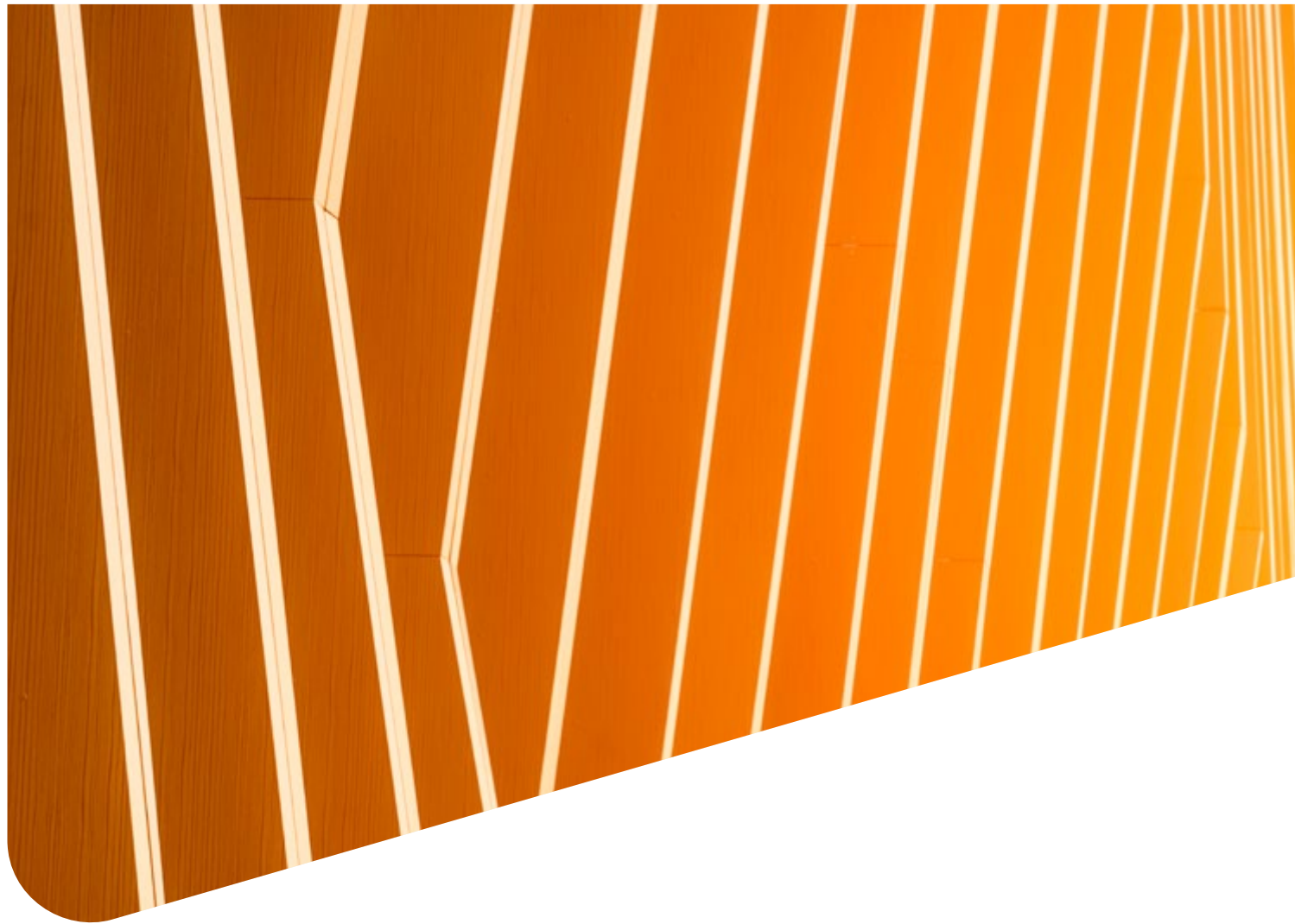




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Cetraro, Italy 2019

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V. Ambrosio

Nonlinear Fractional Schrödinger Equations in $\mathbb{R}^N$

This monograph presents recent results concerning nonlinear fractional elliptic problems in the whole space. More precisely, it investigates the existence, multiplicity and qualitative properties of solutions for fractional Schrödinger equations by applying suitable variational and topological methods. The book is mainly intended for researchers in pure and applied mathematics, physics, mechanics, and engineering. However, the material will also be useful for students in higher semesters and [...]

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[978-3-030-60219-2](https://doi.org/10.1007/978-3-030-60219-2)



9 783030 602192

Sale prices valid until June 30, 2024

K. Ammari, F. Hassine, L. Robbiano

Stabilization for Some Fractional-Evolution Systems

This brief provides unified methods for the stabilization of some fractional evolution systems, nicely complementing existing literature on fractional calculus. The volume is divided into three chapters, the first of which considers the stabilization for some abstract evolution equations with a fractional damping, the second of which validates the abstract results of chapter 1 on concrete examples, and the third of which studies the stabilization of fractional evolution systems with memory.

Springer

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[978-3-031-17342-4](https://doi.org/10.1007/978-3-031-17342-4)



9 783031 173424

G. A. Anastassiou, R. A. Mezei

Numerical Analysis Using Sage

This is the first numerical analysis text to use Sage for the implementation of algorithms and can be used in a one-semester course for undergraduates in mathematics, math education, computer science/information technology, engineering, and physical sciences. The primary aim of this text is to simplify understanding of the theories and ideas from a numerical analysis/numerical methods course via a modern programming language like Sage. Aside from the presentation of fundamental theoretical [...]

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[978-3-319-38585-3](https://doi.org/10.1007/978-3-319-38585-3)



9 783319 385853

T. D. Andersen, C. C. Lim

Introduction to Vortex Filaments in Equilibrium

This book presents fundamental concepts and seminal results to the study of vortex filaments in equilibrium. It also presents new discoveries in quasi-2D vortex structures with applications to geophysical fluid dynamics and magnetohydrodynamics in plasmas. It fills a gap in the vortex statistics literature by simplifying the mathematical introduction to this complex topic, covering numerical methods, and exploring a wide range of applications with numerous examples. The authors have produced [...]

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[978-1-4939-1937-6](https://doi.org/10.1007/978-1-4939-1937-6)



9 781493 919376

T. Andreescu, D. Andrica

Quadratic Diophantine Equations

This monograph treats the classical theory of quadratic Diophantine equations and guides the reader through the last two decades of computational techniques and progress in the area. These new techniques combined with the latest increases in computational power shed new light on important open problems. The authors motivate the study of quadratic Diophantine equations with excellent examples, open problems and applications. Moreover, the exposition aptly demonstrates many applications of [...]

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[978-1-4939-3880-3](https://doi.org/10.1007/978-1-4939-3880-3)



9 781493 938803

G. E. Andrews, C. Krattenthaler, A. Krinik

Lattice Path Combinatorics and Applications

The most recent methods in various branches of lattice path and enumerative combinatorics along with relevant applications are nicely grouped together and represented in this research contributed volume. Contributions to this edited volume will be mainly research articles however it will also include several captivating, expository articles (along with pictures) on the life and mathematical work of leading researchers in lattice path combinatorics and beyond. There will be four or five [...]

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[978-3-030-11101-4](#)



9 783030 111014

D. Andrica, T. M. Rassias

Differential and Integral Inequalities

Theories, methods and problems in approximation theory and analytic inequalities with a focus on differential and integral inequalities are analyzed in this book. Fundamental and recent developments are presented on the inequalities of Abel, Agarwal, Beckenbach, Bessel, Cauchy–Hadamard, Chebychev, Markov, Euler’s constant, Grothendieck, Hilbert, Hardy, Carleman, Landau–Kolmogorov, Carlson, Bernstein–Mordell, Gronwall, Wirtinger, as well as inequalities of functions with their integrals and [...]

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[978-3-030-27406-1](#)



9 783030 274061

D. Angella, C. Medori, A. Tomassini

Complex and Symplectic Geometry

This book arises from the INdAM Meeting “Complex and Symplectic Geometry”, which was held in Cortona in June 2016. Several leading specialists, including young researchers, in the field of complex and symplectic geometry, present the state of the art of their research on topics such as the cohomology of complex manifolds; analytic techniques in Kähler and non-Kähler geometry; almost-complex and symplectic structures; special structures on complex manifolds; and deformations of complex [...]

