

## ALUMNI OF THE SCHOOL OF PHYSICS AND TECHNOLOGY - ITS MATTER OF PROUD

**V.D. Khodusov**

*V.N. Karazin Kharkiv National University*

*4, Svobody Sq., Kharkov, Ukraine, 61022*

*E-mail: [vkhodusov@ukr.net](mailto:vkhodusov@ukr.net)*

*Received February 22, 2013*

Recently, V.N. Karazin Kharkiv National University celebrated two memorable events. 65 years ago, nuclear physicists graduated from the University for the first time. 50 years ago, School of Physics and Technology was established on the base of the Department of nuclear Physics. 2872 young people have graduated from the School since that time. If the alumni of the Department of Nuclear Physics are taken into account then total number of the nuclear alumni is 3428. 733 alumni graduated from the School with diplomas with distinction. 78 persons more graduated with such diplomas from the Department. Among the nuclear alumni there are over one thousand Doctors and Candidates of Science, 28 Academicians and Corresponding Members of the Academy of Sciences, Hero of Socialist Labor O.I. Pavlovsky, Hero of Ukraine V.G. Baryakhtar, authors of three inventions which were registered in the Soviet register of inventions, directors of the largest research institutions and enterprises, heads of physical laboratories all over the Ukraine and abroad, well-known political figures and managers of science. More than one hundred alumni are laureates of different prizes: State Prizes of USSR, Ukrainian and other Republics, Prizes of Academies.

What is the secret of such a high efficiency in educating the specialists? The answer is simple: the secret consists in so-called "fiztech" system of education that was introduced from the very first days of functioning of the Department of Nuclear Physics. This system is based on the fundamental education in Mathematics and Physics as well as on including of the students into real research carried out in physical institutions (first of all - national Science Center "Kharkiv Institute of Physics and Technology") for which the School prepares the specialists. Leading researchers of these institutes give lectures on special issues, supervise the students' research projects. Students start to carry out the research on the third-fourth year. Experimental equipment of the institutes is available for the students' research, for the BSc and MSc thesis preparation, for the industrial practice, etc.

In the paper below, one can find biographical data on the most outstanding alumni of the Department of Nuclear Physics and School of Physics and Technology, which had become Academicians. We hope, it will be interesting for those indifferent persons and, especially, for the youth.



**AZARENKOV Mykola Oleksiyovych** was born on December 15, 1951 in Kharkiv region in the village of Muravlynka, Novovodolazhsky district. In 1976, he graduated with honor from the School of Physics and Technology (SPhT), KhSU and was assigned to work at this University, to which he devoted all of his life. In 1980, he defended PhD thesis, and in 1991, he defended doctorate thesis. All these years, in parallel to the scientific activity, he taught. Since 1983, he worked as an assistant, since 1987 – associate professor, since 1992 – full professorship at the Department of General and Applied Physics. Since 1996, Professor M.O. Azarenkov headed the Department of Materials for Reactor Engineering. Since 1996 till 2005 he was a dean of the SPhT. Now he occupies the position of vice-rector of the University. In 2006, he was elected a corresponding member, and in 2012 - academician of the NASU. He actively participated in the establishing of new Computer Science School and School of Physics and Energy, and in establishing a new structure for the University - Institute of

High Technologies, bringing together the three schools. He was the first director of this Institute.

Scientific work takes a special place in the work of Professor M.O. Azarenkov and has a breadth of scientific topics and scientific approaches. This is evident from his primary scientific activity: physics of limited plasma-like media, the physical basis of plasma-technological devices, parametric processes, nonlinear physics, semiconductor physics, radio physics, plasma electronics, material science, nanomaterials and their application for the development of new materials for nuclear power engineering, nanotechnology, and nuclear methods in materials. To each of these areas of scientific activity, together with his students and colleagues, he has made a significant contribution. With his students I. Denysenko and K. Ostrikov he developed the theory of linear antennas in magnetoactive plasma, which is called in the literature as the theory of ADO.

In 2008 he was awarded the honorary title of "Distinguished Professor of V.N. Karazin Kharkiv National University". In collaboration with colleagues, he has published more than 20 teaching materials, textbooks and monographs and over 500 papers. He has supervised 4 doctoral and 11 PhD theses. He is currently a member of the Coordinating Committee for the implementation of government agreements between Ukraine and the European Union on cooperation in the field of nuclear power engineering and in the field of controlled thermonuclear fusion.

Professor M.O. Azarenkov was awarded the distinctions of Ministry of Education and Science of Ukraine "Excellence in Education of Ukraine" (2000) and "For scientific achievements" (2010). In 2002, he was awarded the title "Honored Worker of Science and Technology of Ukraine". In 2005, he was awarded a Diploma of the NASU, and in 2010, honors of NASU "For scientific achievements". In 2010, he was awarded the K.D. Sinelnikov Prize of NASU (together with Prof. V.M. Voevodin and Prof. I.O. Girka).



**AZHAZHA Volodymyr Mykhailovych (19.11.1931 – 23.12.2009)** was born in the village of Velyki Sorochynyci of Poltava region. In 1956, he graduated from the Department of Nuclear Physics (DNPh), School of Physics and Mathematics, Kharkov State University (KhSU). In January 1957 following the job assignment was sent at Institute of Physics and Technology, Academy of Science of Ukrainian SSR (at present - National Science Center "Kharkov Institute of Physics and Technology" -NSC KhIPhT), in which he was working all of his life, passing the scientific career from research assistant up to academician. He was a director of the Institute of Solid State Physics, Materials Science and Technology of NSC KhIPhT since 2004 till 2010. In 1964 he defended PhD thesis, and in 1986 – doctorate thesis.

V.M. Azhazha was well known scientist in solid state physics, material science and atomic energy. He was one of the founders of new scientific and technical area – vacuum and ultrahigh-vacuum metallurgy of ultra-pure metals and alloys with special physical features. He made a significant contribution to the development of physical bases, new methods and technology of producing the constructional alloys for atomic power engineering. He published more than 500 scientific papers, among them 5 monographs, 31 reviews, 36 inventions. He was scientific adviser of 5 doctorate and 15 PhD theses. He was a member of several specialized and coordinating councils, particularly, section "Rare Metals" of International association of Academies of Science, scientific council on chemistry and technology of ultra-pure matter of Russian Academy of Science, member of the bureau of the nuclear physics and power engineering of National Academy of Science of Ukraine (NASU). He was the editor of scientific journal series "Problems of Atomic Science and Technology".

In 1982, V.M. Azhazha was awarded the State Prize of Ukraine in science and technology. In 1990, he was awarded the title of Professor. In 2003, he was elected a corresponding member of NASU, and in 2006 – academician of the NASU. In 2008, he was awarded the title "Honored Worker of Science and Technology of Ukraine". He was awarded the "Badge of Honor", medals "For Valiant Labor", "For long and dedicated work," "In honor of the 100th anniversary of Lenin's birthday", diploma of Council of Ministers of Ukraine and other marks of distinction. In 2009, he was awarded the title "Honorary Doctor" of V.N. Karazin Kharkiv National University (KhNU).



**BAKAI Olexander Stepanovych** was born on September 16, 1938 in Kharkiv city. He graduated from the DNPh, KhSU in 1961. In 1966, he defended PhD thesis, and in 1972, he defended his doctoral thesis. Since 1961, he has worked in NSC KhIPhT. He started as a research assistant passing to the head of the theoretical division (since 1981). In 1977-1999, he was a Professor of KhSU, and in 1994-1998 – professor of Belgorod Pedagogical University. His research areas are as follows: theoretical and mathematical physics.

He developed the theory of nonlinear multiwave phenomena in continuous media - plasma, ionospheric plasma, solid state; he developed the theory of moderate turbulence in plasma; he formulated the poly-cluster model of amorphous solids and studied the physical properties of poly-clusters; he built the structural phase diagrams of binary alloys under reactor irradiation; he heads the programs on the development and testing in experiments with irradiating the materials for the reactors of the fourth generation.

Professor O.S. Bakai is a member of the Shevchenko Scientific Society (2007), academician of NASU (2009), Soros Professor (1996), winner of K.D. Sinelnikov Scholarship (2003). Scientific work by professor Bakai on the theory of poly-cluster amorphous bodies was awarded the State Prize of Ukraine (1992), and the work on nuclear power was awarded the O.I. Leypunsky Prize of NASU (2008).

