

## Editorial

It is a pleasure to present to our readers this Special Issue of Acta Physica Universitatis Comenianae. This is really a very special issue dedicated to several our colleagues, who have recently been celebrating their anniversaries (Prof. Š. Šáro – 75, Prof. V. Bezák – 70, Prof. J. Pišút – 70, Prof. P. Lukáč – 70, Prof. M. Noga – 70, Prof. V. Martišoviš – 70, Assoc. Prof. M. Chudý – 70, Assoc. Prof. N. Pišútová – 70, Assoc. Prof. M. Florek – 70, and Ing. R. Janik – 70). Especially those born in 1939 represent the strongest group in the physics community of the Faculty of Mathematics, Physics and Informatics of the Comenius University in Bratislava.

All our jubilees have made for about fifty years important contributions to pedagogical and scientific achievements of the Faculty, which made them famous not only in Slovakia, but throughout the world. I will mention at least a few of them:

- **Prof. RNDr. Štefan Šáro, DrSc.** – discovery of new superheavy elements 110, 111 and 112 (in cooperation with GSI Darmstadt), and co-formation of the national school of low-radioactivity physics.
- **Prof. RNDr. Viktor Bezák, DrSc.** – contribution to the quantum theory, one of the founders of the quantum solid-state theory in Slovakia.
- **Prof. RNDr. Ján Pišút, DrSc.** – contribution to the theory of particle physics, and co-formation of the Bratislava school of the theory of particle physics.
- **Prof. RNDr. Peter Lukáč, DrSc.** – contribution to the low-temperature plasma physics, and co-formation of the national school of plasma physics.
- **Prof. Ing. Milan Noga, DrSc.** – contribution to the theory of particle and solid state physics, and co-formation of the respective schools.
- **Prof. RNDr. Viktor Martišoviš, DrSc.** – contribution to the low-temperature plasma physics, and co-formation of the national school of plasma physics.
- **Assoc. Prof. RNDr. Martin Chudý, CSc.** – development of new detectors for low-level counting, and co-formation of the national school of low-radioactivity physics.
- **Assoc. Prof. Nevenka Pišútová, CSc.** – contribution to the theory of particle physics.
- **Assoc. Prof. Matej Florek, CSc.** – contribution to the neutron physics.
- **Ing. Rudolf Janik, CSc.** – development of new detectors for high and low energy physics.

We wish all our jubilees strong health, happiness in their families, and many new exciting results in their scientific work.

Pavel Povinec  
Editor

**Prof. RNDr. Štefan Šáro, DrSc.**

Štefan Šáro was born on December 10, 1933 in Békecsaba (Hungary). He moved, together with his parents, to Komárno (Slovakia) in 1947. He completed his secondary school in 1952 in Kyjov (Czech Republic). He studied at the Faculty of Natural Sciences of the Comenius University in Bratislava from 1951 till 1957. In 1957 he started to work as a scientific fellow at the Institute of Nuclear Physics of the Czechoslovak Academy of Sciences in Rež near Prague. In 1959 he moved to the Faculty of Natural Sciences of the Comenius University, where he got the permanent position as the Assistant Professor

at the Department of Physics. From 1967 to 1969 he was working as an expert on nuclear physics at the Basra University (Iraq). In 1985 he moved as Senior scientist to the Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research, Dubna, Russian Federation. From 1990 to 1991 he was a visiting scientist at GSI - Gesellschaft für Schwerionen Forschung, Darmstadt (Germany). Since 1991 he was many times as visiting scientist at GSI Darmstadt, JINR Dubna, Jyväskylä University Finland, ATOMKI Debrecen, Lomonosov University Moscow and other laboratories, where he participated in joint experiments.

He received the degree Doctor Rerum Naturalium (RNDr.) in 1967, and the degree Candidate of Sciences (CSc, equivalent of PhD) in Experimental Physics in 1969. In 1990, after a delay due to political reasons, he became the Associate Professor of Nuclear Physics and Full Professor of Nuclear and Subnuclear Physics in 1994. He received the Doctor of Sciences (DrSc) degree in 1992.

Prof. Šáro is one of the founders of the Department of Nuclear Physics (DNP) at the Faculty of Natural Sciences, Comenius University, Bratislava (1961). He was one of the leading members of this department and significantly influenced the scientific orientation of the young collective for many years. At the beginning his research activities were oriented on low environmental radioactivity and on methods of its detection. He constructed and realized several unique detector systems of very low specific alpha- and beta-activities of environmental samples. In years of the so called “normalization of the Czechoslovak society” starting in 1970, his activities were damped. In 1985 when he became a senior scientist at the Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research, Dubna, he collaborated with the research group of academic G. N. Flerov and later academic Yu. Ts. Oganessian. He took an active part in experimental search for primordial superheavy elements and in synthesis of nuclei of heavy and superheavy elements. From 1990 he has been a core member of the superheavy element research group at the Gesellschaft für Schwerionen Forschung GSI, Darmstadt. His successful collaboration with both research institutes is still active.

Lecturing activities of Prof. Šáro started in 1962 when the DNP opened the specialization “Nuclear Physics”. He played a substantial role in building a nuclear

physics laboratory for exercises of the students of this specialization and also for all physics students. His first lecture was on impulse and nuclear electronic, as nobody else was ready to lecture this subject. After his comeback to DNP in 1991 he has been lecturing “Nuclear Reactions” and leading nuclear physics seminars for the specialization “Nuclear and Subnuclear Physics”. Till now, he has led about 15 diploma projects and 9 very successful PhD projects from 1994 to 2008. He is the author or co-author of several laboratory exercise textbooks and three monographs on nuclear physics topics.

**The main results of Prof. Šáro can be summarized as follows:**

*Environmental radioactivity and methods of detection*

Construction and realization of a large volume liquid scintillation coincidence-anticoincidence spectrometer for the detection of very low-level tritium and carbon-14 activities in environmental samples. Construction of the tritium enrichment line. Applications for environmental radioactivity control and tritium dating of underground water samples.

Construction and realization of grid ionization chambers with active sample sizes of 50 cm<sup>2</sup>, 500 cm<sup>2</sup> and 20 000 cm<sup>2</sup>, aimed to measure extremely low specific alpha activities in environmental samples. Applications in the field of possible plutonium pollution around and in the inner area of nuclear power stations.

