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Anatolii Aleksandrovich Vlasov (obituary)

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Anatolii Aleksandrovich Vlasov, a prominent theoretical physicist, a member of the Communist Party of the Soviet Union since 1944, a Lenin Prize Laureate, Doctor of Physical and Mathematical Sciences and a Professor in the Physics Department of Moscow State University, died on December 22, 1975, in his 68th year, after a grave illness.

Vlasov devoted more than 40 years of his life to the service of Soviet science and the education of youth. Vlasov's kinetic equation, which is the basis for statistical analysis of the properties of plasma, has become a part of the treasury of world science. His numerous students include dozens of prominent scientists—Candidates and Doctors of the Physicomathematical Sciences.

Vlasov was borne at Balashov, Saratov Oblast', on August 20, 1908 into the family of a steamfitter. He completed his intermediate schooling at Balashov and entered Moscow University in 1927 as a student in the Physics and Mathematics Department. After his graduation in 1931, he was accepted as a graduate student. In 1934, he defended his Candidate's Dissertation “On the Quantum-Mechanical Problem of Interaction,” and stayed on as a senior scientific collaborator of the Moscow State University Scientific Research Institute of Physics. From 1934 to 1936 he worked in theoretical optics, developing a theory of spectral-line width based on consideration of molecular interaction. These studies gave impetus to many experimental and theoretical studies by Soviet and foreign authors.

Vlasov's paper “On the Vibrational Properties of the Electron Gas,” which contained the first thorough analysis of the physical properties of charged particles (plasma), demonstrated that Boltzmann's gaskinetic equation cannot be applied to them, and proposed a new



kinetic equation (now known as the Vlasov equation) that takes account of collective interactions between the charged particles, was published in the Soviet Journal of Experimental and Theoretical Physics in 1938. Vlasov was the first to recognize the nature of the interaction among plasma particles, which is qualitatively different from the interaction in an ordinary gas, and concluded even at that early date that “the plasma is not a gas, but a unique system that is held together by long-range forces.” This paper formed the basis for Vlasov's doctoral thesis, which he defended in 1942.

The concept of collective vibrations, which was first introduced by Vlasov, is now widely used in modern physics in investigations of many-particle systems. For his theory of the vibrational properties of the electron gas, Vlasov was awarded a First Degree Lomonosov Prize at Moscow University in 1944.

Further development of this theory enabled Vlasov to devise a fundamental method for the study of the properties of plasma. These studies, which certain physicists refused to recognize at first, were later evaluated highly both in our country and abroad, and Vlasov won a Lenin Prize for them in 1970.

In addition to his work on plasma theory, Vlasov also did research on the theory of the crystalline state and the theory of gravitation.

He devoted the last years of his life to the construction of an original statistical theory of multiple particle production.

Vlasov gave a great deal of attention to scientific teaching through all of his highly creative years. Having become a Professor at Moscow University in 1944, he lectured in many areas of theoretical physics in its Physics Department. He was a brilliant speaker; his lectures were distinguished by their originality, depth of content and fascination. They were read to standing-room-only audiences. Vlasov concerned himself actively with methodological problems of theoretical physics and often appeared with interesting papers at methodological seminars.

From 1945 through 1953, Vlasov held the chair of theoretical physics in the Moscow State University Physics Department, and served many terms as a member of the Department's Party Bureau.

Vlasov's scientific, scientific teaching, and civic activities were recognized by governmental honors. He was awarded several Orders and Medals of the Soviet

Union.

Vlasov's scientific achievements have become an integral part of modern physics, and his glowing image will forever remain the memory of all those who knew him.

BASIC SCIENTIFIC WORKS OF A. A. VLASOV

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