nizhny Tagil, Sverdlovsk province. In 1968-1973, studied at the Faculty of Radiophysics at the State University of Gorky (now, N. I. Lobachevsky State University of Nizhny Novgorod, UNN). In 1999, obtained her PhD. In 2012, obtained her D.Sc. Since 2010, Associate Professor. In 1973-2016, worked at the Radiophysical Research Institute (NIRFI), starting as a junior researcher and progressing to leading researcher and then to department head. Executive secretary of the journal "Radiophysics and Quantum Electronics", UNN. Member of the European Astronomical Society (EAS), Community of European Solar Radio Astronomers (CESRA). Awarded the certificate of honor of the Ministry of Education and Science of the Russian Federation.

O.A. Sheiner's research interests are radio astronomy, radio physics, solar physics and solar-terrestrial relations.

O.A. Sheiner started her scientific career with research in solar physics. Using the spectral data of solar radio emission observations, she received significant results on the creation of refined models of the solar atmosphere, the spatial structure of the solar activity centers and the solar plasma diagnostics. O.A. Sheiner's research on wave and oscillatory motions in the solar atmosphere provided explanation for a number of effects at the preceding stages of powerful energy release. She developed and patented (together with S.D. Snegirev and V.M. Fridman) a method for short-term forecast of solar flares by the dynamics of long-term quasi-periodic components of the solar radio emission. O.A. Sheiner was among the first researchers working on processes in the solar atmosphere at stages preceding powerful energy release such as solar flares and Coronal Mass Ejections (CMEs) using observations in the radio band. Her research findings related to the processes of CME formation and their initial propagation in the lower layers of the solar atmosphere. She was also one of initiators to study CME effects on the magnetosphere and ionosphere of the Earth and complex technical systems. O.A. Sheiner's research results in the area of the dynamics of the Earth's magnetic field in the pre-flare period demonstrated the connection between magnetospheric wave phenomena and the ionizing radiation from the Sun.

O.A. Sheiner's studies have a practical implementation providing a basis for a number of methods for predicting solar flares and CMEs, using Earth's magnetic field and solar radio emission and X-ray data. Some of these methods have also been patented.

O.A. Sheiner regularly presented her research results at international conferences organized by the Community of European Solar Radio Astronomers (CESRA), the Committee on Space Research (COSPAR), the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), and the European Space Agency (ESA). For a number of years, she had been providing information for "The Sun" division of the Scientific Council for Astronomy of the Russian Academy of Sciences.

SHEMATOVICH Valery Ivanovich

Born 29.04.1952 in the Grodno province, Belarus. In 1976, graduated from Moscow Engineering Physics Institute (MEPhI) with a specialization in theoretical nuclear physics. In 1976-1979, a PhD student at the Computing Centre of the USSR Academy of Sciences. From December 1979, has been working at the Astronomical Council of the Academy of Sciences USSR (now, the Institute of Astronomy of the Russian Academy of Sciences), starting as a junior researcher and then progressing to a department head. PhD in applied mathematics (1980). DSc in Mathematical Modeling (1993). Member of several scientific committees and scientific unions, editorial boards of national and international journals on astronomy.

V.I. Shematovich is an expert in planetary atmospheres in the solar and extrasolar planetary systems. Author of over 200 research publications, including 8 monographs and 10 review papers.

V.I. Shematovich's main scientific achievements:

– developed the stochastic simulation method of non-equilibrium processes in the planetary atmospheres based on the kinetic Monte Carlo method for the solution of the kinetic Boltzmann equation;

– developed the first kinetic models of hot planetary coronae of the terrestrial planets, which enabled estimating the atmospheric loss rates on the astronomical time scales;

– developed the kinetic Monte Carlo model of precipitation of high-energy charged particles into the planetary upper atmospheres and the processes of energy transfer as well as investigated the atmospheric loss induced by the solar wind for the terrestrial planets and the giant planets;

– examined the processes of dissipation of the atmospheres of extrasolar giant planets and, together with his colleagues, discovered the non-spherical structure of gaseous envelopes of hot Jupiters;

– developed a self-consistent chemical-dynamical model and based on the kinetic Monte-Carlo simulations, studied the formation of the molecular composition of the gas and dust fractions in the prestellar and protostellar cores in molecular clouds.

Since the mid-1990s, together with his colleagues, he initiated a new direction in the theory of star formation – the theory of chemical-dynamical evolution of protostars. The theory provided a key to understanding the general nature and specific properties of the dense clumps in the molecular clouds – precursors of stars. For the series of studies "Theory of the Earliest Stages of Star Formation", B. M. Shustov, V. I. Shematovich, and D. Z. Wiebe were awarded the A.A. Belopolsky Prize by the Russian Academy of Sciences (RAS) in 2005.

Another significant contribution of V.I. Shematovich's research is the development of numerical kinetic models describing the processes of interaction of the solar UV radiation and solar wind with upper planetary atmospheres. This model is now one of the most popular numerical methods and is currently used for the interpretation of global measurements of planetary aurorae and studies of the thermal and non-thermal atmospheric mass-loss of planets in the solar and extrasolar planetary systems.

Member of the Editorial Board of the RAS journal "Solar System Research". In 2009-2012, a representative of the Russian Academy of Sciences in the Scientific Committee of the International Institute of Space Studies. Member of the "Solar System" division of the RAS Council for Space Research. Winner of the Annual Prize of the International Academic Publishing Company IAPC "Nauka/Interperiodica" in 2005 and 2010.

SHEVCHENKO Ivan Ivanovich

Born 11.07.1959 in Saint Petersburg. In 1981, graduated from the Mathematics and Mechanics Faculty of Saint Petersburg State University (SPbU). In 1988, obtained his Ph. D. with the thesis “Theoretical Analysis of Rapid Variability of Active Galactic Nuclei in Emission Lines”. In 2000, obtained his D.Sc. with the thesis “Exploration of Some Problems on Stability and Chaotic Behavior in Celestial Mechanics”. In 1989–1998, worked at the Institute of Theoretical Astronomy of RAS, joining as a researcher and progressing to a laboratory head. In 1998–2021, worked at the Central Astronomical Observatory of RAS at Pulkovo, first as a senior researcher, then as the head of Laboratory of Dynamics of Planets and Minor Bodies and then as the head of Department of Celestial Mechanics and Dynamical Astronomy. Since 2021, a professor and the head of the Department of Celestial Mechanics at SPbU. Member of IAU, DDA AAS, Editorial Board of the “Solar System Research” journal. Vice-chairman of the “Celestial Mechanics” division of the Scientific Council for Astronomy of RAS.

I.I. Shevchenko’s research interests lie in the fields of celestial mechanics and dynamical astronomy, nonlinear dynamics, physics of active galactic nuclei, cosmology, and computer algebra methods (systems of analytical computations). Author of more than 150 scientific publications, including three books.

I.I. Shevchenko’s main scientific achievements: developed “reverberation models” for rapid emission-line variability of active galactic nuclei (1984–88); developed computer-algebraic algorithms for normalization of Hamiltonian systems in problems of celestial mechanics (with A.G.Sokolsky, 1991–95); developed methods of numeric deduction of analytical expressions in computer algebra systems (with N.N.Vasiliev, 1993–97); provided analytical description of “separatrix-kind” cosmological models (1993); identified the effects of Hamiltonian intermittency in chaotic dynamics of asteroids (with H.Scholl, 1996–97); generalized the separatrix map and Kepler map theories in celestial mechanics (1998–2000, 2011); developed methods for estimation of Lyapunov timescales and widths of chaotic layers of non-linear resonances in problems of celestial mechanics (2000–08); analyzed and provided classification of resonant and chaotic rotational dynamics of minor planetary satellites (with A.V.Melnikov and V.V.Kouprianov, 2002–05, 2010); provided theoretical description of statistics of Poincaré recurrences in systems manifesting Hamiltonian intermittency (2010); estimated Lyapunov and diffusion timescales in the solar neighborhood (2011); created first catalogues of resonant asteroids (with E.A.Smirnov, 2012–13); developed a theory of formation of spiral patterns in circumbinary planetesimal disks (with T.V. Demidova, 2015); obtained a strictly analytical criterion for disintegration of gravitating triples (2015). With his collaborators from France, developed a theory of chaotic dynamical environments of rotating minor bodies of the Solar system (2017–19). A number of his research results were recognized as annual achievements by the “Celestial Mechanics and Planetary Studies” division of the Scientific Council for Astronomy of the Russian Academy of Sciences. In 2017–21, he derived conditions for stability and habitability of circumbinary planetary systems.

Research supervisor of four Ph.D. and one D.Sc. theses.

Editor of two major modern Western textbooks on celestial mechanics translated into Russian for undergraduate and postgraduates students (C.D.Murray, S.F.Dermott «Solar System Dynamics», Moscow, 2009, 2010; A.Morbidelli «Modern Celestial Mechanics», Moscow–Izhevsk, 2014). Author of “Unpredictable Orbits” awarded the "Best Popular Science Review" Prize by RFBR (2010). Co-author (with M.Ya. Marov) of the first-ever book in Russian on exoplanets, "Exoplanets. Exoplanetology" (Moscow–Izhevsk, 2014). Author of the books “The Lidov–Kozai Effect – Applications in Exoplanet Research and Dynamical Astronomy” (Springer Nature, 2017) and “Dynamical Chaos in Planetary Systems” (Springer Nature, 2020).

SHEVCHENKO Vladislav Vladimirovich

Born 18.06.1940 in Moscow. Graduated from MIIGAiK (formerly Moscow State University of Geodesy and Cartography) in 1964 as astronomer-geodesist. Worked at the Sternberg State Astronomical Institute of MGU in various roles since 1964. Head of Department of Lunar and Planetary Research since 1978. Habilitation (1982), Professor of astrophysics and radioastronomy (2005). Member of various scientific committees and editorial boards of Soviet/Russian journals of astronomy and earth sciences.

Main scientific works relate to the fields of astrophysics, the physics of bodies of the Solar System, and space research, authoring around 300 scientific papers including author/co-authorship of around 30 books. V. V. Shevchenko participated in the realisation and data analysis of the spacecraft missions Zond (1965-1973), Luna (1966-1976), Lunakhod (1970-1973). V. V. Shevchenko led a series of projects in collaboration with RAS and ROSKOSMOS studying the planets and satellites of the Solar System and dedicated to space exploration. From 1978-2015 he was the scientific leader of contracts with IKI RAS, NPO-Energiya, KBOM, the Keldysh Center, NPO Lavochkin, TsNIIMASh and others for the preparation and realisation of lunar and planetary projects. He participated and led the preparation of a series of maps and globes of the Moon, of Venus, and of Mars. He led a series of projects within the framework of international cooperation with NASA in the US, the European Space Agency (ESA) and others. From 2003-2006 he was a member of the working group for the realisation of the ESA SMART-1 lunar spacecraft, for which he was acknowledged with an international prize for his outstanding contribution to lunar science. Since 2005 he has worked on the Russian-American working group for the preparation and realisation of an experiment to search for polar low-temperature volatile deposits on the Moon within the NASA LRO mission. He received the personal thanks of the director of NASA for his contribution to this experiment (2010). He is Member of the International Astronomical Union (IAU). For over 30 years (1978-2010) V. V. Shevchenko was a member of the IAU Working Group on Planetary Nomenclature, and chairman of the sub-group on lunar nomenclature. Member of COSPAR. Member of International Academy of Astronautics. Member of the Solar System section of the RAS space council. From 1991-1995 lectured on space science at the TsPK Yu. A. Gagarin. Regularly gives specialised courses to students of the MGU physics faculty, and supervises undergraduate and postgraduate project work. V. V. Shevchenko has received government awards, awards from the Federation of Russian Cosmonautics, holds the title Distinguished Scientific Associate of MGU and Honoured worker of higher professional education of the Russian Federation. In 2010 his biography was included in Who is Who in the World. The International Biographical Centre (England) declared him among the 100 distinguished scientists of 2010. In 2012 he was awarded the Medal "For Merit in Space Exploration". Since 2016 member of the Expert Council of the RAS. Since 2020 a member of the Interdepartmental Working Group on the Exploration, Development and Use of Space Resources.

SHIBANOV Yuri Anatolievich

Born in 1944 in Leningrad. In 1968 he received the master degree from the Radio-electronics faculty of the Politechnical Instititute of Leningrad (LPI) and working at the Ioffe Insttute since 1968. In 1968-1971 he was the lecture-assistant at the Theoretical physics faculty of LPI and in 2008 became the professor at the LPI Cosmical studies faculty. He recievd the doctoral Ph.D. in 1999 and is the member of IAU.

Yu.A. Shibanov is the russian astrophysists made a considerable contribution into theoretical and observational studies of energetic cosmic objects. In particular, together with A.D. Kaminker and A.Z. Dolginov, he studied processes of magnetic field generation in turbulent astrophysical plasma (1968-1973). In collaboration with G.G. Pavlov, Y.N Gnedin, N.A. Silant'ev, A.D. Kaminker and D.G. Yakovlev, he investigated processes of generation and absorption of radiation in strongly magnetized plasma in application to the white dwarf and neutron star conditions (1972-2000). As a result, atmosphere models of neutron stars were created in collaboration with G.G. Pavlov and V.E. Zavlin, which are widely used at the interpretation of X-ray and optical emission of radio-pulsars and isolated neutron stars. Last years he focused on the observational studies of pulsars, pulsar nebulae and supernova remnants from the radio through X-rays with modern ground-based and orbital telescopes. Several observational programms were developed and conducted using VLT, GTC, Gemini, Spitzer, ATCA, HST, XMM-Newton, Chandra and other instruments. The observations are aimed for the study of radiation mechanisms of the objects which are still not clearly understood. Seven Ph.Ds were defended under his supervision. He gives two introductory courses on the data reduction and analysis of the optical, radio and X-ray observations for students specialized in the Cosmical Resarch. Participates in international scientific collaborations with scientists from USA, Australia, Sweden, Mexico, Chile and others and participated in many international astrophysical conferences held in various countries. The member of IAU and the member of IAU commssion on High energy astrophysiscs. The member of the Russian astronomical council. The author of more than 130 publications in leading scientific journals.

Yu. A. Shibanov is avarded by the Rozhdestvenskiy medal of the Russion Optical Union (2011).

SHISHOV Vladimir Ivanovich

Born 10.09.1938 in Shepetovka, Khmelnitsky region, Ukraine. In 1961, he graduated from the Faculty of Mathematics and Mechanics of Leningrad State University with a degree in astronomy. Since 1961, he has been constantly working at the Pushchino Radio Astronomy Observatory (now PRAO ASC LPI). In recent years, he worked as the head of the department of the ASC LPI. Doctor of Physics-Mat. (1978), Professor of the Pushchino Natural Science Institute. Died 20.04.2018 in Pushchino, Moscow region.

His main investigations were related to the theory of wave propagation in randomly inhomogeneous media, radio astronomy, plasma astrophysics, author of more than 200 scientific publications.

V. I. Shishov conducted fundamental research in the field of the theory of wave propagation in randomly inhomogeneous media, he created the correlation theory of strong scintillation. In 1990, Shishov V. I., as part of a team of scientists (Gurvich, A. S., Tatarsky V. I., Shishov V. I., Rytov S. M., Klyatskin V. I., Kravtsov Yu. A., Obukhov A.M., Chernov L. A.), was awarded the USSR State Prize for the study of the basic laws of wave propagation in turbulent media.

Under the guidance and with the active participation of V. I. Shishov, the time spectra of interplanetary scintillation of radio sources were measured and the spatial spectrum of interplanetary plasma turbulence was determined based on the analysis of these measurements. He proposed (together with V. I. Vlasov and T. D. Shishova) a method for mapping interplanetary scintillation indices of radio sources to determine the global structure of interplanetary plasma. Currently, this method is used to monitor the turbulent solar wind from daily observations of several thousand scintillating radio sources on the 96-beam radio telescope BSA FIAN.

The analysis of observational data on turbulent interplanetary plasma led V. I. Shishov and I. V. Chashey to create a theoretical self-consistent model of the formation of the solar corona, solar wind, and turbulence in the solar corona and solar wind.

V. I. Shishov theoretically explained the main effects of pulsar and quasar scintillation on the inhomogeneities of interstellar plasma. By analyzing the pattern of interstellar scintillation, V. I. Shishov and T. V. Smirnova determined the sizes of pulsar radiation sources with a record angular resolution of about 10 angular nanoseconds.

SHITOV Yuri Pavlovich

Born 31.07.1941 in Barnaul, Altai Region (Krai). Graduated from the Tomsk State University (TSU) in 1965. Next year Yu.P. Shitov worked as an engineer in the laboratory of the Department of Radio Wave Propagation of TSU. From 1966 until the end of his life in 2007, he is staff member of the Pushchino Radio Astronomy Observatory (in 1960-1980s – Radio Astronomy Station). Since 1967 Yu.P. Shitov worked his way from engineer to a head of the Pulsar Physics Department and Deputy Director of the PRAO ASC for Scientific Affairs. Doctor of Physical and Mathematical Sciences (1994). He was a member of the Council for Radio Astronomy of the USSR Academy of Sciences and the Council for Astronomy of the Russian Academy of Sciences, a member of the International Astronomical Union (IAU). Died 20.01.2007 in Pushchino, Moscow region.

His main research works relate to the field of experimental radio astronomy – the study of low-frequency radio emission of pulsars. Yu. P. Shitov is an author of more than 100 scientific publications. In the first years of his work at PRAO LPI, Yu. P. Shitov took an active part in the development, construction and installation of remote broadband antenna amplifiers on the East-West arm of the DKR-1000 cross-type radio telescope. In 1968, after the news on the discovery of pulsars appeared in the press, he is first in Russia who constructed the pulsar-receiver and fulfilled successful observations using the E-W arm of DKR-1000.

Among the most significant results obtained by Yu. P. Shitov in the field of pulsar research are the following:

detection of the phenomenon of sub-pulse drift and the second-class period in pulsars PSR 0809+74 and PSR 0320+39; detection of the phenomenon of superdispersive delay of pulsar pulses at low frequencies; detection of one of the first Pushchino pulsars, including the anomalous pulsar PSR B0943+10, which is unique in many of its properties; creation of the first catalogues of pulsar average-pulse profiles and spectra in the meter wave range; one of the first measurements of the polarization plane rotation of pulsar radio emission caused by the Faraday effect in the interstellar medium at low radio frequencies (Rotation Measure); detection of pulsed radio emission from the SGR 1900+14 gamma repeater and investigation of the Geminga radio emission; determination of the parameters of the interstellar medium from the measured values of the dispersion measure of and the rotation measure for the significant number of pulsars.

Yu. P. Shitov was one of the outstanding astronomers-experimenters who could investigate the entire range of issues, from astrophysical problems related to the nature of the objects under study up to the potential capabilities of experimental facilities and the methods of conducting observations and final data processing. This ensured the reliability of all the results he obtained.

SHKLOVSKY Iosif Samuilovich

Born 01.07.1916 in Glukhov. In 1933-1935, studied at Vladivostok State University. In 1935-1938, studied at Moscow State University. PhD student at Sternberg Astronomical Institute (SAI MSU), where he obtained his PhD (1944) and D.Sc. (1949). Since 1944, worked at SAI MSU. Since 1969, worked at the Space Research Institute of the USSR Academy of Sciences. Corresponding member of the USSR Academy of Sciences (1996). Member of the Royal Astronomical Society, the American Academy of Arts and Sciences, the National Academy of Sciences. Awarded the Lenin Prize (1960). Died 03.03.1985 in Moscow.

I.S. Shklovsky's primary field of research was theoretical astrophysics. I.S. Shklovsky was involved in the development of the physical theory of solar corona and solar radio emission (1944-1949). Studied the chemical composition and ionization conditions of the solar corona. He showed that electron collisions are the main mechanism of excitation in the inner solar corona and developed a theory of this process. He gave an interpretation of radio emission of "calm" Sun as thermal emission of upper chromosphere and corona. In 1946, he was the first to propose a hypothesis explaining flares of solar radio emission by plasma oscillations in solar corona that occur when flows of energetic particles pass through it.

I.S. Shklovsky was also interested in the origin of cosmic radio emission. In 1948, he performed calculations of the 21 cm neutral hydrogen radio line predicted by X.K. van de Hulst. He showed that the Galaxy's emission intensity in this line can be detected by instruments available at that time. In 1949, he identified the possibility of interstellar molecules observation in radiowaves. In 1952, he showed that emission coming from low and high galactic latitudes has spectral differences. Linked sources emitting in meter wavelengths to supernova remnants. In 1953, he explained the radio emission of supernova remnants' discrete sources by synchrotron emission. In 1956, he proposed the evolution scheme of planetary nebula and its core. He was the first to identify red giants with average masses as possible progenitors of planetary nebulas and their cores.

In 1967, before the discovery of pulsars, he suggested that the emission of SCO X-1 is generated by accretion onto a neutron star. Some of his research related to the aurora borealis and infrared emission of the night sky, quasar emission, pulsars, x-ray, and gamma-sources. He also participated in space research planning.

I.S. Shklovsky was also known as an active promoter of science. His book "Universe. Life. Intelligence" attracted a lot of attention to the problem of extraterrestrial intelligence. He declared that there are at least a billion planets in the Galaxy where intelligent life is possible. His statement made in the 1960s is now being confirmed by the Kepler space telescope (500 million habitable planets).

I.S. Shklovsky was also an advocate and activist for human rights.

SHOKIN Yuri Alexandrovich

Born 27.09.1939 in the town of Kimry, Kalinin Oblast (now Tver Oblast). He studied at school no. 1 of Kimry from 1946 to 1956, worked as a drill man at Savelovo Machine Tool Plant from 1957 to 1958, and served in the Soviet Army from 1958 to 1961. After the end of his service Shokin entered the Division of Astronomy of the Faculty of Physics of Moscow State University (1961–1967) and, after graduation, continued his education by pursuing post-graduate studies at the same faculty (1967–1970). After defending his Candidate of Sciences dissertation on the phototelevision method of observing distant space objects and the investigation of the accuracy of the measurement of their coordinates in 1970 Shokin worked as a junior (1970–1975), senior (1975–1996), and leading research fellow (1996–1999) at Sternberg Astronomical Institute.

Since 1967 work has been carried out at the division of astrometry under the supervision of V.V.Podobed on the use of television observations of artificial space objects in order to determine their angular coordinates. Shokin worked extensively on developing operational methods for observing faint distant space objects. These methods were successfully used to observe the launches of Luna-16, Zonda-8, Luna-17, Luna-18 and Luna-19 space probes. In particular, the coordinates of the Zond-8 probe were determined when it was at a distance of 348 thousand km from the Earth.

Shokin, along with other observers, thoroughly analyzed the AFR-1 wide-angle astrograph of Sternberg Astronomical Institute and showed this instrument to be superior to Zeiss astrographs of this class in terms of astrometric performance.

Shokin's Candidate of Sciences dissertation supervised by V.V.Podobed was dedicated to ground-based tracking of interplanetary spacecraft and astrometric calibration of wide-field sky surveys.

In the 1970s, Shokin (in collaboration with N.M. Evstigneeva, K.V. Kuimov, and D.N. Ponomarev) created an atlas-catalog to be employed in observations of geostationary satellites using a single reference star. The technique was suggested by Shokin and made it possible to measure the positions of these objects with an accuracy better than one arc second.

The advent of computers made it possible to improve astrometric reduction computations. Much research work in this direction was done by K.V. Kuimov and Yu.A. Shokin. The latter showed that when processing astronomical negatives obtained with the AFR-1 wide-angle astrograph the reduction formula should include a term depending on the diameter of the stellar images. As a result, in 1977, after successfully applying the method of overlapping plates and a special cassette with folding screens reduce the flux from the the brightest stars, Shokin was able develop a high-precision astrometric standard in SA-18 for assessing the field distortions of a TV unit attached to a telescope.

On April 12, 1996, Shokin was awarded the degree of Doctor of Physical and Mathematical Sciences for his large integrating work. His doctoral dissertation was devoted to special photographic catalogs of stellar coordinates, which made it possible to address a number of important problems in the development of astronomy and cosmonautics.

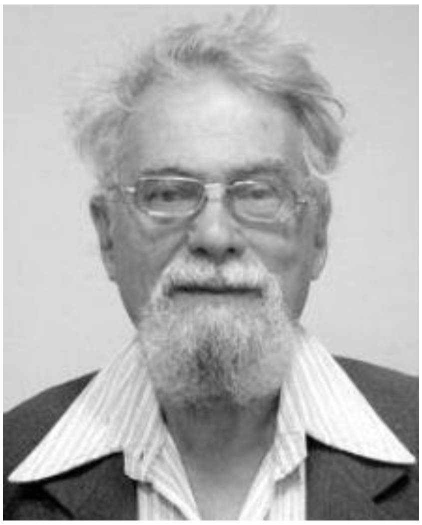
YA Shokin coauthored 31 research works.

For his successful career, Shokin distinguished with the following awards:

Bronze Medal of the Exhibition of Achievements of National Economy (1985), Silver Medal of the Exhibition of Achievements of National Economy (1986), Medal "For Distinguished Labor" awarded by the Decree of the Presidium of the Supreme Soviet of the USSR (1987), and K.E. Tsiolkovsky Medal (1988).

In 1979 Shokin was awarded the academic status of senior researcher and in 1996 he defended his Doctor of Sciences dissertation entitled "Dedicated photographic catalogs of stellar positions for astronomical tasks".

SHOR Viktor Abramovich



Born 29.09.1929 in Kharkov; graduated from the Kharkov University (1952); was a postgraduate student (from 1956 to 1959) in the Institute of Theoretical Astronomy of the USSR Academy of Sciences (ITA); Junior (from 1959) and Senior (from 1967) ITA Researcher; Deputy Head of the ITA Minor Planet and Comet Department (from 1967); Head of the Minor Planet Dynamics Laboratory (from 1989 to 1998); Leading Researcher (from 1998) of the Institute of Applied Astronomy of the Russian Academy of Sciences (IAA RAS); headed the IAA RAS Minor Planet Laboratory (until 2004); completed his PhD thesis "The Satellite Case Solution of the Three Body Problem Using the Hill-Brown Method on High Speed Computers" (1961) and Doctoral thesis "Theories of motion and ephemeris support of planets and satellites" (1999). Died 20.11.2021.

V.A. Shor is a Soviet and Russian astronomer. His PhD thesis described an automated process to create an analytical theory of satellite motion affected by strong perturbations from the Sun (the Hill-Brown Lunar Method). The Solar perturbations in the motion of Jupiter's satellite VII were calculated by the program he developed. In the mid-1960s, V. A. Shor's task was to maintain scientific collaboration with the Crimean Minor Planet and Comet Group of Observers. Close cooperation with this group has led to increase the accuracy of the data in the annual "Ephemerides of Minor Planets" (EMP) which had been published by ITA at the request of IAU since 1948.

V.A. Shor was engaged in studying the motion of Mars satellites from 1965. Processing the Phobos and Deimos observations for the period 1877-1973 allowed him to specify the theory of their motion and to resolve a debatable issue of their secular accelerations. The mass of Mars and the orientation of its rotation axis were specified. These satellite ephemerides were used in the preparation of Soviet expeditions to Mars and ensured successful observations of satellites from the Phobos-2 spacecraft in 1989.

V.A. Shor and G.A. Chebotarev studied (1970s) the issues of the dynamic structure of the asteroid belt, the evolution of this structure and the origin of the whole belt. V.A. Shor headed (the late 1970s) the work to automatize completely the minor planet orbit improvement process based on observations and the calculating process for the annual EMP tables. At the end of the 1980s, he initiated the development of more advanced integrated software packages of EMP.

In the early 1990s, he turned to the problem of asteroid-cometary hazard. V. A. Shor co-authored a number of works on improvements in the orbit data from the radar and optical observations and studied potentially dangerous asteroid motion over long-time intervals. He is one of the developers of a software system to forecast approaches of asteroids and comets to the Earth and the Moon and to describe possible scenarios of the catastrophic consequences of collisions.

He has published more than 120 papers being also a coauthor of 4 monographs; was Deputy Editor-in-Chief (from 1977 to 1998) and Editor-in-Chief (from 1999 to 2016) of the EMP; a member of the IAU Commission No.20 Organizing Committee (from 1988 to 2009), the IAU Asteroid and Comet Naming Committee (from 1994 to 2012); and the RAS Expert Council on Space Threats. Minor planet (3946) Shor is named in his honour.

SHTERNBERG Pavel Karlovich

Born 21.03(02.04).1865 in Orel. In 1887 he graduated from Moscow University, in 1888 he was appointed as assistant to the university observatory. Since 1890 – assistant professor at the university and astronomer-observer of the university observatory. Master's thesis "Latitude of the Moscow Observatory in connection with the movement of the poles" (1903). Doctoral dissertation "Some applications of photography to precise measurements in astronomy" (1913). Professor of Moscow University (1917). Director of the Observatory of Moscow University (1916-1920). Member of the Collegium of the People's Commissariat of Education (1918). D. 01.02.1920 in Moscow.

A student of F.A. Bredikhin. His main scientific works are devoted to the rotational motion of the Earth, photographic astronomy and gravimetry. In 1888–1891 he participated in expeditions to study gravity anomalies in the European part of Russia. For this work he was awarded the silver medal of the Russian Geographical Society. In 1892-1903 he carried out a major research "Latitude of the Moscow Observatory in the relationship with the movement of the poles", the results of which became the topic of his master's thesis (1903), awarded the medal of the Russian Astronomical Society (1906). In 1902, on behalf of the director of the observatory V.K. Tseraskiy began longstanding work on photographic observations and precise measurements of binary stars using the 15-inch astrograph telescope. The photographic observations of binary stars, which were provided by Sh., were one of the first in astronomy rigorously developed attempts to use photographic methods to accurately measure the relative position of stellar pairs. The results of Sh. research became the basis for his doctoral dissertation "Some applications of photography to precise measurements in astronomy" (1913). Since 1915 to 1917 Sh. investigated the Moscow gravitational anomaly, discovered and studied in the 1850s by a professor at Moscow University B.Ya. Schweitzer, and for the first time carried out accurate measurements of it in a new direction ("Sternberg cut").

He devoted a lot of time and effort to teaching at Moscow University, where for a quarter of a century he lectured on a number of sections of astronomy and geodesy. Sh. also lectured on astronomy at the Higher Courses for Women. In 1902 Sh. was elected a full member of the Pedagogical Society at Moscow University. In recognition of Sh.'s scientific and pedagogical merits, he was elected in April 1917 as chairman of the first, founding All-Russian Astronomical Union, held in Petrograd. Since March 1918 Sh. is a member of the Board of the People's Commissariat of Education and head of a department of higher education. In July 1918, Sh. took part in the preparation and conduct of a conference of university leaders on the reform of higher education.

Since 1905 Sh. was a member of the Russian Social Democratic Labor Party (b) and took an active part in the October Revolution and the Civil War. In 1919 he was appointed a member of the Revolutionary Military Council of the Eastern Front. When crossing the Irtysh, he fell ill with pneumonia, which led to his death. The name of Sh. was assigned to the State Astronomical Institute of Moscow University, formed in 1931, as well as to the minor planet No. 995 and one of the craters on the far side of the Moon.

SHUGAROV Sergey Yurievich

Born was born in 1953 in Moscow.
In 1971–76 he was a student of astronomical department of Lomonosov Moscow State University. At first he worked at the astrophysics and stellar astronomy department of MSU, since 1990 he has been working at Sternberg astronomical institute of MSU (SAI). In 2003 S.S defended the PhD thesis “Photometrical investigation of interacting binaries. He and his colleagues won a Moscow Komsomol award in 1984.
The number of scientific publications – 420. He is a co-author of the catalog “Highly Evolved Close Binary Stars”, Gordon and Breach Publications Brussels, Belgium and 8 other books.
S.S. was one of the discoverers of Nova Cyg 1975 (V1500 Cyg).

The basic direction of S.S. activity is photometric study of cataclysmic (CV) and symbiotic (SV) variables. He independently and with colleagues from SAI, INASAN, Slovak Academy of Sciences, SAO, Kyoto University (Japan), CrAO and other observatories of the world carries out photometric monitoring of selected variable stars. He discovered several CVs (AN UMa, AC Cnc, UU Aqr, AY Psc, IP Peg, EG UMa, DV Dra, BE UMa, V795 Her, V361 Lyr, etc.). Also with co-authors, he first discovered eclipses in some CVs, which were subsequently actively studied by many astronomers. Since 2008, he has carried out joint studies of tidal-resonance processes in accretion disks of SU UMa and WZ Sge stars; as a result the 10 large generalizing papers and more than the 25 papers about individual stars of this type have already been published, for which the regularities of the superhumps period variability have been investigated, and their physical characteristics have been found. A nodal precession of the accretion disc was found in CV MN Dra.

Together with colleagues, he carried out studies of classical and X-ray Novae with a relativistic component, including candidates for black holes, models for these systems have been built for this objects (V616 Mon, KV UMa, LZ Aqr, V404 Cyg, V959 Mon, V426 Sge, V2491 Cyg and etc.). S.S. studied the peculiarities of the orbital light curves and variability of the periods of classical novae V339 Del, Q Cyg, V723 Cas,V1974 Cyg, V1548 Aql, V612 Sct and others (also with co-authors) and found for the first time orbital period of novae V2468 Cyg and V392 Per.

At first he detected the orbital period of symbiotic nova RT Ser and built a preliminary model of the wide binary. Third eclipse of SV PU Vul was detected. Fast, orbital, pulsations and outburst variability in SV V407 Cyg, CH Cyg, FG Ser, AG Peg, V1413 Aql, BF Cyg, etc. was studied in details (with the colleagues).

Using archival negatives since 1899, he constructed the historical light curve of SV V426 Sge, whose outburst took place in 2018, discovered another outburst in 1968, and with co-authors investigated the pulsations of the red giant.

Together with Italian and other astronomers S.S. studied the unusual photometric behavior the star TCP J05074264 + 2447555 and explained it by the microlensing. It was proved that the planet like Neptune orbited the star.

Since 1982 he conducts pedagogical work, under his leadership the 16 graduate works were defended by students of the astronomical department of Moscow State University, some of these graduates became professional astronomers. Supervises coursework for junior students and provides advice to learner and graduate students. Under the leadership of SS in 2021, a Ph.D. thesis was defended also.

SHULOV Oleg Serafimovich

Born 15.11.1935 in Leningrad (now, St. Petersburg). In 1958, graduated from Leningrad State University (LGU, now St. Petersburg State University SPbU) with a major in astronomy. In 1958–1960, worked at the the Astronomical Observatory of LGU (AOLGU) first as a senior laboratory assistant and then as an engineer. In 1961–1964, a postgraduate student at the Department of Astrophysics of LGU. Later on, a researcher and after 1973, a senior researcher and Head of Laboratory of Observational Astrophysics at AOLGU. In 1967, defended his Ph.D. thesis "Methods of Stellar Polarimetry and Its Application to Observations of Polarization Effects in Close Binary Systems". Member of the International Astronomical Union. Died 13.08.2008 in Saint Petersburg.

O.S. Shulov's primary area of research related to observational astrophysics. Author of more than 50 research publications, mostly on stellar astrophysics.

In 1957-1972, studied polarization of radiation of eclipsing variable stars. Discovered the polarization of radiation from certain close binary stars, which as the first-ever reliable discoveriy of the proper (i.e., non-interstellar) polarization of stellar radiation. Showed that the polarization was due to the scattering of radiation by free electrons in ionized gas streams in binary stellar systems. The polarization proved to be variable explained by time variations in the stream structure. His research results are reflected in a series of papers "Polarimetric Investigations of Stars, Nebulae, and Galaxies" (with V.A.Dombrovsky and V.A.Hagen-Thorn) awarded the Bredikhin Prize of the USSR Academy of Sciences in 1974.

In the 1980–1990s, O.S. Shulov's research interests centered on young stellar clusters and young stars. In particular, using five-color photometric and polarimetric observations of clusters in the Orion Nebula and NGC 2264, he found stars with a non-standard dependence of the polarization degree on wavelength. Analyzed the abnormal extinction and discovered its two-component structure. Carried out observations of the fuor V1057 Cyg and built and analyzed its lightcurve. Found the circular polarization of radiation from the Ae Herbig star WW Vul, indicating the existence of magnetic field in the star's circumstellar disk.

SHUSTOV Boris Mikhailovich

Born 10.01.1947 in Sovetsk, Kirov province**. In 1969, graduated from Ural State University (now, Ural Federal University, UrFU). Since 1971, after completing his postgraduate studies at the Astronomical Council of the Academy of Sciences USSR (now, the Institute of Astronomy of the Russian Academy of Sciences, INASAN), worked at INASAN, occupying different positions, including Research Team Lead and Director (2003-2016). Since March 2016, Scientific Director at INASAN. PhD (1979), D.Sc. (1991), Professor in Astronomy (2005), Corresponding Member of RAS (2006), Vice-President of the European Astronomical Society (1993-2000), Vice-President of the IAU (2015-2021), Member of a number of scientific councils and editorial boards of national and international journals on astronomy.**

B.M. Shustov's fields of research were astrophysics, solar system physics, and space astronomy. He is the author of about three hundred research publications, including co-authorship of five monographs.

In the 1970-1980s, in collaboration with A.V. Tutukov, based on the wide application of numerical models, B.M. Shustov developed the theory of interaction of stars with circumstellar matter at various evolutionary stages (at the early stages, dusty cocoons of young stars; at the late stages, planetary nebulae, dust shells around peculiar stars, supernova shells as well as large-scale formations, supershells). His theory of the loss of heavy elements from disk galaxies during the evolution of supershells as well as due to the loss of dust matter by radiation pressure made it possible to approach the cherished goal of many astrophysicists – the development of a self-consistent theory of the evolution of galaxies and intergalactic matter.

Since the mid-1990s, together with D. S. Wiebe and V. I. Shematovich, B.M. Shustov developed a new direction in the theory of star formation – the theory of chemo-dynamic evolution of protostars. The theory provided the key to understanding the general nature and specific properties of dense clumps of molecular clouds – the precursors of stars. In 2005, B. M. Shustov, V. I. Shematovich, and D. S. Wibe were awarded the A. A. Belopolsky Prize of the Russian Academy of Sciences for their series of works "The Theory of the Earliest Stages of Star Formation".

Since 2007, B. M. Shustov has been working on a comprehensive scientific approach to tackling the problem of asteroid-comet hazards, leading the Expert Group on Space Threats of the RAS Council for Space Research. In charge of the scientific aspect of the program for creating a national system for countering space threats.

He is the PI of the Spektr-UF (WSO-UV) international project initiated by A. A. Boyarchuk. The project is included in the Federal Space Program of Russia. The goal of the project is to create an ultraviolet space observatory for solving fundamental problems of astrophysics, cosmology and physics.

B. M. Shustov organizes the Russian wide annual winter (Kourovka) astronomical school events for young astronomers (49 schools have already been held). Under his supervision, nine PhDs and three doctoral dissertations were completed.

He was awarded the Order of the Badge of Honor (1986), Honored Scientist of the Russian Federation (1996), the Order of Friendship (2012) as well as departmental awards of Roscosmos. A main belt asteroid No. 9145 discovered by N. S. Chernykh in 1976 (Crimean Astrophysical Observatory) is named after B. M. Shustov.

SHVARTSMAN Viktoriy Favlovich

Born 22.0701945 (Nizhniy Tagil).
In 1968 graduated from Moscow State University, in 1971 defended his PhD at Sternberg Astronomical Institute. Since 1971 worked at Special Astrophysical Observatory, Russian Academy of Sciences. Created and led Relativistic Astrophysics Group here, was a senior researcher. Died 27.08.1987 in Moscow.

Scientific interests: particle physics, relativistic astrophysics, cosmology, astrostatistics, astronomical instrumentation, SETI problem. Author of more than hundred scientific articles, co-author of two monographs.

He was the first to study the interaction of relativistic objects with surrounding medium, and to predict the possibility of transition from ejection to accretion in radio pulsars. He analyzed the role of magnetic fields in accretion of interstellar plasma onto isolated stellar mass black holes and demonstrated that the luminous halos around these black holes may be bright enough to be detected, and will have featureless spectra and an ultra-fast variability reflecting the behavior of the plasma near event horizon, which is a defining feature of such halos. Basing on this theoretical result, he proposed the program of searching for black holes (specifically, their event horizons) by observing candidate objects (galactic objects with featureless spectra) with high tenporal resolution down to 1 us – MANIA (Multichannel Analysis of Nanosecond Intensity Alterations) experiment (still ongoing). Necessary instrumentation and analysis methodology had been developed, and massive study of various classes of relativistic and rapidly variable objects – x-ray binaries, pulsars, flaring stars, black hole candidates – had been performed.

He also argued that our Universe may have a non-trivial topology, and proposed a critical experiment for its detection – the search for “ghosts” of extra-galactic objects. Together with T.Fetisova, A.Koplylov, D.Kuznetsov and A.Lipovetskii he carried out an observational program for its detection and analyzed its results. The “ghosts” had not been detected, but they discovered, supposedly for the first time, the density fluctuations in distribution of galaxy clusters on 100-300 Mpc scales.

He also significantly contributed to the development of SETI problem. He proposed to consider it in the context of general cultural status of human civilization, and proposed possible directions of such approach for the selection of mehods of communicating with extraterrestial civilizations. Moreover, he started the search for signals from extraterrestial civilizations in optical range using MANIA instrumentation and methodology.

He passed away early, but his thoughts, ideas and projects are still being developed and actualized by his pupils and colleagues.

SIDORENKO Vladislav Viktorovich

Born 27.07.1961 in Krasnoyarsk. From 1978 to 1984, a student at Moscow Institute of Physics and Technology (MIPT). Later, a PhD student at the Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences (KIAM), working on his thesis on attitude dynamics of deformable celestial bodies. In 1988, joined the Department of Applied Celestial Mechanics at KIAM. In 1997, obtained his D.Sc. with the thesis on different mathematical techniques of quasi-steady motion studies. Since 1993, has been involved in research at KIAM and teaching at MIPT. Professor (2007), Associate Editor of the international journal "Celestial Mechanics and Dynamical Astronomy" (since 2009). Member of IAU.

V.V.Sidorenko's research interests lie in the field of celestial mechanics. In collaboration with D.Scheeres, A.I.Neishtadt and A.A.Vasiliev, he developed a theory of cometary nucleus rotation evolution based on a certain empirical model of the matter sublimation from the surface of the nucleus. Some of his research publications relate to periodic motions in problems of celestial mechanics. His other area of research is theoretical analysis of secular effects in case of mean motion resonance (MMR) of orbiting celestial bodies. He established conditions of quasi-satellite motion formation and destruction, interpreting this motion as 1:1 MMR and applying the modified "adiabatic" approach proposed by American astronomer J.Wisdom. In a similar way, he explained the dynamic behavior of so-called "jumping" Trojans that pass at time to time from the motion around one triangular libration point to another one. Demonstrated the possibility of interpreting the eccentric Kozai-Lidov effect (i.e., the transitions between direct and retrograde orbital motion) as a resonance phenomenon.

In addition to theoretical research, V.V. Sidorenko is actively involved in solving problems in the area of applied celestial mechanics (in particular, studies of space debris dynamics). Author of more than 100 research publications.

SIDOROV Vladimir Vasilievich

Born 01.12.1932 in Kazan. Graduated from the physical faculty of the Kazan State University (nowadays the Kazan Federal University) as a Radiophysicist (1955). Ph. D. of Physical and Mathematical Sciences (1955), senior engineer of the KSU Problem Radioastronomy Laboratory (PRAL) (1957), senior researcher of the PRAL KSU (1960), Director on scientific work of the PRAL KSU (1965). Assistant (1963), Senior Lecturer (1964), Associate Professor of the Radioastronomy department (1965). Head of the KSU Radiophysics department (1982), Grand Ph.D. of Physical and Mathematical Sciences (1985), professor of the KSU Radiophysics department (1986). Awarded with the "Veteran of Labor" medal (1983). Died 05.06.2012 in Kazan.

Research interests: meteoric astronomy, radiophysics, geophysics.

V.V. Sidorov is the founder of meteoric phenomena radar observations in Kazan and the scientific school of complex radar research of physical and astronomical aspects of the meteor particles phenomena, as well as their usage in astronomy, radio communications, time measurement, and information security. V.V. Sidorov organized the construction of the KSU radiophysical test site (1968), now named after him. In the period 1975-1980 a unique measuring complex "KGU-M5" was developed and put into operation for wind and astronomical purposes.

The main directions of radar research: meteoric and sporadic atmospheric phenomena, the dynamic structure of the atmosphere at meteoric heights, the orbital structure of the meteoric complex, the propagation of radio waves due to meteoric, ionospheric, and atmospheric irregularities, the development of meteor-ionospheric communication systems adaptive to the conditions of radio wave propagation, time measurement, and information security. V.V. Sidorov developed a fundamentally new discrete quasi-tomographic approach for meteor showers radiant coordinates measurement, which made it possible to improve the angular resolution in the celestial sphere by ~ 5 times. Based on long-term experiments (including international geophysical projects MAP, MAC, DIANA, etc.) are important for understanding the patterns of the prevailing, tidal, wave, and turbulent motions of the atmosphere at upper mesosphere and lower thermosphere heights, their correlation with solar activity and meteorological phenomena. There have been obtained the fundamental results in the physics of radio wave scattering by meteoric ionizations, including resonance, diffraction, and polarization phenomena, and the effects of nonreciprocity and instability.

V.V. Sidorov has headed the Education Ministry Program "Radio waves propagation in near-Earth space", worked as a chairman of "Meteoric propagation of radio waves" section in the Scientific Council of the Russian Academy of Sciences, has been the chairman of the meteors section of the National Geophysical Committee of the Russian Academy of Science, a member-consultant of the IAU Commission 22 "Meteors, Meteorites & Interplanetary dust", a Commission member of the Academy of Sciences of the USSR on the "Global System of Meteor Observations (GLOBMET)" international project (1983-1985), has headed the section "Radio navigation and radio communication systems" at the International Academy of Informatization of the Tatarstan Republic. V.V. Sidorov was an organizer and editor of the annual thematic digest of articles "Meteoric propagation of radio waves". He is the author of over 300 scientific publications in Russian and foreign editions. Under the leadership of V.V. Sidorov, 15 Ph. D. and 5 Grand Ph.D. of Physical and Mathematical Sciences developed their thesis.

Titles: Honored Professor of KSU (2007), Honored Scientist of the Tatarstan Republic (1996), Honored Scientist of the Russian Federation (2004), Soros Professor (1998), Honored Inventor of the USSR, Laureate of the State Scientific Scholarship (1995-1997, 1997-2000), Member of the International Astronomical Union (IAU).

