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IN MEMORIAM

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Aleksandr Aleksandrovich Pomanskii

The 9th April 1994 was the anniversary of the death of Aleksandr Aleksandrovich Pomanskii, an outstanding Russian scientist, the first and permanent director of the Baksan Neutrino Observatory of the Institute of Nuclear Research of the Russian Academy of Sciences (RAS), Professor, and Doctor of Physicomathematical Sciences.

Pomanskii was born on 6th May 1932 in Moscow into a white-collar workers' family. After graduating in 1955 from the Physical Faculty of Moscow State University, he began to work at the Physical Institute of the Academy of Sciences of the USSR (FIAN). From 1957 until 1963, he worked in the Cosmic Rays Laboratory of FIAN, where he was engaged in research into large atmospheric showers and the cascade theory of showers. When still a student at the Moscow State University, he began to participate in the Pamir expeditions of the FIAN, during which he investigated the physics of cosmic rays. At the very beginning of his career, he turned his attention to the inconsistency in the radiation length and calculated its correct value. He devoted a series of studies to the development of nuclear cascades in the atmosphere; he was the first to apply the theory of the avalanche-type proton – meson (APM) effect to the calculation of electromagnetic cascades in dense media. He defended his dissertation "The problem of the passage of cosmic ray particles through matter", based on all his studies carried out at the time, in order to obtain the scientific degree of Candidate of Physicomathematical Sciences (equivalent to PhD).

In 1963, Pomanskii moved to the Neutrino Laboratory newly organised in the FIAN. From that time, he began to be engaged in neutrino astrophysics both in the field of the development of methods for the detection of solar neutrinos and in the field concerned with the creation of specialised (subterranean) laboratories for subterranean low-background experiments. Model installations of the chlorine – argon detector of solar neutrinos were created for the first time in the Soviet Union under his supervision. He was also the first to demonstrate the practical feasibility of the gallium – germanium method for the detection of solar neutrinos. The method which he proposed for the extraction of single atoms of radioactive germanium-71 from the large-scale gallium-based radiochemical detector was used successfully in the GALLEX experiment, in which the stream of neutrinos from the Sun was detected. His pioneering studies on the development of the lithium – beryllium radiochemical method for the detection of solar neutrinos are widely known. He also put forward a series of interesting ideas concerning the application of the thallium and bromine – krypton geochemical methods for the detection of neutrinos.

Aleksandr Aleksandrovich Pomanskii
(1932 – 1993)

In 1968, Pomanskii directed the building of the Baksan Neutrino Station — a unique multipurpose research establishment. It was created because of the need to formulate experiments of different kinds under subterranean conditions, where the intensity of cosmic rays is thousands of times lower than on the surface of the Earth. Since that time, Pomanskii carried out much work on the research and organisation needed to initiate the experiments in the Observatory. In 1971, he organised the Institute of Nuclear Research of the Academy of Sciences of the USSR. The Baksan Neutrino Observatory became part of the Institute and Pomanskii became the Director of the Observatory.

He developed the field of low-background research at the Institute. A series of unique experiments were formulated in the Laboratory of Low-background Research of the

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Baksan Observatory under his supervision. He discovered a record limit to the rate of the possible electron decay and investigated the processes involving the formation in the atmosphere of the long-lived cosmogenic Kr-81 isotope. He was the supervisor and a direct participant in the experiment designed to determine the composition of cosmogenic isotopes in lunar soil and experiments designed to search for ultradense nuclei.

In 1977, Pomanskii defended his dissertation ''Studies with low backgrounds of ionising radiation'', based on research concerned with the development of the methods of neutrino astrophysics and low-background studies, and was awarded the degree of Doctor of Physicomathematical Sciences.

Among the studies carried out at the Observatory under his supervision, special mention should be made of the experiments designed to search for double β-decay. The first positive results concerning the observation of two-neutrino double β-decay were obtained in the Observatory. The most stringent restriction to the existence of nonneutrino double β-decay were found for a series of nuclei. The Observatory occupies one of the leading places in world science in this field of research.

Pomanskii was the initiator and organiser of many investigations carried out in collaboration with foreign scientists. Thus, experiments designed to test the Pauli principle, which yielded the most stringent limitation of the probability of its infringement, were carried out on his initiative on the accelerator of the Technical University in Munich, Germany. In collaboration with Spanish colleagues from the University of Saragossa, an experiment was undertaken in which a search was made for the conversion of an atomic electron into a positron on Kr-78 nuclei. The experiments initiated under his supervision are being continued to the present time. They involve the search for the nonneutrino double β-decay of Ge-76 (IGEX International Collaboration, Russia – USA – Spain) and for weakly interacting heavy particles — the possible candidates for the role of the constituents of the hidden mass of the universe (collaboration with several universities of the USA).

Pomanskii published more than 100 scientific papers. Many of his students have successfully defended dissertations to secure the degree of Candidate of Physicomathematical Sciences. The young have been drawn to him, being won over by his spiritual generosity and optimism.

A small scientific station in the mountains of Priel'brus'ye [in the Caucasus] was transformed during the 25 years of its existence into the largest scientific centre for subterranean physics in Russia. During the last years of his life, Pomanskii devoted much effort and time to problems associated with the normal work of the Observatory, which left an increasingly smaller amount of time for science. Those who knew him during those years were therefore particularly struck by the fact that he remained throughout in touch with the main events in physics and his scientific thoughts did not lose its keenness.

Pomanskii was a versatile individual. He had a taste for art which he inherited from his father — a professional artist.

As an organiser and participant of many conferences both here and abroad, Pomanskii was known to many members of the scientific community. His scientific and general cultural erudition, openness and goodwill, friendliness, and vital energy gained him an unusually broad circle of friends. The bright memory of Aleksandr Aleksandrovich Pomanskii will forever remain in our hearts.

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