

Aleksandr Ovseevich Vaisenberg (Obituary)

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Usp. Fiz. Nauk **146**, 721–722 (August 1985)

The well-known Soviet experimental physicist, Doctor of physico-mathematical sciences, Aleksandr Ovseevich Vaisenberg died on January 10, 1985 in his 69th year.

Vaisenberg was born on 22 August 1916 in the city of Slonim (BelSSR) into the family of a pharmacist. In 1923 the family moved to Leningrad, where he completed his secondary schooling and graduated from the Electro-Technical College. In 1935 Vaisenberg enrolled in the Physics Faculty of the Leningrad State University, from which he graduated in 1940.

Vaisenberg began his scientific activity in 1938. While still a student he became a laboratory assistant in the radon laboratory of Leningrad X-ray and Radiological Institute where he remained to become a member of the scientific staff after graduating from the University.

The war interrupted the scientific activity of Aleksandr Ovseevich. In June 1941 he was called up to enlist in the Soviet Army. Senior lieutenant A. O. Vaisenberg was in command of a platoon of audiometric reconnaissance and participated in battles on the Leningrad, Volkhov and the third Baltic fronts. Under battle conditions Vaisenberg showed himself to be an able specialist and a considerate commander. His comrades note his self control and courage which he exhibited during the difficult days of the war. For his service in battle Vaisenberg was awarded the Order of the Red Star and medals.

In 1944 as a specialist in atomic physics he was demobilized and placed at the direction of the Academy of Sciences of the USSR, and he worked in the Institute of Physical Problems and in the Physics Institute of the Academy of Sciences.

The principal scientific specialty of Vaisenberg became nuclear physics and elementary particle physics. The first work he carried out in this field was the measurement of large-angle scattering of electrons published in 1946 together with A. I. Alikhanov and A. I. Alikhan'yan.

During this period Vaisenberg began an active study of cosmic rays as a member of the High Altitude Expedition on Aragats Mountain in Armenia. Under his direction a magnetic spectrometer for investigating cosmic rays was constructed high up in the mountains. This apparatus was used to make measurements of momentum spectra and of the composition of cosmic rays; it was shown that protons and neutrons are present in the flux of particles, the positive excess of the hard component of cosmic rays was measured in the momentum range up to $2.5 \cdot 10^9$ eV/c at an altitude of 3250 m.

In 1955 Vaisenberg began his work in the Institute of Theoretical and Experimental Physics and became one of the leading scientists of the Institute. Here he participated in the establishment of a laboratory for nuclear photoemul-



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(1916–1985)

sions, which investigated properties of elementary particles using the accelerators of the Joint Institute for Nuclear Research and of the Institute of Theoretical and Experimental Physics. The principal work during this period consisted of the study of the decay properties of muons, π and K mesons and of the investigations of phenomena arising upon the capture of these particles by nuclei.

A number of the papers of Vaisenberg and his collaborators was devoted to the problem of $\pi^+ \rightarrow \mu^+ \rightarrow e^+$ decay in connection with the nonconservation of parity in weak interactions. Particularly careful measurements were made of the asymmetry associated with muon polarization in the emission of positrons in $\mu \rightarrow e$ decay. Investigations were carried out in the domain of low energies, which were practically inaccessible to other methods of measurement. In a number of papers a study was made of the effect of strong magnetic fields on the degree of depolarization of muons in a nuclear photoemulsion. These measurements made it possible to estimate the energy of the hyperfine splitting of muonium in the 1S state. Using the materials of these investigations Vaisenberg in 1961 defended his doctoral dissertation.

In 1964 "Nauka" published his monograph "The mu-meson". It was published in English translation in Amster-

dam in 1967 by the North-Holland Publishing Company. This book describes and practically interprets the basic results obtained in the experimental investigation of the properties and interactions of muons. The monograph has retained its scientific significance until the present time.

Experiments on the investigation of decays of strange particles were carried out by Vaisenberg and collaborators in competition with strong groups abroad. One of the more important papers completed during this period is the paper on the measurement of the polarization of muons arising in a $K_{\mu 3}$ decay. The original design of the experiment carried out at the accelerator of the Institute for Theoretical and Experimental Physics enabled Vaisenberg's collaborators, using nuclear photoemulsions, to measure for the first time the magnitude and sign of the polarization of the muons and thus to establish the vector nature of the interaction in this decay.

A magnetic spectrometer with streamer chambers for the investigation of the decays of K^+ mesons along different channels was constructed in the Institute of Theoretical and Experimental Physics with the active participation of Vaisenberg together with members of the Physics Institute of the Academy of Sciences. The estimate obtained in these papers of the probability of radiative $K^+ \rightarrow \mu^+ \nu \gamma$ decay and the value of the ratio of $K_{\mu 2}^+$ and $K_{e 2}^+$ decays have been included in tables of the properties of elementary particles.

In recent years Vaisenberg was involved in experiments searching for charmed particles originating in the interaction of neutrinos with nuclei of photoemulsions. The experiment was carried out by an international collaboration

which included photoemulsion laboratories in Australia, Bulgaria, Poland, USSR and USA. In connection with these investigations Vaisenberg published in *Usp. Fiz. Nauk* (1981, Vol. 135) the review well known to physicists devoted to the production, lifetime and other properties of charmed particles.

In the course of an extended period Vaisenberg was actively involved in pedagogical work. During 1952–1954 he was in charge of the Department of Physics of the Vologda Agricultural Institute, and from 1962 to 1970 he lectured in the Department of General Physics of the Moscow Physico-Technical Institute. During this time he developed and gave lecture courses in mechanics and molecular, atomic and nuclear physics.

Graduates of the Moscow Engineering Physics Institute and of the Moscow Physico-Technical Institute who completed their diploma projects under Vaisenberg's direction are now working in many institutes of our country.

Vaisenberg devoted considerable attention to scientific-literary activity. In 1975–1980 he edited the section on the physics of cosmic rays and elementary particles in the review journal "Physics". He translated into Russian and edited a large fraction of the well-known Berkeley course on general physics.

All those who knew Aleksandr Ovseevich respected him highly, valued his knowledge and experience, his clear mind and benevolence, and the nobility of his thoughts and actions.

Translated by G. M. Volkoff