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[978-3-319-62913-1](#)



9 783319 629131

B. Anglès, T. Ngo Dac

Arithmetic and Geometry over Local Fields

VIASM 2018

This volume introduces some recent developments in Arithmetic Geometry over local fields. Its seven chapters are centered around two common themes: the study of Drinfeld modules and non-Archimedean analytic geometry. The notes grew out of lectures held during the research program “Arithmetic and geometry of local and global fields” which took place at the Vietnam Institute of Advanced Study in Mathematics (VIASM) from June to August 2018. The authors, leading experts in the field, have put [...]

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9 783030 662486

D. Apushkinskaya

Free Boundary Problems

Regularity Properties Near the Fixed Boundary

This book is concerned with several elliptic and parabolic obstacle-type problems with a focus on the cases where the free and fixed boundaries meet. The results presented complement those found in existing books in the subject, which mainly treat regularity properties away from the fixed boundary. The topics include optimal regularity, analysis of global solutions, tangential touch of the free and fixed boundaries, as well as Lipschitz- and C^1 -regularity of the free boundary. Special [...]

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9 783319 970783

A. Arabia

Equivariant Poincaré Duality on G-Manifolds

Equivariant Gysin Morphism and Equivariant Euler Classes

This book carefully presents a unified treatment of equivariant Poincaré duality in a wide variety of contexts, illuminating an area of mathematics that is often glossed over elsewhere. The approach used here allows the parallel treatment of both equivariant and nonequivariant cases. It also makes it possible to replace the usual field of coefficients for cohomology, the field of real numbers, with any field of arbitrary characteristic, and hence change (equivariant) de Rham cohomology to [...]

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9 783030 704391

A. Arabia

Introduction to Isospectrality

"Can one hear the shape of a drum?" This striking question, made famous by Mark Kac, conceals a precise mathematical problem, whose study led to sophisticated mathematics. This textbook presents the theory underlying the problem, for the first time in a form accessible to students. Specifically, this book provides a detailed presentation of Sunada's method and the construction of non-isometric yet isospectral drum membranes, as first discovered by Gordon–Webb–Wolpert. The book begins with an [...]

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9 783031 171222

A. Arai

Inequivalent Representations of Canonical Commutation and Anti-Commutation Relations

Representation-theoretical Viewpoint for Quantum Phenomena

Canonical commutation relations (CCR) and canonical anti-commutation relations (CAR) are basic principles in quantum physics including both quantum mechanics with finite degrees of freedom and quantum field theory. From a structural viewpoint, quantum physics can be primarily understood as Hilbert space representations of CCR or CAR. There are many interesting physical phenomena which can be more clearly understood from a [...]

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9 789811 521799

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A. Arai

Infinite-Dimensional Dirac Operators and Supersymmetric Quantum Fields

An Introduction to Analysis on Boson–Fermion Fock Spaces

This book explains the mathematical structures of supersymmetric quantum field theory (SQFT) from the viewpoints of functional and infinite-dimensional analysis. The main mathematical objects are infinite-dimensional Dirac operators on the abstract Boson–Fermion Fock space. The target audience consists of graduate students and researchers who are interested in mathematical analysis of quantum fields, including supersymmetric ones, and infinite-dimensional analysis. The major topics are the [...]

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9 789811 956775

C. Araujo, G. Benkart, C. E. Praeger, B. Tanbay

World Women in Mathematics 2018

Proceedings of the First World Meeting for Women in Mathematics (WM)²

The first World Meeting for Women in Mathematics - (WM)² - was a satellite event of the International Congress of Mathematicians (ICM) 2018 in Rio de Janeiro. With a focus on Latin America, the first (WM)² brought together mathematicians from all over the world to celebrate women mathematicians, and also to reflect on gender issues in mathematics, challenges, initiatives, and perspectives for the future. Its activities were complemented by a panel discussion organized by the Committee for [...]

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[978-3-030-21169-1](https://doi.org/10.1007/978-3-030-21169-1)



9 783030 211691

C. Arhancet, C. Kriegler

Riesz Transforms, Hodge-Dirac Operators and Functional Calculus for Multipliers

This book on recent research in noncommutative harmonic analysis treats the L_p boundedness of Riesz transforms associated with Markovian semigroups of either Fourier multipliers on non-abelian groups or Schur multipliers. The detailed study of these objects is then continued with a proof of the boundedness of the holomorphic functional calculus for Hodge–Dirac operators, thereby answering a question of Junge, Mei and Parcet, and presenting a new functional analytic approach which makes it [...]

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9 783030 990107

B. Arras, C. Houdré

On Stein's Method for Infinitely Divisible Laws with Finite First Moment

This book focuses on quantitative approximation results for weak limit theorems when the target limiting law is infinitely divisible with finite first moment. Two methods are presented and developed to obtain such quantitative results. At the root of these methods stands a Stein characterizing identity discussed in the third chapter and obtained thanks to a covariance representation of infinitely divisible distributions. The first method is based on characteristic functions and Stein type [...]

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9 783030 150167

H. Aslam, J. A. Brown

Affordance Theory in Game Design

A Guide Toward Understanding Players

Games, whether educational or recreational, are meant to be fun. How do we ensure that the game delivers its intent? The answer to this question is playtesting. However, a haphazard playtest process cannot discover play experience from various dimensions. Players' perceptions, affordances, age, gender, culture, and many more human factors influence play experience. A playtest requires an intensive experimental process and scientific protocols to ensure that the outcomes seen are reliable for [...]

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9 783031 009952

S. Asmussen, M. Steffensen

Risk and Insurance

A Graduate Text

This textbook provides a broad overview of the present state of insurance mathematics and some related topics in risk management, financial mathematics and probability. Both non-life and life aspects are covered. The emphasis is on probability and modeling rather than statistics and practical implementation. Aimed at the graduate level, pointing in part to current research topics, it can potentially replace other textbooks on basic non-life insurance mathematics and advanced risk management [...]

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9 783030 351786

A. Atangana, S. İğret Araz

Fractional Stochastic Differential Equations

Applications to Covid-19 Modeling

This book provides a thorough conversation on the underpinnings of Covid-19 spread modelling by using stochastics nonlocal differential and integral operators with singular and non-singular kernels. The book presents the dynamic of Covid-19 spread behaviour worldwide. It is noticed that the spread dynamic followed process with non-local behaviours which resemble power law, fading memory, crossover and stochastic behaviours. Fractional stochastic differential equations are therefore used to [...]

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9 789811 907289

F. M. Atay, P. B. Kurasov, D. Mugnolo

Discrete and Continuous Models in the Theory of Networks

This book contains contributions from the participants of the research group hosted by the ZiF - Center for Interdisciplinary Research at the University of Bielefeld during the period 2013-2017 as well as from the conclusive conference organized at Bielefeld in December 2017. The contributions consist of original research papers: they mirror the scientific developments fostered by this research program or the state-of-the-art results presented during the conclusive conference. The volume [...]

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A. Aubert, M. Mishra, A. Roche, S. Spallone

Representations of Reductive p-adic Groups

International Conference, IISER, Pune, India, 2017

This book consists of survey articles and original research papers in the representation theory of reductive p-adic groups. In particular, it includes a survey by Anne-Marie Aubert on the enormously influential local Langlands conjectures. The survey gives a precise and accessible formulation of many aspects of the conjectures, highlighting recent refinements, due to the author and her collaborators, and their current status. It also features an extensive account by Colin Bushnell of his [...]

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B. Bajnok

An Invitation to Abstract Mathematics

This undergraduate textbook promotes an active transition to higher mathematics. Problem solving is the heart and soul of this book: each problem is carefully chosen to demonstrate, elucidate, or extend a concept. More than 300 exercises engage the reader in extensive arguments and creative approaches, while exploring connections between fundamental mathematical topics. Divided into four parts, this book begins with a playful exploration of the building blocks of mathematics, such as [...]