He was awarded the medals "For Valiant Labor", "In honor of the 100th anniversary of Lenin's birthday" (1970), "For Labor Valor" (1981), "Veteran of Labor" (1987). He was awarded the Gratitude of the Council of Ministers of Ukraine (2003), the honor of NASU "For scientific achievements" (2008). Among his students – 13 PhDs and 5 Doctors of Science. He has a portfolio of about 300 scientific papers and 5 monographs.



**BAR'YAKHTAR Viktor Grygorovych** was born on August 9, 1930. He graduated from the DNPh, KhSU in 1953. In 1959, he was awarded the title of PhD, and in 1965 – the title of Doctor of Physics and Mathematics. In 1972, he was elected a corresponding member of the Academy of Sciences of the Ukrainian Soviet Socialist Republic, in 1978, he was elected an academician.

In 1954-1973, he was a researcher, a head of the laboratory of theoretical division at KhIPhT, AS of Ukrainian SSR, led by academician O.I. Akhiezer; in 1973-82, he was a head of the department, deputy director for science at Donetsk Institute of Physics and Technology of the AS of Ukrainian SSR; and in 1985-89, he was a head of the department of theoretical physics and director of the Institute of Metal Physics, AS of Ukrainian SSR. In 1982-89, he was an academician-secretary of the department of physics and astronomy of the AS of Ukrainian SSR; in 1989-94, he was a vice-president of NASU; in 1994-98, he was a senior vice-president of NASU. Since 1995,

he is a director of the Institute of Magnetism of the NASU and Ministry of Education and Science of Ukraine.

Professor V.G. Bar'yakhtar was actively involved in efforts to eliminate the consequences of the Chernobyl disaster. He was a chairman of the Committee on nuclear policy under the President of Ukraine, chairman of the commission on Chernobyl of the NASU.

Academician V.G. Bar'yakhtar is the author of over 500 scientific papers, including 16 monographs on physics and 5 monographs on eliminating the consequences of the Chernobyl disaster, co-author (with O.I. Akhiezer and S.V. Peletminsky) of discovery of "Magnetoacoustic resonance in ferro-, ferri- and antiferromagnetics" (1956).

Professor V.G. Bar'yakhtar gave lectures at KhSU, University of Donetsk, Taras Shevchenko Kiev National University and National Technical University of Ukraine "KPI". Among the students of professor Bar'yakhtar there are 25 doctors and more than 50 PhDs, six winners of the State Prize of Ukraine, the two heads of research institutes (V.N. Varyukhin and V.F. Klepikov), academician V.P. Seminozhenko, corresponding members of NASU V.F. Klepikov, B.A. Ivanov, and a member of the Academy of Pedagogical Sciences Yu.I. Gorobets.

Academician V. G. Bar'yakhtar is a founder and the first President of the Ukrainian Physical Society, a member of the American and the Italian Physical Societies, member of the Russian Academy of Arts, a member of the New York Academy of Sciences. The evidence of great public importance of the activity of academician V.G. Bar'yakhtar is rewarding him with three awards and honorary of President of Ukraine, as well as the medal of Pope John Paul II. In 2010, he was awarded the title "Hero of Ukraine".



**DOVBNYA Anatoliy Mykolayovych** was born on 12<sup>th</sup> of May in 1940 in Krasnograd, Kharkiv region. In 1962, he graduated from M. Gorky KhSU (DNPh). All his further work and scientific activities was closely associated with KhIPhT (now NSC KhIPhT). There he started to work as an intern-researcher, and nowadays he is a Director of the Science and Research Unit "Accelerator" and a Director of the Institute of High-Energy Physics and Nuclear Physics. He defended the PhD thesis in 1972, and in 1993, he was given a degree of Doctor of Science, then he became a Professor. Since 1979, he was a Head of the Laboratory. Further, since 1990 he was a Head of the Department of the Accelerator LEA 2 GeV, where all the works on improvement of the KIPT's linear electron accelerators were carried under his direct leadership. Since 1992, a new stage in his scientific and organizational activities has been started. It is the stage of development and constructing of the relatively small accelerator complexes and their applications for the solution of various fundamental and applied problems. A large number of researches for the medical isotopes production were carried out under

A. Dovbnya's initiative. Ongoing developments will provide Kharkiv region with medical radionuclides, which are necessary both for diagnostics and for treatment of various diseases. A large complex of studies on the high-energy physics, the nuclear physics, the development of the charged particle detectors, the development of the computer technologies, the constructing of the complex of accelerators and storage rings were carried out under A. Dovbnya's leadership in the IHEPNP. A. Dovbnya is a famous scientist in the field of the accelerator physics, the nuclear and radiation physics. He is the author of more than 300 publications. He is a member of the Ukrainian and American Physical Society. He is the editor of the journal "Problems of Atomic Science and Technology". He is a Corresponding Member of NASU since 2006.

The fruitful work of A. Dovbnya was awarded by the government according to his deserts. He was awarded the Order "For Services" of III class by President of Ukraine. Also he was awarded the A.I. Leypunskiy Prize by NASU.



**FOMIN Petro Ivanovich (20.06.1930 – 05.10.2011)** was born in Zhikharevo village, Orel region. In 1952, he graduated from the DNPh, M. Gorky KhSU. After postgraduate study, Petr Fomin started to work as a Researcher at the O.I. Akhiezer Theoretical Department of the KhIPhT of AS of Ukrainian SSR (now NSC KhIPhT).

His science and creative activity inseparably connected with the Institute and the University for 21 years. There he grew up as a scientist. He defended the PhD thesis in 1957, and in 1972 he was given a degree of Doctor of Science. P. Fomin carried out the advanced researches on the theory of the radiative corrections to the electron bremsstrahlung in the external electromagnetic field. He determined the structure of the mass renormalization electron in quantum electrodynamics based on the adding the perturbation theory major terms in the renormalization group approach.

Without leaving off the quantum field theory research, P. Fomin began to investigate the fundamental problems of astrophysics and cosmology. The main task of it was the problem of the Universe origin. He proposed the theory of the Universe spontaneous creation from the vacuum due to its gravitational instability. In 1972,

P. Fomin moved to Kiev, where he headed the Department of Astrophysics and Elementary Particles at the Institute of Theoretical Physics of the AS of Ukrainian SSR. P. Fomin developed the quantum-field theory of the quasars activity and the radio galaxies. The model of the spontaneous formation of the vacuum crystal-like structure at the Planck scales was proposed by him.

P.I. Fomin was an excellent educator as well as talented scientist. He lectured firstly at the KhSU and then at the Kiev University for many years. Since 1979, he was a Professor at the Kiev National University. He trained more than 20 PhDs, including 5 Doctors of Science. He was the author of more than 170 publications. He was a Corresponding Member of the NASU since 1990. He was the State Prize winner in Science and Technology of Ukraine, the Barabashov Prize of NASU. he was also a "Honored Worker of Science and Technology of Ukraine".



**GNATCHENKO Sergiy Leonidovich** was born on March 20, 1947 in Kupyansk city of Kharkiv region. In 1971, he graduated from the SPhT, KhSU. From the first years of his activity at Institute of Low Temperature Physics and Engineering which he joined after graduating from the University, the main focus of his scientific work was formed, i.e. the study by means of magneto-optical methods the low-temperature magnetic phase transitions and properties of domain structures, which are formed during these transitions in magnetic dielectrics. Further development of experimental studies of low-temperature magnetic phase transitions in antiferromagnetics and ferrimagnetics culminated in the formation of a new area - the study of the static and dynamic properties of magnetoinhomogeneous states formed during phase transitions in multisublattice magnetics. The second important area of his scientific activity is the study of photoinduced phenomena observed at low temperatures in magnetic materials and superconductors. The obtained results in this area are not only foreground and principal for low-temperature solid-state physics, but also are of great practical importance. S.L. Gnatchenko has written more than 100 scientific papers published in

leading specialized journals. In 1987, S.L. Gnatchenko with his co-authors was awarded the joint prize of the AS of USSR and the Polish Academy of Science for the study of magneto-optical inhomogeneous states in magnetics. The series of his works on "New optical and magneto-optical phenomena in antiferromagnetics" was awarded the State Prize of Ukraine in the field of science and technology in 2004.

Professor S.L. Gnatchenko successfully combines his scientific study with a science management and training of young highly qualified researchers. For many years he headed the department of low-temperature magnetism, was the deputy director for research of B.I. Verkin Institute for Low Temperature Physics and Engineering (ILTPE) of the NASU, and now he heads this institute. Under the leadership of professor S.L. Gnatchenko 5 PhD students defended their theses in physics and mathematics.