SILCHENKO Olga Kasyanovna

Born 12.04.1958 in Moscow. Graduated from Lomonosov Moscow State University (physics faculty, astronomy department) in 1981. From 1984, after defending a PhD thesis in MSU, she holds a permanent position in the Sternberg Astronomical Institute of the MSU: junior researcher (1984-1990), senior researcher (1990-1994), leading researcher (1994-2004), head of the department of emission-line stars and galaxies (from 2004),
Deputy director of the SAI MSU (from 2018). Doctor of Phys-Math Sciences (1994). Counsellor of the European Astronomical Society Council (2014-2018), Directory member of the European-Asian Astronomical Society. She has been awarded by the MSU Shuvalov prize of the first degree in 1996 and also by the State Science-Technology Prize of the Russian Federation in 2003.

Main scientific interests lie in the area of extragalactic astronomy; on this subject she has published more than 200 papers indexed in the NASA ADS.

In 1980thies Olga Silchenko developed a method of evolutionary synthesis for integrated spectra of stellar populations. In her PhD thesis the following important effects were noted for the first time: age-metallicity degeneracy while analyzing integrated spectra, and the applicability of TiO bands for determination of the stellar initial mass function. Both those effects were independently recovered by Western astronomers by 10-20 years later.

In the late 1980thies a series of Silchenko's observational works was started made at the 6m Russian telescope of the Special Astrophysical Observatory. Due to creation of the unique integral-field spectrograph MPFS by Victor Afanasiev in 1989 and to possibility for Silchenko to explore it from the first verification observations, she discovered chemically and evolutionary decoupled stellar nuclei in galaxies at the dawn of 1990thies and inner polar gaseous disks – at the fall of 1990thies. By compiling the results of the long-term MPFS survey of a sample of nearby S0 galaxies, she had confirmed the presence of decoupled stellar nuclei which suffered their last starforming event not earlier than 3-5 Gyr ago, in the majority of nearby S0 galaxies. This work was published by Olga Silchenko in the Astrophysical Journal in 2006.

Later deep long-slit spectroscopy of early-type galaxies with the reducer SCORPIO has allowed Silchenko to made two more conceptual discoveries. In 2007 together with Alexei Moiseev and Maarten Baes she published a study of metallicity radial gradients in giant elliptical galaxies. They found that the elliptical galaxies demonstrated two-zone radial structure: in the inner parts of galaxies the metallicity gradients were very steep (that excluded their formation by major merger) while in the outer regions they were very shallow. Basing on these results, Silchenko was the first to propose so called two-stage scenario of elliptical galaxy formation: firstly a very compact stellar seed was formed by monolithic collapse of a protogalactic cloud, and then outer parts were grown slowly through multiple minor mergers of small satellites. In 2012 the next scenario, this time for disk galaxy formation, was published. The study of the stellar populations of large-scale disks of S0 galaxies has revealed that these disks are old – mostly older than 10 Gyr. It means that S0 galaxies had fully completed the formation of their stellar disks till the redshift of 2; meanwhile spiral galaxies only started the formation of their stellar disks at z=1. The hypothesis has been formulated that 8-10 Gyr ago all disk galaxies were of S0 type, including our own Galaxy; and only much later many of them, those who had succeeded to `find' a source of outer cold gas accretion strictly in the main galactic plane, were transformed into spirals with current star formation confined to their thin stellar disks.

SITNIK Grigory Fedorovich

Born 01.02.1911 in the village of Pogar in Bryansk province. Graduated from the Mechanics and Mathematics Faculty of Moscow State University (MSU) (1933). Completed his postgraduate studies at Sternberg Astronomical Institute (SAI MSU) (1937). PhD thesis: "The Question about the Nature of Sunspots" (1938). D.Sc. thesis: "Absolute Photoelectric Photometry of Continuous Spectrum of the Sun" (1956). Associate Professor of Astrophysics (1939-1949), Deputy Director for Science at SAI (1940-1941), acting Head of Astrophysics Department at MSU, Head of Kuchino Observatory of SAI (1945-1996), and Head of Solar Physics Department at SAI (1958-1986). In July 1941, he went to the front as a volunteer. In 1945, discharged from the military service as Major General. Recipient of multiple awards, including six orders and the medal "For Courage". Professor (1961), member of IAU (since 1947), member of research group on Calibration Absolute Measurements of the International Meteorological Association. Died 14.10.1996 in Mosvow.

G. F. Sitnik was one of the leading experts in the field of solar physics, absolute measurements of radiation, and atmospheric optics. He was the first in the USSR and the third in the world who did absolute spectrophotometry of solar radiation. Based on his work, the secondary standards were developed for energy distribution over the spectrum (about 80 ribbon lamps for various organizations) and the calculation techniques were developed for the insolation of rooms and urban territories (his tables provided the basis for the urban sanitary norms).

G. F. Sitnik studied the distortion of the Earth's atmosphere to the observed energy distribution in the spectrum of the Sun. He analyzed the observations of emission lines of water vapor in the mountains and plains as well as analyzed the seasonal changes of the telluric lines of oxygen and water vapor. Found, for the first time, the dependence of the optical depth in the direction of the vertical from the zenith distance. His research results have applications in a few other areas: the identification of the most favorable conditions for the passage of laser radiation in the Earth's atmosphere; the estimation of the increase in the abundance of CO_2 molecules in the Earth's atmosphere due to anthropogenic factors, using the records of the Sun’s spectrum in the 1960s.

G. F. Sitnik developed a research method for emission and absorption lines in the solar spectrum, using the observed intensities of the multiple lines. As a result, the method was developed for empirical estimation of the effective depths of the emission and absorption lines formation.

G.F. Sitnik was an outstanding inventor. His 37 research publications related to observational instruments and methods. Based on the trophy vacuum King’s oven with the power unit, he developed the first Soviet high-temperature "model of the black body". Under his leadership and personal involvement, Kuchino Observatory was reestablished, the new solar telescope with cellostat was built, technical specifications were developed for the construction of solar telescopes ATB-1 at Lenin Hills (Moscow) and in Nanjing (China) as well as the optical design was developed for a horizontal solar telescope at the Tien Shan Astronomical Observatory (Kazakhstan).

During the postwar years, G. F. Sitnik taught courses on practical astrophysics and solar physics at the Mechanics and Mathematics Faculty of MSU and organized astronomy field trips in Kuchino. In 1958-1959, he delivered lectures in astrophysics at Nanjing University (China).

Author of more than 250 research publications and one monograph. Supervisor of 15 PhD students (including five foreign students).

SKLYAROV Yuri Andreevich

Born 27.01.1931 in the village of Zolotarevka, Stavropol province on January 27, 1931. Graduated from the Physics Faculty of Saratov State University (SSU) with a major in astronomy in 1953. In 1955-1960, worked as a collective farm (kolkhoz) chairman in Bezymyansky district of Saratov province. From 1960, taught astronomy at Saratov Pedagogical Institute. Elected for the position of an Associate Professor (1969), Professor (1984), Head of the Department of Meteorology and Climatology, the first Vice-Rector (1995-1999) at SSU. PhD thesis "Bolometric Pyroheliometer as Reference Instrument for Absolute Measurements of Direct Solar Radiation" (1965). D.Sc. in Technical Sciences thesis "Physical Principles of Precision Absolute Measurements and Providing Uniformity of Irradiance Measurements of Solar Radiation Flows" (1984). Died 19.06.2014 in Saratov.

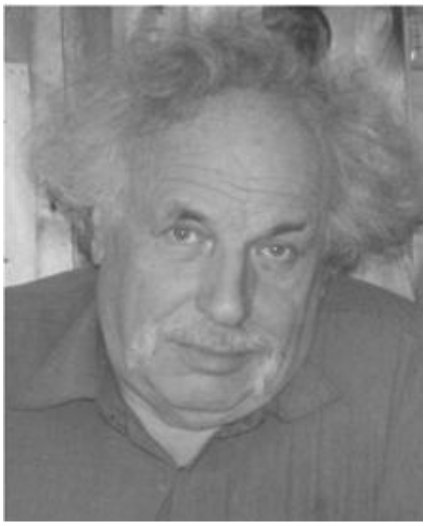
In 1954-1980, Yu.A. Sklyarov organized photographic observations of planetoids and comets at SSU to determine their precise positions. Since 1969, he was the head of Satellite Tracking Station No. 1044, in which staff members carried out visual coordinates measuring along with complete astrometric processing of satellite photographic observations obtained by different stations of the Astronomical Council of the Academy of Sciences USSR.

Yu.A. Sklyarov's research interests lie in the area of instrument design for precision radiation measurements, including high-altitude balloons and satellite measurements. Different versions of pyrheliometers and radiometers as well as devices for laser radiation measuring were designed with his participation. He was the chief designer of satellite instruments for measuring the important components of the Earth radiation budget – solar constant and short-wave reflected radiation. Those instruments worked efficiently on two Earth satellites "Meteor-3" No. 7 (1994-1995) and "Resurs-01" No. 4 (1998-1999). The longest sets of observations were recorded with an instrument measuring short-wave reflected radiation IKOR-M onboard of the Earth satellites "Meteor-M" No. 1 (2009-2014) and "Meteor-M" No. 2 (2014-2020). The processing of that data by his students and colleagues made it possible to generate maps of global distributions of monthly average albedo values and absorbed solar radiation. Geostationary satellite "Electro-L" No. 2 observations were successfully obtained with solar constant measuring instrument ISP-2M (2015-2016).

Yu.A. Sklyarov was actively involved in teaching. He was a research supervisor for 12 PhD students. Author and co-author of three monographs and about 260 research publications. Co-author of 15 certificates of inventions, patents and registered computer programs. Member of the Bureau of the Scientific Council for Astronomy of the Russian Academy of Sciences (RAS). On a regular basis, he read popular lectures in planetariums and gave presentations on radio and television. For many years, he was a deputy chairman of the local community organization "Znaniye".

Yu.A. Sklyarov was awarded two Orders of the Badge of Honor, the Order of Friendship, a gold and silver VDNH Medals, the Yuri Gagarin Medal and the Badge "Inventor of the USSR".

SKOMOROVSKY Valery Iosifovich



Born 27.08.1939 in Saratov. Graduated from Kazan State University in 1962. Since 1962 until present, has been working at the SB RAS Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation (from 1992 renamed into the Institute of Solar-Terrestrial Physics SB RAS), first as a a laboratory assistant and junior researcher and then progressing to the Optics Research Team lead and then head of the Solar Atmosphere Structure Laboratory (since 1986). D.Sc. in Phys.-Math. Sciences (2001). Member of the Rozhdestvensky Optical Society, Member of the Joint Organization for Solar Observations (JOSO) (2006–2010).

V.I. Skomorovsky's field of research relates to the solar atmosphere's fine structure and development of methods and instruments for its observation. V.I. Skomorovsky's research findings and inventions have applications in national and foreign observatories. Author of 154 research publications (including 23 inventions).

His creative efforts are focused on the establishment of modern observatories in the Sayan Mountains and near Lake Baikal. In the 1960–1970s, under his leadership, experimental facilities were built, which facilitated research and manufacturing of telescope optics and birefringent filters (BF). High-resolution telescopes have been designed and manufactured: specialized chromospheric telescopes (1970), the Automated Solar Telescope (1976), Large Solar Vacuum Telescope (1980), Solar Telescope for Operational Predictions (1982), and Expedition Telescope to observe extended corona during solar eclipses (1997).

Together with his international colleagues, V.I. Skomorovsky performed observations with the Swedish Vacuum Telescope with the filter for the Ba II 4554 Å, H_β lines, 0.08 Å at the International Science Center in the Canary Islands (2000). The filter was designed under his direction in 1974. Unique observational data were obtained that revealed the solar atmosphere fine structure in the intergranular spaces. In 2010, in cooperation with researchers from the University of Utrecht, he performed the adaptation of the Ba II 4554 Å, H_β birefringent filter to the Dutch Open Telescope for high-resolution tomographic observations of the solar atmosphere. V.I. Skomorovsky and his team designed a two-band filter on the He I 10830 Å, H_α lines that is of great predictive interest and a filter for the Fe X 6374 Å red coronal line.

Based on new synthetic crystals, developed an optical scheme; for the first time, manufactured a wide-field Solc filter as an element of a controlled filter to measure solar magnetic fields. Developed a new structure for an electrooptic modulator to improve the accuracy of magnetic field measurements.

Awards: the Medal of the Order "For Merit to the Fatherland", 2nd Class (2011).

SKULACHEV Dmitry Petrovich

Born in 1946 in Moscow. He graduated from the Physics Department of Moscow State University and since 1971 has been working at the Space Research Institute of the Russian Academy of Sciences (formerly the USSR Academy of Sciences).

Skulachev D.P. is the author of a large number of scientific papers and inventions.

The main area of scientific interests of Skulachev is the issues of experimental radiophysics and radio astronomy. With his participation, projects were carried out and instruments for radio engineering measurements, microwave analysis of electronic circuits, scientific instruments for remote research of natural resources from the Earth's surface, from aircraft and spacecraft were created.

Skulachev took part in scientific expeditions, carried out experimental work and measurements with the developed equipment in ground conditions and from aircraft.

Skulachev was directly involved in the development of methods and testing of scientific equipment for fundamental astronomical research, as well as the equipment of the RADIOASTRON space telescope.

According to the results of the research carried out by D.P. Skulachev, in 1991 he defended his thesis of the candidate of physical and mathematical sciences. Skulachev is the author of numerous scientific articles and inventions. Skulachev is actively promoting activities, is the author of popular science articles.

D.P. Skulachev participated in the creation and development of test methods and directly in the testing of scientific equipment for the "Relict" space experiment on board the artificial Earth satellite "Prognoz-9".

Skulachev DP took part in the processing of scientific data obtained in the space mission "Relict". The results of this work made it possible to obtain new fundamental results in the field of observational cosmology.

Skulachev is the head and chief designer of scientific instruments for radiophysical microwave research from spacecraft intended for landing on the surface of Mars and the Moon.

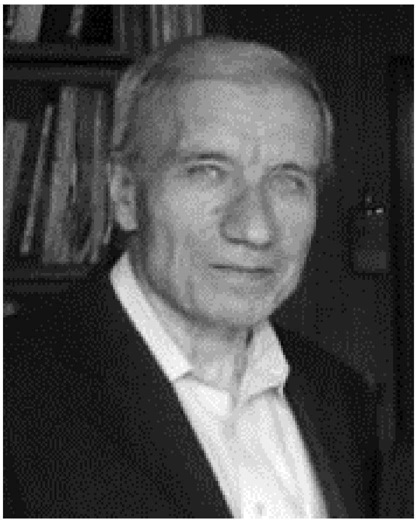
D. P. Skulachev is a holder of the Soviet Order of the Badge of Honor, his scientific work was awarded the Prize. I.S. Shklovsky 2020

SLYSH Vyacheslav Ivanovich

Born 19.11.1935 in Kharkov, Ukraine. He graduated from the Moscow Power Engineering Institute in 1959, postgraduated from the Institute of the Terrestrial Magnetism, Ionosphere and Radio Wave Propagation in 1962 and Moscow State University in 1964. His tutor in astrophysics at the MSU was Joseph Shklovsky. In 1977, V. Slysh obtained the degree of Doctor of Sciences. In 1997, he was elected as a Corresponding Member of the Russian Academy of Sciences. Vycheslav Slysh began his career as an engineer at the P.N. Lebedev Physical Institute of the USSR Academy of Sciences in 1959, and continued as a junior researcher at the Sternberg Astronomical Institute of the Moscow State University in 1962-1968. Since 1968 he worked as a Head of the Radio Spectroscopy Laboratory and Head of the Department of Astrophysics at the Space Research Institute of the USSR Academy of Sciences. Died 22.08.2008 in Moscow.

In 1990, together with the Department, V. Slysh moved to the Astro Space Centre of the P.N. Lebedev Physical Institute where he became a Deputy Director (1990-2005) and Head of Department (1990-2008). In 1963, V. Slysh proposed a method of determination of sizes of celestial sources of synchrotron emission (known as the "Slysh formula" in the literature) and predicted the existence of radio sources associated with quasars and active galactic nuclei. He demonstrated that non-stationary sources can contain ultra compact nuclei with brightness temperature exceeding the synchrotron limit. He conducted first investigations of low frequency radio emission of the Sun and the Galaxy using the spacecraft 'Venera', 'Mars', 'Luna-11,12'. As a result of these investigations, the role of the galactic ionized gas in the formation of the synchrotron spectrum of the Galaxy has been exposed. In these experiments, low frequency flashes of solar radio emission have been discovered. These flashes have been shown to be related to the transfer of flows of energetic particles and shocks from the solar corona to the interplanetary medium. Later, he studied interstellar molecules of hydroxyl, water, formaldehyde and methanol, and discovered a large number of sources of maser emission in the Galaxy associated with star formation regions. V. Slysh proved that masers related to the star formation regions, in particular the masers in lines of interstellar hydroxyl, were situated deep within molecular clouds. He conducted large surveys of the Galaxy searching for new methanol masers and discovered about 100 new sources. He was one of the initiators the new 70 meter radio telescope on the plateau Suffa in Uzbekistan, the space radio interferometer RadioAstron. V. Slysh was a member of Scientific Council on Astronomy of the Russian Academy of Sciences, a member of the International and European Astronomical Unions. He was awarded the Bredikhin Medal of the Russian Academy of Sciences for outstanding work in astronomy. He published more than 200 scientific papers.

SMIRNOV Grigory Timofeevich



Born 11.10.1948 in village Verkhneye Tserkovinskoe of Tonkinsky district of the Gorky region. In 1971, he graduated from the Gorky State University named after Lobachevsky (now UNN State University, Nizhny Novgorod). Since 1972, he has been constantly working at the Pushchino Radio Astronomy Observatory (now – PRAO ASC FIAN) in various positions: from engineer, researcher, to Deputy Director of the Observatory for Science (2000-2004). Since 2004 – Head of the Department of Space Radio Spectroscopy. Candidate of Physical and Mathematical Sciences (1985). Member of the IAU (since 2003).

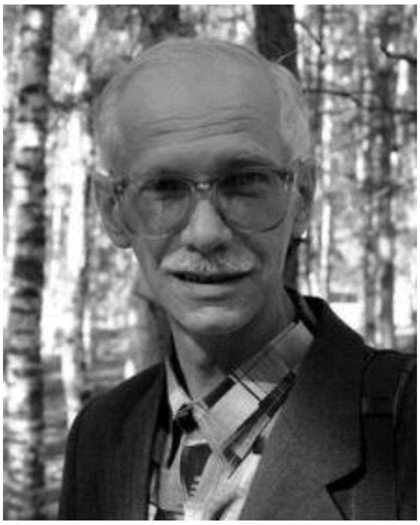
The main scientific works are in the field of radio astronomy, the study of the interstellar matter, cosmic rays, radio spectroscopy, and radio recombination lines. He is the author of more than 90 scientific publications.

In the middle of 70, with the active participation of G. T. Smirnov, multichannel filter spectrum analyzers and a digital system for collecting information and controlling the RT22 FIAN radio telescope based on the M6000 computer were created. For the first time in the USSR, a system for automating radio astronomy research was created on a full-steerable radio telescope, which allowed observations to be made in the cm and mm wave bands 24 hours a day. In the 1980s, G. T. Smirnov created an installation, developed a technique, and conducted spectral line observations on the DKR-1000 FIAN radio telescope. For the first time, radio recombination lines were recorded in the meter wave band.

As a result of radio astronomic studies of radio recombination lines together with R. L. Sorochenko, the following regularities were established. The experimental dependence of the Stark broadening of radio recombination lines on the main quantum number ~ $n^{4.4}$ was obtained, which confirmed the theory of broadening developed by Grim and Sobelman. This was made by accurate measuring profiles of higher order lines $\Delta n > 1$ in the fully ionized gas of the HII region. The carbon lines of the meter range n = 382 – 747 observed in the absorption indicate a nonequilibrium population of the quantum levels due to dielectronic recombination. Observations of the C747β carbon recombination line in the interstellar medium revealed giant atoms with a Bohr orbit diameter of 0.06 mm, which is close to the maximum possible size of ~ 0.1 mm of highly excited atoms in the Galaxy. The radiation of radio recombination lines of hydrogen from the cold clouds of the interstellar medium in the direction of Cassiopeia A. The rate of hydrogen ionization by cosmic rays of 10^{-16} s^{-1} was determined. Observations of radio recombination lines of hydrogen in a cold ISM can be a new effective method for studying cosmic rays.

G. T. Smirnov was awarded the USSR State Prize in Science and Technology (1988) as a member of the author's team for the series of works "Discovery and research of radio lines of highly excited atoms (RRL)".

SMIRNOV Mikhail Alexandrovich



Born 11.11.1954. In 1978, graduated with Distinction in astronomy from M.V. Lomonosov Moscow State University (MSU). Later on, did his postrgraduate studies in astrophysics at Sternberg Astronomical Institute (SAI MSU). In 1981, defended his PhD thesis "Evolution of Galaxies" and got employed by the Astronomical Council of the Academy of Sciences USSR (Astrosovet, now the Institute of Astronomy of the Russian Academy of Sciences, INASAN) at the Artificial Earth Satellites department. In 1996, defended his D.Sc. thesis "Photometric Observations of Artificial Celestial Bodies". Died 30.08.2006 in Moscow.

A.M. Smirnov is the author of 60 research publications and co-author of 4 inventions. He developed and implemented a method of spectral and photometric observations of artificial celestial bodies to determine their shape, reflectivity, and orientation. Based on the developed methodology and observations, he was the first to determine the shape of 9 geostationary satellites (with no a priori information), and established the nature of damage to the American satellite Tras-Teige. He is a co-author of the brilliant idea of detecting meter- and decameter-sized bodies in meteor showers before entering the Earth's atmosphere (often called Inasans) as well as a technique for detecting and identifying such bodies. An avid promoter of astronomy, encyclopedist and author of many popular articles in different areas of natural science. Scientific editor of several volumes of the "Great Children's Encyclopedia" of the Russian Encyclopedia Association. For his contribution to the field of astronomy in Russia, the asteroid 109573 Mishasmirnov (2001 QQ269) discovered by M. A. Smirnov and S. I. Barabanov at the Simeiz Observatory was named after M.A. Smirnov.

SMIRNOVA Maria Alexandrovna

Born in 1892 in Moscow. A student of Girls' Academy (the first decade of the 20th century); P.K. Sternberg's student. A junior staff member of the Astronomical Observatory of Moscow State University (AO MSU) (1919), researcher at the AO Time Service (since 1920), researcher at Sternberg Astronomical Institute (SAI MSU) (after 1931). PhD in Physics and Mathematics (1935). Associate Professor in Astrometry at the Astronomy Department of the Faculty of Mechanics and Mathematics, MSU (1940). Head of the SAI Time Service (1932 – 1941). Senior Researcher at SAI (1951). Died in 1986 in Moscow.

In January 1920, following the AO MSU Director's order (S.N. Blazhko), M.A. Smirnova, together with A.S. Mirolyubova, assumed responsibility for the Time Service's operation. In the 1920s, the Moscow Time Service worked for the Central Telegraph, railway stations, railway lines, the station of city tram electric clocks, factories, large stores, and individual citizens. The main Kremlin clock was also checked with the AO clock each midnight. After 1st September 1931, the AO Time Service became a part of the SAI Time Service. Later on, the SAI Time Service joined the network of newly organized similar services, with the main service located in Pulkovo. It was reliably connected to the main foreign time services at the Greenwich and Paris Observatories. The improved accuracy of signals was of the order of thousandths of a second. In 1934, a new primary clock, Shortt-47, was purchased. M.A. Smirnova assembled, installed, and started the clock on her own. During World War II, after SAI's evacuation (early October 1941), M.A. Smirnova and A.S. Mirolyubova stayed in Moscow and showed genuine heroism and dedication. They ensured the reliability of the time service during the most difficult months when the Pulkovo Observatory's time service stopped its operation because of the approaching front and the main SAI Time Service in Sverdlovsk had not yet become operational.

The Riefler clock was checked using radio time signals from Bordeaux (France) and since December 1941, also from Sverdlovsk.

For their heroic work during World War II, M.A. Smirnova and A.S. Mirolyubova were awarded the Orders of Lenin (1951).

SMIRNOVA Tatiana Vasilievna

Born 18.05.1947 in Yaroslavl. In 1970, she graduated from the Moscow Institute of physics and technology (MFTI). She completed postgraduate studies at MFTI and defended her PhD thesis in 1974, Doctor of Physics and Mathematics since 2000. Permanent employee of the Pushchino Radio Astronomy Observatory of Phys. P. N. Lebedev Institute of the Russian Academy of Sciences in various positions from eng. up to leading scientist (from 1974 up to now). Member of the Russian Astronomical society, the American Astronomical society, and the International Astronomical Union (MAS).

The main scientific works relate to the field of radio astronomy, physics of pulsars and the interstellar medium. Author of more than 100 scientific papers.

In the 1970s, T. V. Smirnova and her colleagues determined the atmospheric parameters of Venus (temperature, pressure) at the average surface level from radioчastronomy and radar measurements, the content of water vapor and ammonia in the lower atmosphere of this planet was estimated. These data were used to launch spacecraft to Venus. Together with A.D. Kuzmin, she studied the physical conditions in the atmospheres of Saturn and Jupiter (temperature and pressure profiles, gas content in the atmosphere), which was important for further research on spacecrafts.

In the 1980s, she performed (together with her colleagues) the first observations of the microstructure of pulsars at low frequencies and developed a technique for analyzing data with high frequency and time resolution. As a result, a number of important results on the properties of micropulse radiation from pulsars were obtained in the 1980s and 1990s. From 1994 to 1996, she worked at Oberlin College, USA. There, important work was done on the study of refractive scintillation of pulsars.

Together with V. I. Shishov, a new method for studying the spatial structure of the pulsar magnetosphere using interstellar plasma was proposed. It was used to determine the two-dimensional spatial structure of the radiation regions of a number of pulsars with a record angular resolution of 10^{-8} arcseconds. In the 2000s, observations of pulsars at low frequencies were made using the Pushchino Observatory's antennas to study interstellar plasma. Analysis of these data together with measurements at high frequencies allowed us to obtain the spectra of the interstellar plasma inhomogeneity in the direction of a number of pulsars in a wide range of spatial scales of inhomogeneities. It was shown for the first time that angular refraction plays a significant role in the observed pulsar scintillations.

Since the launch of the RadioAstron space telescope in 2011, she has been actively involved in observations at the world's largest antennas and analysis of data obtained at ground-based and ground-space interferometers. T. V. Smirnova with co-authors have obtained data on the distribution of effective interstellar plasma layers on which radiation from pulsars is scattered. The scattering angles in the direction of a number of pulsars are measured, the presence of giant prisms in the interstellar plasma is shown, and the distances to these structures are estimated.

She works with young scientists as the Chairman of the State attestation Commission of the Pushchino State Natural Science Institute.

SMOLKOV Gennady Yakovlevich

Born 10.04.1933, Chelno-Vershiny village, Chelno-Vershinsky district, Kuibyshev oblast. In 1955, graduated from Irkutsk State University with a degree in physics. From 1955 to 1960, worked at the Irkutsk Integrated Magnetic-Ionospheric Station, first as Head of the Radio Astronomy Department and then Scientific Secretary of the Station. Since 1961, after joining the Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation, the USSR Academy of Sciences (since 1992, ISTP SB RAS) held different positions: Scientific Secretary, Lab Supervisor, Head of Observatory, Head of Department, and Scientific Director. Since 1999, Chief Researcher in Radio Astrophysics. Doctor of Sciences in Technical Sciences (1986), Professor (2001). Died 01.08.2021.

G.Y. Smolkov's primary areas of research relate to solar physics, solar-terrestrial relations, and astrophysical research methods. Author and co-author of more than 200 research publications and three monographs.

G.Y. Smolkov is a founder and facilitator of astrophysical research in Siberia, one of the leading scientific schools of the Russian Federation. Actively participated in the development of the Institute, Department of Radiophysics and Department of Astrophysics of Irkutsk State University.

Developed the methods of coronal magnetic field measurements, which enabled studying the structure and dynamics of magnetic fields in prominences for the first time. His main contribution to solar corona research was the design and construction of the unique Siberian Solar Radio Telescope (SSRT). Based on SSRT data, enabling studies of the spatial structure of microwave radiation sources, G.Y. Smolkov obtained new fundamental results on corona above active regions, non-monotonic heating of corona, and the signs of flare preparation and their prediction methods.

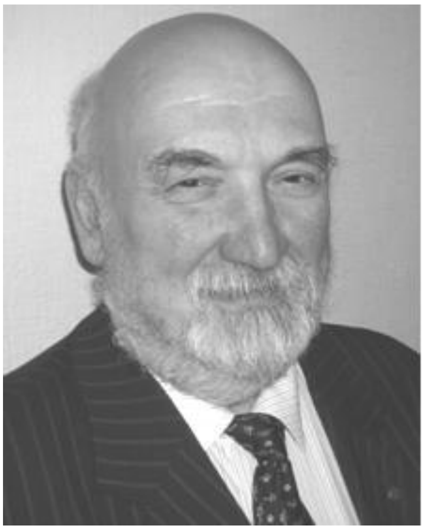
In 1997, G.Y. Smolkov and his research team were awarded the Russian Federation Government Prize in Science and Technology for the design and construction of SSRT.

Research supervisor of two D.Sc. and five PhD theses.

Member of the Russian Astronomical Society (1965), a Member of the RAS Scientific Council Bureau for Astronomy (1999), representative of Russia in the Joint Organization for Solar Observations (1964), Member of the Scientific and Dissertation Councils of ISTP SB RAS, Member of the International Astronomical Union (1965).

Awards: the Medal "For Valiant Labour" (1974), Medal "For Labour Valour" (1975), Medal "Veteran of Labor" (1984), honorary title "Honored Scientist of the Russian Federation" (2004). Official awards from the RAS, SB RAS, and the Ministry of Science and Higher Education of the Russian Federation: "Honored Veteran of the SB RAS" (1982), "Honored Worker of the Russian Federation in Science and Technology" (2016).

SNEGIREV Sergey Donatovich



Born 12.04.1945 in the town of Alatyr, the Chuvash ASSR (now the Chuvash Republic). 1963-1968, studied at the Faculty of Radiophysics at the State University of Gorky (now N. I. Lobachevsky State University of Nizhny Novgorod). In 1983, completed his PhD. In 1999, obtained his D.Sc. In 2012, awarded the title of a Professor. In 1968-1971, did his military service in the Russian Navy. In 1971-2016, worked at the Radiophysical Research Institute (NIRFI) holding different positions, including an engineer, senior engineer, junior researcher, head of department, deputy director, and director (2000-2019). Member of the International Astronomical Union (IAU). Awarded two medals. Died 04.09.21 in Nizhnii Novgorod.

S.D. Snegirev's research interests are radio astronomy, radio physics, solar physics and solar-terrestrial relations, the use of radio-physical methods in medical diagnostics.

S.D. Snegirev's early research was focused on wave and vibrational motions in the chromosphere and corona of the Sun based on the investigations of fluctuations in the solar radio emission in the range from cm to decametre wavelengths. He was the first to investigate by radio methods the propagation of disturbances in the lower corona of the quiet sun. For a number of quiet sun models, he estimated theoretically that the disturbances with periods of 30-180 s propagate with velocities 7-40 km/s being the trains of slow MHD waves. At the same time, the disturbances responsible for the frequency drift of radiation pulsations from the lower corona to the upper layers at heights R = 1,5R☼ are observed as radiation pulsation trains with periods of ~ 10 minutes and being interpreted as magnetoacoustic waves in the coronal plasma.

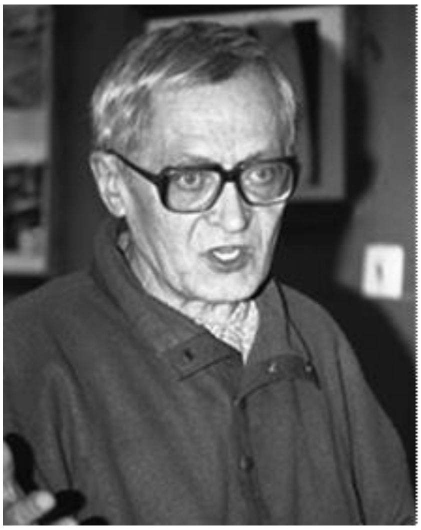
S.D. Snegirev with his colleagues studied long-period fluctuations of the solar radio emission and found their growth related to pre-flare processes in the activity centers. That led to the development of the patented method of short-term forecast of powerful solar flares.

Together with his colleagues, studied solar spike-like events using very-long-baseline interferometry (VLBI) network with high spatial resolution. The apparent angular size of the burst-like sources was estimated to be no more than 0.5 arc second and a brightness temperature of £ 10^9 K. The results obtained were explained in the frame of the coherent mechanism of spike generation by quasi-linear relaxation of the loss-cone electron distribution.

Under his leadership, research results on the long-period pulsations of the Earth's magnetic field made it possible to establish their relationship to variations of solar ionizing radiation and to develop a patented method of a forecast of powerful solar flares on the basis of the dynamics of such pulsations.

SD Snegirev's recent research relates to the use of radio-physical methods in medicine. A number of important results have been obtained in the diagnosis of various diseases using microwave radio-thermometric measurements.

SNEZHKO Leonid Isaakovich



Born 03.11.1940 (Irbit, Sverdlovsk Region. Graduated from Ural University (Sverdlovsk, now – Ural Federal University, Ekaterinburg) in 1962. Postgraduate student of Sternberg Astronomical Institute of Moscow State University in 1962-1965. In 1966-1969 – Assitant of Astronomy Department and Junior Researcher scientist of Kourovka Observatory of Ural University. Since 1975 to 2003 he had been working at the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991), holding different positions: Junior Researcher, Head of Department (1974-1979), Deputy Director (1985-1991), Leading Research Scientist (1991-2003). In 1980, he defended his Ph.D. thesis on «Studies of Large telescope optics». In 1991-2003 – responsible astronomer of the 6-meter telescope. Died 19.05.2011 in Novyy Arkhyz.

His research interests were related to the study of the internal structure and evolution of stars and binary systems, studies of large astronomical optics. He is an author of more than 60 scientific papers.

In the end of 60s – beginning of 70s he published some studies on physics and evolution of close binary star systems. In particular, results of his studies on computation of these systems evolution had been compiled in fundamental work on classification of close binary systems (co-author – M.A.Svechnikov, 1974). His astrophysical work of subsequent period devoted mainly to the study of hot stars, a quantitative analysis of their atmospheres, the study of the effects in the extended photosphere of supergiants, leading to distortions in the line profiles. One of the main of coauthors of these works was V.V. Leushin.

Since the mid-70s his main interests shifted to the field of study of astronomical optics, which was due primarily to the needs of the study of 6-m SAO telescope optics, features of a microclimate of its giant dome. Under his leadership, the work was carried out to optimize the telescope working conditions; the reconstruction of an automated telescope control system was conducted until the end of the 90s. His unique experience has been invaluable to the SAO, he also was in demand in other observatories in the country and abroad. The results of this work were outlined in his Ph.D. thesis on "The study of optics of large telescopes" (1980).

For participation in the work on the development and research of the 6-m telescope he was awarded the medal "For Labor" (1976). His work on the study and control of large optics were awarded a silver medal of Exhibition of Achievements of National Economy and the USSR Council of Ministers Prize (1982).

SOBOLEV Andrey Mikhailovich

Born 30.06.1956 in Sverdlovsk (now Yekaterinburg). Graduated from Ural State University (now Ural Federal University, UrFU) (1978). Completed his postgraduate studies at the Astronomical Council of the Academy of Sciences USSR (now, the Institute of Astronomy of the Russian Academy of Sciences, INASAN). Since 1982, worked at K.A. Barkhatova Kourovka Astronomical Observatory of UrFU, first as a senior researcher (1991), then as Head of Department of Astrophysics and Solar Physics and then progressing to Deputy Director (2017). Member of the International Astronomical Union, European Astronomical Society and Eurasian Astronomical Society.

A.M. Sobolev is an expert in theoretical and observational research on star-forming regions and young stars. Author of about 250 research publications in national and international journals. His studies of cosmic masers have attracted the greatest interest (by a citation index). A.M. Sobolev extensively cooperates with Russian and international colleagues. His research findings on the regions and processes of star formation are listed among the most important achievements of Russian astronomy:

– 2001: developed a model of pumping of various maser transitions of methanol and hydroxyl molecules by radiation of heated dust;

– 2005: detected periodic ejections from a young massive binary star system based on observations of radio lines of silicon oxide and methanol;

– 2006: detected a record-breaking narrow peak with a width of less than 30 m/s in the maser radio lines in the source G343.12-0.06, which is almost an order of magnitude smaller than the width of the narrowest components of the previously recorded maser lines (in cooperation with M.A.Voronkov, K.J.Brooks, S.P.Ellingsen, A.B.Ostrovskii, and J.L.Caswell);

– 2013: developed a model for explaining periodic variability of class II methanol masers in the vicinity of binary stars (in cooperation with S.Yu.Parfenov);

– 2015: discovered a new type of cosmic methanol masers in the vicinity of evolved stars (in cooperation with J.I.Nakashima, S.V.Salii, S.Deguchi, et al.);

– 2016: a theoretical study of the magnetic field in the accretion disks of young stars: the influence of magnetic diffusion, buoyancy and the Hall effect (cooperation with S.A.Khaibrakhmanov, S.Yu.Parfenov, A.E.Dudorov);

– 2018: discovered ultra-fine structures in water vapor masers with the size of the Sun in the star-forming region of Cepheus A using the RadioAstron ground-space interferometer (in cooperation with J.M. Moran, A. Alakoz, M.D. Gray, H. Imai, W.A. Baan, A.M. Tolmachev, V.A. Samodurov, and D.A. Ladeyshchikov);

– 2019: series of research studies on astrophysics of masers (in cooperation with colleagues from Australia, Japan, USA, Russia, China, Germany, and other countries);

– 2020: study of masers in the accretion disk of the massive young stellar object G358.93-0.03: measuring the propagation velocity of the excitation wave and discovery of new maser molecules (in cooperation with R.A.Burns, X.Chen, S.Yu.Parfenov, and other colleagues).

Research supervisor for 4 PhD degrees, more than 30 Master’s degrees, and graduate and undergraduate research projects. For many years, he has been in charge of the scientific program for the Russia-wide annual student astronomical conferences "Physics of Space".

Awarded the VDNH Bronze Medal (1987), the Certificate of Honor of the Ministry of Industry and Science of Sverdlovsk province (2014).

SOBOLEV Victor Victorovich

Born 02.09.1915 in Petrograd (now St. Petersburg). In 1938, graduated from Leningrad State University (LGU, now St. Petersburg State University, SPbU). In 1941, completed postgraduate studies in astrophysics and obtained his Ph.D. In 1946, obtained his D.Sc. Corresponding Member of the Academy of Sciences USSR (AS USSR) (1958). Academician of AS USSR (1981). Worked at LGU all his life. Researcher at the Astronomical Observatory (1941–1944). Research Assistant (1944–1945), Associate Professor (1945–1948), Professor (1948–1999) and Head of Department of Astrophysics (1948–1989). In 1960–1961, Director of the Astronomical Observatory of LGU (now **V. V. Sobolev Astronomical Institute,** SPbU). **Award the honoured title of 'Hero of Socialist Labour' (1985). Died 07.01.1999 in St. Petersburg.**

V.V. Sobolev's main areas of research are the theory of radiative transfer and the physics of gaseous nebulae and stellar envelopes. Author of more than 150 research publications and 4 books.

V.V. Sobolev proposed the now standard method for determining gaseous nebulae temperatures by considering the energy balance of their electronic gas (1941). In the 1940s, developed the theory of line formation in dilute gaseous media moving with velocity gradients (stellar envelopes, stellar winds, accretion discs, etc.). Due to the Doppler shifts caused by the velocity gradients, spectral line photons directly escape from the medium, thus avoiding multiple scattering. This leads to radical simplifications in calculating the state of a non-LTE gas and the spectrum of the emergent radiation. This theory, now known as the Sobolev theory, is presented in his book "Moving Stellar Envelopes" (1947; English translation, 1960). In 1941, in his study of the transfer of Lyman-alpha radiation in planetary nebulae, V.V. Sobolev formulated the approximation of complete frequency redistribution (CFR). The CFR is one of the cornerstones of the modern theory of line formation in stellar spectra. In 1946, he formulated the basic integral equation describing CFR multiple scattering of spectral line photons and found its approximate solution. Using Ambartsumian's invariance principle and assuming CFR, V.V. Sobolev found the exact solution of the Milne–Eddington model problem of absorption line formation in stellar spectra.

V.V. Sobolev is one of the founders of the analytical theory of radiation transfer in scattering media. He developed the resolvent method for solving the integral equations of multiple light scattering. He formulated and solved vector equations of multiple Rayleigh scattering (1943) and predicted the possibility of observing polarization in eclipsing variables (the Sobolev–Chandrasekhar effect). Attempts to find this effect led to the discovery of interstellar polarization in the radiation of stars. He also studied non-stationary radiation fields and applied the theory to explain phenomena observed in the ejecta of novae. These results were summarized in his book "Transfer of Radiation in Atmospheres of Stars and Planets" (1956; English translation: "Treatise on Radiative Transfer", 1963).

The analytical theory of multiple anisotropic light scattering founded by Ambartsumian and Chandrasekhar in the 1940s got its essentially final form in Sobolev's publications of 1960s, summarized in his book "Light Scattering in Planetary Atmospheres" (in Russian, 1972; in English, 1975).

V.V. Sobolev founded the St. Petersburg astrophysical scientific school, with dozens of his Ph.D. and D.Sc. students. For decades, V.V. Sobolev's "Theoretical Astrophysics" (3rd ed. in 1985) was the standard textbook on theoretical astrophysics in Russia.

Minor planet 2836 discovered in 1978 was named after V.V. Sobolev.

SOBOLEV Vladislav Mikhailovich

Born 01.05.1928 in the village of Krug, Chudovo District Novgorod Region. In 1951, graduated from Dept. of Physics, The State University of Leningrad. In 1955, after the post-graduate course of the Central Astronomical Observatory at Pulkovo – with Dept. of Solar Physics of the Pulkovo Observatory. Deputy Director (1965–1983), Interim Director (1982–1983). Cand.Sci. (Phys.,Math., 1955), Senior Researcher (Astronomy), (1962), Member of IAU (1961), Member of the Organizational Committee of IAU Commission No 12, Curator on Chromosphere of the Section «The Sun» of the AstroCouncil of the USSR Academy of Sciences, Deputy Chief Editor of «Solar Data» Bulletin. Died 24.09.1993 in St.-Petersburg.

His well-known scientific works are devoted to studies of the solar atmosphere and prominences. Expert in the area of Solar Spectroscopy. Authored more than 70 scientific works, contributing to the theory of the solar chromosphere.

Enthusiastically observed total solar eclipses; took part in six eclipse expeditions (record in the history of the Pulkovo Observatory). The most successful of these were observations in Mexico (1970) and in Mauritania (1973).

In 1960-ies and 1970-ies, was one of managers and executive officers in the implementation of the Soviet Stratospheric Solar Observatory, headed by Director of the Pulkovo Observatory Prof V.A. Krat. As a result of four successful launches of the stratospheric astronomical station (1966–1973), unique photographic and spectral data on the solar photosphere were obtained.

Regularly carried out spectral and photometric observations of the Sun at Pulkovo; was in charge of the AZU-5 Telescope. In 1980-ies, going on with studies of the solar chromosphere, studied also solar-terrestrial connections.

Organized solar studies in Cuba (1970-ies), on particular, supervised the facilitation of Horizontal Solar Telescope for Habana optical station. Summarized his long-year observations, both made during eclipses and out-of-eclipses in his Dr.Sci. Thesis, «The Study of Physical Characteristics of the Solar Atmosphere on the basis of spectral-photometric observations», which remained unfinished because of his premature death.

Supervised two Cand.Sci. theses.

Honored with State Awards: Order of «Badge of Honor» (1975), Order of the Republic of Mauritania «For Merit to the Nation» (1973).

SOBOLEVA Natalya Sergeevna

Born 17.07.1933.
Studied at the Moscow State University from 1951 to 1955.
Staff member of the Main (Pulkovo) astronomical observatory (Leningrad) from 1955 to 1969. Defended her Ph.D thesis in 1966. Worked at the Special Astrophysical Observatory of the Academy of Sciences of the USSR (Russian Academy of Sciences since 1991) from 1969 to 2012. Starting from 1989 – Leading Researcher at the Saint Petersburg branch of SAO RAS. Defended her Dr.Sci. thesis on "Investigation of radio galaxies with the Large Pulkovo Radio Telescope and RATAN-600" in 1993. She was honored with a medal "For Valiant Work" for her contribution to science and her participation in the development and work of the RATAN-600 radio telescope. Died 01.01.2012 in Zelenchuk.

She is the author of over 200 scientific papers. Her main area of scientific research is related to radio astronomy and physics of the Solar System.

In 1956-1958, Soboleva had been one of the authors of the first world-known results on the detection of circular polarization of Solar radio emission in centimeter wavelengths, as well as refining the geometry and physics of the long-lived magnetic plasma formations in the lower chromosphere of the Sun. She developed a technique of determining the magnetic field of the radiating region located above a sunspot, and also was the initiator of using the eclipse method (occultation of the Sun by the Moon) to refine the coordinates and height above the photosphere of these formations.

N.S. Soboleva developed a theory of plasma formations and suggested simple methods of determining their parameters from the multi-frequency data of radio observations.

For 22 years, Natalia Sergeevna had studied with a high accuracy (up to small fractions of a degree) the Faraday effect variations during occultation by the Solar corona of highly polarized radio sources. It later became evident that in reality, the Solar magnetic field has a "spiral" rather than dipole structure, which is formed by the Solar wind.

Natalia Sergeevna was the first to obtain polarized radio images of the Crab Nebula in multiple centimeter wavelengths, and she conducted the first detailed investigation of radio polarization of the Moon and the most accurate determination of the dielectric capacity of the Lunar surface.

N.S. Soboleva was one of the active members of the development of the RATAN-600 radio telescope. Her methodological work is an invaluable contribution to the investigation of factors that lower the effectiveness of the radio telescope.

In 1976, during her Lunar studies with RATAN-600, she discovered the strong radiation of active emitters installed by the USA, which were thought to be turned off in compliance with the demand of the global community (ALSEPs, Apollo Lunar Surface Experiment Package). Using RATAN-600, their exact coordinates were determined and proven to correspond with the positions of ALSEPs.

N.S. Soboleva had suggested and implemented in the RATAN-600 observations the "fixed-focus method", which allows one to considerably increase the accuracy of determining the flux density of the studied radio sources.

In the later decades, N.S. Soboleva conducted research within the scope of the "Big Trio" international project (RATAN-600, VLA, BTA), in the course of which one of the most distant radio galaxies in the Universe (z=4.515) was discovered. The age of the stellar population of the host galaxy is estimated as ~ 0.8 billion years.

