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## In Memory of Victor Petrovich Shestopalov (1923–1999)

Victor Petrovich Shestopalov was born in Slavyansk, Donetsk Region, on January 23, 1923, in a worker's family. In 1941, he entered the Department of Physics Mathematics of the Kharkov State University (KhGU). During the World War II, V.P. Shestopalov took part in military operations and was decorated with battle medals and orders. After the war, he continued his study at the University. In 1949, he published his first scientific work.

V. P. Shestopalov received his candidate degree in physics and mathematics when he was 27. At the age of 28, he became the head of the chair of calculus and theoretical mechanics at the Kharkov Teacher's Training College. Later, he founded the chair of theoretical radio physics at the KhGU, and the chairs of mathematical physics, plasma physics, and radio physics in the Kharkov Institute of Radio Electronics.

Such rare qualities as the ability to find new areas in science, to have his own concept of research prospects, to prove his rightness even to a most convinced and titled sceptic, and skill to inspire his colleagues by his enthusiasm distinguished the young scientist. Along with the enormous diligence, these qualities served as a reliable support to his talent of a scientist, became the basis of his success, determined the exclusive productivity of his fruitful work for many years, and became the banner of V. P. Shestopalov's scientific school.

At the very beginning of his scientific career, V.P. Shestopalov was active in studies of dynamics of vicious fluids (he published more than 30 works on this subjects), propagation of electromagnetic waves in slow-wave structures, design of novel modified amplifiers and oscillators, and studies of properties of various media (he published more than 60 works on this subject).

In the early 1960s, V. P. Shestopalov chose his main line in science, which involved the solution of the problems of electromagnetic wave scattering by different electrodynamic structures and development of novel methods for solving boundary-value diffraction problems (considered in the rigorous mathematical formulation). The results of these investigations were published in 6 monographs and more than 150 papers.

A special place in the scientific activity of V.P. Shestopalov belongs to investigations in the millimeter and submillimeter wavelength fields. He was the first to propose radically new sources of electromagnetic oscillation, such as diffracted radiation oscillators, antenna systems, and various transmission lines. These scientific results, which have glorified the Kharkov school of radio physics, are generalized in 4 monographs and 100 articles.

During 1980–90s, V.P. Shestopalov and his disciples developed, on the basis of new mathematical approaches, the spectral theory of open electrodynamic structures and analyzed their excitation by different sources. The results of this research are published in several monographs.

Under V.P. Shestopalov's leadership, rigorous methods for solving direct and inverse diffraction problems were intensively developed using a principally new approach to the analytical regularization of a rather general class of operators, which made it possible to solve the problems of diffraction, propaga-

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tion, and radiation of waves in the presence of electrodynamic objects of complex shapes which have different internal structures (inhomogeneous, anisotropic, plasma-like, weakly nonlinear, and other media). The results of this fundamental research are published in 6 monographs and more than 100 papers.

The study of linear spectral problems and, especially, the study of the Morse critical points of dispersion equations formed the basis for another new branch of science started by V.P. Shestopalov. It is the nonstationary nonlinear dynamics of strongly dispersive media. A new view of the analytical nature of the Morse critical points made it possible to predict, discover, and explore fundamental physical phenomena arising in different structures in the regions of the spectrum concentration. The results obtained were published in leading scientific editions and presented in a monograph.

V.P. Shestopalov gave more than 45 years to teaching and consulting post-graduate and doctorate students. He trained a pleiad of talented disciples, who appropriately carry on the affair of their teacher (there are more than 25 doctors and 150 candidates of science). He has created the Kharkov school of diffraction, which is widely known all over the world for outstanding achievements.

For more than thirty years, Academician V.P. Shestopalov worked in the Institute of Radio Engineering and Electronics (IRE) of the National Academy of Sciences of Ukraine. For more than 20 years, he was at the head of the institute, exhibiting the talent of a wise leader, an outstanding strategist, and a tireless researcher. These years, marked by the flowering of science, laid the foundation of the scientific authority of the IRE and determined the world level of the achievements of the IRE scientists in radio physics and electronics. For many years, V.P. Shestopalov was at the head of the North-Eastern Research Center of the National Academy of Sciences of Ukraine.

V.P. Shestopalov's multifaceted activity won him the USSR and Ukrainian SSR State Prizes.

*The memory of Victor Petrovich Shestopalov,  
a remarkable personality, and an outstanding scientist  
will forever remain in the hearts of his disciples and followers.*

**On behalf of the Editorial Board,  
the Editor-in-Chief,  
Doctor of Physics and Mathematics,  
Professor V. F. Kravchenko**

