

MATHEMATICS



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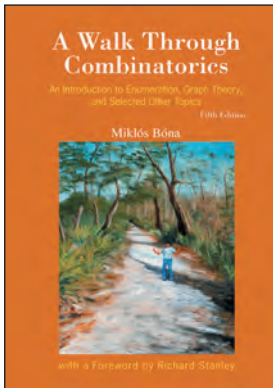
2024



Highlights

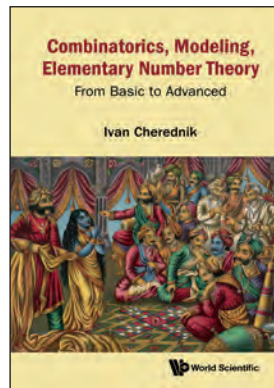
Mathematics Catalogue 2024

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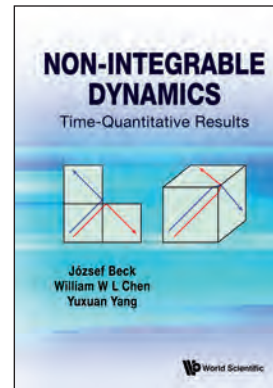
by **Miklós Bóna**
(University of Florida, USA)

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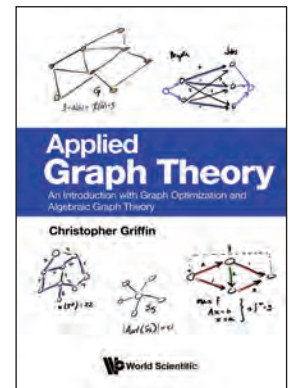
by **Ivan Cherednik**
(The University of North Carolina at Chapel Hill, USA)

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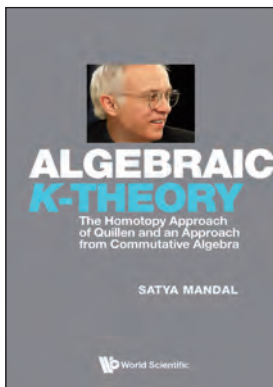
by **József Beck** (Rutgers University, USA), **William W L Chen** (Macquarie University, Australia) & **Yuxuan Yang** (Beijing University of Posts and Telecommunications, China)

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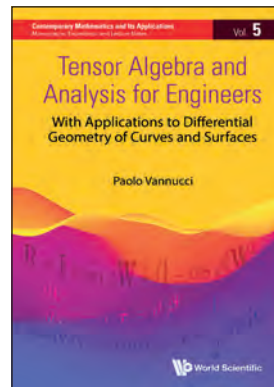
by **Christopher Griffin**
(Pennsylvania State University, USA)

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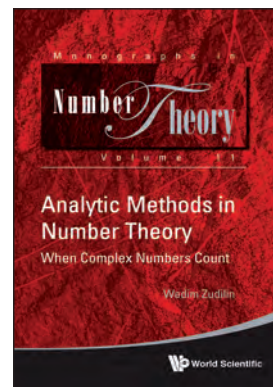
by **Satya Mandal**
(University of Kansas, USA)

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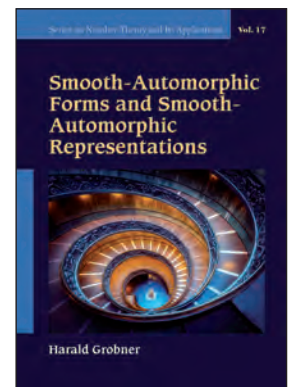
by **Paolo Vannucci**
(Université de Versailles et Saint-Quentin-en-Yvelines, France)

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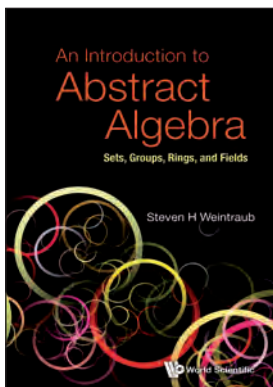
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(Radboud University Nijmegen, The Netherlands)

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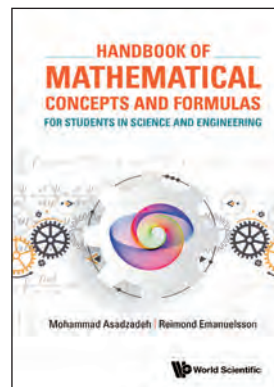
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(University of Vienna, Austria)

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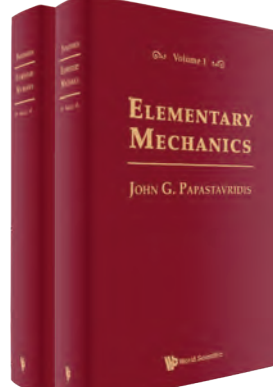
by **Steven H Weintraub**
(Lehigh University, USA)

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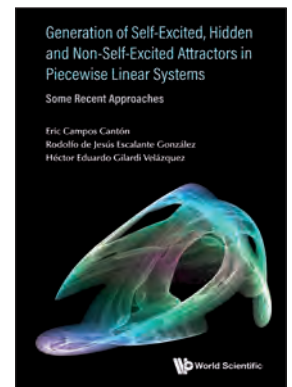
by **Mohammad Asadzadeh** (Chalmers University of Technology, Sweden) & **Reimond Emanuelsson** (Chalmers University of Technology, Sweden)

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by **John G Papastavridis**
(Georgia Institute of Technology, USA)

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by **Odile Pons**
(French National Institute for Agronomical Research, France)

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C O N T E N T S

Mathematics

4	Combinatorics
5	Algebra
5	Number / Category / Group Theory
7	General Pure & Applied Mathematics
8	Computer Math & Science
9	Differential Equations
10	Integral Equations / Transforms
11	Algebraic Geometry / Algebraic Topology
12	Geometry (Convex & Discrete Geometry) and Topology
13	Complex Manifolds
13	Calculus of Variations & Optimal Control / Optimization
14	Mathematical Physics
15	Functions, Functional / Harmonic Analysis
18	Mathematical Biology, Computation & Modeling
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COMBINATORICS

Latest Edition of All Time Bestseller!

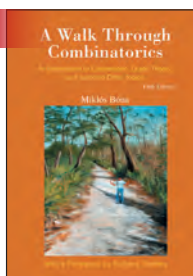
A Walk Through Combinatorics

An Introduction to Enumeration, Graph Theory, and Selected Other Topics
5th Edition

by **Miklós Bóna** (*University of Florida, USA*)

Review of the 4th Edition:

"This is still one of the best introductions to combinatorics."



Mathematical Association of America

New to this fifth edition of *A Walk Through Combinatorics* is the addition of Instant Check exercises — more than a hundred in total — which are located at the end of most subsections.

Readership: This book is primarily suitable for advanced undergraduate students and instructors teaching an introductory combinatorics class. However, it would also be applicable to graduate students in fields other than combinatorics who need an introduction to Combinatorics.

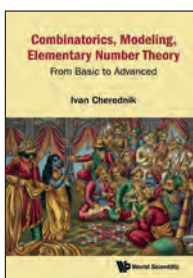
636pp	Aug 2023	
978-981-127-784-9	US\$128	£115
978-981-127-785-6(ebook)	US\$205	£180

Combinatorics, Modeling, Elementary Number Theory

From Basic to Advanced

by **Ivan Cherednik** (*The University of North Carolina at Chapel Hill, USA*)

This unique book features the key themes of classical introductory combinatorics, modeling (mainly linear), and elementary number theory with a constant focus on applications in statistics, physics, biology, economics, and computer science. These applications include dimers, random walks, binomial and Poisson distributions, games of chance (lottery, dice, poker, roulette), pricing options, population growth, tree growth, modeling epidemic spread, invasion ecology, fission reactors, and networks



Key Features

- It is relatively simple to use in the classroom: 1 Chapter is designed for 2 weeks, and the notes can be provided designed for remote teaching or to display in the classroom
- An impressive collection of about 135 problems and 270 exercises

Readership: Undergraduate students, including first-year students and graduate students. The book is suitable for college-university courses in combinatorics-modeling for beginners and for introductory courses in number theory. It can serve as core and reference textbook in these fields and their applications. And those who like recreational mathematics.

392pp	Jun 2023	
978-981-126-539-6	US\$118	£105
978-981-126-540-2(ebook)	US\$189	£165

Selected Chapters of Number Theory: Special Numbers - Vol 3

Stirling Numbers

by **Elena Deza** (*Moscow Pedagogical State University, Russia*)

This book is suitable for students and professionals, providing a broad perspective of the theory of this class of special numbers, and many generalizations and relatives of Stirling numbers, including Bell numbers and Lah numbers. Throughout the book, readers are presented with exercises to test and cement their understanding.

Readership: Teachers and students (esp. at university) interested in Combinatorics, Number Theory, General Algebra, Cryptography and related fields, as well as general audience of amateurs of Mathematics.

292pp	Nov 2023	
978-981-127-809-9	US\$98	£85
978-981-127-810-5(ebook)	US\$157	£140

Non-Integrable Dynamics

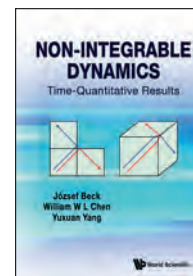
Time-Quantitative Results

by **József Beck** (*Rutgers University, USA*),
William W L Chen (*Macquarie University, Australia*) & **Yuxuan Yang** (*Beijing University of Posts and Telecommunications, China*)

This is a book on some flat dynamical systems which can be read without any background of ergodic theory. The only technical requirement is a basic understanding of some basic linear algebra and elementary number theory. The ideas are further illustrated by over 200 figures.

Readership: Graduate students, academics and researchers in mathematics as well as libraries in universities and research institutes.

400pp	Sep 2023	
978-981-127-385-8	US\$158	£140
978-981-127-386-5(ebook)	US\$253	£220



Applied Graph Theory

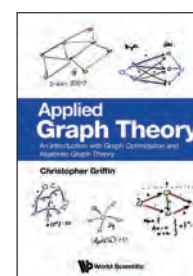
An Introduction with Graph Optimization and Algebraic Graph Theory

by **Christopher Griffin** (*Pennsylvania State University, USA*)

This book serves as an introduction to graph theory and its applications. It is intended for a senior undergraduate course in graph theory but is also appropriate for beginning graduate students in science or engineering. The book presents a rigorous (proof-based) introduction to graph theory while also discussing applications of the results for solving real-world problems of interest. The book is divided into four parts. Part 1 covers the combinatorial aspects of graph theory including a discussion of common vocabulary, a discussion of vertex and edge cuts, Eulerian tours, Hamiltonian paths and a characterization of trees.

Readership: Advanced Undergraduate Students or Beginning Graduate Students in Mathematics (those who have taken a first course in proofs). Graduate Students in STEM who want a rigorous text on graph theory that also focuses on applications. This could be used as a secondary text in a physics course on Network Science, or potentially in a rigorous course in theoretical computer science or operations research with graph theory.

304pp	Aug 2023	
978-981-127-310-0	US\$98	£85
978-981-127-311-7(ebook)	US\$157	£140



Series on Knots and Everything - Vol 72

Laws of Form

A Fiftieth Anniversary

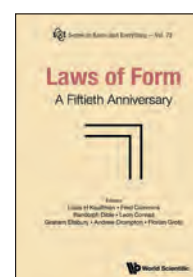
edited by **Louis H Kauffman** (*University of Illinois Chicago, USA*), **Fred Cummins** (*University College Dublin, Ireland*),

Randolph Dible (*The New School for Social Research, USA*), **Leon Conrad** (*Independent Scholar, UK*), **Graham Eillsbury** (*Independent Scholar, UK*), **Andrew Crompton** (*University of Liverpool, UK*) & **Florian Grote** (*CODE University of Applied Sciences, Germany*)

This is a unique book consisting of new and groundbreaking research and viewpoints related to Laws of Form.

Readership: Academic and scientific readers: undergraduate and graduate students and researchers in mathematics, logic, computer science, cybernetics, philosophy, linguistics, physics and natural sciences. General readers: persons interested in the above fields.

944pp	Jan 2023	
978-981-124-742-2	US\$188	£165
978-981-124-743-9(ebook)	US\$301	£240

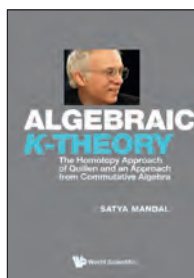


ALGEBRA

Algebraic K theory

The Homotopy Approach of Quillen and an Approach from Commutative Algebra by **Satya Mandal** (*University of Kansas, USA*)

Currently, there is no book on Higher Algebraic K-theory that is suitable for non-experts. This book fills the vacuum. The book is unique because it is the only readable book in the literature, for a upper level graduate student and a broader math community

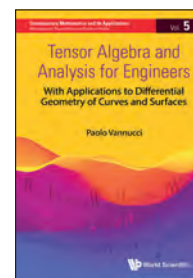


Contemporary Mathematics and Its Applications: Monographs, Expositions and Lecture Notes - Vol 5

Tensor Algebra and Analysis for Engineers

With Applications to Differential Geometry of Curves and Surfaces

by **Paolo Vannucci** (*Université de Versailles et Saint-Quentin-en-Yvelines, France*)



- Self-contained introduction to the modern language of tensors for graduate students of classical mechanics and engineering
- Application of tensor algebra and analysis to the differential geometry of curves and surfaces in the Euclidean space
- More than 100 exercises for the reader, with solutions provided. Contains 50 figures

Readership: Graduate students and researchers in Algebra.

680pp Jul 2023
978-981-126-938-7 US\$168 £150
978-981-126-939-4(ebook) US\$269 £235

Mathematical Society of Japan Memoirs - Vol 41

Cluster Algebras and Scattering Diagrams

by **Tomoki Nakanishi**

The theme of this monograph is the relation between cluster algebras and scattering diagrams. Cluster algebras were introduced by Fomin and Zelevinsky around 2000 as an algebraic and combinatorial structure originated in Lie theory. Recently, Gross, Hacking, Keel, and Kontsevich solved several important conjectures in cluster algebra theory by the scattering diagram method introduced in the homological mirror symmetry. This monograph is the first comprehensive exposition of this important development. The text consists of three parts. Part I is a first step guide to the theory of cluster algebras for readers without any knowledge on cluster algebras. Part II is the main part of the monograph, where we focus on the column sign-coherence of C-matrices and the Laurent positivity for cluster patterns, both of which were conjectured by Fomin and Zelevinsky and proved by Gross, Hacking, Keel, and Kontsevich based on the scattering diagram method. Part III is a self-contained exposition of several fundamental properties of cluster scattering diagrams with emphasis on the roles of the dilogarithm elements and the pentagon relation. As a specific feature of this monograph, each part is written without explicitly relying on the other parts. Thus, readers can start reading from any part depending on their interest and knowledge.



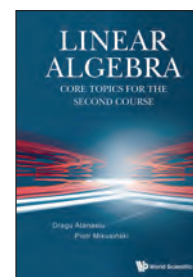
Readership: Graduate or PhD students and young researchers in mechanics, engineering, and applied mathematics. Applicable to courses in differential geometry or tensor algebra, and advanced applied or theoretical continuum mechanics courses for engineering students.

232pp Apr 2023
978-981-126-480-1 US\$88 £75
978-981-126-481-8(ebook) US\$141 £125

Linear Algebra

Core Topics for the Second Course by **Dragu Atanasiu** (*University of Borås, Sweden*) & **Piotr Mikusiński** (*University of Central Florida, USA*)

This is a book for the second course in linear algebra whereby students are assumed to be familiar with calculations using real matrices. To facilitate a smooth transition into rigorous proofs, it combines abstract theory with matrix calculations.



Readership: Undergraduate students taking a second course in linear algebra.

332pp Feb 2023
978-981-125-854-1 US\$118 £95
978-981-125-855-8(ebook) US\$189 £150

Published by Mathematical Society of Japan and distributed by World Scientific Publishing Co. for all markets

Readership: Graduate students and researchers in mathematics.

279pp Mar 2023
978-4-86497-105-8(pbk) US\$46.63 £40

Basic Linear Algebra

Exercises and Solutions

by **Mohammed Hichem Mortad** (*University of Oran 1, Algeria*)

This book is mainly intended for first-year university students who undertake a basic linear algebra course, as well as instructors. It contains the basic notions of linear algebra through solved exercises as well as a "True or False" section in each chapter. Each chapter also contains an essential background section, which makes the book easier to use.

Readership: First year mathematics and computer science students and instructors who will be learning/teaching linear algebra.

