PREFACE: ANALYSIS, GEOMETRY AND PDE

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Special Issue on Analysis, Geometry and PDE dedicated to the memory of Professor Yurii Reshetnyak

This special issue on Analysis, Geometry and PDE is dedicated to the memory of Professor Yurii Reshetnyak.

Yurii Reshetnyak (1929–2021) was an outstanding Soviet and Russian mathematician, who has made fundamental contributions to the fields of Analysis, Geometry, and Function Theory and became one of the founders of Geometric Analysis. In the beginning of his scientific activity, he proved the fundamental theorem regarding isothermic coordinates on the two-dimensional surfaces of bounded curvature introduced by Aleksandr Aleksandrov. Yurii Reshetnyak obtained the final solution to the Mikhail Lavrentyev problem of stability of conformal mappings and founded the theory of mappings of bounded distortion, which are generalizations of conformal mappings. He proved theorems concerning weak convergence of Jacobians, the lower semicontinuity of the functionals of variational calculus, and the differentiability almost everywhere of the functions with Sergei Sobolev's generalized derivatives. Yurii Reshetnyak suggested an approach to Sobolev functions with values in metric measure spaces, based on the Kuratowski embedding. Professor Reshetnyak is an author of 150 research publications and 8 books. He has supervised 15 doctoral students. In 2000 Professor Reshetnyak was awarded the Lobachevsky Prize.

Reshetnyak's school and its achievements are universally accepted and well known to specialists.

In this special issue we present papers authored by a select group of experts in the areas of Analysis, Geometry and PDE. The papers collected here have been contributed by collaborators, friends and colleagues of Yurii Reshetnyak, who were influenced by his scientific work. The special issue contains eleven papers contributed by researchers from Austria, Canada, China, the Czech Republic, Finland, Israel, Italy, Russia, the United Kingdom, and the USA.

These papers cover a wide spectrum of important problems and topics of current research interest, including the Gauss equation on surfaces of bounded integral curvature, differentiability almost everywhere of weak limits of bi-Sobolev homeomorphisms, the theorems of Morse, Sard, Dubovitskii, Federer and the Luzin N-property, the principal frequency of non-homogeneous membranes, radial limits of quasiregular local homeomorphisms, Landen transformations, curvelinear functionals of tangent Abelian disks in universal Teichmüller space, capacity and modulus measures in metric measure spaces, weak quasiconformal mappings and weighted Poincaré-Sobolev inequalities, the curvatures of irregular curves in Euclidean spaces and Riemannian surfaces, and solvability of some quadratic integral equations.

Therefore, we feel that this special issue will be highly important for many mathematicians, who are interested in recent developments in Analysis, Geometry and PDE, as well as in their diverse applications.

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