He is the deputy chairman of the Scientific Council of NASU on the problem of "low-temperature physics and cryogenic technology," chairman of the specialized council for doctoral theses at ILTPE of the NAS of Ukraine, a member of the editorial board of "Low Temperature Physics" journal.



**IVANOV Borys Oleksiyovych** was born in 1948. In 1972, he graduated from SPbT, KhSU. After finishing the PhD course in 1974, he started to work at Institute for Low Temperature Physics and Engineering in Kharkiv as a Junior Researcher (1974-1978) and then as a Senior Researcher (1978-1983). After that, he was working in Institute for Physics of Metals NAS of Ukraine in Kyiv as a head of laboratory (1983-1992) and as a Leading Researcher (1992-1995). Since 1995, he has been working in Institute of Magnetism NASU and Ministry of Education in Kyiv as a Principal Researcher. He defended the PhD thesis "About the theory of magnetic domains" in 1974 under supervision of Academician V.G. Baryakhtar). He defended the doctoral thesis "Dynamical and topological solitons in magnetic" in 1983. In 2009, he was elected as a Corresponding Member of NASU. Under B.O. Ivanov's supervision 14 PhD students had prepared and defended their thesis successfully, three of them were given the Doctor of Science degree after that.

He is giving lectures on "Theoretical Mechanics", "Solid State Physics", "Selected Questions of Theoretical Physics", "Physics of Magnetism" in Taras Shevchenko National University of Kyiv.

The area of his scientific interests covers the solitons in solid state, the non-one-dimensional solitons, the theory of magnetic domain structures, the magnetic relaxation, the macroscopic quantum phenomena, the magnetic nanoparticles.

He published 4 monographs, 8 reviews and more than 200 papers in referred scientific journals. Prof. Ivanov was awarded the O.S. Davydov Prize of NASU in 2005 for a series of works "Vortex dynamics of magnets" (shared with O.S. Kovalev and D.D. Sheka).



**KARNAUKHOV Ivan Mikhailovych** was born on January 19, 1937 in the village of Syrcevo of Ivnyansk district of Belgorod region. After graduating from the DNPh, KhSU in 1959 he was hired by KhIPhT of AS of Ukrainian SSR. Formation and development of scientific talent of I.M. Karnaukhov was held in the Institute (now NSC KhIPhT), where he started as a research assistant and rose up to the deputy director general for research (1997). Here, he defended his Ph.D. (1967) and doctorate (1982) thesis. In 1991, he was awarded the title of professor. In 2009, he was elected a corresponding member, and in 2012 - academician of the NASU. His academic research focuses on the physics of nuclei and elementary particles, radiation physics, physics of synchrotron radiation. Studies of polarized phenomena in double polarization experiments using the developed by him a complex of experimental setups with polarized proton and deuteron targets brought him worldwide fame. Designed and created by him experimental setups work in ErFI (Armenia), Institute of Nuclear Physics (Russia), JINR (Dubna, Russia) and in the Institute of Solid State Physics

(Julich, Germany). Of particular interest is the work carried out by him to create electron storage ring in order to obtain high-power monochromatic collimated beams. The main equipment of the storage is installed and the study of how to run the installation is initiated. Professor I.M. Karnaukhov took the initiative to develop a safe clean nuclear energy in Ukraine, which is based on sub-critical assemblies that are driven by a powerful beam. He heads the finalization of the development of the conceptual project "Neutron source, based on the subcritical assembly controlled by linear electron accelerator" and initial stage on this project under the financial support from the Argonne National Laboratory (USA). With rich experience of working with powerful radiation fields, professor I.M. Karnaukhov actively participated in the formation and implementation of the proposed by NSC KIPT program to make the fourth unit of Chornobyl NPP an environmentally safe area. I.M. Karnaukhov is an author of 231 scientific papers and two monographs; he was a supervisor of eleven PhD and one doctorate theses. For many years he taught at the V.N. Karazin KhNU. Professor I.M. Karnaukhov is a member of International Advisory Committee "Synchrotron Radiation Instrumentation", and a member of the editorial board of the journal "Problems of Atomic Science and Technology." Scientific achievements and labor services of I.M. Karnaukhov was awarded the State Prize of Ukraine in science and technology (2002). he was awarded the marks "Veteran of Nuclear Energy and Industry of the Russian Federation" and "For the preparation of scientific generation" of NASU. He was awarded the Diploma of the Ministry of Education and Science of Ukraine for the significant contribution to the development of national science and fruitful scientific activity.



**KHARCHENKO Mykola Fedorovych** was born on October 21, 1939 in a family of teachers in rural farm village HTZ of Chutovski district of Poltava region. In 1960, he graduated from the DNPh, KhSU. In 1961, M.F.Kharchenko started to work at the ILTPE of the AS of Ukrainian SSR. Since then for more than 50 years, scientific activity of M.F.Kharchenko is inseparably linked to this institute. There he was promoted from engineer to the head of the department. In 1969, M.F.Kharchenko defended his PhD, and in 1984 - his doctoral thesis. In 1995, he was elected a corresponding member of NASU, on the specialty "experimental physics," and in 2009 - a member of NASU.

M.F. Kharchenko is a renowned expert on magnetism and optics of magnetically ordered systems, whose works cover a wide range of physical problems. He obtained important results in scientific and technical aspects in various fields of physics of magnetism of solids that forever enter in the treasury of world science. Among the main results of M.F.Kharchenko there are the pioneering research of new magneto-optical effects, which are called "linear magneto-optical effect" and "quadratic magnetic rotation of the plane of polarization of light." M.F.Kharchenko was the first to realize the optical imaging of collinear antiferromagnetic domains, developed methods for switching collinear antiferromagnetic domains in the crystals with different magnetic symmetry and demonstrated the possibility of preparing the antiferromagnetic domain structure with a predetermined configuration.

He is a co-author of the monograph "Magnetic optics and spectroscopy of antiferromagnets," published by the publishing house "Naukova Dumka" and later reprinted by «Shpringer-Verlag». He is an author of over 150 scientific papers and reviews.

M.F.Kharchenko is a chairman of the Scientific Council of the ILTPE on the problem of "Low temperature magnetism and optics of ferroics", a member of the editorial boards of the journals "Low Temperature Physics" and «Ukrainian Journal of Physical Optics».

M.F. Kharchenko pays a great attention to teaching and training of scientific personnel. About 30 years, he is actively cooperating with the V.N. Karazin KhNU, where he teaches courses at the department of General Physics and acts as a head of the branch of the department at ILTPE. Six PhDs were prepared and defended under his supervision. Among the students of M.F. Kharchenko there are one academician of NASU and two doctors of sciences.

M.F. Kharchenko was awarded the K.D. Sinelnikov prize of AS of Ukrainian SSR (1985), prize of the AS of USSR and the Polish Academy of Sciences (1987) and the State Prize of Ukraine in science and technology (2004).



**KLEPIKOV Vyacheslav Fedorovych** was born in Kharkiv in 1949. In 1971, he graduated from the Department of Theoretical Nuclear Physics, SPhT, Maxim Gorky KhSU. During 1971-1990, he was working at KhIPhT NASU. During 1990-1992, he was organizing a new institution in NASU – Center of Electrophysical Machining (nowadays it is the Institute of Electrophysics and Radiation Technologies of NASU). He is a Director of the institute now.

The following main scientific results are obtained by V.F. Klepikov. The conditions of the giant amplification of the nuclear magnetic resonance in the thin magnetic films are predicted; the physical principles of the data storage devices with the record parameters, which can work under a radiation, are developed; the radiation methods of recovering the nuclear material properties are developed; the effects of the radiation stimulated superplasticity are predicted; the methods of the quantum electrodynamics are generalized for the cases of the non-local fields of matter, and they are applied for solving the problems of the electromagnetic interactions in nuclei; the methods of the modification and phase transformation using beams of the charged particle are proposed, and the new nuclear and radiation technologies, which are now widely implemented in practice, are developed; the new radiation technologies of diagnostics, safety control and lifetime prolongation for the nuclear reactors and other equipment of the NPPs are developed; the radiation technologies for medicine, agriculture and security are developed; the mechanism of the spontaneous breakdown of the discrete analog of the supersymmetry for the field theories with the highest derivatives is proposed; the particle spectra in the critical areas in the scope of the nonlinear field theories are studied..

His students prepared and defended 4 theses for Doctor of Science degree and 5 PhD thesis. For many years he is giving lectures at SPhT of V.N. Karazin KhNU. In 2003, he was elected as a Corresponding Member of NASU.

