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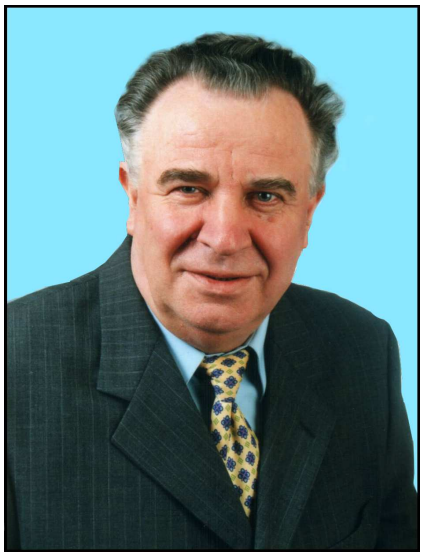
IN MEMORY OF OTTO BARTOLOMIYOVYCH SHPENYK (14.07.1938–29.09.2020)



On September 29, 2020, the heart of the famous Ukrainian scientist and science manager Otto Bartolomiyovych Shpenyk stopped beating at the age of 83. O.B. Shpenyk gained a wide recognition throughout the world owing to the results that were obtained within a wide scope of his research and substantially enriched atomic physics, physics of electron collisions, and atomic and molecular spectroscopy. O.B. Shpenyk was the Dr.Sci. in physics and mathematics, Professor, Academician of the National Academy of Sciences of Ukraine (NASU), Honored Worker of Science and Engineering of Ukraine, Laureate of the State Prize of Ukraine in Science and Engineering, a Member of the Physics Section in the Committee of the State Prizes of Ukraine in Science and Engineering, and a foreign member of the Hungarian Academy of Sciences.

Otto Bartolomiyovych Shpenyk was born on July 14, 1938, in the town of Mukachevo [1] in a family of office workers. His school years coincided with the post-war devastation, so he had to study at several schools in Mukachevo. Simultaneously, he learned to play the violin at the Mukachevo Children's Music School. Like most children in the post-war period, Otto was involved in the technical clubs at the Palace of Pioneers. He was also fond of sports – lawn and table tennis, football, and fencing – and participated in the town, regional, and national competitions. At the same time, he was a member of the famous symphony orchestra of the Mukachevo Town's Palace of Culture.

After graduating from school in 1956, Otto Bartolomiyovych became a student of the Faculty of Physics and Mathematics (Department of Physics) at the Uzhgorod State University. The level of students-physicists was rather strong that year, and, in order to be among the best, one had to work hard from the very beginning. Because of the lack of their own textbooks, the students studied making use of the lecture notes and textbooks that were available only in the reading hall of the university library, and they worked there till 10–11 pm. This course of physicists was lucky with lecturers who were graduates from the leading universities in Kyiv, Moscow, Lviv, and Leningrad. At that time, the scientific staff of the faculty included persons whose names became later well known throughout the country: the mathematician O.F. Khitchii, the physicists D.V. Chepur, M.V. Bratiichuk, Yu.M. Lomsadze,

[1] At that time, Mukachevo belonged to Subcarpathian Ruthenia, a part of Czechoslovakia. Since January 22, 1946, Subcarpathian Ruthenia (Transcarpathian Ukraine) has become officially known as the Transcarpathian region of the Ukrainian SSR.

V.O. Skoda-Ulyanov, I.P. Zapisochnyi, S.M. Kyshko, A.Ye. Kovalchuk, Ye.L. Zhukova, and I.G. Zhukov.

O.B. Shpenyk was always at the leading edge of time and strived for new knowledge. He began his scientific activity in the 3rd year of the university under the supervision of the Dean of the Faculty of Physics, the associate professor S.M. Kyshko. The first scientific task and, at the same time, the subject of his coursework consisted in carrying out studies in the domain of radio spectroscopy.

After successfully graduating from the university, the young graduate was sent to work as a physics teacher at the Lybokhora secondary school in the Lviv region. At the same time, as an excellent student, he was given a recommendation for his admission to the postgraduate course. After having successfully passed the entrance exams, O.B. Shpenyk became a postgraduate student at the Department of Optics of the Uzhgorod State University. His scientific supervisor was the head of the department, Professor I.P. Zapisochnyi. In such a way, the further scientific destiny of the future academician had become coupled with the Uzhgorod State University, where Otto Bartolomiyovych passed a path from a postgraduate student to a professor and the scientific head of the Problematic Scientific Research Laboratory of the Physics of Electronic Collisions. From 1964 to 1982, he worked at the Uzhgorod State University as a senior engineer, a senior researcher, the head of the Problematic Laboratory, and professor of the chair of quantum electronics.

