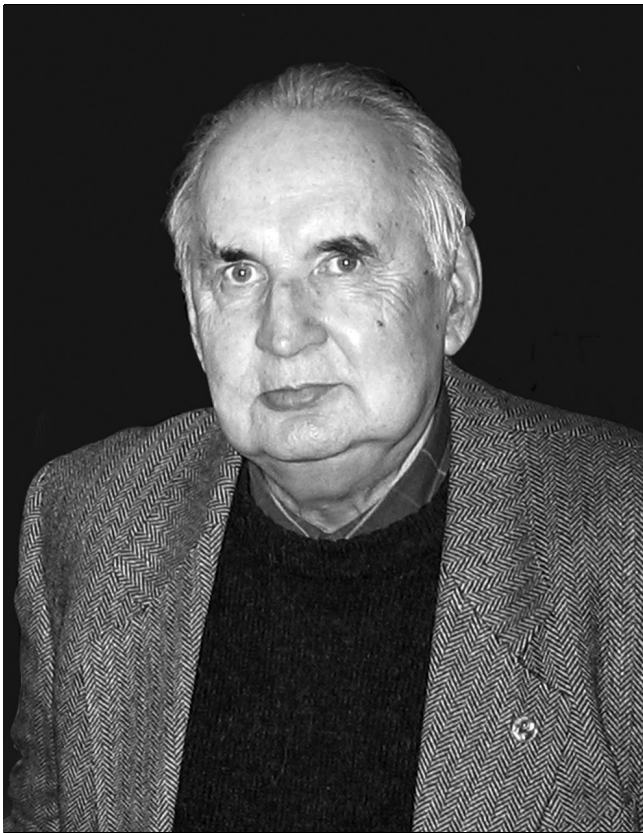


## To the memory of Igor Il'ich Sobel'man



Igor Il'ich Sobel'man, an outstanding scientist who had made a unique contribution to optics, spectroscopy, quantum electronics and atomic physics, Director of the Department of Optics at the Lebedev Physics Institute (FIAN), Professor of the leading chair at the Moscow Institute of Physics and Technology, Corresponding Member of the Russian Academy of Science, died suddenly on 23 November 2005.

Igor Il'ich Sobelman was born on 26 January 1927 in Moscow in a family of an engineer. During the war years, being a youngster he worked as a machine operator at a defense plant in Perm. In 1944 he entered the Bauman Moscow Higher Technical School and in 1947 became a student of the Department of Physics and Technology at the Moscow State University from which he graduated in 1952 among the first graduates of the Moscow Institute of Physics and Technology.

After graduation, Igor Il'ich worked for four years at a departmental research institute.

I.I. Sobel'man wrote his graduation paper at FIAN under the supervision of academician G.S. Landsberg. Since then, the scientific and pedagogical activity of Igor Il'ich was inseparably linked with the Lebedev Physics Institute and Moscow Institute of Physics and Technology. Igor Il'ich highly valued his scientific supervisors – G.S. Landsberg and

S.L. Mandel'shtam – and believed that work and personal relations with them predetermined his scientific carrier and influenced his life.

I.I. Sobel'man is one of the founders of the modern theory of spectral line broadening. He developed the consistent quantum theory of this phenomenon, elaborated a number of actual applications of this theory, which are used in plasma physics, radio astronomy, nonlinear laser spectroscopy and in the problem of laser frequency standards. He also substantiated new spectroscopic methods for calculating the effective cross sections for atomic collisions.

In the field of quantum electronics, he proposed and substantiated a number of methods for obtaining high-power laser beams, in particular in photodissociation lasers, fundamentally new SRS beam converters, which can increase the radiation brightness and are promising for creating highest-power nanosecond lasers. He also worked out methods for developing far-UV and soft X-ray lasers.

Under the supervision of I.I. Sobelman, outstanding studies were performed, including measurements of the effect of parity nonconservation in bismuth atoms, and the method of nuclear spin polarisation of  $^3\text{He}$  in a dense gas for a gas target polariser of slow neutrons was realised. He supervised works on satellite X-ray astronomy of the Sun, and participated in the development of a new efficient method for regular ozone monitoring in the upper atmosphere in the millimeter wavelength range.

Igor Il'ich proposed a new method for search for the electric dipole moment (EDM) of the xenon atom caused by the violation of time-reversal symmetry. He substantiated the principal scheme of the experiment for measuring the electric field of the T-odd EDM of spin-polarised xenon atoms with a Rydberg-atom Stark electrometer.

I.I. Sobel'man founded a school of specialists, well known in our country and abroad, on atomic spectroscopy and its applications in laboratory and astrophysical plasma physics. His pupils and colleagues play an important role in the development of promising directions in these fields of physics and technology. I.I. Sobel'man is well known by his monographs, which were published many times in Russian and English. These books, starting with 'Introduction to the Theory of Atomic Spectra' in 1963, quickly became handbooks both for Russian and foreign specialists.

For many years, I.I. Sobel'man was a member of the editorial council of Quantum Electronics, a member of the editorial board of JETP Letters and a number of other Russian and foreign journals, Chairman of the Scientific Council of RAS on Spectroscopy of Atoms and Molecules.

Igor Il'ich had a gift to formulate clearly and exactly the essence and approach to the solution of physical problems, knew well and understood the modern experiment, was highly respected by scientists in our country and abroad, was a wise and well-wishing supervisor.

The memory about Igor Il'ich Sobel'man, a prominent scientist and a bright person, will remain forever in the hearts of his pupils and colleagues.

**O.N. Krokhin**