Since organizing the Division of the Nuclear physics and energy in NASU, V.F. Klepikov is a Deputy Academician-Secretary of the Division, and he has brought a lot in its formation and in organization of its activities. He is a Head of Expert Council on State Nuclear Program of Ukraine.

V.F. Klepikov is a Honoured Science and Technology Worker of Ukraine, and he was awarded the S. Pekar prize of NASU and M. Ostrovsky Prize.



**MIROSHNYCHENKO Valentyin Ivanovych** was born in Ivanovka village, Volchansk district, Kharkiv region on 21<sup>th</sup> of May in 1935. In 1958, he graduated from Maxim Gorky KhSU (DNPh). After graduation V. Miroschnychenko started to work at KhIPhT of AS of Ukrainian SSR (now NSC KhIPhT) as a Junior Researcher. In 1967, he defended his PhD thesis, and in 1989, he was given a degree of Doctor of Science. He has been a Senior Researcher since 1975.

Since 1995, he has been a head of the Electrostatic Accelerators Department at the Institute of Applied Physics, NASU, in Sumy. Since 2006, he has been a Deputy Director on Scientific Activities. He was elected a Corresponding Member of NASU in 2006. He is a "Honored Worker of Science and Technology of Ukraine" since 2009.

He is the author of the pioneer papers about the application of the relativistic electron beams for generating the short-wave electromagnetic radiation on the basis of the stimulated coherent scattering of electromagnetic waves by the relativistic electrons. He developed the free electron laser non-linear theory in the so-called Raman regime simultaneously with American scientists for the first time. He is one of the developers

of the plasma free electron laser nonlinear theory. In this theory Langmuir wave excited in a plasma is the undulator. Another pioneer paper of V.I. Miroschnychenko is devoted to the studies of the plasma instability due to the ion-cyclotron heating. This study initiated a wide range of both theoretical and experimental works carried out at NSC KhIPhT for solving the problem of the controlled thermonuclear fusion. His scientific advances of the last decade are related to the development and construction of the analytical accelerating complex in IAP NASU for the study of the elemental composition and structure of the matter by the nuclear-physical methods. These investigations were finished by launching the scanning nuclear microprobe for the local non-destructive analysis of the matter structure and elemental composition. This microscope is the first in the CIS.

V.I. Miroschnychenko takes an active part in the young human resource development. He gives courses of lectures on the "Physical basis of the charged particle acceleration" and "Fundamentals of Plasma Physics" in Experimental and Theoretical Physics Department of the Sumy University, working part-time as a professor.



**ORAEVSKY Viktor Mykolayovych (09.03-1935 – 23.11.2006)** was born on March 9, 1935 in Poltava city. He graduated from the DNPh, KhSU in 1957. During 1958 – 1965, he was a senior laboratory assistant, associate researcher at the Institute of Nuclear Physics of the USSR Academy of Sciences. During 1965-1970, he was a senior scientist at the Institute of Physics of the AS of the Ukrainian SSR. From 1970 till 1974, he was a head of the department of the Institute of Nuclear Research, AS of the Ukrainian SSR. In 1974-1979, he was a head of the section of the SPA "Energy". From 1979 till 1989, he was a head of laboratory, head of the department of the Institute of terrestrial magnetism, ionosphere and radio wave propagation, AS of the USSR. In 1989-2003, he was a director of this institute. He was a head of international satellite projects. He was a doctor of physics and mathematics, professor, academician of the Academy of Natural Sciences (1996), a member of the International Informatization Academy, International Academy of Astronautics, the New York Academy of Sciences. He was awarded the title "Honored Worker of Science of

Russia" (1996). He was a winner of the State Prize of the Ukrainian SSR, State Prize of the USSR (1987), the State Prize of Russia (1997). he was a foreign Member of the NASU in "space physics" (2003). He was a specialist in the theory and calculations of plasma processes.



**PAVLOVSKY Olexander Ivanovych (27.06.1927-12.02.1993)** was born in Zaporizhzhya city. In 1951, he graduated from the DNPh, KhSU. In the same year he was sent to work at Arzamas-16. There under the supervision of A.D. Sakharov and Yu. B. Khariton he worked to develop the thermonuclear weapons. He was responsible for the creation of high-intensity neutron sources, neutron physics, and nuclear fission. At first O.I. Pavlovsky worked as a senior laboratory assistant, after a while headed the laboratory, and from 1960 he led a major research department of All-Russian Research Institute of Experimental Physics (VNIIEF). In 1953, O.I. Pavlovsky awarded the Stalin Prize. In 1971, he led the division of fundamental and applied research, and then became deputy and first deputy of supervisor of VNIIEF while leading the department. He was doing research in the field of neutron physics, pulse technology, physics and technology of accelerators, high energy density physics, and quantum electronics. He was one of the founders of a new direction in high energy density physics - magnetic

cumulation. Under his leadership, cumulative phenomenon was studied and powerful pulsed sources of energy based on magnetocumulative generator, a device for generating ultra-high pulsed magnetic fields, was created. In 1963, Olexander Pavlovsky defended doctor thesis. In the same year he was awarded the Lenin Prize. In 1979, O.Pavlovsky was elected a corresponding member of the USSR AS (the department of nuclear physics). By the Decree of the Presidium of the Supreme Soviet of the USSR from 29.07.1966 O.I.Pavlovsky was awarded the title of Hero of Socialist Labor with awarding the Order of Lenin and the Gold medal "Hammer and Sickle" for his work in nuclear physics used in the interests of nuclear and thermonuclear weapons. In 1983, he became a laureate of the State Prize of the USSR. In 1988, he was awarded the title "Honored Scientist of the RSFSR." In 1991, O.I.Pavlovsky was elected an Academician of the Russian AS. In 1999, he was awarded the State Prize of Russia (posthumously) for outstanding results on generators of microwave radiation.



**PELETMINSKY Sergiy Volodymyrovych** was born on February 14, 1931 in urban village Tetkino of Kursk region. In 1953, he graduated from the DNPh, KhSU and was enrolled in graduate school to O.I. Akhiezer. In 1957, he started to work in KhIPhT (now NSC KhIPhT of the NASU). Here he went from a research assistant to the head of the laboratory of statistical physics. From 1989 till 1996, he was a head of theoretical physics department. In 1959, S.V. Peletminsky defended his PhD thesis, and in 1966 - his doctoral dissertation. In 1969, he was awarded the title of Professor. In 1978, Professor S.V. Peletminsky was elected a corresponding member, and in 1990, he was elected an academician of the AS of the Ukrainian SSR.

Research interests of S.V. Peletminsky are associated with the different areas of theoretical physics and are devoted to solving the fundamental problems of quantum field theory, statistical mechanics, the physics of quantum liquids and crystals, theory of magnetic phenomena in crystals. He owns a number of fundamental results, recognized by the international scientific community. Together with O.I. Akhiezer and V.G. Bar'yakhtar he predicted a new physical phenomenon, i.e. the "phenomenon of interaction of hypersonic and magnetic (spin) waves in ferro-, ferri- and antiferromagnetics (magnetoacoustic resonance)" registered as a discovery under the number No. 46 in 1956 year. Studies by S.V. Peletminsky, I.O. Akhiezer and V.G. Bar'yakhtar on the theory of high-frequency relaxation processes in magnetic materials have been awarded the K.D. Sinelnikov prize of AS of Ukrainian SSR in 1978. In his studies on statistical mechanics S.V. Peletminsky refers to the proposed by M.M. Bogolyubov method of reduced description of nonequilibrium processes. In a series of works by professor S.V. Peletminsky and his students, this method has been successfully used both for kinetic equations describing irreversible processes, and to find the asymptotic properties of the Green's functions of different physical systems. For the study of systems with spontaneously broken symmetry in 1986 year S.V. Peletminsky was awarded the N.M. Krylov prize of the AS of Ukraine. In the 80s years, professor S.V. Peletminsky and his students developed semi-phenomenological Fermi-liquid approach as applied to the description of superfluid systems. The proposed theory was the generalization for the superfluid system as a Landau-Silin normal Fermi liquid and for the BCS-Bogolyubov equations. In 1996, S.V. Peletminsky with a group of scientists was awarded the State Prize of Ukraine in science and technology for the set of works "Kinetic processes in quantum liquids and crystals". In 2002, he was awarded the M.M. Bogolyubov Prize of the NASU for the set of works "Field theory and the theory of disordered systems". S.V. Peletminsky has authored and co-authored over 250 scientific publications and 5 monographs published in Ukraine and abroad. S.V. Peletminsky pays a lot of attention to the training of researchers. He created the world famous school on statistical physics. Among his students there are twenty PhDs of physics and mathematics, twelve of which are doctors. Over 45 years, he gave lectures on quantum electrodynamics to the students of SPHT, KhSU. In 2001, S.V. Peletminsky was awarded the medal "Excellence in Education of Ukraine" for outstanding scientific achievements, selfless teaching career, and a great contribution to the development of the University. In 2004, he was awarded the title "Honorary Doctor of Kharkiv University."