In 1966, O.B. Shpenyk defended his Ph.D. dissertation at the Leningrad University (Russia). In his report on this scientific work, the winner of the State Prize, Professor V.M. Dukelskii (the A.F. Ioffe Physico-Technical Institute of the Academy of Sciences of the USSR) wrote, "... A high value of the experimental studies performed by O.B. Shpenyk and presented in his dissertation is beyond doubt. In the course of those studies, new important effects were discovered, which have not been reliably interpreted yet. It is quite probable that the explanation of those effects would demand a substantial complement of the available theory of atomic excitation by electron impact." In those words, V.M. Dukelskii outlined a broad scientific path for the future academician.

The successful defense of the Ph.D. dissertation by a young 28-year-old scientist at the Leningrad University, one of the oldest (founded in 1819) and the most world-famous universities of the USSR, testified to his large talent and abilities, broad scientific erudition, purposefulness, and prospects. So it was no wonder that O.B Shpenyk together with the first disciples of Professor I.P. Zapisochnyi – V.S. Shevera, L.L. Shimon, I.S. Aleksakhin, P.V. Feltsan, V.V. Skubenych, I.G. Zhukov, and I.I. Garga – stood at the origin of the Uzhgorod State University's scientific school of atomic physics, the physics of electronic and atomic collisions, which was later named Professor I.P. Zapisochnyi's school. A dedicated scientific activity of O.B. Shpenyk and the recognition of the uniqueness of the research performed by him and his scientific team made it possible to write a doctoral dissertation, which he successfully defended in 1975 at the Institute of Physics of the Academy of Sciences of the Ukrainian SSR, thus becoming the youngest (37 years old) Dr.Sci. among the experimental physicists at the Uzhgorod State University.

O.B. Shpenyk directly participated in the creation and formation of the first important center of academic science in Transcarpathia, the Uzhgorod branch of the Institute for Nuclear Research of the Academy of Sciences of the Ukrainian SSR (INR AS UkrSSR). From 1982 to 1988, he was the head of the Department of Ionic Processes at this center, and, from 1988 to 1992, the head of this department and the deputy director for scientific work at the INR AS UkrSSR. In 1992, he was elected the director of the Institute of Electronic Physics (IEP) of the NASU, which was created on September 21, 1992, on the basis of the Uzhgorod branch of the INR of the NASU and which became the first independent academic institution in Transcarpathia.

O.B. Shpenyk was the director of this Institute for a quarter of century: from the day of its opening to 2017. At this position, his talent as a scientist and science manager, his erudition and scope of interests, his kindness and intelligence revealed themselves the most clearly. To a great extent, it was owing to Otto Bartolomiyovych, who continued the traditions of his teacher, Professor I.P. Zapisochnyi, that a democratic, free, and creative atmosphere was created at the Institute from the first days of its existence. This atmosphere favored scientific studies and discussions, the exchange of opinions on topical issues in modern physics at seminars and in an informal atmosphere. It was especially attractive for young people who tried to find their place in science.

O.B. Shpenyk was the one who drove the Institute to leading positions in the world science, who created the glory of this academic Institute, which he loved infinitely and which he served to his last breath. He eagerly supported the idea of holding the international conference "The Centenary of the Electron (EL-100)" at the IEP of the NASU in 1997. It was the only conference held on this topic in Ukraine. The conference was dedicated to a unique event in the history of physics, the discovery of the electron. Leading scientists from the USA, Europe, Russia, and Ukraine made vivid reports at that conference. It was the first international recognition of the young academic Institute and allowed its international scientific links to be expanded and strengthened further. The next step in this direction was the organization and holding, also on the basis of the IEP, of the first European Conference on the Elementary Processes in Atomic Systems (CEPAS'2000). The subject of the conference was formulated by O.B. Shpenyk and supported by the European Physical Society. Currently, the CEPAS conference has a high scientific reputation and is regularly organized in various European countries.

For O.B. Shpenyk, physics was the main thing in his life and his main passion. The scope of his research interests included modern atomic physics, optical and electron spectroscopy, physical electronics, simulation of elementary processes in the atmosphere of the Earth and other planets. He was a living encyclopedia on the history of the development of the experimental physics of electronic collisions in Uzhgorod. He is deservedly recognized in the world science as one of the founders of precision experiments with highly monoenergetic electron beams, which enabled the fine structure in the electronic excitation functions of atoms to be identified for the first time. Together with his colleagues and disciples, he created a modern, at that time, experimental basis and developed a number of new unique devices and methods for studying the elementary processes in atomic systems stimulated by low-energy electronic and ionic beams. The list of devices, together with the others, includes electron guns, multichannel sources of atomic and molecular beams, an efficient universal ion source, high-performance monochromators and electron analyzers with record parameters, including a hypocycloidal electron spectrometer, a vacuum microbalance, and vibrational modulators of neutral atomic and molecular beams. O.B. Shpenyk is an author of a good many experimental research methods. In particular, he proposed and implemented methods for determining the absolute cross-sections of total electron scattering by atoms and molecules (the electron-trap method), a quadrupole capacitor for measuring the resonance ion recharging at atoms, metastable spectroscopy, and electron backscattering at atoms, ions, and solid surface.