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D. Bakry, I. Gentil, M. Ledoux

Analysis and Geometry of Markov Diffusion Operators

The present volume is an extensive monograph on the analytic and geometric aspects of Markov diffusion operators. It focuses on the geometric curvature properties of the underlying structure in order to study convergence to equilibrium, spectral bounds, functional inequalities such as Poincaré, Sobolev or logarithmic Sobolev inequalities, and various bounds on solutions of evolution equations. At the same time, it covers a large class of evolution and partial differential equations. The book [...]

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V. Baladi

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D. Ban

p-adic Banach Space Representations

With Applications to Principal Series

This book systematically develops the theory of continuous representations on p-adic Banach spaces. Its purpose is to lay the foundations of the representation theory of reductive p-adic groups on p-adic Banach spaces, explain the duality theory of Schneider and Teitelbaum, and demonstrate its applications to continuous principal series. Written to be accessible to graduate students, the book gives a comprehensive introduction to the necessary tools, including Iwasawa algebras, p-adic [...]

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9 783031 226830

J. Bang-Jensen, G. Gutin

Classes of Directed Graphs

This edited volume offers a detailed account of the theory of directed graphs from the perspective of important classes of digraphs, with each chapter written by experts on the topic. Outlining fundamental discoveries and new results obtained over recent years, this book provides a comprehensive overview of the latest research in the field. It covers core new results on each of the classes discussed, including chapters on tournaments, planar digraphs, acyclic digraphs, Euler digraphs, graph [...]

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9 783030 101220

D. Banerjee, K. S. Kedlaya, E. de Shalit, C. Chaudhuri

Perfectoid Spaces

This book contains selected chapters on perfectoid spaces, their introduction and applications, as invented by Peter Scholze in his Fields Medal winning work. These contributions are presented at the conference on "Perfectoid Spaces" held at the International Centre for Theoretical Sciences, Bengaluru, India, from 9–20 September 2019. The objective of the book is to give an advanced introduction to Scholze's theory and understand the relation between perfectoid spaces and some aspects of [...]

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9 789811 671203

C. Bär, C. Becker

Differential Characters

Providing a systematic introduction to differential characters as introduced by Cheeger and Simons, this text describes important concepts such as fiber integration, higher dimensional holonomy, transgression, and the product structure in a geometric manner. Differential characters form a model of what is nowadays called differential cohomology, which is the mathematical structure behind the higher gauge theories in physics.

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I. Bárány, G. O. H. Katona, A. Sali

Building Bridges II**Mathematics of László Lovász**

This volume collects together research and survey papers written by invited speakers of the conference celebrating the 70th birthday of László Lovász. The topics covered include classical subjects such as extremal graph theory, coding theory, design theory, applications of linear algebra and combinatorial optimization, as well as recent trends such as extensions of graph limits, online or statistical versions of classical combinatorial problems, and new methods of derandomization. László [...]

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9 783662 592038

E. J. Barbeau

**University of Toronto
Mathematics Competition
(2001–2015)**

This text records the problems given for the first 15 annual undergraduate mathematics competitions, held in March each year since 2001 at the University of Toronto. Problems cover areas of single-variable differential and integral calculus, linear algebra, advanced algebra, analytic geometry, combinatorics, basic group theory, and number theory. The problems of the competitions are given in chronological order as presented to the students. The solutions appear in subsequent chapters [...]

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G. Biau, L. Devroye

Lectures on the Nearest Neighbor Method

This text presents a wide-ranging and rigorous overview of nearest neighbor methods, one of the most important paradigms in machine learning. Now in one self-contained volume, this book systematically covers key statistical, probabilistic, combinatorial and geometric ideas for understanding, analyzing and developing nearest neighbor methods. Gérard Biau is a professor at Université Pierre et Marie Curie (Paris). Luc Devroye is a professor at the School of Computer Science at McGill [...]

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D. A. Bini, F. Di Benedetto, E. Tyrtyshnikov, M. Van Barel

Structured Matrices in Numerical Linear Algebra

Analysis, Algorithms and Applications

This book gathers selected contributions presented at the INdAM Meeting Structured Matrices in Numerical Linear Algebra: Analysis, Algorithms and Applications, held in Cortona, Italy on September 4-8, 2017. Highlights cutting-edge research on Structured Matrix Analysis, it covers theoretical issues, computational aspects, and applications alike. The contributions, written by authors from the foremost international groups in the community, trace the main research lines and treat the main [...]

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F. Blanchini, S. Miani

Set-Theoretic Methods in Control

The second edition of this monograph describes the set-theoretic approach for the control and analysis of dynamic systems, both from a theoretical and practical standpoint. This approach is linked to fundamental control problems, such as Lyapunov stability analysis and stabilization, optimal control, control under constraints, persistent disturbance rejection, and uncertain systems analysis and synthesis. Completely self-contained, this book provides a solid foundation of mathematical [...]

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9 783319 179322

A.M. Bloch, P. S. Krishnaprasad, R.M. Murray

Nonholonomic Mechanics and Control

This book explores some of the connections between control theory and geometric mechanics; that is, control theory is linked with a geometric view of classical mechanics in both its Lagrangian and Hamiltonian formulations and in particular with the theory of mechanical systems subject to motion constraints. The synthesis of the topic is appropriate as there is a particularly rich connection between mechanics and nonlinear control theory. The book provides a unified treatment of nonlinear [...]

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9 781493 938216

A. M. Blokh, O. M. Sharkovsky

Sharkovsky Ordering

This book provides a comprehensive survey of the Sharkovsky ordering, its different aspects and its role in dynamical systems theory and applications. It addresses the coexistence of cycles for continuous interval maps and one-dimensional spaces, combinatorial dynamics on the interval and multidimensional dynamical systems. Also featured is a short chapter of personal remarks by O.M. Sharkovsky on the history of the Sharkovsky ordering, the discovery of which almost 60 years ago led to the [...]

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9 783030 991234

M. J. Blondin, P. M. Pardalos, J. Sanchis Sáez

Computational Intelligence and Optimization Methods for Control Engineering

This volume presents some recent and principal developments related to computational intelligence and optimization methods in control. Theoretical aspects and practical applications of control engineering are covered by 14 self-contained contributions. Additional gems include the discussion of future directions and research perspectives designed to add to the reader's understanding of both the challenges faced in control engineering and the insights into the developing of new techniques. [...]

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D. D. Bochtis, M. Lampridi, G. P. Petropoulos, Y. Ampatzidis, P. Pardalos

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This volume is the first (I) of four under the main themes of Digitizing Agriculture and Information and Communication Technologies (ICT). The four volumes cover rapidly developing processes including Sensors (I), Data (II), Decision (III), and Actions (IV). Volumes are related to 'digital transformation' within agricultural production and provision systems, and in the context of Smart Farming Technology and Knowledge-based Agriculture. Content spans broadly from data mining and [...]

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D. D. Bochtis, D. E. Moshou, G. Vasileiadis, A. Balafoutis, P. M. Pardalos

Information and Communication Technologies for Agriculture—Theme II: Data

This volume is the second (II) of four under the main themes of Digitizing Agriculture and Information and Communication Technologies (ICT). The four volumes cover rapidly developing processes including Sensors (I), Data (II), Decision (III), and Actions (IV). Volumes are related to 'digital transformation' within agricultural production and provision systems, and in the context of Smart Farming Technology and Knowledge-based Agriculture. Content spans broadly from data mining and [...]

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D. D. Bochtis, C. G. Sørensen, S. Fountas, V. Moysiadis, P. M. Pardalos

Information and Communication Technologies for Agriculture—Theme III: Decision

This volume is the third (III) of four under the main themes of Digitizing Agriculture and Information and Communication Technologies (ICT). The four volumes cover rapidly developing processes including Sensors (I), Data (II), Decision (III), and Actions (IV). Volumes are related to 'digital transformation' within agricultural production and provision systems, and in the context of Smart Farming Technology and Knowledge-based Agriculture. Content spans broadly from data mining and [...]

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D. D. Bochtis, S. Pearson, M. Lampridi, V. Marinoudi, P. M. Pardalos

Information and Communication Technologies for Agriculture— Theme IV: Actions

This volume is the last (IV) of four under the main themes of Digitizing Agriculture and Information and Communication Technologies (ICT). The four volumes cover rapidly developing processes including Sensors (I), Data (II), Decision (III), and Actions (IV). Volumes are related to 'digital transformation' within agricultural production and provision systems, and in the context of Smart Farming Technology and Knowledge-based Agriculture. Content spans broadly from data mining and [...]