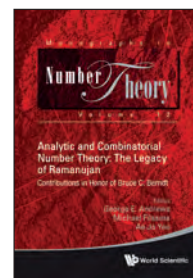
200pp Jun 2024
978-981-125-337-9(pbk) US\$38 £30
978-981-125-267-9 US\$58 £45
978-981-125-268-6(ebook) US\$98 £80

NUMBER / CATEGORY / GROUP THEORY

Monographs in Number Theory - Vol 12

Analytic and Combinatorial Number Theory: The Legacy of Ramanujan

Contributions in Honor of Bruce C Berndt edited by **George E Andrews** (*The Pennsylvania State University, USA*), **Michael Filaseta** (*University of South Carolina, USA*) & **Ae Ja Yee** (*The Pennsylvania State University, USA*)



Contains a collection of research articles that will be of interest to those working in analytic and combinatorial aspects of Number Theory, particularly with a slant toward work of Srinivasa Ramanujan and related work by Bruce C Berndt

Readership: Graduate students and academics interested in the research of Number Theory, especially on Ramanujan's work.

650pp Apr 2024
978-981-127-736-8 US\$168 £150
978-981-127-737-5(ebook) US\$269 £235



Monographs in Number Theory - Vol 11

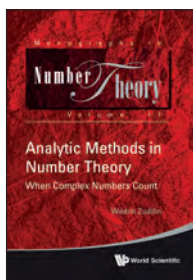
Analytic Methods in Number Theory

When Complex Numbers Count
by **Wadim Zudilin** (*Radboud University Nijmegen, The Netherlands*)

- A review of different analytic techniques used in number theory
- A supply of the material with varying difficulty-level problems
- A book by a world expert in the theory of irrational and transcendental numbers

Readership: Graduates, researchers and enthusiasts in number theory, complex analysis, and special functions; suitable for teaching graduate courses in number theory and self-study.

192pp	Sep 2023	
978-981-127-931-7	US\$78	£70
978-981-127-932-4(ebook)	US\$125	£110



Selected Chapters of Number Theory:

Special Numbers - Vol 2

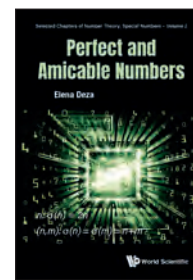
Perfect and Amicable Numbers

by **Elena Deza** (*Moscow State Pedagogical University, Russia*)

This book contains a detailed presentation on the theory of two classes of special numbers, perfect numbers, and amicable numbers, as well as some of their generalizations. It also gives a large list of their properties, facts and theorems with full proofs.

Readership: Teachers and students (especially at the university level) interested in Arithmetic, Number Theory, General Algebra, Cryptography and related fields, as well as a general audience of amateur mathematicians. The book can also be used as source material for individual scientific works by undergraduate and postgraduate students.

464pp	Mar 2023	
978-981-125-962-3	US\$148	£130
978-981-125-963-0(ebook)	US\$237	£210



Series on Number Theory and Its Applications - Vol 17

Smooth-Automorphic Forms and Smooth-Automorphic Representations

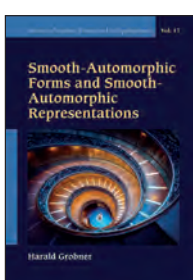
by **Harald Grobner** (*University of Vienna, Austria*)

This book provides a conceptual introduction into the representation theory of local and global groups, with final emphasis on automorphic representations of reductive groups G over number fields F . Graduate students and researchers will find the covered topics appear for the first time in a book, where the theory of smooth-automorphic representations is robustly developed and presented in great detail.

Our approach to automorphic representations differs from the usual literature: We do not consider "K-finite" automorphic forms, but we allow a richer class of smooth functions of uniform moderate growth. Contrasting the usual approach, our space of "smooth-automorphic forms" is intrinsic to the group scheme G/F .

Readership: PhD students and researchers in the fields of automorphic forms, representation theory of local groups (archimedean and non-archimedean) and, more generally, the Langlands Program.

264pp	Jul 2023	
978-981-124-616-6	US\$88	£75
978-981-124-617-3(ebook)	US\$141	£115



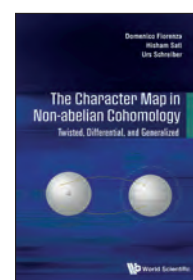
The Character Map in Non-abelian Cohomology

Twisted, Differential, and Generalized
by **Domenico Fiorenza** (*Sapienza Università Roma, Italy*), **Hisham Sati** (*New York University Abu Dhabi, UAE*) & **Urs Schreiber** (*New York University Abu Dhabi, UAE*)

This book presents a novel development of fundamental and fascinating aspects of algebraic topology and mathematical physics: "extra-ordinary" and further generalized cohomology theories enhanced to "twisted" and differential-geometric form, with focus on, firstly, their rational approximation by generalized Chern character maps, and then, the resulting charge quantization laws in higher n -form gauge field theories appearing in string theory and the classification of topological quantum materials.

Readership: Graduate students, researchers in differential geometry, algebraic topology, and their applications to physics. Advanced undergraduate in mathematics and physics, novice researchers interested in a modern introduction to homotopy theory and techniques.

248pp	Sep 2023	
978-981-127-669-9	US\$98	£85
978-981-127-670-5(ebook)	US\$157	£140



Advances in Number Theory and Applied Analysis

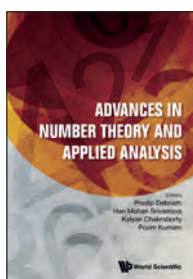
edited by **Pradip Debnath** (*Assam University, India*), **Hari Mohan Srivastava** (*University of Victoria, Canada*), **Kalyan Chakraborty** (*Kerala School of Mathematics, India*) & **Poom Kumam** (*King Mongkut's University of Technology Thonburi (KMUTT), Thailand*)

Presently, the exploration of the applications of different techniques and tools of number theory and mathematical analysis are extensively prevalent in various areas of engineering, mathematical, physical, biological and statistical sciences.

The book will present the current state of the art development in these two areas through original new contributions and surveys. As such, readers will find several useful tools and techniques to develop their skills and expertise in number theory and applied analysis. New research directions are also indicated in each of the chapters.

Readership: Graduate students and researchers in Number Theory and Applied Analysis.

464pp	Jun 2023	
978-981-127-259-2	US\$148	£130
978-981-127-260-8(ebook)	US\$237	£210



Abstract Algebra

by **Shaoqiang Deng** (*Nankai University, China*) & **Fuhai Zhu** (*Nanjing University, China*)

The aim of this book is to introduce the fundamental theories of groups, rings, modules, and fields, and help readers set up a solid foundation for algebra theory. The topics of this book are carefully selected and clearly presented.

Readership: Textbook for an advanced undergraduate course on abstract algebra. Reference book for graduate students in physics, engineering, and computer science. Any students interested in abstract algebra.

280pp	Nov 2023	
978-981-127-870-9(pbk)	US\$58	£50
978-981-127-766-5	US\$98	£85
978-981-127-767-2(ebook)	US\$157	£140



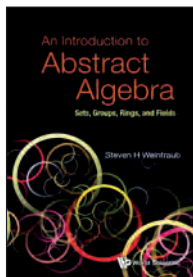
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GENERAL PURE & APPLIED MATHEMATICS

An Introduction to Abstract Algebra

Sets, Groups, Rings, and Fields
by **Steven H Weintraub** (*Lehigh University, USA*)



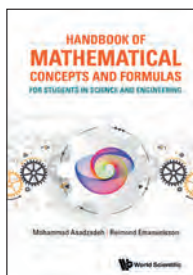
This book is a textbook for a semester-long or year-long introductory course in abstract algebra at the upper undergraduate or beginning graduate level. It treats set theory, group theory, ring and ideal theory, and field theory (including Galois theory), and culminates with a treatment of Dedekind rings, including rings of algebraic integers. In addition to treating standard topics, it contains material not often dealt with in books at this level. It provides a fresh perspective on the subjects it covers, with, in particular, distinctive treatments of factorization theory in integral domains and of Galois theory.

Readership: Advanced undergraduate and beginning graduate students in mathematics, suitable for introductory abstract algebra course in general, and particularly suitable for such a course with an orientation toward number theory.

438pp	Jun 2022		
978-981-124-755-2(pbk)	US\$78	£60	
978-981-124-666-1	US\$148	£120	
978-981-124-667-8(ebook)	US\$237	£190	

Handbook of Mathematical Concepts and Formulas for Students in Science and Engineering

by **Mohammad Asadzadeh** (*Chalmers University of Technology, Sweden*) & **Reimond Emanuelsson** (*Chalmers University of Technology, Sweden*)



This book is a comprehensive collection of main mathematical concepts: definitions, theorems, tables, and formulas that the students of science and engineering encounter in their studies and later on in their professional careers. The aim is to introduce mathematics in an up-to-date text that supports the reader/target group to see, easily accessible, ways to approach their questions/problems, meanwhile getting familiar with, often short, mathematical/logical reasoning.

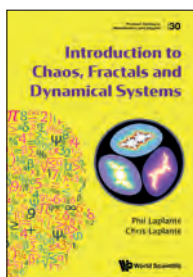
Readership: Students in Natural Science and Engineering Programmes at universities, instructors, professionals in industry.

536pp	Nov 2023		
978-1-80061-331-7	US\$168	£150	
978-1-80061-332-4(ebook)	US\$269	£235	

Problem Solving in Mathematics and Beyond - Vol 29

Introduction to Chaos, Fractals and Dynamical Systems

by **Phil Laplante** (*Penn State University, USA*) & **Chris Laplante** (*Agilent Technologies, USA*)



Introduction to Chaos, Fractals and Dynamical Systems contains ample mathematical definitions, representations, discussions and exercises, so that this book can be used as primary or secondary source in home schooling environments.

Readership: The market consists of mathematically inclined and/or homeschooled students from grades 6 or 7 through 12, and even early undergraduate, as well as computer science students the same grade levels as above. Hobbyists of all ages. Rust community — while this is not a book that intends to teach the Rust language, it is an impactful showcase of the language. We think we could generate some buzz for it on social media, for example by posting links to the program source code and full-color images (which are freely available online).

216pp	Aug 2023		
978-981-127-390-2(pbk)	US\$38	£35	
978-981-127-324-7	US\$78	£70	
978-981-127-325-4(ebook)	US\$125	£110	

Transition to Proofs

by **Simon Rubinstein-Salzedo** (*Euler Circle, USA*)



This textbook is aimed at transitioning high-school students who have already developed proficiency in mathematical problem solving from numerical-answer problems to proof-based mathematics.

Readership: High-school students with some problem-solving background, for example, at the level of being able to qualify for the American Invitational Mathematics Exam. It can also be used as a textbook for an undergraduate introduction to proofs for honors students, and it may be of interest to mathematical hobbyists who just want to learn more mathematics rigorously.

376pp	Sep 2023		
978-981-127-232-5(pbk)	US\$48	£40	
978-981-127-208-0	US\$118	£105	
978-981-127-209-7(ebook)	US\$189	£165	

On Extended Hardy-Hilbert Integral Inequalities and Applications

by **Bicheng Yang** (*Guangdong University of Education, China*) & **Michael Th Rassias** (*Hellenic Military Academy, Greece*)



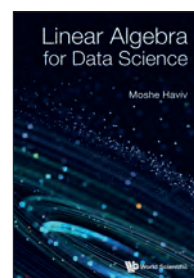
In the present monograph, applying weight functions, the idea of parametrization as well as techniques of real analysis and functional analysis, we prove some new Hilbert-type integral inequalities as well as their reverses with parameters. These inequalities constitute extensions of the well-known Hardy-Hilbert integral inequality.

Readership: Advanced undergraduate students, graduate students, established research mathematicians, researchers working in applied mathematical analysis.

204pp	Mar 2023		
978-981-126-709-3	US\$78	£70	
978-981-126-710-9(ebook)	US\$125	£110	

Linear Algebra for Data Science

by **Moshe Haviv** (*The Chinese University of Hong Kong, Shenzhen, China & The Hebrew University of Jerusalem, Israel*)



This book serves as an introduction to linear algebra for undergraduate students in data science, statistics, computer science, economics, and engineering. The book presents all the essentials in rigorous (proof-based) manner, describes the intuition behind the results, while discussing some applications to data science along the way.

Readership: Undergraduate course in linear algebra as part of a major in data science, statistics, computer science, economics, and engineering.

256pp	Jul 2023		
978-981-127-622-4	US\$78	£70	
978-981-127-623-1(ebook)	US\$125	£110	

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Elementary Mechanics

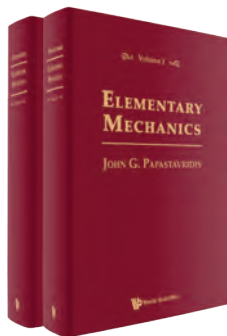
(In 2 Volumes)

by **John G Papastavridis**

(Georgia Institute of Technology, USA)

No volume of such scope [comprehensiveness + level + readability (multiple complementary notations, clear figures) + extensive list of references / bibliography] has ever been written, in any language — there are no real competitors.

Readership: Teachers, and Researchers in most areas of engineering (especially aerospace, mechanical, and engineering mechanics), physics, and applied mathematics.



1680pp	Jan 2024	
978-981-4603-04-1(Set)	US\$384	£319
978-981-4603-05-8(Set)(ebook)	US\$614	£490

The Collected Works of Anatole Katok

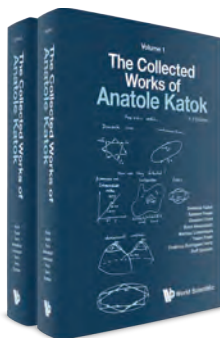
In 2 Volumes

edited by **Svetlana Katok** (The Pennsylvania State University, USA), **Bassam Fayad** (University of Maryland, College Park, USA), **Giovanni Forni** (University of Maryland, College Park, USA), **Boris Hasselblatt** (Tufts University, USA), **Mariusz Lemańczyk** (Nicolaus Copernicus University, Poland), **Yakov Pesin** (The Pennsylvania State University, USA), **Federico Rodriguez Hertz** (The Pennsylvania State University, USA) & **Ralf Spatzier** (University of Michigan, USA)

The book presents and illuminates a large cross section of dynamics in the last half century by publishing the body of work of a leading dynamicist in a form that is organized and discussed by leading experts.

These collected works are organized by topic into six chapters, each featuring an introduction written by respective leading specialists. Volume I focuses on the following topics: Hyperbolicity, Entropy, Geodesic Flows, Interval Exchange Transformations, Billiards, Twist Maps, Spectral Theory, Approximations, Combinatorial Constructions, and History of Dynamics. Volume II focuses on these topics: Cohomology and Geometric Rigidity, and Measure Rigidity.

Readership: Graduates and researchers in the fields of dynamical systems and ergodic theory.



2696pp	Dec 2023	
978-981-123-806-2(Set)	US\$540	£475
978-981-123-807-9(Set)(ebook)	US\$864	£760

Generation of Self-Excited, Hidden and Non-Self-Excited Attractors in Piecewise Linear Systems

Some Recent Approaches

by **Eric Campos Cantón** (Instituto Potosino de Investigación Científica y Tecnológica A.C., Mexico), **Rodolfo de Jesús Escalante González** (Technological Institute of San Luís Potosí, Mexico) & **Héctor Eduardo Gilardi Velázquez** (Universidad Panamericana, Aguascalientes, Mexico)



This book presents some fundamentals of linear system theory and recent approaches to design the three classes of chaotic attractors in piecewise linear systems. Each chapter presents a brief description and basic concepts to provide an overview of linear systems theory; chaos and multistability in integer linear systems; hidden and non-self-excited attractors; and fractional approaches.

Readership: Advanced undergraduate and graduate students, researchers in Chaos and complex systems. General public interested in topics related to chaos theory.

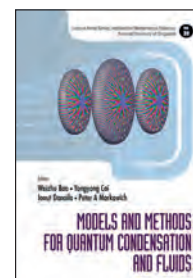
192pp	Jul 2023	
978-981-127-411-4	US\$78	£70
978-981-127-412-1(ebook)	US\$125	£110

COMPUTER MATH & SCIENCE

Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore - Vol 39

Models and Methods for Quantum Condensation and Fluids

edited by **Weizhu Bao** (National University of Singapore, Singapore), **Yongyong Cai** (Beijing Normal University, China), **Ionut Danaila** (Université de Rouen Normandie, France) & **Peter A Markowich** (King Abdullah University of Science and Technology, Saudi Arabia)



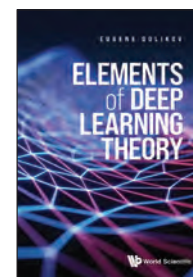
This invaluable volume collects six expanded lecture notes with self-contained tutorials. The coverage includes mathematical models and numerical methods for multidimensional solitons in linear and nonlinear potentials; Bose – Einstein condensation (BEC) with dipole-dipole interaction, higher order interaction and spin-orbit coupling; classical and quantum turbulence; and molecular dynamics process based on the first-principle in quantum chemistry.

