Valentina Ivanovna Iveronova (Obituary)

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Professor Valentina Ivanovna Iveronova, Doctor of Physico-Mathematical Sciences, a prominent scientist and educator and a specialist in the field of x-ray structural analysis and solid state physics well-known both in our country and abroad died on July 27, 1983.

Dr. Iveronova was born in Moscow on September 17, 1908 into a family of a professor of astronomy and geodesy, and rector of the Petrov (Timiryazev) Agricultural Academy. Upon graduating from the Moscow State University in 1929 with a degree in "radio-roentgenology" she successfully introduced the method of x-ray structural analysis, which was new at the time, at first in the All-Union Institute of Raw Materials to which she was sent in the course of distribution of young specialists graduating from the Moscow State University, and later at the Central State Institute for Nonferrous Metals where she carried out pioneering investigations of the recrystallizaiton of alloys. In 1936 Iveronova organized the x-ray laboratory in the Central Institute for Railroad Transport of the Ministry of Communications of the USSR in which she carried out for the first time in the entire world x-ray investigations of the fatigue of rails.

Beginning with 1938 Ivernonova's work was entirely concentrated in the Department of Metal Physics of the Physics Faculty of the Moscow State University, and later to an ever greater extent in the Department of General Physics. In her doctoral dissertation (1947) devoted to the x-ray structure analysis of strained and annealed alloys Iveronova showed the complex nature of the processes of redistribution of atoms taking place within the varying fields of internal stresses and temperature in which the phenomena of diffusion of atoms and relaxation of stresses are in competition. These processes lie at the foundation of structural mechanisms of phase transformations in alloys which constitute one of the central problems in solid state physics.

During the period of 1951–1969 Iveronova headed the Department of General Physics for physicists. She selflessly devoted to this department all her bubbling energy, effort, talent, and pedagogical mastery in carrying out the program of physical principles set out as the basis for training students by S. I. Vavilov while he was in a charge of this department (1929–1932). Iveronova had a deep understanding of the special role of the general course in physics as a discipline which forms the basis of training future physicists. She strove to structure the teaching of the general course of physics in such a way that this course should shape the outlook of the students and train them in a nonformalisitic approach in analyzing physics problems. After the department was moved to the new building of the Faculty of Physics at Leninskie Gory (1953) the possibilities of carrying out the educational process within the department were significantly ex-

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panded, the amount of work within it grew, new problems arose which were effectively solved under the leadership of Dr. Iveronova. During this period the department became the largest department of the university. The content of the course in general physics was brought in line with new demands made by life and with the level of development of physics. The collection of physics demonstration apparatus was significantly expanded both qualitatively and quantitatively with the number of individual demonstrations approaching 1000. Under Iveronova's editorship a fundamental and complete guide to lecture demonstrations in the course of general physics was published twice (1965 and 1972). In it, in particular, for the first time a description was given of original demonstrations using lasers. A great amount of attention was devoted to the content and improvement of the methodological level of student seminars in physics. The new general practical physics course supplemented by new problems and provided with first-class and in a number of cases with unique apparatus became the pride of the Moscow State University. The description of the problems of this practical course formed an excellent teaching aid prepared and published in several editions under the editorship of Iveronova. "The General Practical Course in Phys-

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ics" became a manual which was used and continues to be used by many generations of students. Within the system of the Ministry of Higher Educational Institutions of the USSR the Department of General Physics for physicists in the Moscow State University became the acknowledged scientific-methodological center which was given responsibililty for approving the manuscripts of new textbooks and problem collections in physics for universities, for the organization of seminars for examination of and approval of new lecture demonstrations constructed in different higher educational institutions, and for many other similar matters. The extensive and multifaceted activity of the department carried out under the general leadership of and with great personal contributions by Iveronova undoubtedly aided the significant raising of the level of knowledge in physics by graduates not only from the universities but also from other higher educational institutions of our country. The importance of this problem was repeatedly pointed out by the rector of the Moscow State University I. G. Petrovskiĭ under whose direction was carried out the relocation and the organization of the work of the university within the "Science Palace" at Leninskie Gory. A unified scientific laboratory which brought together in scientific work the teaching staff of the department was organized for the first time in the Department of General Physics under the guidance of Dr. Iveronova. In this laboratory in addition to the personal scientific investigations of Iveronova work was carried out on the optics of phase transformations in cyrstals, generation of coherent hypersound at a frequency of 10^9 Hz was realized for the first time, etc. Graduate studies were organized within the department, and a number of doctoral dissertations was initiated and defended.