SOKOLOV Leonid Leonidovich

Born 17.12.1945 in Kizlyar. In 1970, graduated from Pet-rozavodsk State University. From 1972, has been working in the Special Astrophysical Observatory, AS of the USSR (RAS from 1991) in different positions: Research Technician, Junior, Sen-ior, Leading Researcher, and Head of the Group of gamma-ray bursts study (2003-2015). During 1973–1977, a postgraduate student at SAO AS of the USSR under I.M. Kopylov's scientific supervision. In 1986, defended his Ph.Dr. thesis on "Nonstation-ary Atmospheres of Hot Supergiants and Late Stages of Evolu-tion of Massive Close Binary Systems". In 2002, defended his Dr.Sc. thesis on "Identification of Gamma-Ray Bursts: Optical Transients and Host Galaxies". An IAU member from 1990. An editorial board member of the "Astrophysical Bulletin" journal.

The author of more than 170 scientific papers on late stages of evolution of massive stars, gamma-ray bursts (GRBs) and their host galaxies, supernovae, compact relativistic objects of stel-lar mass. He was the first in Russia who observed optical afterglows of gamma-ray bursts.

In the early 1980s', V.V. Sokolov, on the basis of observations fulfilled together with I.M. Kopylov, studied the first close binary system Cyg X-1 with a blue supergiant and a compact mas-sive (relativistic) object. The system parameters were determined. The observational lower limit of mass of the relativistic companion was determined (> 6.5 solar mass) which was awarded with a VDNKh medal.

From the middle 1980s' to 1991, was an active participant of A.A. Lovunov's seminar in Protvino (IHEP) on theoretical-field (Feynman) description of gravitation. It resulted in publica-tion of several papers in the "Astrophysics and Space Science" journal. At these seminars the statement of observational problem on studying space gamma-ray bursts was also discussed.

In the early 1990s', V.V. Sokolov initiated the study of space GRBs in SAO. Together with S.V. Zharikov, V.N. Komarova, and A.I. Kopylov, he studied the GRB localization regions in the time when it was still thought that their sources are neutron stars in the Galaxy. Based on the accumulated experience of BTA observations of faint objects (pulsars), a group headed by V.V. Sokolov was formed for follow-up observations and identification of new bursts which started in SAO in May of 1997 from the source GRB070508. The first ten GRBs were identified and their redshifts were determined together with ASC FIAN, ISR, PTI, SAI, Mexico National Institute of Astronomy, Institute of Astrophysics of Andalusia (Spain), Nainital Astrophysical Observatory (India). These results were used in observations with the HST, Keck, Subaru, the 10.4-m GTC telescope. V.V. Sokolov studied host galaxies with BTA, made the first review of data on their photometry and spectroscopy, made the modeling of energy distribution in their spectra, determined their luminosity, age, internal absorption, and star formation rate. Three Ph.Dr. theses were prepared and defended under V.V. Sokolov's supervision. He also directed the work of postgraduates in India and Spain. In 2011 and 2012, participated in organization and holding of international workshops in India and Spain. In 2010, V.V. Sokolov lectured on identification of gamma-ray bursts to students and postgraduates in Leiden University. V.V. Sokolov initiated and worked in organizing committees of three international workshops in SAO: "GRB Mini-Workshop" (2006), "Many Faces of GRB Phenomena – Optics vs High Energy" (2009), and "Quark Phase Transition in Compact Objects and Multimessenger Astronomy: Neutrino Signals, Supernovae, and Gamma-Ray Bursts" (2015).

SOKOLOV Vladimir Vladimirovich

Born 23.04.1952 in Shadrinsk, Kurgan province. In 1974, graduated with a degree in Astronomy from Leningrad State University (LGU, now St. Petersburg State University SPbU). In 1974-1996, worked at the Astronomical Observatory of LGU (AOLGU) (now V. V. Sobolev Astronomical Institute, SPbU), holding different positions. In 1999-2005, worked at the Center for Technical Support of Educational Programs at SPbU. Studied towards his PhD degree by correspondence (1976-1980) and D.Sc. degree (1996-1999) at the Department of Celestial Mechanics of the Mathematics and Mechanics Faculty, SPbU. Associate Professor (2005), Professor (2010), the Department of Celestial Mechanics, SPbU. PhD thesis "Conditionally Periodic Solutions and Resonances in the Problems of Celestial Mechanics". D.Sc. thesis "Gravitational Scattering Trajectories and Their Astronomical Applications."

L.L. Sokolov’s main field of research is celestial mechanics. Author of more than 90 research publications.

In the second half of the 1970s, studied the motion of resonant artificial Earth satellites and satellite systems. Obtained estimates of the mass stability boundaries in the planetary three-body problem. The appearance of dynamical chaos and instability at the intersection of separatrices of various resonant zones were used as criteria. These results were included in his Ph.D. thesis (1980). Since the mid-1980s, studied trajectories of artificial and natural celestial bodies experiencing close approaches to planets; in particular, spacecraft dynamics with gravitational maneuvers. Deduced conditions for reaching the vicinity of the Sun. He showed that passive gravitational maneuvers provide opportunities for directing spacecraft to various desirable orbits. In the second half of the 1980s and later on, participated in research on reaching the vicinity of the Sun, using a spacecraft with a solar sail. Limitations related to the sail heating near the Sun were taken into account. At the same time, he initiated studies on the trajectories of the N-body problem in the case of high-velocity bodies. They led to the proof (with K.V. Kholshevnikov) of the regional integrability of the problem of N bodies in the domain of high energies. These results were included in his D.Sc. dissertation.

In the 1990s, participated in studies of nonlinear dust dynamics in planetary rings, in particular in hypothetical rings of Phobos and Deimos, as well as in studies of similar effects in dynamics of artificial satellites with large sailing factor. In the early 2000s, explored dynamics of exoplanet systems. This showed that the large eccentricity of the orbit of a massive planet induces strong-amplitude eccentricity oscillations in the orbit of any smaller planet in the system.

Since 2006, L.L. Sokolov’s research interests center on the asteroid hazard problem. His most important findings relate to possible collisions of the Apophis asteroid with the Earth (and other asteroids subject to resonant returns). Created a complete list of possible encounters with Apophis in the current century and investigated the corresponding trajectories.

SOLOVAYA Nina Andreevna

Born 20.01.1940 in Kaluga. Graduated from the Astronomical Department of the Physics Faculty of Lomonosov Moscow State University in 1963. Post-graduate student of the Physics Faculty of Moscow State University (1967-1970). Has been working in SAI since 1970, first as a junior researcher, scientific researcher (1986) and senior researcher (1994). Candidate of physical and mathematical sciences (1971), dissertation on the topic "The stellar three-body problem." Doctor of physical and mathematical sciences (1999). Dissertation on the topic "Evolution of triple systems of the Lyra epsilon type". Leading researcher SAI (2000-2014). Secretary of the Department of Celestial Mechanics and Gravimetry, Faculty of Physics, Moscow State University (1970-1979). Secretary of the Coordination Council for Celestial Mechanics of the Moscow State University (1970-1979).

Specialist in the field of celestial mechanics. The main topics of scientific work: a) study of intermediate orbits of distant satellites of the planets of the solar system; b) the stellar three-body problem. Within the framework of the first topic, studies of three variants of intermediate orbits in the theory of motion of distant (from VI to XII) satellites of Jupiter were carried out. Together with A.A. Orlov constructed a new type of intermediate orbit, different from Keplerian, taking into account the most significant solar disturbances. Within the framework of the second topic, the theory developed by her is applied to the study of the evolution of the orbits of real-life triple star systems that form a close pair, and the third star is at a considerable distance. For the multiple system Xi of the Ursa Major, the average motions of the periastrons and nodes of the inner and outer orbits were determined for various variants of the relative position of the ascending nodes on the plane of the sky. For the system zeta of Aquarius and others, their stability and evolution were investigated, and the movements of the periastrons and nodes were calculated. A new interesting result was obtained in the motion of exoplanets rotating in binary stellar systems (E. Plavalova, N. A. Solovaya, E. Pittich, O. Kiyaeva). It is shown that stable and unstable orbits are possible. Together with colleagues from the Astronomical Institute of the Slovak Academy of Sciences, the rotation of nonspherical small particles under the influence of solar radiation is considered. It is shown that solar radiation increases the speed of rotation of particles, which leads to their decay. The decay time depends on the particle size, its nonsphericity and chemical composition. Together with E. Pittich, a study of collisions of small bodies as a source of hyperbolic meteoroids in the Solar System was carried out, possible collisions of trans-Neptunian objects (TNO) with small bodies in highly eccentric orbits were considered. For exoplanet Gamma Cephei C, two paths of possible dynamic evolution are considered.

Author of 62 scientific papers and one book. Referee for the abstract journal Zentralblatt MATH, Berlin, Germany. Member of the IAU (2000) and member of the European Astronomical Society (EAS) (1990). The name "Solovaya" was assigned to a minor planet (5417). She was awarded the medal "850th Anniversary of Moscow".

SOLOVYOV Alexander Anatolievich

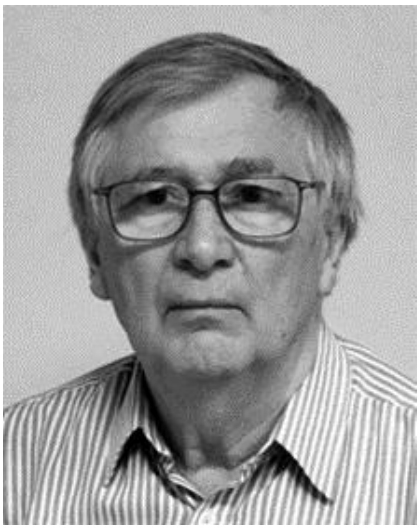
Born in 1946 in Sverdlovsk (now Ekaterinburg). Graduated from the Gorky University of Ural (1969). Post-graduate student at the Central Astronomical Observatory at Pulkovo (1969–1972). Cand.Sci. («Magnetic Flux Rope Structures on the Sun» (1973). 1972 to 2000: in Kalmyk State University (Lecturer, Assistant Professor, Head of Chair, Professor, Vice-Rector). Dr.Sci. («Theoretical Studies of Magnetic Structure of Sunspots» (1992). Professor since 1992. Minister of Education and Science of The Kalmyk Republic (2001 – 2003). Since 2003 – Head of Laboratory of Solar Physics at the Pulkovo Observatory. Member of IAU and of the Scientific Board on Astronomy of RAS. Honoured Scientist of The Kalmyk Republic (1997). Honorary Worker of Higher Professional Education of RF (2000). Poet and translator, Member of the Union of Russian Writers.

The central subject of studies – theoretical modeling of physical characteristics of active solar formations. Developed a general theory of wisp-like magnetic structures in the solar atmosphere, studied the conditions for their equilibrium in hydrostatic solar atmospherep, wave and oscillational characteristics of these configurations, constructed new theoretical models of sunspots, prominences, flare filaments, spicules, faculae, coronal loops, coronal mass ejections, coronal holes. Under his direction, in the Laboratory of the Solar Physics at the Central Astronomical Observatory at Pulkovo, a qualitatively new phenomenon in the solar physics has been studied in detail: long-period oscillations in sunspots and related radio sources, and also low-frequency oscillations of chromosphere and coronal filaments. Suggested new approaches to modeling of sunspots, which for the first time physically explained a number of basic characteristics of sunspots, previously remained incomprehensible (the model of a "shallow sunspot"). First built an analytical model of observed layers of asymmetric sunspot with the penumbra that displays fine filamentary structure with gas flows in its radial filaments.

Authored more than 270 scientific papers on astrophysics and solar physics and one monograph, and also of more than 20 publications of Pedagogy and Methodology of teaching of Physics. Published several books of poems. Supervised two Dr.Sci. and five Cand.Sci. Theses. Medal of A.L. Chizhevsky (2013). Minor planet No 7910 «Alexola» was named after him.

solov.a.a@mail.ru

SOMOV Boris Vsevolodovich



Born 07.01.1945 in Krasnodar, RF. Student and post-graduate of Moscow Physical-Tech. Inst. (famous `fiz-tekh') 1962-1972. PhD, 1972. Dr. of Sci., 1990. Professor, 1992. Appointments: (a) Junior and senior sci. researcher in Lebedev Phys. Inst., Acad. of Sci. of USSR 1972-1990. (b) Head of Solar Physics Dept, P.K. Sternberg Astronomical Inst. of the MSU from 1990 (http://istina.msu.ru/profile/somov@sai.msu.ru/). Laureate of the USSR State Government Prize, 1982. Laureate of the IBC (Cambridge) Award '2000 Outstanding People of the 20th Century', 1997. Member of several sci. councils and editorial boards.

From 1972, being a member of the research staff of the I.E. Tamm Dept of Theoretical Physics in the P.N. Lebedev Phys. Inst., together with his teacher, the eminent prof. S.I. Syrovatskii, Somov significantly contributed to the theory of magnetic reconnection in plasmas of high conductivity with strong magnetic field. In 1982, Somov became Laureate of the USSR State Government Prize for investigations in 'Dynamics of Current Layers and Solar Activity'. From 1982 Somov is a `discipline representative on solar physics' in COSPAR Sub-commission E2 and SCOSTEP.

From 1990, Somov leads Solar Physics Dept of P.K. Sternberg Astronomical Inst. of the MSU, including an astrophysical research group of young talented coworkers. They investigate physical processes in the solar atmosphere as well as in the coronae of accretion disks and compact relativistic objects. Main achievements of this group on fundamental problems of plasma astrophysics are: (a) the self-consistent theory of magnetic reconnection in super-hot turbulent-current layers with particle acceleration to high energies, (b) the theory of kinetic and MHD phenomena that explain observational properties of solar flares (Somov B.V., Plasma Astrophysics, Part II, Reconnection and Flares, 2nd Ed., Springer, 2013).

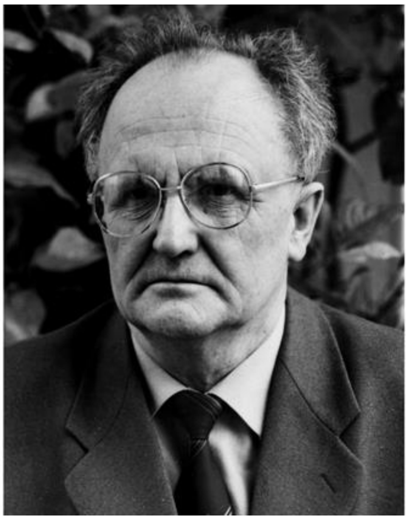
The favorite topics in his investigations are: (a) the topological trigger of solar flares, (b) the structural instability or evolutionarity of reconnecting current layers and other MHD discontinuities, (c) the continuous transitions between discontinuous solutions of MHD, (d) the self-consistent kinetic theory of fast particle propagation in plasma with account of return-current electric field. Publications: 10 monographs, 328 sci. articles.

Somov gives the lectures 'General Astrophysics' and 'MHD' in the Faculty of General and Applied Physics at 'fiz-tekh' 1977-1989, then the lectures 'Plasma Astrophysics' to the students of Astronomical Division in the Faculty of Physics at the Moscow State University from 1990 to present time (Somov B.V., Plasma Astrophysics, Part II, Fundamentals and Practice, 2nd Ed., Springer, 2013).

Somov is a full professor of 'Astrophysics and Astronomy' from 1990, a member the Editorial Board of 'Solar Physics' 1982-1993, a member of the Editorial Board of the International series of monographs 'Astrophysics and Space Science Library' (Springer, USA) from 1993, a member of the IAU commission E2 `Solar activity' from 1994. In 1997, Somov became the Laureate of the IBC (Cambridge, England) Award '2000 Outstanding People of the 20th Century' in honour of his contribution to space physics.

Somov-boris@mail.ru

SOROCHENKO Roman Leonidovich



Born 28.09.1924 in Kalinin (Tver'). World War II veteran. In 1952 he graduated from Phys.-Tech. fac. Moscow State University M.V. Lomonosov (now MIPT) with a degree in radio physics. In the same year, he joined the group of V.V. Vitkevich, who was engaged in radio astronomy as part of the oscillations laboratory of the Lebedev Physical Institute (LPI) on the basis of the LPI Crimean scientific expeditions. He went from a radio engineer to the chief scientist's position with. Doctor degree of physics and mathematics (defended 1971). Died on 21.01.2017 in Moscow.

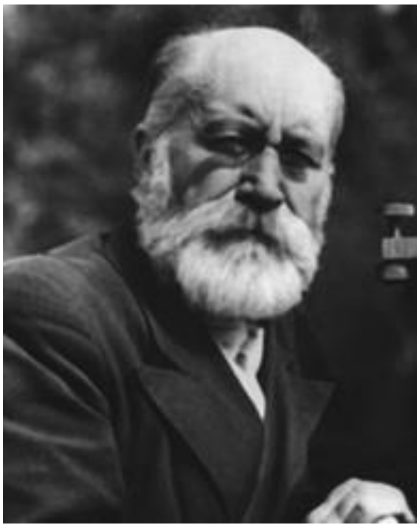
R.L. Sorochenko is the founder of space radio spectroscopy researches in our country, the author of more than 150 scientific papers in this field and the monograph "Radio Recombination Lines:. Their Physical and Astronomical Applications", wroted together with M.A.Gordon (published 2002 in English and 2003 in Russian). He had discovered of spectral lines formed during transitions between highly excited states of atoms, theoretically predicted by N.S. Kardashev (registered by USSR Committee on inventions and discoveries, No. 47, 1964). This discovery established that in the interstellar medium, under low density conditions, atoms can emit spectral lines not only in the UV, optical and IR ranges, but also in the radio range. He obtained new data on the physics of excited atoms, developing the quantum theory of the structure of the Bohr atom. It was found that 1) atoms, as quantum systems, can exist up to excitation levels of ~ 1000, reaching sizes of ~ 0.1 mm, 2) the spectrum of cosmic radio emission contains spectral lines emitted (absorbed) by highly excited atoms, which can be observed in a wide range radio waves from millimeter to meters and contain the richest information about the structure of the interstellar medium.

The works of R.L. Sorochenko and of his students on the radio lines of highly excited atoms (named "Recombination Radio Lines" – RRL) have received wide recognition in the scientific world. RRL studies are now being carried out in many scientific institutions around the world and have become a new fields in science.

R.L. Sorochenko did a lot of work with young scientists. 11 Ph.D. thesises were completed and defended under his supervision.

In 1988, for a series of works devoted to the discovery and study of recombination lines, a group of radio astronomers from the LPI and other institutions headed by R.L. Sorochenko was awarded the USSR State Prize

SOROKIN Leonid Vasilievich



Born in 31.07(12.08).1886 in Borisoglebsk. Died in 20.9.1954 in Moscow. Graduated from physics and mathematics Faculty of Moscow University in 1911. In 1920 S. worked in the geodetic department of the Corps of Military Topographers at the General Staff of the Red Army. From 1922 worked at the Astronomical and Geodetic Institute (AGNII) of Moscow State University, From 1931 – at the State Astronomical Institute named after P. K. Sternberg (SAI) Moscow State University. Since 1926 – Associate Professor, since 1932 – Professor of Moscow State University. Since 1936 – Doctor of Physical and Mathematical Sciences (without protection). From 1939 headed the Department of Gravimetry of Faculty of Mechanics and Mathematics of Moscow State University. In 1943-1953 – professor of the Moscow Oil Institute named after I. M. Gubkin, Head of the Department of Geophysics. Died 20.09.1954 in Moscow.

Student S.N. Blazhko, S.A. Kazakov and P.K. Sternberg. Founder of the Soviet school of marine gravimetry. In 1921–1926 he took part in the measurements of the force of gravity in the region of the Kursk magnetic anomaly, developed the theory of instruments and a method for interpreting measurements. In 1926–1929, S. carried out gravimetric exploration for oil in the Caspian region, substantiating the prospects of this region. Consultant to a number of central scientific and industrial geophysical organizations of the USSR, introduced effective methods of mineral exploration. The S.'s school of exploration gravimetry played an important role in supplying the country with oil during the Great Patriotic War. In 1929, after getting acquainted with the publications of the Dutch geophysicist and geodesist F.A. Vening-Meines, S. created a marine pendulum device of his own design to measure the force of gravity. Constantly improving his device, S. used it in gravimetric expeditions on submarines: in 1930, 1933-1935 in the Black Sea, in 1937 in the Sea of Okhotsk and the Sea of Japan, in 1948 – in the Barents Sea. Since 1930, S. developed methods and instruments for pendulum measurements from surface ships. S. created a lightweight pendulum device and an improved optical counter, which were widely used in the general pendulum survey of the USSR. He invented and improved more than 50 devices and instruments for the purposes of gravimetry and time service. Developed equipment for accelerated determination of gravity. He took part in the creation of the first domestic gravimeters.

S. for more than 30 years read gravimetry at the astronomical department of the Faculty of Mechanics and Mathematics of Moscow State University. In collaboration with E.N. Kalenov, B.I. Maximov, L.A. Ryabinkin et al. Published the General Course in Exploration Geophysics (1949). In 1950, together with V.A. Dolitsky, L.A. Ryabinskin and V.O. Uryson prepared a "Course in Geophysical Methods for Exploration of Oil Fields". In 1951 S. published "A course of gravimetry and gravimetric exploration." In total, he published 42 scientific works. Laureate of the Stalin Prize (1951), awarded the Orders of the Red Banner of Labor and Lenin, the medal "For the Defense of Moscow". The swell (linear uplift) in the Nenets National District of the Arkhangelsk Region is named after S.

SOTNIKOVA Natalia Yakovlevna

Born 07.06.1957 in Magdeburg (GDR, now Germany). Graduated from the Faculty of Mathematics and Mechanics of the Leningrad State University (LSU), now St. Petersburg State University (1980). Post-graduate student of the Department of Astrophysics, LSU (1983-1988), with Professor V.G. Gorbatsky as supervisor. After defending her Ph.D. thesis (1988), she worked at the Astronomical Observatory of Leningrad State University in various positions. In 2005-2016, Associate Professor of the Department of Astrophysics. Since 2016, Professor of the Department of Celestial Mechanics. Dr.Sci. in Phys.-Math. Sciences (2015). Member of IAU.

Main research interests concern extragalactic astronomy, structure and dynamics of galaxies, and numerical modelling. Author and co-author of about 60 works. In 1980-1990s, she was engaged in numerical modelling of gas-dynamical flows in interacting galaxies. In joint work with V.P. Reshetnikov, she was the first to construct a numerical model of the formation of polar rings in galaxies due to accretion of matter from neighbouring galaxies. The reference to this result has become standard in the astronomical literature on this topic. Built numerical models of several galaxies with tidal features (stellar loops, tidal tails). Based on the results of modelling these systems, estimates of the dark halo mass was made (with V.P. Reshetnikov).

Since late 1900s, she was engaged in N-body simulations (structure and dynamics of disk galaxies). The mechanisms of stellar disk heating in the vertical direction are classified; the linear criterion for bending instability was first matched with the results of numerical experiments, thereby solving the problem of the efficiency of stellar disk heating by bending instability; revealed the role of a compact bulge (or compact halo) in the development of bending instability (together with S.A. Rodionov). The results of modelling of bending instabilities and of the vertical structure of stellar disks were used to estimate mass of dark matter.

Participated in developing a unique algorithm for constructing N-body models proposed by S.A.Rodionov, – an iterative method. This method is of particular value for reconstructing phase models of specific galaxies from their observed photometry and kinematics, as well as for modelling new classes of systems with complex geometry and velocity anisotropy that have no analytical analogs.

Since 2014, she has taken part in compiling edge-on galaxies catalogs (EGIS). These catalogs are still the most extensive ones.

Developed several courses of lectures. Works successfully with students, graduate students, and young scientists.

STANKEVICH Kazimir Stanislavovich

Born 25.10.1931 in Tolokontsevo, Borsky district of Nizhny Novgorod krai (now Nizhny Novgorod Region). 1949-1954, student at the Gorky State University (GSU) (now the N.I. Lobachevsky State University of Nizhny Novgorod (UNN)). 1954-1957, postgraduate student at the GSU. Defended PhD thesis in 1963, D.Sc. thesis in 1975. Professor since 1987. 1957-2013, senior researcher, head of sector, head of department, head of division of the Radiophysical Research Institute (NIRFI).
Member of the International Astronomical Union (IAU), the European Astronomical Society (EAS), the Euro-Asian Astronomical Society (EAAS).
Awarded two medals.
Died 13.09.2013 in Nizhny Novgorod.

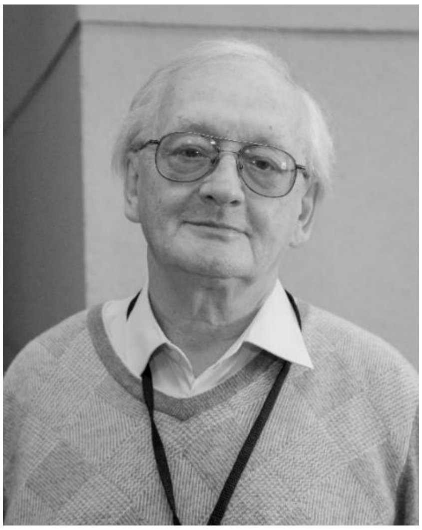
K.S. Stankevich's research interests are radio astronomy, astrophysics, and radiophysics. The main scientific results in astrophysics and radio astronomy were obtained by him and his co-workers in the study of the cosmic microwave background (CMB) radiation and the evolution of the radio emission of supernova remnants (SNR's) and planetary nebulae. He first measured the CMB temperature in the millimetre wave range and made an important contribution to establish the CMB powerful spectrum. It was made due to the accurate absolute radio-astronomical measurements based on the “artificial moon” method.

In a series of works started in 1960, K.S. Stankevich with the co-workers first received most important results on the evolution of the radio emission of historical SNR's and their radiation mechanisms. He obtained detailed data on secular decreases in SNR flux densities and luminosities and their frequency dependences. He showed that alongside with the synchrotron radiation there existed a radiation mechanism of the transient scattering of relativistic electrons in the SNR shells. K.S. Stankevich with co-workers developed an effective method to study central stars in the planetary nebulae on the basis of data on their optical and radio flux densities, resulting in the establishment of the dependence between the temperature and the radius of the stars. K.S. Stankevich with his team created an accurate radio-astronomical scale of radiation flux densities and spectra of the cosmic radio emission sources which included spectra of two primary and about 30 secondary calibration sources. The scale is used to determine the parameters of all large antennas of the Deep Space Communication Complexes.

Under the leadership and guidance of K.S. Stankevich, a series of experimental and theoretical works was carried out using radio-astronomical and radio-physical approaches. These works were focused on the study of the electromagnetic radiation of natural environments, radio wave propagation in the atmosphere, remote sensing of the atmosphere and the sea surface.

During several years K.S. Stankevich was the Head of the leading Scientific School of Russia. He was also the organizer and scientific supervisor of Kara-Dag Radio Astronomy Station of NIRFI in the Crimea. In 1994-1996 and 1997-1999 K.S. Stankevich was awarded with scholarships for outstanding scientists of Russia.

STAROBINSKY Alexey Alexandrovich



Born 19.04.1948. Student of the Physics Department of Moscow State University from 1966 to 1972. Post-graduate student at the Institute for Theoretical Physics named after V.I. LD Landau RAS (ITF RAS) from 1972 to 1975. Defended his Ph.D. thesis in 1975, Student of Ya.B. Zeldovich. Worked and continues to work at the ITP RAS, progressing from a junior researcher to a chief researcher. Corresponding Member of the Russian Academy of Sciences since 1997, Academician of the Russian Academy of Sciences since 2011 – Department of Physical Sciences of the Russian Academy of Sciences. He was awarded the medal of the Order of Merit for the Fatherland, II degree and the medal for Labor Valor.
Laureate of the A.D. Sakharov RAS and the A.A. Friedman RAS.

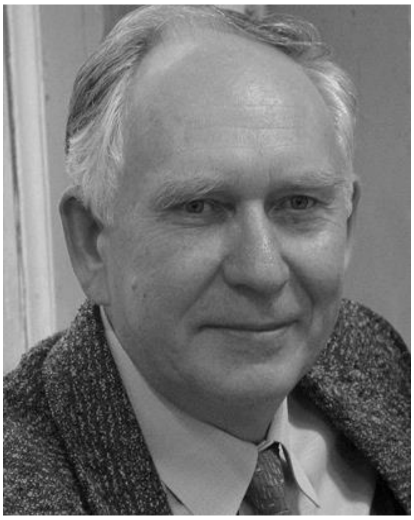
Research interests: theories of gravity, cosmology, relativistic astrophysics.

Alexei Aleksandrovich developed the idea of the existence of cosmological solutions without an initial singularity (nonsingular cosmology, Alexei A. Starobinsky, Phys. Lett. B 91 (1980) 99-102). A.A. Starobinsky is one of the authors of the idea of the existence of an inflationary stage in the early Universe, the role and significance of phase transitions (Alexei A. Starobinsky, Phys. Lett. B 117 (1982) 175-178) and the existence of a stage of secondary heating (Lev Kofman, Andrei D. Linde, Alexei A. Starobinsky, Phys. Rev. D 56 (1997) 3258-3295). Together with his colleagues, he proposed and developed a new model of the cosmological constant with a positive signature (Varun Sahni, Alexei A. Starobinsky, Int.J. Mod.Phys.D 9 (2000) 373-444). He developed the ideas of expanding the Lagrangian of general relativity with the help of higher-order terms in curvature (f (R) gravity) and proposed the most accurate model to explain the accelerated expansion of the Universe (Alexei A. Starobinsky, JETP Letters 86 (2007) 157-163), ideas were developed to use scalar-tensor theories of gravity for these purposes (B. Boisseau, Gilles Esposito-Farese, D. Polarski, Alexei A. Starobinsky, Phys. Rev. Lett. 85 (2000) 2236), other methods of modeling the cosmological constant (Varun Sahni, Alexei Starobinsky, Int. J. Mod. Phys. D 15 (2006) 2105-2132). A.A. Starobinsky was the first to calculate the spectrum of primary gravitational waves (A.A. Starobinsky, Letters to ZhETF 30 (1979) 719-723). In his early works, Aleksey Aleksandrovich developed the idea of superradiation – the amplification of radiation incident on it by a rotating black hole (A.A. Starobinsky, ZhETF 64 (1973) 48-57). Together with his scientific advisor – Ya.B. Zeldovich – he developed the ideas of vacuum polarization and the creation of particles in a strong gravitational field (Ya.B. Zel'dovich, A.A. Starobinsky, ZhETF 61 (1971) 2161-2175).

A.A. Starobinsky is a member of the editorial boards of Russian journals: Letters to ZhETF, Letters to Astronomical Journal, Gravitation and Cosmology, International Journal of Modern Physics D, Journal of Cosmology and Astroparticle Physics, Modern Physics Letters A, SIGMA (Symmetry, Integrability and Geometry: Methods and Application).

He was awarded the Tomall International Prize (Switzerland), the V.I. Gruber for his work in the field of the Standard Cosmological Model (together with V. Mukhanov), the Kavli Prize for "pioneering work in the theory of cosmic inflation", the MAIK Prize "Science / Interperiodica" for the best publication in her journals. He was awarded the O. Klein Medal (Royal Swedish Academy of Sciences), the Amaldi Medal of the Italian Gravity Society.

STEPANOV Alexander Vladimirovich



Born in 1944 in Penza. Graduated from The State University of Irkutsk (1967). Post-graduate student at Dept. of Radio-Physics at The State University of Gorky (1970). 1970 to 1988: SibIZMIR of Siberian Branch of the USSR Academy of Sciences. Dr.Sci. (Phys.,Math, 1986). Head of Laboratory of Radioastronomy in the Crimean Astrophysical Observatory (1988–1995), Deputy Director of The Central Astronomical Observatory at Pulkovo (1995–2000), Director of the Pulkovo Observatory (2000–2015). Since 2015: Academic Supervisor of the Pulkovo Observatory. Since 2018: Head of Cosmic Ray Lab in the Ioffe Institute. Member of IAU, EAS Council Member (2006–2010), Vice Chairman of the Scientific Board of RAS on Physics of Solar-Terrestrial Connections. Corresponding Member of RAS (2011).

Renowned expert in the area of astrophysics, radioastronomy, and physics of space plasma. Authored more than 200 science publications and two monographs. Pioneered some important contributions to physics of the Sun and stars. For the first time showed the fundamental role of loss-cone instabilities in dynamics and radiation of energetic particles in coronal magnetic loops (a magnetic mirror traps) – the basic structures in active regions of the Sun and flare stars. His works on oscillations of plasma structures – magnetic loops and filaments, laid the basis for a new actively developing direction in the astrophysics – coronal seismology, which considers wave and oscillation processes in stellar coronae. On the basis of coronal seismology, developed methods of diagnostics of a wide range of astrophysical objects – from coronae of the Sun and red dwarfs to magnetospheres of neutron stars. In cooperation with V.V. Zaitsev contributed substantially to the solar flare model based on the Alfven-Carlquist analogy between a solar flare and electric circuit. Revealed an important role of electric currents and the Rayleigh–Taylor instability in acceleration of charged particles and heating of stellar atmospheres. Suggested a plasma radiation mechanism of sub-THz emission of solar flares.

Member of Executive Committee of the UN Program «The International Heliophysical Year-IHY» (2006–2008), and «International Space Weather Initiative – ISWI» (2009– 2012). Coordinates collaboration in the field of radioastronomy between RAS and the Academy of Finland. Belopolsky Prize of RAS (1999). Co-Chair of a leading science school «Multiwave Astrophysical Studies». Chairman of the Expert Comission for the Award of the RAS Prize named after F.A. Bredikhin. Member of Editorial Boards of Solar Physics (1993-2000), Geomagnetism and Aeronomy, Solar-Terrestrial Physics. Awarded with the Medal of the Order «For Merit to the Fatherland» of II Degree.

stepanov@gaoran.ru

STEPANOV Vladimir Evgenievich

Born 14.12.1913 in Donetsk District, Donskoye Voisko Region. Worker in Donbass (1928–1931); student at Dnepropetrovsk Mining Institute (1931–1933). 1933-1937: student of Lomonosov Moscow State University (MSU). Researcher at Tashkent Observatory (1937–1941). 1941–1945: in Soviet Army. From 1946, with the Astronomical Observatory of L'viv University; Senior Res. (1946–1950), Director (1950–1953). Senior Lecturer of the Astrophysics Department of the MSU Faculty of Mechanics and Mathematics (1953–1955). Senior Res. at Crimean Astrophysical Observatory (1955–1962). Since 1962: SibIZMIR SB USSR Academy of Sciences, Deputy Director (1962—1964), Director (1964—1978), Dr.Sci. (Phys.-Math., 1961), Corr. Member of the USSR Academy of Sciences (1968). Consulting Senior Researcher (1979—1984). Lab Supervisor in IZMIRAN (1984—1986). Died 26.08.1986 in Moscow.

Areas of research: solar physics and astrophysical instrumentation. Authored and co-authored 115 scientific papers.

Greatly contributed to the theory of absorption spectral line formation in the magnetic field. In 1958–1962, solved the problem of radiation transfer in the presence of magnetic field, i.e., considering polarization of incident and scattered (absorbed) radiation. One of the creators of the first national magnetograph for measuring weak solar magnetic fields. Observed solar active regions. Studied the structure and dynamics of magnetic field and plasma at different levels of the atmosphere of active regions of the Sun. Proved the existence of a magnetic field vortex structure, developed the magnetic field transport detection method, which allowed revealing transfer of a sunspot magnetic field and its close relation to transfer of matter. Proposed a mechanism for heating plasma in disturbed chromosphere. Directed research of dynamics and rotation of the solar atmosphere at coronal levels.

Chairman of the Presidium of the East Siberian Division, Siberian Branch of USSR Academy of Sciences (1972–1977), Member of the Presidium Siberian Branch of USSR Academy of Sciences (1973–1980), Member of the Editorial Board of the international journal "Solar Physics" (1967–1986); Supervisor of the Program of Solar Maximum Year in the USSR (1979–1981); Chairman of Academic Council of the USSR Academy of Sciences for the problem "Physics of Solar-Terrestrial Relations" (1982–1986), Deputy of the USSR Supreme Council of the ninth convocation (1974–1979).

Gave a high priority to work with young researchers. Supervised four Dr.Sci. and seven Cand.Sci. Theses.

Awarded with the Order of the Red Star (1943), Order of the Patriotic War 2nd Class (1944), Order of the Red Banner of Labor (1975, 1982), Order of the Badge of Honor (1967, 1973), Medal "For Courage" (1942), Medal "For the Defense of Leningrad" (1945), Medal "For the Victory over Germany in the Great Patriotic War 1941–1945" (1945). A minor planet No. 3493 was named "Stepanov" after him. A memorial plaque was installed on the facade of the Institute of Solar-Terrestrial Physics to honor the outstanding astronomer (2002).

STEPANYAN Arnold Artashesovich

Born 15.05.1931 in Baku and died on November 17, 2005 in Nauchny. In 1949–1954 – student at the Faculty of Physics, Moscow State University. Since 1954 to 2005 – researcher at the Crimean Astrophysical Observatory. In 1963 he defended the Ph.D. thesis "Some results on studies of the Forbush effect". In 1968 A.A. Stepanian was appointed to the rank of senior researcher. In 1980 he defended his Doctoral thesis "The study of ultrahigh-energy gamma-ray discrete sources". Died 17.11.2005 in Nauchnyy.

Astrophysicist, expert in the field of cosmic rays. In 1956 under the leadership of A.A. Stepanian the Station of cosmic rays was organized in CrAO which was included into the world geophysical network. By means of these stations cosmic rays reaching the Earth were studied, as well as secondary effects occurring while passing through the Earth's atmosphere. This was a new direction of works at CrAO. A number of sufficient results were derived with the cubic telescope constructed by A.A. Stepanian to record meson components of cosmic rays and the modernized neutron monitor.

In the early 1970s A.A. Stepanian organized the first systematic searches for extragalactic ultrahigh-energy gamma-ray sources at CrAO. Under his leadership the first gamma-ray telescope was constructed that enabled Cherenkov bursts in the Earth's atmosphere to be recorded. A series of ultrahigh-energy gamma-ray sources were discovered, among them such well-known objects as Cyg X-3, Cas γ-1 etc.,

In the late 1970s under the leadership of A.A. Stepanian the first in the world double gamma-ray telescope of the second generation (GT-48) was designed. This telescope was put into operation in the early 1990s and became an efficient instrument in searching for and studying ultra-high-energy gamma-rays. The first gamma-ray fluxes from such objects as BL-Lac, 3C 66A, Cyg OB2, Geminga were recorded with it.

A.A. Stepanian authored over 150 scientific publications. Under his supervision 4 Ph.D. theses were defended. For many years he headed the Laboratory of cosmic rays founded by him. A member of the European and International Astronomical Unions.

The contribution of A.A. Stepanian was recognized by the government prize – "Mark of Honor" order.

STEPANYAN Natalia Nikolaevna

Born 22.06.1931 in Moscow. In 1954, she graduated from Lomonosov Moscow State University. Since 1954 − a researcher at the Crimean Astrophysical Observatory. In 1954−1957 – a post-graduate student of A.B. Severny. For many years she was the Head of the Solar Physics Depart-ment. In 1963, she defended the Ph.D. thesis “The study of metal lines and rare earths in flares”. In 1984, defended her Doctoral thesis “Evolution of activity and its prediction”. In 2006, she was appointed a Professor. In 2009 – an Honored Worker of Science and Technology of Crimea. A member of IAU. Died 15.05.2018 in Simeiz.

Based on spectral observations in metal and rare earth lines N.N. Stepanian studied a character of distribution of excitation and flare shock waves in the solar atmosphere. She investigated a behavior of the magnetic field in the solar atmosphere during flares on measurements of the field in lines formed at different heights. The sunspot magnetic field was found to increase with height before the flares occurring near these sunspots. The initial phase of the development of activity regions was studied; two international observation programs on this topic were initiated and carried out.

N.N. Stepanian elaborated the multi-parameter methods for predicting evolution of active regions applied particularly in operative solar activity predictions during the cosmonauts’ flights. The studies of N.N. Stepanian concerned the problems of evolution of the solar large-scale structures: coronal holes, structures of the background magnetic fields, and their relationships with solar activity at heights from the photosphere to 2.5 solar radii. Two types of large-scale structures of the weak magnetic field were determined characterized by different heights of distribution, lifetime and relations with active formations. The magnetic fields of such complexes are weakly associated with a field of outer – with respect to the complex – regions. The regularities of rotation and latitudinal drifting of the background field structures from the moment of their formation to extinction were shown. She confirmed the conclusion that background fields are not the remnants of active regions but an independent phenomenon. N.N. Stepanian paid much attention to organization of the Solar Patrol in CrAO.

She supervised a monitoring of two types of data: sunspot magnetic field strength measurements and solar images in the infrared HeI 1083 nm line. N.N. Stepanian actively participated in designing and studying an instrumental base for solar observations. She took part in mounting the Tower Solar Telescope BST-1 and in the first observations with it. She contributed significantly to developing the horizontal, the second tower telescopes and two versions of the air-borne telescope to make an operative prediction of flares under unfavorable weather conditions.

An author of more than 240 publications and two popular books.

STESHENKO Nikolay Vladimirovich

Born 28.11.1927 in Dikanka, Poltava region, USSR. In 1945–1950 – a student, in 1950–1953 – a postgraduate student in the Department of Astronomy, Taras Shevchenko National University of Kyiv. In 1955, he defended his Ph.D. thesis "Investigation of the solar chromosphere on spectrograms of the eclipse on February 25, 1952 and June 30, 1954". In 1973, he defended his Doctoral thesis "Structural features of solar active regions". A Corresponding Member of the USSR Academy of Sciences (1990). An Academician of the Ukraine NAS (1997). An Honored Worker of Science and Technology of Ukraine (1998). A Professor (1999). In 1953–1957 – a researcher at the Astronomical Observatory of Kiev University, in 1957–1960 – a junior researcher. Vice Director (1960–1988), Director (1988–2005), Head of the Laboratory (2005–2016) at CrAO, since 2016 – a scientific laboratory adviser of CrAO RAS.
Died 19.03.2018 in Nauchnyy.

N.V. Steshenko is a well-known scientist-experimenter in the field of astrophysics and an expert in optics and instrumentation, an author of 100 scientific publications, including 4 author's certificates. His name is associated with major progress in the study of solar physics: its magnetic field, radiation, excitation and ionization in spectra of chromospheric flares. He is an active participant in modeling solar flares and studying spectra of high-power (0.5 million amperes) pulsed discharge in hydrogen. He was the first to show that the nature of the explosive phase of solar flares (speed up to 300 km/s) is the same as in a high-power pulsed discharge in hydrogen.

Under N.V. Steshenko's scientific supervision an orbital solar telescope was constructed. This telescope operated successfully onboard the Salyut-4 space station, whereby the plasma motion and fine structure in the region between the chromosphere and the corona were investigated using ultraviolet spectra; he also promoted high-quality optics for the 0.8 m space telescope operated onboard Astron satellite for 6 years. The telescope brought new information about the UV spectra of various space objects.

N.V. Steshenko developed the fundamental decision for the 25 m multi-element optical telescope. Telescopes with a diameter of 10 m or more are currently built on the same optical system.

N.V. Steshenko is an active participant in the work on creating the 1.7 m ultraviolet telescope for the international space observatory WSO-UV / Spektr-UV. There were developed methods for polishing surfaces of large thin mirrors to the theoretically possible accuracy, including a method of optical processing in vacuum by accelerated inert gas ions; the optical stands for studying a wave front constructed by the telescope optics were designed and created.

Under the supervision of N.V. Steshenko 3 Doctoral and 1 Ph.D. theses were defended. He was awarded the Order of the Red Banner of Labour in 1975.

N.V. Steshenko was an editor-in-chief of the journal Izvestiya Krymskoi Astrofizicheskoi Observatorii.

STOTSKY Alexander Alexandrovich

Born 30.04.1932; graduated and post-graduated from the Leningrad Polytechnical Institute; got his PhD thesis and started working at the Radio Astronomy Department of the Main Astronomical Observatory of the USSR Academy of Sciences (1962); moved to the Special Astrophysical Observatory (SAO) of the USSR Academy of Sciences (1964) and to the Institute of Applied Astronomy (IAA) of the USSR Academy of Sciences (1987); became Doctor of Sciences in Physics and Mathematics, Professor and the Honored Scientist. Died 08.05.2004 in St. Petersburg.

A.A. Stotsky was a Soviet and Russian radio astronomer. He studied mainly the influence of fluctuations in the Earth's atmosphere on operation of radio telescopes and interferometers and the development of methods for aligning and measuring the parameters of large antennas. From 1959 to 1965 he was engaged in measuring parameters of the Big Pulkovo Radio Telescope (BPR) and developing the alignment methods for big antennas. He offered and developed two radio physical methods of alignment– The Phase Comparator Method and The Auto Collimation Method, which allow him to install the reflecting elements of antennas with a relative accuracy of 10^{-6}. This accuracy was necessary for improving a surface of the 100 m diameter reflector operating at the 8 mm wavelength. As a result, BPR achieved a record resolution of 15 arc seconds at a frequency of 36 GHz.

The phase comparator, built by A.A. Stotsky, turned out to be an excellent tool for measuring temporal and spatial fluctuations in the phase of a signal during propagation in the atmosphere. With its help, A.A. Stotsky carried out a cycle of research, which enabled him to demonstrate the performance of antennas with a variable profile of 10 km in diameter. A.A. Stotsky continued to study the influence of the atmosphere parameter fluctuations on the operation of large antennas and radio interferometers with very long baselines (VLBI) and became internationally recognized authority in this field.

A.A. Stotsky is an active participant in three major projects to create radio telescopes — BPR, RATAN-600 and telescopes of the “Quasar” VLBI Network. His Auto Collimation Alignment Method was used to adjust the RATAN-600 telescope and became a standard method afterwards that is still used today.

In 1985, A.A. Stotsky joined a team that was developing the “Quasar” VLBI Network project. He worked on the specification for an antenna system with a mirror diameter of 32 m, proposed and developed (together with M.N. Kaydanovsky) the project of the tropospheric signal delay measurement systems based on water vapor radiometers.

A.A. Stotsky was a talented tutor and a talented scientist as well. He brought up many researchers, PhDs and doctors of sciences. He read his "Radio Astronomy" course of lectures to the St. Petersburg University students during his last years.

