

In memory of Mikhail Aleksandrovich El'yashevich

Mikhail Aleksandrovich El'yashevich, a world-famed spectroscopist, leading scientist in the field of the plasma physics and radiational plasmodynamics, prominent historian of science, recipient of the Lenin prize, two State prizes of the Republic of Belarus, Honoured Scientist of Belarus, academician of the National Academy of Sciences of Belarus, doctor of physical and mathematical sciences and professor, passed away on January 4, 1996 at the age of 88 years.

The life and scientific career of M A El'yashevich is unusual and in many ways unique. He was born on August 21, 1908 in the city of Munich to a family of Russian students who had met and married then left for Germany to study: his father was from Irkutsk and his mother was from St. Petersburg. On the eve of World War I the El'yashevich family returned to Russia. His father subsequently became a prominent economist and taught in Leningrad.

Aside from an excellent family upbringing, M A El'yashevich also had the opportunity to receive fine schooling. The Leningrad Middle School No. 217, which he graduated in 1925, was none other than the renowned St. Petersburg Karl May Lyceum, renamed after the 1917, which was founded in the middle of the Nineteenth century. This was an elitist educational institution with a well-established reputation as an institution of progressive learning. It turned out many graduates who made lasting contributions to Russian science and culture. Suffice it to recall such names as professor Ya I Frenkel', academician D S Likhachev, the architect L N Benois, the painter K A Somov, writer and linguist Lev Uspensky.

In 1925 M A El'yashevich enrolled in the Faculty of the Physics at the University of Leningrad, from which he graduated in 1930. This University was closely associated with the State Optical Institute (SOI), which to a large extent determined the future research trends of M A El'yashevich. He embarked upon his scientific endeavours in the laboratory of the leading pupil of D S Rozhdestvensky, A N Terenin, who went on to become one of the founders of modern photochemistry. The clear-cut propensity of M A El'yashevich for theoretical research, however, soon led him (in 1931) to the Institute of Chemical Physics, whose founder and permanent director was Noble Prize winner, N N Semenov, whereas Ya I Frenkel' supervised the theoretical group. Interested in theoretical problems of molecular spectroscopy, M A El'yashevich began to work in the theory group of SOI, under the leadership of V A Fok. He successfully defended his dissertation as a candidate of science in 1937 and it was published one year later as a monograph entitled *Rotational and Oscillatory Energy of Multi-Atomic Molecules*. At the



Mikhail Aleksandrovich El'yashevich

same time M A El'yashevich began to occupy himself with questions relating to the spectroscopy of atoms, which eventually led to the appearance of a monograph in 1940 *The Spectra of Rare-Earth Atoms*.

In 1939 M A El'yashevich transferred to the laboratory of molecular spectroscopy at SOI, directed by V M Chulanovsky, where his collaboration with B I Stepanov (a brilliant future scientist in the field of spectroscopy and laser theory and founder of the now well-known Belorussian school of optics in the field of the oscillation theory of multi-atomic molecules. Here M A El'yashevich set out what has come to be a classical approach whose fundamental principles were published for the first time in 1940 at the same time as other results were published by E Wilson. M A El'yashevich tested his new method with B I Stepanov by calculating the oscillatory frequencies of a number of specific hydrocarbons. The work was broken short by the war, however, and was resumed only in 1943 in Ioshkar-Ola, where the SOI had been evacuated from Leningrad. M V Vol'kshtein also joined in this research project and subsequently the three scientists

jointly published a seminal two-volume monograph entitled *Oscillations of Molecules* (1949) which immediately received the State Prize of the USSR and set a major trend in scientific research for many years to come. With the help of M A El'yashevich, L A Gribov reworked the monograph in light of subsequent advances in the field and a second edition appeared in 1972.

M A El'yashevich defended his doctoral dissertation during the war, back in 1944.

One of the most unusual stages of M A El'yashevich's scientific career was his involvement in the Soviet atomic project. From 1946 to 1949 he was assigned to draft and carry out a programme of optic tests in conjunction with the first Soviet nuclear explosion. Many facets of this programme were used at a later time (1957–1962) for the purpose of high-altitude explosions. Upon successful completion of this set of research projects M A El'yashevich was among the co-authors who were awarded the Lenin Prize in 1966.