Readership: Graduate students and researchers in computational and applied mathematics, computational quantum physics, atomic and molecular physics, nonlinear optics, and computational quantum chemistry.

360pp	Jan 2023	
978-981-126-604-1	US\$138	£120
978-981-126-605-8(ebook)	US\$221	£195

Elements of Deep Learning Theory

by **Eugene Golikov** (Ecole Polytechnique Fédérale de Lausanne, Switzerland)



The goal of the present book is to present these core concepts of Deep Learning theory to readers so that they could directly dive into recent papers of this area. For this purpose, each chapter elaborates a simple model or a classical result in details first and then discusses possible generalizations and more recent developments of the same idea.

The book, in its present form, covers the following topics: uniform generalization bounds, PAC-bayesian generalization bounds, double descent phenomena, infinitely-wide networks, implicit bias of gradient descent, loss landscape, gradient descent convergence guarantees, and initialization strategies.

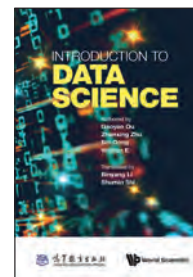
Readership: Graduate in computer science and mathematics interested in deep learning theory, researchers in deep learning.

200pp	Jun 2024	
978-981-127-126-7	US\$88	£75
978-981-127-127-4(ebook)	US\$141	£125

Introduction to Data Science

by **Gaoyan Ou** (Beijing Institute of Big Data Research, China), **Zhanxing Zhu** (Peking University, China), **Bin Dong** (Peking University, China) & **Weinan E** (Beijing Institute of Big Data Research, China)

Translated by: **Binyang Li, Shumin Shi**



The book systematically introduces the basic contents of data science, including data pre-processing and basic methods of data analysis, handling special problems (e.g. text analysis), deep learning, and distributed systems.

In addition to systematically introducing the basic content of data science from a theoretical point of view, the book also provides a large number of data analysis practice cases.

Readership: Undergraduate and graduate students, researchers.

500pp	Nov 2023	
978-981-126-389-7	US\$148	£130
978-981-126-390-3(ebook)	US\$237	£210

DIFFERENTIAL EQUATIONS

Basic Theory of Fractional Differential Equations

3rd Edition

by **Yong Zhou** (*Macau University of Science and Technology, China & Xiangtan University, China*)

Reviews of the First Edition:

"The book is a good resource to familiarize oneself with current achievements in the theory of fractional differential equations of various types. It is well written, and every chapter is equipped with an interesting introduction."

Mathematical Reviews Clippings

This accessible monograph is devoted to a rapidly developing area on the research of qualitative theory of fractional ordinary differential equations and evolution equations. It is self-contained and unified in presentation, and provides the readers the necessary background material required to go further into the subject and explore the rich research literature. The tools used include many classical and modern nonlinear analysis methods such as fixed point theory, measure of noncompactness method, topological degree method, Picard operators technique, critical point theory and semigroups theory.

Readership: Researchers and graduate students dealing with fractional calculus and applied analysis, differential equations and related areas for research, seminars, and advanced graduate courses, in pure and applied mathematics, physics, mechanics, engineering, biology, and related disciplines.

436pp	Oct 2023	
978-981-127-168-7	US\$148	£130
978-981-127-169-4(ebook)	US\$237	£210

Essential Textbooks in Mathematics

Ordinary Differential Equations and Applicationsby **Enrique Fernández-Cara** (*University of Seville, Spain*)

The book can be very useful as a support for basic courses of Ordinary Differential Equations. It contains the main theoretical results and their proofs and a lot of connections to applications

Readership: Undergraduate and graduate students, especially those interested by the role played by differential equations in mathematics and science in general.

352pp	Aug 2023	
978-1-80061-396-6(pbk)	US\$58	£50
978-1-80061-393-5	US\$118	£105
978-1-80061-394-2(ebook)	US\$189	£165

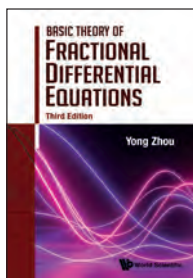
Interdisciplinary Mathematical Sciences - Vol 22

Dissipative Lattice Dynamical Systemsby **Xiaoying Han** (*Auburn University, USA*) & **Peter Kloeden** (*Universität Tübingen, Germany*)

There is an extensive literature in the form of papers (but no books) on lattice dynamical systems. The book focuses on dissipative lattice dynamical systems and their attractors of various forms such as autonomous, nonautonomous and random. The existence of such attractors is established by showing that the corresponding dynamical system has an appropriate kind of absorbing set and is asymptotically compact in some way.

Readership: Researchers ranging from doctoral students to professors in mathematics and related areas. Can also be used in lecture for a graduate course.

380pp	Apr 2023	
978-981-126-775-8	US\$138	£120
978-981-126-776-5(ebook)	US\$221	£195

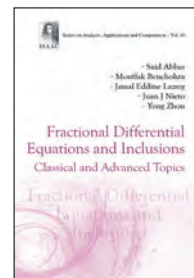


Series on Analysis, Applications and Computation - Vol 10

Fractional Differential Equations and Inclusions

Classical and Advanced Topics

by **Saïd Abbas** (*Tahar Moulay University of Saida, Algeria*), **Mouffak Benchohra** (*Djillali Liabes University of Sidi Bel-Abbes, Algeria*), **Jamal Eddine Lazreg** (*Djillali Liabes University of Sidi Bel-Abbes, Algeria*), **Juan J Nieto** (*Universidade de Santiago de Compostela, Spain*) & **Yong Zhou** (*Xiangtan University, China & Macau University of Science and Technology, China*)



This monograph is devoted to the existence and stability (Ulam – Hyers – Rassias stability and asymptotic stability) of solutions for various classes of functional differential equations or inclusions involving the Hadamard or Hilfer fractional derivative. Some equations present delay which may be finite, infinite, or state-dependent. Others are subject to impulsive effect which may be fixed or non-instantaneous.

Readership: Researchers and graduate students for research, seminars, and advanced graduate courses, in pure and applied mathematics, physics, mechanics, engineering, biology, and other applied sciences.

328pp	Feb 2023	
978-981-126-125-1	US\$118	£105
978-981-126-126-8(ebook)	US\$189	£165

Analysis and Differential Equations

2nd Edition

by **Odile Pons** (*French National Institute for Agronomical Research, France*)

The book presents advanced methods of integral calculus and optimization, the classical theory of ordinary and partial differential equations and systems of dynamical equations. It provides explicit solutions of linear and nonlinear differential equations, and implicit solutions with discrete approximations.

Readership: Undergraduate and graduate students in mathematics courses of analysis and differential calculus; researchers in mathematics.

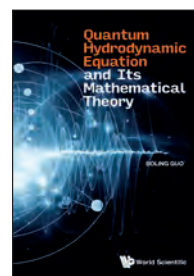
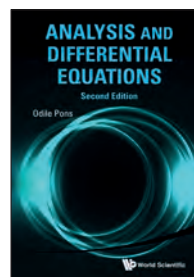
304pp	Jan 2023	
978-981-126-856-4	US\$98	£85
978-981-126-857-1(ebook)	US\$157	£140

Quantum Hydrodynamic Equation and Its Mathematical Theoryby **Boling Guo** (*Institute of Applied Physics and Computational Mathematics, China*)

The main contents of this book are: the derivation and mathematical models of quantum hydrodynamic equations, global existence of weak solutions to the compressible quantum hydrodynamic equations, existence of finite energy weak solutions of inviscid quantum hydrodynamic equations, non-isentropic quantum Navier-Stokes equations with cold pressure, boundary problem of compressible quantum Euler-Poisson equations, asymptotic limit to the bipolar quantum hydrodynamic equations.

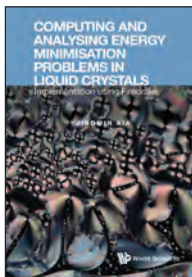
Readership: For graduate students, doctoral students and researchers who are interested in quantum hydrodynamic equations.

320pp	Jul 2023	
978-981-126-083-4	US\$118	£105
978-981-126-084-1(ebook)	US\$189	£165



Computing and Analysing Energy Minimisation Problems in Liquid Crystals

Implementation using Firedrake
by **Jingmin Xia** (*National University of Defense Technology, China*)



This book presents some of the latest work on numerical investigations of liquid crystals, addressing some mathematical modelling and numerical problems. This book consists of three major parts, each of which focuses on different problems for different phases of liquid crystals: nematics and cholesterics, ferronematics and smectics. The associated topics include robust solvers for cholesterics, multiple solutions for ferronematics, and mathematical modelling theory for smectics, etc.

This interdisciplinary book can be helpful in utilising the open-source libraries Firedrake (for solving problems using finite element methods) and Defcon (for computing multiple solutions) to solve general energy minimisation problems.

Readership: Advanced undergraduate and graduate students interested in numerical modelling of liquid crystals; researchers in the fields of mathematical theories and numerical aspects in liquid crystals.

244pp	Jun 2023	
978-981-127-338-4	US\$88	£75
978-981-127-339-1(ebook)	US\$141	£125

UTokyo Engineering Course/ Basic Mathematics

Partial Differential Equations

by **Osamu Sano** (*Tokyo University of Agriculture and Technology, Japan*)



Quite a number of phenomena in science and technology, industrial and/or agricultural production and transport, medical and/or biological flows and movements, social and/or economical developments, etc., depend on many variables, and are very much complicated. Although the detailed knowledge is accumulated in respective fields, it is meaningful to model and analyze the essential part of the phenomena in terms of smaller number of variables, which falls into partial differential equations.

- In this book, particular attention is paid to bridge the gap between mathematics and the real world. Logical thinking in depth and wide linking to various fields are sought to construct intellectual network

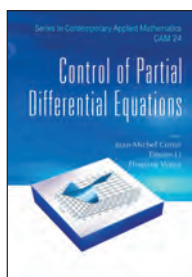
Readership: Undergraduate students majoring in engineering and other mathematical sciences.

240pp	Jul 2023	
978-981-127-131-1(pbk)	US\$58	£50
978-981-127-088-8	US\$98	£85
978-981-127-089-5(ebook)	US\$157	£140

Series in Contemporary Applied Mathematics - Vol 24

Control of Partial Differential Equations

edited by **Jean-Michel Coron** (*Sorbonne Université, France*), **Tatsien Li** (*Fudan University, China*) & **Zhiqiang Wang** (*Fudan University, China*)



This book is mainly a collection of lecture notes for the 2021 LIASFMA International Graduate School on Applied Mathematics. It provides the readers some important results on the theory, the methods, and the application in the field of "Control of Partial Differential Equations".

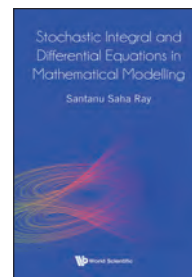
Readership: Graduate students and researchers in mathematics or control theory.

316pp	May 2023	
978-981-127-162-5	US\$118	£105
978-981-127-163-2(ebook)	US\$189	£165

INTEGRAL EQUATIONS / TRANSFORMS

Stochastic Integral and Differential Equations in Mathematical Modelling

by **Santanu Saha Ray** (*National Institute of Technology, Rourkela, India*)



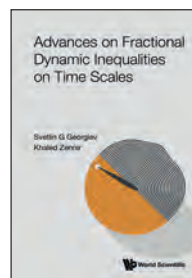
This book is written in a simple and clear mathematical logical language, with basic definitions and theorems on stochastic calculus provided from the outset. Each chapter contains illustrated examples via figures and tables. The reader can also construct new wavelets by using the procedure presented in the book. *Stochastic Integral and Differential Equations in Mathematical Modelling* fulfils the existing gap in the literature for a comprehensive account of this subject area.

Readership: Useful for Master degree students with numerical methods as a specialization and Research scholars working in this field. Supplementary book for undergraduate students or those in engineering working on wavelets.

320pp	Jun 2023	
978-1-80061-357-7	US\$118	£105
978-1-80061-358-4(ebook)	US\$189	£165

Advances on Fractional Dynamic Inequalities on Time Scales

by **Svetlin G Georgiev** (*Sofia University, Bulgaria*) & **Khaled Zennir** (*Qassim University, Saudi Arabia*)



This book is devoted on recent developments of linear and nonlinear fractional Riemann-Liouville and Caputo integral inequalities on time scales. The book is intended for the use in the field of fractional dynamic calculus on time scales and fractional dynamic equations on time scales. It is also suitable for graduate courses in the above fields, and contains ten chapters.

Readership: Undergraduate students and Graduate students in Engineering, Physics, and Biology. Researchers in ordinary differential equations.

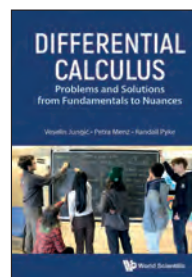
336pp	Sep 2023	
978-981-127-546-3	US\$128	£115
978-981-127-547-0(ebook)	US\$205	£180

Differential Calculus

Problems and Solutions from

Fundamentals to Nuances

by **Veselin Jungić** (*Simon Fraser University, Canada*), **Petra Menz** (*Simon Fraser University, Canada*) & **Randall Pyke** (*Simon Fraser University, Canada*)



This volume contains more than 900 problems in differential calculus, covering limits, continuity, derivatives, and their applications. With about 260 true-false and multiple-choice questions, the book provides its users with an accessible way to assess and practice their understanding of calculus related facts and nuances. More than 180 figures are included to help readers to visualize properties of functions, illustrate word problems, depict solutions, and provide an extensive bank of polar curves.

Readership: High school and undergraduate students taking a first-level calculus course as well as high school teachers and calculus instructors. Anyone, e.g., employees in industry who need a refresher in differential calculus, or as a quick reference, or need to further their understanding in certain areas of calculus.

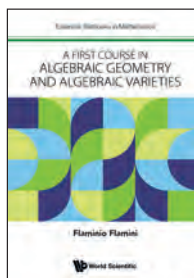
270pp	Nov 2023	
978-981-127-389-6(pbk)	US\$38	£35
978-981-127-298-1	US\$88	£75
978-981-127-299-8(ebook)	US\$141	£125

Essential Textbooks in Mathematics

A First Course in Algebraic Geometry and Algebraic Varieties

by **Flaminio Flamini** (University of Rome "Tor Vergata", Italy)

"The readers are taken by the hand and shown introductory and fundamental notions of Algebraic Geometry. The problems at the end of each chapter are helpful for ensuring a better understanding and for further practice of the concepts dealt with in the textbook. The clarity of presentation makes the book suitable and versatile in different contexts, not only — as one might assume at first sight — for the courses of the three-year degree in Mathematics."



Gilberto Bini
Professor in Geometry
University of Palermo, Italy

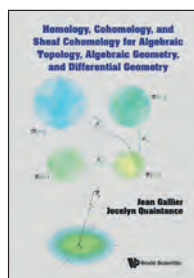
Readership: Advanced undergraduate students (specifically in their 3rd year of undergraduate study or their 1st year of postgraduate study) in the field of Algebraic Geometry; advanced Bachelor courses in Geometry or first courses Geometry during postgraduate study.

328pp	Mar 2023	
978-1-80061-274-7(pbk)	US\$58	£45
978-1-80061-265-5	US\$98	£80
978-1-80061-266-2(ebook)	US\$157	£125

Homology, Cohomology, and Sheaf Cohomology for Algebraic Topology, Algebraic Geometry, and Differential Geometry

by **Jean Gallier & Jocelyn Quaintance** (University of Pennsylvania, USA)

Provides a historical overview of the development of homology/cohomology, while at the same time gently introducing the reader to pertinent fundamental concepts such as exact sequences, chain complexes, presheaves/sheaves, stalk spaces, universal functors, and sheaf cohomology



Readership: Senior undergraduates of maths major who are familiar with some basic notions of linear algebra and abstract algebra, in particular the notion of a module. Also good for graduate students of abstract algebra courses.