*Methods and detectors for the investigation of heavy and superheavy nuclei*

Construction and realization of a unique large 4<sup>-</sup>double ionization chamber, aimed to detect simultaneously the alpha particles and both fission fragments of recoil nuclei, synthesized in complete fusion nuclear reactions. The chamber was connected to a kinematic separator (VASSILISSA) and cyclotron U400 at the Laboratory of Nuclear Reactions, JINR Dubna, and was used at the search for superheavy elements.

Construction and realization of a large area time-of-flight (TOF) detector system used behind the kinematic separator SHIP at GSI Darmstadt, aimed to distinguish between impulses from recoil nuclei and radioactive decay of nuclei, implanted into the active end-detector volume earlier. The TOF system consists of three 80 90 mm foil-micro-channel plate units and has the detection efficiency of 99.98 %.

*Physics of heavy elements*

Member of international collaborations on spectroscopic investigation of heavy nuclei of Z = 82–110. Within this framework, 15 new isotopes were discovered, their production cross sections and their decay properties were determined. Isomeric states of several isotopes of No, Lr and some other elements were discovered.

*Physics of superheavy elements*

The core member of an international collaboration on superheavy element research at GSI Darmstadt. Many attempts were made to synthesize new superheavy elements at the kinematic separator SHIP. In November 9, 1994 the new element “Darmstadtium” of Z = 110 was discovered in the reaction of  $^{208}\text{Pb}(^{62}\text{Ni}, n)^{269}110$ . In December 1994 another new element “Roentgenium” of Z = 111 was discovered in the reaction of  $^{209}\text{Bi}(^{64}\text{Ni}, n)^{272}111$ .

In 1996 the element of  $Z = 112$  was discovered in the reaction of  $^{208}\text{Pb}(^{70}\text{Zn}, n)^{277}112$ . In later experiments aimed to discover elements of  $Z = 113, 116$  and  $120$  only the upper limit of the reactions cross-section was determined.

Participation in experiments at the Laboratory of Nuclear Reactions, JINR, Dubna where the reactions of  $^{242,244}\text{Pu}(^{48}\text{Ca}, 3n)^{287,289}114$  were realized at the kinematic separator VASSILISSA in 1998–1999. Later these discovery reactions were repeated with better statistics.

Prof. Šáro is the author and co-author of over 240 articles in physics journals and conference proceedings, from which 73 articles were published in current physical journals and 33 in proceedings from international conferences.

Štefan Šáro has been seven times awarded at his home Comenius University: Silver (1983) and Golden medals (1993, 1996) of the Faculty of Mathematics, Physics and Informatics; Silver (1998), Golden (2001), large silver medal (2008) and the memorial medal (2009) of the Comenius University. He was also honored as the Slovak scientist of the year (1998). He is the holder of honorary diplomas (1996, 1998) and premiums (1992, 2004) of the Joint Institute for Nuclear Research, Dubna and some other awards.

*Pavel Povinec*

**Prof. RNDr. Viktor Bezák, DrSc.**

Viktor Bezák was born on September 10th, 1938, in Lučenec. His parents were bank clerks. He spent his childhood and youth (since 1941 until 1955) in Zlaté Moravce where he passed the secondary school. Even now he remembers very gladly his teacher of physics Peter Pavol Bartoš and teacher of mathematics Ján Šumný who both filled him with enthusiasm for exact science. During the period 1955–1960 he attended the Faculty of Natural Sciences of the Comenius University in Bratislava, where he studied the „general physics“ with emphasis on mathematical physics. He defended his diploma work

devoted to models of atomic nuclei under the tutorship of Ján Fischer. His ambition to become a theoretical physicist was not satisfied immediately after finishing the magister study. Namely, he was not able to find a job at a department of physics in Slovakia in 1960 and he was not experienced enough to try to find a work at an institute of the Slovak Academy of Sciences. Instead, he accepted one of positions that were then afforded by the state planning procedures. In his case, it was a technological position at the TESLA Works in Rožnov pod Radhoštěm, where he spent three years. The work there was a hard school of life for him (his assignment was to prepare single crystals of silicon for the semiconductor industry in Czechoslovakia), but it had at least two positive effects: he became a realist in understanding what the modern physics can give for the economy of a small country, and he changed his way of thought converting from a pure theorist to a theorist who should also have an eye on engineering problems.

Nevertheless, he always felt and still feels to be first of all a mathematical physicist. In 1963, he achieved the post-graduate position at the Institute of Electrical Engineering of the Slovak Academy of Sciences in Bratislava where he defended his dissertation in 1966 (the equivalent of the PhD dissertation). The main results of this dissertation were published in two papers in *Journal of Physics and Chemistry of Solids* (1966) about the n-type InSb thin films. From the present-day viewpoint, these papers outran, by about three decades, what has recently been fashionable – the nano-physics. In particular, his first paper published in 1966 involved clearly the idea of a two-dimensional electron gas which contemporarily has become central in the nano-physics!

A very important period in the life of V. Bezák was the academic year 1968–1969. Since October 1968 till June 1969, he enjoyed a postdoc stay at the Cavendish Laboratory, University of Cambridge, England. There he had the excellent opportunity to get acquainted with N. F. Mott, P. W. Anderson, A. B. Pippard, B. D. Josephson and others. He finished his stay at the University of Cambridge by publishing one paper that was communicated to the *Proceedings of the Royal Society* directly by N. F. Mott (who was then the Fellow of the Royal Society). (As it is well known, B. D. Josephson was awarded the Nobel prize in 1973. N. F. Mott and P. W. Anderson were awarded the Nobel prize in 1977.)

After returning to Bratislava, V. Bezák was engaged in organizational activity at the Institute of Electrical Engineering, where he became the vice-director until 1974. In October 1974, he went over to the Department of General Physics at the Comenius University. A part of this Department became the Department of the Solid State Physics and V. Bezák was its head for six years. In 1991, he was appointed the full professor of physics at the Faculty of Mathematics, Physics and Informatics, Comenius University. Since 2003, although he retired from the full professor appointment, he is still scientifically active at the Department of Experimental Physics of this Faculty.