O.B. Shpenyk was the first who discovered and studied the resonance character of the excitation of the atomic energy levels near the process threshold. This achievement allowed the so-called "fine structure" of the energy dependences of electron excitation cross-sections to be studied in detail for a lot of atoms and the crucial role of negative ions in the appearance of "resonances" at the atomic level excitation to be unambiguously pointed at. Those studies initiated a new research direction in atomic physics, namely, negative ion spectroscopy. O.B. Shpenyk together with his colleagues discovered the effect of interaction between the scattered and ejected electrons in the ionic-core field, which occurs at electron-atomic collisions when the electron energy is close to the energy corresponding to the position of the autoionization atomic states. It was proved that this phenomenon brings about the appearance of a structure in the atomic level excitation functions. While studying the processes of low-energy ion-atomic and ion-molecular collisions, O.B. Shpenyk was the first who revealed a regular oscillatory structure in the energy dependences of resonance recharging of the ions of alkaline earth elements and the effect of phase interference of quasimolecular terms, which manifests itself in the polarization of optical radiation emitted at the collision of heavy particles. Interesting results were also obtained for the first time while studying the formation dynamics of the metastable states of inert gas atoms at the electronic excitation and when ultramonoenergetic electrons are scattered at the solid surface.

Academician O.B. Shpenyk is a co-author of more than 350 scientific papers, including 5 monographs and 6 inventions. Under his supervision, 16 Ph.D. theses were defended, and three of his disciples became Doctors of science. The scientific works of O.B. Shpenyk are widely known both in Ukraine and abroad. Being one of the best disciples of the famous Ukrainian scientist and science manager, the founder of the Uzhhorod School of Electronic and

Atomic Collision Physics, Professor I.P. Zapisochnyi, Otto Bartolomiyovych applied a lot of efforts to develop this school further. He favored the formation of new directions in modern physics, in particular, low-energy nuclear physics, quantum electronics, and functional electronics materials, as well as applied research extension.

O.B. Shpenyk also carried out significant scientific, organizational, and educational work. For many years, he was a member of the expert council of the Higher Attestation Commission of Ukraine, a member of the physics section at the Committee on the State Prizes of Ukraine in Science and Engineering, and a Bureau member of the Department of Physics and Astronomy of the NASU. For many years, he headed the Transcarpathian Physical Society, was the head of the Transcarpathian branch of the Small Academy of Sciences, the organizer of plenty of All-Union and international conferences. He had a high scientific rating inside and outside Ukraine. The international recognition of the scientific authority of O.B. Shpenyk is evidenced by his election a member of the General Committee of International Conferences on the Physics of Electronic and Atomic Collisions (the first among the Ukrainian scientists), a member of the Presidium of the Hungarian Academy of Sciences "Hungarian Education Abroad", a member of the Presidium of the World Council of Hungarian Professors, and a member of other scientific organizations.

His merits in science and education were distinguished by plenty of awards and honorary titles: Academician of the NASU, Honored Worker of Science and Engineering of Ukraine, a foreign member of the Hungarian Academy of Sciences, a laureate of the State Prize of Ukraine in Science and Engineering, a winner of the I. Pului Prize of the NASU, an honorary citizen of Uzhgorod. But those and a lot of other awards cannot be compared with the substantial contribution of Academician O.B. Shpenyk to science and education.

Otto Bartolomiyovych was not only an outstanding scientist and an excellent teacher, but also a bearer of high human qualities. He was distinguished by his modesty, friendly attitude to colleagues, and readiness to come to help at any time. He spoke with incredible respect and gratitude about his teacher, Professor I.P. Zapisochnyi, and his colleagues, and told many interesting stories about them. A large number of scientists are grateful to Otto Bartolomiyovych for his help and wise advice concerning the further development of their scientific works. He did not refuse his concern and support to anyone.

He was a person of diverse interests, which extended far beyond the scope of his professional activity. He loved and perceived art, played the violin wonderfully, investing his soul in this impeccable instrument, which is considered the queen of the orchestra. His sense of humor did not betray him. He was a rare example of an organic combination of wisdom, nobility, and intelligence. He enjoyed deep respect and undeniable authority among his colleagues, both scientists and educators. Now that Otto Bartolomiyovych is not with us, everyone who knew him realizes that he was, is, and will remain a tuning fork for the moral attitude to science, educators, disciples, colleagues, and the Institute.

There are no words to express our condolences on the unexpected death of a man who deserves the best words of respect and honor. Emotional pain grips our hearts, and we respectfully bow our heads in the blessed memory of the Man who did good for the good of science, his native country, and his native Transcarpathia. However, we believe that the glorious memories of those who had left good deeds behind and had lived their lives honestly will always be stronger than death.

The eternal and blessed memory of Otto Bartolomiyovych Shpenyk, a scientist, science manager, talented administrator, teacher, and an extremely intelligent Human Being will forever remain in the hearts of his disciples, followers, colleagues, and like-minded people.

H.M. GOMONAI, A.M. ZAVILOPULO,
I.YU. ROMAN, A.M. MYLYMKO