800pp	Feb 2022	
978-981-124-502-2	US\$148	£130
978-981-124-503-9(ebook)	US\$237	£210

GEOMETRY (CONVEX AND DISCRETE GEOMETRY) & TOPOLOGY

Series on Analysis, Applications and Computation - Vol 12

Metric Space Topology

Examples, Exercises and Solutions

by **Wing-Sum Cheung** (The University of Hong Kong, Hong Kong)

In this book, the pictorialization or visualization of abstract situations into simple pictures is very often crucially conducive to the understanding of the materials. This serves to give an insightful view of the intricate problems, as well as a clue or a direction to formulate rigorous arguments.

Readership: Advanced undergraduate students and fresh graduate students in mathematics, physics, engineering, economics and finance. Suitable for an introductory course in Topology and Mathematical Analysis.

420pp	Oct 2023	
978-981-126-697-3	US\$148	£130
978-981-126-698-0(ebook)	US\$237	£210

A Royal Road to Topology

Convergence of Filters

by **Szymon Dolecki** (Mathematical Institute of Burgundy, France)

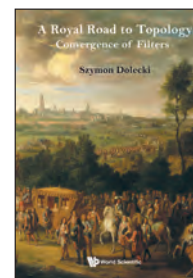
The book is addressed both to those who wish to learn topology and to those who, being already knowledgeable about topology, are curious to review it from a different perspective, which goes well beyond the traditional knowledge.

Usual topics of classic courses of set-theoretic topology are treated at an early stage of the book — from a viewpoint of convergence of filters, but in a rather elementary way. Later on, most of these facts reappear as simple consequences of more advanced aspects of convergence theory.

The mentioned virtues of the approach stem from the fact that the class of convergences is closed under several natural, essential operations, under which the class of topologies is not! Accordingly, convergence theory complements topology like the field of complex numbers algebraically completes the field of real numbers.

Readership: Graduate students of mathematics, Academia (topology, analysis).

500pp	Nov 2023	
978-981-123-210-7	US\$158	£140
978-981-123-211-4(ebook)	US\$253	£200



Series on Knots and Everything - Vol 73

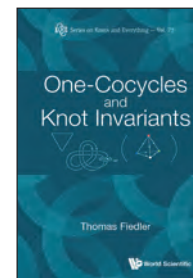
One-Cocycles and Knot Invariants

by **Thomas Fiedler** (Université Paul Sabatier, France)

One-Cocycles and Knot Invariants is about classical knots, i.e., smooth oriented knots in 3-space. It introduces discrete combinatorial analysis in knot theory in order to solve a global tetrahedron equation. This new technique is then used to construct combinatorial 1-cocycles in a certain moduli space of knot diagrams. The construction of the moduli space makes use of the meridian and the longitude of the knot.

Readership: This title will be particularly useful for academic researchers and PhD students.

340pp	Jan 2023	
978-981-126-299-9	US\$128	£100
978-981-126-300-2(ebook)	US\$205	£165



Perspectives in Scalar Curvature

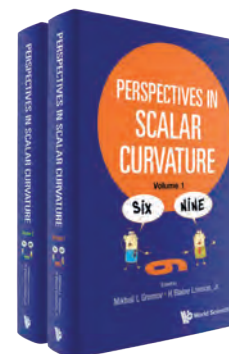
In 2 Volumes

edited by **Mikhail L Gromov** (Institut des Hautes Études Scientifiques, France) & **H Blaine Lawson, Jr.** (Stony Brook University, USA)

This is a wide-ranging work centered on the subject, from geometry, of scalar curvature. It begins with a long article written by Misha Gromov with many topics and open problems. The rest of Volume 1 consists of articles written about very recent major advances, by people involved in these discoveries. Volume 2 is a diverse and fascinating collection of essays written by mathematicians and physicists about their view of scalar curvature in their own work. They were invited to write whatever they found appealing. Some wrote large surveys and others wrote articles that were specifically focused. The ensemble is extremely interesting

Readership: Professional mathematicians and physicists, and certainly graduate students, in differential geometry and related areas in mathematics, and in general relativity and related areas in physics. The books could easily be used for advanced graduate courses in mathematics and physics.

1636pp	Mar 2023	
978-981-124-935-8(Set)	US\$388	£340
978-981-124-936-5(Set)(ebook)	US\$621	£545



COMPLEX MANIFOLDS**Lectures on Differential Geometry**by Rui Loja Fernandes (*University of Illinois Urbana-Champaign, USA*)

This book presents a concise introduction to differential geometry. It is aimed at advanced undergraduate students and first year graduate students who wish to have a basic solid knowledge of the subject, and it can serve as a starting point for more advanced reading. The book is organized into lectures, so it can easily be used as a textbook for a beginning graduate-level course in differential geometry.

Readership: For advanced undergraduate and beginning graduate level courses in Mathematics/Physics on Differential Geometry.

300pp	Sep 2024	
978-981-125-336-2(pbk)	US\$68	£55
978-981-125-264-8	US\$98	£80
978-981-125-265-5(ebook)	US\$157	£125

Series on Knots and Everything - Vol 74

Seeing Four-Dimensional Space and Beyond

Using Knots!

by Eiji Ogasa (*Meiji Gakuin University, Japan*)

- High dimensional space is of interest not only to mathematicians and physicists, but also the lay public
- The book is introductory and suitable for students and novice researchers in mathematics and physics
- The first half will be easily digestible by freshmen and sophomores and provide the foundations for the second half

Readership: Freshmen and sophomores of science and people with similar mathematical background; general public interested in science, sci-fiction, and high-dimensional space; novice researchers in knot theory.

172pp	Aug 2023	
978-981-127-512-8	US\$78	£70
978-981-127-515-9(ebook)	US\$125	£110

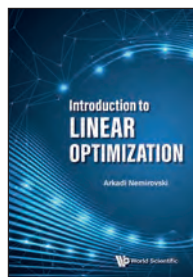
CALCULUS OF VARIATIONS & OPTIMAL CONTROL / OPTIMIZATION**Introduction to Linear Optimization**by Arkadi Nemirovski (*Georgia Institute of Technology, USA*)

The book presents a graduate level, rigorous, and self-contained introduction to linear optimization (LO), the presented topics being

- expressive abilities of LO;
- geometry of LO — structure of polyhedral sets, LO duality and its applications;
- traditional LO algorithms — primal and dual simplex methods, and network simplex method;
- polynomial time solvability of LO via ellipsoid algorithm;
- conic programming with emphasis on expressing abilities of second order and semidefinite optimization, and polynomial time primal-dual interior point algorithms for linear and semidefinite optimization

Readership: Senior undergraduate and graduate students dealing with building and processing optimization models. Main textbook for a semester-long graduate course on linear optimization; auxiliary text for more general graduate courses on optimization.

570pp	Jan 2024	
978-981-127-873-0(pbk)	US\$78	£70
978-981-127-790-0	US\$168	£150
978-981-127-791-7(ebook)	US\$269	£235

**Motion Control**

Multi-Faceted Movement in Space, Time and Neurological Impairment

by Yoram Baram (*Technion — Israel Institute of Technology, Israel*)

“Following an exposition of systems and control theory foundations, Motion Control presents the author’s work with medical collaborators on human gait problems; this includes a presentation of their virtual reality feedback device for gait stabilization, in particular for those suffering from Parkinson’s Disease. Motion Control joins the author’s preceding monograph, The Subcritical Brain, to make a valuable contribution to the scientific and clinical area of human cybernetics.”

Peter E Caines

**FRSC, Distinguished James McGill Professor
Macdonald Chair in the Department of Electrical and
Computer Engineering
McGill University**

This book addresses the mathematical and the practical aspects of motion implied by advanced control theory. The richness and power of the theory are demonstrated by separate analyses of single-model and multi-modal repertoires, consisting of verities of estimation and control facets. Starting with purely mathematical concepts, specifically, abstract probability and information theories, model control theory is gradually revealed as a rather amazing domain. The mathematical equations, taking essentially simple forms, are exposed as powerful generators of motion. Moreover, seemingly obvious applications of the theory, such as high-performance aircraft control make room for unexpected virtual reality feedback in control of motion for the neurologically impaired.

Following the presentation of some historical milestones and mathematical preliminaries, the book is divided into four parts. The first deals with minimal-order models of state estimation and control. The second addresses multi-modal estimation and control, which facilitates the operation of high-performance aircraft in large flight envelopes. The third presents the transition from naturally nonlinear control of movement in obstacle avoidance and object targeting to virtually linear control of movement in the neurologically impaired. The fourth and final part of the book addresses the application of virtual sensory feedback in walking with specific neurological impairment.

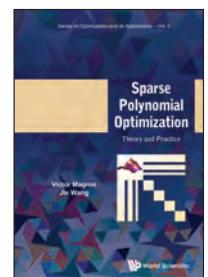
Readership: Graduate students and professors of control theory, applied mathematics, electrical engineering, aeronautical engineering, mechanical engineering, medicine, computer science, physics, biology, neurology, psychology, cognition, linguistics, zoology, neurologists, doctors, physical therapists, neuroscientists, mathematicians, physicists, computer scientists. Biologists, psychologists, linguists, zoologists.

344pp	Jun 2023	
978-981-126-957-8	US\$128	£115
978-981-126-958-5(ebook)	US\$205	£180

Series on Optimization and its Applications - Vol 5

Sparse Polynomial Optimization

Theory and Practice

by Victor Magron (*LAAS-CNRS, France*) & Jie Wang (*Chinese Academy of Sciences, China*)

This book presents several research efforts to resolve this scientific challenge with important computational implications. It provides the development of alternative optimization schemes that scale well in terms of computational complexity, at least in some identified class of problems. It also features a unified modeling framework to handle a wide range of applications involving both commutative and noncommutative variables, and to solve concretely large-scale instances.

Readership: Anyone interested in solving optimization problems with polynomial input data: advanced undergraduates and graduate students, engineers, and researchers in applied mathematics, quantum physics, deep learning, or power systems.

224pp	Jun 2023	
978-1-80061-294-5	US\$88	£70
978-1-80061-295-2(ebook)	US\$141	£110

Unilateral Variational Analysis in Banach Spaces

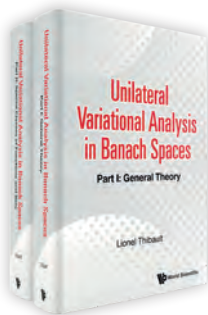
(In 2 Parts)

Part I: General Theory

Part II: Special Classes of Functions and Sets

by **Lionel Thibault** (University of Montpellier, France)

The monograph provides a detailed and comprehensive presentation of the rich and beautiful theory of unilateral variational analysis in infinite dimensions. It is divided into two volumes named Part I and Part II. Starting with the convergence of sets and the semilimits and semicontinuity of multimappings, the first volume develops the theories of tangent cones, of subdifferentials, of convexity and duality in locally convex spaces, of extended mean value inequalities in absence of differentiability, of metric regularity, of constrained optimization problems.



Readership: The book is intended for researchers, PhD students, graduate students concerned with variational analysis, practitioners using variational analysis tools.

1628pp	Apr 2023	
978-981-125-816-9(Set)	US\$498	£400
978-981-125-817-6(Set)(ebook)	US\$797	£635

Advanced Textbooks in Mathematics

Classical and Modern Optimization

by **Guillaume Carlier** (Université Paris Dauphine, France)

"Carlier's book on Optimization is one of its kind: it provides all the material necessary for beginners while covering at the same time a wide range of lively problems and algorithms in finite or infinite-dimensional spaces, drawing examples from cutting-edge data-driven problems, optimal transport, or from the classical calculus of variations. Its conciseness, sharpness, and insight make it an excellent reference both for students and researchers."



Jérôme Bolte
Professor of Mathematics,
Toulouse School of Economics

Readership: Thought-leaders, executives, industry strategists, research scientists, graduate students, advanced undergraduate students, policy-makers, research funding agencies, private research institutions, government regulators, investors, corporate managers, purchasing agents, and entrepreneurs in the areas of computer science, quantum computing, information theory, neuroscience, and physics.

388pp	Apr 2022	
978-1-80061-086-6(pbk)	US\$68	£55
978-1-80061-065-1	US\$138	£110
978-1-80061-066-8(ebook)	US\$221	£175

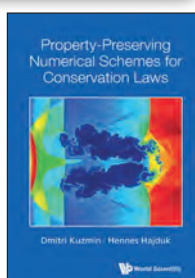
MATHEMATICAL PHYSICS

Property-Preserving Numerical Schemes for Conservation Laws

by **Dmitri Kuzmin** (TU Dortmund University, Germany) & **Hennes Hajduk** (TU Dortmund University, Germany)

An introduction to classical nonlinear stabilization approaches is given in the simple context of one-dimensional finite volume discretizations.

Readership: Instructors, advanced graduate students, researchers in the field of numerical methods for conservation laws, practitioners in the field of computational fluid dynamics.



492pp	Sep 2023	
978-981-127-818-1	US\$168	£150
978-981-127-819-8(ebook)	US\$269	£235

An Introduction to the Poisson Sigma Model

by **Ivan Contreras** (Amherst College, USA)

This book contains an introduction to symplectic, Poisson and graded geometry, the path space construction for Lie algebroids via the reduced phase space of the Poisson Sigma Model, and the Cattaneo-Felder interpretation of Kontsevich's star product via Feynman diagrams. It also describes in detail particular cases of the Poisson Sigma Model, including constant, linear (2-dimensional BF-theory) and quadratic Poisson structures.

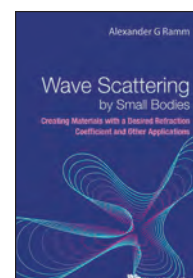
Readership: Graduate students studying differential geometry, mathematical physics and/or topology. Masters students studying topics for a potential PhD in mathematics and physics.

200pp	Jun 2024	
978-981-124-871-9	US\$78	£70
978-981-124-872-6(ebook)	US\$125	£100

Wave Scattering by Small Bodies

Creating Materials with a Desired Refraction Coefficient and Other Applications

by **Alexander G Ramm** (Kansas State University, USA)



The book is a research monograph. An asymptotically exact solution of the many-body scattering problem is given under the assumption $a; d; \lambda$, where a is the characteristic size of a small particle, d is the smallest distance between particles and λ is the wavelength in the medium in which the particles are embedded. Scattering of scalar and electromagnetic waves is considered. Heat transfer theory in the medium in which many small bodies are embedded is developed. Quantum-mechanical theory of scattering by many potentials with small support is constructed.

Readership: Mathematical physics and Physics graduate students and researchers interested in wave scattering. Engineers and materials scientists creating materials with desired refraction coefficient or wave focusing properties.

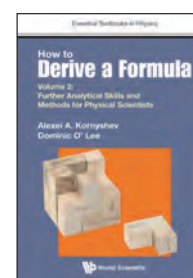
292pp	Nov 2023	
978-981-127-648-4	US\$108	£95
978-981-127-649-1(ebook)	US\$173	£150

Essential Textbooks in Physics

How to Derive a Formula

Volume 2: Further Analytical Skills and Methods for Physical Scientists

by **Alexei A Kornyshev** (Imperial College London, UK) & **Dominic O'Lee** (Imperial College London, UK)



This two-volume book *How to Derive a Formula* is an attempt to engage learners by presenting mathematical methods in as simple terms as possible, with more of an emphasis on skills as opposed to technical knowledge. Based on intuition and common sense rather than mathematical rigour, it teaches students from scratch using pertinent examples, many taken from across the physical sciences to demonstrate the application of the methods taught.

Readership: Undergraduate and graduate students (in any disciplines of exact sciences), and postdoctoral researchers in physical sciences, university lecturers for teaching the material of some of the chapters of the book.

768pp	Aug 2023	
978-1-80061-297-6(pbk)	US\$98	£80
978-1-80061-279-2	US\$168	£135
978-1-80061-280-8(ebook)	US\$269	£215

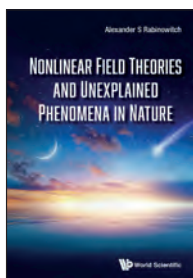
Nonlinear Field Theories and Unexplained Phenomena in Nature

by Alexander S Rabinowitch (*HSE University, Russia*)

The book is devoted to several topical questions in modern mathematical and theoretical physics, astrophysics, geophysics, and cosmology that remain unsolved within the framework of the standard approaches. To them, one can attribute unexplained properties of the magnetic fields of stars and planets, puzzles of the Earth's atmosphere, the phenomenon of ball lightning, the problem of a qualitative description for nuclear forces and their well-known property of saturation, enigmatic properties of spiral galaxies, the problem of the cosmological singularity, mysteries of the dark matter and dark energy, amongst others. To find theoretical ways for understanding such phenomena, new nonlinear generalizations of the classical field theories and advanced methods to solve nonlinear equations arising in them are studied and presented in this book.