**SEMINOZHENKO Volodymyr Petrovych** was born on June 9, 1950 in Kiev. In 1972, he graduated from the SPHT, KhSU. In 1974, he defended his PhD thesis, and in 1984 - his doctoral thesis. He is a Professor, corresponding member of the AS of Ukrainian SSR (1988), academician of the NASU (1992).

Until 1985, he worked as a senior research fellow at ILTPHE. In 1985, he was appointed a general director of SPA "Monokristallreaktiv." Since 1991, he has headed the STC "Institute for Single Crystals" NASU. Since 1992, he is a member of the Presidium of the NASU, chairman of the North-East Scientific Center of NASU and Ministry of Education and Science of Ukraine. Professor V.P. Seminozhenko is an author of more than 500 scientific papers, 80 patents and inventions. He is the editor in chief of the journals "Problems of Science" and "Functional Materials", the anthology of comparative studies "Ecumene", member of editorial board of several scientific



journals, including the scientific journal of the National Security and Defense of Ukraine "Strategic View", etc. He was thrice elected to the Parliament of Ukraine. In 1996-1998, he was a Minister of Science and Technology. In 1999 and 2001-2002 he was a Deputy Prime Minister of Ukraine. In 2003-2005 he was an Advisor to the President of Ukraine. In 2006-2007 he was an Advisor to the Prime Minister. In 2010, he was appointed a head of the State Agency for Science, Innovation and Informatization of Ukraine. V.P. Seminozhenko is twice winner of the State Prize of Ukraine in science and technology (1992, 2000), and the International Prize in nuclear physics (1999). He was awarded the Order "For Merit" I, II and III degrees, "Holy Prince Vladimir" IV degree, diplomas of the Council of Ministers and the Parliament of Ukraine, etc. he is a Honor Full Member (Academician) of the Academy of Arts of Ukraine. he is a Honorary doctor and president of the alumni association, faculty and friends of V.N. Karazin Kharkiv National University. He is a honorary Citizen of the city of Kharkiv (2010).



**SHUL'GA Mykola Fedorovych** was born on September 15, 1947 in Kharkiv. After graduating in 1965 with silver medal from high school, he enrolled to study at the SPhT, KhSU. After the graduating from KhSU in 1971, M.F. Shul'ga was drafted into the Soviet Army and served as an officer for two years in the city of Volgograd. From 1973 until the present time, he works at KhIPhT (now NSC KhIPhT). Within its walls, he defended his PhD in 1977 and doctoral thesis in 1985. In 2009, he was elected an academician of the NASU. Academician M.F. Shul'ga is one of the founders of the Institute for Theoretical Physics of NSC KhIPhT and is the first its director (1996).

Academician M.F. Shul'ga is a leading expert in quantum electrodynamics and high energy physics. The fundamental results obtained by him in these areas are well known and recognized throughout the world. Together with S.P. Fomin he predicted the suppression of bremsstrahlung in a thin layer of the material (this effect is called in the literature as the effect of Tarnovsky-Shul'ga-Fomin), and developed the quantitative theory of this phenomenon. Together with A.A. Grinenko, he predicted the stochastic slewing of the high-energy particle beams by bent crystals, thus opening up new opportunities for a relatively simple solution of the problem how to output beams of different charged particles from accelerators. On the initiative and with direct participation of M.F. Shul'ga a number of critical experiments were carried out to test the predicted phenomena on the accelerators at CERN (Switzerland), SLAC (USA), MAMI and S-DALINAS (Germany), as well as at KhIPhT. In the late 90's, M.F. Shul'ga with O.I. Akhiezer have initiated the work in theoretical physics at KhIPhT on physics of fast neutron reactor, which operates in a wave of slow nuclear burning.

M.F. Shul'ga pays much attention to the education of decent scientists. For many years, M.F. Shul'ga gives lectures at V.N. Karazin KhNU on quantum electrodynamics at high energy in the matter. He is the head of a branch of the department of Theoretical Nuclear Physics of SPhT of V.N. Karazin KhNU at NSC KhIPhT. Among his students there are four doctors and eight PhDs in Physics and Mathematics.

M.F. Shul'ga is an author and co-author of over 250 scientific papers (including 8 monographs and monographic reviews). In 2000, the scientific work of M.F. Shul'ga was awarded the O.S. Davydov prize of NASU. In 2002, he was awarded the State Prize of Ukraine in science and technology. M.F. Shul'ga is a member of the Scientific Council of the NASU on the subject "Nuclear Physics and Nuclear Energy" and of the Scientific Council of the CIS countries on the application of nuclear physics methods in the interdisciplinary areas.

He is a member of the editorial boards of the "Ukrainian Physics Journal", "Problems of Atomic Science and Technology", "Journal of Kharkiv University," and enters a number of scientific councils of NSC KhIPhT and V.N. Karazin KhNU. In 2004, M.F. Shul'ga was elected a vice-president of the Ukrainian Physical Society.



**SLYUSARENKO Yuriy Viktorovych** was born on 24th of January in 1957 in Lesnoy village, Kirov region of Russia. In 1980, he graduated from the SPhT, Maxim Gorky KhSU. Since finishing the PhD course and till 1991, he was working at the laboratory of ion processes of KhSU. There he obtained the important theoretical results on the description of the interaction of the charged particles with the solid state surface. These results have been used for the statement and interpretation of the new experiments. In 1984, he defended the PhD thesis. Since March 1991 till present, he is working in O.I. Akhiezer Institute for Theoretical Physics, NSC KhIPhT. Now, he is a head of the Department of Statistical Physics and Quantum Field Theory. Due to his efforts, the method of the reduced description of the nonequilibrium states of the systems with a large correlation radius was developed. It gives a possibility to describe the kinetics and hydrodynamics of the long range fluctuations. In 1996 he defended the thesis for Doctor of Science degree.

Then his scientific interests were directed to studying and describing the Bose-Einstein condensation phenomenon.

In 1998 in co-authorship with Academicians O.I. Akhiezer and S.V. Peletminsky he carried out the pioneer investigation on the Bose-Einstein condensation of the particles with the integer spin in the external magnetic field. Recently he has developed the original scheme of the approximate method of the secondary quantization of the systems in the case of the bound states. This scheme can be used for the small kinetic energies of the particles.

He is managing the scientific projects of State Programs of NASU, and he is participating in the set of international projects. He published 120 papers in scientific journals. During many years he is giving lectures on "Kinetic Theory", "Quantum Statistics", "Probability Theory" and "Higher Mathematics", "Solid State Physics" at V.N. Karazin KhNU and Belgorod State University (Russia). In 2009, he was elected as a Corresponding Member of NASU.



**SOLOSHENKO Igor Oleksandrovych** (01.01.1942 – 29.04.2007) was born in Lugovka village of Sumy region in Ukraine. In 1963, he graduated from the SPbT, Maxim Gorky KhSU and started to work at the Institute of Physics AS of Ukrainian SSR in Kyiv. His entire science and job career was related with the institute, where he worked at positions from an engineer to a head of laboratory and a director. In 2000, he was elected as a Corresponding Member of NASU.

He worked in different areas of plasma physics, radiation physics and physics of intense ion beams, i.e. ion sources, interaction of ion beams with solid state surface, gas discharge in low-density gases and atmosphere. His most significant results were related with problems of the space charge compensation of the positive and negative ion beams; the oscillation excitation in the compensated ion beams; the long range transport of the ion beams. Due to the obtained results, the prediction of the intense ion beams behavior in various systems became possible, i.e. in the neutral beam injectors for the controlled nuclear fusion, in accelerators and other technological systems. Most of these works were carried out in 1970s and 1980s. These works founded the principles of the new branch of plasma physics, i.e. physics of ion-beam plasmas. It still excels the analogous works, which are carried out in other organizations worldwide.

The research of the plasma sources of the negative ions is widely known among specialists in Ukraine and abroad. In these works by I.O. Soloshenko the main mechanisms of the negative ion formation and breakdown are determined; the emission characteristics of the sources are calculated; the steady state source of the negative ions of hydrogen with the record parameters is constructed. His studies on the interaction of the ion fluxes with the metal surface were recognised. One of the most important work among applied works of the I.O. Soloshenko is the new technology of the cold sterilization of medical instruments based on the gas discharge plasma. This technology should replace the environmentally dangerous technology which is based on the use of the toxic gases. The innovation excels by its performance, universality and simplicity of usage. Now it has been successfully implemented to production in Ukraine and USA.