The scientific interests of V. Bezák were very broad. Although he is mainly known as one of founders of the quantum solid-state theory in Slovakia, he was also engaged in the statistical physics, in solving various problems of the mathematical physics, in seeking applications of the theory of stochastic processes in physics, in seeking original ways of how to cope analytically with functional integration, and so on. His application of Feynman's functional (path) integrals in the theory of disordered semiconductors proved to be inspiring for many theorists both in Slovakia and abroad. He showed also that Feynman's path integrals are well applicable even in such different fields as the theory of optical cables or the theory of population genetics of soil bacteria. V. Bezák succeeded in generalizing Feynman's path integrals so that they may represent not only fundamental solutions of the Schrödinger equation for spinless particles, but also of the Pauli equation for spin-1/2 particles in an arbitrary magnetic field. Nowadays, V. Bezák is paying detailed attention to the tunnelling of electrons through laterally inhomogeneous barriers. The lateral inhomogeneity (and possibly stochastic inhomogeneity) of barriers, even if being almost ubiquitous in various semiconductor nano-structures, is the feature which was not duly respected in usual tunnelling theories (before his calculations) yet. In some published works, V. Bezák devoted attention to semiconductor superlattices, to the point contact spectroscopy, to stochastic boundary conditions for electron and/or phonon distribution functions, etc. One of his papers (co-authored in 1974 with M. Kedro and A. Pevala) involved the idea to use thin gold films as long-term detectors of mercury in water. Such detectors were recently fabricated by Italian technologists (V. Mattoli, B. Mazzolai, V. Raffa et al.)

In 1980, he defended his dissertation of the doctor of sciences (DrSc.), which is the highest scientific degree in Slovakia. The subject of his dissertation was „Continual path integrals with non-local potentials and their applications in physics“.

V. Bezák was pedagogically active at the Comenius University for four decades. His lectures concerned the transport theory of electrons and phonons in solids (i.e. electrical and thermal conductivity), theory of symmetry of crystals, theory of amorphous semiconductors, and many special topics. Together with L. Hrivnák, J. Foltin and M. Ožvold, he co-authored an extensive monograph “Theory of solids”. (This book had two editions 1978, 1985 and was used in fact as the text-book at Slovak and Czech universities.)

Some of Bezák's present colleagues at the Department of Experimental Physics were his former students (J. Greguš, R. Hlubina, P. Kúš, T. Roch). Among his former students, we register university professors (J. Banský, P. Kúš) and theorists with the degree of DrSc. (R. Hlubina, P. Markoš, L. Šamaj).

V. Bezák was active in Grant Agencies of the Slovak Republic. For one period, he was elected the president of the Grant Agency VEGA (at the Ministry of Education of the

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Slovak Republic and Slovak Academy of Sciences). For six years, he was also elected the president of the Union of Slovak Mathematicians and Physicists (JSMF, 2002–2008). Besides, he served more than thirty years as the chairman of the Bratislava division of JSMF. He served more than twenty years also in the committees for defences of dissertations (both for PhD. and DrSc.) for the subject „Physics of Condensed Matter and Acoustics“ as their chairman.

In 2004, the Learned Society of the Slovak Academy of Sciences elected him its regular member. During his scientific career, V. Bezák received many awards and medals, both from Slovak universities and from the Slovak Academy of Sciences.

*Pavel Povinec*

### Prof. RNDr. Ján Pišút, DrSc.



Ján Pišút was born on 16th of March 1939 in Bratislava. His father was a well known professor of Slovak and European literature and history of literature. In a similar way as his father, life of Ján Pišút has been connected with the Comenius University. Ján studied physics at the Faculty of Natural Sciences in the period from 1956 to 1961. As a student of Prof. Milan Petráš, the founder of theoretical particle physics in Slovakia, Ján has started to work in this relatively new field. At his alma mater he defended his thesis (1968), habilitated (1978), became the Doctor of Sciences (1981), and Professor of Physics (1983).

He spent most of his career as university teacher at the Department of Theoretical Physics at the Faculty of Natural Sciences (after its splitting in 1980 at the Faculty of Mathematics and Physics, and after its renaming in 2000 at the Faculty of Mathematics, Physics and Informatics).

After the foundation of the Department of Physics Education in 1988 Ján was appointed the head of this new Department, and he served in this function for two terms (1996–2004), after his comeback from „big politics“. After the „velvet revolution“ in 1989 he was involved in reorganization of the Slovak educational system. Since December 1989 to September 1990 he served as the first deputy of the Minister of Education of the Slovak Republic. In this position, apart of other issues, he took part in preparation of a modern Act of Higher Education in Slovakia. In September 1990 he was appointed the Minister of Education and remained in this position up to the elections in June 1992.

During his long career Ján Pišút had regular lectures in different fields of theoretical physics, but many of his former students remember his excellent lectures on quantum mechanics. He has supervised 25 diploma theses in Theoretical Physics and 15 diploma theses in Physics Education. He supervised more than twenty PhD students (14 in Theoretical Physics and some in Physics Education). Many of his former students belong today to respected personalities of Slovak and European science (P. Prešnajder, V. Černý, Š. Olejník, B. Tomášik and others).

He has been active in theoretical particle and nuclear physics and in physics education. With his friends and students he studied dispersion relations, representations of data by analytic functions, and many particle production in hadron and nuclear collisions. Some of the results are well known, for example he is one of the authors of analytic extrapolations methods (with P. Lichard and P. Prešnajder), summarized in a book published in 1983. Together with V. Černý and P. Lichard, he developed a phenomenological model of multiparticle production in hadronic collisions (LEPHAD) in 1977. Together with J. Ftáčnik and P. Lichard, he proposed the frequently cited alternative model of  $J/\psi$  suppression in heavy ion collisions. An indirect evidence of his scientific activities is a large number of publications in international physics journals (above 100), as well as many citations (close to 1000).



The successful career of prof. Pišút has also been connected with his regular stays at the CERN in Geneva (first in 1967, later in 1969–70, 1995 and 2002) and in other places (e.g. a few months stays at Clermont-Ferrand and Helsinki universities).

His efforts in the field of physics education resulted also in his appointment as the honorary Editor (1987–90) of European Journal of Physics, publishing papers on physics education at high schools, and on introductory physics courses at universities.

