
IN MEMORY OF IGOR OLEKSANDROVYCH SOLOSHENKO



On April 29, 2007, the known scientist in the fields of plasma physics, ion beams, gas discharge, and radiation physics, Director of the Institute of Physics of the National Academy of Sciences of Ukraine, the Corresponding Member of the NAS of Ukraine, the Honored Worker in Science and Engineering of Ukraine, Doctor of Science in physics and mathematics, Professor Igor Oleksandrovych Soloshenko suddenly died at the age of 65. An excellent scientist, a talented organizer of science, a vigorous manager, a competent instructor of youth, a good friend, and a true comrade passed away.

I.O. Soloshenko was born at the village of Lugovka, the Okhtyrskyi – now Velykopysarivskyi – district of the Sumy region, Ukraine, on January 1, 1942. In 1963, he graduated from the Kharkiv State University and, in February 1964, came to the Institute of Physics of the NAS of Ukraine as a young specialist, where he permanently worked till his last days. Here, Igor Oleksandrovych came a long uneasy way full of searches and achievements, difficulties and victories; the way from an engineer to the Director of the institute, the

Corresponding Member of the NAS of Ukraine. In 1973, he successfully defended his Ph.D. thesis and, in 1983, the doctoral one. Since 1985, he had been heading the Department of Gas Electronics. During seventeen years, from 1989 to 2006, Igor Oleksandrovych held the appointment of the deputy director for scientific issues; and, in May 2006, he was elected the Director of the Institute of Physics of the NAS of Ukraine.

The mainstream of I.O. Soloshenko's scientific activity was the physics of intense ion beams which includes the technology and engineering realization of their generation, formation, and transport; the studies of their interaction with the substance in various aggregate states, in particular, with the surfaces of solids and with plasma. The most outstanding results of I.O. Soloshenko's researches are associated with the study of the problem concerning the compensation of the spatial charge of positive and negative ion beams, the discovery of mechanisms of the excitation of oscillations in compensated ion beams, and the transport of ion beams over significant distances. He was a discoverer of new effects inherent to only ion-beam systems, in particular, the capture of plasma electrons by the fields of beam-excited electron oscillations and the self-focusing of ion beams under conditions of nonlinear interactions with ion oscillations in plasma. Widely known to experts in Ukraine and beyond are the results of I.O. Soloshenko's researches of negative-ion plasma sources. In his works, the basic mechanisms of negative ion formation and decay were established, the emission characteristics of ion sources were calculated, and a stationary source of negative hydrogen ions with the top record parameters was created. The obtained results underlie a new direction in plasma physics, physics of ion-beam plasma. They allow one to predict the behavior of intense ion beams in neutral-particle beam injectors for controllable thermonuclear synthesis, accelerators, and various technological systems. The level of those researches, which were carried out mainly in 1970–1980s, still remains unattainable for other

institutions, including abroad. For this reason, the works of I.O. Soloshenko were included into the cycle of works nominated for the 2007 State Prize of Ukraine in Science and Engineering.

Lately, I.O. Soloshenko had been actively studying a gas discharge at atmospheric pressure and in a rarefied gas. His profound fundamental researches carried out together with his disciples brought about the elaboration of a new technology of the cold-plasma sterilization of medical instruments in a low-pressure gas discharge with a hollow cathode. Such a method has to replace the existing, ecologically dangerous routine of cold sterilization where highly toxic gases are applied. The developed technology, which is characterized by enhanced performance, universality, and simplicity in applications, has been patented in Ukraine and the USA. During last years, Igor Oleksandrovych worked hard for the practical realization of the developed method in Ukraine and abroad.

I.O. Soloshenko actively participated in the international scientific cooperation. Since 1990s, more than ten All-Union and International seminars on ion beams and ion injectors have been organized with his participation. He was the Chairman of the Organizing committee of the 10-th International Symposium on the Production and Neutralization of Negative Ions and Beams, which was held for the first time in Kyiv in 2004 as an evidence of the recognition of a high level of works in this domain that have been fulfilled in Ukraine, in particular, at the Institute of Physics of the NAS of Ukraine.

Igor Oleksandrovych permanently worked together with the youth. He lectured at the National Technical University of Ukraine "Kyiv Polytechnic Institute"

and had trained five Ph.D.'s. He was an ardent supporter of introducing various managerial forms to encourage the youngsters in scientific activity. He was an initiator of awarding the prizes for young reporters at annual scientific conferences of the Institute; he introduced various forms of material stimulation for young employees and post-graduate students.

I.O. Soloshenko's scientific and managerial activity was highly appreciated by the government and the scientific community. In 1998, President of Ukraine, by his decree, conferred I.O. Soloshenko a honorary title "The Honored Worker in Science and Engineering of Ukraine". On April 7, 2000, he was elected a Corresponding Member of the NAS of Ukraine in the experimental radiation physics speciality. On October 19, 2005, he was conferred the academic rank of Professor.

Igor Oleksandrovych was gone in the plenitude of his creative power, full of new original plans and projects. It is a great bereavement and an irreparable loss for the science in Ukraine and abroad.

We express our deepest sympathy to the colleagues, relatives, and friends of Igor Oleksandrovych. The blessed memory of him will retain forever in the heart of everyone who knew this wonderful bright person; and the scientific achievements of I.O. Soloshenko will be useful for many generations to follow.

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