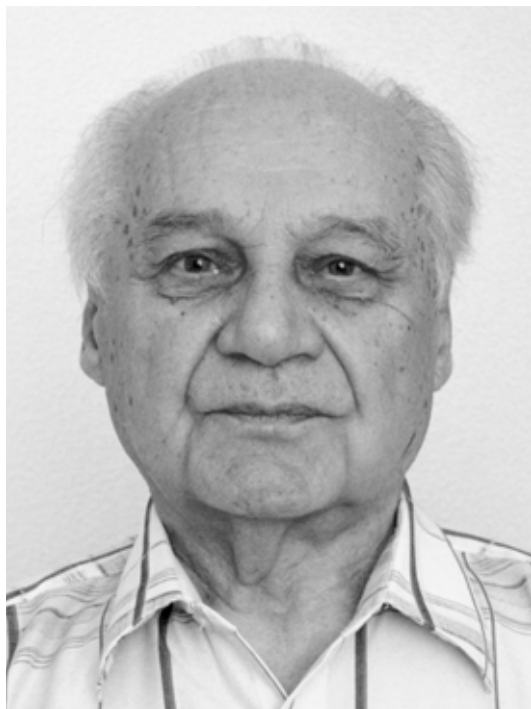


**LEONID PAVLOVYCH NIZHNIK  
(TO 80TH BIRTHDAY ANNIVERSARY)**



L. P. Nizhnik, a prominent Ukrainian mathematician, professor, a member of the Ukrainian Academy of Sciences was born on July 15, 1935, in the family of an employee in the village Maidanivka near the town of Borodyanka, Kyiv region. In 1936, in connection with transfer of his father to another job in the Teteriv forestry, the family moved to Teteriv. Here the boy received his primary education in the seven-year school and then continued studies in the Piskiv secondary school. Mathematics was his favorite subject. He is also fond of chess and even reached there the first sports category. Having graduated the school, the young man entered in 1952 the T. Shevchenko University of Kyiv to study mathematics at the Mathematics and Mechanics Faculty, and graduated from it in 1957.

Studying in his first years at the University, L. P. Nizhnik already manifested his mathematical abilities. The rich in content lectures of B. V. Gnedenko, J. I. Gihman, L. A. Kaluzhnin, Yu. M. Berezansky and an active participation in their seminars stimulated his tendency to research. Being a student he developed (together with K. L. Yushchenko and V. S. Korolyuk) the programs for tabulation of statistic acceptance control, realized on the first national electronic computer. The results were published and presented in his talk at the 3d USSR Mathematical Congress of USSA. His graduate work, concerning the Hörmander themes on partial differential equations with constant coefficients, was written under the guidance of Yu. M. Berezansky. In 1957 L. P. Nizhnik became his postgraduate student at the Institute of Mathematics of the Academy of Sciences of USSR in Kyiv. Under Y.M. Berezansky's influence and support, his subsequent scientific interests were formed. Since then, his entire scientific activity was going

on at the Department of Mathematical, and later, Functional Analysis of the Institute. Here, beginning from 1960, he successively held the positions of junior, senior, leading and then chief researcher, headed the Inverse Problems of Spectral Analysis Laboratory. Here he obtained both the Candidate/PhD (1961) and Doctor (1974) of Science degrees in Mathematics for the theses “The spectral properties of some differential operators and scattering problems” and “Nonstationary inverse scattering problems”, respectively (adviser Yu. M. Berezansky).

As a scientist L. P. Nizhnik is distinguished himself by capability to catch quickly the essence of a problem under consideration, clearness of its formulation, combination of concreteness with broad general conceptions. From the outset of his research at the Institute of Mathematics he turned his attention to investigation of the self-adjointness and the spectral properties of perturbations of a differential equation with constant coefficients by differential operators with variable ones, dependent in a certain way on the initial equation. He was the first who began to study, in 1960, nonstationary direct and inverse scattering problems for hyperbolic equations and systems. The selection of such systems was due to a variety of their applications in the mathematical physics. He obtained here a number of important results related to finding correct statements for direct and inverse problems, the introduction and description of scattering data, investigation of inverse problems for the string equation on a semi-axis and the nonstationary system of Dirac equations, development of an effective procedure for recovering coefficients of an equation by the scattering operator. Some later these results were extended by him and his students to a considerably larger class of multidimensional inverse problems with their applications to integration of multidimensional nonlinear evolutionary equations. Some works were devoted to investigation of the conditional stability of inverse scattering problems for the two-dimensional Dirac system and development methods for its regularization in the nonstationary case, search for the operator approach to nonlinear evolutionary problems with nonstationary boundary and conjugation conditions, typical, in particular, for problems of heat and mass transfer in the electric welding. L. P. Nizhnik first integrated the spatially symmetric two-dimensional Korteweg–de Vries equation, which is called now the Nizhnik–Novikov–Veselov equation, and equations associated with two-dimensional Toda chains. He gave in terms of Lie groups of Volterra operators the orbit interpretation of Hamiltonianity of the Davey–Stewartson equation, constructed the exact periodic solutions via elementary functions, investigated the Cauchy problem, found the explicit form for integrals of motion.

One of the main L. P. Nizhnik’s achievements consists in a development of the spectral theory of singularly perturbed operators when the perturbation is not an operator in the initial space (for example, the perturbation by a potential which is a  $\delta$ -function). The similar situation arises continuously in the quantum field theory. Furthermore, as a rule, the perturbed expression may be considered as a bilinear functional containing a singular component. The method of quadratic forms for investigating singularly perturbed operators was extended by him to the case of strong singularities as a bilinear forms method. He (jointly with S. Albeverio) obtained a number of perfect results in the spectral theory of singularly perturbed Schrödinger operators, in particular, operators with point interactions. There were also proposed and realized new models of quantum mechanical operators with nonlocal potentials, investigated direct and inverse problems for quantum graphs. In recent years L. P. Nizhnik is actively engaged in the spectral analysis of infinite metric graphs and its connection with analysis of orthogonal sums of specific Jacobi matrices.

In the entire L. P. Nizhnik’s scientific work, the theoretic and applied mathematics are always tied together. The mathematical models of important processes in power electrical equipment, constructed and investigated by him and implemented in practice, were

awarded with the State Prize of Ukraine (1987). He has also developed numerical and analytic methods for studying nonlinear diffusion-analytic chains of generalized billiard type and dynamic systems. All his results have a completed classical character. They brought him an international recognition, and they are frequently cited by scientists from various countries. The scientific contribution of L. P. Nizhnik is large enough. He published over 170 papers in the leading journals and 4 monographs, one of which "Inverse scattering problems for hyperbolic equations" is a part of the series of works honored with the State Prize of Ukraine (1998).

L. P. Nizhnik is not only a remarkable scientist but an excellent pedagogue, too. He gave some courses of lectures to students and young researchers at the T. Shevchenko University of Kyiv and for young engineers in the Kyiv Society "Knowledge". 4 Educational accessories of high level, 3 Doctors and 17 Candidates of Science is a result of his fruitful many years' scientific and educational work.

As ever, today Leonid Pavlovykh works successfully in pure mathematics and mathematical physics, collaborates with native and foreign mathematicians, takes an active part in international conferences. We wish him health and happiness, a good fortune in his personal life and creative field for many years to come, and to always keep in mind that his years make his wealth and, certainly, a contribution to Mathematics.

*Editorial Board*