In the 60's Ján became one of the founders of the so called Triangle collaboration (Bratislava-Budapest-Vienna), which developed later into a systematic cooperation of physics institutes in Central Europe. Therefore, it was natural that he also became one of the main organizers of international Triangle Conferences which took place annually in Slovakia in the period from 1975 to 1991. Theoretical physicists in Slovakia and abroad know Ján Pišút also as the organizer of regular weekly seminars on Theoretical physics in Bratislava, as well as the initiator and organizer of the Educational seminar. Ján Pišút also helped to start the Physics Seminar by Correspondence in 1984. The first head of this seminar, Martin Mojžiš, provided an excellent start of this activity, and the seminar is marching on since that time.

Ján Pišút has authored a number of publications, including some in the outreach. He wrote, together with Ladislav Gomolčák, *The Introduction to Quantum Mechanics*, the first textbook in quantum mechanics by local authors in former Czechoslovakia (1st edition in 1975, 2nd edition in 1983 co-authored with V. Černý). He led a team of authors of the physics textbook for the 4th year of high schools, published since 1987 in 6 editions. The book also included chapters on modern physics, including some elements of quantum physics, relativity and astrophysics. He wrote, in cooperation with R. Zajac, a book popularizing quantum mechanics (*On atoms and quantization*; 1st edition in 1983, 2nd edition in 1988). He also initiated publication of the monograph *Historical sources of modern physics* (R. Zajac, J. Šebesta), and he co-authored the 2nd volume of this series (1st volume 1990, 2nd volume 1997).

The work of Ján Pišút has been frequently awarded by national and foreign awards. He is a honorary member of the Hungarian Roland Eötvös Society (1977), and he received the 1st Class Austrian Cross for Science and Arts in 1993. He is a honorary member of the Union of Slovak Mathematicians and Physicists (1999). He received the Dionýz Ilkovič Medal of the Slovak Academy of Sciences (1999), Gold Medal of the Comenius University (1999), Gold Medal of the Faculty of Mathematics, Physics and Informatics (1999), Ernst Mach Medal of the Czech Academy of Sciences (2001) and the Prize of the Slovak Physical Society (2004). He received the Slovak State Ľudovít Štúr award for his contribution to science and education in 2006.

Contributions of Ján Pišút to the development of physics in Slovakia are numerous. He has been an influential teacher for the whole generation of theoretical physicists and physics teachers. Due to his erudition in physics, ability of leading research teams, and thanks to his organizational talent, he has significantly contributed to the formation and development of the Bratislava school of the theory of particle physics. For more than three decades he has also belonged to leading personalities in physics education in the former Czechoslovakia and later in Slovakia.

*Juraj Šebesta*

### Prof. RNDr. Peter Lukáč, DrSc.



Prof. Peter Lukáč was born on 3rd March 1939 in small village Ábelová (south Slovakia). His father was a Lutheran priest and his mother was a teacher. Perhaps it was his older brother Pavel, who encouraged his interest in mathematics and physics, and persuaded him to leave the school for miners which he had entered as a young freshman. Peter studied physics at the Faculty of Natural Sciences of Comenius University in Bratislava in the period from 1956 to 1961. An extremely important role in Peter's formation as a scientist is attributed to his teacher Prof. Štefan Veis, the founder of plasma physics in Slovakia. He

defended his Mgr. thesis in 1961, his RNDr. thesis in 1967, his CSc. thesis (equivalent of PhD thesis) in 1969, habilitated in 1973, became Doctor of Sciences in Plasma Physics in 1987 and Professor of Plasma Physics in 1989. Since 2006 he is Professor Emeritus at the Faculty of Mathematics, Physics and Informatics of Comenius University.

He spent the whole his career as the university teacher, beginning at the Department of Experimental Physics at the Faculty of Natural Sciences of Comenius University (after its splitting in 1980 at the Faculty of Mathematics and Physics, and after its re-naming in 2000 at the Faculty of Mathematics, Physics and Informatics).

After the sudden and unexpected death of Professor Veis in 1981, Peter was nominated as the head of the Plasma Physics Division at the Experimental Physics Department, and he served in this function till September 1, 1989 when he founded the Plasma Physics Department. After the „velvet revolution“ (in November 1989) he was elected the head of Plasma Physics Department in June 1990 and he served in this function for allowed two terms (1990–1996). After one term interruption he was again elected for two terms and he served since September 1, 1999 to the end of June 2004. After reorganization in 2004 the Plasma Physics Department was partly included in Experimental Physics Department and partly in the Department of Astronomy, Earth Physics and Meteorology.

During his long career Peter Lukáč had regular lectures in different fields of physics (e.g. waves in plasma, microwave diagnostics of plasma), but many of his former students remember his original lectures on vacuum physics and techniques. He had lectures also on general physics for chemistry students. He has supervised more than 20 diploma theses in Plasma Physics and a few diploma theses in Physics Education. He supervised 14 PhD students. Many of his former students belong today to respected personalities of Slovak and European science (L. Šikurová, Š. Matejíček, J. Miertušová, Ľ. Malinovský, M. Foltin and others).

He has been active in vacuum and low temperature plasma physics (gas discharges) for over 50 years. With his friends and students he studied electron loss processes in afterglow period of DC or RF glow discharges in inert gases as a function of their purity, electron collisions with atom of noble gases, ion-molecule reactions at low energy, electron attachment to  $\text{CO}_2$ ,  $\text{CHClBr}_2$ , electron impact ionization of  $\text{CHF}_2\text{Cl}$ , frag-

mentation of argon cluster ions, dissociative ionization of O<sub>2</sub> molecule in argon-oxygen clusters, charge transfer from ion to molecule at thermal energies, electron and gas temperature dependences of dissociative recombination of electrons with molecular ions of noble gases, sorption processes of molecular sieves, investigation of corona discharge as a chemical reactor, electron density measurements by toroidal and cylindrical microwave cavity oscillating in different modes, deposited thin films by various methods, optical and microwave diagnostics of plasma, sterilized effects of corona discharges, microwave scattering by plasma column, combustion and carbonization in electrical discharge, cataphoretic phenomena in gas mixtures, etc. He published, together with V. Martišovič, the book "Air leaks in vacuum systems" in 1981. An indirect evidence of his scientific activities is large number of publications in international physics journals and in proceedings of international or national conferences (above 130), as well as many citations (more than 330). He was the principal researcher of seven national grants. He is coauthor of 4 textbooks in vacuum physics.