Readership: Advanced undergraduate and graduate students, physicists, astrophysicists and mathematicians interested in nonlinear field theories and their applications to unsolved problems of contemporary mathematical physics and theoretical physics, astrophysics, cosmology and the explanations of the mysterious phenomena in nature.

324pp	Jul 2023	
978-981-126-411-5	US\$118	£105
978-981-126-412-2(ebook)	US\$189	£165



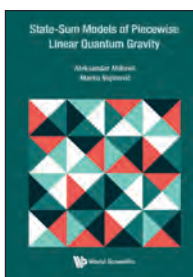
State-Sum Models of Piecewise Linear Quantum Gravity

by Aleksandar Miković (*Lusófona University, Portugal*) & Marko Vojinović (*University of Belgrade, Serbia*)

This book gives a description of state-sum quantum gravity models which are based on triangulations of a smooth spacetime manifold. It contains detailed descriptions of Regge quantum gravity, spin-foam models and spin-cube models. Some other similar models, like the dynamical triangulations models, are only briefly described, since the sum over the spacetime triangulations is outside the scope of this book.

Readership: PhD students in mathematical physics and theoretical physics. Researchers in quantum gravity and related mathematical physics.

184pp	Jun 2023	
978-981-126-931-8	US\$78	£70
978-981-126-932-5(ebook)	US\$125	£110



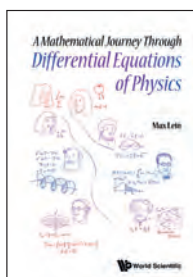
A Mathematical Journey Through Differential Equations of Physics

by Max Lein (*Tohoku University, Japan*)

The book alternates between mathematics- and physics-centric chapters, and includes plenty of concrete examples from physics as well as 76 exercises with solutions. It exploits that readers from either end are familiar with some of the material already. The mathematics-centric chapters provide the necessary background to make physical concepts mathematically precise and establish basic facts. And each physics-centric chapter introduces physical theories in a way that is more friendly to mathematicians.

Readership: Advanced undergraduate and graduate students of mathematics and physics with an interest in mathematical physics. Instructors can use it to design a comprehensive course on differential equations after paring down some of the material. Or alternatively, it also serves as a good basis for more specialized classes on, e.g., quantum mechanics or electromagnetism that place more emphasis on the necessary mathematics.

480pp	Oct 2022	
978-981-122-766-0(pbk)	US\$78	£70
978-981-122-537-6	US\$138	£120
978-981-122-538-3(ebook)	US\$221	£195



FUNCTIONS, FUNCTIONAL / HARMONIC ANALYSIS

An Introduction to Banach Algebras and Operator Algebras

by Laurent W Marcoux (*University of Waterloo, Canada*)

This book serves as an introduction to Banach algebra theory, operator theory, and C^* -algebras. It is aimed at graduate students with basic knowledge of functional analysis, or researchers who wish to pursue research in these areas.

While covering the standard material necessary to embark on any further exploration of the theory (Gelfand theory, the GNS construction and the spectral theorem for normal operators), the book also presents specialized material and topics of recent interest, including the holomorphic functional calculus and upper-semicontinuity of the spectrum, Jacobson's Density Theorem, the Cohen–Hewitt Factorisation Theorem, Kaplansky's Density Theorem and Kadison's Transitivity Theorem.

The presentation is detailed and clear, with special attention to highlighting the scope and limitations of the theory through examples. Each chapter includes Notes and Remarks which provide extra context, and in many instances relate the material to recent results in the research literature and to open problems.

Readership: Advanced undergraduate and graduate students, researchers and practitioners in the fields of Operator Theory, Operator Algebras, Banach Algebras, Abstract Harmonic Analysis and Functional Analysis.

400pp	Jul 2024	
978-981-126-576-1	US\$128	£115
978-981-126-577-8(ebook)	US\$205	£180

Fixed Point Theory in p -Vector Spaces

by George Xianzhi Yuan (*Sun Yat-sen University, China & Chengdu University, China & Sichuan University, China & East China University of Science and Technology, China*)

This book provides an updated discussion of fixed point theory using the framework of p -vector spaces, a core component of nonlinear analysis in mathematics. The book covers three main topics: 1) the “best approximation approach” for classes of semiclosed 1-set contractive set-valued mappings in both p -vector spaces (including locally p -convex spaces); 2) the general principle of Leray-Schauder alternatives; and 3) various forms of fixed point theorems for non-self mappings.

Readership: This book should be the first choice of textbook for senior undergraduate students, postgraduate (and PHD) students. It is also the key reference for mathematicians and researchers in nonlinear analysis and related applied fields. General readers, experts in physical sciences, engineering, and applied disciplines.

300pp	Jul 2024	
978-981-127-787-0	US\$108	£95
978-981-127-788-7(ebook)	US\$173	£150

Lectures on Functional Analysis and Applications

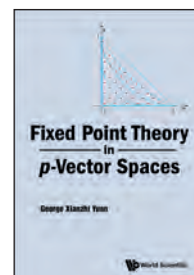
2nd Edition

by V S Pugachev & I N Sinitsyn (*Russian Academy of Sciences, Russia*)

This volume is not only intended for mathematicians who deal with applications of functional analysis, but also for those having only a moderate background in mathematics in their areas of work.

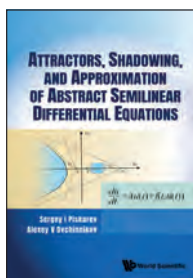
Readership: Undergraduate and graduate students as well as researchers in applied mathematics, and engineers.

800pp	Jan 2024	
978-981-3203-18-1(pbk)	US\$88	£73
978-981-3203-17-4	US\$178	£148
978-981-3203-19-8(ebook)	US\$285	£237



Attractors, Shadowing, and Approximation of Abstract Semilinear Differential Equations

by **Sergey I Piskarev** (*M V Lomonosov Moscow State University, Russia & Mari State University, Russia & Bauman Moscow State Technical University, Russia & Russian Institute for Scientific and Technical Information, Russia*) & **Alexey V Ovchinnikov** (*M V Lomonosov Moscow State University, Russia & Russian Institute for Scientific and Technical Information, Russia*)



The book is devoted to some branches of the theory of approximation of abstract differential equations, namely, approximation of attractors in the case of hyperbolic equilibrium points, shadowing, and approximation of time-fractional semilinear problems. In this book, the most famous methods of several urgent branches of the theory of abstract differential equations scattered in numerous journal publications are systematized and collected together, which makes it convenient for the initial study of the subject and also for its use as a reference book.

Readership: This book is addressed to graduate and postgraduate students specialized in functional analysis, approximation of abstract differential equations, and dynamical systems. It is also useful for mathematicians and physicists working in these and related areas.

212pp Jul 2023
 978-981-127-277-6 US\$88 £75
 978-981-127-278-3(ebook) US\$141 £125

A Friendly Approach to Complex Analysis

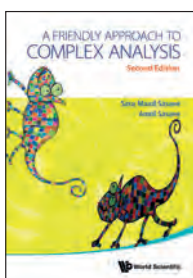
2nd Edition

by **Sara Maad Sasane** (*Lund University, Sweden*) & **Amol Sasane** (*London School of Economics, UK*)

Reviews of the First Edition:

"This book is 'friendly' because the treatment is rigorous and makes no concessions to lazy-mindedness. Another reason is that the narrative always conveys a sense of direction, and it makes many valuable comparisons with real and complex analysis. Overall, this is a very nice addition to the existing literature on complex analysis. It is rich in ideas and there is a very effective use of diagrams at key points in the text."

Mathematical Association of America



The second edition corrects errors from the first edition, and includes 89 new exercises, some of which cover auxiliary topics that were omitted in the first edition. Two new appendices have been added, one containing a detailed rigorous proof of the Cauchy Integral Theorem, and another providing background in real analysis needed to make the book self-contained.

Readership: Undergraduate students in complex analysis.

220pp Jul 2023
 978-981-127-410-7(pbk) US\$48 £40
 978-981-127-280-6 US\$88 £75
 978-981-127-281-3(ebook) US\$141 £125

UTokyo Engineering Course/ Basic Mathematics

Complex Function Theory

by **Takeo Fujiwara** (*The University of Tokyo, Japan*)

The goal of the book is not rigor as mathematics, but ease of use that may suit the application. Explanations are based on concrete examples rather than abstract general theory

Readership: Undergraduate students majoring in engineering and other mathematical sciences.

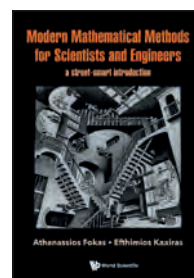


292pp Jul 2023
 978-981-127-132-8(pbk) US\$58 £50
 978-981-127-091-8 US\$98 £85
 978-981-127-092-5(ebook) US\$157 £140

Modern Mathematical Methods for Scientists and Engineers

A Street-Smart Introduction

by **Athanassios Fokas** (*University of Cambridge, UK & University of Southern California, USA*) & **Efthimios Kaxiras** (*Harvard University, USA*)



Modern Mathematical Methods for Scientists and Engineers is a modern introduction to basic topics in mathematics at the undergraduate level, with emphasis on explanations and applications to real-life problems. There is also an "Application" section at the end of each chapter, with topics drawn from a variety of areas, including neural networks, fluid dynamics, and the behavior of "put" and "call" options in financial markets.

Readership: Advanced undergraduate students and graduate students in physical science and engineering departments; researchers and practitioners (both in industry and academia) in the same fields. Can be used as textbook for courses in: Applied Mathematics, Mathematics for Physicists, Mathematics for Engineers, at both the advanced undergraduate and graduate level. Can also be adopted for fields that use mathematical tools for modeling, such as finance.

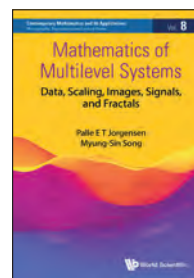
568pp Mar 2023
 978-1-80061-183-2(pbk) US\$98 £85
 978-1-80061-180-1 US\$248 £220
 978-1-80061-181-8(ebook) US\$397 £350

Contemporary Mathematics and Its Applications: Monographs, Expositions and Lecture Notes - Vol 8

Mathematics of Multilevel Systems

Data, Scaling, Images, Signals, and Fractals

by **Palle E T Jorgensen** (*The University of Iowa, USA*) & **Myung-Sin Song** (*Southern Illinois University Edwardsville, USA*)



This book presents the mathematics of wavelet theory and its applications in a broader sense, comprising entropy encoding, lifting scheme, matrix factorization, and fractals. It also encompasses image compression examples using wavelet transform and includes the principal component analysis which is a hot topic on data dimension reduction in machine learning.

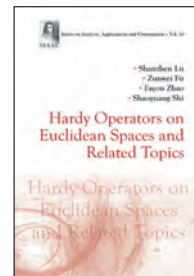
Readership: Undergraduate students in wavelet analysis, image compression, and applied mathematics. Master's level wavelet analysis course.

272pp Jul 2023
 978-981-126-897-7 US\$88 £75
 978-981-126-899-1(ebook) US\$141 £125

Series on Analysis, Applications and Computation - Vol 11

Hardy Operators on Euclidean Spaces and Related Topics

by **Shanzhen Lu** (*Beijing Normal University, China*), **Zunwei Fu** (*Linyi University, China*), **Fayou Zhao** (*Shanghai University, China*) & **Shaoguang Shi** (*Linyi University, China*)



This book can not only serve as an introductory textbook for graduate students to learn the Hardy operator and related topics, but also enable interested mathematicians to understand this content and conduct further scientific research work. I strongly recommend this book."

Professor FAN Dashan
 Department of Mathematical Sciences
 University of Wisconsin-Milwaukee

Readership: This book is suitable for undergraduate and graduate students as well as researchers in theoretical and applied mathematics. It will be a useful teaching material at seminars as well as an invaluable reference source in all science libraries.

216pp May 2023
 978-981-125-367-6 US\$78 £70
 978-981-125-368-3(ebook) US\$125 £110

Metric Spaces and Related Analysis

by **Subiman Kundu** (*Indian Institute of Technology Delhi, India*) & **Manisha Aggarwal** (*University of Delhi, India*)

This book offers the comprehensive study of one of the foundational topics in Mathematics, known as Metric Spaces. The book delivers the concepts in an appropriate and concise manner, at the same time rich in illustrations and exercise problems. Special focus has been laid on important theorems like Baire's Category theorem, Heine – Borel theorem, Ascoli – Arzela Theorem, etc, which play a crucial role in the study of metric spaces.

Readership: Undergraduate and graduate students, researchers in the areas of real analysis, analysis on metric spaces, real functions, topology, functional analysis.

300pp **Dec 2023**
978-981-127-891-4 **US\$118** **£105**
978-981-127-892-1(ebook) **US\$189** **£165**



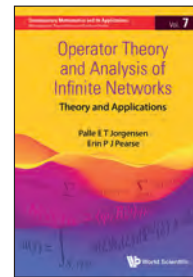
Contemporary Mathematics and Its Applications: Monographs, Expositions and Lecture Notes - Vol 7 Operator Theory and Analysis of Infinite Networks

Theory and Applications
 by **Palle E T Jorgensen** (*University of Iowa, USA*) & **Erin P J Pearse** (*California Polytechnic State University, USA*)

This volume considers resistance networks: large graphs which are connected, undirected, and weighted. Such networks provide a discrete model for physical processes in inhomogeneous media, including heat flow through perforated or porous media. These graphs also arise in data science, e.g., considering geometrizations of datasets, statistical inference, or the propagation of memes through social networks.

Readership: Upper-level undergraduate and graduate students in mathematics, electrical engineering, probability/statistics, theoretical computer science, data science, physics, and econometrics, who would like to get a deeper understanding of large network models. It includes students as well specialists from a host of neighboring areas that are different from analysis of large networks but related. Suitable for courses and self-study.

448pp **Apr 2023**
978-981-126-551-8 **US\$148** **£130**
978-981-126-552-5(ebook) **US\$237** **£210**



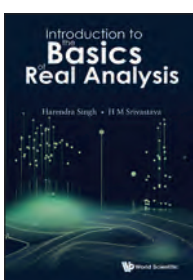
Introduction to the Basics of Real Analysis

by **Harendra Singh** (*Ravindrapuri Ghazipur, India*) & **H M Srivastava** (*University of Victoria, Canada*)

This book presents an introduction to the key topics in Real Analysis and makes the subject easily understood by the learners. The book is primarily useful for students of mathematics and engineering studying the subject of Real Analysis. It includes many examples and exercises at the end of chapters. This book is very authentic for students, instructors, as well as those doing research in areas demanding a basic knowledge of Real Analysis. It describes several useful topics in Real Analysis such as sets and functions, completeness, ordered and field, neighborhoods, limit points of a set, open sets, closed sets, countable and uncountable sets, sequences of real numbers, limit, continuity and differentiability of real functions, uniform continuity, point-wise and uniform convergence of sequences and series of real functions, Riemann integration, improper integrals and metric spaces

Readership: Undergraduate and postgraduate students in Real Analysis.

270pp **Nov 2023**
978-981-127-821-1 **US\$88** **£75**
978-981-127-822-8(ebook) **US\$141** **£125**



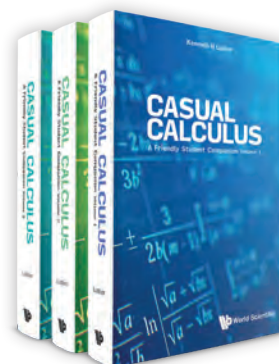
Casual Calculus: A Friendly Student Companion (In 3 Volumes)

by **Kenneth H Luther** (*Valparaiso University, USA*)

Yes, this is another Calculus book. However, it fits in a niche between the two predominant types of such texts. It could be used as a textbook, albeit a streamlined one — it contains exposition on each topic, with an introduction, rationale, train of thought, and solved examples with accompanying suggested exercises.

Readership: Undergraduate students currently taking or refreshing themselves on Calculus.