**STEPANOV Kostyantyn Mykolayovych** (24.03.1930 – 19.04.2012) was born in Leningrad. In 1952, he graduated from the DNPh, Maxim Gorky KhSU. After graduation, he started to work at KhIPhT (now NSC KhIPhT), where he carried out his researches at positions of Researcher, Senior Researcher (since 1959 года) and a head of a laboratory (since 1967). Since 1976, K.M. Stepanov headed newly arranged Department of Radiofrequency Heating and Plasma Theory at the Plasma Physics branch of KhIPhT (since 1993 Department of Plasma Theory at the Institute for Plasma Physics of NSC KhIPhT). In 1958, he defended PhD thesis, and in 1965 he defended the thesis for Doctor of Science degree. In 1961, he was given a degree of Senior Researcher, and in 1969, he was given a degree of Professor. In 1992, he was elected as a Corresponding Member of NASU.

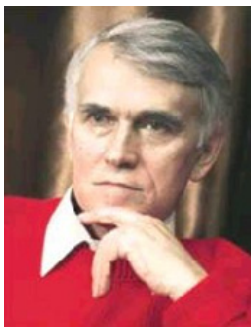
Main works of K.M. Stepanov are related to plasma physics and controlled nuclear fusion. In this area he obtained a set of fundamental results on the kinetic theory of propagation, absorption and mode conversion of the electromagnetic waves in the plasma in the external magnetic field; the theory of the charged particle fluxes and the strong electromagnetic fields interaction with the plasma in the external magnetic field; the theory of plasma stability in the magnetic traps.

He is one of the founders of the Plasma Electrodynamics in the magnetic field. He had proposed new effective methods of the radiofrequency plasma heating, which nowadays have become the basis for experiments on RF heating in the largest toroidal traps (tokamaks and stellarators). These methods are promising for tokamak-reactor.

K.M. Stepanov was an author and a co-author of more than 600 scientific works, including 5 monographs and 10

inventions, which were well-known to scientist worldwide. He had prepared 26 PhD and 14 Doctors of Science, among them D.G. Lominadze, who is an Academician and a Vice President of Georgian AS. More than 40 years, Prof. Stepanov carried out scientific and teaching work at V.N. Karazin KhNU. These activities were awarded by giving him the degree of Honorary Doctor of V.N. Karazin KhNU, the degree of Soros's Professor and by awarding him the sign "Excellent Education Worker of Ukraine".

For many years K.M. Stepanov was a member of the bureau of the United Scientific Council on Problems of Plasma Physics in AS of Ukrainian SSR, member of the bureau of the Plasma Physics Problem Council in AS of Ukrainian SSR, a member of the editorial boards of journals: "Plasma Physics Reports", "Problems of Atomic Science and Technology" Series: "Thermonuclear fusion" and The Journal of Kharkov National University (Physical series "Nuclei, Particles, Fields"), headed Scientific Council on Problems of Plasma Physics and Plasma Electronics in NASU. He was awarded by the Order of the Red Banner of Labour, Diploma of the Presidium of the Supreme Soviet of the Ukrainian SSR and medals, he was given the honorary degree "Honored Worker of Science and Technology of Ukraine" and State Prize in the Area of Science and Technology of Ukraine.



**STORIZHKO Volodymyr Yuhymovych** was born on October 26, 1935 in the village of Ol'hovatka of Kharkiv region in the family of rural intellectuals. In 1958, he graduated from the DNPh, KhSU. In 1962, he finished postgraduate studies at the department of experimental nuclear physics under the guidance of the eminent nuclear physicist academician Anton Karlovych Walter, and was hired in KhIPhT. Here he created a new direction - study of subbarrier reactions with protons by nuclei of medium atomic weight, which process analysis is based on a statistical model, or on the basis of the model-independent method for the angular correlations of aligned nuclei. This is a rapidly developing area and now it is supported by his students and followers. It has been shown in his works that to obtain the maximum information on the structure of atomic nuclei the measurements of angular correlations should be carried out near the reaction threshold, at which the maximum alignment of cores is achieved and where the data analysis is weakly dependent on the parameters of the optical potential. These

studies identified the conditions under which the angular correlations are isotropic or anisotropic. In 1974, V.Yu. Storizhko successfully defended his doctoral thesis, and in 1978 he was awarded the title of professor.

Since 1988, professor V.Yu. Storizhko concentrates on establishing of the Institute of Applied Physics of the NASU, in Sumy city. And from 1991 till now, he is its director. The accelerator, complex physical installations and equipment, which are actively used in various areas of applied physics, are built in this institute. In 1992, V.Yu. Storizhko was elected a corresponding member, and in 1995 - a member of the NASU; he was awarded the title of "Honored Worker of Science and Technology of Ukraine".

V.Yu. Storizhko is an author and co-author of about 300 scientific works and inventions. He has supervised 2 doctors of science and 14 PhDs. He is a member of scientific councils of the NASU, member of the specialized councils of the V.N. Karazin KhNU and NSC KhIPhT.

At the same time professor V.Yu. Storizhko actively manifests itself as a statesman. From 1994 till 1998, he was a deputy of Parliament of Ukraine, member of the Presidium of the Parliament of Ukraine, Chairman of the Committee on Science and Education, Chairman of the State Committee for Science, Technology and Industrial Policy, chairman of Interstate committee for scientific and technological development, member of the bureau of the Department of physics and astronomy and the Division of nuclear physics and power engineering of the NASU.



**STRUTINSKY Vilen Mitrofanovych (16.10.1929 – 28.06.1993)** was born in Danilova Balka village, Ulyanovsk district Kirovograd region. In 1952, he graduated from M. Gorky KhSU (DNPh). After graduation, V. Strutinsky started to work to I.V. Kurchatov Institute of Atomic Energy (group of nuclear theory), where he worked since 1953 till 1970. In 1959, he defended the PhD thesis, and in 1965 he was given a degree of Doctor of Science. He underwent an internship in Niels Bohr Theoretical Physics Institute, Copenhagen, Denmark (1957-1958). In 1967, V. Strutinsky was invited to Niels Bohr Institute for development of his theory, and he worked there until 1970. After that he returned to Kiev. He was a Head of Nuclear Theory Department at the Institute of Nuclear Research of AS of Ukrainian SSR till 1991. Since 1992 till 1993 he was a Senior Researcher of Nuclear Theory Department of INR NASU.

The first research period of V. Strutinsky was related with development of new concepts of the complex nuclei structure, because of the discovery of its non-spherical shape. Using these concepts he specified the dependences of the alpha decay probabilities, known as Alagi's rules. The next series of studies were devoted to the classical interpretation of the quantum angular momentum, the additional

rules of the quantum angular momentums and correlation between orbital angular momentum of the particle and its motion direction. As a result, the simple expressions for angular distributions of the debris of the rotating nucleus (Halpern-Strutinsky formula), angular distributions of the particles emitted from the rotating compound nucleus (Erikson-Strutinsky formula) and the angular correlation in the processes of mixed type were obtained. V. Strutinsky carried out fundamental work, which was devoted to the quantitative description of the geometric shapes, which the nucleus undergo during its fission. In the following investigations of the nuclear fission theory he showed the equivalence of the liquid drop model of the deformed nuclei and the statistical models which are using the energy density functional. These studies had shown the need of the shell effect accounting in the nuclei deformation. And they became the basis for the method of calculating the net binding energy of a nuclei (the method of the shell corrections), which has been developed in 1965 - 1968's by V. Strutinsky, and which received his name further. V. Strutinsky theory gave a possibility to explain many known features of the nuclear fission process as well as to predict its new properties, which were unexpected from the point of view of the traditional concepts of the Niels Bohr theory. The theoretical conclusions of V. Strutinsky were confirmed completely by the following intensive researches and experiments. For the first time his theory has provided the ability to predict the nuclear masses, and many properties of the fissionable nuclei, in particular, the stability of the superheavy nuclei. The theory has been widely spread and it took place in the principles of nuclear physics.

