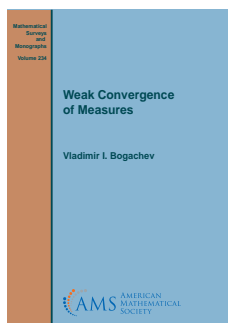


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Analysis



Weak Convergence of Measures

Vladimir I. Bogachev,
Lomonosov Moscow State University, Russia, and National Research University Higher School of Economics, Moscow, Russia

This book provides a thorough exposition of the main concepts and results related to various types of convergence of measures arising in measure theory, probability theory, functional analysis, partial differential equations, mathematical physics, and other theoretical and applied fields. Particular attention is given to weak convergence of measures. The principal material is oriented toward a broad circle of readers dealing with convergence in distribution of random variables and weak convergence of measures.

The book contains the necessary background from measure theory and functional analysis. Large complementary sections aimed at researchers present the most important recent achievements. More than 100 exercises (ranging from easy introductory exercises to rather difficult problems for experienced readers) are given with hints, solutions, or references. Historic and bibliographic comments are included.

The target readership includes mathematicians and physicists whose research is related to probability theory, mathematical statistics, functional analysis, and mathematical physics.

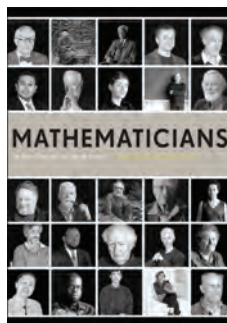
This item will also be of interest to those working in probability and statistics.

Contents: Weak convergence of measures on \mathbb{R}^d ; Convergence of measures on metric spaces; Metrics on spaces of measures; Convergence of measures on topological spaces; Spaces of measures with the weak topology; Comments; Bibliography; Index.

Mathematical Surveys and Monographs, Volume 234

November 2018, 286 pages, Hardcover, ISBN: 978-1-4704-4738-0, 2010 *Mathematics Subject Classification*: 60B10, 28C15, 46G12, 60B05, 60B11, 60B12, 60B15, 60E05, 60F05, 54A20, **AMS members US\$97.60**, List US\$122, Order code SURV/234

General Interest



Mathematicians

An Outer View of the Inner World

Mariana Cook

Mathematicians is a remarkable collection of ninety-two photographic portraits, featuring a selection of the most impressive mathematicians of our time. Acclaimed photographer Mariana Cook captures the exuberance and passion of these brilliant thinkers. The superb images are accompanied by autobiographical texts written by each mathematician. Together, the photographs and words illuminate a diverse group of men and women dedicated to the absorbing pursuit of mathematics.

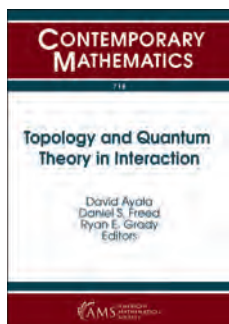
The compelling black-and-white portraits introduce readers to mathematicians who are both young and old and from notably diverse backgrounds. They include Fields Medal winners, those at the beginning of major careers, and those who are long-established celebrities in the discipline. Their candid personal essays reveal unique and wide-ranging thoughts, opinions, and humor. The mathematicians discuss how they became interested in mathematics, why they love the subject, how they remain motivated in the face of mathematical challenges, and how their greatest contributions have paved new directions for future generations. Mathematicians in the book include Jean-Pierre Serre, Henri Cartan, Karen Uhlenbeck, David Blackwell, Eli Stein, John Conway, Timothy Gowers, Frances Kirwan, Peter Lax, William Massey, John Milnor, Cathleen Morawetz, John Nash, Pierre Deligne, and James Simons.

This book conveys the beauty and joy of mathematics to readers outside the field as well as those in it. These pictures and their texts are an inspiration, and a perfect gift for those who love mathematics as well as for those who think they can't do it!

Contents: Preface by Mariana Cook; Introduction by Robert Clifford Gunning; *Mathematicians: Portraits*; Afterword by Brandon Fradd; List of Mathematicians.