1796pp **Sep 2022**
978-981-124-264-9(Set)(pbk) **US\$188** **£165**
978-981-124-263-2(Set) **US\$448** **£395**
978-981-124-265-6(Set)(ebook) **US\$717** **£575**



Cofinally Complete Metric Spaces and Related Functions

by **Subiman Kundu** (*Indian Institute of Technology Delhi, India*), **Manisha Aggarwal** (*University of Delhi, India*) & **Lipsy Gupta** (*University of Missouri Columbia, USA*)

The monograph targets a huge variety of characterizations of cofinally complete metric spaces. These spaces are studied in terms of several properties of some classes of functions between metric spaces that are stronger than the continuous functions such as Cauchy-regular, uniformly continuous, strongly uniformly continuous, and various Lipschitz-type functions. There is one chapter that is dedicated to studying cofinally complete metric spaces in terms of hyperspace and function space topologies. Along with that, various characterizations are studied in terms of geometric functionals, sequences, Cantor-type conditions, etc.

Readership: Graduate students and researchers in real analysis.

152pp **May 2023**
978-981-127-265-3 **US\$68** **£60**
978-981-127-266-0(ebook) **US\$109** **£95**



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MATHEMATICAL BIOLOGY, COMPUTATION AND MODELING

Modelling and Computational Approaches for Multi-scale Phenomena in Cancer Research

From Cancer Evolution to Cancer Treatment
 edited by **Raluca Eftimie** (*University of Franche-Comté, France*) & **Dumitru Trucu** (*University of Dundee, UK*)

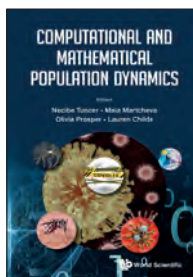
This review volume summarises the current state of the art related to the modelling, experimental investigation and data assimilation for multiscale phenomena during cancer development, evolution and treatment, as well as computational and analytical investigation of the multi-scale models developed to reproduce the biological phenomena. We also aim to identify the (experimental and theoretical) open problems that will have to be addressed in the near future, in order to advance this field. As such this book is an excellent resource, both for early career and advanced researchers.

Readership: Suitable for postgraduate students and researchers interested in single-scale and multi-scale modelling in oncology.

200pp	Jun 2024	
978-1-80061-437-6	US\$88	£75
978-1-80061-438-3(ebook)	US\$141	£125

Computational and Mathematical Population Dynamics

edited by **Necibe Tuncer** (*Florida Atlantic University, USA*), **Maia Martcheva** (*University of Florida, USA*), **Olivia Prosper** (*University of Tennessee, Knoxville, USA*) & **Lauren Childs** (*Virginia Polytechnic Institute and State University, USA*)



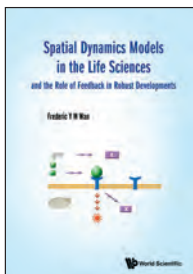
This book is a collection of works that represent the recent advancements in computational and mathematical methods applied to population dynamics. It concentrates on both development of new tools as well as on innovative use of existing tools to obtain new understanding of biological systems. The volume introduces new state-of-the-art techniques for defining and solving numerically control problems in mathematical biology in which the control appears linearly. Such problems produce simpler optimal controls that can be implemented in practice.

Readership: Academic libraries, Researchers, Professors, Postgraduate students, Graduate students.

472pp	Jul 2023	
978-981-126-302-6	US\$148	£120
978-981-126-303-3(ebook)	US\$237	£190

Spatial Dynamics Models in the Life Sciences and the Role of Feedback in Robust Developments

by **Frederic Y M Wan** (*University of California, Irvine, USA*)



Similar to the two previous volumes by the author, another unique feature of the book is highlighting the scientific theme(s) of interest for the biological phenomena being modelled and analysed. In addition to temporal evolution of a biological phenomenon, its limiting equilibrium states and their stability, the possibility of locational variations leads to a study of additional themes such as (signal and wave) propagation, spatial patterning and robustness.

Readership: Beginning graduate students and upper division undergraduates in mathematical biology. Also accessible to researchers in the life sciences interested in spatially nonuniform models but with little or no background in partial differential equations.

496pp	Jan 2023	
978-981-125-656-1	US\$138	£120
978-981-125-657-8(ebook)	US\$221	£195

Contemporary Mathematics and Its Applications: Monographs, Expositions and Lecture Notes

Contemporary Research in Mathematical Biology

Modeling, Computation and Analysis
 edited by **Robert Stephen Cantrell** (*The University of Miami, USA*), **Maia Martcheva** (*University of Florida, USA*), **Andrew Nevai** (*University of Central Florida, USA*), **Shigui Ruan** (*The University of Miami, USA*) & **Zhisheng Shuai** (*University of Central Florida, USA*)

- The book has a distinguished list of authors
- With its focus on infectious diseases and cancer, it is very relevant to today's world events
- With its contributions in population dynamics and ecology it will reach a wide base of mathematical biology enthusiasts

Readership: Mathematical biologists: academic faculty and graduate students. Theoretical biologists: academic faculty, graduate students, industry PhD level personnel, undergraduate students.

600pp	Jan 2025	
978-981-124-912-9	US\$168	£150
978-981-124-913-6(ebook)	US\$269	£215

The Thermostatted Kinetic Theory Approach

Theory, Inverse Problems, and Models
 by **Carlo Bianca** (*ECAM-EPMI, France*)

"This book contains very interesting results of kinetic theory and its useful applications to the modeling of complex systems. It is of great interest to a broad section of the kinetic theory community and is a true advance."

Maria Alessandra Ragusa

Professor of Mathematics, University of Catania, Italy

Readership: Researchers, lecturers, and graduate students in mathematical modelling, complex systems, nonequilibrium systems, mathematical physics, and applied mathematics courses and research fields; part 2 of the book will be of specific interest to those involved in biomathematics/mathematical biology, immunology, crowd simulation, and trading market simulation.

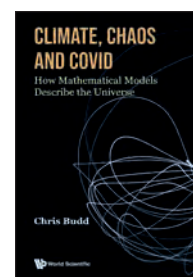
300pp	Sep 2024	
978-981-126-755-0	US\$118	£105
978-981-126-756-7(ebook)	US\$189	£165

Climate, Chaos and COVID

How Mathematical Models Describe the Universe

by **Chris Budd** (*University of Bath, UK*)

"Chris Budd conveys the power and wonder of mathematics in stories — and, having gained your interest, explains the underlying mathematics. Discover how, during a boring sermon, Galileo observed the predictability of the swing of a pendulum, later explained by the mathematics of Newton. Mathematical models are relatively easy to develop for physical systems where the underlying equations are understood, and are also now being used in biological and social sciences. This was vital during the COVID-19 pandemic. Chris explains how models can describe population behaviour and also spells out their limitations. He uses analogies, quotes, and stories to enliven a complex topic. Look out for the glass of whisky and the warning 'don't eat the menu'."



Vicky Pope

Honorary Professor STEaPP University College London, UK
Editor in Chief of Climate Resilience and Sustainability

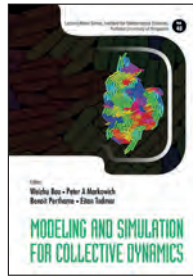
Readership: Keen high school students, teachers, STEM undergraduates and postgraduates interested in the field of applied mathematics and mathematical modelling; policymakers and decision makers in relevant industries such as Education, Environment, Health and Social Care, and Energy; members of the general public who want to understand more of the mathematics behind the models used in everyday life.

312pp	Apr 2023	
978-1-80061-304-1	US\$78	£60
978-1-80061-305-8(ebook)	US\$125	£100

Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore - Vol 40

Modeling and Simulation for Collective Dynamics

edited by **Weizhu Bao** (National University of Singapore, Singapore), **Peter A Markowich** (King Abdullah University of Science and Technology, Saudi Arabia), **Benoit Perthame** (Sorbonne Université, France) & **Eitan Tadmor** (University of Maryland, USA)



This volume serves to inspire graduate students and researchers who will embark into original research work in kinetic models for collective dynamics and their applications.

Readership: Graduate students and researchers in computational and applied mathematics, mathematical biology, mathematical modeling, computational science and engineering.

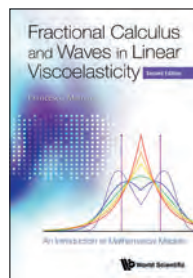
244pp	Feb 2023	
978-981-126-613-3	US\$88	£75
978-981-126-614-0(ebook)	US\$141	£125

Fractional Calculus and Waves in Linear Viscoelasticity

An Introduction to Mathematical Models
2nd Edition

by **Francesco Mainardi** (University of Bologna, Italy)

"The book is essential if one wishes to initiate research in the field of fractional rheology. The topic is quite promising and this book is a useful tool for taking the first step. In my opinion, it is well written and is very readable, with many technical details."



Dr José M Carcione
Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS)

This new edition keeps the structure of the first edition but each chapter has been revised and expanded, and new additions include a novel appendix on complete monotonic and Bernstein functions that are known to play a fundamental role in linear viscoelasticity.

Readership: Engineers, graduate students and researchers in applied mathematics, physics and engineering departments.

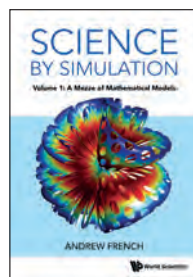
628pp	Sep 2022	
978-1-78326-398-1	US\$158	£140
978-1-78326-399-8(ebook)	US\$253	£200

Science by Simulation

Volume 1: A Mezze of Mathematical Models

by **Andrew French** (Winchester College, UK)

"Science by Simulation is a personal and altruistic call to science teachers to bring more mathematical modelling into their science lessons. This interesting and impressive book contains a dozen examples of how mathematical modelling can be applied to mostly physics-related situations, such as fluid dynamics or the movement of double pendulums ..."



School Science Review

Readership: A book for early undergraduate and keen high school students of Mathematics, Physics, Economics, Chemistry, Engineering, Computer Science, and Biology. Teachers and lecturers should consider using this to assist with teaching STEM subjects. Also valuable as a general interest textbook for the professional mathematical modelling community.

276pp	Jun 2022	
978-1-80061-121-4(pbk)	US\$48	£40
978-1-80061-107-8	US\$88	£75
978-1-80061-108-5(ebook)	US\$141	£115

MATHEMATICAL LOGIC AND FOUNDATIONS

Topics in Model Theory

by **Anand Pillay** (University of Notre Dame, USA)

The book has two chapters. The first chapter is a modern or contemporary account of stability theory. After a preliminary section on some of the basic techniques of model theory, the focus is on local (formula-by-formula) stability theory, treated a little differently from in the author's Geometric Stability Theory book. There is also a survey of general and geometric stability theory, as well as detailed applications to combinatorics (regularity lemma) using pseudofinite methods.

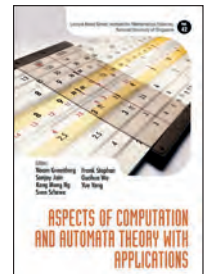
Readership: Graduate students and researchers in mathematics and related subjects interested in model theory and its applications.

150pp	Aug 2024	
978-981-124-399-8(pbk)	US\$28	£25
978-981-124-380-6	US\$58	£50
978-981-124-381-3(ebook)	US\$98	£80

Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore - Vol 42

Aspects of Computation and Automata Theory with Applications

edited by **Noam Greenberg** (Victoria University of Wellington, New Zealand), **Sanjay Jain** (National University of Singapore), **Keng Meng Ng** (Nanyang Technological University, Singapore), **Sven Schewe** (University of Liverpool, UK), **Frank Stephan** (National University of Singapore), **Guohua Wu** (Nanyang Technological University, Singapore) & **Yue Yang** (National University of Singapore)



- Comprehensive and original collection of cutting-edge topics on automata theory, computational complexity and recursion theory
- The contributors are expert researchers in these fields and both contribute new scientific results and ideas for future directions

Readership: Advanced undergraduate students, graduate students and researchers interested in automata theory, computability theory, complexity theory and recursion theory.

470pp	Oct 2023	
978-981-127-862-4	US\$158	£140
978-981-127-863-1(ebook)	US\$253	£220

Temporal Logic

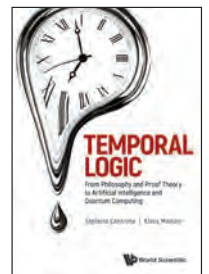
From Philosophy and Proof Theory to Artificial Intelligence and Quantum Computing

by **Stefania Centrone** (Technical University of Munich, Germany) & **Klaus Mainzer** (Technical University of Munich, Germany)

The book culminates in an outlook on trendsetting applications of temporal logics in future technologies such as artificial intelligence and quantum technology. However, it will not be sufficient, as in traditional temporal logic, to start from the everyday understanding of time.

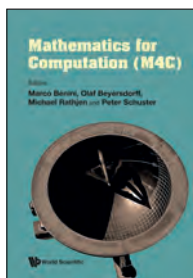
Readership: Researchers and students of mathematical logic and foundations, theoretical computer science, and philosophy. The level is graduate with introductions on the undergraduate level. The book can be used for courses on temporal logic in mathematical logic as well as in computer science. It is also of general interest for the general reader in philosophy, social science (e.g., security issues), and history of science.

220pp	Jun 2023	
978-981-126-853-3	US\$78	£70
978-981-126-854-0(ebook)	US\$125	£110



Mathematics for Computation (M4C)

edited by **Marco Benini** (*Università degli Studi dell'Insubria, Italy*), **Olaf Beyersdorff** (*Friedrich-Schiller-Universität Jena, Germany*), **Michael Rathjen** (*University of Leeds, UK*) & **Peter Schuster** (*Università degli Studi di Verona, Italy*)



While M4C is situated within mathematical logic and the related area of theoretical computer science, in principle it involves all branches of mathematics, especially those which prompt computational considerations. In traditional terms, the topics of M4C include proof theory, constructive mathematics, complexity theory, reverse mathematics, type theory, category theory and domain theory.

The aim of this volume is to provide a point of reference by presenting up-to-date contributions by some of the most active scholars in each field. A variety of approaches and techniques are represented to give as wide a view as possible and promote cross-fertilization between different styles and traditions.

Readership: Graduate students, researchers, and professors in Mathematics, Computer Science, and Philosophy.

476pp **Apr 2023**
978-981-124-521-3 **US\$148** **£130**
978-981-124-522-0(ebook) **US\$237** **£210**

PROBABILITY, STATISTICS, STOCHASTIC PROCESSES

Anisotropic Scaling of Random Fields with Long-Range Dependence

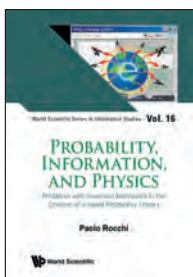
Scaling Limits of Random Fields with Applications by **Donatas Surgailis** (*Vilnius University, Lithuania*)

- The topic of the book is very new, based on recent work of the author and his collaborators
- It might interest various researchers working in stochastic processes, spatial statistics but also in applied sciences such as geophysics, telecommunications and other areas
- The central concept of the book — scaling transition — has not been previously discussed in any monograph
- The book provides a number of open problems and suggestions for future research

Readership: Advanced graduate students, researchers and practitioners in the fields of stochastic processes, spatial statistics and telecommunications.

280pp **May 2024**
978-981-124-941-9 **US\$98** **£85**
978-981-124-942-6(ebook) **US\$157** **£125**

World Scientific Series in Information Studies - Vol 16
Probability, Information, and Physics
 Problems with Quantum Mechanics in the Context of a Novel Probability Theory by **Paolo Rocchi** (*IBM, Italy & LUISS University, Italy*)



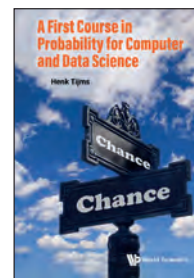
This book deals with two main topics. The first is a theory that aims to unify the many interpretations of probability presented in the literature. The second uses this comprehensive theory of probability to answer the questions of quantum mechanics that have long been debated. The entire book proposes original solutions that several experimental cases substantiate.

Readership: Experts and academicians involved with probability and statistics at the theoretical level and/or application level.

288pp **Sep 2023**
978-981-127-274-5 **US\$98** **£85**
978-981-127-275-2(ebook) **US\$157** **£140**

A First Course in Probability for Computer and Data Science

by **Henk Tijms** (*Vrije University, The Netherlands*)



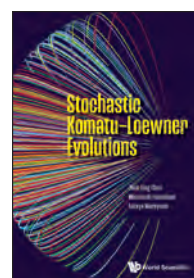
In this undergraduate text, the author has distilled the core of probabilistic ideas and methods for computer and data science. The book emphasizes probabilistic and computational thinking rather than theorems and proofs. It provides insights and motivates the students by telling them why probability works and how to apply it.

Readership: Undergraduate students in computer and data science, business analytics, and operations research. Data scientists working at companies.