A significant place in investigations of V. Strutinsky and his colleagues is occupied by the theory of the collective motion in nuclei under the high amplitudes and the finite value of the velocity. They obtained fundamental results, which were important for developing the quantitative theory of such nuclear processes. New theoretical model for the dynamics of the collective processes in heavy nuclei, namely the gas-liquid drop model (GLM) was proposed and developed by them. Such expressions as "the Strutinsky energy theorem", "the Strutinsky shell correction method", "the Strutinsky double-peak fission barrier" widely entered to the world scientific literature on the nuclei theory and nuclear physics.

The phenomenon of the shell structure existence in the strongly deformed nuclei and formation of the intermediate metastable state during the nuclear fission, predicted by V. Strutinsky, were registered as a discovery in the USSR (the State Register of Scientific Discoveries of the USSR № 200, 1977).

A large number of specialists were trained under his supervision. Many of his students were given a degree of PhD and Doctor of Science, became Professors. V.M. Strutinsky was an Alexander von Humboldt Science Prize winner (1991), and he was given the T. Bonner Award for Nuclear Physics of the American Physical Society. He was awarded a medal "For Labor Valor" (1983) and "In memory of the 1500<sup>th</sup> anniversary of Kiev." He was a Honorary Doctor of Sciences of Copenhagen University since 1979.



**TERESHIN Volodymyr Ivanovych** (17.01.1938 - 11.07.2010) was born in Donetsk. In 1960, he graduated from the DNPh, Maxim Gorky KhSU, and started to work at KhIPhT (now NSC KhIPhT). There he had started career at position Junior Researcher and finally became a Director of Institute for Plasma Physics in NSC KhIPhT. In 1968, V.I. Tereshin defended PhD thesis, and in 1992 he defended the thesis for Doctor of Science degree. In 2009, he was elected as a Corresponding Member of NASU.

Scientific interests of V.I. Tereshin were concentrated in the field of the experimental plasma physics. He studied the parametric resonance, which takes place in the rippled magnetic field with plasma fluxes, he spent a lot of time developing the complex plasma accelerator, which generates the plasma fluxes with suitable parameters for injection into stellarator magnetic traps; he developed the methods of the particle plasma diagnostics and the multichannel analyzers for measuring the energetic characteristics of the moving plasma (this work was awarded by Silver medal on the Exhibition of Achievements of the National Economy UdSSR and the invention

certificate was obtained).

Under supervision of V.I. Tereshin, the constructing and the wide class of researches of quasi-stationary plasma accelerators had been started. As a result of these activities, the plasma fluxes with record parameters were obtained. These fluxes can be used in different areas of plasma physics and plasma technologies. In the framework of the international program on the tokamak-reactor ITER V.I. Tereshin in a close collaboration with German physicists had been involved in studies on the experimental simulation of the processes at the divertor plates in the reactor in the case of the extreme scenarios of operation. Immediately he launched the investigation of the surface modification of the structural materials under the strong plasma fluxes in order to improve their physical and chemical characteristics.

V.I. Tereshin was a Professor of the Department of Physical Technologies at SPhT, V.N. Karazin KhNU, where he was giving lectures on Plasma Dynamics, supervising the diploma studies of students and PhD students. Under his supervision, 6 PhD theses were defended, and he was a scientific consultant in one work for Doctor of Science degree. He published more than 300 scientific papers. Besides that several inventions were developed. In 2007, he was awarded the State prize in the field of Science and Technology.



**TOLOK Volodymyr Tarasovych** (25.12.1925 – 11.12.2012) was born in Uman city of Cherkasy region. In 1951, he graduated from the DNPh, Maxim Gorky KhSU and started to work at KhIPhT (now NSC KhIPhT). He was starting his scientific activities at the laboratory of accelerator equipment. In 1957, V.T. Tolok defended the PHD thesis. His scientific advisor was Academician K.D. Sinelnikov.

Since 1958, on recommendation of K.D. Sinelnikov V. Tolok started new in that time area of physics, i.e. plasma physics and controlled thermonuclear fusion. These work has just launched at the institute, and he was involved in studying the constant and alternate fields' interaction with plasma and gases. Besides that, he dealt with the developing of the plasma heating methods, and took part in the constructing of the sources of the energetic plasma fluxes. In 1960, on the recommendation of K.D. Sinelnikov and on the direct instructions of Academician I.V. Kurchatov he was entrusted to head the new scientific program related with developing of principles of the controlled thermonuclear fusion reactor.

Since 1966, he was entrusted to head the whole stellarator program at KhIPhT. As a result of activities carried out for many years at the institute, a set of stellarators were constructed starting from Sirius, Uragan-1 and then Uragan-2 and much later Uragan-2M. The milestone in the upgrowth of the Plasma branch at KhIPhT was constructing the torsatron Saturn for the first time in the world in 1970. The new concept of the magnetic system of the device was proposed by a physicist of the Institute V.F. Aleksin. In 1982, the largest at that time torsatron Uragan-3 was constructed. Its modification Uragan-3M was launched with the magnetic system placed in the vacuum vessel.

In the early 1970s, the study of the non-equilibrium plasma chemistry with high energies was started on the V.T. Tolok's initiative. As a result the new technology of the vacuum-plasma coatings was developed (condensation with ion bombardment). It gave an opportunity to increase the endurance of the cutting tools up to several times, and to rise the reliability and service life of the mechanism docking assembly with friction. This new technology got a wide spread in our country as well as abroad (in 1982 the license on this technology was sold to the American company Mulyarcs for the first time in the history of KhIPhT and of Ministry of Medium Machine-Building Industry).

V.T. Tolok started to work at the Kharkiv university since the end of 1966, when he had headed the Department of Plasma Physics on the invitation of G.A. Milyutin - the dean of the SPhT. The Department was arranged by K.D. Sinelnikov. V.T. Tolok headed the Department till the beginning of 1971. Since that time he maintained a close relations with the Department and the SPhT constantly. In 1988, V.T. Tolok with the help of the university administration organized the vacuum-plasma laboratory at the university.

In last his years, V. Tolok paid much attention to the popularization of the science and technology achievements. He published a lot in different editions including the university journal *Universitates*, which is published by the V.N. Karazin KhNU Association of Alumni, Tutors and Friends. At the apogee of these activities the book 'Physics and Kharkiv' was published in 2009.

V.T. Tolok was awarded by the Order of the October Revolution, the Order of the Patriotic War of the 2<sup>nd</sup> class, the Order of the Badge of Honour, the Order For Courage of the 3<sup>rd</sup> grade and numerous medals. On 2<sup>nd</sup> of November in 2012 V.T. Tolok was awarded the medal and the diploma of the Honored Doctor of the V.N. Karazin KhNU.



**VOLKOV Dmitry Vasylyovych** (03.07.1925 – 05.01.1996) was an outstanding physicist theoretician, academician of the NASU, a major specialist in the field of elementary particles, quantum electrodynamics, nuclear physics, quantum field theory, condensed matter physics.

He was born in Leningrad. In 1943 he was drafted into the Soviet Army. In 1947, he joined the school of physics of Leningrad University. In 1951, he moved to study in Kharkiv, where he graduated from the DNPh, KhSU in 1952. After completing his graduate studies at the University under the supervision of academician O.I. Akhiezer and his defense of PhD in scalar quantum electrodynamics in 1956, D.V. Volkov was assigned to work for the theoretical department of KhIPhT headed by O.I. Akhiezer. There for nearly forty years, he has made a career from researcher to the head of the laboratory, to the academician. In 1959, he proposed a new scheme of field quantization - the so-called parastatistics or statistics of Green-Volkov, which was the important instrumental in the development of concepts of the quark structure of

hadrons. The discovery of a new type of symmetry – supersymmetry (in 1972, co-authored by V.P. Akulov) and built upon it the supergravity theory, which generalized Einstein's theory of gravitation (in 1973, co-authored by V.A. Soroka) brought V.D. Volkov the international fame. In 1968, he defended his doctoral thesis. In 1976, he was elected a corresponding member of the AS of Ukrainian SSR, was awarded the Order of the Red Banner of Labor. In 1977, he received the title of Professor. In 1988, he was elected an Academician of NASU. He was awarded the title of "Honored Worker of Science and Technology of Ukraine". In 1997 (posthumously), he was awarded the International

W. Thirring Prize for the discovery of supersymmetry and supergravity, and in 2010 (posthumously), he was awarded State Prize of Ukraine in Science and Technology.



**VOYEVODIN Victor Mykolayovych** was born in Kharkiv on 24<sup>th</sup> of April in 1946. In 1970, he graduated from Maxim Gorky Kharkiv State University (klhSU) (School of Physics and Technology (SPhT)). After its graduation, V.M. Voyevodin started to work at the KhIPhT (now NSC KhIPhT). He started to work there as an intern-researcher, and nowadays he is a Director of Institute for Solid-State Physics, Materials Science and Technologies. In 1984 he defended the PhD thesis, and in 1995 - the doctoral degree. In 2012, he has been elected a Corresponding Member of the NASU.