The successful career of prof. Lukáč has also been connected with his stays at the Royal Holloway College (University of London) with prof. Wooding in 1969–1970, than at Innsbruck University with Prof. Lindinger and Prof. Märk (first in 1979–1980, later in 1986, and several times after 1990), and at other places (e.g. University of Freiburg Prof. Helm, Heidelberg University Prof. Wolf, Charles University Prof. Šícha, Prof. Tichý, Eindhoven University of Technology Prof. Schramm, Aston University Birmingham Prof. Sullivan, University College Swansea Prof. Davies, University of Salford Prof. Armour, Unniversite de Rennes Prof. Queffelec, Prof. Rowe). He was invited as the Visiting Professor to Innsbruck University in 2007 and also to give lectures at seminars in several universities (Graz, Ljubljana, Groeningen, Bremen, Canterbury, Padova). His efforts in plasma physics resulted also in his appointment as the member of the Editorial Board of journals: Czech. J. Phys. (1993–2007), Pokroky matematiky, fyziky a astronomie (1971–1989), Čs. časopis pro fyziku (since 2008) and as the Editor of Acta Physica Universitatis Comenianae (1993–2006).

His scientific enthusiasm and personality pushed him to organize scientific conferences and to perform other activities influencing development of physics. In the years 1972–1973 Peter became one of the founders of the now very well established conference ESCAMPIG – European Sectional Conference on Atomic and Molecular Physics of Ionized Gases, organized for the first time at Versailles in 1973. He was the member of International Scientific Committee since the first to the fifth of this conference. A few years later he, together with Prof. Veis, organized the 3rd ESCAMPIG in Bratislava. In 1996 he was the chairman of the Local Organizing Committee of the 13th ESCAMPIG organized again in Slovakia in Poprad-Tatry. He was also co-organizing Symposium on Elementary Processes and Chemical Reactions in Low Temperature Plasma, now renamed to Symposium on Application of Plasma Processes – SAPP, which was founded by Prof. Veis in 1975. Peter later became the chairman of the organizing committee, and this symposium has become well known in the world. Peter was also a member of international scientific committees of several conferences (e.g. HAKONE, EPCLP 91, SAPP) or organizing committees of several conferences (e.g. ICPEAC 20 – Vienna, ICTP 12 – Bratislava, 6th Joint Vacuum Conf. Slovenia-Hungaria- Croatia-Austria 1995 – Ljubljana, seminar EAPE 1999 –

Bratislava). These conferences later developed into a systematic cooperation of physics institutes in Europe. Peter Lukáč also organized regular weekly seminars on Plasma physics in Bratislava, where many young physicists received first experiences in the presentation of their works.

Peter Lukáč has spent a lot of energy in promoting mobility programmes for outstanding students not only in plasma physics, but also in other fields of physics. Many graduate or current postgraduate students of our Faculty are certainly grateful for his effort to prepare for them positions or scholarships at well-known European Universities. These positions were important for their scientific career at home or at foreign universities. He was a member of the coordinating committee of the European Mobility Scheme of Physics Students - EMSPS, supervised by the European Physical Society. He took part in the TEMPUS project PEGAS, and in a few projects of the Programme CEEPUS. He also joined the international project EPIC.

The work of Peter Lukáč has been frequently awarded by national awards. He is a honorary member of the Union of Slovak Mathematicians and Physicists (1999), and the Slovak Physical Society (2006). He received Bronze and Silver Medals of the Comenius University (1989 and 1999), Gold Medal of the Faculty of Mathematics, Physics and Informatics (1999), Memorial Medal to the 50th anniversary of the Faculty of Natural Sciences of the Comenius University, Silver Medal of the Faculty of Natural Sciences of the Masaryk University in Brno, Medal of second order of the Faculty of Mathematics and Physics of the Charles University in Prague, Bronze Medal of the Faculty of Nuclear and Physical Engineering of the Czech Technical University in Prague, Medal of second order of the Physical Scientific Section of the Union of Czechoslovak Mathematicians and Physicists. In 2008 he received the Honorary award „Ehrenbuerger der Leopold Franzens University in Innsbruck“ (Honorary citizen of Innsbruck University) for outstanding contribution to the development of research in physics at the Innsbruck University, and resulting in more than 100 common published papers.

Professor Lukáč is an individual member of several international and national professional societies. He is the member of the Institute of Physics - IoP (London), American Vacuum Society (AVS), European Physical Society (EPS). He is the representative of Slovakia in the Plasma Science and Technique Division (PSTD) of the International Union of Vacuum Science, Technique and Applications (IUVSTA). He was the Alternate Councilor of the Executive Committee of IUVSTA since 1988. He is the member of the Union of Slovak Mathematicians and Physicists (JSMF). He was the chairman of its National Committee (1993 - 1996) and its vice chairman (1996 - 2005). He is the member of Slovak Physical Society, member of the Slovak Vacuum Society (vice-chairman between 1993 and 2006). He was the member of the National Committee of IUPAP (1999 - 2005).

Contributions of Peter Lukáč to the development of physics, namely vacuum and plasma physics, in Slovakia are numerous. He has been an influential teacher for a whole generation of experimental physicists and chemists. Due to his erudition in physics, ability of leading research teams, and thanks to his organizational talent, he has significantly contributed to the formation and development of the well know Bratislava school of elementary processes in low temperature plasma.

*Pavel Povinec*

**Prof. Ing. Milan Noga, DrSc.**

Milan Noga was born on October 2nd, 1939, in Spišský Štiavnik (Poprad district). After finishing Poprad High School in 1957 he studied physics at the Faculty of Technical and Nuclear Physics of the Czech University of Technology in Prague, where he graduated in 1962. Since 1962 he became the permanent staff member at the Department of Theoretical Physics of the Faculty of Natural Sciences of the Comenius University in Bratislava. At the Department of Theoretical Physics he joined the research group led by Prof. Milan Petráš who established a scientific school on the theory of elementary particles in Slovakia.