244pp **Jul 2023**
978-981-127-204-2(pbk) **US\$48** **£40**
978-981-127-174-8 **US\$88** **£75**
978-981-127-175-5(ebook) **US\$141** **£125**

Stochastic Komatu – Loewner Evolutions

by **Zhen-Qing Chen** (*University of Washington, USA*), **Masatoshi Fukushima** (*Osaka University, Japan*) & **Takuya Murayama** (*Kyushu University, Japan*)



The present monograph on stochastic Komatu – Loewner evolutions (SKLEs) provides the first systematic extension of the Schramm – Loewner evolution (SLE) theory from a simply connected planar domain to multiply connected domains by using the Brownian motion with darning (BMD) that has arisen in a recent study of the boundary theory of symmetric Markov processes.

It brings new insights into SLEs as special cases of SKLEs. Mathematically, it can be viewed as a powerful application of stochastic analysis via BMDs to complex analysis.

Readership: Researchers and graduate students interested in the Schramm – Loewner evolution (SLE).

256pp **Feb 2023**
978-981-126-278-4 **US\$98** **£80**
978-981-126-279-1(ebook) **US\$157** **£125**

Series on Multivariate Analysis

Statistical Methods for Directional Data

by **S Rao Jammalamadaka** (*University of California, Santa Barbara, USA*), **Ashis SenGupta** (*Indian Statistical Institute, India & Augusta University, USA*) & **Riccardo Gatto** (*University of Bern, Switzerland*)

This is a thoroughly revised and updated edition of the earlier research monograph *Topics in Circular Statistics* by the first two authors. While maintaining the spirit as a research monograph, this book now covers the broader theme of directional statistics. Starting with an introduction to the area for those who wish to learn about this novel field, it goes on to survey the recent advances and developments in terms of theory, methodology, and applications.

Readership: (i) Academic researchers or scientists in applied areas that deal with directional data can benefit from this complete and rigorous introduction to directional statistics. (ii) Anyone who wants to learn about the subject, maybe for the first time. (iii) Statisticians and scientists who are familiar with this area, but want to update themselves on many recent developments. (iv) Applied mathematicians who want to use this as a resource by citing results, and perhaps utilize software that are referred to in the book. (v) Upper-level undergraduate and graduate students in statistics and other scientific fields who want to follow a complete book. (vi) It can be used for lectures to students of statistics as well as for students from other technical fields, at the upper level undergraduate or graduate level.

500pp **Jan 2025**
978-981-126-797-0 **US\$158** **£140**
978-981-126-798-7(ebook) **US\$253** **£220**

Functional Estimation for Density, Regression Models and Processes

2nd Edition

by **Odile Pons** (French National Institute for Agronomical Research, France)

Review of the First Edition:

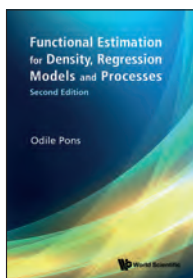
"This book is useful for researchers interested in the study of asymptotic properties of different types of optimum estimators obtained through the method of kernels."

Mathematical Reviews

This second edition presents minimax properties with L^p risks, for a real p larger than one, and optimal convergence results for new kernel estimators of function defining processes: models for multidimensional variables, periodic intensities, estimators of the distribution functions of censored and truncated variables, estimation in frailty models, estimators for time dependent diffusions, for spatial diffusions and for diffusions with stochastic volatility.

Readership: Advanced undergraduate and graduate students in mathematical statistics and computational statistics; researchers and statisticians interested in the theory or applications to data analysis.

260pp	Oct 2023	
978-981-127-283-7	US\$88	£75
978-981-127-284-4(ebook)	US\$141	£125



MATHEMATICS EDUCATION

Problem Solving in Mathematics and Beyond

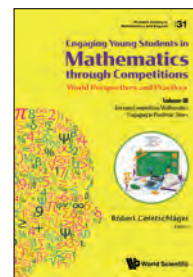
Engaging Young Students in Mathematics through Competitions — World Perspectives and Practices

Volume III — Keeping Competition Mathematics Engaging in Pandemic Times edited by **Robert Geretschläger**

This book presents a wide range of topics relating to mathematics competitions and their meaning in the world of mathematical research, teaching and entertainment.

Readership: This book is most suited as a reference text for organisers of mathematics competitions and math didactics researchers.

368pp	Dec 2023	
978-981-128-024-5(pbk)	US\$48	£40
978-981-127-928-7	US\$98	£85
978-981-127-929-4(ebook)	US\$157	£140



INFORMATION THEORY

World Scientific Series in Information Studies - Vol 15

Chaos, Information, and the Future of Physics

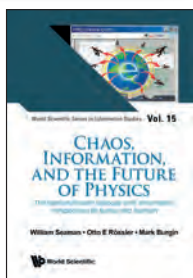
The Seaman-Rössler Dialogue with Information Perspectives by Burgin and Seaman

by **William Seaman** (Duke University, USA), **Otto E Rössler** (University of Tübingen, Germany) & **Mark Burgin** (University of California, Los Angeles, USA)

The main part of the book consists of the dialogue between physicist Otto Rössler, and artist and AI researcher Bill Seaman with the commentaries disclosing information perspective by information scientist Mark Burgin and Bill Seaman. In this dialogue, Rössler and Seaman discuss concepts surrounding Rössler's major research over his lifetime.

Readership: Researchers and general public in information studies, including Philosophy, Physical Chemistry, Artificial Intelligence, Theoretical Computer Science, Bioinformatics, Neural Networks, Mathematical Physics, Mathematical Modelling, Mathematical Biology, Neuroscience, Nonlinear Science, Chaos & Dynamical Systems, Theoretical Physics.

600pp	Jul 2023	
978-981-127-136-6	US\$168	£150
978-981-127-137-3(ebook)	US\$269	£235



Science, Music, and Mathematics

The Deepest Connections (2nd Edition)

by **Michael Edgeworth McIntyre** (University of Cambridge, UK)

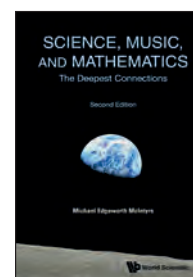
"The first edition of Michael Edgeworth McIntyre's book rightly received plaudits for its insightfulness, clarity of thought, unique approach and explanation of cross-cutting topics in science, music and mathematics. One of its highlights, for me as an atmospheric physicist, was the Postlude 'The amplifier metaphor for climate' which discusses how the climate system can respond significantly to small changes in inputs, such as solar energy, and how these are magnified by the greater availability of 'fuel' in the form of water vapour associated with human-produced global warming. In the second edition this discussion is augmented by sections on the evidenced increase in occurrence of extreme weather events and the physics behind the possibility of climate tipping points. A key theme of the book is the clear-headed objectivity needed in communicating complex scientific results to non-specialists, both to support policymakers in acting on climate change and to call out those who try to distort such information. Michael's writing exemplifies how such clarity can be achieved without detracting from a really good read."

Professor Joanna D Haigh

Faculty of Natural Sciences, Dept of Phys, Imperial College London

Readership: Young scientists in academia: undergraduate and graduate; students, and postdoctoral researchers. Also more senior scientists and mentors, and a general readership of scientifically-minded lay persons, as well as Musicians interested in scientific aspects of music.

236pp	Aug 2023	
978-981-127-850-1(pbk)	US\$24	£20
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World Scientific Series in Information Studies - Vol 14

The Logic of the Third

A Paradigm Shift to a Shared Future for Humanity

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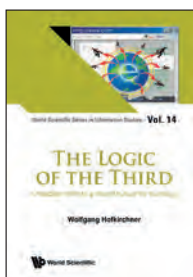
"This book is an essential contribution to the reform in thinking needed to face the complexity of our troubled times and the uncertainties of our future."

Edgar Morin

Centre national de la recherche scientifique (CNRS)
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Readership: Advanced undergraduates, graduates, researchers.

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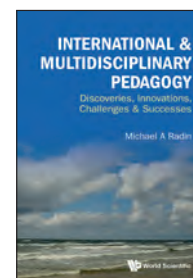
Discoveries, Innovations, Challenges & Successes

by **Michael A Radin** (Rochester Inst. of Tech. USA)

The book's primary objectives are to welcome you to the abundant and meaningful international and multidisciplinary education discovery journey. You will grow from exposure to other cultures and their practices and I daresay, become better teachers in your local as well as on-line environments. Most every local classroom is multi-cultural as well.

Readership: Students, faculty and administrators.

172pp	Jan 2023	
978-981-126-211-1(pbk)	US\$38	£30
978-981-126-107-7	US\$78	£60
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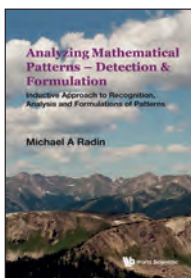
Analyzing Mathematical Patterns — Detection & Formulation

Inductive Approach to Recognition, Analysis and Formulations of Patterns by **Michael A Radin** (*Rochester Institute of Technology, USA*)

The book's objectives are to expose students to analyzing and formulating various patterns such as linear, quadratic, geometric, piecewise, alternating, summation-type, product-type, recursive and periodic patterns. The book will present various patterns graphically and analytically and show the connections between them. Graphical presentations include patterns at same scale, patterns at diminishing scale and alternating patterns.

Readership: High school and undergraduate levels in mathematics for Non-STEM disciplines, Pattern Recognition, Discrete Mathematics, Difference Equations.

252pp	Jan 2023	
978-981-126-210-4(pbk)	US\$58	£45
978-981-126-104-6	US\$98	£80
978-981-126-105-3(ebook)	US\$157	£125



Problem Solving in Mathematics and Beyond - Vol 30

Sharpening Everyday Mental/Thinking Skills Through Mathematics Problem Solving and Beyond

by **Alfred S Posamentier** (*City University of New York, USA*) & **Hans Humenberger** (*University of Vienna, Austria*)

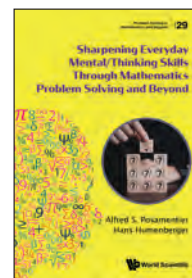
Mathematics is a subject taught from kindergarten through to high school, and yet it is the one subject that most adults are almost proud to admit to not having been very good at, and, therefore, tend to avoid it where they can. However, one of the key factors in mathematics is its ability to enable us to solve everyday problems. When we consider "the worst-case scenario" of the situation, it is analogous to solving a mathematical problem by considering extremes. Or, we might consider the best path to take from point A to point B, where geometric relationships can be helpful. This book is intended to demonstrate a variety of neglected aspects of mathematics, in order to demonstrate the power and beauty of the field of mathematics beyond where most people, students, and teachers believe is possible.

The chapters of the book explore a multitude of topics: unusual arithmetic calculations and shortcuts, entertaining and instructional problem-solving strategies, unusual applications of algebra, and how geometry allows us to better appreciate physical relationships. Only a basic mathematical knowledge is needed to understand these topics and problems; however, the book also demonstrates that, armed with even this level of understanding, our mathematical skills far exceed what we learned at school! The final chapter is the most challenging, and explores a curious problem-solving technique.

- The book aims motivate a love for mathematics for a general audience and young students by showing them more interesting and practical elements of mathematics than is often found in school curriculums
- The maths covered in this book aims to strengthen the readers problem-solving in mathematics and beyond

Readership: This book is aimed at the general readership to enhance their appreciation of mathematics, and to secondary/high school teachers for the awareness of the mathematics they must expose students to beyond the standard curriculum. Also aimed at folks who would like to enhance their knowledge of mathematics.

389pp	Nov 2023	
978-981-127-639-2(pbk)	US\$48	£40
978-981-127-394-0	US\$108	£95
978-981-127-395-7(ebook)	US\$173	£150



POPULAR & RECREATIONAL MATHEMATICS

Archimedes' Stomach ... and Other Puzzles You'll Love to Digest

by **Yossi Elran** (*Weizmann Institute of Science, Israel*)

This book will have a wide audience, including math-lovers (professional and amateurs), historians, puzzlers, kids and adults. It will also be great for teachers who are looking for new ways to engage kids with math and for anyone who wants to enhance their creative thinking and innovation skills.

Readership: General public, math lovers of all ages, math teachers, puzzlers and magicians. Academia from various departments like mathematics, mathematics education, computer science, computer science education, science and science education. And those from hi-tech industries.

150pp	Aug 2024	
978-981-126-947-9(pbk)	US\$19.90	£20
978-981-126-859-5	US\$38	£35
978-981-126-860-1(ebook)	US\$98	£80

Mathematical Olympiad Series - Vol 21

Problem Solving Methods and Strategies in High School Mathematical Competitions

by **Bin Xiong** (*East China Normal University, China*) & **Yijie He** (*East China Normal University, China*)

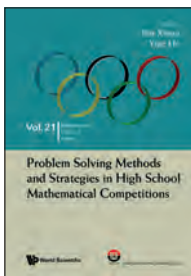
Translated by: **Yongming Liu** (*East China Normal University, China*)

This book not only introduces important methods and strategies for solving problems in mathematics competition, but also discusses the basic principles behind them and the mathematical way of thinking.

The materials of this book come from a book series of Mathematical Olympiad Competition. It is a collection of problems and solutions of the major mathematical competitions in China. The translation is done by Yongming Liu.

Readership: Senior high school students and math teachers, undergraduate in mathematics, amateurs interested in mathematics.

200pp	Nov 2023	
978-981-127-868-6(pbk)	US\$38	£35
978-981-127-742-9	US\$58	£50
978-981-127-743-6(ebook)	US\$98	£85



Wu Wenjun

A Biography in Pictures

by **Tianxin Cai** (*Zhejiang University, China*)

Translated by: **Bin Tang** (*Beihang University, China*)

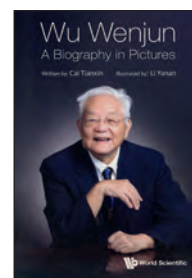
Illustrated by: **Yanan Li**

This book depicts the fascinating life story of Wu Wenjun, a renowned mathematician who made significant contribution in the field of topology, ancient Chinese mathematics, and mathematics mechanization. He was a recipient of the Highest Science and Technology Award, the highest scientific award in China, as well as the Shaw Prize in Mathematics.

Through vivid illustrations and eloquent writing, this book recounts rarely known anecdotes and significant events from Wu Wenjun's life through his childhood, education, and scientific career, offering insights into his life values.

Readership: General public interested in: (1) life and scientific legacy of Wu Wenjun; (2) history of mathematics in China.

