# Aleksandr Iosifovich Shal'nikov (on his eightieth birthday)

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Academician Aleksandr Iosifovich Shal'nikov, an extremely talented experimental physicist, reached 80 on 10 May 1985.

In his first scientific steps at the Leningrad Physicotechnical Institute, where he began his scientific activity, he distinguished himself by his unusual liveliness, his original approach to the new problems which arose, his brilliant inventiveness in devising new techniques, and the virtuosity and care with which he developed them. His systematic work in the laboratory has been a continuous stream of intelligently formulated experiments, each in answer to a clearly formulated scientific question.

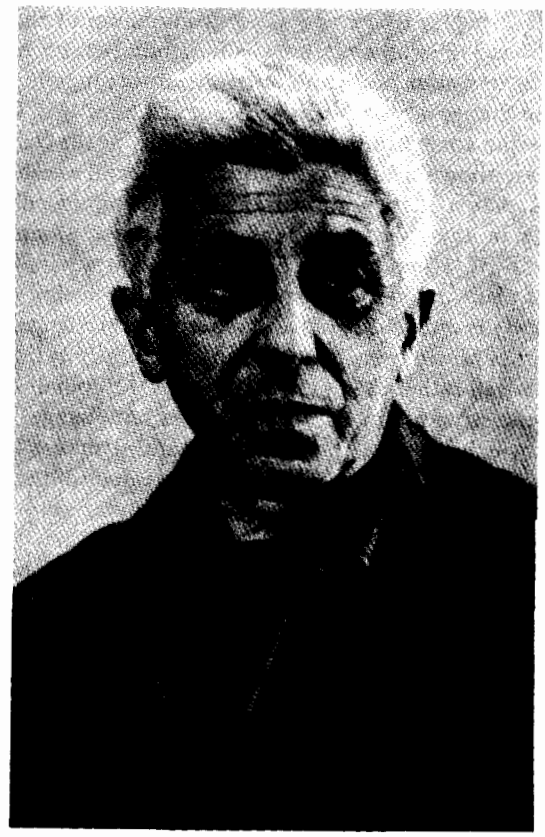
Over the many years of his labor—more than 60—Aleksandr Iosifovich Shal'nikov has taken up a wide variety of problems: the properties of thin metal films, the intermediate state of superconductors, technical studies which have made it possible to solve problems of importance to the government and problems regarding the properties of solid helium, and studies in the field of cryogenic surgery, where he pioneered in the development of Soviet apparatus for operations through the destruction of diseased tissues by freezing.

The original experimental methods developed by Aleksandr Iosifovich have in many cases become the standard methods and have subsequently been used successfully by his students and researchers.

In the 1960s, he took up the study of the properties of solid helium. To pursue this problem he developed a new method for growing helium crystals, which made it possible to grow crystals of record high purity and quality. This method, which has now become a classic method, was of decisive importance to the progress of all subsequent research on solid helium.

He was the first to observe successfully the motion of electric charges in helium crystals and to study the mechanisms for this motion. The high lattice quality of the helium crystals made it possible to discover a new effect in a study of their thermal conductivity: the Poiseuille flow of a phonon gas. He was the first to call attention to the unusual growth kinetics of helium crystals. The development of this research has recently led to the discovery in his laboratory of a fundamentally new mechanism for crystal growth which is specific to helium: quantum crystallization. For this work, he was awarded the P. N. Lebedev Gold Metal of the Presidium of the Academy of Sciences of the USSR.

A lively and active attitude toward all events in his Party and scientific activities has been characteristic of



ALEKSANDR IOSIFOVICH SHAL'NIKOV

Aleksandr Iosifovich. Scientific generosity and frankness are the basic rules by which he deals with his colleagues and his students. He always shows a lively interest in each new experimental problem, goes into it in detail, offers good advice, and, where necessary, carries out additional experiments. This was the case, for example, in the history of the discovery of paramagnetic resonance by F. K. Zavoĭskiĭ, when Aleksandr Iosifovich with his bustling energy helped Zavoĭskiĭ to carry out some further graphic experiments to convince some skeptics.

The enthusiasm and passion which are characteristic of Aleksandr Iosifovich can also always be seen in his style of work in the laboratory, where an elegant experiment is always of the foremost importance. His bright and emotional perception of the world around him makes him attractive to

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youth, many of whom have become part of this school of experimental physicists. A major role in the guidance of these young people was played by his seminar for the students at Moscow State University, where many of today's physicists gained a profound understanding of vigorous experimental physics and methods for approaching its problems.

His encyclopedic knowledge of the facilities available for experimental physics and his unflagging energy have allowed him to become the organizer of, and to be continuously the editor in chief of, the journal *Instruments and Experimental Techniques*, which is the primary Soviet publication on the methods of experimental research in all fields of physics today.

His scientific achievements have won him some high honors from the State: two Orders of Lenin, five Orders of the Red Banner of Labor, the Badge of Honor, and three State Prizes of the USSR.

For 50 years Aleksandr Iosifovich has lived and worked in the Institute of Physical Problems, Academy of Sciences of the USSR, where he was one of the first workers and is now the oldest.

His colleagues, students, and friends sincerely congratulate him on his birthday and wish him health, strength, and further successes in his scientific activity.

Translated by Dave Parsons