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H. G. Bock, K. Küfer, P. Maass, A. Milde, V. Schulz

German Success Stories in Industrial Mathematics

This book should illustrate the impact of collaborations between mathematics and industry. It is both an initiative of and coordinated by the German Committee for Mathematical Modeling, Simulation and Optimization (KoMSO). This publication aims at comparing the state of the art at the intersection of mathematics and industry, as well as the demands for future development of science and technology in Germany and beyond. Each contribution addresses the [...]

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V. I. Bogachev, O. G. Smolyanov

Real and Functional Analysis

This book is based on lectures given at "Mekhmat", the Department of Mechanics and Mathematics at Moscow State University, one of the top mathematical departments worldwide, with a rich tradition of teaching functional analysis. Featuring an advanced course on real and functional analysis, the book presents not only core material traditionally included in university courses of different levels, but also a survey of the most important results of a more subtle nature, which cannot be [...]

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Topological Vector Spaces and Their Applications

This book gives a compact exposition of the fundamentals of the theory of locally convex topological vector spaces. Furthermore it contains a survey of the most important results of a more subtle nature, which cannot be regarded as basic, but knowledge which is useful for understanding applications. Finally, the book explores some of such applications connected with differential calculus and measure theory in infinite-dimensional spaces. These applications are a central aspect of the book, [...]

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G. Böhm

Hopf Algebras and Their Generalizations from a Category Theoretical Point of View

These lecture notes provide a self-contained introduction to a wide range of generalizations of Hopf algebras. Multiplication of their modules is described by replacing the category of vector spaces with more general monoidal categories, thereby extending the range of applications. Since Sweedler's work in the 1960s, Hopf algebras have earned a noble place in the garden of mathematical structures. Their use is well accepted in fundamental areas such as algebraic geometry, representation [...]

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V. Bolotnikov, S. ter Horst, A. C.M. Ran, V. Vinnikov

Interpolation and Realization Theory with Applications to Control Theory

In Honor of Joe Ball

This volume is devoted to Joseph A. (Joe) Ball's contributions to operator theory and its applications and in celebration of his seventieth birthday. Joe Ball's career spans over four and a half decades, starting with his work on model theory and related topics for non-contractions and operators on multiply connected domains. Later on, more applied operator theory themes appeared in his work, involving factorization and interpolation for operator-valued [...]

Birkhäuser

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M. C. Bonanome, M. H. Dean, J. Putnam Dean

A Sampling of Remarkable Groups

Thompson's, Self-similar, Lamplighter, and Baumslag-Solitar

This textbook offers students with a basic understanding of group theory a preview of several interesting groups they would not typically encounter until later in their academic careers. By presenting these advanced concepts at this stage, they will gain a deeper understanding of the subject and be motivated to explore more of it. Groups covered include Thompson's groups, self-similar groups, Lamplighter groups, and Baumslag-Solitar groups. Each chapter focuses on one of these groups, and [...]

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M. Bonforte, G. Grillo, J. A. Carrillo, M. del Pino, A. Figalli, G. Mingione, J. L. Vázquez

Nonlocal and Nonlinear Diffusions and Interactions: New Methods and Directions

Cetraro, Italy 2016

Presenting a selection of topics in the area of nonlocal and nonlinear diffusions, this book places a particular emphasis on new emerging subjects such as nonlocal operators in stationary and evolutionary problems and their applications, swarming models and applications to biology and mathematical physics, and nonlocal variational problems. The authors are some of the most well-known mathematicians [...]

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J. F. Bonnans

Convex and Stochastic Optimization

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O. Bordellès

Arithmetic Tales

Advanced Edition

This textbook covers a wide array of topics in analytic and multiplicative number theory, suitable for graduate level courses. Extensively revised and extended, this Advanced Edition takes a deeper dive into the subject, with the elementary topics of the previous edition making way for a fuller treatment of more advanced topics. The core themes of the distribution of prime numbers, arithmetic functions, lattice points, exponential sums and number fields now contain many more details and [...]

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T. A. Borges, R. Neves

Financial Data Resampling for Machine Learning Based Trading

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D. Borthwick

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This modern take on partial differential equations does not require knowledge beyond vector calculus and linear algebra. The author focuses on the most important classical partial differential equations, including conservation equations and their characteristics, the wave equation, the heat equation, function spaces, and Fourier series, drawing on tools from analysis only as they arise. Within each section the author creates a narrative that answers the five questions: What is the [...]

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S. Bosch

Algebraic Geometry and Commutative Algebra

Algebraic Geometry is a fascinating branch of Mathematics that combines methods from both Algebra and Geometry. It transcends the limited scope of pure Algebra by means of geometric construction principles. Putting forward this idea, Grothendieck revolutionized Algebraic Geometry in the late 1950s by inventing schemes. Schemes now also play an important role in Algebraic Number Theory, a field that used to be far away from Geometry. The new point of view paved the way for spectacular [...]

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D. Bourn

From Groups to Categorical Algebra

Introduction to Protomodular and Mal'tsev Categories

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S. Bosch

Algebra

From the Viewpoint of Galois Theory

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S. Bosch

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9 783319 044163

A. Bovier, F. den Hollander

Metastability

A Potential-Theoretic Approach

This monograph provides a concise presentation of a mathematical approach to metastability, a wide-spread phenomenon in the dynamics of non-linear systems - physical, chemical, biological or economic - subject to the action of temporal random forces typically referred to as noise, based on potential theory of reversible Markov processes. The authors shed new light on the metastability phenomenon as a sequence of visits of the path of the process to different metastable sets, and focuses on [...]

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978-3-319-24775-5



9 783319 247755

F. Bracci, M. D. Contreras, S. Díaz-Madrigal

Continuous Semigroups of Holomorphic Self-maps of the Unit Disc

The book faces the interplay among dynamical properties of semigroups, analytical properties of infinitesimal generators and geometrical properties of Koenigs functions. The book includes precise descriptions of the behavior of trajectories, backward orbits, petals and boundary behavior in general, aiming to give a rather complete picture of all interesting phenomena that occur. In order to fulfill this task, we choose to introduce a new point of view, which is mainly based on the intrinsic [...]

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[978-3-030-36781-7](https://doi.org/10.1007/978-3-030-36781-7)



9 783030 367817

J. Brandts, S. Korotov, M. Křížek

Simplicial Partitions with Applications to the Finite Element Method

This monograph focuses on the mathematical and numerical analysis of simplicial partitions and the finite element method. This active area of research has become an essential part of physics and engineering, for example in the study of problems involving heat conduction, linear elasticity, semiconductors, Maxwell's equations, Einstein's equations and magnetic and gravitational fields. These problems require the simulation of various phenomena and physical fields over complicated structures [...]

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[978-3-030-55676-1](https://doi.org/10.1007/978-3-030-55676-1)



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K. Bredies, D. Lorenz

Mathematical Image Processing

This book addresses the mathematical aspects of modern image processing methods, with a special emphasis on the underlying ideas and concepts. It discusses a range of modern mathematical methods used to accomplish basic imaging tasks such as denoising, deblurring, enhancing, edge detection and inpainting. In addition to elementary methods like point operations, linear and morphological methods, and methods based on multiscale representations, the book also covers more recent methods based on [...]

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9 783030 014575

P. Brémaud

Fourier Analysis and Stochastic Processes

This work is unique as it provides a uniform treatment of the Fourier theories of functions (Fourier transforms and series, z-transforms), finite measures (characteristic functions, convergence in distribution), and stochastic processes (including arma series and point processes). It emphasises the links between these three themes. The chapter on the Fourier theory of point processes and signals structured by point processes is a novel addition to the literature on Fourier analysis of [...]

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9 783319 095899

P. Brémaud

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This book is devoted exclusively to Lebesgue spaces and their direct derived spaces. Unique in its sole dedication, this book explores Lebesgue spaces, distribution functions and nonincreasing rearrangement. Moreover, it also deals with weak, Lorentz and the more recent variable exponent and grand Lebesgue spaces with considerable detail to the proofs. The book also touches on basic harmonic analysis in the aforementioned spaces. An appendix is given at the end of the book giving it a [...]

