

Contents

I. Sobolev Type Inequalities

Vladimir Maz'ya Ed.

My Love Affair with the Sobolev Inequality	1
<i>David R. Adams</i>	
Maximal Functions in Sobolev Spaces	25
<i>Daniel Aalto and Juha Kinnunen</i>	
Hardy Type Inequalities Via Riccati and Sturm–Liouville Equations	69
<i>Sergey Bobkov and Friedrich Götze</i>	
Quantitative Sobolev and Hardy Inequalities, and Related Symmetrization Principles	87
<i>Andrea Cianchi</i>	
Inequalities of Hardy–Sobolev Type in Carnot–Carathéodory Spaces ...	117
<i>Donatella Danielli, Nicola Garofalo, and Nguyen Cong Phuc</i>	
Sobolev Embeddings and Hardy Operators	153
<i>David E. Edmunds and W. Desmond Evans</i>	
Sobolev Mappings between Manifolds and Metric Spaces	185
<i>Piotr Hajłasz</i>	
A Collection of Sharp Dilation Invariant Integral Inequalities for Differentiable Functions	223
<i>Vladimir Maz'ya and Tatyana Shaposhnikova</i>	
Optimality of Function Spaces in Sobolev Embeddings	249
<i>Luboš Pick</i>	
On the Hardy–Sobolev–Maz'ya Inequality and Its Generalizations	281
<i>Yehuda Pinchover and Kiril Tintarev</i>	
Sobolev Inequalities in Familiar and Unfamiliar Settings	299
<i>Laurent Saloff-Coste</i>	
A Universality Property of Sobolev Spaces in Metric Measure Spaces ..	345
<i>Nageswari Shanmugalingam</i>	
Cocompact Imbeddings and Structure of Weakly Convergent Sequences	361
<i>Kiril Tintarev</i>	
Index	377

II. Applications in Analysis and Partial Differential Equations

Vladimir Maz'ya Ed.

On the Mathematical Works of S.L. Sobolev in the 1930s	1
<i>Vasilii Babich</i>	
Sobolev in Siberia	11
<i>Yuri Reshetnyak</i>	
Boundary Harnack Principle and the Quasihyperbolic Boundary Condition	19
<i>Hiroaki Aikawa</i>	
Sobolev Spaces and their Relatives: Local Polynomial Approximation Approach	31
<i>Yuri Brudnyi</i>	
Spectral Stability of Higher Order Uniformly Elliptic Operators	69
<i>Victor Burenkov and Pier Domenico Lamberti</i>	
Conductor Inequalities and Criteria for Sobolev-Lorentz Two-Weight Inequalities	103
<i>Serban Costea and Vladimir Maz'ya</i>	
Besov Regularity for the Poisson Equation in Smooth and Polyhedral Cones	123
<i>Stephan Dahlke and Winfried Sickel</i>	
Variational Approach to Complicated Similarity Solutions of Higher Order Nonlinear Evolution Partial Differential Equations	147
<i>Victor Galaktionov, Enzo Mitidieri, and Stanislav Pokhozhaev</i>	
$L_{q,p}$ -Cohomology of Riemannian Manifolds with Negative Curvature ...	199
<i>Vladimir Gol'dshtein and Marc Troyanov</i>	
Volume Growth and Escape Rate of Brownian Motion on a Cartan–Hadamard Manifold	209
<i>Alexander Grigor'yan and Elton Hsu</i>	
Sobolev Estimates for the Green Potential Associated with the Robin–Laplacian in Lipschitz Domains Satisfying a Uniform Exterior Ball Condition	227
<i>Tünde Jakab, Irina Mitrea, and Marius Mitrea</i>	
Properties of Spectra of Boundary Value Problems in Cylindrical and Quasicylindrical Domains	261
<i>Sergey Nazarov</i>	
Estimates for Completely Integrable Systems of Differential Operators and Applications	311
<i>Yuri Reshetnyak</i>	

Counting Schrödinger Boundstates: Semiclassics and Beyond 329
Grigori Rozenblum and Michael Solomyak

Function Spaces on Cellular Domains 355
Hans Triebel

Index 387

III. Applications in Mathematical Physics

Victor Isakov Ed.

Preface 1
Victor Isakov

Geometrization of Rings as a Method for Solving Inverse Problems 5
Mikhail Belishev

The Ginzburg–Landau Equations for Superconductivity with
 Random Fluctuations 25
Andrei Fursikov, Max Gunzburger, and Janet Peterson

Carleman Estimates with Second Large Parameter for Second
 Order Operators 135
Victor Isakov and Nanhee Kim

Sharp Spectral Asymptotics for Dirac Energy 161
Victor Ivrii

Linear Hyperbolic and Petrowski Type PDEs with Continuous
 Boundary Control → Boundary Observation Open Loop Map:
 Implication on Nonlinear Boundary Stabilization with
 Optimal Decay Rates 187
Irena Lasiecka and Roberto Triggiani

Uniform Asymptotics of Green’s Kernels for Mixed and Neumann
 Problems in Domains with Small Holes and Inclusions 277
Vladimir Maz’ya and Alexander Movchan

Finsler Structures and Wave Propagation 317
Michael Taylor

Index 335