124pp	Jul 2023	
978-981-127-595-1	US\$68	£60
978-981-127-596-8(ebook)	US\$109	£95



Proceedings

TITLE	EDITOR	PUB DATE	ISBN13	US\$	£
INFINITE DIMENSIONAL ANALYSIS, QUANTUM PROBABILITY AND RELATED TOPICS PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON INFINITE DIMENSIONAL ANALYSIS, QUANTUM PROBABILITY AND RELATED TOPICS, QP38	LUIGI ACCARDI, SI SI & NOBORU WATANABE	02-Oct-23	978-981-12-7598-2	128	120
COMPUTABILITY THEORY AND FOUNDATIONS OF MATHEMATICS - PROCEEDINGS OF THE 9TH INTERNATIONAL CONFERENCE ON COMPUTABILITY THEORY AND FOUNDATIONS OF MATHEMATICS	PENG NINGNING ET AL	20-May-22	9789811259289 9789811259296(EB)	98 157	80 125
STOCHASTIC ANALYSIS, RANDOM FIELDS AND INTEGRABLE PROBABILITY - FUKUOKA 2019 - PROCEEDINGS OF THE 12TH MATHEMATICAL SOCIETY OF JAPAN, SEASONAL INSTITUTE (MSJ-SI) "STOCHASTIC ANALYSIS, RANDOM FIELDS AND INTEGRABLE PROBABILITY"	INAHAMA YUZURU, OSADA HIROFUMI & SHIRAI TOMOYUKI	18-Dec-21	9784864970945	66.3	55
DEVELOPMENT OF IWASAWA THEORY - THE CENTENNIAL OF K IWASAWA'S BIRTH - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE "IWASAWA 2017"	KURIHARA MASATO, BANNAI KENICHI, OCHIAI TADASHI & TSUJI TAKESHI	11-Feb-21	9784864970921	94.5	85
ROLE OF METRICS IN THE THEORY OF PARTIAL DIFFERENTIAL, THE - PROCEEDINGS OF THE 11TH MATHEMATICAL SOCIETY OF JAPAN, SEASONAL INSTITUTE (MSJ-SI)	GIGA YOSHIKAZU, HAMAMUKI NAO, KUBO HIDEO, KURODA HIROTOSHI & OZAWA TOHRU	11-Feb-21	9784864970907	74.5	65
RING THEORY 2019 - PROCEEDINGS OF THE EIGHTH CHINA-JAPAN-KOREA INTERNATIONAL SYMPOSIUM ON RING THEORY	ASASHIBA HIDETO ET AL	4-Jan-21	9789811230288 9789811230295(EB)	118 189	105 170
SINGULARITIES - KAGOSHIMA 2017: PROCEEDINGS OF THE 5TH FRANCO-JAPANESE-VIETNAMESE SYMPOSIUM ON SINGULARITIES	ISHIKAWA MASA HARU ET AL	15-Jun-20	9789811206023 9789811206030(EB)	128 205	115 185
VARIOUS ASPECTS OF MULTIPLE ZETA FUNCTIONS - IN HONOR OF PROFESSOR KOHJI MATSUMOTO'S 60TH BIRTHDAY - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE	MISHOU HIDEHIKO, NAKAMURA TAKASHI, SUZUKI MASATOSHI & UMEGAKI YUMIKO	31-Mar-20	9784864970884	69	60
NEW TRENDS IN ALGEBRAS AND COMBINATORICS - PROCEEDINGS OF THE THIRD INTERNATIONAL CONGRESS IN ALGEBRAS AND COMBINATORICS (ICAC2017)	KAR PING SHUM ET AL	19-Feb-20	9789811215469 9789811215476(EB)	198 317	175 280
PRIMITIVE FORMS AND RELATED SUBJECTS - KAVLI IPMU 2014 - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE	HORI KENTARO, LI CHANGZHENG, LI SI & SAITO KYOJI	12-Dec-19	9784864970853	82	70
ASYMPTOTIC ANALYSIS FOR NONLINEAR DISPERSIVE AND WAVE EQUATIONS - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE	KATO KEIICHI, OGAWA TAKAYOSHI & OZAWA TOHRU	14-Nov-19	9784864970815	78.2	69
RECENT TOPICS IN DIFFERENTIAL GEOMETRY AND ITS RELATED FIELDS - PROCEEDINGS OF THE 6TH INTERNATIONAL COLLOQUIUM ON DIFFERENTIAL GEOMETRY AND ITS RELATED FIELDS	ADACHI TOSHI AKI ET AL	17-Oct-19	9789811206689 9789811206696(EB)	138 221	120 190
OPERATOR ALGEBRAS AND MATHEMATICAL PHYSICS - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE	IZUMI MASAKI, KAWAHIGASHI YASUYUKI, KOTANI MOTOKO, MATUI HIROKI & OZAWA NARUTAKA	12-Jul-19	9784864970792	59.3	50
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ALGEBRAIC AND GEOMETRIC COMBINATORICS ON LATTICE POLYTOPES - PROCEEDINGS OF THE SUMMER WORKSHOP ON LATTICE POLYTOPES	HIBI TAKAYUKI & TSUCHIYA AKIYOSHI	31-May-19	9789811200472 9789811200489(EB)	198 317	175 280
PROCEEDINGS OF THE INTERNATIONAL CONGRESS OF MATHEMATICIANS 2018 (ICM 2018) (IN 4 VOLUMES)	SIRAKOV BOYAN ET AL	1-Mar-19	9789813272873	850	750
PROCEEDINGS OF THE 14TH AND 15TH ASIAN LOGIC CONFERENCES	KIM BYUNGHAN ET AL	16-Jan-19	9789813237544 9789813237551(EB)	118 189	104 165
SINGULARITIES IN GENERIC GEOMETRY	IZUMIYA SHYUICHI ET AL	28-Sep-18	9784864970556	96.3	85
REPRESENTATION THEORY, SPECIAL FUNCTIONS AND PAINLEVE EQUATIONS - RIMS 2015 - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE	KONNO HITOSHI ET AL	10-Jul-18	9784864970501	96	85



MATHEMATICS OPEN (MO)

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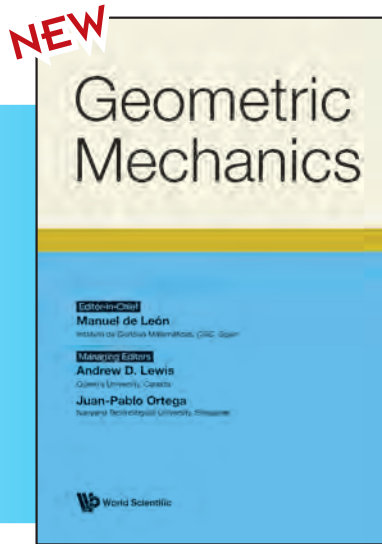
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Mathematics Open is a new fully peer-reviewed, open access, broad scope journal that publishes original research and review articles on all aspects of mathematical sciences. The journal is editorially aligned with World Scientific's collection of high-quality and leading mathematics journals which are considered essential content by top institutions globally.

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GEOMETRIC MECHANICS (GM)

ISSN (print): 2972-4589

ISSN (online): 2972-4597



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LAUNCHING IN 2024

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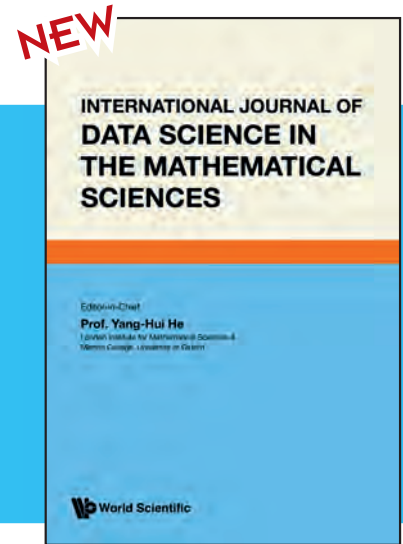
Geometric Mechanics is a field that applies geometric methods in mechanics, dynamics, control, transport, stochastic processes, data science, and learning, using both pure and applied mathematics.

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INTERNATIONAL JOURNAL OF DATA SCIENCE IN THE MATHEMATICAL SCIENCES (IJDSMS)

ISSN (print): 2810-9392

ISSN (online): 2810-9406



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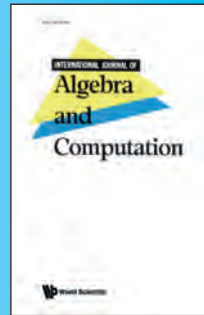
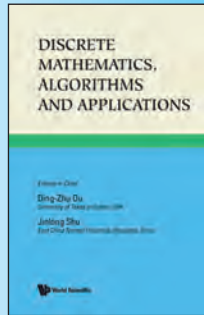
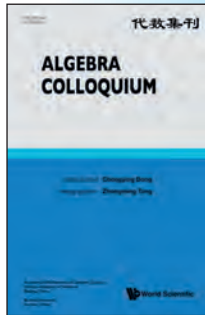
The aim of this new, highly inter-disciplinary journal is to establish a much-needed platform for experimental mathematicians, both pure and applied, physicists and other experts in theoretical STEM fields, as well as data scientists and computer scientists specializing in machine-learning and artificial intelligence.

This platform will publish and promote discussion in the following areas:

Data in pure mathematics, especially those already freely available online: LMFdB, GrDB, GAP, KnotsDB, etc. and in particular in line with MathSage;

- Data in applied mathematics, ranging from mathematical biology to theoretical physics;
- Data Science & Theoretical Physics: especially in relation to the string landscape;
- Machine-Learning & Mathematical Structures: in parallel with XenaProject, Coq and LEAN projects in automated theorem proving;
- Machine-Learning applications to Applied Mathematical sciences;
- New techniques in machine-learning inspired from theoretical physics, especially from quantum field theory and statistical mechanics;
- Interpretability Methods in Machine Learning;
- Conjecturing Formulation

Algebra & Related Topics

**Algebra Colloquium (AC)**

Print / Online ISSN: 1005-3867 / 0219-1733
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IMPACT FACTOR
0.3

This is an international mathematical journal founded at the beginning of 1994. It is edited by the Academy of Mathematics & Systems Science, Chinese Academy of Sciences, jointly with Suzhou University, and published quarterly in English in every March, June, September and December. Algebra Colloquium carries original research articles of high level in the field of pure and applied algebra. This journal aims to reflect the latest developments in algebra and promote international academic exchanges.

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Managing Editor

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Discrete Mathematics, Algorithms and Applications (DMAA)

Print / Online ISSN: 1793-8309 / 1793-8317
<https://www.worldscientific.com/dmaa>



IMPACT FACTOR
1.2

The aim of this journal is to advance and promote the theory and applications of discrete mathematics, which is a research area in mathematics with applications in computer science, industrial engineering, bio-informatics, chemistry and communication networks. The journal encourages contributions from the two important parts of discrete mathematics, graph theory and combinatorics. The former includes structural graph theory, extremal graph theory, algebraic graph theory, random graphs and internet graphs. The latter consists of combinatorial design, combinatorial enumeration, coding theory, combinatorial probabilistic method, etc.

Co-Editors-in-Chief

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Jinlong Shu, *East China Normal University, China*

International Journal of Algebra and Computation (IJAC)

Print / Online ISSN: 0218-1967 / 1793-6500
<https://www.worldscientific.com/ijac>



IMPACT FACTOR
0.8

This journal publishes high quality original research papers in combinatorial, algorithmic and computational aspects of algebra (including combinatorial and geometric group theory and semigroup theory, algorithmic aspects of universal algebra, computational and algorithmic commutative algebra, probabilistic models related to algebraic structures, random algebraic structures), and gives a preference to papers in the areas of mathematics represented by the editorial board.

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International Journal of Number Theory (IJNT)

Print / Online ISSN: 1793-0421 / 1793-7310
<https://www.worldscientific.com/ijnt>



IMPACT FACTOR
0.7

This journal publishes original research papers and review articles on all areas of Number Theory, including elementary number theory, analytic number theory, algebraic number theory, arithmetic algebraic geometry, geometry of numbers, diophantine equations, diophantine approximation, transcendental number theory, probabilistic number theory, modular forms, multiplicative number theory, additive number theory, partitions, and computational number theory.

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Journal of Algebra and Its Applications (JAA)

Print / Online ISSN: 0219-4988 / 1793-6829
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IMPACT FACTOR
0.8

This journal publishes papers both on theoretical and on applied aspects of Algebra. There is special interest in papers that point out innovative links between areas of Algebra and fields of application. As the field of Algebra continues to experience tremendous growth and diversification, we intend to provide the mathematical community with a central source for information on both the theoretical and the applied aspects of the discipline. While the journal will be primarily devoted to the publication of original research, extraordinary expository articles that encourage communication between algebraists and experts on areas of application as well as those presenting the state of the art on a given algebraic sub-discipline will be considered.

Executive Editors

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S R López-Permouth, *Ohio University, USA*

Random Matrices: Theory and Applications (RMTA)

Print / Online ISSN: 2010-3263 / 2010-3271
<https://www.worldscientific.com/rmta>



IMPACT FACTOR
0.9

This journal publishes high quality papers on all aspects regarding random matrices, both theory and applications. These areas will include, but not be limited to, spectral theory, new ensembles (those not generally considered in classical random matrix theory), and applications to a wide variety of areas, including high dimensional data analysis, wireless communications, finance, and economics. Only papers that contain original, innovative and correct results, which deepen our understanding on the theory of random matrices and its applications, will be considered for publications.

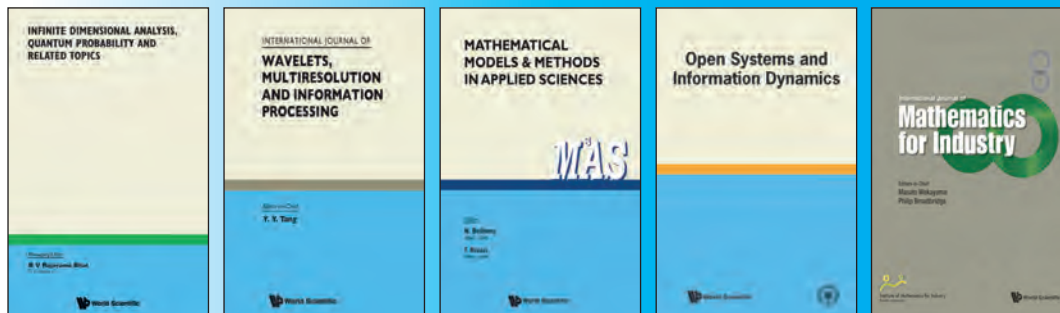
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Arup Bose, *Indian Statistical Institute, India*

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Applied Mathematics



Mathematical Analysis



Infinite Dimensional Analysis, Quantum Probability and Related Topics (IDAQP)

Print / Online ISSN: 0219-0257 / 1793-6306

<https://www.worldscientific.com/idaqp>

IMPACT FACTOR
0.9

In the past few years the fields of infinite dimensional analysis and quantum probability have undergone increasingly significant developments and have found many new applications, in particular, to classical probability and to different branches of physics. The number of first-class papers in these fields has grown at the same rate. This is currently the only journal which is devoted to these fields.

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Open Systems & Information Dynamics (OSID)

Print / Online ISSN: 1230-1612 / 1793-7191

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IMPACT FACTOR
0.8

The aim of this journal is to promote interdisciplinary research in mathematics, physics, engineering and life sciences centered around the issues of broadly understood information processing, storage and transmission, in both quantum and classical settings. Our special interest lies in the information-theoretic approach to phenomena dealing with dynamics and thermodynamics, control, communication, filtering, memory and cooperative behaviour, etc., in open complex systems.

Editor-in-Chief

D. Chruściński, *Nicolaus Copernicus University, Poland*

International Journal of Wavelets, Multiresolution and Information Processing (IJWMP)

Print / Online ISSN: 0219-6913 / 1793-690X

<http://www.worldscientific.com/ijwmp>



IMPACT FACTOR
1.4

This journal considers the current state-of-the-art theories of wavelet analysis, multiresolution and information processing as well as their applications. This journal aims at publishing papers in both the theories and applications, concentrating on the practical applications of the wavelets, multiresolution and information processing to all areas in science and engineering.

Editor-in-Chief

Yuan Y Tang, *University of Macau, China*

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International Journal of Mathematics for Industry (IJMI)

Print / Online ISSN: 2661-3352 / 2661-3344

<https://www.worldscientific.com/ijmi>



IMPACT FACTOR
0.2



This journal is dedicated to enhancing the interaction between mathematics and industrial applications as a two-way process. It publishes original research articles that illustrate how, through the utilization of mathematical results, questions about industrial problems including various scientific questions potentially connected to industrial problems are answered to yield new insight for both industry and mathematics.

Editors-in-Chief

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Mathematical Models and Methods in Applied Sciences (M3AS)

Print / Online ISSN: 0218-2025 / 1793-6314

<https://www.worldscientific.com/m3as>



IMPACT FACTOR
3.5

The purpose of this journal is to provide a medium of exchange for scientists engaged in applied sciences (physics, mathematical physics, natural, and technological sciences) where there exists a non-trivial interplay between mathematics, mathematical modelling of real systems and mathematical and computer methods oriented towards the qualitative and quantitative analysis of real physical systems.

Editors

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Analysis and Applications (AA)

Print / Online ISSN: 0219-5305 / 1793-6861

<https://www.worldscientific.com/aa>



IMPACT FACTOR
2.2

This journal publishes high quality mathematical papers that treat those parts of analysis which have direct or potential applications to the physical and biological sciences and engineering. Some of the topics from analysis include approximation theory, asymptotic analysis, calculus of variations, integral equations, integral transforms, ordinary and partial differential equations, delay differential equations, and perturbation methods. The primary aim of the journal is to encourage the development of new techniques and results in applied analysis.

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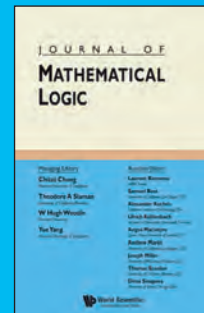
General Mathematics



Mathematical Biology



Mathematical Logic & Foundations



Asian-European Journal of Mathematics (AEJM)

Print / Online ISSN: 1793-5571 / 1793-7183
<https://www.worldscientific.com/aejm>



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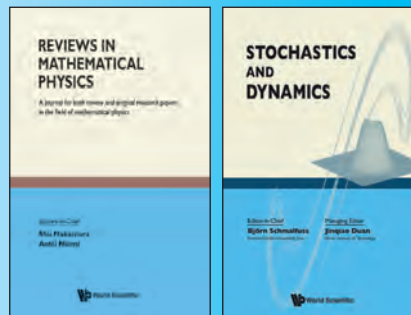
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