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9 783319 300320

S. P. Chakrabarty, A. Kanaujiya

Mathematical Portfolio Theory and Analysis

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9 789811 985430

A. Chambert-Loir

(Mostly) Commutative Algebra

This book stems from lectures on commutative algebra for 4th-year university students at two French universities (Paris and Rennes). At that level, students have already followed a basic course in linear algebra and are essentially fluent with the language of vector spaces over fields. The topics introduced include arithmetic of rings, modules, especially principal ideal rings and the classification of modules over such rings, Galois theory, as well as an introduction to more advanced topics [...]

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9 783030 615949

M. G. Charalambous

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This book covers the fundamental results of the dimension theory of metrizable spaces, especially in the separable case. Its distinctive feature is the emphasis on the negative results for more general spaces, presenting a readable account of numerous counterexamples to well-known conjectures that have not been discussed in existing books. Moreover, it includes three new general methods for constructing spaces: Mrowka's psi-spaces, van Douwen's technique of assigning limit points to [...]

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9 783030 222314

R. Chattamvelli, R. Shanmugam

Continuous Distributions in Engineering and the Applied Sciences -- Part I

This is an introductory book on continuous statistical distributions and its applications. It is primarily written for graduate students in engineering, undergraduate students in statistics, econometrics, and researchers in various fields. The purpose is to give a self-contained introduction to most commonly used classical continuous distributions in two parts. Important applications of each distribution in various applied fields are explored at the end of each chapter. A brief overview of [...]

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9 783031 013027

S. Chatterjee

Superconcentration and Related Topics

A certain curious feature of random objects, introduced by the author as "super concentration," and two related topics, "chaos" and "multiple valleys," are highlighted in this book. Although super concentration has established itself as a recognized feature in a number of areas of probability theory in the last twenty years (under a variety of names), the author was the first to discover and explore its connections with chaos and multiple valleys. He achieves a substantial degree of [...]

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9 783319 038858

L. Chaumont, A. E. Kyprianou

A Lifetime of Excursions Through Random Walks and Lévy Processes**A Volume in Honour of Ron Doney's 80th Birthday**

This collection honours Ron Doney's work and includes invited articles by his collaborators and friends. After an introduction reviewing Ron Doney's mathematical achievements and how they have influenced the field, the contributed papers cover both discrete-time processes, including random walks and variants thereof, and continuous-time processes, including Lévy processes and diffusions. A good number of the articles are focused on classical fluctuation theory and its ramifications, the area [...]

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9 783030 833084

J. Chen, P. Lu, Z. Lu, Z. Zhang

Geometric Analysis**In Honor of Gang Tian's 60th Birthday**

This edited volume has a two-fold purpose. First, comprehensive survey articles provide a way for beginners to ease into the corresponding sub-fields. These are then supplemented by original works that give the more advanced readers a glimpse of the current research in geometric analysis and related PDEs. The book is of significant interest for researchers, including advanced Ph.D. students, working in geometric analysis. Readers who have a secondary interest in geometric analysis will [...]

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9 783030 349523

G. Chenevier, J. Lannes

Automorphic Forms and Even Unimodular Lattices

Kneser Neighbors of Niemeier Lattices

This book includes a self-contained approach of the general theory of quadratic forms and integral Euclidean lattices, as well as a presentation of the theory of automorphic forms and Langlands' conjectures, ranging from the first definitions to the recent and deep classification results due to James Arthur. Its connecting thread is a question about lattices of rank 24: the problem of p -neighborhoods between Niemeier lattices. This question, [...]

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Y. Cheng

Incompleteness for Higher-Order Arithmetic

An Example Based on Harrington's Principle

Gödel's true-but-unprovable sentence from the first incompleteness theorem is purely logical in nature, i.e. not mathematically natural or interesting. An interesting problem is to find mathematically natural and interesting statements that are similarly unprovable. A lot of research has since been done in this direction, most notably by Harvey Friedman. A lot of examples of concrete incompleteness with real mathematical content have been found to date. This brief contributes to Harvey [...]

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R. Chirivì, I. Del Corso, R. Dvornicich

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G. H. Choe

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Y. Choie, M. H. Lee

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This book explores various properties of quasimodular forms, especially their connections with Jacobi-like forms and automorphic pseudodifferential operators. The material that is essential to the subject is presented in sufficient detail, including necessary background on pseudodifferential operators, Lie algebras, etc., to make it accessible also to non-specialists. The book also covers a sufficiently broad range of illustrations of how the main themes of the book have occurred in various [...]

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C. S. Chou, A. Friedman

Introduction to Mathematical Biology

Modeling, Analysis, and Simulations

This book is based on a one semester course that the authors have been teaching for several years, and includes two sets of case studies. The first includes chemostat models, predator-prey interaction, competition among species, the spread of infectious diseases, and oscillations arising from bifurcations. In developing these topics, readers will also be introduced to the basic theory of ordinary differential equations, and how to work with MATLAB without having any prior programming [...]

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9 783319 296364

S. Chowdhury

Monte Carlo Methods A Hands-On Computational Introduction Utilizing Excel

This book is intended for undergraduate students of Mathematics, Statistics, and Physics who know nothing about Monte Carlo Methods but wish to know how they work. All treatments have been done as much manually as is practicable. The treatments are deliberately manual to let the readers get the real feel of how Monte Carlo Methods work. Definite integrals of a total of five functions (), namely $\sin()$, $\cos()$, e , $\log_e()$, and $1/(1+)^2$, have been evaluated using [...]

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C. Ciliberto

An Undergraduate Primer in Algebraic Geometry

This book consists of two parts. The first is devoted to an introduction to basic concepts in algebraic geometry: affine and projective varieties, some of their main attributes and examples. The second part is devoted to the theory of curves: local properties, affine and projective plane curves, resolution of singularities, linear equivalence of divisors and linear series, Riemann–Roch and Riemann–Hurwitz Theorems. The approach in this book is purely algebraic. The main tool is commutative [...]

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Non-commutative Multiple- Valued Logic Algebras

This monograph provides a self-contained and easy-to-read introduction to non-commutative multiple-valued logic algebras; a subject which has attracted much interest in the past few years because of its impact on information science, artificial intelligence and other subjects. A study of the newest results in the field, the monograph includes treatment of pseudo-BCK algebras, pseudo-hoops, residuated lattices, bounded divisible residuated lattices, pseudo-MTL algebras, pseudo-BL algebras and [...]

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K. Clark

Jost Bürgi's Aritmetische und Geometrische Progreß Tabulen (1620)

Edition and Commentary

This monograph presents a groundbreaking scholarly treatment of the German mathematician Jost Bürgi's original work on logarithms, Arithmetische und Geometrische Progreß Tabulen. It provides the first-ever English translation of Bürgi's text and illuminates his role in the development of the conception of logarithms, for which John Napier is traditionally given priority. High-resolution scans of each page of the his handwritten text are reproduced for the reader and as a means of preserving [...]

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C. Clason

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9 783030 527839

R. A. Clement

Mathematical Tools for Neuroscience

A Geometric Approach

This book provides a brief but accessible introduction to a set of related, mathematical ideas that have proved useful in understanding the brain and behaviour. If you record the eye movements of a group of people watching a riverside scene then some will look at the river, some will look at the barge by the side of the river, some will look at the people on the bridge, and so on, but if a duck takes off then everybody will look at it. How come the brain is so adept at processing such [...]

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9 783030 984946

G. Codogni, R. Dervan, F. Viviani

Moduli of K-stable Varieties

This volume is an outcome of the workshop "Moduli of K-stable Varieties", which was held in Rome, Italy in 2017. The content focuses on the existence problem for canonical Kähler metrics and links to the algebro-geometric notion of K-stability. The book includes both surveys on this problem, notably in the case of Fano varieties, and original contributions addressing this and related problems. The papers in the latter group develop the theory of K-stability; explore canonical metrics in the [...]