October 2018, 199 pages, Softcover, ISBN: 978-1-4704-4838-7, LC 2018026735, 2010 *Mathematics Subject Classification*: 01A65, **AMS members US\$28**, List US\$35, Order code MBK/116

Mathematical Physics



Topology and Quantum Theory in Interaction

David Ayala, *Montana State University, Bozeman, MT*, **Daniel S. Freed**, *University of Texas at Austin, TX*, and **Ryan E. Grady**, *Montana State University, Bozeman, MT*, Editors

This volume contains the proceedings of the NSF-CBMS Regional Conference on Topological and Geometric Methods in QFT, held from July 31–August 4, 2017, at Montana State University in Bozeman, Montana.

In recent decades, there has been a movement to axiomatize quantum field theory into a mathematical structure. In a different direction, one can ask to test these axiom systems against physics. Can they be used to rederive known facts about quantum theories or, better yet, be the framework in which to solve open problems? Recently, Freed and Hopkins have provided a solution to a classification problem in condensed matter theory, which is ultimately based on the field theory axioms of Graeme Segal.

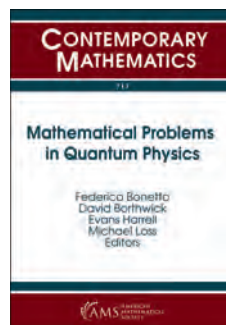
Papers contained in this volume amplify various aspects of the Freed–Hopkins program, develop some category theory, which lies behind the cobordism hypothesis, the major structure theorem for topological field theories, and relate to Costello’s approach to perturbative quantum field theory. Two papers on the latter use this framework to recover fundamental results about some physical theories: two-dimensional sigma-models and the bosonic string. Perhaps it is surprising that such sparse axiom systems encode enough structure to prove important results in physics. These successes can be taken as encouragement that the axiom systems are at least on the right track toward articulating what a quantum field theory is.

This item will also be of interest to those working in geometry and topology.

Contents: **D. R. Morrison**, Geometry and physics: An overview; **I. Saberi**, An introduction to spin systems for mathematicians; **A. Debray** and **S. Gunningham**, The Arf–Brown TQFT of pin^- surfaces; **A. Beaudry** and **J. A. Campbell**, A guide for computing stable homotopy groups; **D. Ayala** and **J. Francis**, Flagged higher categories; **O. Gwilliam** and **T. Johnson-Freyd**, How to derive Feynman diagrams for finite-dimensional integrals directly from the BV formalism; **R. Grady** and **B. Williams**, Homotopy RG flow and the non-linear σ -model; **O. Gwilliam** and **B. Williams**, The holomorphic bosonic string.

Contemporary Mathematics, Volume 718

November 2018, approximately 262 pages, Softcover, ISBN: 978-1-4704-4243-9, 2010 *Mathematics Subject Classification*: 18A05, 53C44, 55Q10, 55T15, 81S40, 81Txx, **AMS members US\$93.60**, List US\$117, Order code CONM/718



Mathematical Problems in Quantum Physics

Federico Bonetto, *Georgia Institute of Technology, Atlanta, GA*, **David Borthwick**, *Emory University, Atlanta, GA*, **Evans Harrell**, *Georgia Institute of Technology, Atlanta, GA*, and **Michael Loss**, *Georgia Institute of Technology, Atlanta, GA*, Editors

This volume contains the proceedings of the QMATH13: Mathematical Results in Quantum Physics conference, held from October 8–11, 2016, at the Georgia Institute of Technology, Atlanta, Georgia.

In recent years, a number of new frontiers have opened in mathematical physics, such as many-body localization and Schrödinger operators on graphs. There has been progress in developing mathematical techniques as well, notably in renormalization group methods and the use of Lieb–Robinson bounds in various quantum models.

The aim of this volume is to provide an overview of some of these developments. Topics include random Schrödinger operators, many-body fermionic systems, atomic systems, effective equations, and applications to quantum field theory. A number of articles are devoted to the very active area of Schrödinger operators on graphs and general spectral theory of Schrödinger operators. Some of the articles are expository and can be read by an advanced graduate student.