STRATONOV Vsevolod Viktorovich

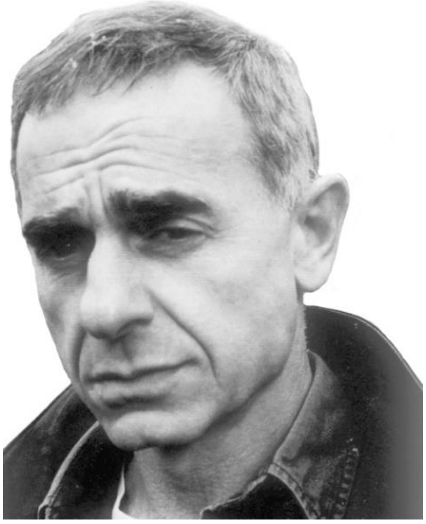
Born 17.04.1869 in Odessa, Ukraine. Studied at the University of Novorossiya (now I.I. Mechnikov Odessa National University) (Odessa, 1886–1891). Worked at the Odessa Astronomical Observatory (1891–1892). F. A. Bredikhin's student in Pulkovo for 2 years. Worked at Tashkent Astronomical Observatory (now Ulugh Beg Astronomical Institute of the Uzbek Academy of Sciences) (1894–1904). He had to stop observation work due to his eye disease and worked as a clerk (1904–1911) and then banker (1911–1917) in Caucasus. Professor, Dean of the Physics and Mathematics Faculty of Moscow State University, MSU (1918–1922). Initiator (1920) and first organizing committee chairman of the Main Russian Astrophysical Observatory (August 1922). After taking part in the strike of MSU professors, was arrested in August 1922 and expelled to Germany with a group of professors (September 1922). Professor at Russian Science Institute in Berlin (1918). Professor at Higher Technical School in Prague (1923–1938). Died 06.07.1938 in Prague.

V.V. Stratonov was an outstanding Russian astrophysicist at the turn of the 19th and 20th centuries, the first observer of the Tashkent Astronomical Observatory. As a participant of the Carte du Ciel international program, obtained a large number of observations: more than 400 photographs of the starry sky (including about 200 photographs of globular and open clusters), nebulae and dark clouds, variable stars, photographs of planets, and the solar surface. He studied star clusters, planetary nebulae, Novae, improved the knowledge of the Milky Way's structure, and discovered "star clouds" in the Milky Way. Confirmed the difference of the solar axial rotation rate at different latitudes, studied comets, asteroids (85 photographs of Eros during its opposition in 1900–1901), meteor streams (Leonids). In 1921, he invited Prof. V.G. Fesenkov from Novocherkassk to assist in the organization of the Main Russian Astrophysical Observatory, resulting in the establishment of the State Astrophysical Institute in Moscow (SAPI, 1922) and then, on its base, Sternberg Astronomical Institute (1931).

Author of many research publications in the field of stellar and galactic astronomy, popular science books, and several textbooks in the Russian and Czech languages.

Awarded a prize for his contribution to solar research (1897); prizes from the Russian Astronomical Society for the popular science book "Sun" (1914) (self-published in 1910) and "Stars" (1919).

STRELNITSKI Vladimir Semenovich



Born 08.09.1941 in Dunai, Primorskii Territory. In 1965, graduated from Leningrad State Pedagogical Institute (now the Herzen State Pedagogical University of Russia). From 1970 to 1973, did postgraduate studies at the Astrophysics Department of M.V. Lomonosov Moscow State University (MSU). Completed his PhD (1973). Obtained his D.Sc. (1982). From 1966 to 1969, worked as an observer at the Astronomical Observatory of Leningrad State University (now V. V. Sobolev Astronomical Institute, SPbU). From 1973 to 1992, worked in different positions at the Astronomical Council of the Academy of Sciences USSR (now, the Institute of Astronomy of the Russian Academy of Sciences, INASAN), including the Scientific Secretary of the Presidium of the Astronomical Council and a researcher. From 1975 to 1980, Executive Secretary of the Astronomicheskii Zhurnal. From 1982 to 1991, Editor of the Russian journal Astronomicheskii Tsircular. In 1992 to 2013, worked at the Smithsonian Institution, New Mexico Institute of Mining and Technology, and Maria Mitchell Observatory (USA).

V.S. Strelnitski's research interests lie in the fields of comets, stars, interstellar medium, galaxies, and the early stages of the Universe. He is both an observer and a theorist. His most renowned results are related to cosmic masers and lasers. He published the first review on cosmic masers (1974). The author of a thermodynamic theory of cosmic masers (1979) and of an innovative ("collision-collisional") pumping mechanism for masers (1984).

In 1972, he showed that radiation pressure in masers is "negative" (directed inward), it can cause the observed variability of maser radiation and puts a strict upper limit on radiation intensity (close to the highest observed values).

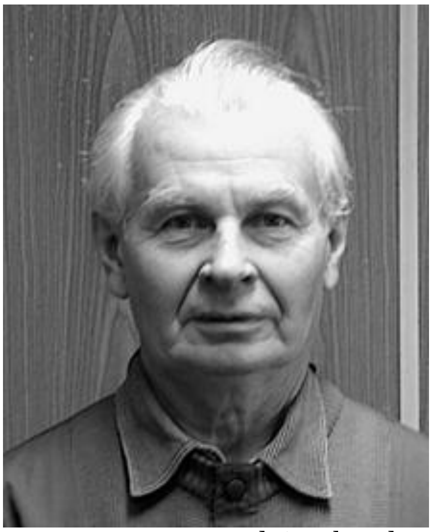
In 1972, V.S. Strelnitski theoretically predicted (together with R.A. Sunyaev) the dynamic instability and expansion of the clusters of H2O masers surrounding very young stars. This prediction was confirmed observationally and turned out to be the first indication of a new astrophysical phenomenon: the fast mass outflow from newly born stars.

In 1995, the team led by V.S. Strelnitski discovered the first high-gain cosmic masers in IR domain (i.e. the first cosmic lasers), working on hydrogen atoms. The theory of hydrogen masers and lasers developed by V.S. Strelnitski and his co-authors is published in a series of research papers from 1992 to 1996.

In 1995-2002, he led a study of supersonic turbulence probed by H2O masers, obtaining for the first time an equation for the dissipation scale of supersonic turbulence in a neutral gas and showing that the masers themselves can be a product of turbulence.

V.S. Strelnitski is a member of the International Astronomical Union, Euro-Asian Astronomical Society, and American Astronomical Society. He is the author of more than 200 research publications, many popular science articles and brochure on astrochemistry. He was actively involved into teaching and was a research supervisor for many undergraduate, graduate, and post-graduate research projects and dissertations. He was a recipient of the U.S. Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (2009) and of the W.T. Olcott Distinguished Service Award of AAVSO (2008).

STRUKOV Igor Arkadevich



Born in 1937 in the city of Orel. He graduated from the Physics Department of the Moscow State Pedagogical Institute, worked in the Problem Radiophysics Laboratory of the institute. In 1970, he defended his dissertation as a candidate of physical and mathematical sciences and went to work at the Space Research Institute of the USSR Academy of Sciences (now IKI RAS). In 1990, he defended his dissertation as a Doctor of Physical and Mathematical Sciences.

He was engaged in the development of new semiconductor devices and their applications. Strukov I. A. is the author of a large number of scientific works and inventions, an honorary member of the K. E. Tsiolkovsky Academy of Cosmonautics, an inventor of the USSR, an honored creator of space technology. Strukov I. A. is known as a scientist in the field of experimental cosmology, radio astronomy and radiophysics. Under his leadership, unique radiophysical complexes of the projects "Venus-Halley", "Relict", "Relict 2", "MILIZA" were created. Strukov I. A. was the technical director of the space experiment "Relict" on board the artificial Earth satellite Prognoz-9, and participated in the creation of scientific equipment for fundamental astronomical research, as well as the equipment of the RADIOASTRON space telescope. As a result of these works, unique radio astronomy receivers based on parametric microwave amplifiers were created for the first time, capable of withstanding the conditions of a spacecraft launch, and then successfully operating in the harsh conditions of a space experiment for a long time. The results of scientific experiments in the "Relict" space mission proved to be very important and allowed us to obtain new fundamental results in the field of observational cosmology. For the first time, it was discovered that the cosmic microwave background radiation is not, as previously thought, homogeneous. The effects found in the research are traces of processes that took place in our Universe in the early stages of its development, more than 10 billion years ago. The analysis of these phenomena allows us to take a new look at the structure of our world as a whole – from the microcosm to the cosmological scale. The results of observations of the domestic "Relict" project were then reliably confirmed by foreign studies on board foreign spacecraft "COBE", "WMAP", "PLANCK". Strukov I. A. is the winner of the Shklovsky Prize in 2020.

SUBBOTIN Mikhail Fyodorovich

Born 28.06.1893 in Ostrolenka (now Poland); graduated from the Warsaw University (1914); was left in the Warsaw University to prepare for a professorship (from 1912 to 1915) and worked in it (from 1915 to 1922); was Lecturer in the Rostov-on-Don Polytechnical Institute (from 1922 to 1930); Director of the Tashkent Observatory and Professor in the Central Asia University (from 1930 to 1960); in 1930-1960 worked at the Leningrad University headed the Astronomy Department (from 1930 to 1935), the Celestial Mechanics Department (from 1935) of the Mathematics and Mechanics Faculty (its Dean from 1933 to 1941), the Observatory (from 1934 to 1939); headed the Theoretical Sector in the Pulkovo Observatory (from 1931 to 1934); worked at the Astronomical Institute (from 1942), at the Institute of Theoretical Astronomy of the USSR Academy of Sciences (ITA, its Director from 1943 to 1964). Died 26.12.1966. Buried at the Pulkovo Memorial Cemetery.

M.F. Subbotin made his research mainly in the field of celestial mechanics and theoretical astronomy. He was the founder of the Leningrad School of Celestial Mechanics and initiated the Department of Applied Celestial Mechanics in ITA which played an important research role in solving the artificial satellite and spacecraft motion problems and in using their observations to carry out scientific and applied tasks. M.F. Subbotin improved the method for solving the Euler-Lambert equations for finding orbital elements and made it practically applicable. Modified the method for improving orbits based on a large number of observations. Investigated the problem of two bodies with variable masses. He gave a solution to the problem of finding secular inequalities in the form of series in powers of eccentricity of the disturbing planet. A number of M.F. Subbotin’s works was devoted to the applied and computational mathematics. He also dealt with some astrometry issues, for example, he developed the idea of observing minor planets in order to determine a star catalog coordinate system orientation and proposed his methods of determining systematic errors of star catalogs. M.F. Subbotin’s "The Course of Celestial Mechanics" (1933 vol. 1, 1937 vol. 2 and 1949 vol. 3) was the first in Russia to account for the main problems of celestial mechanics with sufficient completeness. M. F. Subbotin was the author of the well-known monograph "Introduction to theoretical astronomy" (1968), as well a few basic studies in the history of astronomy, the Editor-in-Chief of "The Astronomical Yearbook", "The Transactions of ITA" and "The Bulletin of ITA" which were published by ITA, had an extensive teaching experience and engaged himself in painting art having gained professional mastership skills in it. He was a Correspondent Member of the USSR Academy of Sciences (from 1946). Minor planet (1692) Subbotina and the Crater Subbotin on the back side of the Moon are named in his honour.

SUCHKOV Anatoly Alexandrovich

Born in 1944.
Alma matter: Tadjik State University (1960-1965)
Positions held: Institute of Astrophysics of Tajik Socialistic Republic' Academy of Sciences (1965-1972), Assistant Professor, head of the department at Rostov State University (1972-1991), Professor at STScI (1991-2011), head of the research group at Rockland Hill (2012 – 2016)
Doctor thesis: "Structure and evolution of the Galaxy" (1980). Author of more than 200 publications, author of two books: "Galaxies: Known and Unknown" (1988), "The Milky Way Galaxy" (1996, Co-author L.S. Marochnik)
Scientific interests: chemical and dynamical evolution of stellar systems and interstellar medium.

Main scientific achievements:

He performed modelling of the Milky Way's spiral structure, determined the geometry, rotational velocity and other physical properties of the galactic spiral pattern.

He discovered the intermittent change of the chemical composition between the galactic halo and galactic disk. He has constructed the numerical model of galactic nuclei activity that accounts for star-formation bursts and galactic winds.

He has developed the numerical model of molecular gas distribution in normal and active galaxies. He discovered the super-luminosity effect in type F stars. He established that super-luminous type F stars are much older than normal type F starts (up to 2-3 billion years) of the same temperature and surface gravity, and that their X-ray luminosity does not drop, but instead increases with age.

He proposed a model in which the nature of super-luminous type F stars is associated with the difference in the rotation of the core and the outer layers of the stars, leading to the enrichment of the core with hydrogen from the outer layers.

He compiled catalogs of binary type F stars, a catalog of normal and super-luminous type F stars. He created and implemented an automatic classification system for X-ray sources (ClassX), and classified ROSAT sources.

He conducted statistical analysis of SDSS sources based on ClassX classification. He developed and implemented correction and calibration systems for the Hubble Space Telescope and its instruments (NICMOS, WFPC 2, ACS).

SULEYMANOVA Svetlana Akramovna

Born 17.12.1943 in Ufa, Bashkirian ASSR (now the Republic of Bashkortostan). Graduated from Kazan State University in 1966 with a degree in Radiophysics. Staff member of Pushchino Radio Astronomy Observatory since 1967 (now – PRAO ASC FIAN). She worked her way up from a senior laboratory assistant to a leading researcher. Doctor of Physical and Mathematical Sciences (2005). Member of the International Astronomical Union.

The beginning of S.A. Suleymanova's scientific career coincided with the arising of a completely new field in astrophysics and radio astronomy, associated with the discovery and study of a new type of radio sources – pulsars. Here she achieved a number of significant results. The problem has been solved of experimental determination of the linearly polarized pulsar-radiation characteristics in the lowest radio frequency range. Based on observations at the Pushchino Radio Astronomy Observatory using Wide-band Cross-type radio telescope (DKR-1000) and the Large Phased Array antenna (BSA), a linear polarization catalog of pulsars in the frequency range from 40 to 112 MHz was created. S.A. Suleymanova has made a major contribution to the development and application of the original method for measuring the polarization of pulsar radiation, based on the rotation of the polarization plane during propagation of the radiation through the interstellar medium (the Faraday effect).

S. A. Suleymanova has discovered a number of new phenomena in the pulsar radioemission that are essential for elucidating the mechanism of radio emission of neutron stars-pulsars. In 1980 S.A. Suleymanova studying the pulsar PSR B0943+10, discovered the phenomenon of switching modes of radioemission, which is very rare among neutron stars. The characteristics of the pulses in the quiet (Q) and burst (B) mode of radiation are as distinct as if they are emitted by two different pulsars. Moreover, as a result of many years of collaboration with professor Joanna M. Rankin (University of Vermont, USA) a new type of radioemission variations has been identified and investigated in the pulsar PSR B0943+10. These variations manifest themself via continuously and exponentially changes of all main characteristics of the burst– mode radiation over several hours, such as the intensity, shape and polarization of the average pulse, and the drift rate of the sub-pulses.

As a result of long-term chronometric studies of the pulsar PSR B0943+10 at PRAO using the BSA radiotelescope, evidence was found in favor of the existence of a planetary system in this pulsar. This project has been fulfilled due to the initiative and the leadership of S. A. Suleymanova.

She was awarded the medal "In Memory of the 850th Anniversary of Moscow" (1997), the Certificate of Honor of the Lebedev Physical Institute of the Russian Academy of Sciences (2006) and the honorary badge "For gratifying labour" of the Governor of the Moscow Region (2006).

SULEYMANOV Valery Fialovich

Born 29.08.1964 in p. Paranga, Mary-El (Marijskaya ASSR). He had been learning astronomy at the Kazan State University (Kazan (Volga region) Federal University now) for five years and achieved an MSc degree (with honor) in1986. He worked at the Astronomy Department of the KSU as a researcher until 1995 and then became an Assistant (Tutor). Since 1998 he taught as an Associated Professor up to 2005. Then he moved to the research position at the KPFU. He is also a researcher at the Institute for Astronomy and Astrophysics, the University of Tuebingen, Germany. He has a second PhD degree (2008, Doctor of Physics and Mathematics, Habilitation). He is an Associate Professor at the Astronomy Department (2003), and a member of IAU (since 2003).

The main scientific works dealt with astrophysics of compact objects: black holes (BH), white dwarfs (WD), and neutron stars (NS). V. Suleimanov is an author of more than one hundred scientific publications.

He is known for his investigations of the accreting compact objects in close interacting binaries. The aim of the investigation is the determination of their masses, radii, and angular momenta by comparing observed spectra with the computed in the model atmospheres approach. The works devoted to NS radii determinations performed by V.Suleimanov and his colleagues are very important for investigations of supra-dense matter properties in NS cores, and the existence of quark stars.

He was one of the first who modeled accretion disc (AD) atmospheres and their radiation spectra. He determined (together with G.V. Lipunova and N.I. Shakura) Kerr parameters of BHs in some X-ray Novae. He suggested (with F. Meyer and Meyer-Hofmeister) the solution to the problem of high optical luminosities of ADs in super-soft sources (SSS). He evaluated the WD masses in some intermediate polars using their hard X-ray spectra (in collaboration with M.G. Revnivtsev and H. Ritter). The model spectra of hot WDs computed together with A.A. Ibragimov, were used to determination of the masses and radii of SSSs in Magellanic Clouds and galaxy M81.

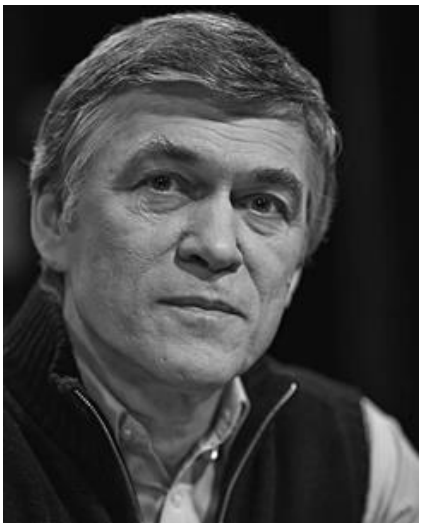
Since the middle of 2000-th, he works on the NS radii determination problem. Limitations of NS radii were obtained using a comparison of the typical boundary layer spectrum between AD and NS with the model spectra computed using the spreading layer model together with J. Poutanen. V. Suleimanov developed (together with J. Poutanen, M.G. Revnivtsev, and K. Werner) and successfully applied for some LMXBs a new method of mass and radius determination of NSs in X-ray bursting sources. The method is based on the comparison of the burst spectral evolution on the decline phase with the computed one.

He investigated (in collaboration with A.A. Mushtukov, J. Poutanen, S.S. Tsygankov, et al.) different accretion states of accreting X-ray pulsars (XP). They suggested some new models, which explained the observed correlations between XP luminosity and the cyclotron line position in its spectrum. They also computed the upper limits of XP luminosities determined by NS magnetic field strength and showed that the pulsed ultraluminous X-ray source in galaxy M82 was an accreting NS with a superstrong (1014 G) magnetic field on the surface.

His computations of magnetized NS atmospheres allowed us to understand the origin of the absorption features in observed spectra of some magnetized NSs (together with G.G. Pavlov, A.Yu. Potekhin, and others). His model spectra of pure carbon NS atmospheres were used for evaluating the basic parameters of NS located in supernova remnant HESS J1731-347 and for investigations of NS cooling physics (together with D. Klochkov, G.G. Pavlov, D.G. Yakovlev, and others).

V. Suleimanov mainly taught in the 90-th and early 2000-th. He was a supervisor of one PhD thesis.

SURDIN Vladimir Georgievich



Born 01.04.1953 in the city of Miass, Chelyabinsk region.
In 1976 graduated from the astron. dept. of phys. fac. at Lomonosov MSU; in 1979 – postgraduate study at LMSU. In 1980 defended PhD thesis “Evolurion of globular star clusters”. Since 1979 he has been working in the Sternberg Astronomical Institute of LMSU. Since 1995, he taught part-time at the Department of astrophysics and stellar astronomy of phys. fac. LMSU. Since 2011 he has taught the course "General Astronomy" as associated professor of Dep. experimental astronomy of phys. fac. LMSU, combining teaching with scientific work in the SAI. Has the title of associated professor.

IN SAI V.G. Surdin studied the origin and evolution of star clusters, investigated the mechanisms of their interaction with other objects and subsystems of the galaxy (giant molecular clouds, galactic disk, field stars, etc.). He was the first to consider the evolution of the orbits of globular star clusters under the influence of dynamical friction, leading to their partial destruction and formation of the galactic nucleus from the central dense parts of globular clusters. He was the first to show the influence of dynamical friction, dissipation, and tidal shocks when crossing the galactic disk on the distribution of globular clusters in the Galaxy. V.G. Surdin investigated the interaction of expanding supernova remnants with field stars and, based on this, proposed a new mechanism for the destruction of star clusters, which does not require the release of a large mass of gas.

V.G. Surdin developed a new method for determining the distance to the center of the Galaxy, based on the galactocentric symmetry of the metallicity distribution of globular clusters. He also studied the properties of hierarchical stellar systems, the mechanisms of stimulated star formation, and some questions of the structure of the Solar system. Scientific work of V.G. Surdina was awarded the 1984 Moscow Komsomol prize.

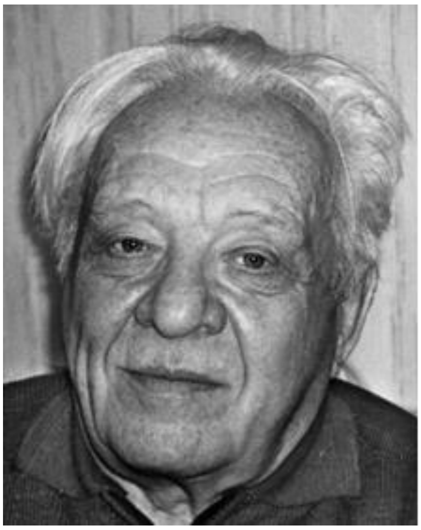
V.G. Surdin is involved in educational activities: he read thousands of popular science lectures in various cities of the country and abroad, translated and edited hundreds of books and articles on astronomy. As a member of the Bureau of the “Znanie” Society of the USSR, he supervised the work of planetariums. He worked on the editorial board of the Great Russian Encyclopedia, in the RAS Commission on science popularization, for many years he organized the Moscow Astronomical Olympiad and was a member of the Central Methodological Commission on Astronomy of the All-Russian Olympiad for Schoolchildren.

V.G. Surdin has published over 100 scientific and over 1000 popular science articles, as well as over 50 books; some of them have been awarded prestigious prizes ("Enlightener-2012 and -2015", British Council Prize, Belyaev Prize, etc.).

V.G. Surdin constantly takes part in the educational process. Annually reads the interfaculty course of Moscow State University "Fundamentals of Astronomy", on-line astronomy courses on the portals "Lectorium" and "Open Education", courses "Astronomy for Physicists" and "Observational Astronomy" at Novosibirsk State University. He supervised the work of undergraduate and graduate students. Awarded the title of "Honorary Worker of Education of the City of Moscow".

V.G. Surdin is a member of the IAS, a member of the Bureau of the Scientific Council on Astronomy of the Russian Academy of Sciences, a member of the editorial board of the RAS journal "Quant".

SVECHNIKOV Marij Anatolyevich



Born 28.01.1933 in Odessa, Ukraine. Graduated from Leningrad State University (LGU, now St. Petersburg State University SPbU) (1954). Obtained his PhD at LGU (1957). In 1957-1959, a lecturer at Leningrad State Pedagogical Institute. In 1960-1964, worked in various positions at LGU, starting as a junior researcher and progressing to the head of construction of the Burakan Astrophysical Observatory in Armenia.

In 1964-1979 and 1993-2009, worked at Ural State University (now, Ural Federal University, UrFU), first as Assistant Professor and then moving on to Senior Researcher. In 1972-1976, he was appointed to work in Algeria. In 1979-1999, worked at Chelyabinsk State University. D.Sc. in Phys.-Math. Sciences. (1987), Prof. (1988). Member of the International Astronomical Union (1967). Died in 2011 in Yekaterinburg.

M.A. Svechnikov is the founder of a new scientific branch – the statistical study of close binary stars of various types. He created unique catalogs of orbital elements, masses, and luminosities of close binary stars (1969, 1987) and two-volume catalog of approximate elements of eclipsing variable stars (1990). He developed a new classification of close binary stars (1969) that combined the advantages of the Kopal classification (that takes into account mainly geometric characteristics of the systems) and the Krat classification (based mainly on the physical characteristics of the components of the eclipsing system). Based on the external features of the systems, his classification was associated with the evolutionary stages of eclipsing systems determined by the age, initial masses of the components, and the size of the system. It formed the basis of the modern classification used in the General Catalog of Variable Stars. He was the first to determine the probabilities of discovering close binary systems of various types as eclipsing variable stars (1984 – 1992), estimated the spatial density of close binary systems of various types in the vicinity of the Sun (1987 – 1993), refined the statistical dependencies connecting mass with luminosity, spectrum, radius, and other parameters for main-sequence stars and subgiants.

He led statistical studies of close binary systems. Research supervisor for 10 completed PhD theses. Author of 5 training manuals, 170 research publications in national and international journals, including 7 monographs.

He prepared and had for many years been delivering lecture courses "Theoretical Astrophysics", "Additional Chapters of Theoretical Astrophysics", "Variable Stars", "General Astrophysics", "General Astronomy" for physics specialization students, "Methods of Dimensions and Similarity", " Physics and Evolution of Stars" for mathematics specialization students, "Physics of Space" for physics specialization students, "Foundations of Natural Science" for social sciences students, "Problems of Modern Astrophysics", "Physical Geography and Geophysics in Natural Science" for students of pedagogical universities, "Astrophysics", "Thermodynamics", "Theory of Dimensions and Similarity" for students with specialization in theoretical physics.

Awarded the badges "For Excellent Success in Work", "Winner of the Eleventh Five-Year Plan".

SVIDSKY Pavel Mikhailovich

Born 10.12.1933, Zaporozhye. From 1950-1955 studied at the Faculty of Physics, Moscow State University. Since 1956 has been working at the Institute of Applied Geophysics of the Academy of Sciences of the USSR (now – FGBU IPG), where he worked his way up from an engineer to the head of a scientific department. Candidate of physical and mathematical sciences (1975), senior researcher (1984), author of over 100 scientific publications. Took part in applied research on radioactive environmental pollution from nuclear tests and accidents. Participant of PA Mayak distress consequences liquidation. Received a number of state and departmental awards, such as "Honored Meteorologist of the Russian Federation", "300 years of the Russian fleet", "For excellence in labor", "Excellence in environmental protection", "100 years of international geophysics, for outstanding contribution to the implementation of international geophysical projects."

P.M. Svidsky is one of the initiators and active performers of research and scientific developments, starting with the «Cosmos» satellite (11, 17, 70) and continuing with the satellites «Meteor», to create scientific, methodological and instrumental bases for monitoring the radiation situation in near-Earth space, as an important factor in ensuring the reliability of existing technical systems and the safety of manned projects. This work led to the Government decision in 1973 to establish the Service for Monitoring and Forecasting the Radiation Situation in near-Earth space.

Since 1986 he has been the head of the IPG department responsible for scientific support of the Service for the Development of Terrestrial and Satellite Observations of Solar Activity Diagnosis and Prediction. The department actively participated in the preparation of the Federal Target Program (FTP) "Geophysical Monitoring" (2008 – 2016). Under this program a number of developments were carried out to create new and improve the existing observational complexes located mainly at the astrophysical observatories of the RAS institutes involved in the study of processes on the Sun and in the circumsolar space, since regular operational data on solar activity are one of the most important information components of the System of heliogeophysical monitoring. Organizational and financial support for these works was carried out by State contracts, where Roshydromet acted as the Customer, and the execution was entrusted to the "Institute of Applied Geophysics (FBSU" IPG ") in cooperation with specialized institutes. This provided the opportunity to maintain a high scientific and professional level required for the creation of such unique observation platforms. The cooperation included ISTP SB RAS, MAO RAS, PRAO ASC LPI, SPbF SAO RAS, as well as NRNU MEPhI. He was a scientific supervisor – a responsible executor for these State contracts, managing to create a favorable atmosphere of interaction and cooperation. As a result of these developments, a number of observatories were equipped with new and modernized complexes for solar-interplanetary observations. Specifically, the new OFST telescopes-stokes meters were installed in the UAO, BAO, MAS MAO, a solar synoptic telescope with a vector magnetograph in the BAO, a solar mirror coronagraph and a Coronal infrared magnetograph in the SSO, a multiwave radioheliograph and a multichannel microwave radio spectropolarimeter in Badar RO, and advanced radio astronomy complexes in PRAO and on RATAN-600 (solar), as well as the Automated Muon Hodoscope (AMG) at MEPhI.

SYROVATSKY Sergey Ivanovich

Born 02.03.1925 in Bereznehuvate, Mykolaiv region. D. 26.09.1979 in Moscow. In 1941, at the age of 16, he went to the war. He got wounded four times. He was awarded two Orders of the Red Banner. In 1951 he graduated from the Faculty of Physics of Moscow State University named after M.V. Lomonosov. Same year he entered the postgraduate course of the Theoretical Department of Lebedev Physical Institute (scientific supervisor Prof. S.Z. Belenky). After graduating from Lebedev Physical Institute, he left to work there as the head of sector. Doctor of Physical and Mathematical Sciences, professor of MIPT. Died 26.09.1979 in Moscow.

His main scientific works are devoted to the field of space physics and plasma physics. Formulated a closed system of equations of magnetohydrodynamics in the form of conservation laws. Investigated some problems of stability of magnetohydrodynamic discontinuities; found a class of exact solutions to the equations of magnetohydrodynamics corresponding to the motion of a medium along a magnetic field of an arbitrary form, in particular, he solved the problem of buoyancy in magnetohydrodynamics. The results of these works are widely used in the physics of outer space, as well as in the design of magnetohydrodynamic separators for the separation of mechanical mixtures. In his radio astronomy research, he developed the theory of synchrotron radiation as applied to space conditions; developed a method for calculating the intensity of this radiation and with its help showed that relativistic electrons in the Galaxy are accelerated directly in the sources. He received and investigated the equations that determine the transformation of radio emission spectra under the influence of electron energy losses, which made it possible to estimate the age of some space radio sources. In the field of astrophysics, he analyzed cosmic rays, general questions of the theory of the origin of cosmic rays together with V.L. Ginzburg, considered their chemical composition and transformation during wandering in interstellar space, pointed out the mechanism providing the predominant acceleration of heavy ions. He received a number of important results concerning the spectrum and intensity of electromagnetic radiation arising from some processes in gamma and X-ray sources. His work on the problem of plasma dynamics in strong frozen-in magnetic fields opened up the possibility of explaining the appearance of accelerated particles in solar flares, the generation of cosmic rays in turbulent magnetic fields of supernova shells, nonstationary galactic nuclei and quasars.

Author of the monograph "The Origin of Cosmic Rays" (with V.L. Ginzburg, 1963).

SUNYAEV Rashid Alievich

Born 01.03.1943 in Tashkent, USSR. In 1960-66 was a student and in 1966-68 a postgraduate of the Moscow Institute of Physics and Technology (MIPT). Prof. Yakov Zeldovich was his scientific advisor. Candidate of Sciences (equivalent of Ph.D.) in astrophysics (1968), Doctor of Sciences in astrophysics (1973). From 1968 to 1974 he was a junior and then a senior researcher at the Institute of Applied Mathematics of the USSR Academy of Sciences. Since 1974 Head of the laboratory of the Space Research Institute (IKI) of the USSR Academy of Sciences. In 1982 he has organized the High Energy Astrophysics Department of IKI and was its Head till 2002. From 2002 to the present time he is a chief researcher and Head of the Laboratory of Theoretical Astrophysics at IKI RAS. Simultaneously from 1975 to 2001 he was a professor at MIPT. From 1995 to 2018 Director of the Max Planck Institute for Astrophysics in Germany.

Scientific interests cover a wide range of problems from elementary physical processes under extreme astrophysical conditions to physical cosmology and relativistic astrophysics.

Among the best-known results are the "standard" theory of disk accretion onto black holes (Shakura and Sunyaev, 1973); prediction (together with Zeldovich, 1970) of the position of the "last scattering surface" and "black body photosphere" of our Universe and, most importantly, of the existence of baryon acoustic oscillations and acoustic peaks in the power spectrum of CMB angular distribution; the Sunyaev-Zel'dovich thermal and kinematic effects (1972, 1980) allowing to use galaxy clusters as a powerful tool of observational cosmology and to measure their peculiar velocities. He was a member of the scientific team of the ESA PLANCK cosmological mission, Project Scientist of the orbiting X-ray observatories on the module KVANT of the space station MIR and on the GRANAT and INTEGRAL spacecrafts in Russia. He is Project Scientist of the orbiting X-ray observatory SRG with the ART-XC (Russia) and eRosita (Germany) telescopes with grazing incidence optics aboard. SRG received the world's best map of the entire sky in X-rays (2020).

Corresponding member of the USSR Academy of Sciences since 1984. Since 1992 Full member of the Russian Academy of Sciences (RAS). Member of the German National Academy of Sciences "Leopoldina". Foreign member of the Royal Society, National Academies of Sciences of the USA and India, Royal Academy of Arts and Sciences of the Netherlands.

Winner of two State Prizes of Russia in Science and Technology (2003, 2016), the RAS Friedman Prize in Cosmology and Gravitation, and the RAS Zeldovich Gold Medal. He is a recipient of the Bruno Rossi Prize of the American Astronomical Society, the Gold Medal and Eddington Medal of the Royal Astronomical Society, the Catherine Wolf Bruce Medal of the Pacific Astronomical Society, the Dirac and Benjamin Franklin Medals in Physics, and the Karl Schwarzschild Medal of the German Astronomical Society. Recipient of the Heinemann Prize of the American Institute of Physics, the Gruber Prize in Cosmology, the Crafoord Prize in Astronomy, the King Faisal International Prize in Physics, and the Kyoto Prize. He is Distinguished Visiting Professor at the Institute for Advanced Study, Princeton (from 2010 to the present time).

TARANOVA Olga Georgievna

Born 20.05.1938 in Dushanbe, Tajikistan. In 1960, graduated from Moscow State University (the Mechanics and Mathematics Faculty, the Astronomy Department). From 1960 to 1966, she worked at the now Obukhov Institute of Atmospheric Physics, Russian Academy of Sciences. Having started as a postgraduate researcher with Sternberg Astronomical Institute (SAI MSU) in 1966, she became one of the leading scientists at the Institute, with over 150 publications in national and international journals. In 1970, she completed her PhD with the thesis "Infrared Glow Night Sky and Aurora Polaris" at SAI MSU. In 2001, she was awarded D.Sc. at SAI MSU for her thesis "Search and Investigation Dust Shells in Galactic and Extragalactic Objects". In 2008, she became Distinguished Research Fellow at Moscow State University. From 1963, a member of the International Union of Geodesy and Geophysics (IUGG) and member of the International Astronomical Union (IAU) (2002). Died 28.05.2017 in Moscow.

O.G. Taranova's work focused on the areas of infrared emission of the night sky and Aurora Borealis, planetary astronomy and stellar astrophysics.

Her primary research expertise was IR photometry in the 0.70-10 μm range using instruments that she helped to design during her tenures at Obukhov Institute of Atmospheric Physics and Sternberg Astronomical Institute.

Notable achievements include:

Development of a novel technique for absolute calibration of IR spectra. This technique was successfully applied to spectrophotometric investigation of Airglow and Aurora, twilight hydroxyl airglow and other objects.

Estimated the height of the dust clouds on Mars during the dust storm of 1971; estimated optical and dynamic parameters of Jupiter atmosphere based on observations of β Sco occultation in 1971.

Based on NIR observations of Venus, established the latitude variations of W (CO2). Analyzed IR photometric measurements of the Galley Comet in 1985.

For over 30 years, O.G. Taranova was actively engaged in the research program of search and investigation of gas-dust shells in galactic and extragalactic objects at the Crimean Astrophysical Observatory. The findings of those long-term observations are unique and contain many-year worth of data in a uniform photometric system of 0.36-5.0 μm spectral range. This set of unique data allowed to evaluate long-term and, possibly, evolutionary changes of many astrophysical objects. The data for 254 such objects is catalogued and published (http://www.sai.msu.ru/basa/index.html).

TATEVYAN Surya Kerimovna

Born 22.01.1937 in Bakou, Azerbaydjan. In 1960 she graduated from the Moscow State Geodetic University, Astronomy-Geodesy de-partment. Since 1962 constantly worked in the Astronomical Council (since 1991 renamed to the Institute of Astronomy of the USSR, now – Institute of Astronomy – INASAN) in various positions: from Junior Researcher (1962) till the head of the Satellite Geodesy department (1986). She received her Ph.D. in 1967 and her full D. in 1998. Passed away on July 16 2015. She was an Academician of the International Academy of Astro-nautics, a member of the "Asia-Pacific Space Geodynamics" In-ternational Project Steering Committee, a member of the Space Research Coordination Council of the Russian Academy of Sciences in the field of earth sciences. Member of the Coordi-nating Council of RAS on the problems of the coordinate and time support. Died 16.07.2015.

Her research interests relate to the areas of space geodesy, geophysics and geodynamics. She is the author of over 110 scientific papers and one invention.

She is one of the initiators of the wide use of the measurements of satellite laser ranging, satellite navigation systems GPS and GLONASS, satellite radio Doppler DORIS system in the fundamental research.

In the 1960s – 1980s, the main scientific interests are connected with the use of the laser ranging satellite observations for the purposes of geodesy and geophysics. During this period, there is provided a method of short arc for the ground points positioning. The main advantage of the method is to maximize the use of the obtained observational material which allows to determining the coordinates of the stations within the limited tracking territory. Since 1968, she takes an active part in the international cooperation on the program "Intercosmos" in the field of exploration and use of outer space, the participation in the development of laser range satellite device "Intercosmos".

She participates in the "Big chord" project in order to determine the meridian arc stretching from the island of Spitsbergen to Antarctica with the local geodetic networks adjustments to the nodal points of the chord. In 1980-1984 she participates in the international project MERIT with the aim of the development the new methods for the Earth's rotation studying.

In the last years of her life she actively involved in solving the problems of coordinate-time support of the Russian Federation on the basis of various modern satellite technologies (GPS, GLONASS, DORIS). With her direct participation on the Russian territory are created and successfully functioning GPS/GLONASS and DORIS networks included in international navigation (IGS) and DORIS (IDS) services. Her research interests cover various fields of space geodesy and geodynamics (high-precision positioning on the earth surface, and the change of the points velocities, the movement of the center of mass of the Earth, studying the Earth rotation parameters, the definition of the gravitational field of the Earth and others).

She successfully carried out the work with young scientists. Under her scientific direction four persons received their Ph.D. theses.

She was awarded by the State medal “Za trudovyu doblest” (1983) as well as with different awards from the RAS and the Russian Space Agency.

Information prepared by Kuzin S.P. – Senior Researcher of the INASAN.

TAVASTSHERNA Kirill Nikolaevich

Born 01.05.1921 in Petrograd. In 1939, entered the State University of Leningrad; since November, in the Army. After the war, in 1945, resumed his education in the University. 1945–1950 – Student, Dept. of Mathematics and Mechanics, in 1950–1953, post-graduate. 1953: Junior Researcher at the Pulkovo Observatory. 1954: Cand.Sci. («Fundamental Determination of the longitude difference between Astronomical Observatory of The State University of Leningrad and VNIIM Institute with photoelectric method». 1959: Senior Researcher, 1971–1979: Director of Science of Pulkovo Observatory, 1979–1982 – Interim Director of Pulkovo Observatory. 1982: Dr.Sci. («Astrometric Studies of Stellar Position of Fundamental Stars of the Southern Sky»). Member of IAU, 1973: Member of the Commission №8 IAU, 1979: Vice President of the Commission. Since 1972: Member of AstroCouncil. Died tragically 24.06.1982.

Basic science interests belonged to the area of Fundamental Astrometry, Astronomical and Geodetical Coordinates, methodology and organization of observations of Solar system bodies. Authored more than 100 science works.

Taking into account that astronomy, geodesy, and space navigation needed both precise astrometric observations, and precise longitude values, for the first time applied the photoelectric technique suggested in 1951 by N.N.Pavlov to determine the difference of longitudes between Astronomical Observatory of the University and VNIIM Institute (1953–1955). Much attention was given to instrumental errors, including thermal ones. Determined the brightness equation of FK3 Catalog; for bright stars, FK3 right ascensions appeared to be overestimated. Based on N.N.Pavlov's studies for thermal flexure of the vertical circle, derived a series of crucial formulae, which may be used in fundamental longitude works.

In 1955, in collaboration with M.S. Zverev and A.F. Nemiro composed The Pulkovo Program of absolute observations of stellar coordinates taking into account all contemporary requirements. K.N. Tavastsherna was one of the creators of Pulkovo absolute Catalog of right ascensions of 1023 bright and faint fundamental stars from observations with the Pulkovo Major Passage Instrument (1954–1961).

From 1958, managed the processing of absolute observations of right ascensions and declinations of 2420 stars observed in 1928–1941 in Melbourne Observatory (Australia). In this study, especially interesting is suggested by him new method of two-parameter levelling of right ascension of stars, taking into account variations of the scale of the measurements. Also of a great interest are methodological studies of the impact of observational errors on the results of cyclical levelling. Evidence for the impact of errors depending on brightness of the stars on the proper motion system of FK4. On the basis of these works, in 1982 a Dr.Sci. Thesis was prepared, and 6 Catalogs released.

Worked also in the area of astronomical and geodetic problems, methodology and organization of observations of Solar system bodies. In 1967 and 1968 was Head of the expedition of the Pulkovo Observatory to the Southern hemisphere (Chile); directed mounting and testing of the new Pulkovo Major Passage Instrument. Took art in observations of total solar eclipses in 1954 and 1958. Held a course on Fundamental Astrometry in The State University of Leningrad for a number of years.

State Awards: Medals «For Battle Merit» (1943), «For Valorous Labor» (1970) and Bronze Medal of All-Union Exhibition of Achievements of National Economy (1976). Order of the Red Star (1944) and Order «Badge of Honor» (1971).

TEPLITSKAYA Raisa Bentsionovna

Born 13.11.1926, Odessa. Graduated from Odessa State University named after Mechnikov in 1949. Worked as a Researcher in the Lviv University Astronomical Observatory (1949—1957), as a Researcher in Odessa Astronomical Observatory (1957—1963). From 1963 to 2015 worked in the Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation of the SB, the USSR Academy of Sciences (since 1992, Institute of Solar-Terrestrial Physics, ISTP SB RAS) in different positions — from a Researcher to Leading Researcher. Doctoral degree in Phys.-Math. Sciences (1994), a Member of IAU (1965). Died 26.09.2016 in Irkutsk.

Main research works relate to solar physics and astrophysics. Author of more than 130 scientific papers.

After graduating from the university with a degree in Astronomy, Raisa Teplitskaya was appointed to work in the Astronomical Observatory of Lviv University, where she performed a number of works on variable stars and solar physics. In 1957, started working in Odessa Astronomical Observatory and took active part in scaling up the work of Mayaki Astronomical Station for photographic observations of meteors as part of the International Geophysical Year. She taught a course of lectures on theoretical astrophysics for astronomy students. Defended her Candidate's dissertation in 1962.

In 1963, arrived in Irkutsk to work in the newly established Siberian Institute of Earth Magnetism, Ionosphere and Radio Wave Propagation of the SB, the USSR Academy of Sciences and led the spectroscopy group. Raisa Teplitskaya carried out the most complete analysis of spectrophotometric characteristics of strong chromospheric lines of H and K CaII in a sunspot spectrum, was the first to obtain results for three-dimensional structure of a sunspot penumbra, proved the existence of the Wilson–Bappu effect in the spectrum of solar formations, developed the original algorithm to construct a self-consistent chromospheric model without assumption on hydrostatic equilibrium. Under her direction, researchers developed the technique for solving the inverse problem of radiative transfer for modeling the solar chromosphere, which is widely used. Since the mid-1980s, studies of oscillatory processes in quiet and active solar regions along the ionized calcium lines have been initiated. These studies are important for assessing the role of oscillations in energy transfer to the upper solar atmosphere.

Raisa Teplitskaya directed a number of RFBR scientific projects.

She successfully combined her research work and activities concerned with organization of science, editing and teaching. Delivered lectures on solar physics to students of Irkutsk State University and Buryat State University, and to postgraduate students in ISTP. Was a Scientific Editor of the Collection of Scientific Papers "Research on Geomagnetism, Aeronomy, and Solar Physics" (in Russian).

Raisa Teplitskaya was a research advisor to three candidate's dissertations.

Awards: the medals “Veteran of Labor” (1981), “For Valiant Labor in Commemoration of the 100th Anniversary of the Birth of V.I. Lenin” (1970), Certificates of Honor from RAS and trade unions of RAS (2006).

TEREBIZH Valery Yuzefovich

Born in 1941 in Chelyabinsk. From 1958 to 1963 he was a student at the Leningrad State University (LSU). In 1963-1966 – a postgraduate student of the Department of Theoretical Astrophysics, LSU. In 1966-1973 – a researcher at the Byurakan Astrophysical Observatory of the Academy of Sciences of Armenia. In 1969, Terebizh defended his Ph.D. thesis "Nonlinear and non-stationary problems in the theory of radiation diffusion". In 1973-2013 – a Senior Researcher at the Sternberg Astronomical Institute (GAISh-MSU); in 1976-1992 – Head of the GAISh Crimean base. In 1983, he defended his Doctoral thesis "The study of galaxies with active nuclei". Since 2014, Terebizh has been working at the Crimean Astrophysical Observatory (CrAO).

Research interests are related to the theory of radiation transfer, extragalactic astronomy, inverse problems of mathematical physics, and astronomical optics.

V. Terebizh generalized the nonlinear theory of light scattering in spectral lines to the case of complete frequency redistribution of radiation. He found an exact solution to the problem of radiation softening in multiple Compton scattering and substantiated the reduction of non-stationary problems of radiation transfer to stationary ones.

Together with V.S. Oskanyan, he was the first to find out the luminosity function of UV Ceti-type stars.

V. Terebizh developed a few spectrographs and photometers for telescopes. Joint observations with V.T. Doroshenko using these devices provided data on the energy distribution in the spectra of several hundred galaxies with active nuclei. He developed physical models of active galactic nuclei.

V. Terebizh proposed a new approach to solving inverse problems of mathematical physics based on statistical concepts. The field of application of this theory is very extensive. During 1995-2005, stable and effective solutions were obtained in the frame of this approach for a number of inverse problems that do not involve Bayesian-type a priori information. In particular, the consistent estimate of the spectral density and an important similarity law in the theory of time series were found. He proved that the natural limit of the resolution of an optical system is set by the signal-to-noise ratio and can exceed the classical Rayleigh limit by orders of magnitude.