The scientific and academic career of Milan Noga developed quickly and successfully. In the period 1966–1970 he published by himself or with co-authors over 10 scientific papers on theory of elementary particles in renowned scientific international journals such as *Nuclear Physics* and *Physical Review*. In 1969 he defended his PhD thesis, in 1971 he became the Associate Professor, in 1981 he defended his Doctor of Sciences thesis and in 1983 he became the professor of theoretical physics at the Faculty of Mathematics and Physics of the Comenius University in Bratislava. In 1987 he was elected the corresponding member of the Slovak Academy of Sciences, and in 1988 the corresponding member of the Czechoslovak Academy of Sciences.

The scientific results of Milan Noga on theoretical physics of elementary particles were soon recognized and he got several invitations from scientific academic centers from abroad. His first stay abroad was in 1967–1969 at the Institute for Theoretical Physics at the University of Helsinki in Finland, where long and successful cooperation with Prof. Christofer Cronström started. Since 1974 he was visiting the University of Helsinki regularly every year for at least one month. He spent the academic year 1969–1970 at the Department of Physics of the Purdue University in Lafayette in the USA. The next scientific visits were at the Karlsruhe University in Germany (1975) and at the International Centre for Theoretical Physics (ICTP) in Trieste in Italy (1988).

Milan Noga has been giving lectures on the classical theory of the electromagnetic field, on theory of relativity, statistical physics and thermodynamics, theory of condensed matter, quantum field theory of many particle systems, and functional integral methods in physics. He has been one of the best physics teachers at the Faculty, and his lectures were very attractive and popular. He also contributed for many years to the education of young scientists as the Chairman of the Committee for the Competition for the best student research work from physics at the Faculty of Mathematics and Physics. Pedagogical activities of Milan Noga were not restricted only to the Comenius University. He was giving lectures at the University of Helsinki and at the University of Technology in Helsinki within the program Socrates and Erasmus in the period of years 1999–2002.

From the beginning of his scientific research, Milan Noga was interested in the theory of elementary particles, namely, in S-matrix theory, theory of self-consistency within the

S-matrix theory, and later mainly in applications of algebraic realizations of symmetries in elementary particle physics. The main results from this period are: (i) the explanation of the origin of the Cabibbo angle, which is the fundamental parameter in the weak interaction theory, and (ii) the solution of non linear relations between masses of hadrons and their decay amplitudes proposed by Steve Weinberg. Both results were obtained and published together with Prof. Cronström. They showed that the Weinberg's algebraic realizations of symmetries are isomorphic to certain Lie algebras, and the hadron masses form tensor components of these Lie algebras.

In 1980 Milan Noga switched his research work to solid state physics. His main interests became the laser induced structures in solids, and a self-organization of structures in fermion systems due to Coulomb and magnetic interactions. The main results cover the development of the theory of the laser annealing of disordered semiconductors, as well as the superconductivity in heavy fermion systems. Since the discovery of high-temperature superconductivity, Prof. Noga devoted his research effort for the explanation of this phenomenon. He showed the possibility of the separation of the charge and spin degrees of freedom of electrons (proposed by Anderson) by the explicit decomposition of electron field operators as product of two operators, in which one is associated with the charge and the second with the spin degrees of freedom.

Prof. Noga has established a scientific school on the theory of many body systems by supervising diploma works of many students, as well as five PhD students, one of them is now already Doctor of Sciences. Further, three of his PhD students have completed their PhD studies on renowned scientific institutions abroad, and they are presently professors at universities in Germany, USA and Sweden.

Prof. Noga is also co-author of the university textbook from statistical physics and thermodynamics (F. Čulík, M. Noga: Introduction to statistical physics and thermodynamics, 1st edition 1984, 2nd enlarged edition 1993). He is the author of the lecture notes on the Theory of the electromagnetic field, and coauthor (with M. Dubec and V. Balek) of the lecture notes on the Theory of relativity. Both these lecture notes were issued by the Comenius University Press.

The organisation activities of Milan Noga have also been noticeable. He was the chairman of the Slovak Physical Society, at that time a section of the Union of Slovak Mathematicians and Physicists (1979 1981), member of the Council Board of the European Physical Society (1980 1981), member of the Scientific Board for Physics of the Czechoslovak Academy of Sciences (1982 1992), and the Academy of Sciences of the Czech Republic (1993 2002). During 1990 1991 he was the Vice-Rector for science and research of the Comenius University, and during 1998 2004 he was the head of the Department for Theoretical Physics at the Faculty of Mathematics, Physics and Informatics of the Comenius University. He was also a member of: the Accreditation Committee at the Government of the Slovak Republic (1990 1995), Editorial Board of the Czechoslovak Journal for Physics A (1990 2002), and the Grant Agency VEGA (1991 2000). Through his long-term cooperation with Prof. Cronström, the Department of Theoretical Physics of the Comenius University has been keeping close contacts with the University in Helsinki for more than 4 decades. As the result of this cooperation, the Socrates Bilateral Agreement 2001 2006 between the University of Helsinki and the Comenius University in Bratislava has also been signed, and Prof. Noga has become the

authorized representative for the cooperation between Department of Physics at the University of Helsinki and the Department of Theoretical Physics at the Comenius University in Bratislava.

Prof. Noga was awarded by the Gold Medal of the Comenius University (1999), the Gold Medal of the Faculty of Mathematics, Physics and Informatics of Comenius University (2004), as well as by the Medal of the University of Helsinki (2001) for his scientific, pedagogical and organization activities.

Prof. Ing. Milan Noga, DrSc., thanks to his achievements in scientific and pedagogical work, has become a prominent Slovak theoretical physicist. He contributed in a noticeable way to the development of the theory of elementary particles and the solid state physics theory in Slovakia. As a university teacher he has a great share on the education of several generations of Slovak theoretical and experimental physicists.

*Juraj Šebesta*

**Doc. RNDr. Martin Chudý, CSc.**

Martin Chudý was born in a teacher family on 27th January 1939 in Martin. He attended the secondary school in Banská Bystrica and in Bratislava and he started to study mathematics and physics at the Faculty of Natural Sciences of the Comenius University in 1956. He completed the studies of physics in 1961, and became an Assistant Professor at the newly formed Department of Nuclear Physics at this Faculty. In 1982 he defended his PhD thesis in Physics (at that time called Candidate of Sciences – CSc.), and he became Associate Professor of Physics in 1986.

