
IN MEMORY OF MYKHAILO PAVLOVYCH LISITSA (15.01.1921–10.01.2012)



On January 10, 2012, the outstanding Ukrainian scientist in optics, spectroscopy, solid state physics, and semiconductors, the science manager, the chief researcher of the V.E. Lashkaryov Institute of Semiconductor Physics of the National Academy of Sciences of Ukraine, Academician of the NAS of Ukraine Mykhailo Pavlovych Lisitsa passed away.

M.P. Lisitsa was born in 1921 in the Zhytomyr region in a peasant family. He was a combatant in the Great Patriotic War, being awarded decorations and medals. In 1950, M.P. Lisitsa graduated from the Taras Shevchenko Kyiv State University. Working at the University, he defended his Candidate dissertation in 1954 and Doctoral one in 1961. Within this period, he executed the fundamental experimental and theoretical researches of intramolecular Fermi and intermolecular Davydov resonances, which afterwards became a basis for his discovery of the combined Fermi–Davydov resonance in crystal spectroscopy. This phenomenon gained Mykhailo

Pavlovych the recognition of spectroscopists throughout the world. A large cycle of works executed by him on thin-layer optics at that time culminated in the development of the exact theory of multilayered systems, the latter becoming a basis for the creation of important optical systems for bloomed optics, multilayered polarizers, and light reflectors.

In 1961, the scientist obtained a permanent position at a just organized Institute of Semiconductor Physics of the NAS of Ukraine and held the post of the Head of the Department of Optics. Simultaneously, he continued the double jobbing at the Faculty of Physics of the Taras Shevchenko Kyiv State University, holding the position of Professor.

The talent of M.P. Lisitsa as a scientist with a wide outlook ensured a successful development of optical research methods not only at the Department headed by him, but also at the whole Institute, as well as at many high-school institutions in Ukraine. In due time, his disciples headed some other departments and laboratories of the Institute and the chairs at a number of educational institutions. Among Mykhailo Pavlovych's disciples, there are two Corresponding Members of the NAS of Ukraine, 24 Dr. Sci.'s and 50 Ph.D.'s. The scientific directions of the scientific school created by him in optics and spectroscopy include the absorption optics of various elementary and collective excitations in semiconductors, luminescence researches, Raman scattering in solids, and new polarization phenomena.

The organization of the Department of Optics concurred in time with one of the major events in the development of optics in the twentieth century, the invention of lasers. M.P. Lisitsa immediately evaluated the historical value and the prospects of this discovery. As a result, the directions of researches indicated above were appended with issues devoted to optical quantum electronics and nonlinear optics. Following the suggestion of the President of the Academy of Sciences of Ukraine B.E. Paton, Mykhailo Pavlovych became his deputy for

managing the commission in quantum electronics; the task of this commission was to promote the rapid development of researches in this new scientific branch. Lately, M.P. Lisitsa became the Editor-in-Chief of a new periodical, namely, a collection of scientific works “Kvantovaya Elektronika” (“Quantum Electronics”), one of the earliest periodicals in the world that appeared in this direction. In the Department of Optics headed by Mykhailo Pavlovych, the working solid-state lasers were created, and the researches concerning the generation mechanisms of coherent radiation emission and nonlinear optic phenomena were started. Together with his disciples, M.P. Lisitsa developed the theory of a laser resonator with active body and, for the first time in the world practice, used semiconductor quantum dots in glass matrices for modulating the resonator Q-factor and producing powerful light pulses.

A wide response among experts was drawn by the experimental discovery of two new nonlinear optical polarization phenomena made by M.P. Lisitsa and his disciples; these were an extra nonlinear optical activity in gyrotropic crystals and an essentially new, giant optical activity in non-gyrotropic cubic crystals with impurity tunnel centers. Those phenomena allowed new methods to control the characteristics of light beams to be implemented.

As early as at the beginning of his scientific and pedagogic activity, M.P. Lisitsa began experiments with nano-sized structures, namely, superthin layers of atomic semiconductors and metals. Therefore, it is not of surprise that, in the last decade, he and his disciples participated very productively in every scientific program aimed at the development of semiconductor nanophysics and nanoelectronics.

The international recognition of M.P. Lisitsa’s scientific authority is confirmed by awarding him Johannes Marcus Marci Memorial Medal by the Czechoslovak Academy of Sciences as an outstanding spectroscopist and V.I. Vernadskyi Gold medal by the NAS of Ukraine for the outstanding achievements in optics and spectroscopy. He was an Honored worker of Ukraine in science and engineering and a winner of two State Prizes of Ukraine in science and engineering.

Academician M.P. Lisitsa was an author of more than 500 scientific works and about 40 author’s certificates of invention. In the co-authorship with his disciples, he published six monographies, including the first-ever book “Volokonnaya Optika” (“Fiber Optics”), published also abroad in English, as well as a 5-volume edition of “Zanimatel’naya Optika” (“Entertaining Optics”).

The Ukrainian physical science suffered a severe bereavement. All who happened to collaborate with M.P. Lisitsa knew him not only as a talented scientist and organizer, an exigent manager, and a benevolent teacher, but also as a true patriot of Ukraine, a highly intellectual person always capable to understand others and to rescue. The news of his death brought an unquenchable mental anguish to everybody, whom the destiny gave an opportunity to meet and work with and to study under this remarkable and wise person.

*V.F. Machulin, A.E. Belyaev, M.Ya. Valakh,
I.V. Prokopenko, V.G. Litovchenko, F.F. Syzov,
E.F. Venger, G.G. Tarasov, A.M. Yaremko,
I.V. Fekeshgazi, M.R. Kulish*