V. Terebizh led the manufacturing of new optics for the 1.25-m ZTE GAISH telescope, he designed the adaptive optics system for the 4.1-m SOAR telescope and proposed new optical systems with a field of view up to 70 degrees. Many wide-field telescopes, including the 4.1-m Dark Energy Camera and the 3.6-m Canada-France-Hawaii Telescope, have been manufactured using these schemes. The optics of several telescopes of CrAO were either completely or partially modernized according to the Terebizh calculations. A new type of null-corrector for optical control of aspheric surfaces has been proposed, which makes it possible to get an internal check.

V.Yu. Terebizh has written more than 130 scientific articles; he is the sole author of 4 books:

Time series analysis in astrophysics (in Rus.; 392 pp., 1992), Introduction to statistical theory of inverse problems (in Rus.; 376 pp., 2005), Modern optical telescopes (in Rus.; 80 pp., 2005), and Survey Telescope Optics (in Eng.; SPIE, 150 pp., 2019). V. Terebizh is a co-author of 2 books: Sky and Telescope (in Rus.; 2008, 2014, 435 pp.; major prize of the Russian Academy of Sciences in 2009 as the best edition in the field of science, technology, and education), and Advances in Quantum Systems Research (in. Eng.; Nova Publishers, 2014, 424 pp.).

TEREKHOV Oleg Viktorovich

Born 09.12.1960 in Moscow. After graduating from Moscow Engineering Physics Institute in 1983, was working at IKI RAN, having passed the path from engineer to lead researcher, head of the laboratory and Deputy Head of High-energy Astrophysics department. Since 1989, Ph. D., since 1996, doctor of sciences, IAU member.

Specialist in X-ray and gamma-ray astronomy, student of R. A. Syunyaev, author of more than 120 scientific publications.

He play an active role in the development and pre-flight preparation of the Sneg-2MP9 instrument aboard the Prognoz-9 satellite, the Phoebus and IRA detectors onboard of the international astrophysical observatories Granat and Roentgen onboard Kvant module of the Mir space station. Participated in the Lilas experiment on board the interplanetary automatic stations Phobos during their flight to Mars. He played a leading role in the processing and analysis of data from all these instruments.

In the period 1994-2001, he coordinated the work on the very large international astrophysical project – Spectrum-X-Ray-Gamma observatory, being the deputy scientific director of the project. On behalf of Russia, he was responsible for the development and creation of the observatory's two main telescopes equipped with X-ray grazing insidence mirrors – the SODART space-opening telescope and the Joint European X-ray Telescope JET-X.

The main scientific results are related to the study of transient gamma-ray events of various nature: cosmic gamma-ray bursts, sources of repeated bursts, high-energy solar events. He paid much attention to the studies of the background in the spacecraft orbits.

He carried out a large cycle of studies of cosmic gamma-ray bursts, including two of the most powerful events at that time, GRB 830801 and GRB 920723, performed spectroscopy and localization of several hundred bursts, compiled their catalogs, and performed a statistical analysis of this (at that time large) sample of bursts. He detected precursors in the light curves of several bursts. He is a co-author of the discovery of one of the first sources of repeated gamma-ray bursts SGR1806-21 in the constellation Sagittarius.

He compiled a detailed catalog of powerful solar flares with radiation up to 100 MeV during the period of maximum solar activity in 1990-1991 (at this time, the Granat was the only spacecraft capable of observing such events.)

During two particularly powerful flares, SF900524 and SF910322, he obtained unique data on the mechanisms of acceleration and deceleration of protons and neutrons and the generation of radiation in nuclear gamma-ray lines, and based on observations of the 2.2 MeV line, he studied in detail the process of deuterium synthesis on the surface of the Sun. He registered quasi-periodic oscillations of the radiation flux during a series of powerful flashes.

TEREZ Eduard Ivanovich

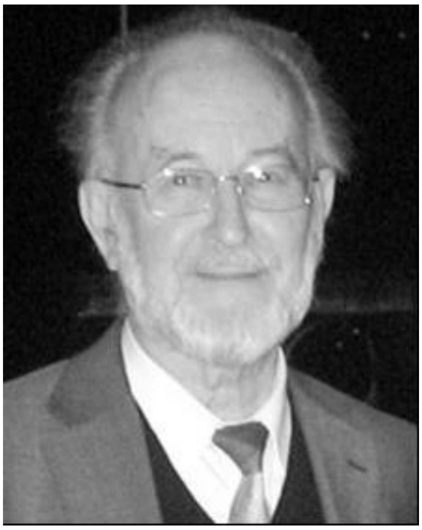
Born in 1939 in Leningrad (USSR). In 1956–1962 – student at the Len-ingrad Institute of Aviation Technology. In 1971 he defended the Ph.D. thesis "Method of absolute calibration of photoelectric devices". In 1962–1975 –junior researcher at the Crimean Astrophysical Observatory (CrAO). In 1975–1977 – Assistant Profes-sor at Simferopol State University. In 1975–2004 – Head of the Department of Astronomy at Simferopol State University. Since 2004 – leading scientist at CrAO. In 1989 he defended the Doctoral thesis "Development of apparatus and absolute calibration of energy distribution in spectra of astronomical objects". In 1990 he was appointed to the rank of Professor.

An expert in the field of space research, astrophysics and atmospheric physics. E.I. Terez participated in several space research projects. Within these projects fundamentally new data on the nature of stars and planets were obtained. (Kosmos-215, Lunokhod-2, Vega-1 and Vega-2; particularly by using device AF3-L mounted on Lunokhod-2 the dusty atmosphere of the Moon was discovered.) E.I. Terez measured spectrophotometric parameters of standard stars which are the base for photometric observations in astronomy and also used when developing systems of celestial navigation in the outer space. He elaborated new methods for determining spectral transparency of the atmosphere in the day and night time. E.I. Terez first showed cyclical changes of the total ozone content in the Earth's atmosphere and ascertained that the global climate changes can be cyclical and not associated with any human activity.

E.I. Terez showed that based on the analysis of the currently available experimental and theoretical data it can be stated that the main source of the internal energy of the Earth (the root cause of endogenic geodynamic and tectonic processes) are synthesis reactions occurring in the inner core of the planet consisting of metal hydrides. The proposed hypothesis, according to modern concepts on dynamics of the geological structure of the Earth, suggests the presence of hydrogen flows – deep fluids (plumes) coming from the Earth's core and transporting thermal energy of thermonuclear reactions to the planet's surface. These hydrogen streams (proton gas) due to the Earth's rotation and Coriolis acceleration are twisted in spirals in the outer electrically conductive liquid core of the Earth which generates the Earth's dipole magnetic field.

E.I. Terez authored over 150 scientific publications.

TESLENKO Nikolay Maximovich



Born 18.08.1937 in the village of Tiotkino, Kursk province. Soviet and Russian astronomer, expert in the field of celestial mechanics and space flight dynamics. In 1959, graduated from M.V. Lomonosov Moscow State University. Since1962 after finishing his post-graduate studies at Sternberg Astronomical Institute, he worked at the Department of Applied Mathematics of the Steklov Mathematical Institute of the USSR Academy of Sciences in various roles, including a senior research associate. In 1981, he obtained his PhD with the thesis: "Multiple Corrections of the Spacecraft's Waiting Orbit". He received a number of awards and medals, including Order of the Badge of Honour (1970).

With his main expertise in applied astronomy, N.M. Teslenko's work on space projects to study celestial bodies, specifically the Moon, Mars and asteroids, is considered his greatest contribution to the field. He is the author of about 50 research publications.

From 1963 to 1965, under the leadership of M.L. Lidov and D.E. Okhotsimskii and as part of the national lunar program, he researched a special trajectory class for spacecraft flights from Earth to the Moon, closely passing the Moon and returning to Earth.

From 1966 to 1976, N.M. Teslenko was part of the KIAM Ballistic Centre control group and was involved in the development of complex mathematical methods and algorithms for spacecraft maneuver control problems. Under his management, spacecraft maneuver calculations were performed during the unmanned lunar missions "Luna-10" – "Luna-12" and "Luna-14" – "Luna-24" (launching the first artificial moon satellites; delivering the rover to the lunar surface with remote control from Earth; robotic probe to land on the Moon to return a sample of lunar soil to Earth).

In the following years, alongside M.L. Lidov and other experts, he worked on optimization of spacecraft launches into halo orbits around the Earth-Moon L2 point (1973-1976) and the Earth-Sun L2 point (1986-1993) and stabilization of spacecraft flights in halo orbits. Those efforts were directed to design a repeater to communicate with the far side of the Moon (Earth-Moon system) and to study the cosmic microwave background anisotropy within the project «Relict-2» (Earth-Sun system). During that time, N.M. Teslenko also worked on control problems of spacecraft's waiting orbit as part of «Mars-5M» project aimed at recovering soil samples from Mars (1978-1980), and of spacecraft's quasi satellite orbits around Phobos (1988-1989, "Phobos" project).

In 1992 – 1993, in collaboration with M.L. Lidov, he developed a method that uses lunar gravitation in space flights to near-Earth asteroids. This method provides an opportunity for a significant increase in payload due to the fuel economy. In 2000 -2009, together with M. A. Vashkov'yak, he studied long-term evolution of all known at that time moons of Jupiter, Saturn, Uranus and Neptune.

TIKHONOV Nikolay Alexandrovich

Born 22.08.1949 in Tashauz, Turkmen SSR. In 1976, graduated from the Leningrad State University. From 1976, has been working in the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) in positions of: Intern Researcher (1976-1981), Junior Researcher (1981-1988), Research Scientist (1988-1995), Senior Researcher (1995-2004), from 2004 – Leading Researcher, Head of the Extragalactic System Study Group. In 1988, defended his Ph.D thesis and in 2002 — Dr.Sc. thesis on "Spatial Distribution and Structures of Galaxies Based on the Study of Brightest Stars".
The IAU member.

His main scientific papers are related to the research areas of extragalactic astrophysics. The author of over 100 scientific papers.

First papers written by N.A. Tikhonov in the 1970's are related to the study of capabilities of the 6-m BTA telescope and enhancement of its operating efficiency. In the 1980's, using the ob-served data of compact galactic groups obtained at the 6-m telescope, he measured dynamic masses of groups, determined the morphology of galaxies, and showed that high spatial density of galaxies in groups do not cause any changes in their morphological composition.

In the 1990's, in collaboration with other astronomers he studied the galaxies resolved into stars, images of which he obtained at the 6-m telescope. Based on the extensive observed data, distances to many galaxies were estimated for the first time and these results were used to study the spatial structure of the Local Group.

From 2000, he has been studying stellar population of galaxies resolved into stars. In collaboration with O.A. Galazutdinova, he derived empirical models of stellar structure of irregular and spiral galaxies. Using the images by the Hubble Space Telescope, in 2005 in collaboration with O.A. Galazutdinova and I.O. Drozdovsky, he discovered extended stellar halos in several spiral galaxies (M81, NGC300, and NGC55) for the first time. In 2008, together with A.I. Kopylov, S.N. Fabrika, and I.O. Drozdovsky, he discovered the last bright galaxy in the Local Group. Studying the stellar population of the galaxy Izw18, the young galaxy main candidate, he was the first to detect its old stellar population and that was indicative of a rather great age of this galaxy.

In 2009-2015, in collaboration with O.A. Galazutdinova, he found that the stellar structure of irregular galaxies resembles a Russian matryoshka. Beginning from young supergiants to old RRLyr

stars the following relation is satisfied: the older the stars are, the more spatial volume they occupy.

At present N.A. Tikhonov studies statistical relations between the parameters of galactic stel-lar population and hierarchical position of galaxies in groups.

TIKHOV Gavriil Adrianovich

Born 01.05.1875 in Smolevichi, Minsk province. In 1897, graduated from the Physics and Mathematics Faculty at MSU. In 1898-1900, studied at the University of Paris and worked as an intern at the Meudon Observatory. Upon returning to Russia, worked as a lecturer in Moscow and Yekaterinoslav for two years. From 1906 to 1941, worked at the now Central Astronomical Observatory of the RAS at Pulkovo. In 1919-1931, was a lecturer at Petrograd University (now SPbU). In 1919, founded the Faculty of Astrophysics at P. F. Lesgaft Institute of Natural Science and was the faculty head for 30 years. In 1941, moved to Almaty. Co-founder of the Academy of Sciences of Kazakh SSR (now National academy of sciences of the Republic of Kazakhstan), the Institute for Astronomy and Physics (now Fesenkov Astrophysical Institute) and Kamenskoye Plato Observatory. Founded the "Astrobotany" division of the Academy of Sciences of Kazakh SSR and was the division head from 1947. Corresponding member of the Academy of Sciences USSR (1927) and full member of the Academy of Sciences of Kazakh SSR (1946). Died 25.01.1960 in Alma-Ata.

G.A. Tikhov's research focused on the areas of photometry and colorimetry of stars and planets, and atmospheric optics. Author of over 230 research publications, including 6 books and textbooks. His textbook "Astrophotometry" (1922) was the first manual in Russian on that branch of astronomy. In 1954-1960, G.A. Tikhov's "Major Research Works" series in 5 volumes were published.

G.A. Tikhov proposed two methods for detecting light dispersion in space. The first method is based on the phase difference of radial-velocity curves of spectroscopic binary stars measured from absorption lines in different parts of the spectrum (1898). The second method uses the phase difference of lightcurves of variable stars in different regions of the spectrum (1908).

He discovered the phase lag of eclipsing stars in the short-wavelength spectral range (the Nordmann–Tikhov effect). He was one of the first to use light filters in astronomy. In 1909-1922, performed colorimetric studies of Mars, Saturn, Uranus, and Neptune. In 1914, based on filter observations of the lunar ashen light, G.A. Tikhov was the first to establish that the Earth, when observed from space, should have a blue tint. In 1937 and 1951, he published catalogs of colors of about 18000 stars in Kapteyn's selected areas.

For 40 years, G.A. Tikhov studied Mars. From photographs in different spectral regions, he discovered a difference in the size and brightness of the Martian polar caps at different wavelengths, established the existence of a blue haze in the planet's atmosphere. His search for evidence of vegetation on Mars, relying on data on spectral reflectivity of terrestrial plants gave a rise to a new branch of science – Astrobotany. G.A. Tikhov also studied the optical properties of the Earth's atmosphere. In 1912, he proposed a design of instrument for registering and reproducing the stellar scintillation. During the First World War, he worked on aerial photography, including development of new techniques for photographic processing, search for ways to reduce the effect of atmospheric haze and *optical* investigation of landscapes. In 1936, discovered the anomalous dispersion of light in the atmosphere.

G.A. Tikhov took part in 20 scientific expeditions, including five expeditions to observe total solar eclipses (in 1914, 1927, 1936, 1941, and 1945). While observing the total solar eclipse in 1936, he was the first to conclude that the solar corona consists of two components, a structureless "matte" corona and "radiant" corona streams penetrating it. He estimated the color temperature of the corona.

Awards: the Order of Lenin, Order of the Red Banner of Labour, the Prize of Paris Academy of Sciences, and two prizes from the Russian Astronomical Society. The lunar crater Tikhov as well as the Martian crater Tikhov were named in his honour. The asteroid No.2251 discovered by N. S. Chernykh in 1977 (Crimean Astrophysical Observatory) is named after G.A. Tikhov.

TITARCHUK Lev Grigorievich

Born 19.04.1944 in Moscow of USSR. In 1969 he graduated from Lomonosov Moscow State University, (MSU) studying in the mechanico-mathematical faculty. In 1969 he began working in the Space Research Institute (IKI) of the USSR AN. In 1972 Lev defended his PhD thesis (his adviser was prof. Vladimir Kurt) and in 1989 he defended his dissertation of Dr. of Science. In 1991 г. Lev was awarded by NASA NRC grant and started working in NASA GSFC in Greenbelt, USA. LT was the first citizen of USSR who received this grant and started working in NASA as a staff member. In the period of 1999-2008 he also worked in the Naval Research Laboratory and in George Mason University (GMU). On the other hand in the period of 2008-2016 LT was professor of University of Ferrara in Italy. In the present time he is a principal investigator in the ASC of the Lebedev Physical Institute (FIAN RAN) and also collaborates with GAISH of MSU.

The LT main scientific interests belong to Astrophysics, X-ray Astronomy and evolutions of accreting neutron stars (NS), black holes (BH) and extra-galactic Astronomy. LT is an author of more than 350 papers, in the world and Russian scientific journals.

His papers with Elena Seifina (ES) are based on application of extensive X-ray data, obtained using many space missions. In these papers they actively develop and probe methods of spectral and timing analysis of X-ray radiation from the sources attributed to various types (BH candidates of the stellar and intermediate masses, microquasors, NSs, entering in the systems of low massive X-ray binary systems and super-massive BHs).

In 1980 in collaboration with R. Sunyaev a classical problem of the Comptonization in the bounded medium was the first time solved. The found analytical spectra were applied to X-ray spectra of many compact sources such as NSs and BHs. Using systematic analysis of these observations Nikolai Shaposhnikov, ES and LT revealed fundamental properties of accreting NSs and BHs. They demonstrated that for a BH there is a characteristic monotonic increase of the spectral index when the accretion mass accretion rate increases . This strong correlation is completed by the index saturation. The level of the index saturation strongly depends on the temperature of accreting plasma temperature. While NSs demonstrate the unique constancy of the index independently of the accretion rate up to a near Eddington limit. However, LT and ES in the first time detect a unique phase of the hardness of the spectra for NSs achieving states near the Eddington limit.

LT and ES suggested and tested a new method of the observational diagnostic for a compact object using X-ray data with a debatable type of a compact source. They also offered and developed a principal new method of a BH mass estimate. LT and ES completed a BH mass estimate in ultra-bright X-ray sourcesв which allows to make more precise their evolution status.

In present time, a number of citations on the papers by Lev Titarchuk with his coauthors exceeds превышает 10 000.

Lev Titarchuk works regularly as the referee of the leading world journals such as Nature Astronomy, MNRAS, Astronomy & Astrophysics and Astrophysical Journal.

Email: ltitarchuk@asc.rssi.ru

TKACHEV Igor Ivanovich

Born 12.01.1957 in Kingisepp, Estonia. In 1980 he graduated from the Physics Department at the Moscow State University, habilitation in physics in 2006. Since 1980, he worked at the Institute of Nuclear Research in various positions, since 2012 as the Head of the Experimental Physical Department. Full member of the Russian Academy of Sciences (2016). A member of a number of scientific councils, boards and commissions in physics and astroparticle physics.

The main scientific interests lie in the areas of gravity, cosmology and astroparticle physics, the author of about two hundred scientific publications. Tkachev has made significant contributions to the development of the theory of the early universe. Currently, at the Troitsk Nu-Mass experiment, he leads searches for the sterile neutrinos, which may constitute the dark matter in the Universe. From 1992 to 2007, he worked at the Fermi National Accelerator Laboratory (USA) and at the European Organization for Nuclear Research (CERN, Switzerland), was part of the Large Hadron Collider Safety Assessment Group. In 2011-2016, a member of the High Energy Particle Physics Board of the European Physical Society. Since 2008, a member of the Presidium of the Troitsk Scientific Center of the Russian Academy of Sciences. Member of the Board of Directors of International Collaborations "Telsscope Array" (ultra-high energy cosmic rays), "KATRIN" (neutrino mass states), "IAXO" (search for axions from the Sun), a member of the JUNO international collaboration (neutrino observatory) and its financial committee. Laureate of the Markov prize for "pioneering works in the field of theoretical astrophysics and cosmology" (2014) and the Friedmann prize for the series of works "New directions in the cosmology of the early and modern Universe" (2017). Lecturer at the MSU physics department.

tkachev@ms2.inr.ac.ru

TLATOV Andrey Georgievich

Born 07.11.1960 in Dushanbe. In 1983, graduated from the Baumann Moscow State Technical University, on plasma power generating systems. 1983–1985: with Работал в Fakel Experimental Design Bureau, Dept. of designing of plasma engines for spacecrafts. 1985–1989: post-graduate course at Baumann Higher Technical College. 1990: Cand.Sci. (numerical modeling of processes in plasma). Since 1989: with Kislovodsk Mountain Astronomical Station of the Pulkovo Observatory in various positions: Laboratory Assistant, Researcher, Director (since 2000). 2006: Dr.Sci. (Phys., Math). Member of IAU.

His basic scientific works belong to observational astronomy, development of methods of the analysis of synoptical observations of the Sun, analysis of long-time series of observations of the solar activity, implementation of robotic solar telescopes, methods of modeling and forecasting of the space weather. Modernized the synoptical complex of the Kislovodsk Mountain Astronomical Station of the Pulkovo Observatory: introduced matrix detectors, developed methods of computer processing of synoptical observations of the solar activity. This made it possible to continue permanent observations of the solar activity at Kislovodsk Station, which began in 1948. In cooperation with V.I. Makarov, showed that the large-scale magnetic field of the Sun predetermines peculiarities of the sunspot cycle. Based on this idea, worked out indices of forecasting of the amplitude and time of onset of the maximum of the following solar activity cycle. Under his direction, hundred-year series of the solar activity were reconstructed, in the course of processing of historical archives of daily observations of the Sun I different spectral lines and in continuum. In 1995, suggested a transport dynamo model of generation of solar cyclicity with immersion of the large-scale magnetic field towards the generation zone in the vicinity of the poles of the Sun. Hypothesized the change of the modes of cyclicity in 200-year solar activity cycle, which manifests itself in the inversion of the Gnevyshev–Ohl rule and in regularity in the onset of the Great minima of the solar activity. In cooperation with the research team of the Kislovodsk Mountain Astronomical Station developed new patrol solar telescopes-spectrographs, which make it possible to carry out in automatic mode continuous observations of the solar activity for determination of the parameters of solar flares and coronal mass ejections. Initiated regular observations at Kislovodsk Mountain Station of large-scale magnetic fields of the Sun. On the basis of magnetographic and patrol ground-based observations of the solar activity, developed methods of forecasting of the space weather on the Earth’s orbit. Deals with education of young scientists. Authored more than 300 scientific works.

tlatov@mail.ru

TOKOVININ Andrey Avrelevich

Born 08.12.1953 in Moscow. Graduated from the Physics Faculty of the Moscow State University (1971), post-graduate student in GAISH. PhD (1980, “Potential of astronomical observations with high angular resolution”), Dr.Sci (1992, “Study of binary stars in the solar neighborhood”) . Worked at GAISH MSU (1980-1998), Lyon Observatory (1999), ESO (2000), Cerro Tololo International Observatory (since 2001, astronomer with tenure since 2012). IAU member (in 2000-2003 president of Commission 30 “Radial velocities”). Member of the Editorial Board of Astronomy Letters since 1993. Shuvalov award (1996), AURA awards (2002 – technology. 2019 – for scientific research).

Works on observations and statistics of binary and multiple stars, development of techniques and instruments for optical observations, characterization of turbulence. Student of P.V.Scheglov.

Performed numerous observations of close visual double stars (in 1979-1990 using an interferometer of his own construction, after 2007 using the speckle camera of the 4.1-m SOAR telescope in Chile). These data resulted in the calculation of hundreds of orbits, discovery of new binary and multiple systems, and binarity surveys. Radial velocities of stars were monitored in 1986-1991 using the correlation radial velocity meter (RVM) designed and constructed by AT, allowing him to establish the rarity of sub-stellar companions (the so-called brown-dwarf desert). RVM was also extensively used by his colleagues and produced material for several dissertations. Compiled a catalog of hierarchical stellar systems, discovered and studies these systems using radial velocities, interferometry, adaptive optics, and astrometry. AT discovered the connection between close binaries and higher-order multiplicity, developed a model for statistics of hierarchical systems, explored its relation to the formation mechanisms.

Working at CTIO, he led the development of the adaptive optics system for the 4.1-m telescope with a UV laser guide star and the high-precision echelle spectrometer CHIRON for exo-planet observations; participated in some other projects. AT developed new methods and instruments for measurement of optical turbulence: interferometers (1978, 1985), outer-scale monitor GSM (1991-1997, in collaboration with the university of Nice in France), lunar scintillometer. Jointly with V.G.Kornilov and his team he developed and implemented the MASS instrument for measurement of the turbulence profile which is used for selecting sites of future large telescopes and in many observatories world-wide. AT contributed to the theory of adaptive optics and stellar scintillation.

AT authored over 200 papers in refereed journals and 75 conference contributions, and the monograph “Stellar interferometers” (Moscow, 1988). Gave lectures to astronomy students in MSU, directed 3 PhD thesis students, prepared a pupular on-line tutorial on adaptive optics.

TROITSKY Vsevolod Sergeevich

Born 25.03.1913 in Mikhailovskoe, Bogoroditsk District, Tula province. In 1932–1936, senior laboratory assistant, engineer at the Central Military-Industrial Radio Laboratory (CMIRL). In 1936-1941, studied at GSU (now N.I. Lobachevsky State University of Nizhny Novgorod (UNN)). In 1941–1945, went from a deputy workshop manager to a workshops manager, and then to the head of laboratory at Gorky Plant named after V.I. Lenin. In 1945-1948, a post-graduate student at GSU, with G.S. Gorelik as a research supervisor. In 1950, completed his PhD, the first PhD degree in radio astronomy in the country. In 1962, D.Sc. In 1964, was awarded the title of a professor. Corresponding Member of the USSR Academy of Sciences from 1970. In 1945–1956, worked at GSU and the Research Institute for Physics and Technology at GSU (now NIFTI at the UNN). From 1956 until his death, served in a number of leadership roles at the NIRFI, including Department Head, Deputy Director, and then Chief Scientist; was on the organising committee of NIRFI. Member of the International Astronomical Union (IAU), International Union of Radio Science (URSI), International Slavic Academy, International Academy of Astronautics (IAA) SETI Committee. Died 05.06.1996 in Nizhny Novgorod.

V.S. Troitsky's main areas of research were radio astronomy, radiophysics, and radioengineering.

His early research efforts were focused on the development of theory and methods to measure weak radio radiation with a continuous spectrum; design of the first Russian radiometers and radio telescopes; studies of the radio emission of the Sun, Moon and discrete radio sources. Investigated noises and linewidths of generators (including quantum generators) to improve the sensitivity and accuracy of low-power signal measurements.

V.S. Troitsky, along with his students at the Radiophysical Research Institute (NIRFI), developed new methods to study various media using their radio emission, with accuracy surpassing all other methods available at the time. Those methods include:

– Determination of radio wave absorption by oxygen and water vapour in the atmosphere;

– Remote operational sensing of the vertical profiles of atmospheric meteorological parameters;

– Precision absolute measurements of the radiation flux densities of cosmic radio sources and measurements of antenna parameters (the “artificial Moon” method);

– Analysis of the physical properties of the upper cover of celestial bodies and measurement of the electrical characteristics of various soils and materials;

– Measurements of the temperatures of human internal organs.

V.S. Troitsky together with his colleagues, developed the most comprehensive theory of the Moon's thermal radio emission. Based on the precision measurements of the lunar radio emission spectrum, he and his team investigated physical, mechanical and structural properties of the Moon's surface material to a depth of several meters. In 1962, V.S. Troitsky and V.D. Krotikov were awarded a prize for their breakthrough discovery of the Moon's heat flow from its interior (Diploma for the scientific discovery No.43). The findings were instrumental in the design of self-propelled chassis for the robotic lunar rovers “Lunokhod”. For his work, V.S. Troitsky was awarded the A.S. Popov Prize of the USSR Academy of Sciences in 1974. Under his leadership, a number of significant projects were completed, including the design of the first Russian very long baseline radiointerferometer (VLBI); the first measurements of the angular sizes of several discrete radio sources in the meter and decimeter wavelength ranges with high resolution. Investigated maser sources with an angular resolution of a few ten-thousandths of an arc-second. Proposed radio interferometry principles and methods necessary to develop a high-precision celestial coordinate system. Developed basic principles for astrometry.

V.S. Troitsky and his team designed radiometers used in prototype development for new radio engineering measurement devices and passive radar and radio astronavigation problems. The invention also found applications in the medical diagnostics field. Participated in the SETI (Search for Extraterrestrial Intelligence) program. Since the mid-1960s, he became a leader in this field both in Russia and world-wide. For 30 years, he was the Chairman of the "Search for Cosmic Signals of Artificial Origin" division of the Scientific Council for Radio Astronomy of the USSR Academy of Sciences. In the last years of his life, he was actively involved in solving problems related to cosmology and the origin of the universe.

V.S. Troitsky was a supervisor of 25 completed PhD theses; 4 of his students received Doctor of Science degrees. Honoured Science and Technology Professional of the Russian Federation (1971). Honoured Science and Technology Professional of the Russian Federation (1971).

TRUSHKIN Sergey Anatolievich

Born 04.05.1953 in Keila town, Estonian SSR. In 1976, he graduated from Leningrad (St. Petersburg now) State University in specialty "Radio Physics". From 1976, has been working at the Special Astrophysical Observatory of the Acade-my of Sciences of the USSR (Russian Academy of Sciences since 1991) in different positions: Research Assistant (1976-1982), Junior Researcher (1982-1985), Senior Researcher (1985-1996), Head of Laboratory from 1996. In 1989, he post-graduated in SAO AS of the USSR under Yu.N. Parijskij's scien-tific supervision and defended his Ph.D. thesis on "Investigation of Galactic Supernova Remnants and Related Objects with the RATAN-600 Radio Telescope". In 1998, defended his Dr.Sci. dissertation on "Galactic Non-Thermal Radio Sources. Multi-Frequency Surveys and Flare Variability Monitoring". Academic title – Senior Researcher (1991). A member of Dissertation Council of SAO RAS. An IAU member (from 1997).

The research area: observational radio astronomy, supernovae remnants, radio stars and microquasars, AGN variability, and astronomical data bases. The author of over 80 scientific publications in leading astronomy journals. Science editor of the first Russian edition of the outstanding monograph "Tools of Radio Astronomy" by Wilson et al. (Fizmatlit, 2012).

Main achievements: discovery of several unknown supernova remnants (G16.3-2.7, e.g.) during a multi-frequency radio survey of a large region of the Galactic plane; study of microquasars unique in volume, time, and flare detection: SS433, Cygnus X-1, Cygnus X-3, GRS 1915+105, LSI+61d303 and others using the RATAN-600 radio telescope.

A member of a number of international joint and alert programs of multiwave studies of microquasars, in the course of which the unusual properties of their jets were discovered for the first time: radio emission modulation with an orbital period and, together with K. Blundell, detection of jet rate variations during radio bursts (SS433), discovery of high anti-correlation of the quiet and correlation of the flare X-ray and radio emission (Cyg X-3 and GRS1915+105), indication of pre-flare "ultrasoft" X-ray state during which radio emission attenuated (Cyg X-3) allowing one to predict possible further ejections of matter out if this binary system. Discovery of interrelation of X-ray and radio bursts (GRS1915+105).

A participant of the first detection of high energy gamma-ray emission during the strong radio burst (Cyg X-3) and the study of properties of periodical radio bursts of the microquasar LSI+61d303 known as an ultra-high gamma-ray emission source during its 4-year superorbital period. Many extremely strong radio bursts from microquasars in the wide frequency range were detected for the first time ever by S.A. Trushkin and his colleagues and served as a basis for further alert investigations.

A co-author (together with O. Verkhodanov, V. Chernenkov, and H. Andernach) of up-to-date and popular astrophysical database CATS (cats.sao.ru) (Certificate of Registration of the program for ECM No. 2015617946).

An Expert of RAS and FANO.

TSAP Teodor Teodorovich

Born 29.03.1930 in Zaluzhye, Ivano-Frankovsk re-gion. In 1954 he graduated from the Ivan Franko State Uni-versity of Lvov and started his researches at the Crimean As-trophysical Observatory (CrAO) of the USSR Academy of Sciences. In 1966 T.T. Tsap de-fended the Ph.D. thesis "Mag-netic fields and chromospheric fea-tures in active and quite regions on the Sun". This direction of inves-tigations deter-mined all his scientific life. In 1999 he defended his Doctoral thesis "The connection of magnetic fields with processes in the solar atmosphere". Died 20.01.2011 in Nauchnyy.

T.T. Tsap carried out unique theoretical and experimental works in the field of solar mag-netism and solar activity. His pioneer works on magnetic spots, faculae, chromospheric network and super-granulation, relations between magnetic fields and chromospheric brightness are widely known. He greatly contributed to the foundation of a new direction in astrophysics – solar helio-seismology and studying internal constitution of the Sun and far stars. The birth of helioseismolo-gy relates to the published in Nature papers by Severny, Kotov, and Tsap (1976, Nature, 259, 87–89) as well as by Brookes, Isaak, and van der Raay (1976, Nature, 259, 92–95) concerned with 160-minute solar os-cillations with an amplitude of approximately 2 m/s. In 1985 this discovery was registered by the State Committee for Inventions and Discoveries. The last years of his life T.T. Tsap devoted to studying the fine structure of solar magnetic fields. Particularly, he ascer-tained the presence of small-scale (3–60 km) magnetic elements with magnetic fields of 1–2 kG outside active regions. He also revealed that the magnetic field suppresses plasma motion on the solar surface and the plasma speed in the downward direction at the boundaries of supergranules does not exceed 10 m/s.

For 56 years of working at the Laboratory of Solar Physics T.T. Tsap advanced from junior re-searcher to leading scientist. He was one of the main observers at the largest in Europe Solar Optical Telescope BST-1.

T.T. Tsap authored about 200 scientific publications. The head of the Crimean society "Znani-ye", a member of International Astronomical Union and European Astronomical Society. In his honor, main-belt asteroid 6113 discovered on September 16, 1982 by L.I. Chernykh at CrAO was named Tsap.

TSAP Yuri Teodorovich

Born 20.01.1966 in Nauchny, Crimean Region. After graduation from Moscow Engineering Physics Institute in 1991 he was taken on to the staff of the Crimean Astrophysi-cal Observatory (CrAO) of the USSR Academy of Sciences. In 1999 Yu.T. Tsap defended the Ph.D. thesis “The influence of plasma partial ionization and small-scale turbulence on energy release and particle acceleration in the solar atmos-phere” (Kiev, Main Astronomical Observatory of the Nation-al Acad. of Sci. of Ukraine). In 2008 he defended his Doctor-al thesis “Plasma processes in magnetic structures of the so-lar and flare star atmospheres” with a specialization in “Astrophysics, Radio Astronomy” (St.Petersburg, Pulkovo Ob-servatory of the Russian Acad. of Sci.).

Based on solar eclipse observations at RT-22 of CrAO in 2005–2008 in cooperation with L.I. Tsvetkov and S.A. Samis’ko Yu.T. Tsap concluded that microwave emission of bright X-ray points is non-thermal. Thus, there were found evidences that the charged particles can accelerate to relativistic energies in the solar minimum. He showed that the thicknesses of current sheets in the solar chromosphere can achieve hundreds of kilometers if we take into account the partial plasma ionization and plasma dynamics in the sheet that allows explaining the origin of different chromospheric ejections. In fact, the effective acceleration of electrons can occur not only in the corona but also in the solar chromosphere.

In cooperation with A.V. Stepanov and Y.G. Kopylova Yu.T. Tsap elaborated new methods for plasma and magnetic field diagnostics within the framework of the coronal seismology. Jointly with A.A. Kuznetsov he showed that tens of strips observed in the solar microwave dynamic spectrum (zebra pattern) can be caused by loss cone instability of the accelerated electrons with a power-law energetic spectrum that excites upper-hybrid waves at double plasma resonance. Based on X-ray and millimeter observations he concluded about an important role of the energy release processes in the solar chromosphere.

Yu.T. Tsap advanced from junior researcher to leading scientist at CrAO. He authored over 200 scientific publications related to different theoretical aspects of plasma astrophysics associated with solar and stellar activity. He is a member of the International Astronomical Union and European Astronomical Society, the Community of European Solar Radio Astronomers, and Section “Sun” of the Russian Academy of Sciences. In his honor, main-belt asteroid 6113 discovered on September 16, 1982 by L.I. Chernykh at the Crimean Astrophysical Observatory was named Tsap.

TSEITLIN Naum Moiseevich

Born 09.08.1929 in Slutsk, Minsk province (now Minsk province of the Republic of Belarus). In 1947-1953, studied at the Faculty of Radiophysics at the State University of Gorky (GSU) (now, N. I. Lobachevsky State University of Nizhny Novgorod, UNN). In 1953-1956, worked at MBX 429. In 1956-1959, a postgraduate student at GSU. Received his Ph.D (1960). Doctor of Sciences in Technical Sciences (1966). In 1983, was awarded the title of a professor. In 1959-1993, worked at the Radiophysical Research Institute (NIRFI), starting as a Senior Research Associate and progressing to a Department Head. Member of the International Union of Radio Science (URSI). Honoured Science and Technology Professional of the Russian Federation. Died 08.02.1993 in Nizhny Novgorod.

N.M. Tseitlin’s field of research was radio astronomy, with a particular interest in antenna design.

He founded a scientific school with the primary goal of developing and implementing radiophysics measurement techniques for applied radio astronomy and antenna design. His inventions were used in a wide range of solutions in industrial applications as well as research and development projects.

N.M. Tseitlin was still early in his career, when together with V.S. Troitsky and S.A. Zhevakin, he developed a method for separate determination of radio wave absorption in oxygen and water vapor for problems of remote sensing of the Earth's atmosphere in the centimeter waveband (1958).

He made substantial improvements to the method previously proposed by V.S. Troitsky and his team at the Radiophysical Research Institute (NIRFI); the method for absolute measurements of signal intensities using as a reference blackbody source of noise generation a metal disc coated with radio wave absorbing material, so-called "black" disc.

With this method (known as the “artificial Moon” method), radio astronomers at NIRFI were able to achieve the highest precision absolute measurements and, therefore, reliably measure the most powerful cosmic radio sources in the cm wavelength band, and make important findings in these spectra.

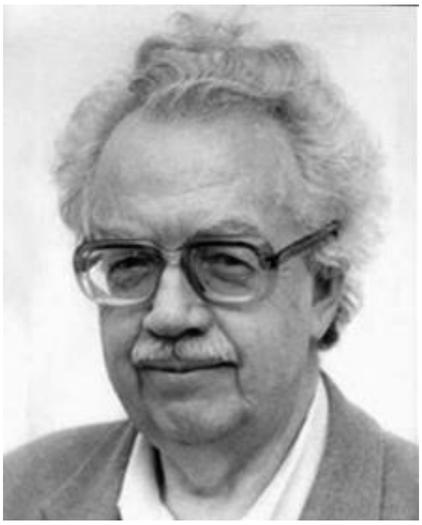
In 1979, N.M. Tseitlin, together with his students, designed a two-element system of aperture synthesis based on 7-m in diameter parabolic antennas for high spatial resolution – the first of its kind in the country.

Some of his main contributions include the development of basic principles for measurement methods for antenna parameters: radio astronomical methods based on cosmic radio emission and radiometric methods based on "black" discs. N.M. Tseitlin proposed and implemented a range of novel methods that use cosmic radio sources, intrinsic emission of the Earth and its atmosphere, and the intrinsic noise of the antenna. His students developed new techniques for measuring the antenna parameters by their fields in the near zone, that were later used in measurements of large high gain antennas of centimeter and decimeter wavelength ranges.

Supervisor of 17 completed PhD theses. Author of over 100 research publications and 5 monographs. Three of his monographs – "Application of Radio Astronomical Methods in Antenna Design," "Antenna Design and Radio Astronomy", "Methods for Measuring Microwave Antenna Characteristics " – became a standard reference for radio astronomers and antenna system designers. The two-volume textbook he coauthored with with A.G. Kislyakov and V.A. Razin, "Introduction to Radio Astronomy", was published in 1995-1996.

Honoured Science and Technology Professional of the Russian Federation.

TSITSIN Felix Alexandrovich



Born 01.06.1931 in Kukoboy village (Yaroslavl region). In 1954 graduated from the Faculty of mechanics and mathematics, Lomonosov Moscow State University (MSU). Ts. worked at the Sternberg Astronomical Institute (SAI) of the MSU: laboratory assistant (1954 – 1957), post-graduate course in 1958–1961, Junior research fellow (1962-1971), PhD dissertation "Topical issues of stellar dynamics" (1972). Assistant and Deputy Head of the Astronomical Department of the Faculty of Physics of MSU (1973 – 1977), Deputy head of the astronomical department of the MSU Faculty of physics (1978–1982). Senior researcher at the SAI of the MSU (1983–2005). Died on 01.01.2005 in Moscow.

Ts.'s fields of research were in astronomy: stellar dynamics; minor bodies and cosmogony of the solar system; in physics: foundations of thermodynamics, statistical mechanics; also: philosophy problems of astronomy and history of astronomy; the problem of life in the universe; search for extraterrestrial intelligence (SETI); some problems of differential calculus . Ts. gave (1954) an original brief math. proof of the Fesenkov–Parenago theorem on the determination of the Galaxy's flattening and later (1975) its wide generalization (this is essentially the "Fesenkov-Parenago-Tsitsin theorem»). Ts. eliminated (1957-1980s, co-authored with A. M. Mikisha) the "Parenago paradox", having decreased the estimated mass of the Galaxy's nucleus by an order of magnitude compared to the generally accepted estimate by J. Oort (1950s). He justified (1954) the Hubble direction of rotation of spiral galaxies (with the ends of the spiral branches backwards), having developed a proof of this in the 80s in collaboration with his student I. Pasha). Ts. was the first in the USSR to indicate (1963) the small size of quasars (with their monstrous luminosity), defining this for C273 as about a light week, based on the same period of change in its brightness, discovered by his colleagues in the SAI). This showed the connection of quasars with BH (according to TS, post-relativist. objects). He presented (1980–2004) a detailed analysis of O.Yu.Schmidt's cosmogony of the solar system. In this regard, Ts.suggested a new concept of the origin of comets, based on his own idea of a relict reservoir of cometary bodies in the solar system (theory of RR CB SS), in part in collaboration with IL Genkin, VM Chepurova, and others. His dissertation with a new solution to fundamental problems of thermodynamics (1961, 1983) was not admitted to defense due to the extreme mutual contradiction of its assessments by physicists. Ts. lectured in the MSU two special courses on stellar dynamics (1963 – 1970-s), also on history of astronomy (1977–1989) and he was a unique teacher-a favorite of his students. He authored more than 150 research papers, textbooks (1989, 2003, coauthor A.I. Eremeeva) and monograph "Essays on the modern cosmogony of the solar system. Origins. Problems. Horizons". 2009 (published posthumously under the editorship of A. I. Eremeeva). Ts. was a member of the History and methodology of natural sciences section formed by the MSU Scientific Council, Veteran of Labor and Distinguished Researcher of the MSU.

TSVETKOV Dmitry Yurievich

Born 08.05.1955 in Moscow. Graduated from M.V.Lomonosov Moscow State University in 1978. Works at SAI MSU since 1978 as senior laboratory assistant, researcher, senior researcher. Candidate of physical-mathematical sciences since 1986.

The research work of D.Yu.Tsvetkov focuses on Supernovae, he is an author of more than 110 scientific papers. He took part in the program of Supernova search at SAI and discovered 4 Supernovae: 1981B, 1983G, 1983I, 1984D.

In the 1990-ies in cooperation with O.S.Bartunov, I.N.Makarova and a group of Italian astronomers he developed a method to estimate frequency of outbursts of Supernovae based on joining the data of several Supernova search programs. The most reliable for that time estimates of frequencies of different types of Supernovae in galaxies of various types were obtained.

The spatial distribution of Supernovae in the galaxies was investigated in cooperation with O.S.Bartunov, N.N.Pavlyuk, I.V.Filimonova and I.N.Makarova. These works established the connection of type Ia Supernovae with the spiral arms and high concentration of type Ib/c Supernovae to the centers of the galaxies.

The regular photometric observations of bright northern sky Supernovae are carried out since 1981. More than 300 Supernovae were observed, for about 100 objects among them the light and color curves were constructed and their main parameters derived. For a number of Supernovae coordinated observations with groups of foreign astronomers were carried out.

The most interesting among the investigated objects are SNe 1981B, 1985F, 1993J, 1994W, 2003du, 2005cs, 2008S, 2010al, 2011dh, 2011fe, 2014J, 2015U, 2017eaw, 2018aoq. These Supernovae belong to most bright nearby objects, to rare classes of Supernovae, or revealed peculiarities of their light curves.

D.Yu.Tsvetkov takes part in popularization of astronomy. He is an author and an editor of scientific-educational site "Astronet". D.Yu.Tsvetkov is a member of IAU, he was awarded by the medal "For discovery of new astronomical objects" from Astrosovet and by honorary diploma from the Ministry of Education and Science of Russian Federation.

TSVETKOV Lev Ivanovich

Born 04.11.1938 in Kineshma, Ivanov region. In 1963 he graduated from the Faculty of Radio Technique at Moscow Aviation Institute. Since 1963 to 2010 L.I. Tsvetkov worked at the Crimean Astrophysical Ob-servatory of the USSR Academy of Sciences and advanced from engineer to Head of the Laboratory. In 1983 he defend-ed the Ph.D. thesis (St.Petersburg, MAO, USSR Acad. of. Sci.) and in 1999 – Doctoral thesis "Microwave solar activi-ty: physical processes in the transition region chromosphere-corona and their diagnostics" (Kiev, MAO, NASU). Died 18.01.2010 in Katsiveli.

L.I. Tsvetkov took active part in programs on studying near space. The basic directions of researches are designing and constructing radio astronomy equipment; study of physical conditions in solar active regions and flare sources based on spectral polarization observations in the millimeter and centimeter wavelength ranges; study of radio granulation and large-scale structures on the solar disk; searching for and identification of the solar global oscillations based on observations of fluctuations and waves in the transition region chromosphere-corona; diagnostics and solar activity prediction based on radio observations.

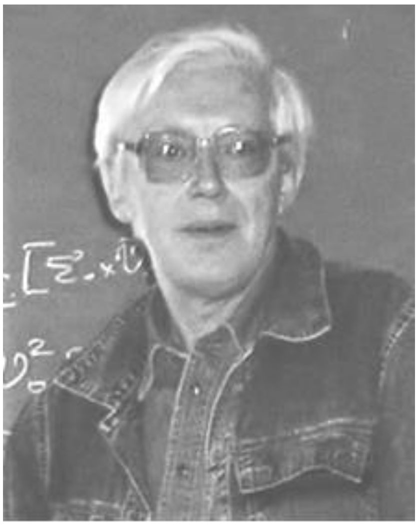
A complex of radio polarimeters was elaborated and developed for observations in the microwave range at RT-22 that allowed the solar global oscillations to be detected. The results of studying solar active regions and outbursts advanced in understanding the fine structure of radio bursts, fluctuations in polarized radiation of the local sources on the Sun, improved the theories of solar radiation.