In the years 1992–1997 Martin was the Head of the Department of Nuclear Physics. During 1998–2003 he was the Vice-Dean of the Faculty of Mathematics, Physics and Informatics (mathematics and physics split from the Faculty of Natural Sciences of the Comenius University in 1981), responsible for educational agenda. In 2004 he officially retired from the Faculty, however, presently he is still delivering lectures and seminars on experimental nuclear physics.

He has been very active in educational work, and contributed significantly to the education of Slovak nuclear physicists. He developed several practical exercises with detailed textbooks for students. He has been delivering lectures on various topics of nuclear physics, e.g. Experimental methods of nuclear physics, Radiation dosimetry, Radiometrics methods, Nuclear energy and the environment. He is co-author of 9 textbooks, and one book on Experimental nuclear physics. He has been very efficient in supervising students as well. He was supervisor of 32 diploma works and 8 PhD students.

Scientific work of Martin Chudý was concentrated on low radioactivity physics, especially on low-level gamma-ray spectrometry, and applications in environmental physics, e.g. on impact studies of nuclear installations on the environment. He has been well known as the leading expert in low-level analysis of radionuclides in the environment. He contributed significantly to the development of the experimental base of the Department of Nuclear Physics for measuring very low activities. He was the responsible officer of more than 10 research projects, including two international projects with the International Atomic Energy Agency in Vienna. He published over 60 papers in scientific journals and proceedings. He is also co-author of 2 patents and 6 newly developed and realized detectors. He also contributed to the development of the project of the Slovak Cyclotron Centre, which is presently under realization.

Martin was also very active in co-organizing over 10 international and national scientific conferences and seminars, which were well received abroad (including 14th Europhysics Conference on Nuclear Physics, Bratislava, 1990).

As the Vice-Dean of the Faculty of Mathematics, Physics and Informatics of the Comenius University he developed a new credit system for students. He has been well known among colleagues and students because of his kind and gentle character, and his willingness always to help.



He was member of various scientific and honorary committees, e.g. Member of the Scientific Council of the Faculty of Mathematics, Physics and Informatics, Member of the Grant Scientific Agency VEGA, Member of the Commission for Postgraduate Studies, Chairman of the Commission for State Examinations in Nuclear and Subnuclear Physics, Chairman of the Commission for RNDr. Degree, Member of the Commission for PhD Degree, etc.

Martin Chudý dedicated almost 50 years for the work at the Department of Nuclear Physics, Faculty and the Comenius University. His achievements in the educational and scientific work were honored by the Comenius University (Silver medal in 1998, Golden medal in 2001, Memorial medal in 2009), as well as by the Faculty of Mathematics, Physics and Informatics (Silver medal in 1983, Golden medals in 1993 and 1996).

*Pavel Povinec*

### Doc. RNDr. Nevenka Pišútová, CSc.



Nevenka Pišútová was born on 11th May 1939 in Michalovce. She attended the secondary school in Poprad, and she started to study mathematics and physics at the Faculty of Natural Sciences of the Comenius University in 1956. She completed the studies of physics in 1961, and started to work in the Institute of Technical Cybernetics of the Slovak Academy of Science. In 1971 she joined the Faculty of Natural Sciences of the Comenius University and became an Assistant Professor at the Department of Nuclear Physics. She defended her PhD thesis in Physics (at that time called Candidate of Sciences - CSc.) and in 1986

became Associate Professor of Physics in 1972.

In the years 1972-1979 Nevenka Pišútová was the Scientific Secretary of the Department of Nuclear Physics. During 1979/1997 she was the deputy of the Head of the Department. During 1997-2003 she led the Department of Nuclear Physics as its Head. For many years she served as supervisor of study program Nuclear and Subnuclear Physics and chairwomen of examination committees at various study levels. In 2004 she officially retired from the Faculty, however, presently she is still active in education of new generation of physicists.

She has been very active in pedagogical work, and contributed significantly to the education of Slovak nuclear physicists. She was the initiator and moving force behind introduction and later wide application of computers and modern numerical methods in nuclear physics research and education. She developed course in computational nuclear physics with detailed textbooks for students. She has been delivering lectures on various topics of atomic and nuclear physics, e.g. Introduction to atomic and nuclear physics, Numerical methods of nuclear physics, Simulations in nuclear physics. She is co-author of 9 textbooks and one book on Experimental nuclear physics. She has also been very active in supervising students. She supervised 8 diploma works, 8 scientific student projects, and 5 PhD thesis. She has been well received among colleagues and students because of her nice attitude and her willingness always to help.

During her first years at the department of Nuclear Physics she was doing research mainly in the field of nuclear data acquisition and its analysis by computers. Most of these activities were in the field of environmental radioactivity. Later she entered the field of high energy physics. She was oriented on the collisions of heavy ions at ultrarelativistic energies in which formation of quark-gluon plasma is expected. Contribution of Nevenka Pišútová was mainly in simulations of these collisions and study of various signatures of quark gluon plasma formations (e.g. dilepton production,  $J/\psi$  suppression, etc.). In this field she was the principal investigator of more than 10 research projects, including a few international projects with colleagues from Europe and USA. She published over 90 papers in prestigious scientific journals and proceedings. She was very active also in organizing scientific life not only at the Faculty, but also in Slovakia. Valuable is her

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contribution to the development of collaboration and later full membership of Slovakia in CERN.

Nevenka Pišútová contributed substantially to organization of over 15 international and national scientific conferences and seminars, which attracted broad international audience (including several Hadron Structure Conferences, 14th Europhysics Conference on Nuclear Physics, Bratislava, 1990).

She influenced significantly organization of Slovak scientific life after November 1989, by her participation in preparation of the system of grant agencies. Similarly, during her term in the Council of Universities of Slovakia, she participated in the reformation of the Slovak university system. She belongs to one of the first collaborators of the Academic Ranking and Rating Agency of Slovakia. She was a member of various scientific and honorary committees, e.g. Member of the Commission for Postgraduate Studies, Chairman of the Commission for State Examinations in Nuclear and Subnuclear Physics, Chairman of the Commission for RNDr. Degree, Member of the Commission for PhD Degree, etc.

