

## PREFACE: ANALYSIS AND PDE, PART II

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This special issue on Analysis and PDE is dedicated to Professor Haim Brezis on the occasion of his 75th birthday.

Haim Brezis is an outstanding French mathematician who has made fundamental contributions to the fields of Functional Analysis and Partial Differential Equations. Professor Brezis wrote his Thèse de Troisième Cycle under the supervision of Gustave Choquet and his Thèse du Doctorat d'État under the supervision of Jacques-Louis Lions. He is Professor Emeritus at the Université Pierre-et-Marie-Curie, a Distinguished Visiting Professor at Rutgers University, and a Distinguished Visiting Professor at the Technion – Israel Institute of Technology. Since 1988, Professor Brezis has been a member of the Académie des Sciences (Paris) and of the Academia Europaea. He has also been a foreign associate of the Romanian Academy of Sciences (since 1993) and a foreign associate of the United States National Academy of Sciences (since 2003). In 2012 Haim Brezis became a fellow of the American Mathematical Society. He holds honorary doctorates from several universities including the Technion (1998) and the Alexandru Ioan Cuza University (2010), and is listed as an ISI highly cited researcher. Professor Brezis is an author of five books and more than 300 research publications, and has supervised over 60 doctoral students.

In part II of this special issue, we present papers authored by a selected group of well-recognized experts in the areas of Analysis and Partial Differential Equations. Most of the papers collected here have been contributed by students, collaborators, friends and colleagues of Haim, who have been influenced by his research. Part II of the special issue contains thirteen papers contributed by researchers in Analysis and PDE from Canada, Croatia, France, Greece, Israel, Italy, Romania, Slovenia, Sweden, Switzerland and the USA.

These papers cover a wide spectrum of important problems and topics of current research interest in Analysis and PDE, including resolvent conditions and growth of powers of operators on  $L^p$  spaces, the Hadamard semidifferential of functions on an unstructured subset of a TVS, essential singularities of fractal zeta functions, parabolic regularity, Sobolev embeddings and global Carleman estimates in  $L^q(L^p)$  spaces, a one dimensional turbulent boundary layer model, compactness and Liouville equations, exponential integrability in the spirit of Moser-Trudinger's inequalities of functions with finite non-local, non-convex energy, estimates of sub and super solutions of Schrödinger equations with very singular potentials, existence for a free boundary problem describing a propagating disturbance, a uniform continuity property of the winding number of self-mappings of the circle, non-variational elliptic equations involving the  $(p, q)$ -Laplacian, convection and convolution, positive solutions for the Robin  $p$ -Laplacian plus an indefinite potential, and compactness properties in the affine Sobolev inequality.

Therefore we feel that this special issue will be highly important to many mathematicians and scientists, who are interested in recent developments in Analysis and Partial Differential Equations, as well as in their numerous applications.

Viorel Barbu, Simeon Reich, Laurent Veron and Alexander J. Zaslavski, Editors

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