Professor O. I. LEYPUNSKIY
(1909–1990)

On January 4, 2009 was the centenary of Prof. Ovsei Ilyich Leypunskiy, the outstanding scientist in the field of chemical and radiation physics, one of the founders of Semenov Institute of Chemical Physics RAS (ICP).

He started his scientific activities in 1930, when he graduated from the physicomechanical course of Leningrad Polytechnic Institute and got a job in ICP, where he worked for all his life. Ovsei Ilyich fortunately combined the talent of observant investigator, scientific intuition, wide scientific horizon, and also high adherence to principles and civic courage. All these talents helped him to create a lot of fundamental works in different fields of physics and to make a significant contribution to modern industrial development. As a result of the cycle of

studies in physics of high pressure, in 1939, he found the conditions for synthesis of artificial diamonds from graphite in the field of thermodynamic stability of diamond. Impending war did not allow to continue his work, and diamonds have been synthesized 15 years later by several independent groups in the U.S., Sweden, and the Soviet Union under the conditions predicted by O. I. Leypunskiy in 1939.

Since very beginning of the Great Patriotic War, O. I. had explored the interior ballistics of rockets using solid propellants. He discovered the phenomenon of increasing of burning rate for propellants blown by combustion products (so-called the phenomenon of inflation or erosion), proposed and proved the mechanism of this phenomenon. Nowadays, the erosion phenomenon is always taken into account as a necessary step in design of solid rocket motors and artillery systems.

In 1947, O. I. was involved in the atomic project of the Soviet Union. He studied physical phenomena associated with the action of penetrating radiation, including formation of the radiation dose for destructiveness and means for protection against it. He also investigated the electromagnetic phenomenon in the nuclear explosions, the global consequences of radioactive contamination of Earth by products of the nuclear explosions. Together with his coworkers, O. I. discovered many new nuclear isomers.

O. I. Leypunskiy was an international class expert in the detection of nuclear explosions and radioactive contaminations; many times he directly participated in international meetings of experts in Geneva. O. I. was one of the first who considered the global consequences of the radioactive fallout from nuclear explosions and helped to create a modern understanding of how harmful to the life on the Earth is to use nuclear weapons. His works had become a significant contribution to the development of academic prerequisites for the Treaty banning nuclear weapon tests in the atmosphere, in outer space, and under water (1963).

From 1958 to 1979, O. I. Leypunskiy combined his work in the ICP with teaching as a professor of the Moscow Engineering Physics Institute (MEPhI) being the head of its unit. This period was marked in his work by further development of the problem of radioactive fallouts (particularly, ^{137}Cs) of nuclear explosions. Also, he had established in MEPhI the radiochemical laboratory for spectrometric measurements of radio nuclides in environmental samples. At that time, O. I. had posed the problem to measure concentrations of krypton and xenon in the atmosphere as important information for monitoring of the world nuclear power industry and energetics. Also, O. I. was the first to consider the relevance of intermediate energy neutron dosimetry, he developed the concept of "thin beam" in the calculation of the radiation field. In 1958, Ovsei Ilyich organized a workshop on dosimetry and protection, successfully working to our time. O. I. is rightly considered as the founder of scientific school on dosimetry and radiation protection in Russia and in former USSR.

In ICP, since 1960, O. I. Leypunskiy returned to studies on physics of combustion of solid propellants. Together with his coworkers, O. I. had investigated the nonsteady structure of combustion wave, the stability of cracks in burning propellants, the role of heterogeneity in propellants ignition and combustion, had revealed the mechanism of "anomalous" burning of propellants in the rocket motors, and mechanism of the phenomenon of secondary ignition of propellants after extinction in rocket motors. His works on combustion of aluminum and metalized propellants were internationally recognized.

The contribution of O. I. Leypunskiy to the development of science and promotion of peace was greatly appreciated. He had been decorated with orders and medals, had the honorary title "Honored Worker of Science and Engineering," and also was awarded the diploma of the Soviet Committee for the Defense of Peace.

As a scientist and a person Ovsei Ilyich earned high respect of all who worked with him, who knew him. He took keen interest not only in science but also in art and sport. He was a passionate mountain climber, wrote poetry, and was not indifferent to public life. He had brought up many apprentices, obliged to him not only for their attainments, but also for education on the bright example of life devoted to science, but not locked only in the science.

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