

*SERGEĬ ÉDUARDOVICH FRISH (on his 70th Birthday)*

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**J**UNE 19 is the 70th birthday of one of the greatest Soviet optical spectroscopists, corresponding member of the USSR Academy of Sciences Sergeĭ Éduardovich Frish.

Frish began his scientific work while still a student of the Physico-mathematical Division of the Leningrad University, under the guidance of D. S. Rozhdestvenskiĭ. After being graduated from the university in 1921, he continued his scientific work at the State Optical Institute and became one of Rozhdestvenskiĭ's closest co-workers. At the same time, he taught and pursued scientific research at the Leningrad University. In 1939 he transferred his main activity to the university, where he was in charge of the Optics Department since 1934. At the same time, for ten years (1937–1947), he was in charge of the teaching and scientific work of the physics department, of which he was named dean. From 1947 to 1957 he was director of the Physics Institute of the Leningrad State University. After being elected Corresponding Member of the USSR Academy of Sciences in 1946, Frish has taken active part in the work of the Academy. He became the editor in chief of the journal "Optics and Spectroscopy," deputy chairman of the Commission on Spectroscopy, and a member of the International Commission on Spectroscopy of UNESCO.

Frish's scientific activity began at a time when the theory of the atomic structure was being developed and atomic spectroscopy underwent a rapid growth. His first papers were devoted precisely to these questions. He investigated the Zeeman effect in alkali-metal spectra and observed a new type of splitting in a magnetic field. He then published a number of papers on the systematics of spectra, investigated the spectra of ionized sodium, neon, and several other elements. In the subsequent years, Frish proceeded to analyze the complex spectra of the cesium and uranium atoms. Since 1930, in connection with the development of nuclear physics, he initiated a large cycle of investigations devoted to applications of optical methods to the study of certain properties of the atomic nucleus. This research on the interaction between the atomic nucleus and the electron shell, which leads to the existence of the hyperfine structure of the spectra, won for Frish great renown. He investigated the hyperfine structure of the sodium lines and established a rule connecting the spin of the atomic nuclei with their parity, he also investigated the hyperfine structure and the isotopic shifts in the lines of potassium, silver, copper, barium, calcium, thallium, samarium, and other elements.

To perform this research on the analysis of spectra, Frish improved the spectral apparatus and developed models of new light sources. Even during those years, his work revealed clearly the high demands he imposed on the neatness and definiteness of the experimental results, which have been so characteristic of his entire scientific activity.



In the mid 30's, Frish was one of the first to point out the possibility of investigating a gas-discharge plasma by optical means. His work and that of his students covers a wide range of problems in this field. A series of his papers is devoted to interferometric investigation of the line contours of the ions in the positive column of a discharge and to the explanation of the character of their motion. He employed widely the methods of reabsorption, inversion, and dispersion in order to determine the concentrations of atoms in different energy states, and performed careful and systematic studies of the high-frequency discharge. As a result of these investigations, Frish proposed a method for the spectral analysis of gases, which is now widely used in industry.

Frish investigated also the mechanism of excitation of high levels of atoms, clarified the role of impact of the second kind, determined the cross sections of these processes. In a large cycle of investigations of the optical excitation functions, he established the existence of a fine structure of optical excitation functions, explained the role of cascade transitions, and determined the level-excitation cross sections.

Frish's scientific activity is inseparably linked with

his pedagogic activity, which has been going on for more than 45 years. He has a large number of students, many of whom became doctors of science. Frish heads a large school of spectroscopists. He wrote several basic monographs: "Atomic Spectra," "Spectroscopic Techniques," "Spectroscopic Determination of Nuclear Moments," "Optical Spectra of Atoms," which are widely used by spectroscopists.

For many years, Frish presented a course of general physics at the physics department of the Leningrad State University. Together with A. V. Timoreva, he wrote a three-volume physics text. This is one of the main textbooks for universities and many higher institutions of learning of the Soviet Union. This textbook was republished many times and translated into many foreign

languages.

Frish has also written many scientific-popular articles, publicizing the latest accomplishments of physics. Strict consistency, clarity, and simplicity of exposition are characteristic of all his scientific and pedagogical printed papers. Frish represented the Soviet Union with distinction in many international conferences. In 1959 he was awarded the title of Honored Scientist of RSFSR.

His many students and colleagues wish him health and further progress. They are verified that he will still do much for the development of Soviet optics and spectroscopy.

Translated by J. G. Adashko