



PREFACE: ANALYSIS AND RELATED TOPICS

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Dedicated to the memory of Professor Anatoly Vershik

This special issue on Analysis and Related Topics is dedicated to the memory of Professor Anatoly Vershik. Anatoly Moiseevich Vershik (28 December 1933 – 14 February 2024) was an outstanding Soviet and Russian mathematician. Anatoly Vershik made significant contributions to many areas of mathematics, including representation theory, dynamical systems, ergodic theory, asymptotic combinatorics, operator algebras, and measure theory. He is well known for his joint work with Sergei V. Kerov on representations of infinite symmetric groups and applications to the longest increasing subsequences. Together with V. Kaimanovich he described a relationship between probabilistic properties of random walks and algebraic characteristics of discrete groups such as amenability and exponential growth. In a series of papers including some with I. M. Gelfand and M. I. Graev he studied representation theory of infinite-dimensional groups. Inspired by the ideas of his teacher, V.A. Rokhlin, he developed a probabilistic description of the universal Urysohn spaces, connecting it to Gromov’s metric triples and the classification of metric measure spaces.

Professor Vershik was the Head of the Laboratory of Representation Theory and Dynamical Systems at the St. Petersburg Department of the Steklov Institute of Mathematics and the Chair of Mathematical Analysis at the Department of Mathematics and Mechanics at St. Petersburg State University. From 1998 to 2008 he was the President of the St. Petersburg Mathematical Society. His seminar in St. Petersburg was one of the major centers of mathematical life in St. Petersburg. In 2008 Anatoly Vershik was awarded a Humboldt Prize. In 2012 Anatoly Vershik became a Fellow of the American Mathematical Society. In 2015, he was elected a member of Academia Europaea. He has authored more than 350 publications and has had 27 PhD students.

In this special issue we present papers authored by a select group of experts in the areas of Analysis and its applications. The special issue contains thirteen papers contributed by researchers from Bulgaria, Canada, France, Germany, Israel, Italy, Portugal, Russia, Switzerland, United Kingdom, and USA. These papers cover a wide spectrum of important problems and topics of current research interest, including the Lie algebra $GL^+(2, C)$, spherical covariance representations, mean value property for nonharmonic functions in R^d , graphs on groups, analysis on the cone of discrete Radon measures, branching points in the planar Gilbert–Steiner problem, quasi-product and multiplicative Markov measures, the Radon–Nikodym problem, random walks in the free group case, representations of currents taking values in $PGL(2, Q_q)$, semiclassical estimates for the magnetic Schrodinger operator on the

line, random walks defined by piecewise actions on finite symmetric groups, spectral properties of random S -adic systems, scaling entropy growth gap, and solvability in the sense of sequences for some non – Fredholm operators with a drift and the cubed Laplacian.

We hope that this special issue is of importance for many mathematicians interested in recent developments in Analysis as well as in its diverse applications.

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