During the last fourteen years Dr. Iveronova worked in the Department of Solid State Physics of the Moscow State University with which she was closely associated also during all the preceding years. She developed a number of basic specialized courses on structural analysis and was the author of a remarkable textbook "Theory of X-ray Scattering" the preparation of the third edition of which she did not have time to complete. Dr. Iveronova's lectures both in the course of general physics, and also in specialized courses, were marked by the depth of content, the originality of approach in presenting complicated problems, the elegance of mathematical form and the liveliness of the exposition. These lectures were very popular among the undergraduates, the graduate students, the staff members on probation, and the students of the Faculty for Qualification Improvement in which Dr. Iveronova headed the section of specialization in solid state physics. Under Iveronova's guidance N. S. Andreeva began in 1950 work in the department on x-ray structural analysis of biopolymers which evolved into the original source in the USSR of a new scientific field the further development of which gave rise to a real revolution in molecular biolgoy. Specialists trained in the department in this field (some of them became doctors of science) now work successfully in the Institute of Molecular Biology of the Academy of Sciences of the USSR, executive committee of the Academy of Sciences, Institute of Biophysics of the Academy of Sciences of the USSR, and others.

After graduating from the university Iveronova was continuously and actively engaged in scientific work. She organized one of the few scientific centers in the world devoted to the development and utilization of diffuse x-ray scattering to study subtle questions in the structure and dynamics of the lattice of solid solutions. Iveronova and her collaborators made a great contribution to the study of short-range order–atomic regroupings in crystals occurring in microvolumes ~ 5–10Å, i.e., in the range which is not easily accessible to investigations by the method of microscopy and selective diffraction. These investigations, which were recognized internationally, were rewarded in our country by the E. S. Federov Academic Prize. Dr. Iveronova surrounded herself by a harmonious scientific group of collaborators, trained a large number of qualifed scientific workers (more than 30 candidates and doctors of science). The All-Moscow seminar organized and for many years guided by Dr. Iveronova at sessions of which scientists also from other cities of our country presented their work played a significant role in the development in our country of investigations on the kinematic and dynamic scattering of x-rays. Dr. Iveronova was an active participant, and also an organizer in the field of her own scientific interest of All-Union scientific conferences, symposia, international congresses, having earned universal recognition by her scientific authority, intuition, devotion to principle, and subtle understanding of the physical meaning of the problems under discussion, and also by her personal qualities of sincerity and humanity.

Dr. Iveronova was engaged in vaied community and scientific-organizational activities. For many years she was a member of the commission of experts in physics of the Higher Certification Council of the USSR, was a member of the editorial board of "Izvestia vuzov" (seriya Fizika) [Bulletin of Higher Educational Institutions (Physics series)], was a member of a number of scholarly and scientific councils of the University and of the Physics Faculty. On a scientific mission organized by the Ministry of Higher Educational Institutions of the USSR Iveronova during the summer of 1950 lectured at P'yongyang University bravely enduring in the course of three months the difficulties created by the war that was beginning in Korea at the time.

The achievements of Dr. Iveronova in science and higher education have been rewarded by the government by the Orders of Lenin and the "Badge of Honor," by many medals, honorary badges, diplomas, and certificates from the Ministry of Higher Educational Institutions of the USSR and the administration of the Moscow State University.

A vivid memory of Valentina Ivanovna Iveronova—a charming person, a talented scientist and educator–will be preserved in science and in the hearts of all those who had the good fortune of knowing her, studying under her, working with her.

Translated by G. M. Volkoff