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9 783030 131579

S. N. Cohen, R. J. Elliott

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9 781493 936816

A. C. Cojocaru, S. Ionica, E. L. García

Women in Numbers Europe III

Research Directions in Number Theory

This volume includes articles spanning several research areas in number theory, such as arithmetic geometry, algebraic number theory, analytic number theory, and applications in cryptography and coding theory. Most of the articles are the results of collaborations started at the 3rd edition of the Women in Numbers Europe (WINE) conference between senior and mid-level faculty, junior faculty, postdocs, and graduate students. The contents of this book should be of interest to graduate students [...]

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9 783030 776992

E. Colombo, B. Fantechi, P. Frediani, D. Iacono, R. Pardini

Birational Geometry and Moduli Spaces

This volume collects contributions from speakers at the INdAM Workshop "Birational Geometry and Moduli Spaces", which was held in Rome on 11–15 June 2018. The workshop was devoted to the interplay between birational geometry and moduli spaces and the contributions of the volume reflect the same idea, focusing on both these areas and their interaction. In particular, the book includes both surveys and original papers on irreducible holomorphic symplectic manifolds, Severi varieties, [...]

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9 783030 371135

F. Colombo, J. Gantner

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This book presents a new theory for evolution operators and a new method for defining fractional powers of vector operators. This new approach allows to define new classes of fractional diffusion and evolution problems. These innovative methods and techniques, based on the concept of S-spectrum, can inspire researchers from various areas of operator theory and PDEs to explore new research directions in their fields. This monograph is the natural continuation of the book: Spectral Theory on [...]

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F. Comets

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École d'Été de Probabilités de Saint-Flour XLVI – 2016

Analyzing the phase transition from diffusive to localized behavior in a model of directed polymers in a random environment, this volume places particular emphasis on the localization phenomenon. The main question is: What does the path of a random walk look like if rewards and penalties are spatially randomly distributed? This model, which provides a simplified version of stretched elastic chains pinned by random impurities, has attracted much [...]

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9 783319 504865

M. Coornaert

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Translated from the popular French edition, the goal of the book is to provide a self-contained introduction to mean topological dimension, an invariant of dynamical systems introduced in 1999 by Misha Gromov. The book examines how this invariant was successfully used by Elon Lindenstrauss and Benjamin Weiss to answer a long-standing open question about embeddings of minimal dynamical systems into shifts. A large number of revisions and additions have been made to the original text. Chapter [...]

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J. Corriou

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S. I.R. Costa, F. Oggier, A. Campello, J. Belfiore, E. Viterbo

Lattices Applied to Coding for Reliable and Secure Communications

This book provides a first course on lattices – mathematical objects pertaining to the realm of discrete geometry, which are of interest to mathematicians for their structure and, at the same time, are used by electrical and computer engineers working on coding theory and cryptography. The book presents both fundamental concepts and a wealth of applications, including coding and transmission over Gaussian channels, techniques for obtaining lattices from finite prime fields and quadratic [...]

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D. Coupier

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Modern Research Frontiers

This volume offers a unique and accessible overview of the most active fields in Stochastic Geometry, up to the frontiers of recent research. Since 2014, the yearly meeting of the French research structure GDR GeoSto has been preceded by two introductory courses. This book contains five of these introductory lectures. The first chapter is a historically motivated introduction to Stochastic Geometry which relates four classical problems (the Buffon needle problem, the Bertrand paradox, the [...])

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D. Crippa

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A Debate Among Gregory,
Huygens and Leibniz

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J. Cuntz, S. Echterhoff, X. Li, G. Yu

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M. D'Abbicco, M. R. Ebert, V. Georgiev, T. Ozawa

New Tools for Nonlinear PDEs and Application

This book features a collection of papers devoted to recent results in nonlinear partial differential equations and applications. It presents an excellent source of information on the state-of-the-art, new methods, and trends in this topic and related areas. Most of the contributors presented their work during the sessions "Recent progress in evolution equations" and "Nonlinear PDEs" at the 12th ISAAC congress held in 2017 in Växjö, Sweden. Even if inspired by this event, this book is not [...]

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This textbook provides a coherent, integrated look at various topics from undergraduate analysis. It begins with Fourier series, continues with Hilbert spaces, discusses the Fourier transform on the real line, and then turns to the heart of the book, geometric considerations. This chapter includes complex differential forms, geometric inequalities from one and several complex variables, and includes some of the author's original results. The concept of orthogonality weaves the material into [...]

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F. De Mari, E. De Vito

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V. De Risi

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The Unpublished Manuscripts

This book offers a general introduction to the geometrical studies of Gottfried Wilhelm Leibniz (1646-1716) and his mathematical epistemology. In particular, it focuses on his theory of parallel lines and his attempts to prove the famous Parallel Postulate. Furthermore it explains the role that Leibniz's work played in the development of non-Euclidean geometry. The first part is an overview of his epistemology of geometry and a few of his geometrical findings, which puts them in the context [...]

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G. De Philippis, X. Ros-Oton, G. S. Weiss, M. Focardi, E. Spadaro

Geometric Measure Theory and Free Boundary Problems

Cetraro, Italy 2019

This volume covers contemporary aspects of geometric measure theory with a focus on applications to partial differential equations, free boundary problems and water waves. It is based on lectures given at the 2019 CIME summer school "Geometric Measure Theory and Applications – From Geometric Analysis to Free Boundary Problems" which took place in Cetraro, Italy, under the scientific direction of Matteo Focardi and Emanuele Spadaro. [...]

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L. Debnath, F. A. Shah

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F. Dilling, F. Pielsticker, I. Witzke

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A. Dimca

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S. Dinew, S. Picard, A. Teleman, A. Verjovsky, D. Angella, L. Arosio, E. Di Nezza

Complex Non-Kähler Geometry

Cetraro, Italy 2018

Collecting together the lecture notes of the CIME Summer School held in Cetraro in July 2018, the aim of the book is to introduce a vast range of techniques which are useful in the investigation of complex manifolds. The school consisted of four courses, focusing on both the construction of non-Kähler manifolds and the understanding of a possible classification of complex non-Kähler manifolds. In particular, the courses by Alberto Verjovsky and Andrei Teleman introduced tools in the theory [...]

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W. Dittrich

Reassessing Riemann's Paper

On the Number of Primes Less Than a Given Magnitude

In this book, the author pays tribute to Bernhard Riemann (1826-1866), a mathematician with revolutionary ideas, whose work on the theory of integration, the Fourier transform, the hypergeometric differential equation, etc. contributed immensely to mathematical physics. The text concentrates in particular on Riemann's only work on prime numbers, including ideas – new at the time – such as analytical continuation into the complex plane and the product formula for entire functions. A detailed [...]

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V. Dolejší, G. May

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Mesh adaptation methods can have a profound impact on the numerical solution of partial differential equations. If devised and implemented properly, adaptation significantly reduces the size of the algebraic systems resulting from the discretization, while ensuring that applicable error tolerances are met. In this monograph, drawing from many years of experience, the authors give a comprehensive presentation of metric-based anisotropic hp-mesh adaptation methods. A large part of this [...]

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9 783031 042782

A. L. Dontchev, R. T. Rockafellar

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9 781493 939695

A. L. Dontchev

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9 783030 799137

O. Došlý, J. Elyseeva, R. Šimon Hilscher

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R. Douc, E. Moulines, P. Priouret, P. Soulier

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This book covers the classical theory of Markov chains on general state-spaces as well as many recent developments. The theoretical results are illustrated by simple examples, many of which are taken from Markov Chain Monte Carlo methods. The book is self-contained, while all the results are carefully and concisely proven. Bibliographical notes are added at the end of each chapter to provide an overview of the literature. Part I lays the foundations of the theory of Markov chain on general [...]

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9 783319 977034

S. T. Dougherty

Algebraic Coding Theory Over Finite Commutative Rings

This book provides a self-contained introduction to algebraic coding theory over finite Frobenius rings. It is the first to offer a comprehensive account on the subject. Coding theory has its origins in the engineering problem of effective electronic communication where the alphabet is generally the binary field. Since its inception, it has grown as a branch of mathematics, and has since been expanded to consider any finite field, and later also Frobenius rings, as its alphabet. This book [...]