In the post-war period the focus of M A El'yashevich's scientific interests gradually shifted from the field of purely oscillatory spectroscopy to the field of the theory of the spectra of complex atoms. The completion of this stage of his activities was marked by the publication in 1953 of the seminal monograph *Rare Earth Spectra*, the main contents of which are still valid.

At the same time M A El'yashevich was actively engaged in pedagogical activity at the Leningrad Institute of Precision Mechanics and Optics, where he directed the sub-faculty of theoretical physics at the faculty of Physics and Engineering and then he directed the sub-faculty of theoretical physics at the A I Gertsen Pedagogical Institute in Leningrad.

The next stage in the scientific and pedagogical career of M A El'yashevich began in 1956 after he was elected a Full Member of the Academy of Sciences of the Belorussian Soviet Socialist Republic (ASB). From this time and for the next forty years his whole life was devoted to the Belorussian Academy of Sciences and the Belorussian State University. He supervised a laboratory of the Institute of Physics of the ASB (1956 – 1979), the Chair of Atomic and Molecular Physics of the Belorussian State University (1968 –1977), taught as a professor at Chair of Nuclear Physics of BSU (1977 – 1983), was a scientific advisor at the Scientific Research Institute of Applied Physics Problems at the Belorussian State University (1983 – 1990), as chief scientific associate of the Institute of Heat and Mass Transfer of the ASB (1990 – 1995) and from April, 1995 he sat as an advisor on the Board of Directors of the Institute of Molecular and Atomic Physics of the ASB.

The Belorussian period in the life of M A El'yashevich also proved exceptionally productive. This was the time when he initiated active scientific research in the field of the spectroscopy of plasma and radiational plasmodynamics, which led to the creation of a now widely acknowledged school of science, pursued intense pedagogical activities and wrote a unique encyclopedic monograph *Atomic and Molecular Spectroscopy* (1962), which has become a fundamental textbook for entire generations of spectroscopists.

From the beginning of the Eighties and literally until the final days of his life M A El'yashevich concerned himself with systematic research in the history of physics. His profound and original approach, which applied analysis from the works of Maxwell, Planck, Bohr, as well as the historical reconstruction of the pre-quantum period of the development of atomic

spectroscopy are well known to the readers of *Physics-Uspekhi*.

M A El'yashevich was a teacher in the broadest sense of the term. His pupils include 12 doctors of science, among which there are an academician and a correspondent member of the Belorussian Academy of Sciences, as well as a correspondent member of the Russian Academy of Sciences.

M A El'yashevich was a great organizer of scientific and public activities, sitting on the Board of Scientific Councils of the Academy of Sciences of the USSR on spectroscopy, the physics of plasma, was the deputy Editor-in-Chief and member of the Editorial Board of *The Journal of Applied Spectroscopy* in the establishment of which he actively participated, member of the Editorial Board of the journal *Optics and Spectroscopy*, scientific advisor of the *Big Soviet Encyclopedia*, *The Encyclopedic Dictionary of Physics*, *The Soviet Encyclopedic Dictionary*, *The Belorussian Soviet Encyclopedia* and other editions. He represented Russian science on numerous occasions at international conventions, conferences, symposiums and for a number of years took part in the proceedings of the International Council of Pure and Applied Chemistry.

M A El'yashevich combined exceptional goodness, tact and responsiveness with firm scientific, political and practical skills. All who associated with the man were impressed by his personal charm, kindness, modesty, broad erudition, extreme intelligence and general culture.

The fond memory of M A El'yashevich as outstanding man of science and pedagogue, magnanimous human being of high moral standards will forever remain in the hearts of those who knew him and were privileged to work alongside him.

*E B Aleksandrov, Zh I Alferov, P A Apanasevich,
A M Bonch-Bruevich, N A Borisevich,
V S Burakov, V I Gol'danskiĭ, A P Voĭtovich,
L A Gribov, O M Martynenko, L Ya Min'ko,
L M Tomil'chik, A F Chernyavskĭ*