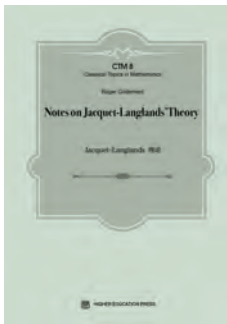
Contents: **R. L. Frank**, **P. T. Nam**, and **H. Van Den Bosch**, A short proof of the ionization conjecture in Müller theory; **M. Porta**, Mean field dynamics of interacting fermionic systems; **H. Abdul-Rahman**, **R. Sims**, and **G. Stolz**, Correlations in disordered quantum harmonic oscillator systems: The effects of excitations and quantum quenches; **J. Z. Imbrie**, The lattice Anderson model with discrete disorder; **V. Mastropietro**, Interacting fermions with quasi-random disorder; **M. Correggi**, **D. Lundholm**, and **N. Rougerie**, Local density approximation for almost-bosonic anyons; **B. Nachtergaele**, **R. Sims**, and **A. Young**, Lieb–Robinson bounds, the spectral flow, and stability of the spectral gap for lattice fermion systems; **J. Bolte** and **G. Garforth**, Solvable models of interacting n -particle systems on quantum graphs; **R. Band** and **A. J. Krueger**, Nonlinear Sturm oscillation: From the interval to a star; **C. Cacciapuoti**, Existence of the ground state for the NLS with potential on graphs; **V. Rabinovich**, Fredholm theory of differential operators on periodic graphs; **P. Exner** and **V. Lotoreichik**, Optimization of the lowest eigenvalue for leaky star graphs; **V. Bruneau** and **G. Raikov**, Local eigenvalue asymptotics of the perturbed Krein Laplacian; **P. von Soosten** and **S. Warzel**, Singular spectrum and recent results on hierarchical operators; **D. Auckly** and **P. Kuchment**, On Parseval frames of exponentially decaying composite Wannier functions; **M. Ballesteros**, **N. Crawford**, **M. Fraas**, **J. Fröhlich**, and **B. Schubnel**, Non-demolition measurements of observables with general spectra; **P. Naaijkens**, Subfactors and quantum information theory; **R. Dick**, Dressing up for length gauge: Mathematical aspects of a debate in quantum optics; **A. Joye** and **M. Merkli**, Random phase infinite coherent states: Construction and dynamics; **M. Merkli**, Effective evolution of open dimers.

Contemporary Mathematics, Volume 717

November 2018, approximately 336 pages, Softcover, ISBN: 978-1-4704-3681-0, 2010 *Mathematics Subject Classification*: 81V45, 81V70, 81V10, 82B28, 82B44, 82B20, 82B23, 82D77, **AMS members US\$93.60**, List US\$117, Order code CONM/717

New AMS-Distributed Publications

Algebra and Algebraic Geometry



Notes on Jacquet-Langlands' Theory

Roger Godement

The Jacquet-Langlands correspondence is an important case of the functorial principle in the Langlands program. This book is written by the founder of the eminent French school of automorphic representations and gives an accessible

introduction to the Jacquet-Langlands correspondence. It starts from the basic results of automorphic representations and ends with the converse theorem for L -functions.

This book is suitable for everyone who is interested in the Langlands program, in particular automorphic representations, L -functions and the Jacquet-Langlands correspondence.

This item will also be of interest to those working in number theory.

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Classical Topics in Mathematics, Volume 8

August 2018, 134 pages, Hardcover, ISBN: 978-7-04-050303-6, 2010 *Mathematics Subject Classification*: 11F41, 11F66, 22E50, **AMS members US\$47.20**, List US\$59, Order code CTM/8



Kuga Varieties: Fiber Varieties over a Symmetric Space Whose Fibers are Abelian Varieties

Michio Kuga

Kuga varieties are fiber varieties over symmetric spaces whose fibers are Abelian varieties and have played an

important role in the theory of Shimura varieties and number theory. This book is the first systematic exposition of these varieties and was written by their creators.

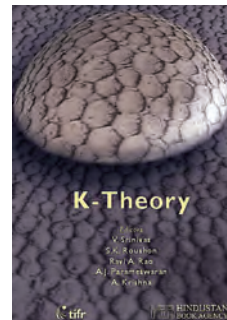
This book also contains one of Weil's letters and a paper by Satake which are relevant to the topic of the book.

This item will also be of interest to those working in number theory.