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S. T. Dougherty

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S. S. Dragomir

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C. Drapaca, S. Sivaloganathan

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9 781493 998128

D. Du, P. M. Pardalos, Z. Zhang

Nonlinear Combinatorial Optimization

Graduate students and researchers in applied mathematics, optimization, engineering, computer science, and management science will find this book a useful reference which provides an introduction to applications and fundamental theories in nonlinear combinatorial optimization. Nonlinear combinatorial optimization is a new research area within combinatorial optimization and includes numerous applications to technological developments, such as wireless communication, cloud computing, data [...]

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9 783030 161965

A. Ducros, C. Favre, J. Nicaise

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We present an introduction to Berkovich's theory of non-archimedean analytic spaces that emphasizes its applications in various fields. The first part contains surveys of a foundational nature, including an introduction to Berkovich analytic spaces by M. Temkin, and to étale cohomology by A. Ducros, as well as a short note by C. Favre on the topology of some Berkovich spaces. The second part focuses on applications to geometry. A second text by A. Ducros contains a new proof of the fact that [...]

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9 783319 110288

A. Ducrot, Q. Griette, Z. Liu, P. Magal

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Introductory Approaches

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9 783030 981358

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9 783319 922393

E. Dupourqué, F. Planchet, N. Sator

Actuarial Aspects of Long Term Care

This book proposes a review of Long-Term Care insurance; this issue is addressed both from a global point of view (through a presentation of the risk of dependence associated with the aging of the population) and an actuarial point of view (with the presentation of existing insurance products and actuarial techniques for pricing and reserving). It proposes a cross-view of American and European experiences for this risk. This book is the first dedicated entirely to long-term care insurance [...]

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9 783030 056599

H. Edelsbrunner

A Short Course in Computational Geometry and Topology

This monograph presents a short course in computational geometry and topology. In the first part the book covers Voronoi diagrams and Delaunay triangulations, then it presents the theory of alpha complexes which play a crucial role in biology. The central part of the book is the homology theory and their computation, including the theory of persistence which is indispensable for applications, e.g. shape reconstruction. The target audience comprises researchers and practitioners in [...]

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9 783030 021245

C. Eck, H. Garcke, P. Knabner

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Mathematical models are the decisive tool to explain and predict phenomena in the natural and engineering sciences. With this book readers will learn to derive mathematical models which help to understand real world phenomena. At the same time a wealth of important examples for the abstract concepts treated in the curriculum of mathematics degrees are given. An essential feature of this book is that mathematical structures are used as an ordering principle and not the fields of application. [...]

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9 783319 551609

C. Eden, A. Iske

Energy Transfers in Atmosphere and Ocean

This book describes a recent effort combining interdisciplinary expertise within the Collaborative Research Centre "Energy transfers in atmosphere and ocean" (TRR-181), which was funded by the German Research Foundation (DFG). Energy transfers between the three dynamical regimes – small-scale turbulence, internal gravity waves and geostrophically balanced motion – are fundamental to the energy cycle of both the atmosphere and the ocean. Nonetheless, they remain poorly understood and [...]

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9 783030 057039

T. Eisner, B. Farkas, M. Haase, R. Nagel

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Stunning recent results by Host–Kra, Green–Tao, and others, highlight the timeliness of this systematic introduction to classical ergodic theory using the tools of operator theory. Assuming no prior exposure to ergodic theory, this book provides a modern foundation for introductory courses on ergodic theory, especially for students or researchers with an interest in functional analysis. While basic analytic notions and results are reviewed in several appendices, more advanced operator [...]

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B. Elias, S. Makisumi, U. Thiel, G. Williamson

Introduction to Soergel Bimodules

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R. Exel, D. R. Pitts

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B. Eynard

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J. A. Ezquerro Fernandez, M. Á. Hernández Verón

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D. Farenick

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X. Feng, O. Karakashian, Y. Xing

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L. Gibelli

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T. H. Gibson, A. T.T. McRae, C. J. Cotter, L. Mitchell, D. A. Ham

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Automation and Implementation Using Firedrake

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T. Giordano, D. Kerr, N. C. Phillips, A. Toms, F. Perera

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An Introduction to Piecewise Smooth Dynamics

This book is aimed at mathematicians, scientists, and engineers, studying models that involve a discontinuity, or studying the theory of nonsmooth systems for its own sake. It is divided in two complementary courses: piecewise smooth flows and maps, respectively. Starting from well known theoretical results, the authors bring the reader into the latest challenges in the field, going through stability analysis, bifurcation, singularities, decomposition theorems and an introduction to kneading [...]

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M. C. Golumbic, A. Sainte-Laguë

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Interactions of Quantum Affine Algebras with Cluster Algebras, Current Algebras and Categorification

In honor of Vyjayanthi Chari on the occasion of her 60th birthday

This volume collects chapters that examine representation theory as connected with affine Lie algebras and their quantum analogues, in celebration of the impact Vyjayanthi Chari has had on this area. The opening chapters are based on mini-courses given at the conference "Interactions of Quantum Affine Algebras with Cluster Algebras, Current Algebras and Categorification", held on the occasion of [...]

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With an Appendix by Oleg Viro

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D. Grupe

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From Finite Groups to Quivers via Algebras

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C. Hoppen, D. P. Jacobs, V. Trevisan

Locating Eigenvalues in Graphs Algorithms and Applications

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Peccot Lecture, Collège de France, March & May 2020

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This BCAM SpringerBriefs is a treaty of the Infinity-Laplace Equation, which has inherited many features from the ordinary Laplace Equation, and is based on lectures by the author. The Infinity-Laplace Equation has delightful counterparts to the Dirichlet integral, the mean value property, the Brownian motion, Harnack's inequality, and so on. This "fully non-linear" equation has applications to image processing and to mass transfer problems, and it provides optimal Lipschitz extensions of [...]

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W. Liu, M. Röckner

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This book highlights the latest developments in the geometry of measurable sets, presenting them in simple, straightforward terms. It addresses nonlocal notions of perimeter and curvature and studies in detail the minimal surfaces associated with them. These notions of nonlocal perimeter and curvature are defined on the basis of a non-singular kernel. Further, when the kernel is appropriately rescaled, they converge toward the classical perimeter and curvature as the rescaling parameter [...]

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A. McEachern

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A Classical Introduction, Mathematical Games, and the Tournament

This book is a formalization of collected notes from an introductory game theory course taught at Queen's University. The course introduced traditional game theory and its formal analysis, but also moved to more modern approaches to game theory, providing a broad introduction to the current state of the discipline. Classical games, like the Prisoner's Dilemma and the Lady and the Tiger, are joined by a procedure for transforming mathematical games into card games. Included is an introduction [...]

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At the 2016 IEEE VIS Conference in Baltimore, Maryland, a panel of experts from the Scientific Visualization (SciVis) community gathered to discuss why the SciVis component of the conference had been shrinking significantly for over a decade. As the panelists concluded and opened the session to questions from the audience, Annie Preston, a Ph.D. student at the University of California, Davis, asked whether the panelists thought diversity or, more specifically, the lack of diversity was a [...]

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Proceedings of the 2019 WICA Workshop

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Summer School, Galatasaray University, Istanbul, 2014

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V. K. Murty, J. Wu

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D. Musielak

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A. Nagar, M. Singh

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W. Narkiewicz

The Story of Algebraic Numbers in the First Half of the 20th Century

From Hilbert to Tate

The book is aimed at people working in number theory or at least interested in this part of mathematics. It presents the development of the theory of algebraic numbers up to the year 1950 and contains a rather complete bibliography of that period. The reader will get information about results obtained before 1950. It is hoped that this may be helpful in preventing rediscoveries of old results, and might also inspire the reader to look at the work done earlier, which may hide some ideas which [...]

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A. Némethi

Normal Surface Singularities

This monograph provides a comprehensive introduction to the theory of complex normal surface singularities, with a special emphasis on connections to low-dimensional topology. In this way, it unites the analytic approach with the more recent topological one, combining their tools and methods. In the first chapters, the book sets out the foundations of the theory of normal surface singularities. This includes a comprehensive presentation of the properties of the link (as an oriented [...])

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Y. Neuman

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This book uncovers mathematical structures underlying natural intelligence and applies category theory as a modeling language for understanding human cognition, giving readers new insights into the nature of human thought. In this context, the book explores various topics and questions, such as the human representation of the number system, why our counting ability is different from that which is evident among non-human organisms, and why the idea of zero is so difficult to grasp. [...]

