

Preface

Prominent mathematician Vladimir Aleksandrovich Marchenko was born on July 7, 1922, in Kharkov (the Soviet Union, now Ukraine). With this volume the authors and editors celebrate his 90th birthday.

Like many people of his generation, Marchenko was strongly affected by World War II during his youth. He was a student at the Department of Physics and the Department of Mathematics (the latter by correspondence) at Leningrad (now St. Petersburg) University in 1939. He experienced World War II while on a summer vacation with his mother and sister, who lived in Kharkov. They were not able to leave Kharkov because of health problems in the family and had to stay there during the whole occupation, October 1941–August 1943. This was a very hard time, requiring enormous efforts just to survive, including the production and sale of hand-made safety matches.

After the liberation of Kharkov in 1943, Marchenko continued his education at Kharkov University, this time in the Department of Physics and Mathematics. He graduated in 1945, received his Ph.D. in 1948 (in two years instead of the usual three), his D.Sc. in 1951, and became a full professor of the department in 1952. In 1959–1960 he was strongly involved in the organization of the Institute for Low Temperature Physics and Engineering in Kharkov and became the head of the Department of Mathematical Physics of the Institute in 1960. Since then Marchenko's scientific life has been entirely linked with the Institute. He is now an Emeritus Professor of the Mathematical Division of the Institute, continuing his research work, writing books, generously sharing with colleagues his erudition and vision of mathematics and, as always, keeping a lively interest in advances in modern science.

Marchenko is the author of more than 130 publications, including 12 monographs. He obtained fundamental and well-known results in harmonic analysis, the theory of almost periodic functions, the spectral theory of differential and finite-difference operators, the theory of inverse problems of spectral analysis and scattering theory, the spectral theory of large random matrices, the theory of diffraction of electromagnetic waves on periodic structures, homogenization theory for boundary-value problems of mathematical physics in domains with complicated microstructure, and the theory of completely integrable nonlinear evolution equations. One can mention at least three quite active fields, inverse problem of spectral theory, homogenization theory, and random matrix theory, where Marchenko is among the founding fathers and where his seminal works are well known and regularly cited. This shows that together with his virtuoso analytical techniques, he has a deep understanding of the trends and challenges of various branches of mathematics, setting their standards and perspectives sometimes well ahead of their time. We

refer the reader to the recent paper by Yu. M. Berezansky et al. (Russian Math. Surveys **67**:5 (2012), 186–191) for more details on his biography and results.

For more than half a century Marchenko has been the leader of the Kharkov school of mathematical physics and spectral theory of operators, which dates back to the 19th century and includes A. M. Lyapunov and V. A. Steklov among its founders. A brilliant researcher and outstanding teacher and personality, he possesses the gift to make deep and difficult topics of analysis, spectral theory and mathematical physics attractive for young people via his lectures, personal discussions, and his well-known seminar. For many years, the seminar has been the center of activity of an informal and large group who conduct research on a wide range of subjects of modern mathematics and mathematical physics.

Marchenko's outstanding scientific achievements made his name well known to mathematicians all over the world. He is a member of the National Academy of Sciences of Ukraine and the Russian Academy of Sciences, a Doctor Honoris Causa of the University Denis Diderot (Paris) and Kharkov University, and is a member of the Royal Norwegian Society of Sciences and Letters. He is a recipient of the Vernadsky Gold Medal of the National Academy of Sciences of Ukraine, the highest academic distinction of the country.

Marchenko's colleagues, friends, and students congratulate him on his 90th birthday and wish him good health and all the best in the coming years.

The Editors