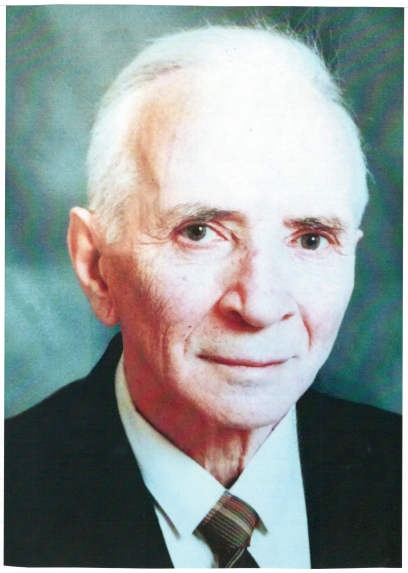
THE LIFE AND CAREER OF ACADEMICIAN VOLODYMYR L. RVACHOV (On the Occasion of the 100th Anniversary of His Birth)



Volodymyr L. Rvachov was a prominent Ukrainian scientist in the fields of mathematics, mechanics, and cybernetics. He was an Academician of the National Academy of Sciences of Ukraine, a laureate of the State Prize of Ukraine in Science and Technology, an Honored Worker of Science and Technology of Ukraine, a professor, and a Doctor of Physical and Mathematical Sciences. He was also an outstanding organizer of scientific research and the founder of a new, internationally recognized scientific school centered on the R-functions method.

Volodymyr L. Rvachov was born on October 21, 1926, in the city of Chyhyryn, Cherkasy Oblast, into a family of teachers. In 1944, he was conscripted into the Navy. Following his demobilization in 1947, he enrolled in the Faculty of Physics and Mathematics at Lviv University, graduating with honors in 1952. From 1952 to 1955, Volodymyr L. Rvachov served again in the Navy, working as a senior instructor at a naval school in Pushkino, Leningrad Oblast. In 1955, he earned his Candidate of Sciences degree at Lviv University; his dissertation was focused on solving problems involving a strip-shaped stamp (rigid indenter) and an infinite beam resting on an elastic half-space. That same year, following his demobilization, Volodymyr L. Rvachov was appointed Head of the Department of Higher Mathematics at the Berdyansk Pedagogic Institute. In 1960, at the Institute for Problems in Mechanics of the USSR Academy of Sciences, Volodymyr L. Rvachov obtained his Doctor of Sciences degree; the dissertation was focused on spatial contact problems in elasticity theory. At the age of 35, he was awarded the title of professor.

Volodymyr L. Rvachov became interested in the problem of incorporating geometric information – a task common to a broad class of optimization and mathematical physics problems solved via computer-based approximation methods. The mathematical theory of R-functions emerged at the intersection of classical applied mathematics, modern cybernetics, and mathematical logic. The foundations of the theory of R-functions were laid by Volodymyr L. Rvachov in 1963. The concept of R-functions was first introduced to address the need to formulate equations for complex geometric objects while seeking approximate solutions to certain spatial contact problems in elasticity theory. Historically, this problem dates back to the time of Descartes and is known in the literature as the inverse problem of analytic geometry: given a geometric object, one must derive its equation. One of the major achievements of the theory of R-functions was a solution to this inverse problem of analytic geometry.

In 1963, Volodymyr L. Rvachov moved to Kharkiv, where he chaired the Department of Computational Mathematics at the Kharkiv Institute of Mining Machinery, Automation and Computer Engineering. This institution was later transformed into the Kharkiv National University of Radio

Electronics, KhNURE, with Rvachov becoming its rector. From 1967 to 2005, Volodymyr L. Rvachov chaired the Department of Applied Mathematics and Computational Methods at the Anatolii Pidhornyi Institute of Mechanical Engineering Problems of the National Academy of Sciences of Ukraine.

Using the constructive apparatus of the theory of R-functions, Volodymyr L. Rvachov developed a unified approach to constructing coordinate sequences for fundamental variational and projection methods. This approach addresses not merely the homogeneous Dirichlet problem, but rather boundary conditions of a wide variety of types applied to domains of virtually arbitrary shape. This laid the foundation for the R-functions method (RFM). The method subsequently enabled major advances in solving various applied problems, including those in elasticity theory, the bending and vibration of thin plates, electrodynamics, and thermophysics. The pursuit of an efficient framework for the numerical solution of boundary-value problems in mathematical physics led Volodymyr L. Rvachov to develop a new programming technology, implemented through the POLE software system. A key factor in this development was the constructive versatility of the R-functions method, which serves as the underlying basis for these systems. Further developments of the method led to the generalization and constructive implementation – within functional spaces – of the widely used Lagrange-Taylor-Hermite formulas, and opened up possibilities for discovering a new class of compactly supported, infinitely differentiable functions, so-called "atomic functions". These functions are of significant importance for the development of approximation theory and methods for solving boundary-value problems in mathematical physics.

In 1972, Volodymyr L. Rvachov was elected a Corresponding Member, and in 1978, a Full Member of the National Academy of Sciences of Ukraine.

In 1989, Volodymyr L. Rvachov proposed a new algebraic calculus – isomorphic to the classical one – known as "non-Archimedean calculus." In this system, the Archimedean axiom (formulated for line segments), upon which the entire classical mathematical apparatus is founded, was replaced by an axiom positing the existence of a largest number.

Volodymyr L. Rvachov's scientific research is documented in hundreds of publications, including seventeen monographs and numerous inventor certificates.

Volodymyr L. Rvachov devoted significant attention to training the next generation of scientists. He held honorary doctorates from the National Technical University "Kharkiv Polytechnic Institute," the Kharkiv National University of Radio Electronics, and the University of Wisconsin–Madison (USA). He mentored multiple generations of scientists, supervising the work of over 70 Candidates of Sciences and 27 Doctors of Sciences.

Volodymyr L. Rvachov's multifaceted and prolific scientific and academic career was recognized with various state honors and awards, including the Order of the Red Banner of Labor, the Order of Friendship of Peoples, the Order of the Badge of Honor, the Order of Prince Yaroslav the Wise, and several medals. In 1980, Volodymyr L. Rvachov and his students were awarded the State Prize of Ukraine in Science and Technology for the creation, development, and implementation of the theory of R-functions within the national economy. In 1997, Volodymyr L. Rvachov was conferred the title of "Honored Worker of Science and Technology of Ukraine." Volodymyr L. Rvachov made a tremendous contribution to the development of fundamental science in Ukraine.

Currently, his students are preparing a multi-author monograph for publication by Springer, which will feature works highlighting the current state and achievements of his scientific school.