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W. Neumann, A. Pichon

Introduction to Lipschitz Geometry of Singularities

Lecture Notes of the International School on Singularity Theory and Lipschitz Geometry, Cuernavaca, June 2018

This book presents a broad overview of the important recent progress which led to the emergence of new ideas in Lipschitz geometry and singularities, and started to build bridges to several major areas of singularity theory. Providing all the necessary background in a series of introductory lectures, it also contains Pham and Teissier's previously unpublished pioneering work on the Lipschitz classification of germs of plane complex algebraic curves. [...]

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G. M. N'Guérékata, B. Toni

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M. Nicole

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M. Nisio

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T. Nosaka

Quandles and Topological Pairs

Symmetry, Knots, and Cohomology

This book surveys quandle theory, starting from basic motivations and going on to introduce recent developments of quandles with topological applications and related topics. The book is written from topological aspects, but it illustrates how esteemed quandle theory is in mathematics, and it constitutes a crash course for studying quandles. More precisely, this work emphasizes the fresh perspective that quandle theory can be useful for the study of low-dimensional topology (e.g., knot [...])

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E. Noble

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T. Novello, V. da Silva, L. Velho

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U. Oberst, M. Scheicher, I. Scheicher

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9 783030 439354

H. Ockendon, J. R. Ockendon

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Now in its second edition, this book continues to give readers a broad mathematical basis for modelling and understanding the wide range of wave phenomena encountered in modern applications. New and expanded material includes topics such as elastoplastic waves and waves in plasmas, as well as new exercises. Comprehensive collections of models are used to illustrate the underpinning mathematical methodologies, which include the basic ideas of the relevant partial differential equations, [...]

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9 783030 560690

A. Olivieri, E. Pitacco

Introduction to Insurance Mathematics**Technical and Financial Features of Risk Transfers**

This second edition expands the first chapters, which focus on the approach to risk management issues discussed in the first edition, to offer readers a better understanding of the risk management process and the relevant quantitative phases. In the following chapters the book examines life insurance, non-life insurance and pension plans, presenting the technical and financial aspects of risk transfers and insurance without the use of complex mathematical tools. The book is written in a [...]

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S. Omata, K. Svadlenka, E. Ginder

Variational Approach to Hyperbolic Free Boundary Problems

This volume is devoted to the study of hyperbolic free boundary problems possessing variational structure. Such problems can be used to model, among others, oscillatory motion of a droplet on a surface or bouncing of an elastic body against a rigid obstacle. In the case of the droplet, for example, the membrane surrounding the fluid in general forms a positive contact angle with the obstacle, and therefore the second derivative is only a measure at the contact free boundary set. We will show [...]

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9 789811 967306

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S. Ovchinnikov

Real Analysis: Foundations

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W. S. Ożański

The Partial Regularity Theory of Caffarelli, Kohn, and Nirenberg and its Sharpness

This monograph focuses on the partial regularity theorem, as developed by Caffarelli, Kohn, and Nirenberg (CKN), and offers a proof of the upper bound on the Hausdorff dimension of the singular set of weak solutions of the Navier-Stokes inequality, while also providing a clear and insightful presentation of Scheffer's constructions showing their bound cannot be improved. A short, complete, and self-contained proof of CKN is presented in the second chapter, allowing the remainder of the book [...]

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G. Pagès

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L. Pandolfi

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Controllability, Stability, Identification

This text addresses systems with persistent memory that are common mathematical models used in the study of viscoelasticity and thermodynamics with memory. In particular, this class of systems is used to model non-Fickian diffusion in the presence of complex molecular structures. Hence, it has wide applications in biology. The book focuses on the properties and controllability of the archetypal heat and wave equations with memory and introduces the dynamic approach to identification problems [...]

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S. Paoli

Simplicial Methods for Higher Categories

Segal-type Models of Weak n-Categories

This monograph presents a new model of mathematical structures called weak n-categories. These structures find their motivation in a wide range of fields, from algebraic topology to mathematical physics, algebraic geometry and mathematical logic. While strict n-categories are easily defined in terms associative and unital composition operations they are of limited use in applications, which often call for weakened variants of these laws. The author proposes a new approach to this [...]

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M. Paolucci, A. Sciomachen, P. Uberti

Advances in Optimization and Decision Science for Society, Services and Enterprises

ODS, Genoa, Italy, September 4-7, 2019

The contributions included in the volume are drawn from presentations at ODS2019 – International Conference on Optimization and Decision Science, which was the 49th annual meeting of the Italian Operations Research Society (AIRO) held at Genoa, Italy, on 4-7 September 2019. This book presents very recent results in the field of Optimization and Decision Science. While the book is addressed primarily to the Operations Research (OR) community, the interdisciplinary contents ensure that it will [...]

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N. S. Papageorgiou, V. D. Rădulescu, D. D. Repovš

Nonlinear Analysis - Theory and Methods

This book emphasizes those basic abstract methods and theories that are useful in the study of nonlinear boundary value problems. The content is developed over six chapters, providing a thorough introduction to the techniques used in the variational and topological analysis of nonlinear boundary value problems described by stationary differential operators. The authors give a systematic treatment of the basic mathematical theory and constructive methods for these classes of nonlinear [...]

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I. N. Parasidis, E. Providas, T. M. Rassias

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E. Pardoux, A. R. ıcanu

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This research monograph presents results to researchers in stochastic calculus, forward and backward stochastic differential equations, connections between diffusion processes and second order partial differential equations (PDEs), and financial mathematics. It pays special attention to the relations between SDEs/BSDEs and second order PDEs under minimal regularity assumptions, and also extends those results to equations with multivalued coefficients. The authors present in particular the [...]

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K. Parthasarathy

Topology

An Invitation

This book starts with a discussion of the classical intermediate value theorem and some of its uncommon "topological" consequences as an appetizer to whet the interest of the reader. It is a concise introduction to topology with a tinge of historical perspective, as the author's perception is that learning mathematics should be spiced up with a dash of historical development. All the basics of general topology that a student of mathematics would need are discussed, and glimpses of the [...]

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I. B. S. Passi, M. Singh, M. K. Yadav

Automorphisms of Finite Groups

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9 789811 328947

L. Peccati, M. D'Amico, M. Cigola

Maths for Social Sciences

This book is aimed at students in social sciences programs that include some course in quantitative methods. Stats for social sciences is frequently the subject of textbooks, while maths for social sciences is often neglected: monographs on specific themes (like, for instance, social choice systems or game theory applications) are available, but they do not adequately cover the topic in general. This textbook stems from the Bocconi University's new "Bachelor in Government", which was [...]

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I. Penkov, C. Hoyt

Classical Lie Algebras at Infinity

Originating from graduate topics courses given by the first author, this book functions as a unique text-monograph hybrid that bridges a traditional graduate course to research level representation theory. The exposition includes an introduction to the subject, some highlights of the theory and recent results in the field, and is therefore appropriate for advanced graduate students entering the field as well as research mathematicians wishing to expand their knowledge. The mathematical [...]

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9 783030 896591

J. Penot

Analysis

From Concepts to Applications

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P. Podio-Guidugli

Continuum Thermodynamics

This book deals with an important topic in rational continuum physics, thermodynamics. Although slim, it is fairly well self-contained; some basic notions in continuum mechanics, which a well-intentioned reader should but may not be familiar with, are collected in a final appendix. Modern continuum thermodynamics is a field theory devised to handle a large class of processes that typically are neither spatially homogeneous nor sequences of equilibrium states. The most basic chapter addresses [...]

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C. Polini, C. Raicu, M. Varbaro, M. E. Walker, A. Conca, S. B. Iyengar, A. K. Singh

Recent Developments in Commutative Algebra

Levico Terme, Trento 2019

This book presents four lectures on Rees rings and blow-ups, Koszul modules with applications to syzygies, Gröbner bases and degenerations, and applications of Adams operations. Commutative Algebra has witnessed a number of spectacular developments in recent years, including the resolution of long-standing problems; the new techniques and perspectives are leading to an extraordinary transformation in the field. The material contained in this volume, based [...]

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9 783031 117985

G. Toth

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Cetraro, Italy 2012, Editors: H. Dugald Macpherson, Carlo Toffalori

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