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Classical Topics in Mathematics, Volume 9

August 2018, 172 pages, Hardcover, ISBN: 978-7-04-050304-3, 2010 *Mathematics Subject Classification*: 14G35, 11G18, **AMS members US\$47.20**, List US\$59, Order code CTM/9



K-Theory

V. Srinivas, S. K. Roushon, Ravi A. Rao, A. J. Parameswaran, and A. Krishna, *Tata Institute of Fundamental Research, Mumbai, India*, Editors

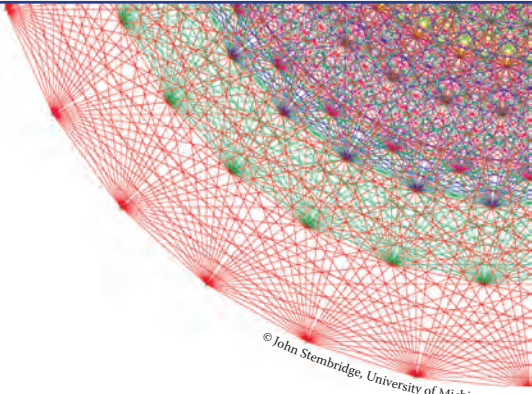
This volume contains the proceedings of the international colloquium organized by the Tata Institute of Fundamental Research in January 2016, one of a series

of colloquia going back to 1956.

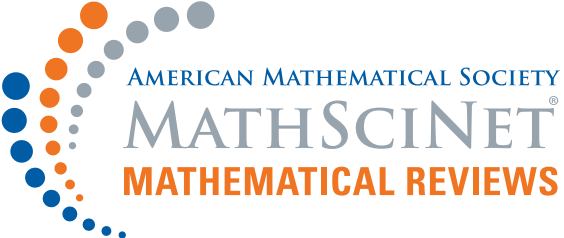
The talks at the colloquium covered a wide spectrum of mathematics, ranging over algebraic geometry, topology, algebraic K -theory and number theory. Algebraic theory, \mathbb{A}^1 -homotopy theory, and topological K -theory formed important sub-streams in this colloquium.

Several branches of K -theory, like algebraic cycles, triangulated categories of motives, motivic cohomology, motivic homotopy theory, Chow groups of varieties, Euler class theory, equivariant K -theory as well as classical K -theory have developed considerably in recent years, giving rise to newer directions to the subject as well as proving results of "classical" interest. The colloquium brought together experts in these various branches and their talks covered this wide spectrum, highlighting the interconnections and giving a better perspective of the whole subject area.

This volume contains refereed articles by leading experts in these fields and includes original results as well as expository materials in these areas.



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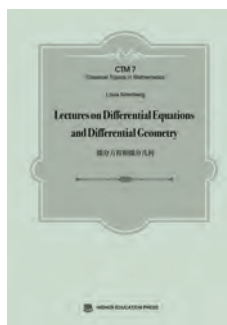
This item will also be of interest to those working in geometry and topology and number theory.

A publication of the Tata Institute of Fundamental Research. Distributed worldwide except in India, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka.

Tata Institute of Fundamental Research

September 2018, 400 pages, Hardcover, ISBN: 978-9-386279-74-3, 2010 *Mathematics Subject Classification*: 14F05, 19D45, 14C15, 19E15, 14C40, 14F42, 14F20, 19E20, 14C25; 13D09, 18G10, 55P42, 19C40, 14L30, 55N15, 20G15, 13D15, 19D10, 19D35, 19D55, 19E08, 19M99, 14C30, 14C35, 14E08, 14F43, **AMS members US\$160**, List US\$200, Order code TIFR/19

Differential Equations



Lectures on Differential Equations and Differential Geometry

Louis Nirenberg, *Courant Institute of Mathematical Sciences, New York University, NY*

This book is superbly written by a world-leading expert on partial differential equations and differential geometry. It consists of two parts. Part I covers the existence and uniqueness of solutions of elliptic differential equations. It is direct, to the point, moves smoothly and quickly, and there are no unnecessary discussions or digressions. Many topics discussed in Part II will be new and surprising to many students, even to some experts in differential geometry.

This item will also be of interest to those working in geometry and topology.

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Classical Topics in Mathematics, Volume 7

August 2018, 134 pages, Hardcover, ISBN: 978-7-04-050302-9, 2010 *Mathematics Subject Classification*: 35-XX, 53-XX, **AMS members US\$47.20**, List US\$59, Order code CTM/7