

Aleksei Aleksandrovich Naumov (Obituary)

Yu. M. Ado, S. T. Belyaev, I. N. Golovin, A. A. Logunov, Yu. D. Prokoshkin, V. A. Sidorov, A. N. Skrinskii, L. D. Solov'ev, V. A. Teplyakov, N. E. Tyurin, B. V. Chirikov, and V. A. Yarba

Usp. Fiz. Nauk **150**, 173–174 (September 1986)

Aleksei Aleksandrovich Naumov suddenly passed away on November 22, 1985, two months short of his seventieth birthday. He was a well-known specialist in the field of charged particle accelerators, a recipient of the Lenin and USSR State Prizes, a corresponding member of the Academy of Sciences of the USSR, Doctor of Technical Sciences, and the associate director of the High Energy Physics Institute of the State Committee on the Utilization of Atomic Energy.

A. A. Naumov was born on January 27, 1916 in Petrograd. In 1942 he graduated from the Moscow Institute of Communications Engineering with honors. During World War II he served as a radio engineer in the army. In 1945 he was assigned to work at the Laboratory No. 2 of the Academy of Sciences of the USSR—now the Kurchatov Institute of Atomic Energy (IAE)—to take part in solving the atomic problem which was of the greatest importance for our country. One of the main problems was the construction of a cyclotron with 1.5-meter poles. At the time, the cyclotron was a new, little-studied machine; its properties were not yet understood. With Aleksei Aleksandrovich's arrival at the cyclotron laboratory, a detailed systematic examination of the accelerator's capabilities was carried out. He quickly immersed himself in the accelerator technology that was new at the time and his comprehensive scientific approach to the problem resulted in the successful resolution of the difficulties that impeded the cyclotron's exploitation. This and other research efforts made A. A. Naumov's reputation at the Laboratory No. 2 and beyond. For his major contribution to the program A. A. Naumov and other scientists were awarded the USSR State Prize in 1953.

During the IAE period began the productive cooperation of two outstanding scientists—G. I. Budker and A. A. Naumov. The enormous engineering experience of A. A. Naumov proved essential for the technical realization of such interesting and scientifically profound ideas as iron-free accelerators, stabilized electron beams, colliding charged particle beams. These experiments were initiated at the IAE and reached their full scope at Novosibirsk, where A. A. Naumov with a group of enthusiasts moved in 1960 to become the associate director of the Institute of Nuclear Physics (INP) of the Siberian Division of the USSR Academy of Sciences. The experiments that were started in Moscow were carried out with great dispatch accompanied by the construction of such original machines as the iron-free B-2S synchrotron reaching 100 MeV energies and 0.5 A current—a cyclotron, betatron, and synchrotron hybrid with a 100% single-orbit particle extraction; the iron-free SB electron synchrotron reaching 70 MeV energies with record



ALEKSEĬ ALEKSANDROVICH
NAUMOV
(1916–1985)

magnetic field intensity of 200,000 Oe; the mixed iron–iron-free B-3M synchrotron reaching 300 MeV intended to serve as the injector for the colliding beam machine. Colliding beams become the main scientific interest of A. A. Naumov. In a brief time complex electron-electron and electron-positron colliding beam machines (VEP-1 and VEPP-2) were constructed—they yielded uniquely important physical results.

Engineering and organizational talents, and a great capacity for work always characterized A. A. Naumov. “Listen to me carefully...” he would often begin, eager to impart his invaluable experience, his research style, and his exacting, almost pedantic, approach to the difficult matter of technically realizing an experiment. And those who listened carefully learned a great deal, together building a first-rate institute, turning out students and completing many impor-

tant studies in the area of colliding beams and in other areas of experimental physics.

In 1961 A. A. Naumov was awarded the degree of Doctor of Technical Sciences for his studies of colliding beams. In 1964 he was elected a corresponding member of the USSR Academy of Sciences. In 1967 A. A. Naumov and a group of scientists at the INP of the Siberian Division of the USSR Academy of Sciences were awarded the Lenin Prize for the complex of studies devoted to colliding particle beams.

From 1966 onward A. A. Naumov served as the associate scientific director at the Institute of High-Energy Physics. He directed the commissioning of the 76 GeV proton accelerator, the largest in the world. Afterwards Alekseĭ Aleksandrovich did much to realize the technical potential of that accelerator and increase its efficiency. He devoted his complete attention to all problems, whether major or minor, and tried to impart this to his co-workers. Under his direction the projected accelerated proton beam intensity was increased fivefold; the working characteristics of the accelerator were improved. The accelerator became one of the most reliable machines of its class in the world. This permitted for an unmatched research effort that made a significant contribution to the understanding of the quark-gluon composition of elementary particles, with six registered discoveries to the machine's credit.

Alekseĭ Aleksandrovich also contributed fruitfully to the construction of a new ring injector-booster and the reconstruction of a number of accelerator sub-systems that yielded a significant enhancement in the intensity of the accelerator beam. A. A. Naumov played a major role in the planning of the 3000 GeV accelerator-storage project.

A. A. Naumov devoted much time and attention to the development and construction at the Institute of High-Energy Physics of a linear accelerator with high-frequency quadrupole (HFQ) focusing. He was one of the first to realize and support the innovative attempts to employ HFQ focusing in linear accelerators. He did not shirk the personal responsibility of recommending that instead of an ordinary linear accelerator an HFQ linear accelerator be employed to accelerate protons to 30 MeV before injection into the booster. Today this accelerator is successfully employed at the three-accelerator complex in the Institute of High-Energy Physics, and analogous machines are widely used at research centers throughout the world.

A. A. Naumov actively participated in public life: he put his scientific organizational abilities to great use as a member of the executive Division of Nuclear Physics of the USSR Academy of Sciences and a vice-chairman of the scientific council responsible for charged particle accelerator physics at the USSR Academy of Sciences.

The Communist Party and the State valued greatly A. A. Naumov's scientific organizational ability. He was awarded an Order of Lenin, two Orders of the Red Banner of Labor, a "Badge of Honor", and medals.

Alekseĭ Aleksandrovich Naumov was extremely demanding of himself, specially receptive to new ideas as a scientist, and a modest, attentive man. As such he will forever remain in the memory of his friends and all those who knew him.

Translated by A. Zaslavsky