Viktor Alekseevich Sviridov (Obituary)

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The eminent scientist, Professor Viktor Alekseevich Sviridov, author of two scientific discoveries, and a laureate of the State Prize of the USSR died on 5 March 1991. His entire multifaceted creative life was spent in the Joint Institute for Nuclear Research in Dubna. Viktor Alekseevich is known for his fundamental experimental research on scattering of particles and for his original ideas in the field of methodology of physical experiment.

V. A. Sviridov was born in Vologda into the family of physicians. On graduating from the Leningrad Polytechnic Institute in 1954 V. A. Sviridov was assigned to the laboratory of V. I. Veksler in Dubna which eventually became a part of the JINR. Remarkable events were unfolding in the 1950's. A political spring arrived. The ice of ideological dogmas was melting, contacts with colleagues abroad were expanding, the fog of secrecy was dispersing, our scientists made sensastional reports at international conferences. The Joint Institute for Nuclear Research was organized, the synchrophasotron was put in operation. The technical and financial possibilities appeared limitless.

Such were the circumstances and the spirit of that glorious time—the time of establishment of the JINR. V. A. Sviridov is a typical representative and expositor of it. The charge of enthusiasm and devotion to science accompanied since that time his entire life which became closely associated with the fate of the Joint Institute for Nuclear Research; he was one of those enthusiastic pioneers with whose names is associated the establishment of the scientific fields that have defined the visage of the Institute.

V. A. Sviridov's talent as an experimenter became apparent from the earliest years of his work. V. A. Sviridov proposed a number of ideas which became the basis of the new method of investigating diffraction processes. The method consists of using a very thin target in the internal beam of a cyclic accelerator and the realization of its multiple passages through the target. The idea of the method was the fruit of the intuition of V. A. Sviridov and his colleagues and the result of quantitative calculations based on the principle of phase stability in the process of acceleration of protons in synchrotrons.

Early in the 1960's the method was realized under the direction of V. A. Sviridov on the synchrophasotron of the JINR in the investigation of elastic proton-proton scattering in the range of small angles previously inaccessible to experimenters where it is possible to observe the interference of Coulomb and nuclear scattering.

In these experiments V. A. Sviridov raised experimental technique to the level of an art. As a result of an experiment of the greatest subtlety Coulomb-nuclear interference was observed for the first time in *pp*-scattering and it was shown that at high energies (2-10 GeV) the real part of the scattering amplitude at 0° is large (~30% of the imaginary part). The spectacular result that was obtained contradicted the generally accepted simple optical model, and the existing



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asymptotic picture of the interaction at high energies turned out to be groundless. Comparison of the results with calculations based on dispersion relations made it possible to check the validity of the basic principles of quantum field theory— Lorentz-invariance, mirocausality and unitarity.

The same method of multiple passage through a thin target was employed in 1968–1969 to obtain, using the just completed Serpukhov accelerator, the first reliable data on the contraction of the cone in elastic small-angle protonproton scattering. V. A. Sviridov and his colleagues succeeded in determining the very important parameter—the slope of the trajectory of the Pomeranchuk pole. The experimental results became the center of attention of international conferences on high-energy physics and were widely quoted.

In these experiments for the first time in the conduct of physics experiments a gaseous (hydrogen and deuterium) jet target was developed and put into operation. At present the use of thin internal film and gaseous targets has become a classical methodology utilized in all the large cyclic accelerators of the world.

During all these years V. A. Sviridov was the leader and the soul of the team that had increased in numbers of physicists from the countries participating in the Institute (it is for this that his colleagues deservedly nicknamed him "the General"). The thin target method and the accumulated experience have found successful application in the project initiated by V. A. Sviridov and his colleagues and realized at the FNAL accelerator in a joint JNRI-USA experiment. The organization of this experiment is a major achievement of V. A. Sviridov.

In recent years Viktor Alekseevich had been working on creating diagnostic means for forming and accelerating of electron-ion rings of a combined accelerator.

He proposed the principle of sectionalizing a Cherenkov counter for identification of fast multiply charged nuclear fragments. This device was used in the search for anomalons—particles with an unusually high interaction cross section.

Among his colleagues V. A. Sviridov was an authority first of all as a generator of ideas. One can confidently speak of him as of a founder of a new scientific field. Being a scientist with a wide overview on the world of physics he aided in every possible way the participation of JINR specialists in constructing the UNK complex at Serpukhov with which is associated the further development of high-energy physics in the USSR and JINR. Many technological and methodological developments in the program of constructing UNK were initiated with his direct participation. The active support by V. A. Sviridov of new scientific projects, his drive to base evaluation on objective significance, and not on personal vision have been deservedly recognized by the scientific community.

Sviridov's culture and scientific conscientiousness permeated the entire style of his life and activity. He invariably respected others, was sincerely modest, knew how to forgive weakness in others, did not shift the weight of responsibility to others, and was a reliable friend. An opponent of violence in any of its manifesta, ons, he was deeply and sincerely democratic.

Sviridov's premature death is a hard and irreplaceable loss for science, for his colleagues and his friends. They will always remember this remarkable man.

Translated by G. M. Volkoff