

Zurich Lectures in Advanced Mathematics

Edited by Habib Ammari, Alexander Gorodnik (Managing Editor), Urs Lang (Managing Editor), and Michael Struwe

Mathematics in Zurich has a long and distinguished tradition, in which the writing of lecture notes volumes and research monographs plays a prominent part. The *Zurich Lectures in Advanced Mathematics* series aims to make some of these publications better known to a wider audience. The series has three main constituents: lecture notes on advanced topics given by internationally renowned experts, in particular lecture notes of "Nachdiplomvorlesungen", organized jointly by the Department of Mathematics and the Institute for Research in Mathematics (FIM) at ETH, graduate text books designed for the joint graduate program in Mathematics of the ETH and the University of Zürich, as well as contributions from researchers in residence. Moderately priced, concise and lively in style, the volumes of this series will appeal to researchers and students alike, who seek an informed introduction to important areas of current research.

Previously published in this series:

- Y.B. Pesin, Lectures on partial hyperbolicity and stable ergodicity
- S.-Y.A. Chang, Non-linear Elliptic Equations in Conformal Geometry
- S.B. Kuksin, Randomly forced nonlinear PDEs and statistical hydrodynamics in 2 space dimensions
- P. Etingof, Calogero–Moser systems and representation theory
- G. Balkema, P. Embrechts, High Risk Scenarios and Extremes A geometric approach
- D. Christodoulou, Mathematical Problems of General Relativity I
- C. De Lellis, Rectifiable Sets, Densities and Tangent Measures
- P. Seidel, Fukaya Categories and Picard–Lefschetz Theory
- A. H. W. Schmitt, Geometric Invariant Theory and Decorated Principal Bundles
- M. Farber, Invitation to Topological Robotics
- A. Barvinok, Integer Points in Polyhedra
- C. Lubich, From Quantum to Classical Molecular Dynamics: Reduced Models and Numerical Analysis
- S. Onn, Nonlinear Discrete Optimization An Algorithmic Theory
- K. Nakanishi, W. Schlag, Invariant Manifolds and Dispersive Hamiltonian Evolution Equations
- E. Faou, Geometric Numerical Integration and Schrödinger Equations
- A.-S. Sznitman, Topics in Occupation Times and Gaussian Free Fields
- F. Labourie, Lectures on Representations of Surface Groups
- I. Gallagher, L. Saint-Raymond, B. Texier, From Newton to Boltzmann: Hard Spheres and Shortrange Potentials
- R. J. Marsh, Lecture Notes on Cluster Algebras
- E. Hebey, Compactness and Stability for Nonlinear Elliptic Equations
- S. Serfaty, Coulomb Gases and Ginzburg-Landau Vortices
- A. Figalli, The Monge–Ampère Equation and Its Applications
- W. Schachermayer, Asymptotic Theory of Transaction Costs
- A. Thomas, Geometric and Topological Aspects of Coxeter Groups and Buildings
- T. Fisher, B. Hasseblatt, Hyperbolic Flows
- S. Baader, Geometry and Topology of Surfaces
- N. Anantharaman, Quantum Ergodicity and Delocalization of Schrödinger Eigenfunctions

Published with the support of the Huber-Kudlich-Stiftung, Zürich

Xavier Fernández-Real Xavier Ros-Oton Regularity Theory for Elliptic PDE



Authors:

Xavier Fernández-Real École Polytechnique Fédérale de Lausanne, Institute of Mathematics, MA C2 567, Station 8, 1015 Lausanne, Switzerland Email: xavier.fernandez-real@epfl.ch

Xavier Ros-Oton ICREA, Pg. Lluís Companys 23, 08010 Barcelona;

Universitat de Barcelona, Departament de Matemàtiques i Informàtica, Gran Via de Les Corts Catalanes 585, 08007 Barcelona;

Centre de Recerca Matemàtica, Campus de Bellaterra, Edifici C 08193 Bellaterra, Barcelona, Spain Email: xros@icrea.cat

2020 Mathematics Subject Classification: Primary 35J15; Secondary 35B65, 35J05, 35J20, 35J60, 35R35

Keywords: elliptic PDE, Schauder estimates, Hilbert XIXth problem, nonlinear elliptic equations, obstacle problem

ISBN 978-3-98547-028-0, eISBN 978-3-98547-528-5, DOI 10.4171/ZLAM/28

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at http://dnb.dnb.de.

Published by EMS Press, an imprint of the

European Mathematical Society – EMS – Publishing House GmbH Institut für Mathematik Technische Universität Berlin Straße des 17. Juni 136 10623 Berlin, Germany

https://ems.press

© 2022 European Mathematical Society

Typesetting using the author's LaTeX sources: Simon Winter, Berlin, Germany Printed in Germany ^(®) Printed on acid free paper