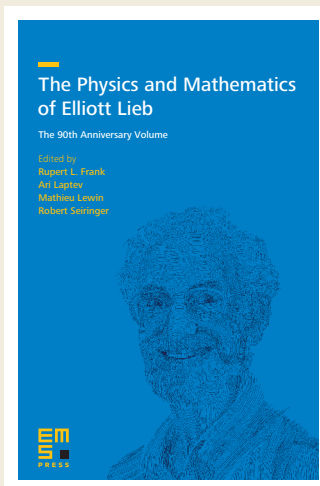


EMS Press New Books 2022



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The Physics and Mathematics of Elliott Lieb

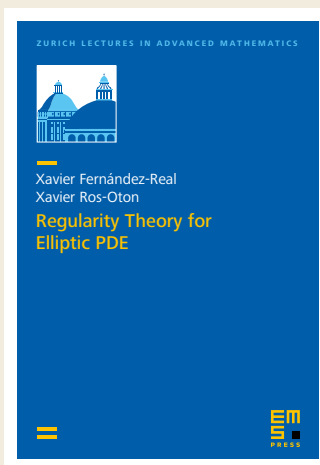
The 90th Anniversary Volume I & II

Rupert L. Frank (Ludwig-Maximilians-Universität München, Munich Center for Quantum Science and Technology, and California Institute of Technology), Ari Laptev (Imperial College London), Mathieu Lewin (Université Paris Dauphine), and Robert Seiringer (Institute of Science and Technology Austria), eds.

ISBN 978-3-98547-019-8 | Vol I. 680 pp. Vol II. 692 pp. | Hardcover | €179/\$189 (both volumes)

These two volumes are dedicated to Elliott Lieb on the occasion of his 90th birthday. They celebrate his fundamental contributions to the fields of mathematics, physics and chemistry. Around fifty chapters give an extensive account of Lieb's impact on a very broad range of topics and the resulting subsequent developments. Many contributions are of an expository character and

are accessible to a non-expert audience of researchers in mathematics, physics and chemistry. A non-exhaustive list of topics covered includes the problem of stability of matter, quantum many-body systems, density functional theory, topics in statistical mechanics, entropy inequalities and matrix analysis, functional inequalities and sharp constants.



Regularity Theory for Elliptic PDE

Xavier Fernández-Real (École Polytechnique Fédérale de Lausanne) and Xavier Ros-Oton (ICREA, Universitat de Barcelona, and Centre de Recerca Matemàtica)

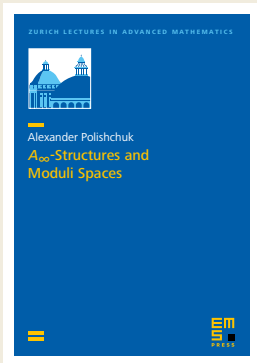
Zurich Lectures in Advanced Mathematics

ISBN 978-3-98547-028-0 | 236 pp. | Softcover | €49/\$55

This book aims to provide a self-contained introduction to the regularity theory for elliptic PDE, focusing on the main ideas rather than proving all results in their greatest generality. It can be seen as a bridge between an elementary PDE course and more advanced books. The book starts with a short review of the Laplace operator and harmonic functions. The theory

of Schauder estimates is developed next, but presented with various proofs of the results. Nonlinear elliptic PDE are covered in the following, both in the variational and non-variational setting and, finally, the obstacle problem is studied in detail, establishing the regularity of solutions and free boundaries.





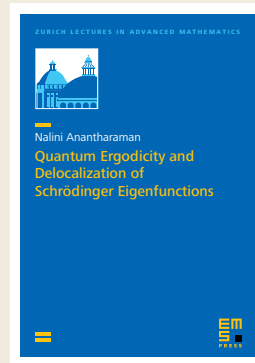
A_∞ -Structures and Moduli Spaces

Alexander Polishchuk (University of Oregon)

Zurich Lectures in Advanced Mathematics

ISBN 978-3-98547-026-6 | 178 pp.
Softcover | €39 / \$45

This book discusses certain moduli problems related to A_∞ -structures. These structures can be viewed as a way of recording extra information on cohomology algebras. They are useful in describing derived categories appearing in geometry, and as such, they play an important role in homological mirror symmetry. The author presents some general results on the classification of A_∞ -structures and also considers two concrete moduli problems. The first is related to the moduli spaces of curves, while the second is related to the classification of solutions of an associative version of the Yang–Baxter equation.



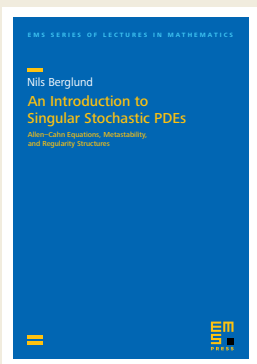
Quantum Ergodicity and Delocalization of Schrödinger Eigenfunctions

Nalini Anantharaman (Université de Strasbourg and CNRS)

Zurich Lectures in Advanced Mathematics

ISBN 978-3-98547-015-0 | 140 pp.
Softcover | €39 / \$45

This book deals with quantum chaos, starting with a historical introduction and then focussing on the delocalisation of eigenfunctions of Schrödinger operators for chaotic Hamiltonian systems. It contains a short introduction to microlocal analysis, necessary for the Shnirelman theorem and for the author's work on entropy of eigenfunctions on negatively curved manifolds. It covers further work by the author on quantum ergodicity of eigenfunctions on large graphs, results on eigenfunctions on the round sphere, and an exposition of the Backhausz–Szegedy result on the Gaussian distribution of eigenfunctions on random regular graphs.



