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New Books 2023

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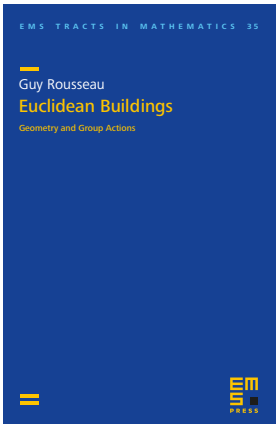


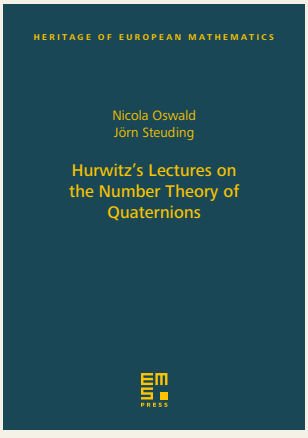
Euclidean Buildings

Guy Rousseau (Université de Lorraine)

EMS Tracts in Mathematics

ISBN 978-3-98547-039-6 | 607 pp. | Hardcover | € 99 | $ 109

The theory of buildings lies at the interplay between geometry and group theory, and is one of the main tools for studying the structure of many groups. The present book develops the general abstract theory of Euclidean buildings (that is, buildings with Euclidean affine spaces as apartments). It is largely self-contained and emphasizes the metric aspects of these objects, as CAT(0) spaces very similar to Riemannian symmetric spaces of non-compact type. The book studies their compactifications, their links with groups, many classical examples, and some applications (for example, to Hecke algebras).



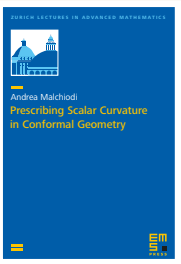
Hurwitz's Lectures on the Number Theory of Quaternions

Nicola Oswald (Bergische Universität Wuppertal) and
Jörn Steuding (Julius-Maximilians Universität Würzburg)

Heritage of European Mathematics

ISBN 978-3-98547-011-2 | 311 pp. | Hardcover | € 79 | $ 85

This book contains an English translation of Adolf Hurwitz's 1919 textbook on the number theory of quaternions as well as his famous 1-2-3-4 theorem on composition algebras. In addition, the reader can find commentaries that shed historical light on the development of this number theory of quaternions, for example, the classical preparatory works (of Fermat, Euler, Lagrange and Gauss to name but a few), the different notions of quaternion integers in the works of Lipschitz and Hurwitz, analogies to the theory of algebraic numbers, and the further development (including Dickson's work in particular).



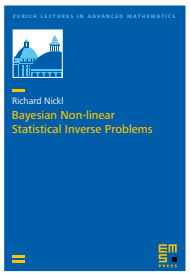
Prescribing Scalar Curvature in Conformal Geometry

Andrea Malchiodi (Scuola Normale Superiore di Pisa)

Zurich Lectures in Advanced Mathematics

ISBN 978-3-98547-052-5 | 161 pp.
Softcover | € 39 | $ 45

This book treats the classical problem, posed by Kazdan and Warner, of prescribing a given function on a closed manifold as the scalar curvature of a metric within a conformal class. Since both critical equations and obstructions to the existence of solutions appear, the problem is particularly challenging. Treating different aspects of the subject and containing several references to up-to-date research directions and perspectives, the book will be useful to graduate students and researchers interested in geometric analysis and partial differential equations.



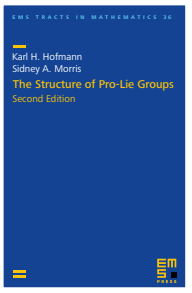
Bayesian Non-linear Statistical Inverse Problems

Richard Nickl (University of Cambridge)

Zurich Lectures in Advanced Mathematics

ISBN 978-3-98547-053-2 | 171 pp.
Softcover | € 39 | $ 45

This book develops a general theory of Bayesian inference for non-linear forward maps and rigorously considers two PDE model examples arising with Darcy's problem and a Schrödinger equation. Starting with the statistical consistency of Gaussian process methods, it then treats local fluctuations and approximations of posterior distributions by Gaussian or log-concave measures whose curvature is described by PDE mapping properties of underlying 'information operators'. Applications to the algorithmic runtime of gradient-based MCMC methods are discussed as well as computation time lower bounds for worst case performance of some algorithms.



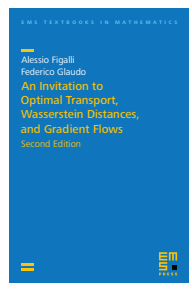
The Structure of Pro-Lie Groups (Second Edition)

Karl H. Hofmann (Technische Universität Darmstadt; Tulane University) and Sidney A. Morris (La Trobe University; Federation University Australia)

EMS Tracts in Mathematics

ISBN 978-3-98547-048-8 | 840 pp.
Hardcover | € 119 | $ 129

This book exposes a Lie theory of almost connected pro-Lie groups (and hence of almost connected locally compact groups) and illuminates the variety of ways in which their structure theory reduces to that of compact groups on the one hand and of finite dimensional Lie groups on the other. It is therefore a continuation of the authors' monograph on the structure of compact groups and is an invaluable tool for researchers and graduate students working in topological groups, Lie theory, harmonic analysis and representation theory.