The derived in the mm and cm ranges observation data on the large-scale structures – coronal holes and activity complexes – significantly improved the method of predicting geoeffective events, and data on radio granulation structures – models of the chromosphere and transition region to corona.

A member of the International Astronomical Union and European Astronomical Society. Since 1995 and up to his last days – a member of the organizing and program committee of the Annual International Conference "KrymMiKo".

L.I. Tsvetkov authored about 130 scientific publications.

TSYMBAL Vadim Vyacheslavovich

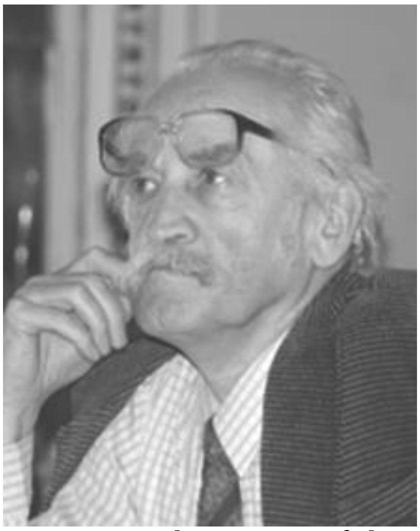


Born in 1950 in Simferopol. In 1967–1973, studied at Odessa State University, majoring in astronomy. 1973 – 1975, completed his military service with the Army. In 1973–1981, a researcher at the Astronomical Observatory of Odessa State University (senior laboratory assistant, junior researcher, assistant at the Faculty of Astronomy). In 1980, obtained his PhD with the thesis: "The Synthetic Spectra of M Stars". In 1981-2020, worked at now V.I. Vernadsky Crimean Federal University (based on Tavrida National V.I. Vernadsky University, internationally known as Simferopol State University), starting as a senior researcher and progressing to an associate professor.

V.V. Tsymbal 's field of research is the physics of stellar atmospheres, with a particular interest in software development for modeling stellar atmospheres and stellar spectra. V.V. Tsymbal 's programs and techniques are widely used for studying different types of stars around the world. In addition to his research contributions, V.V. Tsymbal is well known for supervising students, who have become the world's leading researchers.

Author of over 100 research publications.

TUTUKOV Alexander Vasilievich



Born 06.02.1942 in Zhukovo, Mordovskaja ASSR. In 1966 graduated from the Moscow State University. In 1966–1969 attended post-graduate courses at the Astronomical Counsel of the Academy of Sciences of the USSR (now the Institute of Astronomy of the Russian Academy of Sciences). Since 1969 occupies various po-sitions at the Institute of Astronomy of the Russian Academy of Sciences. Doctor of phys.-math. sciences (1980). A member of the Astronomy Reports Editorial Board.

A.V. Tutukov is one of the major world experts in physics and evolution of stars and galaxies. Main research areas are numerical modeling of the evolution of single and close binary stars, analysis of formation scenarios for various types of binary stars, studies of observed X-ray sources, investigation of galaxy evolution, analysis of formation of planetary systems around single and binary stars. He is an author of over 450 science publications, including a seminal monography "Stellar evolution: theory and observations" (A.G. Masevich and A.V. Tutukov).

Since 1970s in collaboration with L.R. Yungelson, A.V. Tutukov develops numerical models of binary star evolution. He and B.M. Shustov have developed a theory for interaction of stars with the circumstellar matter, in particular, in ionized hydrogen regions and gasdust cocoons around massive stars. A.V. Tutukov has contributed significantly to studies of evolution of single stars, including massive ones, in studies of the evolutionary role of rotation and mass loss by single and binary stars, as well as in statistical studies of various stellar popula-tions.

In 1980s in collaboration with I. Iben (USA) A.V. Tutukov has developed scenarios for supernova explosions in binary systems, including a merging of two degenerate dwarves, having set a solid foundation for studies in this field. This scenario is currently adopted as a major one.

A.V. Tutukov has set the ground for studies of evolution of various components of our Galaxy and other galaxies. A significant contribution is made by him to the study of the Galactic metallicity gradient, mass-metallicity correlation in galaxies of various types. Since 2000s, he is actively involved in theoretical modelling of various galactic structures (including spiral arms) and high-velocity stars.

A.V. Tutukov has co-authored theoretical and observational studies in physics of planetary nebulae, exoplanetary systems, protostellar objects, and protoplanetary disks.

Shklovsky Award of the Russian Academy of Sciences (2017, together with L.R. Yungelson), Viktor Ambartsumian International Prize (2018, together with L.R. Yungelson and E. van den Heuvel).

A.V. Tutukov has numerous apprentices, now having both candidate and doctoral degrees.

TYUL'BASHEV Sergey Anatolievich

Born 06.09.1965 in the village of Sultan-Rabat, Chimkent region, Kazakh SSR. In 1982, he graduated from high school in Ertil, Voronezh Region. For a year he worked as a turner at the Ertil Mechanical Plant. From 1983 to 1985, he served in the army. In 1986, he entered the Department of Astronomy, Faculty of Physics, Lomonosov Moscow State University. After completing his studies in 1992, he joined the Pushchino Radio Astronomy Observatory (PRAO ASC LPI), where he was young scientist in the beginning. Defended his PhD thesis in 1997. Since 2014 up to 2020 Doctor of Physical and Mathematical Sciences and the leading scientist. Since 2020 the director of PRAO ASC LPI.

The main scientific results of S. A. Tyul'bashev relate to observational radio astronomy and astrophysics. These are the study of compact radio sources by the method of interplanetary scintillation, the cosmology of compact radio sources, the physics of compact radio sources, the search and study of giant radio galaxies, the study of interplanetary plasma, the search and study of pulsars. He is the author of about 80 scientific papers published in peer-reviewed journals.

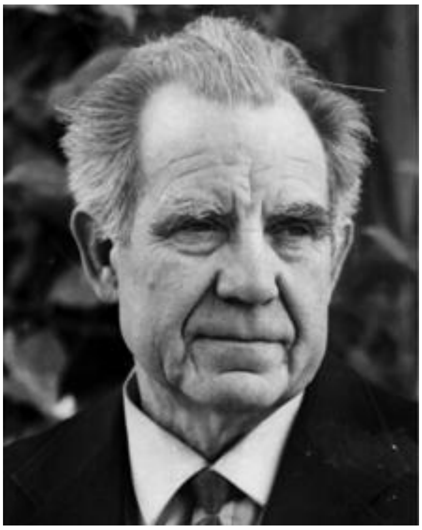
S.A. Tyul'bashev and V.S. Artyukh showed that most of the compact radio sources observed at meter wavelengths (scintillating on inhomogeneities of interplanetary plasma) are quasars with steep spectra and their cosmological evolution differs from the cosmological evolution of radio galaxies. Quasars with steep spectra were born relatively quickly compared to radio galaxies, the birth of which was stretched over time. Estimates of the flux density were given for more than 700 compact (scintillating) radio sources in the meter wavelength range. The properties of the sources in different samples are studied, and some physical parameters are estimated. The limited applicability of the homogeneous compact source model to real sources is shown. The model based on the analytical solution of the emission transfer equations for sources with synchrotron cut-offs in the spectrum and a uniform distribution of fields and particles is practically not applicable to the observed active galactic nuclei. The limitations of the model are considered.

S. A. Tyul'bashev, with collaboration V. I. Shishov and V. I. Chashey, conducted long-term monitoring observations of several thousand compact radio sources for the study of interplanetary plasma. A scheme has been constructed and tested that allows to estimate the rate of coronal mass ejections in real time, starting from a distance of about 0.5 a.u. and to predict with previously unattainable accuracy the time of arrival of these ejections to the Earth.

Jointly with a number of co-authors, it have investigated the well-known giant radio galaxies, which are currently the largest connected objects in the universe. A search for new giant radio galaxies has been carrying out. Dozens of objects of this type with linear sizes of 500 kpc or more have been discovered.

Jointly with other co-authors the properties of individual pulsars were studied. Based on the analysis of the data obtained on the stationary multibeam emission pattern of the Large Phased Array antenna (110 MHz), dozens of new pulsars and rotating transients were discovered. From 2009 to 2018, he was a representative of the Russian Academy of Sciences in the International Telecommunication Union.

UDALTSOV Vyacheslav Anatolievich



Born 03.04.1926 in Armavir. World War II veteran. In 1946-1951 he was a student at the Moscow Power Engineering Institute. From 1952 to 1962 – a member of the Crimean expeditions of the Lebedev Physical Institute (LPI). From 1962 to 2005 – Researcher at the LPI Radio Astronomy Station (RAS) in Pushchino (now – Pushchino Radio Astronomy Observatory of the LPI). From 1965 to 1974 – Deputy Head of the RAS for scientific issues. Defended his PhD thesis in 1966. Died 06.30.2009 in Pushchino, Moscow region.

V.A. Udaltsov was 15 years old when the Second World War began. At the age of 16, he is an active partic-ipant in the underground movement in the occupied territory. After the liberation of his hometown Armavir, he joined the ranks of the regular Red Army. However, soon, after the second and very serious injury, further service in the army becomes impossible.

From 1952 to 1962 he worked as an engineer, and then as a researcher and head of a group in the Crimean expeditions of LPI (in Alupka, on the Koshka mount and in Katsiveli). Here he is actively involved in the creation of the first Russian radio telescopes. On his initiative, the accuracy of the surface of one of the stationary radio telescopes of the meter range (in the form of a 30-meter bowl in the ground) was brought to 2-3 mm, which made it possible to use it for observations in the centimeter range. As part of a group of LPI employees, V.A.Udaltsov participates in studies of the propagation of radio waves in the atmosphere and ionosphere of the Earth, in measurements of the coordinates of the landing of the first Soviet rockets of the Luna series, in studies of the distribution of radio brightness over the solar disk. In 1957 V.A.Udaltsov together with A.D. Kuzmin measured the polarization of radio emission from the Crab nebula, thereby confirming the assumption of I.S. Shklovsky about the synchrotron nature of the radiation from this nebula.

In 1962 V.A.Udaltsov, together with a large group of employees of the LPI Crimean stations went to work at the Pushchino Radio Astronomy Observatory of the LPI (at that time, RAS LPI). Here he continues measuring and researching the polarization of the Crab Nebula at different wavelengths, which formed the content of his Ph.D. thesis, successfully defended in 1966. In subsequent years and until the end of his career (mid-1990s), V.A. Udaltsov pays great attention to the development of instrumental systems for conducting spectral studies in the meter wavelength range, for measuring the polarization of pulsars, and finally, a thorough study of the radio technical parameters of radio telescopes E-W arm of 1-km Cross-type radio telescope (DKR-1000) and the Large Phased Array antenna (BSA) of the LPI. Using these antenna-instrumental complexes, he carried out studies of the Galactic Center region, pulsars and supernova remnants.

UGOLNIKOV Oleg Stanislavovich

Born 06.09.1974 in Moscow. Graduated Moscow State University (physical faculty, astronomical division) in 1997. PhD student of Lebedev Physical Institute of Russian Academy of Sciences in 1997-2000. In 2000-2003 he worked in Astro-Space Center of the same institute, PhD thesis (2001) is related with astrometry and possible gravitational lensing of cosmic gamma-ray bursts. Since 2003 O.Ugolnikov works in Space Research Institute of Russian Academy of Sciences in the field of physics and optics of middle and upper atmosphere of the Earth. Popular science lecturer in astronomy and atmosphere physics.

Field of science interests relates to modern conditions and trends of middle and upper atmosphere. Unlike low atmosphere, increase of greenhouse gases leads to the cooling of such layers. Near the temperature minima (lower stratosphere, upper mesosphere) this leads to condensation of hydrate and ice cloud particles, those are observed more and more frequently in the present time.

Together with Igor A. Maslov (Space Research Institute), O.Ugolnikov had designed wide-angle polarization all-sky cameras and technique of determination of mesospheric temperatures and particle sizes of polar mesospheric (noctilucent) clouds. Together with colleagues in Polar Geophysical Institute (Apatity), he applied this to the measurements of polar stratospheric clouds, the particle size was estimated with accuracy comparable with lidar and satellite measurements.

Investigations of background stratospheric aerosol had shown that its numerical density decreases during the volcanically-quiescent epoch showing the small contribution of anthropogenic sulfur emission to the formation of aerosol in the present time.

Over the last 25 years O.Ugolnikov is the principal organizer and problem author of Moscow and then Russian school olympiad in astronomy, the head of jury. He is an author of a number of school problem books in astronomy, "Astronomical Calendar", "School Astronomical Calendar", "The Sky of Starting Century". He is active popular lecturer in schools and planetariums. His lecture cycle "The Atmosphere of the Earth" released by Trajectory foundation in 2020, took the second place in contest of Russian Academy of Sciences Commission on Popular Science.

UTROBIN Victor Pavlovich

Born 20.07.1947 in Kirov. In 1973, graduated from Moscow Institute of Physics and Technology (MIPT). From 1973 to 1976, a PhD student at MIPT. From 1976 to 1979, a junior researcher at the Steklov Mathematical Institute of the USSR Academy of Sciences. Since 1979, worked at the Institute for Theoretical and Experimental Physics (ITEP), starting as a junior researcher and moving on to a leading researcher. PhD thesis «Hydrodynamic Models of Supernovae with Slow Energy Input» (1980). D.Sc. dissertation «Modeling of Core-Collapse Supernovae») (2006). Since 2020, a leading researcher at the Institute of Astronomy at the Russian Academy of Sciences (RAN), INASAN. Member of the International Astronomical Union.

V.P. Utrobin's research interests lie in the fields of supernovae, hydrodynamics, and radiation transfer. Since 1976, has been involved in the hydrodynamic modeling of supernova explosions. An agreement of the computed models with observational data on the type IIb supernova 1993J led him to the conclusion that the progenitor of the supernova has lost most of its hydrogen-rich envelope prior to the explosion in a close binary system (1994). On 23 February 1987, the outburst of the peculiar type IIP supernova 1987A in the Large Magellanic Cloud ushered in a new era of both observational and theoretical supernova research. Just a month after the discovery of supernova 1987A, V.P. Utrobin (in collaboration with E.K. Grassberg, V.S. Imshennik, and D.K. Nadezhin) built the hydrodynamic model based on the explosion of a blue supergiant. Quantitative modeling of the profile of the Hα hydrogen line at the Bochum event of supernova 1987A resulted in estimating the absolute velocity of the fast nickel-56 clump and its mass (in collaboration with N.N. Chugai and A.A. Andronova, 1995). Two long-standing challenges of supernova 1987A – a problem of strong hydrogen lines at the photospheric stage and a problem of the unacceptably high barium overabundance – were solved by V.P. Utrobin (in collaboration with N.N. Chugai, 2005) by taking into account the time-dependent effects that play the primary role in the line formation. Solving the problem of strong hydrogen lines allowed him to make a detailed comparison of the computed hydrodynamic models of supernova 1987A with both photometric and spectral observations and to obtain a more reliable estimate of explosion parameters and presupernova properties (2005). From 2015 to 2021, the Garching group (E. Mueller, H.-Th. Janka, and A. Wongwathanarat) performed 3D hydrodynamic simulations of gravitational collapse of iron cores for the supernova 1987A progenitors that were evolved in both single-star and binary-merger scenarios. V.P. Utrobin used these 3D simulations to hydrodynamically model the light curves of the supernova. Such a comprehensive study of supernova 1987A showed that neutrino-driven explosion mechanism can produce required explosion energy, inward mixing of hydrogen, and outward mixing of radioactive nickel-56. A comparative analysis of 3D neutrino-driven explosion models of supernova 1987A based on single-star and binary-merger progenitors revealed that only one binary model fulfills all observational constraints, except one. A set of the hydrodynamic simulations of type IIP supernovae undertaken by V.P. Utrobin includes 12 different well-studied objects. In particular, the canonical type IIP supernova 1999em was studied in detail with both parametrized properties of the explosion (2007) and a realistic 3D neutrino-driven explosion (in collaboration with Garching group, 2017).

V.P. Utrobin is the author of over 60 research publications.

VAINER Boris Viktorovich

Born in 1949 in Rostov-on-Don. Undergrad. stud. of the Rostov State Univ. in 1967-1972. Postgrad. stud. of the Department of Astrophysics of the Rostov State Univ. (SFedU now). PhD (1978): «Observational manifestations of the perturbations in the isotropic cosmological models». Lecturer (1979-1984). Senior researcher of the Institute of Physics at the Rostov State Univ. (1984-1992). Doctor of Sciences (1991, Habilitation): «The origin of light elements». Since 1994 Senior Researcher in the NASA Glenn Research Center.

Main scientific achievements:

In his works the numerical simulations of the light isotope abundances in the hot model of the Universe have been realized using initial adiabatic and entropic perturbations, the strict constrains onto the parameters of perturbations have been found.

It has been shown that a variation of the deuterium abundance during galactic evolution leads to the strict bounds for the parameters of the standard model of the Universe. A possible deposit to the light elements abundances due to galactic cosmic rays has been studied. The production of light elements has been studied in the nonstandard cosmological models including very massive Population III stars. An influence of decaying massive leptons on the abundances of light elements has been calculated.

The formation of dust in protogalaxies has been analyzed, the mean density of dust has been estimated. The synthesis of deuterium in hot accretion discs has been considered in detail and the deposit to the total abundance due to this process has been estimated.

He has developed a novel trend in observational manifestations of black holes evaporation. As a result the significant constrains on mean density of primordial black holes with masses 10^{11}-10^{15} gramm have been found. A new effect of the distortion of the distribution function for collisionless particles by gravitational waves of high frequency has been revealed. The problem of relativistic spherical accretion on a black hole has been solved taking into account viscosity.

The total number of papers is more than 150 including 38 in astrophysics and 110 in plasma physics.

VAISBERG Oleg Leonidovich

Born in 1935. In 1952 to 1957 student of the Astronomical Department of mech. – mat.fac.of M. V. Lomonosov Moscow State University. From 1957 to 1967-sotr. Institute of Atmospheric Physics of the USSR Academy of Sciences (M. sc. s., S. sc. s.). Defended his PhD thesis in 1964 on the topic: "Spectroscopic studies of polar aurora". He defended his doctoral dissertation in 1985 on the topic: "The magnetospheres of Mars and Venus compared to the geomagnetosphere. From 1967 to the present-S. N. S., head of the Department. sector, Head of the Laboratory, G. N. S. Institute of Space Research of the RAS. Title of Prof. received in 1987. He was awarded the Order of the Order of Honor and the medal "For Valiant Labor". In 1986, he was elected a full member of the International Academy of Astronautics. O. L. Vaisberg is a specialist in the field of solar system physics and scientific instrumentation, the author of 230 published scientific papers and 12 author certificates.

The main scientific results of O. L. Vaisberg:

The existence of bow shocks in the supersonic plasma in the solar wind in fronts of the Mars and Venus has been established, and the characteristics of obstacles to the solar wind around the non-magnetic planets have been studied.

The magnetospheres of Mars and Venus formed in the process of the mass loading of the magnetized solar wind stream by heavy cometary ions have been discovered, and their characteristics have been studied.

Recently, together with his young colleague Sergey Dimitrievich Shuvalov, he discovered that the daytime magnetosphere of Mars is formed by the interaction of accelerated heavy ions with the outer ionosphere.

It was found that the losses of atmospheric ions induced by the solar wind at Mars and Venus led to the loss of the main mass of Martian atmosphere.

The similarity of the plasma shells of comets with those of Mars and Venus is shown.

A thin structure of the strong quasi-perpendicular Earth' bow shock is investigated; nonlinear electrostatic structures in the foreshock and the similar structure within the shock front (an isomagnetic jump), which leads to deceleration and thermalization of the solar wind flow.

High-latitude reconnection of the interplanetary and magnetospheric magnetic fields and multiple reconnections on the day side of the Earth's magnetosphere were experimentally detected.

The existence of 2 types of the dayside boundary layer of the Earth's magnetosphere is established.

The Chapman layer was registered for first time at the dayside magnetopause. O. L. Vaisberg is the author of plasma spectrometers, energy-mass analyzers, the dust particle sensor, and the method for determining the spatial scale in space plasma for the conducted experiments on the single spacecraft PROGNOZ-1, -2, -7, -8, -10 and Interball-1, interplanetary stations Mars-2, -3, -5, Venera-9, -10, VEGA-2, -3, the probe to Mercury BepiColombo (ESA project), as well as the experiments being prepared on the Russian spacecraft Luna-25, -26 and 27 and the Chinese project to asteroid and comet. O. L. Vaisberg leads teaching work, the head of 8 defended graduate students, 2 of whom successfully work abroad. O. L. Weisberg is a member of the editorial board of the journal "Astronomical Bulletin", a member of the Scientific Council of the ICI RAS, the Doctoral Council D 002.113.03. Information about O.L.Vaisberg is presented by Space Research Institute RAS.

VAL’TTS Irina Evgenievna

Born in 1944, in Noril’sk city, Krasnoyarsk region. Graduated in 1968 г. from Moscow State University (MSU), faculty of physics, department of astronomy. Place of work: in different positions – from Junior Researcher in 1968 in the Space Research Institute of the USSR Acad. of Sci. to Leading Researcher at the Astro Space Center of the Lebedev Physical Institute of the Russian Acad. of Sci. (the ASC of the LPI) in the present time. PhD thesis in Astrophysics “Statistical analysis of quasar absorption spectra” (1992), and Doctorial Thesis “Masers in star forming regions” (2000).
From 1997 – member of two commissions of the IAU: «Division F, Technologies and Data Science» and «Division H, Interstellar Matter and Local Universe» .
Member of Russian Astronomical Union.

Scientific interests – astrophysics, molecules in the interstellar medium, maser effects, radio astronomy.

Projects in which I. Val’tts takes part are performed in the framework of basic science, related to the study of the early stages of evolutionary processes in the interstellar medium, which resulted in forming protostars, protoplanetary disks and protoplanets.

Specific goals of these researches are connected with the fact that the primary gas-dust environment, depending on its density and heating, exists in many different substances of prestellar matter, which activity appears itself in different ranges of the electromagnetic radiation.

In particular, in the early stages of evolution, the interstellar medium is in the form of molecular clouds, and the emission of some molecules can not be interpreted in the framework of the equilibrium state of matter – it turned out to be maser.

The study of interstellar masers, which I. Val’tts is engaged, provides the data on the structure of the inhomogeneities in the interstellar medium, as well as the kinematic characteristics and parameters of the fine spatial structure of protostar condensations, which are most likely to be detected as protoplanetary disks.

The characteristics of masers provide important information needed to clarify the parameters of their pumping and to correct theoretical assessment of reliability of existing models of gas-dust fragment collapsing.

Basic methods of the work – observations on single radio telescopes and at the interferometric arrays, including the unique system of space-ground interferometer RadioAstron.

The relevance of this kind of work is, in particular, in the development, using and implementation in practice of the advanced technical capabilities and methods of scientific experiments, taking into account the direction of modern astronomy in the creation of large interferometric networks to increase the spatial resolution of the observed objects.

As a result of these studies I. Val’tts et al. published 136 articles.

These works have been repeatedly supported by the RFBR grants and a grant of the Federal Program "Research and scientific-pedagogical personnel of Russia 2009-2013", in which I. Val’tts took part as a performer and as a leader, actively using the obtained materials for the training of young scientists.

In the period from 2008 to 2016 five PhD students were trained as postgraduate in ASC/FIAN and in Moscow State Pedagogical University under her leadership and defended the thesis

VARSHALOVICH Dmitry Alexandrovich

Born 14.08.1934 in Leningrad. Graduated from Phys. Dept. of Leningrad State Univ. (1957) specialized in nuclear spectroscopy. Has been employed at Physical-Technical Inst. (presently, Ioffe Inst.) first as junior researcher at Lab. of Nuclear Isomerism, then senior researcher at Theor. Division of Ioffe Inst. Head of Theor. Astrophys. Dept. since 1968; principal researcher at Ioffe Inst. in 1986-2010. In 1968 passed habilitation in Phys. and Math. for work presented as common PhD thesis. Full professor since 1979; head of Space Res. Dept. of St. Petersburg Polytechnic Univ. since 2001. Correspondent-Member of RAS since 1994; Full Member of RAS since 2000. Chairman of Working Group on Relativistic Astrophysics and Gravitational Waves of Astron. Council of RAS; member of Internat. Astron. Union (IAU) since 1976; member of Astrophysics Commission of Internat. Union on Pure and Applied Phys. (IUPAP) since 1996. Died 21.04.2020 in St. Petersburg.

D. A. Varshalovich is famous in the fields of astrophysics and cosmology, spectroscopy of atoms, molecules, and nuclei. Made significant contributions to many fundamental branches of phys. and astrophys. In particular, he discovered and studied spin alignment of atoms and molecules in a rarefied space medium due to resonance scattering of anisotropic radiation fluxes; published a series of articles on spectroscopy of interstellar molecules and cosmic masers (together with V.V. Burdiuzha, and later with W.H. Kegel and S. Chandra) which laid foundation for the theory of galactic masers; discovered clouds of hydrogen molecules formed in the early Universe, 10-13 bln. years ago (with S. A. Levshakov); discovered HD molecules in cosmologically distant clouds; determined the abundance of primary deuterium; estimated the D/H isotope ratio and obtained independent estimate of relative baryon abundance in the Universe, of one of the key cosmological parameters (with A. V. Ivanchik and P. Petitjean); calculated processes in primordial hydrogen-helium plasma at the recombination epoch (with E. E. Kholupenko and A. V. Ivanchik). Results of latter calculations were implemented in international codes widely used to analyze CMB anisotropy. Published a series of articles on possible variations of fundamental physical constants and obtained stringent constraints on such variations.

Author and co-author of more than 250 research and review papers published in most prestigious scientific journals. Co-author of widely used fundamental monograph “Quantum Theory of the Angular Momentum” (with A. N. Moskalev and V. K. Khersonskij). In 2018-2019 published two-volumes of "Quantum Theory of the Angular Momentum and its Applications" (with V.K. Khersonskij, E.V. Orlenko, A.N. Moskalev), in which various applications of the theory are discussed in detail. Member of PhD Defence Councils at Ioffe Inst., Special Astrophys. Observatory and Pulkovo Observatory.

Awards: State Prize of RF in the field of Science and Technology (2008); V. A. Fok Prize (2001); A. A. Belopolsky Prize (1990); Interperiodica Publishing Maik Nauka Prizes (1997, 2007); A. F. Ioffe Medal of St Petersburg Government and SPbSC of RAS (1999); Medal «For Service to Motherland» of 2nd Degree (1999); and «Friendship» Order (2010).

VASHKOV’YAK Mikhail Alexandrovich

Born 02.12.1941 in Moscow. In 1965, graduated from M.V. Lomonosov Moscow State University (MSU). From 1965, he constantly worked at the Department of Applied Mathematics, the Steklov Mathematical Institute of the USSR Academy of Sciences (now the Keldysh Institute of Applied Mathematics of the Russian Academy of Science), first as an intern researcher and then progressing to a leading researcher. In 1969, completed postgraduate studies by correspondence at the Institute. D.Sc. in Phys.-Math. Sciences (1981). Senior Researcher (1981). Member of the International Astronomical Union Divisions (since 2003), including Division A Fundamental Astronomy, Division F Planetary Systems and Astrobiology, Inter-Divisional Commission A-F Celestial Mechanics and Dynamical Astronomy, Commission F2 Exoplanets and the Solar system (until 2021). Member of the editorial board of the journals "Space Research" and “Solar System Research”.

S.N. Vashkov'yak’s main areas of research are celestial mechanics and space flight dynamics. Author of about 120 research publications.

In 1970 – 1976, he participated in operational work on ballistic flights of “Luna 16” – “Luna 24”.

Since 1968, under M.L. Lidov’s supervision, he was engaged in designing ballistic domestic stationery and navigation satellites, studying the evolution of their orbits and introducing the developed analytical and numerical-analytical methods to a number of research and industrial organizations. In the orbital evolution of the geostationary satellite, he identified a new type of periodic trajectories with great amplitudes and covering two points of stable equilibrium together with saddle point in the plane (geographic longitude – period of revolution).

Later on, together with M.L. Lidov and A.P. Markeev, analyzed the launch of spacecraft to the vicinity of unstable libration points of the Earth-Moon system and studied special classes of trajectories restricted to a three-body problem (including the doubly-asymptotic, periodic, and quasi-satellite three-body problems).

In evolutionary problems in celestial mechanics (in particular, the restricted doubly averaged circular and elliptic three-body problem), developed and perfected the non-resonant averaging schemes and developed numerical-analytical methods for the analysis of the evolution of asteroids’ orbits. In particular, found the chaotic nature of the evolution of the asteroid (2335) James’ orbit, with a change of type circulation and libration argument of perihelion (proven by international research).

In 1998, developing M.L. Lidov’s research, received a common solution of doubly averaged Hill’s problem. In this problem and later in the refined model of evolution among the many satellite orbits, identified (proven by international research) apsidal-librational orbits of several irregular satellites giant planets, first of all, S XXII (Ijiraq), S XXIV (Kiviuq), that are in conditions of Lidov-Kozai resonance. In 2008, together with N.M. Teslenko, conducted a study of the evolutionary characteristics of orbits of all known at the time irregular satellites of the giant planets. This work was named the best article of 2008 in the “Solar System Research” journal, MAIK Interperiodika.

Together with the N.V. Emelyanov and S.N. Vashkov'yak, received a united analytical representation of the secular part of perturbing function, including, for orbits with close semi-major axes. On this basis, examined special (integrable) cases of the problem of the evolution of the satellite's orbit under the combined influence of the planet’s oblateness, the attraction of its massive satellites and the Sun.

VASILYEVSKIJ Anatolij Efimovich

Born 02.12.1941 in Sverdlovsk. In 1965, graduated from Ural State University (now, Ural Federal University, UrFU). From 1969 to 1972, did postgraduate studies at UrFU. Since 1969, worked at UrFU as a research assistant initially and progressing to the head of the Department of Astronomy and Geodesy (1987-1992). PhD (1972). Associate Professor (1983). Scientific Secretary of the Head Council for Astronomy of the RSFSR Ministry of Higher Education (1969 – 1980). Died 15.03.2003 in Yekaterinburg.

A.E. Vasilyevskij's research interests include open star clusters, red giants in open star clusters, stellar astronomy, photographic astrometry, the structure of the Galaxy, methods of mathematical statistics, and their application in the field of astronomy. He developed a method for estimating the ages of OCLs by the width of the Hertzsprung gap in the color index – apparent magnitude diagram. Author of 27 research publications and a textbook "Methods of Stellar Statistics" (1985). A.E. Vasilevsky developed and taught courses "Star Clusters", "Extragalactic Astronomy", "Internal Structure and Evolution of Stars", "Radio Geodesy", "Probability Theory and Mathematical Statistics", "Space Geodesy", "Stellar Astronomy", and "Methods of Stellar Statistics".

VASILYEV Alexander Semenovich

Born 31.08.1868 г. in Nikolaev. In 1895, graduated from The University of Novorossiysk (now, in Ukraine), in which he later taught until 1898. In 1899–1907, served in Spitzbergen Commission of the Emperor's Academy of Sciences. In 1896–1897 and 1902–1947: with the Central Astronomical Observatory at Pulkovo taking positions from Extraordinary Adjunct-Astronomer to Senior Researcher. Dr.Sci. (Phys.-Math.) (1919), Professor (1947). Died 04.03.1947, buried at The Memorial Cemetery of the Pulkovo Observatory.

His basic works refer to studies of variability of latitudes and to methodology of geodetic measurements. Authored more than 100 scientific works.

In 1899–1901, took part in Swedish-Russian Enterprise on grade measurements on Spitzbergen Islands, as Deputy Head of the Russian expedition and Head of the Special geodetic party. Russian scientists measured two thirds of the meridian arc, the Swedes – one third. A. Vasilyev performed a significant part of all observations and nearly all calculations; he also carried out detailed mapping of Spitzbergen (1925). His works on the processing of observations and results of the expeditions provided a valuable contribution to astronomical, geodetical, and geographical studies of Spitzbergen.

In 1908–1941, being the highest class observer, carried out observations with the passage instrument in prime vertical, in order to determine astronomical constants and study swings of Pulkovo latitude, and also studied the instrument itself. Suggested an original method of evaluation of the accuracy of leveling of the horizontal axis of the instrument and worked out a way of investigation of its levels. Summarized the processing of multiple-year observation series and derived a new value for the daily term in oscillations of zenith distances of stars; obtained the curve of variations of Pulkovo latitude for 100 years.

In 1920–1924, supervised the training on geodesy and practical astronomy for attendees of The Military Engineering Academy of the General Staff and hydrographers of the Navy. Consulted geodetic work on triangulation Yekaterinburg – Yegorshchinsk Coal Mines (1918). Developed an extremely precise method of investigation of tubular levels (1925). Made valuable works on the methodology of measurements of base lengths.

Honored with State awards: The Order of Saint Stanislav of II Degree (1902), The Order of the Red Banner of Labor (1945).

VASILIEV Evgeniy Olegovich

Born in 1977. Undergrad. and grad. student of Rostov State Univ. (SFedU now) in 1994-2000. Master of Sci. (2000). Postgrad. student of the Space Physics Department of the RSU in 2000-2003. PhD in Astrophysics (2004): «Observational manifestations of first stars and galaxies activity in the early Universe». Works in the Institute of Physics at the RSU/SFedU. Research Associate of the Tartu Observatory in 2008-2008. Since 2014 he is Leading Research Scientist the Institute of Physics at the SFedU. Doctor of Sciences (2015, Habilitation): «Energy and mass exchange between galaxies and circumgalactic medium».

Main scientific achievements:

In his works the nonequilibrium ionization and thermodynamics of photoionized metal-enriched gas is studied. The conditions favoured to thermal instability development behind a shockwave has been found.

The ionizing and thermal evolution of primordial gas and formation of first objects have been studied (together with Yu.A. Shchekinov).

The influence by nonstandard ionizing and heating sources (decaying dark matter particles and primordial magnetic fields) on the formation of first protogalaxies and its possible observational manifestations in the atomic hydrogen 21 cm line have been predicted (together with Yu.A. Shchekinov and Sh.K. Sethi).

The conditions for origin of galactic winds have been studied. The time lag between the onset of starformation and the launch of a galactic wind formed by collective supernova explosions have been interpreted (together with B.B. Nath and Yu.A. Shchekinov).

The evolution of giant molecular clouds in the Galaxy is investigated (together with S.A. Khoperskov, A.V. Khoperskov, A.M. Sobolev and D.A. Ladeishchikov).

VERKHODANOV Oleg Vasil'evich

Born 17.03.1965 in Velikij Novgorod. From 1982 to 1987 he was a student of Leningrad (now St. Petersburg) State University. Since 1987, he has been working in the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991) occupying the positions of Trainee Researcher (1987-1989), Junior Researcher (1989-1992), Researher (1992-1995), Senior Researcher (1995-2006), Leading Researcher from 2006, Head of Cosmology and Galaxies Research Group of the radio astrophysics laboratory from 2011. He was a correspondence postgraduate at SAO from 1989 to 1993. In 1993, he defended his Ph.D. thesis on «Methods of study of radio sources in the near-Zenith mode of RATAN-600». From 2002 to 2004, he worked in Teoretisk Astrofysik Center in Copenhagen (Denmark) as a Guest Professor. In 2005, he passed his Dr.Sci. defense on "Methods and results of observational radio cosmology". Died 05.04.2020 in Nizhnij Arkhyz, KChR.

His major scientific works related to observational radio astronomy, physics of cosmic radio sources, cosmic microwave background and methods of data analysis. He is the author of more than 200 scientific papers, the book "Radio galaxies and cosmology" (2009) with Yu.N. Parijskij, and chapter "Sky pixelization for CMB mapping" in the book "Advances in machine learning and data mining for astronomy" (2012) with A.G.Doroshkevich.

Oleg V.Verkhodanov developed the software for analysis of the radio survey data and observations of individual radio sources at RATAN-600. He explored the possibility of working RATAN-600 as a phased antenna array in the «Zenith» mode. He developed algorithm of phase analysis and the software package GLESP (co-authored) in the new designed sky pixelization scheme for precision study of the CMB on the full sky, for the fist time discovered the non-Gaussian properties of the CMB map (which was later confirmed by other authors), and demonstrated that is due to the Galaxy radiation (with P.D.Naselsky, L.-Yi.Chiang, and M.Way). He estimated the age of distant radio galaxies and demonstrated their concordance with the LCDM standard cosmological model (with Yu.N.Parijskij and A.A.Starobinsky). He investigated the contribution of the different populations of radio galaxies in the cosmic microwave background and prepared new catalogs of radio sources.

In 1994, he developed the largest at the time database of radio astronomical catalogs, CATS, (with S.A.Trushkin, V.N.Chernenkov and H.Andenach), intensively used by astronomical community at the present time. With the help of developed tool, he conducted cross-identification of hundreds of thousands of different frequencies sources.

As a part of the team of the program «Big Trio», BTA – RATAN-600 — VLA, headed by Yu.N.Parijskij, he explored one of the most distant radio galaxies, RCJ0311+0507, at redshift z=4,514 with a supermassive black hole in the center of the host galaxy and the age of the stellar population of ~0.8 billion years.

Since 1994, O.Verkhodanov is one of organizers of astronomical schools for high school students, conducted on the basis of SAO RAS. He is an active popularizer of science.

Under his supervising, two Ph.D. thesis of his post graduate students were defended.

He is a multiple winner of the programs of the Fund for Russian Science Support «Outstanding scientist. Candidates and Doctors of Sciences of RAS» and Dmitry Zimin «Dynasty» Foundation.

VINYAYKIN Evgeny Nikolaevich

Born 17.07.1945 in the city of Gorky (now Nizhny Novgorod). 1963-1968, student of the Radiophysi-cal Faculty at the Gorky N.I. Lobachevsky State University (GSU) (now the N.I. Lobachevsky State University of Nizhny Novgorod (UNN)). Defended PhD thesis in 1984. Senior Researcher since 1991. 1968-1970, military service in the Soviet Army (SA). 1970-2016, junior researcher, leading engineer, senior researcher, head of sector, leading re-searcher of the Radiophysical Research Institute (NIRFI).

Member of the European Astronomical Society (EAS), the Euro-Asian Astronomical Society (EAAS), the Russian National Committee of the In-ternational Union of Radio Science (URSI) (Commission J). Awarded a diploma of the Ministry of Education and Science of the Russian Federation in 2006. Died 28.07.2020 in Nizhny Novgorod.

E.N. Vinyajkin's major interests are focused on the study of the radio emission from young supernova remnants (SNRs), bright radio galaxies, the diffuse Galactic radio emission in the ranges from centimeter (cm) to decameter wavelengths on the radio telescopes of the Staraya Pustyn Radioastronomical Observatory (SPRAO) and the largest national radio telescopes.

E.N. Vinyajkin discovered (together with V.A Razin) a secular decrease in the radio flux density of the Crab Nebula at a frequency of 927 MHz. E.N. Vinyajkin's observations at a wavelength of 2 m at the SPRAO and 3.5 m on the DKR 1000 (together with coworkers from the Pushchino Radioastronomical Observatory (PRAO)), as well as elsewhere data at cm wave-lengths showed that this decrease was independent of frequency. E.N. Vinyajkin investigated (together with his colleagues from NIRFI) the linear polarization of the Crab Nebula at wave-lengths 7.6 cm and 13 cm on the RATAN-600 and performed the approximation of the frequency dependence of polarization parameters of this SNR by these and all other known data.

In the course of long-term observations at frequencies 151.5, 290, 927 and 2924 MHz on the radio telescopes at the SPRAO and at 38 MHz at the PRAO, E.N. Vinyajkin found the frequency dependence of the decrease rate (d) of the SNR Cassiopeia A (Cas A) radio emission flux density. On this basis, and with the involvement of all the known data, he obtained an empiric formula for the frequency dependence of d from decametric to millimetre wavelengths. Using this dependence, he built the spectrum of Cas A for epoch 2015.5 and revealed a positive curvature in it at the frequencies higher than 160 MHz. He explained the cause of the low-frequency spectrum cut-off (the maximum is at a frequency of 15.6 MHz) by the absorption in the Strömgren residual zone around the source. He measured (together with his colleagues from NIRFI) Cas A angular sizes at a record low-frequency of 9 MHz and carried out the polarization studies of this remnant at 13 cm on the RATAN-600.

E.N. Vinyajkin (together with V.I. Abramov) performed polarization observations of bright galaxies Cygnus A, Virgo A, Centaurus A (central region) and some quasars at wavelengths 7.6, 13 and 31 cm on the RATAN-600. He proposed approximation formulas for the radio emission spectra of Cygnus A and Virgo A and found that the spectrum of Virgo A had a small positive curvature in the range from decameter to submillimeter wavelengths.

E.N. Vinyajkin with his colleagues performed multifrequency observations of the linearly polarized diffused (distributed) Galactic radio emission (DGRE) in the meter and decimeter wavelengths in the direction of the North Celestial Pole (NCP), the North Galactic Pole (NGP), the North Polar Spur (NPS), minimum radio brightness of the Northern sky, and in the direction l = 147º, b = 9º in the Fan region with enhanced polarization. The results obtained testify to the presence of low spatial frequencies in the angular distribution of the Stokes parameters Q and U of the DGRE that are not detectable in observations using systems of aperture synthesis.

E.N. Vinyajkin suggested a number of methods to improve the accuracy of the polarization and interferometric observations and measurements of the total electron content of the iono-sphere.

E.N. Vinyajkin is the author and coauthor of more than 170 scientific works.

VITINSKY Yuri Ivanovich

Born 16.06.1926. Graduated from The State University of Leningrad. From 1953, with the Mountain Astronomical Station of The Central Astronomical Observatory at Pulkovo; in 1955, transferred to the Solar Physics Department. A solar astronomer. Cand.Sci. (1963): «Some problems in sunspot activity and the forecasting of Wolf numbers». For 35 years (1965–2000) permanently was the Academic Secretary of The Central Astronomical Observatory at Pulkovo, exposing at this position his skills in science organizing. Died 19.07.2003 in Pulkovo.

Widely known both in Russia and abroad due to his studies of solar activity, primarily, the cyclicity of sunspot formation, and also due to works on methods of forecasting of active phenomena on the Sun. Pioneered studies of such a phenomenon of the solar activity as active latitudes of sunspot formation, and formulated its basic features. Found a series of new parameters of differential rotation of the Sun, spatial and temporal organization of the solar activity, and suggested several methods of forecasting of solar activity.

Authored more than 200 papers and numerous monographs: «Forecasts of the solar activity» (1963), «Morphology of the solar activity» (1966), «Cyclicity and forecasts of the solar activity» (1973), «The Sun and the atmosphere of the Earth» (with A.I. Ohl and B.I. Sazonov, 1976), «Solar activity» (1983), «The Statistics of sunspot formation» (with M. Kopetsky and G.V. Kuklin, 1986).

Most actively participated in issuing of the «Solar Data» Bulletin from the start of its publication (1953), being its Executive Editor and coordinating the collection of data within the framework of the International Program «The Solar Survey».

Veteran of the Great Patriotic War. Honored with eight State Awards.

VITKEVICH Victor Vitoldovich

Born 02.07.1917 in the Klin town of Moscow region. World War II veteran. Graduated from the Moscow Institute of Communications (1939). In 1941-1947 service in the Soviet Army. In 1948 he went to work in the laboratory of oscillations of the Lebedev Physical Institute (LPI) of the USSR Academy of Sciences. The head of the radio astronomy laboratory and head of the LPI Radio Astronomy Station in Pushchino (1960-1972). Professor, Doctor of Physical and Mathematical Sciences, Laureate of the State Prize of the USSR (1968). Died 29.01.1972 in Moscow.

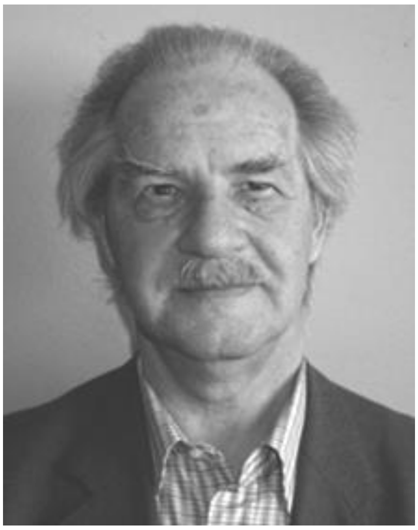
The name of V.V. Vitkevich is associated with the formation of domestic radio astronomy, the creation of experimental bases in the Crimea (Katsiveli settlement) and near Moscow (Pushchino, Moscow region). In 1951 V.V. Vitkiewich proposed a new method for studying the solar corona by observing the distant radio sources when their emission is passing through the corona (the "transmission" method). Using this method, he discovered the supercorona (the outer regions of the solar corona), as well as the radial magnetic fields in it. Both of these discoveries were officially registered by the State Committee for Inventions and Discoveries under the Council of Ministers of the USSR.

Since the late 1950s the center of the radio astronomy research of the LPI staff is shuffling from the Crimea to the Pushchino Radio Astronomy Station. Here, under the leadership of V.V. Vitkevich, a Wide-band Cross-type Radio Telescope (DKR-1000) is being built. At the end of 1964 on the E-W arm of DKR-1000 (40m x 1000m) V.V. Vitkevich continued his studies of solar supercorona, significantly increasing the number of observed objects. From the end of 1965, he began systematic observations of the scintillations of compact radio sources on solar wind irregularities. Using the E-W arm of DKR-1000 together with two specially constructed smaller sizes antennas formed a triangle with sides of ~ 200 km, V.V. Vitkevich for the first time measured the velocity of plasma outflow from the Sun, including at the large helio latitudes.

V.V. Vitkevich made a significant contribution to the study of the spectra and structure of radio galaxies and quasars. Under his leadership, the flux densities of radio sources from the 3C catalog were measured with E-W arm of DKR-1000 and their spectra were analyzed in the 86 – 1400 MHz range. On his initiative, a radio interferometer with a variable base up to 18.5 km in size was created, operating at a wavelength of 3.5 m, on which, in the 1970s-1980s, his followers studied the structure of about 150 extragalactic radio sources.

The last years of his life V.V.Vitkevich devoted to the study of pulsars. A month after the first publication of the discovery of these objects in 1968, their observations were started on the DKR-1000. In the same 1968, the first Pushchino pulsar, PP0943+10, was discovered. In the late 1960s under the leadership of V.V.Vitkevich, construction began on a Large Phased Array antenna (BSA) at a wavelength of about 3 m, intended for studying pulsars, as well as radio sources scintillations on inhomogeneity of the interplanetary plasma. The construction of this radio telescope BSA was completed by V.V. Vitkevich's followers in 1973, who today successfully use the E-W arm of DKR-1000 and BSA antennas in their research.

