

Vadim Vasil'evich Shmidt (Obituary)

L. G. Aslamazov, V. L. Ginzburg, D. A. Kirzhnits, G. A. Leksin, K. K. Likharev, Yu. A. Osip'yan, V. I. Tatarskiĭ, A. I. Shal'nikov, and Yu. V. Sharvin

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On 9 August 1985 a serious illness terminated the life of Vadim Vasil'evich Shmidt, a prominent Soviet physicist who directed the superconductivity laboratory of the Institute of Solid State Physics of the Academy of Sciences of the USSR. The life was cut short of a man of rare spiritual qualities and an outstanding scientist whose work in low temperature physics is well known both in the USSR and abroad.

V. V. Shmidt was born on 7 February 1927 in Moscow into the family of a professional revolutionary, a prominent statesman of our country. In 1952 Shmidt graduated from the physics faculty of the Moscow State University which he entered in the company of the best graduates of the Moscow Power Technical School. He taught physics at the same technical school after graduation from Moscow State University. In the period from 1954 to 1970 he was first a graduate student, and later a member of the staff of the Institute of Metallurgy of the Academy of Sciences of the USSR. In the 1960s a close contact became established between V. V. Shmidt and the theoretical department of the Physics Institute of the Academy of Sciences of the USSR, and with the Institute of Physics Problems of the Academy of Sciences of the USSR and his deep interest in the physics of superconductors was being formed. Shmidt's talent was most prominently displayed during the fifteen years of his work at the Institute of Solid State Physics of the Academy of Sciences of the USSR where he created the experimental superconductivity laboratory and directed it until the end of his life.

The first significant series of Shmidt's papers which formed the basis of his candidate's dissertation deal with the investigation of x-ray spectra of transition metals. Using the double crystal-spectrometer constructed with his participation and on the basis of his calculations Shmidt discovered a number of new effects (excitation of a plasmon near the absorption edge, a shift in the plasmon energy during a phase transition) and developed the theory of these effects. In these papers he clearly demonstrated the combination of talents of an experimenter and a theoretician which he possessed.

In 1966 one of the best known papers of V. V. Shmidt was published which contained the prediction of the appearance of a precursor of superconductivity at temperatures above the critical temperature. In this article conditions were indicated under which fluctuations of the order parameter of a superconductor usually restricted to a very narrow region are manifested over a wide temperature range. This work of V. V. Shmidt was pioneering and opened up a new important direction in the physics of superconductors.

At the beginning of the 1970s Shmidt carried out theoretical investigations of the pinning of magnetic flux in massive and thin-film hard superconductors of the II kind. The



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importance of these investigations is associated with the fact that it is specifically the pinning that determines the critical currents of superconductors of the II kind and thereby the possibility of their utilization as materials for superconducting magnets and other high current devices. The results of the investigation of pinning and of fluctuation phenomena form the content of Shmidt's doctoral dissertation.

From the middle of the 1970s his interest switched over to weak superconductivity—the Josephson effects and the phenomena accompanying them. He and his pupils solved a class of important problems on the motion of quantized vortices of magnetic flux in inhomogeneous Josephson junctions. A significant achievement were the experimental and theoretical investigations carried out by Shmidt's group of nonequilibrium phenomena at the “superconductor-normal metal” boundary acted upon by an electric current or a heat flux. One of the most important results here turned out to be the discovery of thermoanalogs of stationary and nonstationary Josephson effects in “superconductor–normal met-

al-superconductor" structures.

Shmidt devoted much effort to working with young people. We have already mentioned above the laboratory in the Institute of Solid State Physics of the Academy of Sciences of the USSR directed by him in which he succeeded in forming a youthful team bound close together by friendship, enthusiasm and love of science. For more than ten years Shmidt gave a course of lectures at the Moscow Institute of Steel and Alloys on the physics of superconductors, which was distinguished by exceptional clarity of presentation and was very popular among students who regarded as a major piece of good luck the possibility of completing a thesis under the direction of Professor Shmidt. This course of lectures formed the basis for Shmidt's book "Introduction to the physics of superconductors" (Nauka, M., 1982). The broad range of topics and the clarity of exposition within a comparatively short book make it one of the best introductory courses on superconductor physics within world literature, which enables even a poorly prepared reader to enter rapidly into the thicket of modern problems (such as weak super-

conductivity, nonequilibrium phenomena, etc.).

Shmidt's deep sense of decency, his benevolence and an acute sense of fairness attracted to him the sympathy of a large number of people. His life principles were simple and noble, and he followed them undeviatingly, paying no attention to his own well-being, whether he was dealing with the affairs of a comrade in trouble or with the events of public life.

Shmidt's interests were not restricted to science. He was greatly interested in history (particularly in the history of the recent war), in architecture, he loved poetry and songs, he travelled extensively, having covered thousands of kilometers on his bicycle.

Everyone who knew Vadim Vasil'evich Shmidt,—his comrades at work, his colleagues in our country and abroad, numerous friends and pupils—will remember him with warmth and love.

Translated by G. M. Volkoff