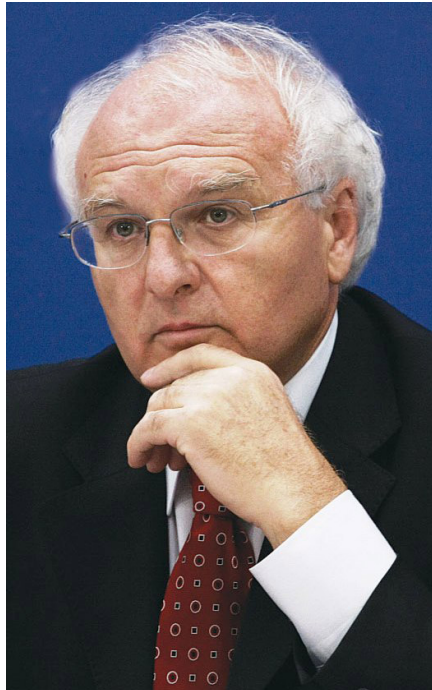


**Obituary**

**In memory of Professor Ivan Vakarchuk (1947 — 2020)**



Professor Ivan Vakarchuk, a leading Ukrainian physicist, statesman and public figure passed away in Lviv on April 4, 2020.

Ivan Vakarchuk was born on March 6, 1947 in the village of Stari Bratushany of Jedynets' district (now in Moldova). He graduated from the Physics Department of Ivan Franko State University of Lviv in 1970 and defended the PhD thesis (1974) under supervision of Prof. Ihor Yukhnovskii. After defending in 1980 the habilitation thesis entitled “Microscopic theory of Bose-liquid” he became one of the youngest doctors of sciences (D.Sc.) in Ukraine and in the Soviet Union. At the same time, he took the post of the head of quantum statistics department in the newly established Lviv Division “Statistical Physics” of the Institute for Theoretical Physics of Acad. of Sci. of UkrSSR and became a deputy-director of this Division (in 1990 on the base of the Division the Institute for Condensed Matter Physics of NAS of Ukraine was established). Since 1984 Prof. Vakarchuk headed the Chair for theoretical physics of the Ivan Franko State University of Lviv, was Rector of this university (1990–2007, 2010–2013) and Minister of Education and Science of Ukraine (2007–2010).

Prof. Vakarchuk is well regarded for his numerous important contributions to several areas of theoretical physics, including statistical physics, fundamental problems of quantum mechanics, mathematical methods of theoretical physics, general relativity, cosmology and theory of stellar spectra, geophysics. His scientific achievements were reported in more than 400 publications.

In statistical physics, which was his favorite and main field of expertise and the subject of his life-long passion, the major results of I. Vakarchuk were obtained in the theory of quantum liquids, theory of phase transitions and critical phenomena, physics of disordered systems. In the 1970s, I. Vakarchuk constructed a quantitative theory of Bose-Einstein condensation in superfluid He-4 based on the density matrix method. In the 1980s, by using the functional integration formalism, he developed a chain of

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functional derivative equations for calculation of correlation functions of both classical and quantum many-body systems. At the same time, he became interested in astrophysics working on the quantum theory of radiative transfer in stellar atmospheres and on different mechanisms for broadening atomic spectral lines.

In the 1980s and 1990s, I. Vakarchuk co-authored an extensive series of articles concerning the theory of disordered and magnetic systems. He studied the phonon, spin and electron excitations in systems with structural disorder, as well as an impact of the external magnetic field on Bose-Einstein condensation. Since the end of 1990s, I. Vakarchuk and his collaborators pioneered in Ukraine the research in the area of quantum mechanics with deformed commutation relations, as well as in quantum information. Early in 2000s, he proposed a new method for analytical calculation of expressions for density matrix and thermodynamic functions of quantum liquids that are valid in a wide range of temperatures including the  $\lambda$ -transition.

Professor Ivan Vakarchuk was an inspiring teacher, keen popularizer of science, original thinker full of new ideas, and effective manager. He trained several generations of scientists: 18 PhD and 3 habilitation theses have been successfully defended under his supervision. His manuals and textbooks “Lectures on general relativity”, “Introduction to the many-body problems”, “The theory of stellar spectra”, and “Quantum mechanics” (4 editions) have become classics among students and professionals, the latter having been awarded the State Prize of Ukraine in Science and Technology in 2000, whereas for a series of papers “Spectral studies of stars and comets” and a textbook “The theory of stellar spectra” he was awarded Barabashov prize in the field of astrophysics (2004). Prof. Vakarchuk was a founder and the editor-in-chief of journals “Journal of Physical Studies” and “World of Physics”, member of the editorial board of the journal “Condensed Matter Physics”. In 2006 he received a title of a Honored Worker of Science and Technology of Ukraine. In 2007 he was conferred a title of Hero of Ukraine — the highest national title that can be conferred upon an individual citizen. In 2017, together with V. Tkachuk and O. Gavrilik he was awarded the Davydov prize for outstanding contributions in theoretical and biological physics. Professor Ivan Vakarchuk was a honorary doctor of Krakow Pedagogical Academy (2002), University of Wrocław (2009), Ukrainian Free University in Munich (2010), Institute for Condensed Matter Physics of the NAS of Ukraine (2011), Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine (2016), Honored Professor of the Ivan Franko Lviv National University (2012).

Due to his scientific, pedagogical, organizational and social activities Prof. Vakarchuk is well known far beyond the mere scientific world. The Editorial Board of “Condensed Matter Physics” presents our condolences to the family of Ivan Vakarchuk, his numerous colleagues and friends in connection with his untimely death. We will always carry his memory in our hearts.