An Introduction to Singular Stochastic PDEs

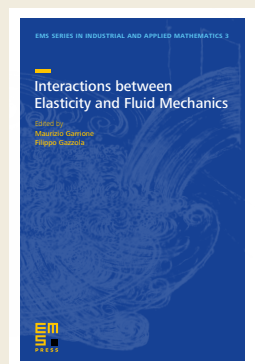
Allen–Cahn Equations, Metastability, and Regularity Structures

Nils Berglund (Institut Denis Poisson, Université d'Orléans, Université de Tours and CNRS)

EMS Series of Lectures in Mathematics

ISBN 978-3-98547-014-3 | 230 pp.
Softcover | €39 / \$42

This book gives a largely self-contained exposition of the subject of regular and singular SPDEs in the particular case of the Allen–Cahn equation. Properties of the equation are discussed successively in one, two and three spatial dimensions, allowing to introduce new difficulties of the theory in an incremental way. In addition to existence and uniqueness of solutions, aspects of long-time dynamics such as invariant measures and metastability are discussed. For the three-dimensional case, the theory of regularity structures developed by Martin Hairer and co-authors is presented.



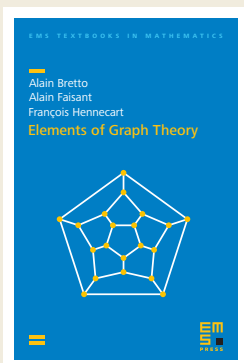
Interactions between Elasticity and Fluid Mechanics

Maurizio Garrione and Filippo Gazzola (both Politecnico di Milano), eds.

EMS Series in Industrial and Applied Mathematics

ISBN 978-3-98547-027-3 | 248 pp.
Hardcover | €69 / \$75

This book collects several contributions and points of view on phenomena where fluid mechanics, elasticity, and their interactions are at play. It is addressed both to junior researchers entering the field as well as to experienced professionals aiming to expand their scientific knowledge to closely related disciplines. The book also aims to bring closer the mathematical and engineering communities working on fluid-structure interactions in order to create a common language and to encourage future collaborations.



Elements of Graph Theory

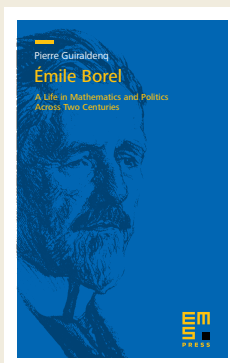
Alain Bretto (Université de Caen Normandie), Alain Faisant and François Hennecart (both Université de Lyon – Université Jean Monnet Saint-Étienne)

Translated by Leila Schneps

EMS Textbooks in Mathematics

ISBN 978-3-98547-017-4 | 502 pp.
Hardcover | €59/\$65

This book is an introduction to graph theory, presenting most of its elementary and classical notions through an original and rigorous approach, including detailed proofs of most of the results. It covers all aspects of graph theory from an algebraic, topological and analytic point of view, while also developing the theory's algorithmic parts. The variety of topics covered aims to lead the reader in understanding graphs in their greatest diversity in order to perceive their power as a mathematical tool.



Émile Borel

A Life in Mathematics and Politics
Across Two Centuries

Pierre Guiraldeq (École Centrale de Lyon)

Translated and edited by Arturo Sangalli

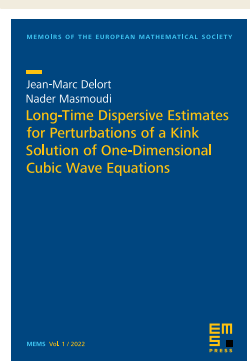
ISBN 978-3-98547-013-6 | 122 pp.
Softcover | €19/\$22

The book follows Borel, one of France's leading scientific and political figures of the first half of the twentieth century, through the various stages and the most significant events of his life, across two centuries and two wars. Originally published in French, this new English edition of the book will appeal primarily to mathematicians and those with an interest in the history of science, but it should not disappoint anyone wishing to explore, through the life of an exceptional scientist and man, a chapter of history from the Franco-Prussian War of 1870 to the beginnings of contemporary Europe.

Memoirs of the European Mathematical Society

ISSN 2747-9080 | eISSN 2747-9099 | Institutional Online €330/\$345 | Institutional Print & Online €420/\$440

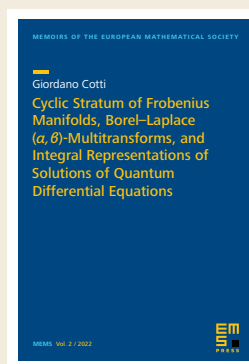
Anton Alekseev (Université de Genève), Gerard van der Geer (Universiteit van Amsterdam), Barbara Kaltenbacher (Universität Klagenfurt), Ari Laptev (Imperial College London), Laure Saint-Raymond (Institut des Hautes Études Scientifiques), Thomas Kappeler † (Universität Zurich), eds.



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Giordano Cotti (Universidade de Lisboa)

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Proceedings of the International Congress of Mathematicians 2022

Dmitry Belyaev (University of Oxford) and Stanislav Smirnov (Université de Genève), eds.

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Euclidean Buildings

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Karl H. Hofmann (Technische Universität Darmstadt and

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