V.M. Voyevodin is a known specialist in the experimental radiation material science and nuclear energy. The main area of his scientific interests is the material science of fuel and constructional materials of nuclear reactors (exploited ones and promising innovative concepts). He has carried out the cycle of researches on the features of the structure and composition of the zirconium alloys under irradiation in nuclear reactors. He is one of the founders of the environmentally-friendly method for

simulating the reactor damage using particle accelerators.

He combines research and teaching activities successfully. During many years he gives a course of lectures on the "Radiation Material Science" at SPhT of the V.N. Karazin KhNU. Besides that he is a head of the branch of the department of Reactor Materials and Physical Technologies at NSC KhIPhT. Three PhD thesis were prepared and defended under his supervision. He is the author and co-author of more than 300 publications, reviews and patents including 3 monographs.

He was the winner of the Prizes of the Committee on the Peaceful Uses of Atomic Energy of the USSR for the best work on the physics of radiation damage in 1985 and in 1989. He is a Honorary Professor of NSC KhIPhT since 2003, and K.D. Sinelnikov prize of the NASU winner in 2010.



**ZALYUBOVSKY Ilya Ivanovych (15.06.1929 – 21.02.2013)** was born in Butenki village, Kobelyatsky district, Poltava region. In 1954, he graduated from M. Gorky KhSU (DNPh). All his further life was closely associated with the University. In 1958, he defended the PhD thesis. In 1963—1965, he was a head of the group of scientists, who carried out a scientific work and trained highly qualified specialists in the Atomic Center of the United Arab Republic of Egypt. In 1966, he was given a degree of Doctor of Science, he was a Professor since 1967. Since 1965, he was a head of the Department of Experimental Nuclear Physics, and since 1967, he was a Vice-President on Scientific Activities at the University. In 1968, he took part in the scientific research and gave a course of lectures in Manchester (former Rutherford) laboratory in England. He was a Corresponding Member of NASU since 1988. From the beginning of his scientific activities, I. Zalyubovsky carried out the investigations on the accelerated particle interaction processes with atomic nuclei and their structure.

For the first time in our country the problem of atomic nuclei static electromagnetic moments measuring was formulated and solved by I. Zalyubovsky together with Academician A.K. Walter using the method of the perturbed angular correlations. This work has been received further development on modern accelerators. In 1983, the series of these investigations was awarded the K.D. Sinelnikov Prize by Ukraine's Academy of Sciences.

The effect of the radio-frequency emission of the wide air showers of the cosmic rays was discovered under the leadership of I. Zalyubovsky, and then a detailed experimental study of its formation mechanism was carried out. Obtained experimental results are interesting for the theory development and understanding the radio emission, as well as for the development of new methods of the detecting the cosmic rays with ultrahigh energies. In 1971, the series of these works was awarded the State Prize of Ukraine. Under the leadership of I. Zalyubovsky, a new areas of study were opened and successfully developed. They were the acoustic phenomena in the interaction process of radiation with matter; a set of the nuclear-physical methods of the solid state physics. The series of works on complex research of the atomic nuclei and the processes of interaction of particles, nuclei and radiation with various energies with matter was awarded by the Yaroslav Mudry Prize in 1994. I. Zalyubovsky contributed significantly to the organization and development of School of Physics and Technology (SPhT) in V.N. Karazin KhNU. He was the first dean of SPhT. He was the author and co-author of more than 400 publications, including 5 monographs, "Nuclear Physics" and "Nuclear Spectroscopy" textbooks for university students. The fourth edition of the "Nuclear Physics" textbook was awarded the State Prize of Ukraine in 1993.

I. Zalyubovsky organized the scientific school, he trained the hundreds highly skilled professionals. Among his students there are 8 Doctors of Science and 40 PhDs.

He gave much energy to the organizational and social work. He was a Chairman of the Science Expert Council of

Technology, a member of the Scientific Council of NASU on nuclear physics and high energy physics. For many years, he presented the government of Ukraine in the Joint Institute of Nuclear Research (Dubna, Russia).

I. Zalyubovsky was a "Honored Worker of Science and Technology of Ukraine". He was awarded two Orders of the Red Banner of Labor (1976, 1986), the Orders of Merit of III, II and I grades (1998, 2004, 2008.). In 2007 he was awarded by title of "Honorary Citizen of Kharkov".



**ZELENSKY Viktor Fedotovych** was born on February 18, 1929 in the village of Globunivka of Novopokrovsky district of Saratov region. In 1951, he graduated from the DNPh, KhSU. Since 1951, all of V. Zelensky's life is connected with KhIPhT (now NSC KhIPhT). He was a graduate student and part-time laboratory technician, junior researcher, senior researcher, head of the laboratory of VM-2, MR department head, head of section, deputy director. Since 1980 till 1997 he was a director of the KhIPhT and then a director of NSC KhIPhT.

He defended PhD thesis in physics and mathematics in 1956, and doctoral thesis in technical sciences - in 1966. Topics of his work were related to the problems of the Soviet nuclear program. In 1978, V.F. Zelensky was elected a corresponding member of the AS of the Ukrainian SSR. In the same year, he was awarded the title "Honored Worker of Science and Technology of Ukraine". In 1988, he was elected an academician of the NASU.

He is a famous scientist, his main research interests lie in the fields of radiation damage physics, nuclear technology and radiative study of materials. he was an initiator of research in the new scientific field devoted to the development of rapid diagnostic methods of radiation damages of the materials of nuclear and fusion reactors by means of irradiation of these materials at the accelerators of multi-charged ions and electrons. In 1971, V.F. Zelensky has initiated a research program of the USSR on radiation physics and radiation material science and supervised the implementation of this program over 20 years. He is the author of the world's first heavy ion material testing accelerator (1973), which operates up to this day. Together with I.M. Neklyudov he made a decisive contribution to the scientific basis of the method of forecasting the reactor damages of steels and alloys. In co-authoring with O.S. Bakai he developed a new theory of the creation of steel and alloys, which are stable under radiation exposure. Under his leadership, the work was carried out in the area of nuclear materials, i.e. the study of the nature of instability of uranium fuel in industrial and power reactors and the search for ways to eliminate this instability, the creation of steel resistant to swelling, development of heat-resistant magnesium-beryllium "pseudoalloys", creation of high temperature reactor heat-generating element with a gas-coolant and other studies.

V.F. Zelensky is an author of several monographs and more than 400 original research papers and 60 inventions. For many years he was teaching at KhSU. Among his students there are about 30 PhDs and doctors of science. He is a laureate of the State Prize of the USSR (1972), the State Prize of Ukraine (2007). He was awarded the Orders of the USSR, Czechoslovakia and Ukraine.

#### REFERENCES

1. Vlasov V.V., Girka I.A., Azarenkov N.A., Khodusov V.D. Khar'kovskomu fiztekhu 50 let. – Kh.: OOO «Izdatel'stvo Maydan», 2012. -188s.
2. <http://www.nas.gov.ua/UA/Staff/Pages/Academicians.aspx>
3. <http://www.nas.gov.ua/UA/Staff/Pages/Correspondingmembers.aspx>
4. Vlasov V.V., Khodusov V.D. Do istoriji stvorenniya "fiztekhiivs'koji" systemy pidgotovky fakhivtsiv na fizyko-tekhnichnomu fakul'teti Kharkivs'kogo natsional'nogo universitetu. Tezy dopovidey Mizhnarodnoi naukovo-praktichnoi konferentsiyi "Universytets'ka osvita Ukrayiny XXI stolittya: problemy, perspektivy, tendentsiji rozvytku". – Kharkiv, 2000. – 243s.
5. Tolok V.T., Kogan V.S., Vlasov V.V. «Khar'kovskaya akademiya fizicheskikh nauk» (k istorii vozniknoveniya) // Universitates. - P.10-21.
6. Tolok V.T., Kogan V.S., Vlasov V.V. Fizika i Khar'kov. - Khar'kov: FLP Timchenko A.N., 2009. – 408s.



**Khodusov Valery Dmytrovych** – D.Sc., Professor of Theoretical Nuclear Physics Department, Head of A.I. Akhiezer Theoretical Nuclear Physics and Higher Mathematics Department of Physical and Technology Faculty V.N. Karazin Kharkiv National University. Scientific interests are in the theory of condensed matter, ekonophysics, history of physics.