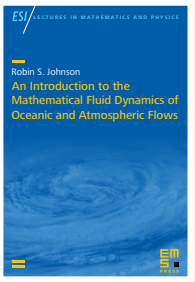
An Invitation to Optimal Transport, Wasserstein Distances, and Gradient Flows (Second Edition)

Alessio Figalli (ETH Zürich) and Federico Glaudo (Institute for Advanced Study)

EMS Textbooks in Mathematics

ISBN 978-3-98547-050-1 | 152 pp.
Hardcover | € 39 | $ 45

Coauthored by one of the leading experts in optimal transport, this book provides a self-contained introduction to this important topic presenting its essentials: Kantorovich duality, existence and uniqueness of optimal transport maps, Wasserstein distances, the JKO scheme, Otto's calculus, and Wasserstein gradient flows. The book is suitable for a course at the graduate level, and also includes an appendix with a series of exercises along with their solutions. The present second edition contains a number of additions, such as a new section on the Brunn–Minkowski inequality, new exercises, and various corrections throughout the text.



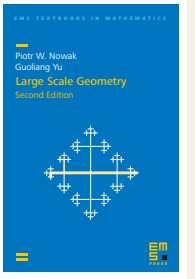
An Introduction to the Mathematical Fluid Dynamics of Oceanic and Atmospheric Flows

Robin S. Johnson (Newcastle University)

ESI Lectures in Mathematics and Physics

ISBN 978-3-98547-029-7 | 176 pp.
Softcover | € 49 | $ 55

The study of the movement of the atmosphere and the oceans is intriguing, challenging and important, particularly in the context of current concerns about the climate. This text presents a single, over-arching modelling approach which uses the thin-shell approximation – and nothing more – applied to the general equations of fluid dynamics. It is suitable for researchers, and students, in the oceanic and atmospheric sciences, and for mathematicians with an interest in the application of fluid dynamics to more complicated flow scenarios.



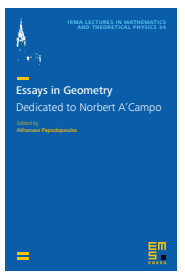
Large Scale Geometry (Second Edition)

Piotr W. Nowak (Polish Academy of Sciences) and Guoliang Yu (Texas A&M University)

EMS Textbooks in Mathematics

ISBN 978-3-98547-018-1 | 213 pp.
Hardcover | € 49 | $ 55

This book provides a friendly approach to the basic theory of large scale geometry and offers a glimpse of its applications to topology, geometry, and higher index theory. The authors have made a conscientious effort to make the book accessible to advanced undergraduate students, graduate students, and non-experts. The present second edition has been updated to cover recent developments involving constructions of groups and metric spaces with exotic properties as well as results charting new directions in index theory, and it also includes minor improvements in the presentation and an updated bibliography.



Essays in Geometry

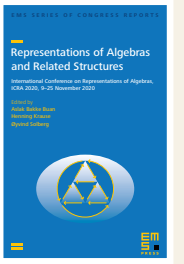
Dedicated to Norbert A'Campo

Edited by Athanase Papadopoulos (Université de Strasbourg)

IRMA Lectures in Mathematics and Theoretical Physics

ISBN 978-3-98547-024-2 | 1,028 pp.
Hardcover | € 129 | $ 139

This volume consists in a collection of essays dedicated to Norbert A'Campo on the occasion of his 80th birthday. The subject is geometry in the broadest sense. The topics include hyperbolic and super hyperbolic geometry, 3-manifolds, metric geometry, mapping class groups, linear groups, Riemann surfaces, Teichmüller spaces, high-dimensional complex geometry, differential topology, symplectic geometry, singularity theory, number theory, algebraic geometry, dynamics, mathematical physics and philosophy of mathematics. The book gives a fairly comprehensive overview of the wealth of current research in geometry.



Representations of Algebras and Related Structures

Edited by Aslak Bakke Buan (Norwegian University of Science and Technology), Henning Krause (Universität Bielefeld) and Øyvind Solberg (Norwegian University of Science and Technology)

EMS Series of Congress Reports

ISBN 978-3-98547-054-9 | 428 pp.
Hardcover | € 89 | $ 95

This volume presents a collection of articles devoted to representations of algebras and related topics. Distinguished experts in this field presented their work at the International Conference on Representations of Algebras in 2020. The book reflects recent trends in the representation theory of algebras and its interactions with other central branches of mathematics, including combinatorics, commutative algebra, algebraic geometry, topology, data analysis, Lie algebras, quantum groups, homological algebra, and theoretical physics. There are thirteen independent articles, written by leading experts in the field.

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