Nevenka Pišútová spent almost 40 years of her professional life at the Department of Nuclear Physics, the Faculty and the Comenius University. Her contribution to the education of many generations of nuclear physicists and her scientific achievements were honored by the Comenius University (Silver medal in 2001), as well as by the Faculty of Mathematics, Physics and Informatics (Silver medal in 1983, Golden medals in 1993 and 1996).

*Jozef Masarik*

**Doc. RNDr. Matej Florek, CSc.**

Matej Florek was born on 4th July 1939 in Krušetnica. He completed the secondary school in Námestovo in 1956. Then he went to study physics in the former Soviet Union, where he completed the Faculty of Physics of the Moscow State University in 1962. In the same year he became the Assistant Professor at the newly formed Department of Nuclear Physics of the Faculty of Natural Sciences of the Comenius University in Bratislava. He defended his PhD (called CSc. at that time) in 1978 and he became the Associate Professor of Physics in 1989. His scientific work has mainly been oriented on neutron physics,

very often in collaboration with the Joint Institute of Nuclear Research (JINR) in Dubna (north of Moscow), where he worked between 1965 and 1971 and again from 1996 to 1999. He worked there in the Laboratory of Neutron Physics studying rare nuclear reactions induced by neutrons, measuring natural neutron background, and studying metrology of the neutron radiation.

Recently at the Faculty of Mathematics, Physics and Informatics of the Comenius University, also in collaboration with JINR, he has been developing nuclear analytical methods, mostly neutron activation analysis. These studies have been carried out with the aim to better understand the contamination of lower atmosphere by aerosols. He was the principal investigator of 8 national and international projects dealing with these topics. He published over 120 scientific papers.

His pedagogical work at the Faculty was also mainly oriented on neutron and experimental nuclear physics. He has been delivering lectures for students on neutron physics and also on reactor physics. He was also leading special experimental exercises for students on nuclear physics.

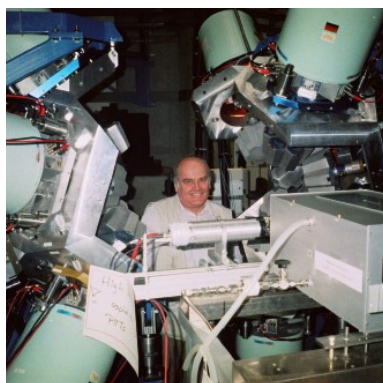
Matej Florek contributed significantly to the experimental character of education at the Department of Nuclear Physics. He is the author and co-author of 8 textbooks for students studying various aspects of neutron, reactor and applied nuclear physics. He also participated in the development of the electronics textbook for students on nuclear physics. He has been currently engaged in leading students in their diploma works and PhD theses.

Matej Florek was the founding member of the Slovak Nuclear Society, member of its Executive Committee (1990–2004), and he was the President of the Society between 1991 and 1992. He has also been member of the Union of Slovak Mathematicians and Physicists.

Matej Florek dedicated over 30 years for the work at the Department of Nuclear Physics. His achievements in the scientific and pedagogical work were honored by the JINR Dubna (the First place in 1971 for papers on Decay of alpha neutron resonances), as well as by the Comenius University, the Faculty of Mathematics, Physics and Informatics, and Slovak Nuclear Society.

*Pavel Povinec*

## Ing. Rudolf Janik, PhD.



Rudolf Janik was born on 28th September 1938 in Piešťany, where he also obtained the secondary education. In 1969 he finished the Faculty of Electrotechnics of the Slovak Technical University in Bratislava as an engineer.

He has been working at the Faculty of Natural Sciences of the Comenius University in Bratislava since 1961 when he joined the newly established Department of Nuclear Physics (in 1981 mathematics and physics was separated as the Faculty of Mathematics and Physics of the Comenius University). He defended his CSc. (equivalent of PhD) thesis

in 1993 at the Faculty of Mathematics and Physics of the Comenius University (which was delayed due to political reasons). In 1997 he became a leading scientific worker at the Faculty.

In 1965 he moved to the Laboratory of Nuclear Problems of the Joint Institute of Nuclear Research (JINR) in Dubna (in the Moscow region), where he joined the Bratislava group working on experiments with Vavilov-Cerenkov radiation, including a search for magnetic monopole. His contribution was important namely in the design and construction of detectors and electronics for high energy physics experiments.

In 1973 he returned back to the Faculty and continued his cooperation in high energy physics and instrumentation with JINR Dubna, as well as with Bologna and Modena universities. He has also been active in low energy physics, contributing especially in the design and construction of radiation detectors and electronics for measuring very low activities.

After 1989, when collaboration in high energy physics with CERN has become feasible, Rudolf became a member of the Bratislava group on the DELPHI experiment carried out on the LEP accelerator. He contributed to the development of silicon strip detectors for Very Forward Tracker of DELPHI. When the DELPHI experiment was completed, he joined the ALICE experiment which is going to run on the LHC collider. He contributed significantly to the results of the Bratislava group on the design and construction of time projection chambers (TPC).

Rudolf Janik has also contributed significantly to the work of the Bratislava group which has been carried out at the Institute of Heavy Ions (GSI) at Darmstadt. He developed time of flight detectors for the measurement of the velocity and the energy of heavy ions. These detectors played an important role for the synthesis of three new superheavy elements, namely 110, 111 and 112. He has also been contributing to the development of TPC for the detection of heavy ions in the fragment separator, as well as in the experiments searching for neutron and proton halo.

He made important contributions in low energy physics in the development of multielement proportional detectors, multilayer plastic scintillation detectors, ionization chambers and gas neutron detectors.

Rudolf has been taking part in many research projects, with responsibility for the development of the detection part of the experiment. He has been recognized as a great expert in construction of radiation detectors, always ready to help with a new idea.

Rudolf has been regularly publishing results of his work in scientific journals and proceedings. He is one of the most active authors at the Faculty, publishing yearly about 10 papers in CC journals, with about 100 citations/year. He is also author and co-author of more than 20 patents.

Rudolf Janik has been awarded with several awards and medals. At JINR Dubna he received several diplomas for scientific achievements (1972, 1973, 1974). His achievements in the scientific work were also honored by the Comenius University (Bronze medal in 1988), as well as by the Faculty of Mathematics, Physics and Informatics (Golden medals in 1998, 2001 and 2008; Silver medal in 1996; Bronze medal in 1994).

*Pavel Povinec*