VITRICHENKO Eduard Alexandrovich



Born 13.10.1936 in Odessa. In 1959 he grad-uated from Odessa State University, in 1961–1972 worked at the Crimean Astrophysical Observatory. In 1968 E.A. Vitrichenko defended the PhD thesis, in 1973 – Head of the group on studying a BTA mirror at the Special Astrophysical Observatory. In 1974–2013 he worked at Space Research In-stitute (SRI), senior researcher, Dr. Sci. in Engineering (1984). A holder of the Order of the Red Banner of Labour and VDNKh gold medal. Died 02.10.2013 in Moscow.

E.A. Vitrichenko is a well-known astrophysicist and expert in studying astronomical optics, authored about 150 publications and 4 books, had several author's certificates. He carried out works on the quality control of telescope mirrors manufactured by Russian and foreign firms for different observatories. A participant in exploring the 2.6 m Shajn telescope mirror, head in exploring the 6 m BTA mirror. He took part in the State Commission on accepting the telescope in the Special Astrophysical Observatory, in workshop tests of the second BTA mirror. Invited by the Bulgarian Academy of Sciences in the late 1970s, he was head of the group on accepting the 2 m telescope designed by Carl Zeiss Jena firm for the Astronomical Observatory Rozhen and was awarded the diploma of the Academy of Sciences of the People's Republic of Bulgaria. In 1999 E.A. Vitrichenko adjusted the optical system at the 1.5 m Russian-Turkish Telescope PTT-150 of the TUBITAK Observatory (Turkey). The set of works carried out at SRI in 1970–1980 formed a new direction in practical astrophysics – quantitative automated methods for studying astronomical optics associated with three others: certification of astronomical optics, automatization of manufacturing astronomical mirrors and building-up of adjusted telescopes. The theoretical and practical objectives on these directions are considered in his Doctoral thesis.

His astrophysical works concern the study of spectral binary stars, supergiant atmospheres and multiple systems. In CrAO he resumed work on detecting stellar radial velocities and improved a method of measurement. The published practical developments were highly demanded by many researchers of stellar spectra. In 1970 E.A. Vitrichenko designed and constructed an IR-spectrograph, which was applied by astronomers from different observatories for studying T Tauri stars and supported in defending several theses. His PhD thesis is devoted to the study of anomalously fast OB stars. The papers of the past years include the results from studying Orion Trapezium stars obtained in cooperation with astronomers from different countries – experts in photometry and spectroscopy. The physical parameters and chemical composition of atmospheres were studied, a multiplicity of some stars was detected, and stars escaping from the system were found. The results are summarized in the book Orion Trapezium. High erudition of E.A. Vitrichenko in the issues concerning practical astrophysics involved astronomers from many observatories. Under his supervision several theses were defended. His papers are of interest due to the problems raised and ideas and hypotheses put forward.

VITYAZEV Veniamin Vladimirovich

Born 15.04.1943, in the city of Leninakan, Armenian SSR. In 1967 he graduated from the Faculty of Mathematics and Mechanics of the Leningrad State University (now – St. Petersburg State University), specializing in astronomy. After completing his postgraduate studies at Leningrad State University in 1970, he worked at the Kalmyk State University. Since 1980 he has been working at Leningrad State University (St. Petersburg State University). From 1983 to the present – head of the department of astronomy, from 1994 to 2007 – Director of the Astronomical Institute named after V.V. Sobolev of St. Petersburg State University. Candidate dissertation: "On the expansion of planetary nebulae" (1973). Doctoral dissertation: "New methods of analysis of stellar catalogues and uneven time series" (2000), professor (2002). Member of a number of scientific councils and editorial boards of Russian journals on astronomy, member of the IAU.

Born on April 15, 1943, in the city of Leninakan, Armenian SSR. In 1967 he graduated from the Faculty of Mathematics and Mechanics of the Leningrad State University (now – St. Petersburg State University), specializing in astronomy. After completing his postgraduate studies at Leningrad State University in 1970, he worked at the Kalmyk State University. Since 1980 he has been working at Leningrad State University (St. Petersburg State University). From 1983 to the present – head of the department of astronomy, from 1994 to 2007 – Director of the Astronomical Institute named after V.V. Sobolev of St. Petersburg State University. Candidate dissertation: "On the expansion of planetary nebulae" (1973). Doctoral dissertation: "New methods of analysis of stellar catalogues and uneven time series" (2000), professor (2002). Member of a number of scientific councils and editorial boards of Russian journals on astronomy, member of the IAU.

His scientific works are devoted to the kinematics of stars and spectral analysis of irregular time series. In the first direction, using the orthogonal representation of proper motions and line-of-sight velocities of stars on the celestial sphere, new kinematic effects were discovered that were not considered by standard models. The second direction is based on the method of a time interferometer, which is similar to the method of aperture synthesis in radio astronomy. These methods are used to study the unevenness of the Earth's rotation from observational data obtained from classical and new astrometric observations using radio interferometric technology. The results of these studies were reported at international conferences in St. Petersburg, the USA, Poland, Spain, Czech Republic, and France. He has published 135 scientific works, including 8 educational and methodical. More than 10 theses have been prepared under his supervision and 2 Ph.D. theses have been defended. On his initiative, new courses were introduced at the department of astronomy of Saint Petersburg State University: General theory of relativity, CCD-astrometry, Geodynamics, Space astrometry, Relativistic astrometry. A unique textbook dedicated to all sections of classical and modern astrometry has been published as well. As the director of the Astronomical Institute, he was involved in the development of a local computer network integrated into the world computer network; instrumentation of scientific research and educational process: equipping telescopes with CCD receivers, development and creation of automated monitoring of solar flares; creation of a VLBI Observation Processing Center within the framework of the International IVS Service; development of a set of equipment for using GPS technology for astrometric purposes.

State awards: Medal of the Order of Merit for the Fatherland, II degree (1999). The gratitude of the President of the Russian Federation (2005); Badge "Honorary Worker of Higher Professional Education of the Russian Federation" for merits in the field of education (2006); Medal of the Order of Merit for the Fatherland, I degree (2014).

By the decision of the IAU dated 02.10.2003, the small planet No. 17356 was named Vityazev.

VLADIMIRSKY Boris Mikhailovich

Born 07.04.1932. In 1958, graduated from Dnepropetrovsk State University and in the same year was employed at the Crimean Astrophysical Observatory. Here he worked for over 50 years, advanced from a laboratory assistant to a leading researcher. Lectured at V.I. Vernadsky Taurida National University (1996–2008). In 1968, defended his PhD thesis “Some issues on the physics of cosmic rays” (MSU). In 1997, defended his Doctoral thesis “Active processes on the Sun and biosphere” (Institute of Biophysics RAS). Authored more than 300 articles and over ten booklets and books.

A person with a wide field of scientific interests. The obtained results may be attributed to three basic sections.

(1) Solar physics – cosmophysics. Based on stratospheric measurements, weak increases of solar cosmic rays from usual (nonproton) flares were detected. Studying the Jupiter radio emission, he established that the sector structure of the interplanetary magnetic field persists up to 5 a.u. B.M. Vladimirsky detected the short-period (tens of minutes–hours) fluctuations in parameters of the ionosphere and geomagnetic field of the solar origin. He was first to find meridional structures in the solar wind in the helioequatorial region.

(2) Gamma-ray astronomy. In collaboration with A.A. Stepanian and V.P. Fomin, he designed gamma-ray telescopes RChV and GT-48. Observing with these facilities, he detected the first discrete sources of very-high-energy gamma rays – Cygnus-X-3, etc. It was shown that radio pulsars do not form a homogeneous population and may be classified.

(3) The impact of space weather on the environment. He elaborated a theoretical model, which allows one to interpret the whole array of the accumulated heliobiological data within the commonly accepted cosmophysical notions. Compiled the first cosmic rhythmics catalog noting that its accordance with biological rhythmics may be due to the synchronization of autofluctuations similar to frequency acquisition. Detected an effect of changing sign of the interplanetary magnetic field (sector boundaries) for bacteria and Piccardi tests. Within the cooperative work with biologists, he detected the influence of electromagnetic blanketing on the space weather. Jointly with A.V. Bruns, elaborated the instrument Ekzakt by means of which it was first possible to observe effects of the space weather in semiconductor structures. He demonstrated that autofluctuations in economics, “the Kondratieff long waves”, are synchronized with variations of solar activity.

B.M. Vladimirsky is a laureate of the Gold Medal named after A.L. Chizhevsky. An author of monographs Cosmic Rhythms (Simferopol, 1995; State Award of the Autonomous Republic of Crimea, co-authored with N.A. Temuryants and V.Ya. Narmansky), On the Roads of Russian Cosmism (Moscow: URSS. 2011 co-authored with L.D. Kislovodsky), Solar Activity and Social Life (Moscow: URSS. 2013).

VLASYUK Valery Valentinovich

Born 26.05.1964 in the Cherkassy Region of the Ukrainian SSR. Graduated from Moscow State University in 1987. Since 1987 he has been working at the Special Astrophysical Observatory of the Academy of Sciences of the USSR (now the Russian Acade-my of Sciences), holding different positions: Junior Researcher, Research Scientist (1992-1998), Deputy Director (1998-2015). Since December of 2015 – director of SAO RAS. In 1992 he de-fended his Ph.D. thesis on "Methods of Analysis of Universe Large Structure by results of Deep Surveys on the 6-m Tele-scope".

A member of the International Astronomical Union (IAU), a member of The Large Telescopes Program Committee (since 2003).

Research interests: extragalactic astronomy, study of extremely faint objects, deep sky sur-veys, study of transient events, physics of active galactic nuclei, data processing methods – photo-metric and spectroscopic, scientific instrumentation. Author of more than 70 scientific and tech-nical papers.

Basic scientific results related to the work performed in collaboration with the staff of optical telescopes of the SAO: the creation of software for the analysis of the photometric and spectral data (1993); software implementation of the regime of frame records and data recovery for panoramic registration system in the photon counting mode (1995); discovery (for the first time ever in Russia) the gravitationally lensed system (1997); multiobject spectroscopy of stars in near-by galaxies at 6-m SAO telescope (1998-1999), simultaneous monitoring of sample BL Lac objects in the optical and radio ranges (2003-2015).

Since 1999 carries out direct management of works on development and modernization of the complex of the 6-m telescope , in particular, modernization of the automated control sys-tems (1999-2002), phased modernization of electric power equipment of the telescope (2003-2006) , re-polishing of working surface of the primary mirror (since 2006) .

VOJKHANSKAYA Natalia Feodorovna

Born 06.04.1937 in Leningrad. Graduated from Department of Physics of Leningrad State University (now SPbSU) with major in optics and spectroscopy in 1959. In 1959-1961 was working in Organic Chemistry Institute of the Bashkir Branch of the AS of USSR. In 1964 she finished post-graduate courses of the De-partment of astrophysics of LSU. Defended her Ph.D. thesis on “Study of solar flares” in 1966. From 1966 has been working at the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991), studied bi-nary systems. The first Research Scientist in SAO. She defended her Dr.Sci. thesis on “Structure and dynamics of novae-like bina-ry systems” in 1991. Member of the working group on study of nonstationary stars of the Astronomical Council of the AS of the USSR.

Main scientific area of interest include: study of physical processes ongoing in low-mass close binary systems (CBS) of stars. The author of over 70 scientific papers.

In the years of building and installation of the 6-m BTA telescope, N.F. Vojkhanskaya took part in application and testing spectral instruments both at the LOMO factory and at the telescope site. She was the first to obtain stellar spectra with the BTA. On the beginning of scheduled observations, she became one of the active observers at the primary focus of the telescope.

When studying CBSs, N.F. Vojkhanskaya focused on nova-like (NL) systems. As a result of long-term observations at the BTA, she determined very strong and different variability of all the characteristics of the NL systems and came to a very important conclusion on the fact that this permanent variability was a fundamental characteristic of them. Investigation of certain systems allowed her to discover many new facts unknown earlier. For example, a change of the spectrum from wide and small absorptions to the highly excited emissive one. In the TT Ari system, with the brightness decrease a sharp and very big leap of the radial velocity was noticed due to emergence of a conical shockwave in the accreting matter. The binarity of the AM CVn system was detected and it was proved that it consisted of two white dwarfs. Such systems are now called binary degenerates, or AM CVn-type systems.

With the discovery of a new type of NL systems, polars, N.F. Vojkhanskaya began to study them intensively. She was the first to discover many interesting phenomena. For example, she was the first to observe the phenomenon of "switching-off" the one of the magnetic poles of AM Her. She also was the first to detect an emission line in the spectrum of AM Her which apparently was the electron cyclotron line and it allowed her to estimate the magnetic field of the white dwarf. In the polar CW1103+254, she found a systematic shift of radial velocity curves and estimated the period of an additional periodic movement by 8-9 years. However, the main thing was that the po-lars showed the same variability as ordinary nova-like systems.

The derived results and the analysis of literature data showed that the standard model of disk accretion could not explain them. N.F. Vojkhanskaya suggested a new model of nova-like systems which included the circumstellar matter into the system volume. The change in its amount, state of excitation, and spatial distribution is the cause of the observed variabilities. Moreover, it also allows one to solve the "riddle of soft X-ray" of polars.

For many years – a member of Scientific and Dissertation Councils of SAO, a member of Editorial Board of the “Izvestia SAO” journal, Executive Editor-in-Chief of “Astrophysical Bul-letin”.

VOLVACH Alexander Evgenyevich

Born in 1965. In 1990 he graduated from Odessa State University. Since 1990 – researcher at the Crimean Astrophysical Observatory. In 2003 he defended the Ph.D. thesis "Variability, structure and radio emission spectrum of active galactic nuclei based on observations with radio telescopes". Since 2005 – Deputy Director for research. In 2006 he was appointed to the rank of senior researcher. In 2010 he defended his Doctoral thesis "Non-stationary radiation of extragalactic sources on observations in the microwave range". A member of IAU and EAS. Laureate of many prizes of the Academy of Sciences (2000, 2004, 2005, 2006, 2008, 2012). He was awarded the certificate of honor of the Ministry of Education and Science (2007). Holder of the badge "For scientific achievements" (2009). Honored Worker of Science and Technology of Crimea (2012). Honored worker of the space industry (2008).

A.E. Volvach carried out a number of important works in the field of cosmic studies widely known in our country and abroad. There was acquired a series of high-class scientific results – from investigations of AGNs and solar system objects to the study of continents' motion and developing research programs for space projects. The equipment was modernized and modern methods of observations with RT-22 in the global VLBI network were elaborated. It enabled continuing high-sensitive investigations of the hyperfine structure of cosmic radio emission sources, for the first time to determine global geodynamical phenomena of the Eurasian tectonic plate and Crimean peninsula, to start observations of asteroids and terrestrial-group planets, to monitor space debris by combining methods of VLBI and classic radio location. The methodical, equipment and program base for electronic radio astronomy was developed, particularly by the real-time VLBI method. A.E. Volvach carried out pioneer works concerned with solving topical fundamental problems of astrophysics – studying physics of phenomena in quasars and AGNs, their circumnu-clear regions, studying energy release, its variability in compact central regions of extragalactic sources. There was acquired the world's only database of AGN variability in centimeter and millimeter wavelengths. The conducted long-term monitoring of non-stationary phenomena in AGNs allowed deriving both spectral characteristics of flux variations and dynamical parameters of the system consisting of supermassive black holes (SMBH). Based on the derived experimental data there was distinguished a class of objects consisting of two close SMBH and central accretion disk. A concept was put forward in which the problem of energy release is considered in conjunc-tion with dynamical characteristics of the binary SMBH. A model was elaborated in which the loss of momentum in the binary SMBH system is considered as an important source of energy re-lease in AGNs, additionally to energy released while the accretion on the disk of the central body. With RT-22 there was realized a possibility to carry out investigations of practically all the space masers. It is worth noting that just several radio telescopes in the world provide such possibilities for observations. The works on studying maser lines in comets were carried out for the first time in the CIS countries.

The results of researches based on the derived observational data are represented in about 350 scientific publications, 4 monographs and publications in press.

VORONTSOV-VELYAMINOV Boris Alexandrovich

Born 01(14).02.1904 in Ekaterinoslav (Dnepropetrovsk). In 1925, he graduated from the Faculty of physics and mathematics of Moscow University (MSU) and in 1930, finished its post-graduate course. After introduction of the system of scientific titles and degrees in the USSR, we was immediately approved as a professor in 1934 and as a D. Sci., in 1935 (without presenting a dissertation). In 1924–1979, V.-V. was affiliated to the Sternberg Astronomical Institute (SAI) of the MSU, first as a researcher, and after 1953, as a head of the department of Novae and gaseous nebular, created by him (currently the department of physics of emission stars and galaxies). After 1979, he continued to supervise studies of the extragalactic astronomy department as a volunteer. Corr.-member of the Academy of pedagogical sci. USSR (1966). Died 27.01.1994 in Moscow.

V.-V.'s main studies were in the field of hot stars, nebulae, and galaxies. In 1934, he compiled the world-first catalog of planetary nebulae (130 objects). Its last edition (1962) already contained 600 nebulae. In 1930s, he was one of the first in the world to apply the method of isophotes in order to estimate a nebula's integrated brightness from its photographic image and to find fluxes from the nebula in spectral lines. In 1940s, he turned attention to the continuous sequence of hot stars in the spectrum–luminosity diagram (the "white and blue" sequence) that included OB and Wolf–Rayet stars, nuclei of planetary nebulae, white dwarfs and established that nuclei of planetary nebulae belonged to the hottest stars. V.-V. is the author of one of the methods for determination of distances to planetary nebulae, named after him, and of a method for estimating temperatures of their nuclei. In 1948, he published the basic study "Gaseous nebular and Novae", still of importance now.

In mid-1950s, V.-V. began his studies of the spiral structure, first of our Galaxy and then of external galaxies. Using the Palomar sky atlas, he discovered many galaxy types not known before. He paid special attention to interacting galaxies: the term was introduced by him for systems of galaxies with distorted structures. The world-first "Atlas and catalog of interacting galaxies" was published by him in 1959. It contained 355 objects and its second edition (1977), 500 systems more. For this discovery, V.-V. was awarded the Bredikhin Prize of the USSR Acad. Sci. (1962). In 1962–1974, V.-V. (in co-authorship with colleagues from his department) compiled and published 5 volumes of the world-known "Morphological catalog of galaxies", containing parameters and descriptions for 35000 galaxies of the whole northern sky and a half of the southern sky. V.-V.'s book "Extragalactic astronomy" appeared in 1972; in 1977, its second edition, revised and appended by the author, was published (English translation, 1987). He authored more than 600 scientific papers.

V.-V. is the author of several books on the history of astronomy. He wrote the history of his ancestors, families of Vorontsovs and Velyaminovs (stored in a library in St. Petersburg). He is the author of several textbooks and tutorials. His astronomy textbook for schools was published 40 times since 1935; it was translated into many languages abroad and in the USSR. He was eagerly working in the field of popular science. Member of the IAU, he actively worked in its commissions, reviewing highlights of the Soviet science. For his merits in science and education, he was awarded the Order of Lenin (1954), certificates of honor from the Ministry of education, N.K. Krupskaya medal. He had a keen interest in history, tourism, travelling.

A Caucasus glacier discovered by V.-V. was named after him.

VOSCHINNIKOV Nikolai Vasilievich

Born 26.06.1951 in Leningrad (now St. Petersburg). In 1968-1973, student at the Department of Astronomy of Leningrad (now St. Petersburg) State University (LSU). In 1973-1976, postgraduate at the Department of Astrophysics of LSU. Defended his Ph.D. and Dr.Sci. dissertations in 1979 and 1991, respectively. From 1976 until his death, he worked at LSU (SPbSU). Member of IAU. In 2011, he was awarded the SPbSU Prize for his series of works "Fundamental Problems of Small Particle Optics and Physics of Cosmic Dust" (with V.B. Il'in). Died 17.12.2017 in St. Petersburg.

Scientific interests of N.V.Voshchinnikov concerned physics of interstellar medium and optics of small particles. Published more than 130 papers and 2 monographs, highly cited in astronomical and physical literature.

With V.G.Farafonov, he developed new methods and algorithms required for calculating the optical properties of small particles of spheroidal shape and layered structure. These new tools were based on the method of separation of variables (with a spheroidal basis) and included a unique code for calculating spheroidal functions of a complex argument. These developments opened ways to solve a wide range of problems concerning light scattering by small particles.

He modelled curves of interstellar extinction and polarization, taking into consideration the likely structure of cosmic dust grains, and showed that estimates of the dust mass, inferred from the flux in far infrared, should be significantly corrected. By studying the light pressure on non-spherical dust grains, he proved that the non-radial component of the radiation pressure force significantly exceeds the force arising due to the Poynting–Robertson effect. He was the first to calculate the temperature of non-spherical dust grains in circumstellar and interstellar media. Studied light scattering in dusty nebulae and circumstellar envelopes; described and interpreted properties of shells around young Herbig Ae/Be stars and the protoplanetary disk around beta Pictoris. He confirmed that Algol-like variability of Herbig Ae/Be stars can be explained by variable circumstellar extinction.

Since 1999, N.V.Voshchinnikov developed a new model of composite cosmic dust grains. The model allowed one to solve the "carbon crisis" problem, i.e., the problem of deficit of heavy elements in the solid phase of interstellar medium. Also showed that porosity of particles can explain the flatness of interstellar extinction curves observed in mid-infrared with the Spitzer space telescope. N.V.Voshchinnikov participated in development of the electronic database of optical properties of small particles (DOP). The database is used to solve a variety of scientific problems concerning interaction of small particles with radiation; it is also used in industrial applications.

He was one of the organizers of the series of international conferences "Electromagnetic and Light Scattering: Measurements, Theory and Applications", held since 1995. He led numerous projects (INTAS, Volkswagen, RFBR, ESO, etc.). At the Astronomy Dept. of SPbSU, he delivered various courses of lectures; supervised the general course "Modern Astronomy: Methods, Achievements, Unresolved Problems." Under supervision of N.V.Voshchinnikov, three Ph.D. theses were defended; he was also consultant of one Dr.Sci. dissertation.

WIEBE Dmitri Siegfriedovich

Born 17.10.1968 in Sverdlovsk (now Ekaterinburg). In 1992 graduated from the Ural State University (now Ural Federal University) in Ekaterinburg. In 1992–1994 worked at the chair of astronomy and geodesy of the Ural State University. Since 1996, after finishing post-graduate courses at the Institute of Astronomy of the RAS, occupies various positions at the Institute of Astronomy of the RAS. Now a head of the Physics and Evolution of Stars department. Doctor of phys.-math. sciences (2005), professor of the RAS (2016). Member of IAU, EAS. Member of Science Counsels of the Moscow Planetarium and Tereshkova Cultural and Educational Center (Yaroslavl), Coordinating editor of Astronomy Reports journal.

His main astronomical studies are related to astrophysics, astrochemistry, physics of interstellar medium, problems of star and planet formation. He is an author of more than sixty science papers and a co-author of two monographies.

Since mid-1990s, in collaboration with B.M. Shustov and V.I. Shematovich he has participated in developing a theory of chemical and dynamical evolution of protostars. In 2005 B.M. Shustov, V.I. Shematovich and D.S. Wiebe have been awarded the RAS Belopolsky prize for the series of papers “Theory of the earliest star formation stages”.

Since 2001 he is involved in comprehensive studies of the chemical structure of protoplanetary disks. As a part of this effort, main features of the disk molecular evolution at early stages of planet formation have been established, including features related to the evolution of organic compounds in young protoplanetary systems.

He takes part in developing a theory of dust particle evolution in regions of ionized hydrogen. In collaboration with his colleagues he has for the first time demonstrated the possibility of organic grain formation in star-forming regions due to destruction of larger dust grains.

He actively works with young scientists. In cooperation with A.V. Stolyarov (Moscow State University) he has developed an MSU inter-faculty course “Astrochemistry — molecules in the Universe”. He is one of organizers of the open-door events at Zvenigorod observatory of the Institute of Astronomy of the RAS. Five PHD theses have been defended under his supervising. He actively participates in promoting astronomy for the public.

YAKOVKIN Avenir Alexandrovich

Born 21.05.1887 in Blagoveshchenskiy Plant, Ufa province. Graduated from Kazan U. (1910), worked in Engelhardt Astron.Obs. (1910-1937), as Director (1927-1937). Head of the Department of Astronomy (1937-1945), Dean of the Physics and Mathematics Department (1939-1945) of Ural State University. Dean of the Physics Department of Kiev University (1945-1951).
Director (1952-1959), scientific consultant (1959-1968) of the Main Astronomical Observatory of the Academy of Sciences of the Ukrainian SSR. Doctor Phys.-Math. sciences (1938), professor (1926), Corresponding Member of the Academy of Sciences of the Ukrainian SSR (1951). Member of IAU (1935) and various councils and societies. Died 18.11.1974 in Kiev.

The main scientific works are devoted to the study of the rotation of the moon and its figure. He processed in detail several series of heliometric observations and determined the parameters of the physical libration of the Moon. The asymmetry of the visible disk of the Moon and its dependence on optical libration ("Yakovkin effect") have been discovered and thoroughly investigated. He proposed and applied a new method of positional angles to study the libration of the Moon. Author of a number of original astronomical instruments and devices. He designed an original cellostat, a horizontal lunar telescope, a cassette for astrometric photography of the Moon, etc. He is an author of about 100 scientific papers and a number of monographs.

In a teaching observatory of university with a group of students he began observing the covering of stars by the Moon. Using a unique device of his own design he organized a pre-calculation of the circumstances of these phenomena for a number of cities in the Soviet Union. He continued to process his heliometric observations of the Moon, which he started in Kazan. During the years of war he designed a special astronomical sextant for aviation.

A.A. Yakovkin delivered lectures on spherical, practical, theoretical astronomy, celestial mechanics, higher geodesy, aerial photography, cartography.

He was awarded the Order of the Red Banner of Labor (1944), two medals "For Valiant Labor during the Great Patriotic War of 1941-1945." (1945, 1946).

YASNOV Leonid Vasilievich

Born 07.06.1942, during the evacuation of his parents to the Tatar ASSR. After graduating from the Leningrad State University, he did his post-graduate course at the Department of Astrophysics. He started working at the Leningrad State University (now St. Petersburg State University) in 1968 and in 1970 defended his Ph.D. thesis. Since 1996, Head of Laboratory of space radio emission. Until 2016, he performed pedagogical as professor. Reads the courses "Cosmic radio emission" and "Computer mathematics in problems of electrodynamics" and supervises students' scientific work at the Department of radiophysics of St. Petersburg State University. Member of the RAS Scientific Council on Physics of Solar-Terrestrial Relations, member of the North-Western Branch of the RAS Scientific Council on the "Propagation of radio waves" problem. Member of two councils for defending doctoral dissertations.

Main research interests concern Solar radiophysics. Author and co-author of about 140 papers. In the last years, these were mostly publications in the world's leading journals. A major series of works concerns dynamics of Solar radio emission. He was the first to analyze quasiperiodic fluctuations of radio emission from Solar active regions using large full-circle radio telescopes (RT-22, TNA-1500).

Together with the staff of SAO RAS, unique studies of radio emission from active regions were carried out using observations with the RATAN-600 radio telescope. Weak microbursts in the decimeter wavelength range with duration of about 1-3 s were detected and analyzed; the time of existence of the bursts was up to several days.

A large series of works, based on results of radio observations, concerned analysis of magnetic fields in the atmospheres of active regions. He developed a stereoscopic method to reveal the magnetic fields topology, which showed, in a number of cases, their quasi-spiral structure and high strengths at high altitudes. An original method was proposed for determining the spatial structure of the magnetic field in active regions from the bursts' dynamical spectra. Nature of the radio emission from sources above the neutral line of the photospheric magnetic field was analyzed.

A significant amount of his joint research with Czech scientists deals with the burst component of the Solar radio emission. In particular, for the bursts with a zebra-structure, a method was proposed for determining the physical conditions in the region of their generation. It was shown, for the first time, that their brightness temperature can reach very high values.

A number of his works concern other aspects of the Solar radio emission theory. His research was carried out and is currently being carried out within grants of the Russian Foundation for Basic Research. Under his guidance, with support of the Russian Foundation for Basic Research, two All-Russian conferences with international participation were organized at St. Petersburg State University, dedicated to physics of the Solar atmosphere plasma.

YERMOLAEV Yuri Ivanovich

Born 01.10.1955 in Moscow. Student of the Moscow Phys.-Technical Institute from 1972 to 1978. Since 1978 he has been working at the Space Research Institute (IKI) of USSR Academy of Sciences and RAS. Post-graduate student of IKI from 1984 to 1987. In 1989 he defended his thesis "Experimental study of minor components of the ionic component of the solar wind Ph.D. Sci., and in 2003 – dissertation "Experimental study of the large-scale structure of the solar wind" for Dr. Phys.-Math.Sci. PI of space experiment "CORAL" in the INTERBALL project (1995-2000). Member editorial board of journals "Geomagnetism and Aeronomy" and "Solar-Terrestrial Physics". Since 2015 scientific. Representative at SCOSTEP for Solar Physics and Space Weather.

The main area of scientific interest is the study of the solar wind. He took part in the development of plasma instruments for a number of scientific satellites of the Prognoz series, as well as in the international space projects Intershock and Interball. The proposed technical solutions were protected by copyright certificates of the USSR and Czechoslovakia, and the data obtained made it possible to draw important scientific conclusions. Based on the research results, more than 200 papers have been published in peer-reviewed scientific journals, indexed in the Web of Science.

One of the important areas of research was the study of minor ionic components of the solar wind. It was shown that since the chemical and ionization compositions of ions practically do not change in interplanetary space, the data obtained in the Earth's orbit allow one to estimate a number of parameters of those regions of the solar corona from which the observed fluxes were accelerated. Thus, minor ionic components of the solar wind can be used as a diagnostic tool for the solar corona.

Another area of research is the study of the relationship between the solar wind and the dynamics of the magnetosphere and the thin boundaries of the Earth's magnetosphere – the bow shock and magnetopause. Since the spacecraft crosses these boundaries very quickly, and data on the MHD parameters and distribution functions must be obtained on kinetic scales, special scientific equipment with a high time resolution was developed for this purpose, and these instruments allowed to study the structure and dynamics of these boundaries. In addition, the Interball project investigated the dynamics of the Earth's magnetosphere and, in particular, its magnetic tail.

As already shown by the first experiments, the solar wind has a large-scale structure (i.e., it consists of intervals in which the parameters have characteristic values and dynamics of parameters), which is associated both with the structure of the solar corona and reflects the development of dynamic processes in interplanetary space. A classification of such phenomena was constructed, a technique for their identification by direct measurements was proposed, and their catalogs were compiled for long time intervals. The dynamics of parameters in various types of the solar wind, their relationship with the structure and phenomena of the solar corona, as well as their ability to excite geomagnetic activity and magnetic storms were investigated. In particular, it was shown that under the same interplanetary conditions, the compression regions at the interface between fast and slow streams from coronal holes and before fast coronal mass ejections excite magnetic storms 1.5 times stronger than the coronal mass ejections themselves. The results obtained are important for predicting the effects of space weather.

YERPILYEV Nikolay Petrovich

Born 19.12.1921 in Zaporozhye. In 1939, he entered the Moscow State University. From 1942 to 1946, he was in the army and participated in the Great Patriotic War. In 1949, he graduated from Moscow State University, and in 1952 – postgraduate studies at the State Astronomical Institute named after P. K. Sternberg. After graduate school (1952-1960), he worked in the Chief editor office of "The Great Soviet Encyclopedia". In 1961, he joined the Astronomical Council of the USSR Academy of Sciences (now INASAN) as a Scientific Secretary (1961-1968) and Senior Researcher (until 1997). Ph. D. (1959). Member of COSPAR since 1963, Member of International Astronomical Union since 1964. Deputy chair of Space Toponymy Comission under the Presidium of the Academy of Sciences of USSR since 1977.

The main scientific works relate to the history of astronomy, the observation of artificial Earth satellites and space toponymy, the author of about 100 scientific works. N. P. Erpylev for three decades was associated with the organization of a network of optical stations of artificial sat-ellites observations in the USSR and abroad, took an active part in the development of methods of observations and astrometric reduction of the results of measurements of the positions of the satel-lites. With his participation, observational tools and software for real-time observations were cre-ated, which made it possible to maintain the operation of the Space Monitoring System at a high world level during the difficult years of Perestroika.

N. P. Erpylev participated in the international programs Intercosmos, Bolshaya Horda…

During the last 20 years of his life, N. P. Erpylev represented Soviet and Russian astronomy in the IAU Commission on space toponymy; with his active participation, many names of Soviet scientists were recorded in the names of structures on the surface of the far side of the Moon, and a gazetteer of spare names for newly discovered formations on the bodies of the Solar system was created and maintained.

Thanks to the editorial efforts of N. P. Erpylev, the latest achievements in astronomy and cosmonautics were correctly described in the main encyclopedic publications; under his editorship, the "Encyclopedia of the Young Astronomer" was published.

He was awarded state awards: medals "For Bravery" (1943), "For the victory over Germany" (1945), "For Valiant Labor" (1970), "In memory of the 800th anniversary of Moscow" (1948), "For Labor Distinction" (1975), etc.

YUNGELSON Lev Rafailovich

Born 09.09.1946 in Riga. In 1969 graduated from Latvian State University. In 1969–1972 attended post-graduate courses at the Astronomical Counsel of the Academy of Sciences of the USSR (now the Institute of Astronomy of the Russian Academy of Sciences). Since 1972 occupies various positions at the Institute of Astronomy of the Russian Academy of Sciences. Doctor of phys.-math. sciences (2011).

L.R. Yungelson is a specialist in the field of stellar evolution. Main research areas are numerical modeling of the evolution of single and close binary stars, analysis of formation scenarios for various observed objects, population synthesis, studies of X-ray emission and gravitation wave sources. He is an author of more than 250 science papers.

Main directions of studies are related to the evolution of interacting binary systems. L.R. Yungelson participates in numerous investigations of the nature of close binary star activity and of the formation mechanisms of various types of interacting binary systems. He has contributed significantly to the study of nature of Type Ia supernovae. He is one of the founders of the scenario approach to studies of different types of binary stars. Together with A.V. Tutukov, L.R. Yungelson has predicted the most promising source of gravitational wave bursts of stellar nature.

Shklovsky Award of the Russian Academy of Sciences (2017, together with A.V. Tutukov), Viktor Ambartsumian International Prize (2018, together with A.V. Tutukov and E. van den Heuvel).

YUROVSKY Yuriy Fedorovich

Born in 1933. In 1951–1957 – student at Moscow Energetic Institute. In 1958–2015 – researcher at the Crimean Astrophysical Observatory advancing from engineer to leading scientist. In 1969 he defended the Ph.D. thesis "Some characteristics of solar emission microbursts in the centimeter wavelength range". In 2000 he defended his Doctoral thesis "Millisecond pulsations of solar radio emission: physical characteristics and origin".

The research activity of Yu.F. Yurovsky deals with studying solar radio emission and its influence on geophysical processes. In 1958 a graduate student of Moscow Energetic Institute Yu.F. Yurovsky was directed to CrAO (Nauchny) as an expert in the field of radio technique. Since 1959 under his leadership a radio telescope for observations in radio wavelength of 10 cm was put into operation. The derived observations were systematized and regularly published. In 1962 it was decided to construct a new radio telescope RT-22 in Katsiveli and transfer the De-partment of Radio Astronomy of CrAO there (later on Laboratory of Radio Astronomy of CrAO). Yu.F. Yurovsky was among the research staff directed to Katsiveli to construct the new instrument and participated in elaborating the construction project on RT-22 and its further equipping. Paral-lel to this, under the leadership of Yu.F. Yurovsky a radio astronomy part of CrAO Solar Patrol was developed. The 10-cm radio telescope was transported to Katsiveli and new instruments of the 10-cm and meter range were constructed then. The daily observations at these telescopes have been carried out since 1965. In 2012 the radio telescopes of CrAO Solar Patrol were equipped with spectrometers and involved into the International Network of solar activity observations e-Callisto. By means of the developed equipment a number of foreign solar eclipse expeditions were carried out (Havana, Cuba, 1970; Santiago de Cuba, Cuba, 1974; Tumba Cuatro, Cuba, 1984; La Paz, Mexico, 1991).

An extensive dataset accumulated for over 40 years of observations allowed a number of scientific problems to be resolved and new data on the nature of solar activity to be obtained. The statistical characteristics and mechanisms of formation of solar radio bursts and noise storms were studied in detail. It was shown that many observed regularities can be explained by effects of radio wave distribution in the solar corona and Earth's envelope. Yu.F. Yurovsky co-authored over 100 publications in Russian and foreign journals. A holder of "Veteran of Labor" award (1987), an Honored Worker of Science and Technology of the Republic of Crimea (2010), laureate of the prize "For outstanding contribution to development of astronomy in Ukraine" (2012).

ZAITSEV Valery Vasilievich

Born 07.07.1940 in Gorky (now Nizhny Novgorod). In 1962 graduated from Gorky State University (now the University of Nizhny Novgorod, UNN), Department of Radiophysics, as a radiophysicist-researcher, in 1965 completed the post-graduate studies. Worked in different positions at the Radiophysical Research Institute, then, since 1977, at the Institute of Applied Physics of the RAS. Ph.D. (1969), Habilitation (Sc.) D. (1980), Professor of Physics (1990). Member of the International Astronomical Union and several scientific and expert societies. Laureate of the RAS award in the name of A.A. Belopolsky (1999), International Academic Publishing Company "Nauka/Interperiodika" award for astrophysical publications (2004), medal V.Ya. Struve (2020).

Specialist in radioastronomy and space plasma physics, author of several monographs and more than 250 scientific articles and reviews. V.V. Zaitsev made a significant contribution to the development of plasma mechanisms of sporadic radio emission of the Sun and Jupiter, the research of interaction of subrelativistic particle beams with the solar corona and solar wind, the creation of the theory of collisionless shock waves' radio emission, the study of energy release processes, particle entrapment and electromagnetic emission in coronal magnetic loops, the investigation of mechanisms responsible for solar and stellar flares.

V.V. Zaitsev and V.V. Zheleznyakov developed the dynamic theory of one of the main components of solar radio emission — type III bursts. They showed that plasma waves, generated at the front of the flux, can be reabsorbed by slower particles at the rear front, which gives an explanation for the stability (despite the presence of a strong quasi-linear relaxation) of the average flux speed at huge distances from the lower corona to the Earth's orbit.

Together with A.V. Stepanov, the dispersion relations for the oscillations of magnetic structures in the solar corona were obtained and analysed for the first time, which laid the foundation for the modern direction in the physics of the Sun — helioseismology of the solar corona. For the first time the emergence of fast drifting radio bursts in the absorption on the background of the type IV continuum was interpreted and its conditions set; said bursts are related to the filling of the "loss cone" as an extra group of fast electrons is injected in the trap, and serve as an important argument for the plasma nature of type IV continuum generation.

V.V. Zaitsev developed the concept of a coronal magnetic loop as an equivalent LRC-circuit and found (together with A.G. Kislyakov) free oscillations of that circuit, which are present in the low-frequency modulation of microwave radio emission of flares; this allowed for the first time to experimentally define the value of electric currents, flowing in coronal magnetic loops, and relate these currents with the energy reservoir of solar flares.

Together with E.Ya. Zlotnik and V.E. Shaposhnikov, he proposed and developed in detail the theory of Io-controlled decametric radio emission of Jupiter, including the explanation of spectral and polarization features of millisecond S-bursts.

Under the supervision of V.V. Zaitsev a number of Ph.D. and Habilitation (Sc.) D. dissertations have been defended.

ZAKHAROVA Polina Yevgenyevna

Born 12.03.1940 in Serov, Sverdlovsk region. Graduated from Ural State University in Sverdlovsk (now Ural Federal University – UrFU, Ekaterinburg) in 1962. Since 1966, after finishing PhD courses in the Ural State University she worked in Ural State University from junior researcher to director of Kourovka Astronomical Observatory (1982–2016). Cand. Phys.-Math. Sci. (1982), senior researcher (1991). Member of IAU (1997), member of various scientific councils and societies. Died 28.09.2020 in Yekaterinburg.

P.E. Zakharova is a well-known organizer of university astronomy and an expert in the study of open star clusters, author of more than 150 scientific papers. The main direction of scientific activity is the study of star formation processes in open star clusters (OSC).

As an observer P.E. Zakharova obtained rich observational material on OSCs, performed photometric studies of more than 100 thousand stars in open clusters and determined physical parameters of many OSCs. P.E. Zakharova created a catalog of stellar magnitudes and color indices of about 40,000 stars in vicinity of 21 OSCs. Analysis of the obtained data lead to conclusion that the luminosity function of young clusters in vicinity of the Sun is universal.

P.E. Zakharova in collaboration with M.A. Svechnikov developed a technique for estimating periods of star formation in star clusters. Studies of P.E. Zakharova have shown that the stars in clusters do not form simultaneously.

P.E. Zakharova provided not only survival but also development of Kourovka Astronomical Observatory. She paid special attention to the development of the observational facilities of observatory: previously modest park of the instruments was complemented with the 700-mm telescope, telescope with a mirror diameter of 1.2 m, robot-telescope "Master II", robotic photometric telescope and other equipment.

P.E. Zakharova was an inspirer and organizer of the All-Russian student scientific conferences "Physics of Space" (also known as “Kourovka winter astronomical school – WAS”) and has made a major contribution to organization and holding of 45 conferences. By the decision of the IAU in 1996 the minor planet No. 4964 was named Kourovka in honor of Kourovka Astronomical Observatory which, as stated in the Certificate, is the "Mecca of Russian astronomer students," and the small planet No. 4780 was named Polina in honor of the director of the observatory and astronomer P.E. Zakharova.

She was awarded the medal “For Valiant Labor in commemoration of the 100th anniversary of the birth of V.I. Lenin ", 1970; Medal of the Order “For Service to the Fatherland” II degree, 2004; gratitude of the Federation Council of the Federal Assembly of the Russian Federation, 2009; Awarded with the Silver Medal of the Exhibition of Economic Achievements, 1985; A.F. Fioletova prize of Astron. Council of the USSR Academy of Sciences, 1990; Medal of the Federal Service for Technical and Expert Control, 2011; Silver Medal of Honor of the International Biographical Center in Cambridge (USA); Certificate of honor of the Governor of the Sverdlovsk region for many years of fruitful organizational, scientific and pedagogical activity, a significant contribution to the training and education of highly qualified specialists, 1999; awarded the title "Daughter of the City – Daughter of Russia", 2001.

ZASOV Anatoly Vladimirovich

Born 03.10.1941 in Borisogleb, the Yaroslavl region of the USSR. In 1964 graduated the Physical Department of Lomonosov' Moscow State University (MSU). He worked at the Physics Department of MSU and at the Sternberg Astronomical Institute of MSU, at different positions from the senior assistant (1963-1966) to professor (since 1992). Since 2007– a head of division of extragalactic astronomy of Sternberg Astronomical Institute (part-time). The doctoral thesis "Rotation and mass distribution in discy galaxies" was defended in 1989. A member of the International Academy of Higher Education (since 1994), of the International Organization "Astronomical Society" (Russia) (since 1999), a member of the International (since 1977) and the European (since 1995) Astronomical societies.

The main field of researches is related to the kinematics of gas and stars in galaxies and a star formation. A.V.Zasov published more than 200 scientific papers in peer-reviewed journals and collective monographs. In the '70-s he participated in the development and implementation of one of the first programs for the spectral observations of galaxies at the 6-meter telescope BTA led by Dr. B.A.Vorontsov-Velyaminov. As a result, the data were obtained for gas velocities for a large number of interacting systems of galaxies. A.V.Zasov (in collab. with I.D.Karachentsev) have discovered the object with double infrared active nucleus (VV617), representing two merging galaxies with the extremely powerful starbursts. In the '80-s he proposed and implemented a method for estimating mass of discs and dark halos of galaxies using the conditions of gravitational stability of a disc. When applied to the gas discs the assumption of local gravitational stability allowed to explain the relationship between the kinematic parameters of galaxies and the radial distribution of gas. Since the '80s A.V.Zasov published (in collaboration) a series of papers on the measurement of the rotational curves of disk galaxies and the mass assessment of their main components, based on observations at BTA. In particular, it was found (in collab. with O.Sil'chenko and V.Afanasiev) that the central regions of massive galaxies are often dynamically distinct from the main disc and have a particular way of evolution. It was also demonstrated the connection between the circular velocity gradient in the central regions of galaxies and masses of supermassive black holes in their nuclei (in collab. with A.M.Cherepashchuk).

Several works of A.V.Zasov (with the co-authors) were dedicated to the study of kinematics of spiral density waves in galaxies. It was proved, in particular, the existence of vertical oscillations of gas associated with the density wave propagation. He also was the first (in collab. with A.V. Khoperskov) to consider a role of static pressure of a hot intergalactic medium on a gas layer of galaxies. Some works were also devoted to the investigation of gas properties and star formation in the disks of galaxies, including their peripheral regions, and tidal structures of the interacting systems. In particular, it was shown that the rate of star formation in galaxies per unit mass of gas is determined by the volume density of stellar disc at a given radial distance.

A.V.Zasov is the author of several editions of the training manual "General Astrophysics" (in collab. with K.A.Postnov), a co-author of the textbooks and manuals on physics and astronomy for schools. He is actively engaged in the popularization of science. HONORS: State Prise of Russian Federation, awarded for the investigation of wave structures in galaxies in the team led by A.M.Fridman (2003), the Lomonosov Prize (1996), and the prize of the Astron. Society for studying a star formation in galaxies (1996). A Honorary Professor of MSU (2013 yr).

ZASOVA Ludmila Veniaminovna

Born 22.05.1945 in Kazachinsko-Lensk, Irkutsk reg., USSR. In 1969 graduated as an astronomer the Physical Department of Lomonosov' Moscow State University (MSU). In 1973 she finished her post-graduate studies in the physical department of MSU. After graduation she worked in Sternberg Astronomical Institute of MSU. Since 1974 she held the different research positions in Space Research Institute (IKI RAN). Since 2018 she is a leading researcher. In 1998 - 2005 she worked as a (half-time) professor visitor of IFSI-CNR (INAF), Rome, Italy. Since 2004 she leads the Laboratory of Planetary Spectroscopy IKI RAN. The Doctoral thesis "Infrared Spectrometry of Mars and Venus from space missions" was defended in 2008.

The main research interests are: spectroscopy, radiative transfer, structure and dynamics of planetary atmospheres. She published more than 140 scientific papers in peer-reviewed journals, most of them are related to space mission research of the atmospheres of Mars and Venus by infrared spectrometry onboard Venera-15, Mariner-9, Mars Express, Venus-Express.

In 1971 L.Zasova (with V. Moroz and D. Cruikshank) for the first time spectrally identified a water ice on the surface of Jupiter' satellite Ganimed. She showed (1981) that a weak solution FeCl3 in H2SO4 fits well the UV Venus spectrum being a candidate for the "unknown" UV-absorber in the clouds of Venus'. L.Zasova has developed a unique method, which allows to obtain by self-consistent way a temperature, aerosol and minor compounds vertical profiles from a single thermal IR spectrum for planetary atmospheres with strong absorption bands of the main compound. This method was successfully applied for interpretation data of the thermal IR experiments IRIS/Mariner 9, NASA; FS/Venera-15, USSR; PFS/Mars Express, ESA. In cooperation with colleagues from IAPS-INAF and IKI the atmosphere dynamics of Venus was studied in the transfer region (90-100 km altitude) using the observations of atmospheric nightglow of molecular oxygen O2 1.27 μm (VIRTIS/VEX, ESA). In particular, it was shown that below this layer a zonal superrotation prevails, while above it, a flux transfer from Sub-Solar (SS) to Anti-Solar (AS) points exists. It was discovered the asymmetry of the SS-AS circulation over midnight. In addition, the gravity waves were identified in the vertical profiles of the O2 1.27 μm night airglow. Hydroxyl OH Meinel bands and the O2 1.58 μm band in the Venus' atmosphere were also identified for the first time in the planetary atmospheres beyond Earth. It was found influence of surface topography on the temperature fields and distribution of clouds at different levels of the Venus mesosphere from upper boundary of clouds to 95 km altitude; Influence of the thermal tides on temperature, clouds, zonal wind in mesosphere was also found from FS/Venera-15 data. In cooperation with colleagues it was found a deceleration of the zonal wind at the upper boundary of Venus clouds linked with big mountains (VMC/VEX); from VIRTIS/VEX observations it was demonstrated the influence of surface relief on the atmosphere' dynamics at 90-100 km altitude. It was discovered that the meridional circulation at lower Venus cloud layer (46– 50 km altitude) forms the direct Hadley cell (the analog of Hadley cell in the upper clouds) from VIRTIS/VEX.

L.V. Zasova is the member of astronomical professional societies DPS AAS, AGU, EGU, EAU, AstrO. In 1996 -2002 – editor of the Advances in Space Res. (sessions C3.1, C4.2-.3 COSPAR); since 2002 – a COSPAR officer: a deputy organizer, and since 2012 – a main organizer of RAPS (Reference Atmosphere of Planets and Satellites); since 2004 – the member of the Editorial Board of Planetary and Space Science, since 2020 – of Cosmic Research; since 2009 – study scientist of the Venera-D– mision, and from 2014 –co-chair of the Roscosmos/IKI –NASA Joint Science Definition Team on Venera-D.

Honors: Medal of the Cosmonautics Federation of Russia "Za Zaslugi".

ZELDOVICH Yakov Borisovich

Born 03.08.1914 in Minsk, d. 12.02.1987 in Moscow. In 1930-31 he attended courses and worked as a lab. assist. at the Inst. of Mechanical Processing of Minerals in Leningrad, and then at the Inst. of Chemical Physics of the USSR Acad. Sci. In 1934, a graduate student in this institute. PhD thesis "Problems of adsorption" (1936). Sci. Hab. thesis "The oxidation of nitrogen during combustion" (1939). Since 1938 the head of laboratory, in 1946-48 the head of dept. at the Inst. of Chem. Phys., professor of Moscow Engineering Phys. Inst. In 1948-65 he was engaged in works on the atomic problem. In 1965-82, the head of dept. at the Inst. of Applied Math. of USSR Acad. Sci. Since 1965 – prof. of Phys. Dept. of Lomonosov Moscow State University. Since 1983 the head of dept. in P.L. Kapitza Inst. for Physical Problems. In 1980 organized the Relativistic Astrophysics dept. at Sternberg Astron. Inst. Corresponding member (since 1946), academician (since 1958) of the USSR Acad. Sci.

The main research fields: adsorption, catalysis, phase transitions, hydrodynamics, shock waves, theory of combustion and detonation, combustion of gunpowder, creation of different types of new equipment, theory of elementary particles, nuclear physics, astrophysics, cosmology, origin of the universe and its large-scale structure. Ya.B.Zeldovich is the founder of relativistic astrophysics. He developed theory of evolution of the hot universe, theory of cosmic microwave background radiation fluctuations, discovered the effect of distortion of the CMB spectrum in hot gas of galaxy clusters (Sunyaev-Zeldovich effect).

Awards: the Hero of Socialist Labor (1949, 1953, 1957), the State awards (1943, 1949, 1951, 1953) and the Lenin Prize (1957), honorary medals of N. Manson (1972), B. Lewis (1984), I.V. Kurchatov (1977), Catherine Bruce (1983), the Royal Astronomical Society (1984), the International P. Dirac Center for theoretical physics (1985). Foreign Member of the Royal Society of London (1979), the US National Academy (1979), the American Academy of Arts and Sciences, the German Academy of Natural Sciences "Leopoldina", the Hungarian Academy of Sciences, the Honorary Member of the International Academy of Astronautics and a number of physics societies and universities. Name Zeldovich is assigned to small planet №11438.

Ya.B. Zeldovich is the author of about 500 papers and 30 monographs and textbooks. The Gold Medal of the Russian Academy of Sciences named after Ya.B.Zeldovich is awarded for outstanding achievements in physics and astrophysics. One of the streets of Moscow has been named after Ya.B.Zeldovich.

ZELENYI Lev Matveevich

Born 23.08.1948 in Moscow. Graduated from the department of Aerophysics and Space Research of the Moscow Institute of Physics and Technology in 1972. From 1972 to the present — an employee of the Space Research Institute (IKI) of the Russian Academy of Sciences (RAS): from 1989 — Head of the Department, from 2001 — Director of the Institute, since 2018 — President of IKI. From 1991 to 2005 worked as a visiting scientist at the Institute of Geophysics and Planetary Physics of the University of California. From 2000 to 2003 worked also at the Institute of Solar-Terrestrial Physics of the Max Planck Society. In 1977 he defended his dissertation for the candidate of sciences, in 1987 — doctoral dissertation. In 2003 elected a corresponding member of the RAS, in 2008 — Academician of RAS, in 2013–2017 acted as Vice President of RAS, since 2017 — Member of the Presidium of the RAS.

His main research interests are physics of space plasma, and in recent years also physics of planets and the Moon. L. Z. published monographs and more than 500 scientific papers in Russian and foreign scientific journals. His works on the theory of collisionless plasma, magnetic fields reconnection, dynamics of charged particles, physics of the magnetosphere are widely known both in Russia and abroad and have received worldwide recognition. The Hirsch index in 2020 was 39.

In 1991–2005, together with his colleagues from the USA and Germany, he studied the role of chaotic and regular effects in the formation of the Earth's magnetosphere, in 1993–2002 he published with co-authors original works on the application of fractal geometry to studies of the solar atmosphere structure, solar wind and the tail of the Earth's magnetosphere. The cycles of the papers with his participation received prizes from the MAIK-Nauka publishing house for the best scientific publications in the journals Space Research, Plasma Physics, and Advances of Physical Sciences.

His scientific studies are related to Dusty plasma at the Moon and Mars. Another field of research activity is the systematic study of current sheets – very peculiar, almost singular structures which play a paramount role in dynamics of the Earth magnetosphere and Solar corona.

From 1982 to 2002 he was Deputy Head of the Interball project, which included 18 countries (CIS, Eastern Europe, France, Sweden, and Canada). At present, he is the scientific leader of international space projects for the exploration of the Moon (Luna 25 — Luna-28), Mars (ExoMars) together with ESA and lightning physics (Chibis microsatellites). L. Z. is playing a major role in the formation of the Russian program of fundamental space research as a chairman (2013-2018) and deputy chairman (since 2018) of the Space Council of the RAS.

Member of the Board of Trustees of the International Space Science Institute (ISSI) in Bern (Switzerland). Member of the editorial boards of the journals Advances of Physical Sciences, Priroda. He was a member of the editorial boards of the Journal of Geophysical Research, Nonlinear Processes in Geophysics, Space Science Reviews. Since 2018 the editor-in-chief of the popular science journal Earth and Universe (cofounded of the RAS).

He is the laureate of the Alexander von Humboldt award for achievements in Space Physics (Germany, 2000), award of the President of the Russian Federation for outstanding contributions to space science education (Russia, 2003), Award of the International Academy of Astronautics (IAA) for scientific work on the space plasma physics (2010), COSPAR International cooperation medal (2016). In 2004 he was awarded the Officer Cross by the President of the Republic of Poland A. Kwasniewski for achievements in establishing scientific contacts between Russia and Poland. The most recent is the prestigious Lev Nikolaev medal, awarded for achievements in scientific and educational activities (2019). Full member (academician) of the Bulgarian Academy of Sciences, the National Academy of Sciences of Ukraine, and the International Academy of Astronautics.

ZELMANOV Abraham Leonidovich

Born 15.05.1913 Gadiach of Poltava Gubernya of the Russian Empire. Grad. from Math. Dep. of Moscow St. Univ. in 1937; Post. Grad. from Sternberg Astronomical Inst. of Moscow St. Univ. in 1941. PhD thes.: "On deformation and curvature of commoving space (relativistic equation for an element of non-homogeneous Universe)" (1944). Sci. Hab. thes.: "On behavior and properties of three dimensional spaces" (1982). Since 1942 he had permanent positions at Sternberg Astronomical Inst. of Moscow St. Univ. from Senior Assistant to Leading Scientific Researcher. Died 02.02.1987 in Moscow.

A.L. Zelmanov has elaborated a series of new mathematical methods in general relativity connected with a possibility of 1 + 3 decomposition of space-time (it differs from the ADM 3 + 1 decomposition). The methods of chronometrically invariant and kinemetrically invariant quantities, orthometric form of monad formalism have been widely applied to study many problems in general relativity, relativistic astrophysics, cosmology, theory of anisotropic Universe. He was very interested in philosophical problems of science, as a result, he formulated his famous Anthropic Principle many years before other scientists,1941–1944, however never published it. The first version sets forth the idea that the law of human evolution is dependent upon fundamental physical constants. In the second form he argues that any observer depends on the Universe he observes in the same way that the Universe depends on him.

Since 1947 he founded the course of lectures in general relativity and cosmology for students of Math. Dep., then Phys. Dep. of Moscow St. Univ. Under supervision of A.L. Zelmanov more than ten PhD and Sci. Hab. thes. have been successfully defended. His former students are now leading scientists. Since 1995, at Sternberg Astronomical Inst. Memorial Zelmanov Seminar in gravity and cosmology works. In 2008 «The ABRAHAM ZELMANOV JOURNAL» (International Journal in gravity and cosmology) was founded. It is supported by D. Rabounski, edited in Sweden and typed in the USA.

ZHARKOV Vladimir Naumovich

Born 04.03.1926 in Leningrad. After graduating in 1949 from the Physical Department of the Moscow State University (specializing in Theoretical Physivs) he was assigned to the laboratory for radio graphics of the Cinema and Photo-Research Institute (Moscow). Since 1956 he has been working at the Schmidt Institute of Physics of the Earth of the USSR (now Russian) Academy of Sciences (the last positions are Chief Scientist and head of the laboratory). Doctor of Sciences in Physics and Mathematics (1964), Professor of the Moscow Institute for Physics and Technology (1973-1991), Professor of Geophysics (since 1977), Honored Scientist of the Russian Federation (2004). Member of the IAU, Honorary Member of the American Geophysical Union (2005). Deputy Editor-in-Chief of Solar System Research, Editorial Board Member of Astronomy Letters. Died 26.02.2021.

The world famous specialist and author of fundamental works in the field of geophysics, planetology, high-pressure physics, the founder of new fields of science – comparative planetology, physics of the Earth and planetary interior, helioseismology, physics of natural oscillations of the Earth and planets. He was one of the few theoretical physicists who successfully passed the legendary "theoretical minimum" of L. D. Landau.

The main scientific works are devoted to the physics of high pressures and interior of the Earth, planets and their satellites, the theory of the equilibrium figure and natural oscillations of planets, cosmogony. Based on the results of laboratory experiments with rocks and minerals at high pressures and temperatures, he built a thermodynamic model of the Earth's core and mantle, recognized the opportunity to study the structure of convection in the mantle using seismic data by identifying zones of increased attenuation of seismic waves, developed a general theory of temperature deformations of the Earth, discovered a layer of low mechanical quality factor in the mantle and introduced the concept of its diffusion viscosity. He constructed a theory of perturbations for natural oscillations of the Earth with the decomposition of the density and elastic moduli of the crust and mantle in spherical functions.

V.N. Zharkov considered the planets and satellites to be natural laboratories of high pressures and temperatures, so the transition from the physics of the Earth to planetary science became natural. He carried out pioneering works in the field of helioseismology, seismology of the giant planets, and calculated for the first time the spectra of natural oscillations of Jupiter, Saturn, and Uranus. Based on the development of the theory of the figure (the main tool for the study of adiabatic giant planets) and the construction of equations of state of cosmochemical elements and their compounds for high (100 Mbar) pressures and temperatures, he came to the conclusion about the gas-liquid state of the giant planets. He proposed a hypothesis about the leading role of the giant planets in the formation of other planets, constructed an evolutionary curve of the Lunar orbit.

Having published more than 250 scientific papers on the physics of the Earth, the Moon, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune, he was also the author of a number of monographs: "Equations of state of solids at high pressures and temperatures" (1968), "Introduction to the physics of the Moon" (1969), "Physics of the Earth and planets. Figures and internal structure" (1971), "Internal structure of the Earth and planets" (1978, 1983), "Physics of planetary interior" (1980), "Helioseismology" (1988), "The Earth and its rotation" (1996), "Physics of the Earth's interior" (2012), "Internal structure of the Earth and planets. An elementary introduction to planetary and satellite geophysics" (2013). He was the supervisor for 19 PhD and 10 doctoral dissertations.

For achievements he was awarded the Order of the Badge of Honor (1979), O.Yu. Schmidt (1980, by the USSR Academy of Sciences) and B.B. Golitsyn (2003, by the Russian Academy of Sciences) prizes, and the Runcorn-Florensky Medal by the European Geosciences Union (2004).

ZHAROV Vladimir Evgenievich

Born 19.09.1956 Train in Moscow. In 1979 he graduated from the astronomical department of the Physics faculty of Moscow State University. Since 1982 after graduate studies at the Physics faculty of Moscow State University he is working in the Sternberg Astronomical Institute in various positions from senior engineer to head of the laboratory of gravimetry Sternberg Astronomical Institute (since 2004). In 2006 he switched to the Physics faculty of Moscow State University in connection with the election of the head of the Department of celestial mechanics, astrometry and gravimetry. Doctor of physical-Mat. Sciences (1998). Professor (2013-present). Member of the academic councils of SAI and of the Physics faculty of the MSU, member of the dissertation council at Moscow state University (2003). Member of the International Astronomical Union (2003). He won the highest scientific award of the European Union named as René Descartes prize (2003).

The main scientific works belong to the field of astrometry and studying the Earth's rotation, the author more than hundred scientific works, including co-author of two monographs. In the 1980-ies V. E. Zharov, under the leadership of Professor L. I. Matveenko participated in the first Soviet observations on the radio interferometer with very long baseline Pushchino – Simeiz and their processing, the results of which formed the basis of a PhD thesis. Since 1982 he has been studying the influence on the Earth rotation of various processes, including the atmosphere. He developed the theory of the influence of atmospheric tides on the nutation of the Earth formed the basis of his doctoral dissertation. The results were used to develop a new theory of nutation of the Earth, which was created in 1998-2002 international group of scientists under the leadership of Professor V. Dehant (Belgium). In 2003, for the development of the theory of nutation this group received the highest scientific award of the European Union named as René Descartes prize. In 2001-2005 he has developed a program of reduction and analysis of radiointerferometric observations named ARIADNA, used in a number of organizations to calculate the Earth rotation parameters, coordinates of telescopes and radio sources. Since the mid 1990-ies he is working on the problem of stability of the celestial coordinate system and its instability related to the non-stationarity of the space-time in the Galaxy. The results of this work were used by the IAU working group for constructing the catalog of reference radio sources (ICRF-2). Since 2010 he worked on the task of processing the observations at the ground-space interferometer in the project "Radioastron". He developed an algorithm and a program to correlate data with ground and space telescopes, installed on the correlator of the FIAN Astro-Space center. From 2013 with colleagues from the Sternberg Astronomical Institute V. K. Milyukov and M. V. Sazhin, and with Chinese scientists involved in a joint project TIANQIN for the development of the cluster spacecraft for detecting gravitational waves. Under his scientific leadership, six candidate and one doctoral dissertation were executed and protected. The author of the textbook "Spherical astronomy" (2006) and the textbook "Fundamentals of radioastrometry" (2011).

Honorary worker of higher professional education of the Russian Federation (2013).

ZHELEZNYAKOV Vladimir Vasilievich

Born 28.01.1931 in Gorky (now N. Novgorod). In 1954 graduated from Gorky State University (now the University of Nizhny Novgorod, UNN), Department of Radiophysics, in 1957 completed the post-graduate studies under the supervision of Nobel laureate V.L. Ginzburg. Ph.D. (1959), in 1964 was awarded the Habili-tation (Sc.) D. degree for the monograph “Radio Emission of the Sun and Planets”. Scientist and head of a department at the Radiophysical Research Institute (1957–1977), head of a department (till 2011) and counsellor of the RAS (to date) at the Institute of Applied Physics RAS, Professor of UNN (1968–2011). Corresponding Member of the RAS (1987), Academician (1997). Member of Bureaus of the Astronomy Council, the “Sun–Earth” Council and the Physical Sciences Division of the RAS (1990), IAU member (1991). Editor-in-chief of the “Radiophysics and Quantum Electronics” journal (1998–2016). The A.A. Belopolsky RAS’s award (1984).

Specialist in theoretical radioastronomy, space plasma physics, theory of waves' propagation in plasma, high-energy astrophysics. Author of more than 200 scientific articles and 3 monographs: “Radio Emission of the Sun and Planets” (Nauka, Moscow, 1964, in Russian; Pergamon Press, 1970), “Electromagnetic Waves in Space Plasma” (Nauka, Moscow, 1977, in Russian), “Radiation in Astrophysical Plasmas” (Kluwer Academic Publishers, 1996; Yanus-K, Moscow, 1997, in Russian). In 2010 the book “Selected Writings” (IAP RAS, Nizhny Novgorod) was published for the 80th birthday of V.V. Zheleznyakov.

V.V. Zheleznyakov stated the crucial role of the cyclotron radiation mechanism for the formation of frequency peculiarities in spectra of the Sun's radio emission, optical radiation of magnetized white dwarves, and X-ray pulsars' emission. He was first to point to the significant influence of the relativistic velocity dependence of an electron's mass on the growth rate of cyclotron instability in weakly relativistic plasma, which made the basis for the gyrotron's theory. He created the theory of synchrotron instability, which shows the possibility of space synchrotron masers' existence.

V.V. Zheleznyakov developed concepts of the thermal cyclotron radiation mechanism, which is the key element in the theory of slowly varying component of the Sun's microwave emission, and the plasma radiation mechanism, related to the combination scattering (merging) of plasma waves in the solar corona and their conversion to the electromagnetic radiation of twice the plasma frequency. Together with colleagues, he proposed and investigated the mechanisms of generation of the quasi-periodic structure (zebra-structure) in the radio emission of the Sun and the Crab Nebula's pulsar, based on the effect of double plasma resonance. Basing on his calculations of the cyclotron radiation pressure force acting on plasma in the magnetospheres of degenerate stars, V.V. Zheleznyakov conjectured and justified the existence of a new type of astrophysical objects, called radiative discons. Of great importance is the conducted by him quantitative description of the effects of linear transformation of electromagnetic modes in magnetoactive plasma during their propagation through areas with non-uniform transverse magnetic field and in neutral current sheets of the solar corona. He concluded that the latter exist on the basis of an analysis of the polarization of solar noise storms.

Other fundamental results in the research of generation and propagation of electromagnetic waves in astrophysical plasma belong to V.V. Zheleznyakov, particularly, in the theory of sporadic radio emission of the Sun, radio, optical and X-ray emission of pulsars, in the investigation of processes in plasma on magnetized white dwarves and neutron stars. About 20 members of V.V. Zheleznyakov's scientific school have become PhD and Habilitation (Sc.) D. in Physics and Mathematics, 4 of them are elected to the RAS.

ZHEVAKIN Sergey Alexandrovich

Born 11.04.1916 in Moscow. 1933-1939, student of the Gorky State University (GSU) (now the N. I. Lobachevsky State University of Nizhny Novgorod (UNN)). 1939-1941, worked at enterprises of the city of Gorky. 1941-1946, fought in the acting Soviet Army. 1941-1949 (with a break), post-graduate student of the GSU. Defended PhD thesis in 1949, D.Sc. the-sis in 1956. Professor since 1963. 1956-1957, lecturer at the Peking University. 1957–2001, senior researcher, head of de-partment of the Radiophysical Research Institute (NIRFI). Member of the International Astronomical Union (IAU). Awarded Orders of the Red Star, the Patriotic War of the first degree, and many medals. Died 21.02.2001 in Nizhny Novgorod.

S.A. Zhevakin's research interests are astrophysics, radiophysics, radio astronomy. physics of the atmosphere.

In the mid-50s, S.A. Zhevakin published articles on the pulsation theory of variable stars based on the self-oscillatory processes in ionized hydrogen layers of the stars. That was a breakthrough in the theory of pulsating stars. For the series of these works, S.A. Zhevakin was awarded the Bredikhin State Prize by the Academy of Sciences of the USSR in 1964.

In 1958, S.A. Zhevakin together with V.S. Troitsky and N.M. Tseitlin worked out the method of separate determination of the radio wave absorption in oxygen and water vapor in the Earth's atmosphere. In 1960, S.A. Zhevakin headed the newly organized department of propagation of millimeter and submillimeter waves at the Radiophysical Research Institute (NIRFI). All further scientific and scientific-organizational activities of S.A. Zhevakin were related to the solution of the radio wave propagation problems in the Earth's atmosphere and the organization of research in this direction, including the successful development of millimeter radio astronomy. S.A. Zhevakin performed the works on the study of the spectral characteristics of atmospheric gases launched together with M.T. Grekhova and V.S. Troitsky at the Gorky Research Institute for Physics and Technology (GIFTI) at the GSU (now NIFTI at the UNN). One of the most striking achievements of S.A. Zhevakin and his post-graduate student A.A. Viktorova was the calculation of the rotation-al spectrum of water vapor dimers. Only in recent years has the existence of dimers obtained ex-perimental confirmation.

S.A. Zhevakin and his disciples, especially A.P. Naumov, obtained classical results on the molecular absorption line profiles of water vapor and oxygen in the atmosphere which received worldwide recognition. For the first time, they obtained spectral absorption coefficients and ex-pressions for the dielectric constant of water vapor in the submillimeter wavelength range. They significantly clarified and refined the absorption coefficients in the centimeter and millimeter wavelength ranges by applying the spectral line profiles from the solution of the kinetic equation. These studies formed the basis of a new direction for applied radiophysics, remote sensing of the parameters of the atmosphere by its own radiation. S.A. Zhevakin was in the team of scientists who were awarded the State Prize in 1987 for this work.

S.A Zhevakin's last works were devoted to an adequate description of microwave absorption by rain using the fractal approach.

ZHILKIN Andrey Georgievich

Born in 1969 in Tselinnoe (Kurgan region). In 1993 graduated from Chelyabinsk State University. In 1993–2007 was a lecturer in Chelyabinsk State University. Since 2007 occupies a position of a leading researcher in the Institute of Astronomy of the Russian Academy of Sciences. Cand. phys.-math. sciences (1999, Numer-ical modelling of self-gravitating MHD flows). Doct. phys.-math. sciences (2010, Magnetic gas dynamics of accretion disks, forming in protostellar clouds and close binary systems». Mem-ber of the International Astronomical Union. Author of over 50 scientific papers.

Main direction of scientific studies is physics of close binary systems.

A.G. Zhilkin co-authored a monography “Gas dynamics of close binary stars” (Moscow, Fizmatlit 2013) and three textbooks in electrodynamics and continuum mechanics.

Since 2007, he has published a series of papers devoted to modelling of the flow structure in close binary systems, taking magnetic field into account.

Scientific interests are close binary stars, accretion disks, star formation, numerical magnetohydrodynamics, adaptive grids.

ZHITNIK Igor Alexandrovich

Born 07.23.1936 in Moscow. In 1960 he graduated from the MIPT (Moscow), Department of Optics. In the same year, he began working at the LPI (FIAN) in the laboratory of S.L. Mandelstam, where he worked in various positions: engineer, senior researcher (1971), since 1987 – head of the laboratory "X-ray Astronomy of the Sun" (XRAS). He participated in the development of multiple space-based scientific equipment and experiments in the area of X-ray spectroscopy of the Sun (in total, more than 20 rockets, satellites, and interplanetary stations). He was awarded the USSR State Prize in Science and Technology (1977) for a series of works on solar X-ray radiation and with the Government Prize (2009) for the design of a set of new scientific equipment for the KORONAS-F satellite (2001-2005) as well as for new scientific results obtained during this mission. Died 08.23.2013 in Moscow.

From the first days of his scientific career, he participated in the development of scientific equipment and scientific investigations of solar active processes and solar-terrestrial connections. Under his guidance, the new research method (X-ray imaging spectroscopy) was successfully developed in the XRAS laboratory to study coronal and astrophysical plasma. In total, 23 projects were carried out under his leadership in the Laboratory in 1963–2009. The most significant results are:

– 1962: the thermal origin of the quiet Sun X-ray radiation was established;

– 1966: X-ray flares were detected, not accompanied by the chromospheric evaporation;

– 1968: the fine structure of the X-ray flare regions was revealed and studied;

– 1969: the polarization of X-ray solar radiation was discovered and investigated, indicating the presence of electron beams in the solar corona;

– 1971: satellite spectral lines were registered in the solar spectrum, indicating the essential role of the dielectronic recombination in the solar corona;

– 1975: the accelerated electrons were discovered in the solar corona in tens of minutes after the optical flare is finished;

– 1980: the density and temperature distribution of coronal plasma were measured in detail for solar flares;

– 1987: the long-term observations of the Sun with high angular and spectral resolution were conducted for the first time during the TEREK experiment onboard the Phobos-1 interplanetary station.

As a direct development of the TEREK project, the CORONAS program (Complex Orbital Observations of Sun Activity) was carried out later with his active participation. Two first spacecraft of the program, CORONAS-I (1994) and CORONAS-F (2001) made it possible to obtain new data on the structure and dynamics of the solar corona in the temperature range from 10^4 to 2×10^7 K, including processes of magnetic reconnection, physics of flares and prominences, and registration of coronal mass ejections with velocities up to several hundred km/s. These results were especially important because of the period of the CORONAS-F mission, which coincided with the maximum solar activity. Based on the scientific results of these missions, he obtained a degree of the Doctor of Science in physics and mathematics. The third space mission, CORONAS-Foton (2009) equipped with the TESIS set of instruments, provided a lot of new data on the physics of the solar atmosphere during the period of extremely low solar activity. Among his other achievements: first applications in the USSR of some new optical and electronic technologies (1960-1970); application of CCD detectors to register short-wave radiation of the Sun (1970-1980), using microprocessors to collect and analyze scientific information (1987) as well as using multilayer X-ray mirrors (1987).

ZHONGOLOVICH Ivan Danilovich

Born 08(20).02.1892 in Grodno; graduated from the Petrograd University (1916); was recruited to the Navy (1917); participated in the Expedition to Study the Kursk Magnetic Anomaly (1919); worked in the Fleet's Head Hydrographic Department (from 1920 to 1930) where he annually participated in the Arctic research expeditions; was Lecturer in the K.E. Voroshilov Naval Academy (from 1930 to 1938) where he participated in expeditions to Pamir and in high altitude expeditions to a number of Arctic regions; took part in the development of the "North Pole – 1" Scientific Expedition Program which was headed by I.D. Papanin; participated in the "Sadko", "Sedov" and "Malygin" ice breaker expeditions (from 1937 to 1938); worked at the same time in the Astronomical and Geodetic Institute (from 1920) and Astronomical Institute, where he was Deputy Director and headed the Department of Special Ephemerides.

I.D. Zhongolovich was an astronomer, gravimetrist and geodesist. He devoted his main scientific works to the problems of theoretical, practical and ephemeris astronomy, the shape and gravitational field of the Earth, satellite geodesy and geophysics. He developed a method for determining the Earth mass center from observations of artificial Earth satellites; studied and evaluated possibilities to use very long baseline radio interferometers to solve main problems of astronomy, geodesy and geodynamics; was the Editor-in-Chief of the "Nautical Astronomical Yearbook" and the "Aviation Astronomical Yearbook". He was awarded the Order of Lenin (1953), the Order of Labour Red Banner (1945), "The Sign of Honour" Order (1938), the Medal of P.P. Semyonov-Tyan-Shansky of the USSR Geographical Society and the Medal "For Discovery of New Astronomical Objects" of the USSR Academy of Sciences Astronomical Council. He was the Honorary Member of the USSR Geographical Society, the Honorable Polar Explorer and the Honored Scientist of the Russian Federation. He died on July 29, 1981 and was buried at the Pulkovo Memorial Cemetery. Minor planet (1734) Zhongolovich is named in his honour.

ZINCHENKO Igor Ivanovich

Born 03.07.1950 in Gorky (now Nizhny Novgorod). In 1972 г. graduated from the Gorky State Univ. (now Nizhny Novgorod Univ.) as radio physicist. Since 1972 was at the Radio Physical Research Inst., since 1977 at the newly establishes Institute of Applied Physics of the USSR Academy of Sciences (now Inst. of Applied Physics of the Russian Academy of Sciences – IAP RAS) holding positions from a junior researcher to a head of department. Doctor of Sci. (1998), member of IAU, URSI, EAS, etc.

Main fields of research: millimeter and submillimeter wave astronomy, molecular and dust emission in space, physics and chemistry of interstellar medium, propagation of millimeter and submillimeter waves in the atmosphere, author of about 250 publications.

In 1970 – 1990th in collaboration with staff members of the IAP RAS and other organizations he developed high sensitivity spectral radio astronomical receiver complexes operating at short millimeter waves. They have been successfully used at the RT-22 CrAO and at the 14-m radio telescope in Metsähovi (Finland). At the same time studies of star forming regions were started using this equipment. The works at the RT-22 CrAO were awarded N.P. Barabashov name prize of NANU (2001, jointly with N.S. Nesterov and V.M. Shul'ga). In collaboration with A. Lapinov, L. Pirogov and V. Khersonsky models of molecular line emission in interstellar clouds were developed. In particular, a model describing HCN hyperfine anomalies in warm clouds was proposed.

In 1990 – 2000th with the most advanced millimeter and submillimeter radio telescopes worldwide in collaboration staff members of the IAP RAS and other Russian and foreign organizations he performed systematic studies of the main physical properties of dense clumps in regions of high mass star formation. In collaboration with L. Pirogov the internal structure and kinematics of massive clumps at different stages of evolution was investigated, in particular radial density and temperature profiles, small-scale clumpiness, etc. The effects of molecular chemical differentiation in regions of high mass star formation were studied. It was shown that some of the observed variations of gas chemical composition could be caused by variations of the ionization degree.

Since mid-2000th in collaboration with several researchers worldwide he is carrying out detailed studies of massive protostellar objects with radio interferometers VLA, SMA, GMRT and the modern millimeter and submillimeter wave antenna array ALMA. New data about properties of protostellar disks and molecular outflows in these objects and about the process of high mass star formation have been obtained.

Since early 2000th he gives lectures on radio astronomy and astrophysics in the Nizhny Novgorod university. He trained several highly qualified specialists in this field.

ZLOTNIK Elena Yakovlevna

Born 26.10.1939 in Gorky (now Nizhny Novgorod). In 1962 graduated from Gorky State University (now the University of Nizhny Novgorod, UNN), Department of Radiophysics, as a radiophysicist-researcher, in 1965 completed the post-graduate studies at the same university. Worked in different positions, first, at the Radiophysical Research Institute (NIRFI), and then since 1977 at the Institute of Applied Physics RAS. Ph.D. (1975), in 1999 was awarded the Habilitation (Sc.) D. Degree. A member of the International Astronomical Union.

Specialist in theoretical radioastronomy, space plasma physics, wave propagation in plasma, author of more than 140 papers and reviews. E.Ya. Zlotnik made an important contribution to the theory of propagation and interaction of electromagnetic waves in the magnetoactive solar coronal plasma, development of the generation mechanisms of the different solar radio emission components and recovery of the physical conditions in the solar corona using the observed spectral features.

E.Ya. Zlotnik put forward the first quantitative model of the source of slowly varying component in the solar radio emission based on the thermal cyclotron mechanism suggested by V.V. Zheleznyakov as an origin of the microwave radiation from the active solar regions. Development of this mechanism and its application to the solar coronal loop conditions gave E.Ya. Zlotnik together with V.V. Zheleznyakov the possibility to predict the existence of narrowband features, in particular, coronal lines, in the solar microwave spectrum.

Together with V.V. Zheleznyakov, E.Ya. Zlotnik developed the double plasma resonance mechanism in the solar corona which appears as a so-called zebra pattern in radio spectrum. This mechanism explains the observed spectral features and serves as a reliable tool for retrieving the physical conditions in the active solar regions. Investigation of the double plasma resonance effect in different space conditions made it possible to explain (together with V.V. Zheleznyakov and V.V. Zaitsev) the observed zebra pattern in the Crab pulsar radiation, as well as (together with V.V. Zaitsev and V.E. Shaposhnikov) the zebra pattern in the Jupiter decametric emission.

E.Ya. Zlotnik made a contribution to investigation of the linear and non-linear interaction of the electromagnetic and plasma waves in the coronal plasma. Solving the problem of electromagnetic wave linear coupling in the transverse magnetic field allowed (together with V.V. Zheleznyakov) to explain the observed polarization peculiarities of solar microwave bursts. Study of the non-linear interaction of plasma waves and their coalescence into the electromagnetic wave explained the second harmonic polarization in Type III solar bursts. Consideration of three plasma wave coalescence into electromagnetic radiation elucidated the origin of the third harmonic in Type II and III solar radio bursts.

During many years lectured on astrophysics for students of Physical and Radiophysical Departments UNN, was envolved in popular science activity.

e-mail: zlotnik@inbox.ru

ZOLOTUKHIN Ivan Yurievich

Born in Moscow on 30.09.1984. Graduated from Moscow State University, faculty of Physics in 2006 (MSc in astronomy), PhD in astrophysics in 2009 (Moscow State University). A researcher, then senior researcher at Sternberg Astronomical Institute, Moscow State University (SAI MSU) since 2009. I. Zolotukhin worked at Paris Observatory (France) and Institute of research in astrophysics and planetology (France). Doctor of phys.-math. sciences (2017).

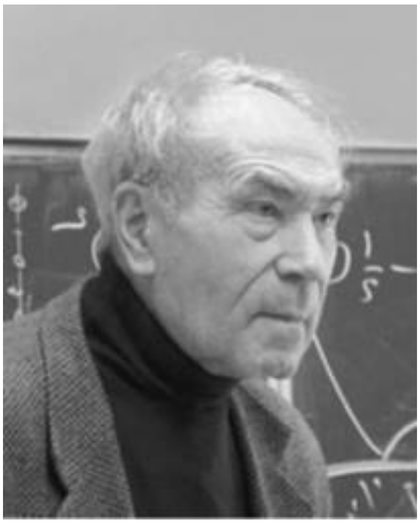
Main research expertise: data driven serendipitous science of X-ray binaries, stellar and intermediate mass black holes, multiwavelength surveys, data reduction and analysis pipelines for X-ray data, astronomical archives and databases, Virtual Observatory, machine learning applications in astronomy, citizen science. Published over 50 papers.

In late 2000s I.Z. began working on galactic and extragalactic research based on multiwavelength surveys and Virtual Observatory. These studies resulted in creation of the open clusters catalog of Sternberg Astronomical Institute which increased the amount of known information about open clusters subsystem in the Galaxy by 20%; new period–luminosity relation of low-mass X-ray binaries to search for the closest of them; popular simple and precise method to determine k-corrections of galaxies.

He advocated for the new type of citizen science when highly skilled volunteer programmers help researchers create Internet websites that allow quick-look online studies. In collaboration with citizen scientists I.Z. developed several popular Internet databases of astrophysical objects: catalog of X-ray sources of space X-ray observatory XMM-Newton, open clusters catalog of SAI (SAI OCL), Reference catalog of galaxy spectral energy distributions (RCSED). I.Z. demonstrated efficiency of this new research method by finding first extragalactic X-ray pulsar in Andromeda galaxy which turned out to be also the slowest spinning X-ray pulsar in globular clusters, and by proving the existence of elusive population of extragalactic hyperluminous X-ray sources apparently related to the off-nuclear intermediate-mass black holes. Later in 2018 with his group at SAI MSU I.Z. confirmed the nature of several nuclear intermediate-mass black holes in nearby galaxies thus reliably identifying their population after decades of unsuccessful searches.

In 2004–2015 I. Z. made a major contribution to the development of technologies and their scientific usage in the international initiative called “Virtual Observatory”. Using Virtual Observatory technique, I.Z. in collaboration with I.Chilingarian identified more than 200 new compact elliptical galaxies adding them only to a dozen known before. This helped to explore in detail their properties and understand processes of galaxy evolution in clusters where they might lose up-to 99% of their stars as a result of tidal interactions with neighbors. This study was published in journal Science (2015).

ZOTKIN Igor Timofeevich



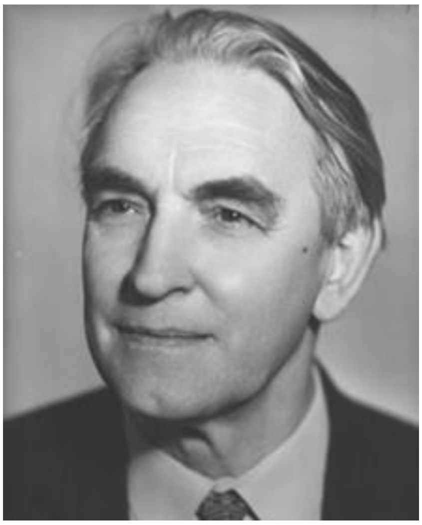
Born 08.04.1929 in Moscow; graduated from the astronomical department of the Faculty of Mechanics and Mathematics of Moscow State University (1952); sotr. Moscow Planetarium (lecturer, head of the Planetarium observatory); scientific. sotr. Committee on Meteorites (KMET) of the Academy of Sciences of the USSR (1956 – 1979); Researcher, Senior Researcher GEOKHI AN CCSR (1979 – 1991), led. engineer and curator of the Museum of the History of the University Observatory of the Moscow State University (1996 – 2016). Scientific works are mainly devoted to meteor astronomy, including studies of the Tunguska phenomenon. He paid much attention to the training of astronomy personnel, scientific and educational work Mind. Died 24.05.2016 in Moscow.

Research area: meteoritics, celestial mechanics, history of astronomy. Disciple of Acad. V.G. Fesenkov invited him to head astronomical research branch at KMET. He pioneered of using asters as research method in meteoritics.. Z. participated in 11 expeditions to the areas of meteorite impact (Chinge, Tsarev, Sychevka, Gorlovka, Sikhote-Alin), he contributed to the evaluation of atmospheric trajectories of several meteorites and fireballs. He proposed method of reconstruction of space trajectories and orbits of parent bodies from the data of meteors and fireballs observations. Z. jointly with the Kola Phil. Of the USSR Academy of Sciences carried out laboratory studies of the mechanical properties of the various types meteorites. He designed jointly with the Leningrad Institute of Precise Mechanics and Optics) an ultra-wide-angle fireball camera (No. 883844). Z. made significant contribution to the study of Tunguska meteorite. He participated in 4 expeditions to the site (1958–1988) resulting in the map compiling of the felled trees zones caused by the explosion. Based on the interviewing witnesses of this phenomenon, study of the archival data, he carried out laboratory modeling of the meteorite explosion collaborated by physicist M.I.Tsikulin. Z. calculated the trajectory (azimuth and inclination) of the parent body and showed that the radiant of the Tunguska meteorite coincided with the radiant of the beta Taurid stream generated by the comet Encke. He thus concluded that the Tunguska meteorite can be regarded a fragment of the comet Encke. The results were published in Sat. "Meteoritics" (№№ 20, 24, 29, 28). Totally, Z. authored over 100 scientific papers and copyright certificates.

Z. was acknowledged as a talented teacher and popularizer of astronomy that was especially exhibited during his work at the Moscow Planetarium. Many distinguished scientists including the famous Acad. N.S. Kardashev, recognized him as mentor. In the course of his multiyear work at GAISH Z. made significant contribution to reconstruction of the interiors of the observatory in Presnya, founded in 1831 and becoming now the museum, as well as to the restoration of many ancient astronomical instruments, including the 15-inch telescope-astrograph, installed in 1900.

In 1955 – 1985 he was repeatedly elected a member of the All-Union Astronomical and Geodetic Society (VAGO). Since 1956 he was a member of the editorial board of the VAGO Bulletin (since 1966 – Astronomical Herald scientific journal).

ZVEREV Mitrophan Stepanovich



Born 16.04.1903, Voronezh. In 1929 he graduated from the Moscow Conservatory, in 1931 – from Moscow State University. Since 1931 he worked at the Sternberg Astronomical Institute (SAI MSU): since 1941 – head of the Time Service, deputy director for research (1946-1951). Habilitation (1947). Professor of the Department of Astrometry, Faculty of Mechanics and Mathematics (1948-1952). Since 1951 he worked at the Pulkovo Observatory (1951-1971 – deputy director). Member of the IAU since 1948, chairman of the IAU Commission №8 (1952-1958). Corresponding Member of the Academy of Sciences USSR (1953). Since 1970 – head of the Department of Astronomy LSU. Chairman of the Leningrad branch of All-Union Astronomical and Geodetic Society (1981-1986). Died 17.11.1991 in Pulkovo.

Pre-war scientific work was associated with fundamental observations on the meridian circle according to the program "geodetic stars", with gravimetry and geodesy, with observations of variable stars on the 7-inch refractor of the SAI MSU and the study of refractive anomalies. The scientific significance of his work in the study of variable stars allowed him to obtain a Ph.D. degree without defending a thesis in 1938.

Since the beginning of work at the Pulkovo Observatory Zverev, developing the ideas expressed in the 1930s by N.I. Dneprovsky and B.P. Gerasimovich, made the creation of the Catalog of Faint Stars (CFS) a priority task. Compiled several stellar catalogs, including, in co-authorship with D.D. Polozhentsev, "Preliminary consolidated catalog of positions and proper motions of faint stars". He took an active part in observations under the international program to obtain the second epochs of the photographic catalog of the northern sky AGK3 in Pulkovo.

In 1962-1973 organized the Pulkovo expedition to the Cerro-Calan observatory (Chile) for observing the stars of the southern hemisphere, he was permanent leader, took a direct part in the observations. He proposed a new meridian instrument – a photographic vertical circle for high-precision determination of the declination of stars. The author of a "quasi-absolute" method for processing differential observations in order to exclude local systematic and random errors and obtain a catalog in a smoothed fundamental system.

In 1983 with the active support and participation of Zverev, an astrometric observation base was created at the Mountain Station of the Pulkovo Observatory near with Kislovodsk.

In 1952-1959 and 1970-1982 lectured on astronomy at the Leningrad State University.

M.S. Zverev is the author of over 200 scientific papers published in domestic and foreign publications. Among them are the monograph "Fundamental Astrometry" and 12 stellar catalogs.

Since 1956 – Chairman, and since 1960 – Vice-Chairman of the "Knowledge" society and a member of the board of the society. For his services in the popularization of astronomy, he was awarded the Vavilov medal.

M.S. Zverev's scientific activity was marked by a number of government awards: the Order of Lenin (1954), the Order of the Badge of Honor, two orders of the Red Banner of Labor, medals "For the Defense of Moscow", "For Valiant Labor in the Great Patriotic War", As well as several jubilee medals. For its great contribution to the development of astrometry, asteroid № 2323 was named after "Zverev".

ZVEREV Yuri Kuzmich

Born 25.10.1935 in Tambov. In 1958, graduated from the Moscow State University of Geodesy, Aerial Photography, and Cartography (now MIIGAiK), geodesy department; attended graduate school from 1971. During the period of 1958-1965, worked as an engineer-astronomer at the North-Western aerial-geodesic Enterprise. During 1965-1969, was senior engineer of the Radioastronomy department of the Main (Pulkovo) astronomical observatory. During 1969-2010, worked in the Leningrad (now Saint Petersburg) branch of the Special Astrophysical Observatory of the Soviet Academy of Sciences (Russian Academy of Sciences since 1991). He occupied various positions from design-engineer to senior researcher; headed the branch during the period of 1988-2004; from 2005 – chief research scientist. In 1974, defended his Ph.D. thesis, "Geodesic methods of adjusting large radio telescopes with variable-profile antennas (LPRT, RATAN-600)". Died 12.09.2010 in St. Petersburg.

The most significant contribution of Zverev Yu.K. to the Russian radioastronomy was his participation in the development of RATAN-600 and in the reconstruction of the Large Pulkovo Radio Telescope (LPRT) – upgrading the quality of its surface to 1 mm, which allowed measuring the temperature and pressure of the surface of Venus at 8 mm.

He is the author of over 40 scientific papers in the field of fundamental astronomical investigations of cosmic radio sources, the development and implementation of geodesic methods of aligning large radio telescopes, and design and facilitation of radioastronomical observations.

The methods that he developed served as a basis for the RATAN-600 radio telescope project – from the foundation layout to the full geodesic alignment of the reflective surface. This allowed one to conduct the first observations using the Northern sector of the radio telescope as early as 1974, at a time when the other parts of the antenna had not yet been operational.

Zverev Yu.K. proposed the shape of the geodesic net of RATAN-600 which allows one to effectively and mutually control the positions of its points. He designed the layout of the foundations for the circular structures, which was used for the RATAN-600 circular reflector. A fiber-optical method for the formation of the reflective surfaces of the secondary mirrors of RATAN-600 was also developed and used to adjust the surface points to their assigned positions with a high accuracy.

The methods that he developed are presently used in scheduled adjustment works, and in the surface measurements of the secondary mirrors and the main reflector of RATAN-600.

In the following years, Zverev Yu.K had shown that the quality of the surface of RATAN-600 could be improved significantly if the shape and quality of the surfaces of individual elements of the radio telescope were changed. This work was completed for all 1024 elements. As a result, an accuracy of 0.2-0.3 mm was achieved.

He was honored by the following State Awards: the order of the Red Banner of Labor (1978), veteran of labor, and the medal "In the commemoration of 300 years of Saint Petersburg" (2003).

Index

Contents: