

2023

MATHEMATICS



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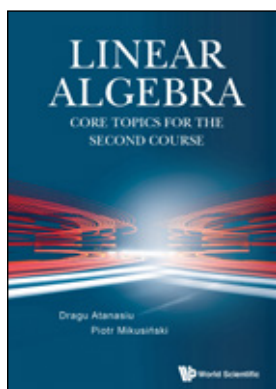
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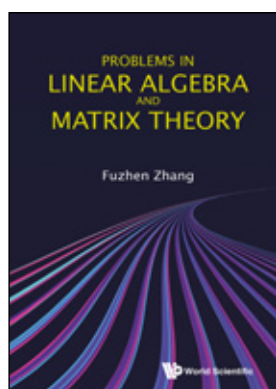
Mathematics Catalogue 2023

page 4



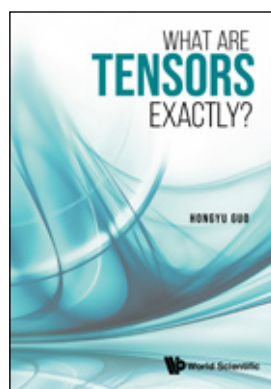
by **Dragu Atanasiu**
(University of Borås,
Sweden) & **Piotr Mikusiński**
(University of Central
Florida, USA)

page 7



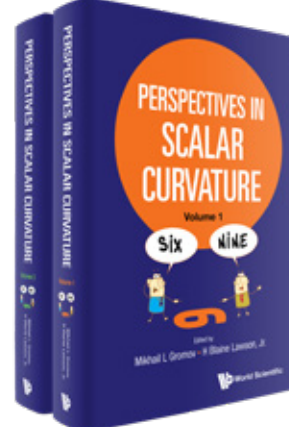
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page 8



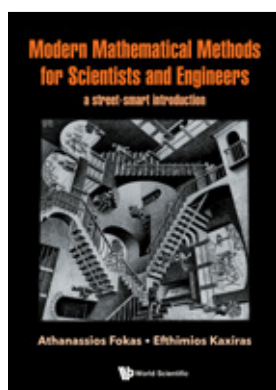
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page 11



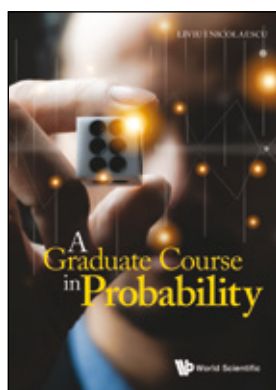
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page 14



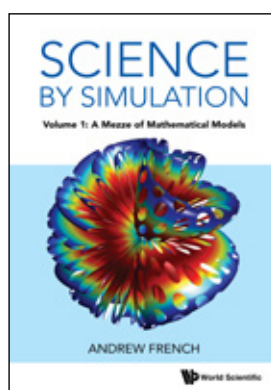
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Southern California, UK) &
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page 19



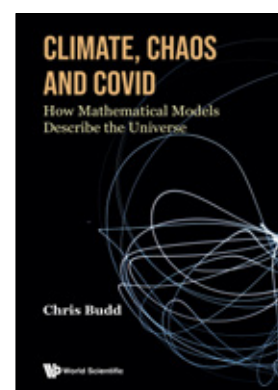
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page 21



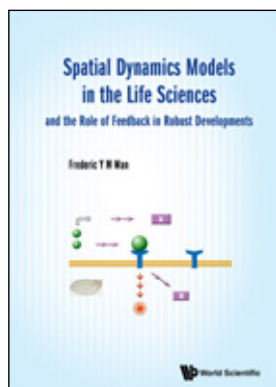
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page 21



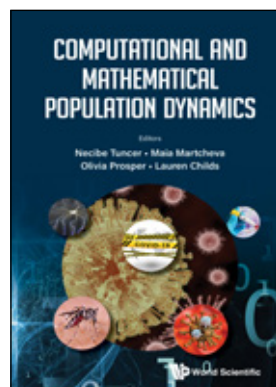
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page 22



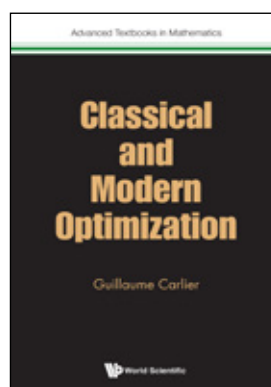
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page 22



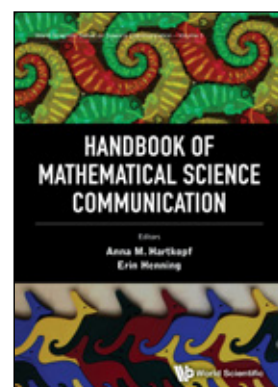
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page 24



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(Université Paris Dauphine,
France)

page 26



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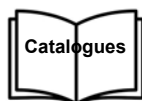
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C O N T E N T S

Mathematics

4	Algebra & Related Topics
9	Differential & Integral Equations
11	Geometry & Topology
13	Mathematical Analysis
15	Mathematical Physics & Related Topics
18	Numerical Analysis & Approximation
19	Probability & Statistics
21	Mathematical Modeling & Computation
22	Mathematical Finance & Economics
22	Mathematical Biology
23	Optimization & Control
23	Computer Mathematics & Science
24	Mathematical Logic & Foundations
25	History of Mathematics
26	Mathematics Teaching & Research
27	Mathematics Teaching & Studying
28	Book Series: Problem Solving in Mathematics and Beyond
29	Mathematical Olympiad (New Releases!)
30	Mathematical Olympiad (Classic)
31	Mathematics Puzzle Collection
32	Book Series: Lecture Notes Series, Institute For Mathematical Sciences, National University Of Singapore
33	Bestsellers
34	Evergreen Titles
35	Proceedings
36	Journals
41	Title Index
42	Author Index



ALGEBRA & RELATED TOPICS

Essential Textbook

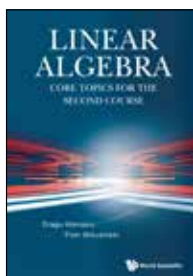
Linear Algebra

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 a 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. This book presents numerous examples and proofs of particular cases of important results before the general versions are formulated and proved. This is highly effective to create the needed depth of understanding a general theory by detailing a proof of a particular case that encapsulates the main idea of a general theorem.

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

350pp	Nov 2022	
978-981-125-854-1	US\$118	£95
978-981-125-855-8(ebook)	US\$189	£150



Selected Chapters of Number Theory:
Special Numbers - Vol 2

Perfect and Amicable Numbers

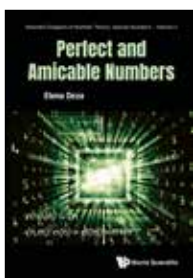
by **Elena Deza** (*Moscow Pedagogical State University, Russia*)

This book gives a complete presentation of the theory of two classes of special numbers (perfect numbers and amicable numbers) and gives much of their properties, facts and theorems with full proofs of them, as well as their numerous analogue and generalizations.

Key Feature: In particular, the author expects to: find and organize much of scattered material; present updated material with all details in clear and unified way

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.

290pp	Nov 2022	
978-981-125-962-3	US\$98	£80
978-981-125-963-0(ebook)	US\$157	£125



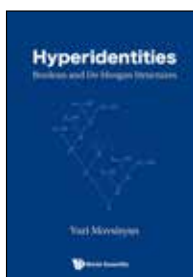
Hyperidentities

Boolean and De Morgan Structures
by **Yuri Movsisyan** (*Yerevan State University, Armenia*)

This book illustrates many important current trends and perspectives for the field of hyperidentities and their applications, of interest to researchers in modern algebra and discrete mathematics. While problems of Boolean functions theory are well known, the present book offers alternative, more general problems, involving the concepts of De Morgan functions, quasi-De Morgan functions, super-Boolean functions, and super-De Morgan functions, etc. In contrast to other generalized Boolean functions discovered and investigated so far, these functions have clearly normal forms. This quality is of crucial importance for their applications in pure and applied mathematics, especially in discrete mathematics, quantum computation, quantum information theory, quantum logic, and the theory of quantum computers.

Readership: Undergraduate, graduate students, researchers.

550pp	Oct 2022	
978-981-125-491-8	US\$168	£135
978-981-125-492-5(ebook)	US\$269	£215



Series on Number Theory and Its Applications

Smooth-Automorphic Forms and Smooth-Automorphic Representations

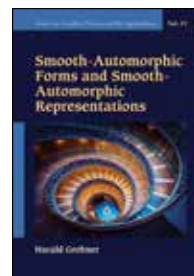
by **Harald Grobner** (*University of Vienna, Austria*)

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 . 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.

This setup also covers the advantage that a perfect representation-theoretical symmetry between the archimedean and non-archimedean places of the number field F is regained, by making the bigger space of smooth-automorphic forms into a proper, continuous representation of the full group of adelic points of G .

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.

250pp	Jun 2023	
978-981-124-616-6	US\$88	£75
978-981-124-617-3(ebook)	US\$141	£115



Theory of Clean Rings and Matrices

by **Huanyin Chen** (*Hangzhou Normal University, China*) & **Marjan Sheibani Abdolyousefi** (*Semnan University, Iran*)

This is the first monograph devoted to clean ring and matrix theory. It aims to study a theory of expressing an element in a ring as the sum of some special ones, such as idempotents, units, nilpotents, tripotents, involutions, etc. A matrix over such rings is thereby expressed as the sum of some special matrices. Also another topics on the behaviors of topological properties and *-properties of such rings are investigated.

Readership: Graduate students and researchers in algebra and analysis, especially, ring and matrix theory, operator theory. Researchers in applied and computation related to generalized inverse.

692pp	Sep 2022	
978-981-126-012-4	US\$188	£150
978-981-126-013-1(ebook)	US\$301	£240

Perfect Numbers and Fibonacci Sequences

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

In this book we first review the history and the current situation of the perfect number problem, including the origin of Mersenne prime number, and then the history and the current situation of Fibonacci sequence, both of which have our own research work. Later, we define the square perfect number, explore and reveal for the first time the secret relationship between square perfect number and Fibonacci sequence, Lucas sequence, twin prime conjecture and Fermat prime.

Readership: It is the first monograph to connecting perfect number and Fibonacci sequence, the two old mathematical problems, with rich history, it will attract number theorists and combinatorists in the world.

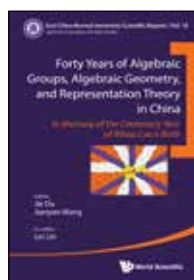
260pp	Aug 2022	
978-981-124-407-0	US\$88	£75
978-981-124-408-7(ebook)	US\$141	£115



East China Normal University Scientific Reports

Forty Years of Algebraic Groups, Algebraic Geometry, and Representation Theory in China

In Memory of the Centenary Year of Xihua Cao's Birth

edited by **Jie Du** (University of New South Wales, Australia), **Jianpan Wang** (East China Normal University, China) & **Lei Lin** (East China Normal University, China)

Professor Xihua Cao (1920 – 2005) was a leading scholar at East China Normal University (ECNU) and a famous algebraist in China. In January 2020, in order to commemorate Professor Xihua Cao's centenary birthday, East China Normal University held a three-day academic conference. Scholars at home and abroad gave dedications or delivered lectures in the conference. This volume originates from the memorial conference, collecting the dedications of scholars, reminiscences of family members, and 16 academic articles written based on the lectures in the conference, covering a wide range of research hot topics in algebra.

Readership: Researchers and postgraduate students interested in algebras, especially in algebraic groups, quantum groups, Lie algebras, algebraic geometry and algebraic number theory; General readers of mathematics and mathematical history.

480pp	Jan 2023	
978-981-126-348-4	US\$148	£120
978-981-126-349-1(ebook)	US\$237	£190

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.

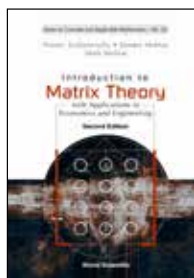
Readership: First year mathematics and computer science students and instructors who will be learning/teaching linear algebra.

200pp	Oct 2023	
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

Series on Concrete and Applicable Mathematics - Vol 23

Introduction to Matrix Theory

with Applications in Economics and Engineering (2nd Edition)

by **Ferenc Szidarovszky** (Corvinus University, Hungary), **Sandor Molnar** (Szent Istvan University, Hungary) & **Mark Molnar** (Eötvös Lóránd University of Sciences, Hungary)

This book is mainly a textbook, that covers a one semester upper division course or a two semester lower division course on the subject. The second edition will be an extended and modernized version of the first edition. Some new theoretical topics and new applications from fields other than economics were added. More difficult exercises were added at the end of each chapter which require deep understanding of the theoretical issues. Some proofs are modernized in the theoretical discussions which give better overview of the study material.

Readership: Written primarily for undergraduate and graduate students studying engineering, economics and business; can also be used in courses offered by the mathematics department, or by any kind of engineering and social sciences;

450pp	Sep 2022	
978-981-125-793-3(pbk)	US\$88	£70
978-981-125-664-6	US\$148	£120
978-981-125-665-3(ebook)	US\$237	£190

Essential Textbook

UTokyo Engineering Course/ Basic Mathematics

Linear Algebra I

Basic Concepts

by **Kazuo Murota** (The Institute of Statistical Mathematics, Japan & The University of Tokyo, Japan & Kyoto University, Japan & Tokyo Metropolitan University, Japan) & **Masaaki Sugihara** (The University of Tokyo, Japan & Nagoya University, Japan)

This is the first volume of the two-volume book on linear algebra, in the University of Tokyo (UTokyo) Engineering Course. The objective of this volume is to present, from the engineering viewpoint, the standard mathematical results in linear algebra such as those on systems of equations and eigenvalue problems. In addition to giving mathematical theorems and formulas, it explains how the mathematical concepts such as rank, eigenvalues, and singular values are linked to engineering applications and numerical computations.

Key Feature: This book takes the approach of developing theories through concrete matrix representations rather than through abstract concepts.

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

316pp	Aug 2022	
978-981-125-797-1(pbk)	US\$58	£45
978-981-125-702-5	US\$98	£80
978-981-125-703-2(ebook)	US\$157	£125

Essential Textbook

UTokyo Engineering Course/ Basic Mathematics

Linear Algebra II

Advanced Topics for Applications

by **Kazuo Murota** (The Institute of Statistical Mathematics, Japan & The University of Tokyo, Japan & Kyoto University, Japan & Tokyo Metropolitan University, Japan) & **Masaaki Sugihara** (The University of Tokyo, Japan & Nagoya University, Japan)

The objective of this second volume is to branch out from the standard mathematical results presented in the first volume to illustrate useful specific topics pertaining to engineering applications. This volume covers other topics such as matrices and graphs, nonnegative matrices, systems of linear inequalities, integer matrices, polynomial matrices, generalized inverses, and group representation theory.

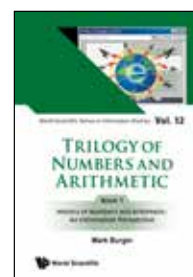
Readership: Graduate students majoring in engineering and other mathematical sciences.

276pp	Aug 2022	
978-981-125-798-8(pbk)	US\$58	£45
978-981-125-705-6	US\$98	£80
978-981-125-706-3(ebook)	US\$157	£125

World Scientific Series in Information Studies - Vol 12

Trilogy of Numbers and Arithmetic

Book 1: History of Numbers and Arithmetic: An Information Perspective

by **Mark Burgin** (University of California, Los Angeles, USA)

The book is the first in the trilogy which will bring you to the fascinating world of numbers and operations with them. This book looks into the chronicle of numbers and arithmetic from ancient times all the way to the 21st century. It also includes the developments in these areas in the 20th century and later. A unique aspect of this book is its information orientation of the exposition of the history of numbers and arithmetic.

Readership: Researchers and graduate students in mathematics, history, and philosophy.

372pp	Jun 2022	
978-981-123-683-9	US\$138	£110
978-981-123-684-6(ebook)	US\$236	£190

Ring and Field Theory

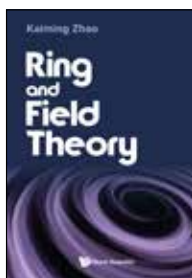
by **Kaiming Zhao** (*Wilfrid Laurier University, Canada*)

This book is intended as a textbook for a one-term senior undergraduate (or graduate) course in Ring and Field Theory, or Galois theory. The book is ready for an instructor to pick up to teach without making any preparations.

The book is written in a way that is easy to understand, simple and concise with simple historic remarks to show the beauty of algebraic results and algebraic methods. The book contains 240 carefully selected exercise questions of varying difficulty which will allow students to practice their own computational and proof-writing skills. Sample solutions to some exercise questions are provided.

Readership: Senior undergraduate and graduate students in abstract algebra.

200pp	May 2022		
978-981-125-577-9	US\$78	£60	
978-981-125-578-6(ebook)	US\$125	£100	



Code Based Secret Sharing Schemes

Applied Combinatorial Coding Theory
by **Selda Çalkavur** (*Kocaeli University, Turkey*),
Alexis Bonnet (*University of Aix-Marseille, France*), **Romar dela Cruz** (*University of the Philippines Diliman, Philippines*) &
Patrick Solé (*University of Aix-Marseille, France*)

Secret sharing schemes form one of the most important topic in Cryptography. These protocols are used in many areas, applied mathematics, computer science, electrical engineering. A secret is divided into several pieces called shares. Each share is given to a user of the system. Each user has no information about the secret, but the secret can be retrieved by certain authorized coalition of users.

This book is devoted to such schemes inspired by Coding Theory. The classical schemes of Shamir, Blakley, Massey are recalled. Survey is made of research in Combinatorial Coding Theory they triggered, mostly self-dual codes, and minimal codes. Applications to engineering like image processing, and key management of MANETs are highlighted.

Readership: Academics interested in Coding Theory, and Cryptography. Engineers and Researchers working in digital security. The book can form the basis for a graduate level course on the topic, to be a part of a master degree in Crypto or Computer security.

212pp	May 2022		
978-981-124-832-0	US\$88	£70	
978-981-124-833-7(ebook)	US\$141	£115	



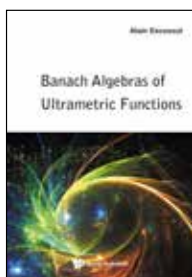
Banach Algebras of Ultrametric Functions

by **Alain Escassut** (*Université Clermont Auvergne, France*)

This book examines ultrametric Banach algebras in general. It begins with algebras of continuous functions, and looks for maximal and prime ideals in connections with ultrafilters on the set of definition. The multiplicative spectrum has shown to be indispensable in ultrametric analysis and is described in the general context and then, in various cases of Banach algebras. Applications are made to various kind of functions: uniformly continuous functions, Lipschitz functions, strictly differentiable functions, defined in a metric space.

Readership: Graduate students and researchers in p -adic analysis, ultrametric functional analysis and ultrametric topological algebra.

324pp	May 2022		
978-981-125-165-8	US\$118	£95	
978-981-125-166-5(ebook)	US\$189	£150	



Essential Textbook

Lectures on Linear Algebra

by **Donald S Passman** (*University of Wisconsin-Madison, USA*)

This book consists of the expanded notes from an upper level linear algebra course given some years ago by the author. Each section, or lecture, covers about a week's worth of material and includes a full set of exercises of interest. The notes cover all the basics of linear algebra but from a mature point of view.

The book includes proofs and techniques that the author has developed over the years to make the material easier to understand and to compute.

Key Feature: Most undergraduate linear algebra courses are not as sophisticated as this one was. Most math graduate students are assumed to have had a good course in linear algebra, but sadly many have not. Reading these notes might fill in the gap.

Readership: Upper level undergraduate math majors and graduate students.

252pp	Apr 2022		
978-981-125-499-4(pbk)	US\$48	£40	
978-981-125-484-0	US\$88	£70	
978-981-125-485-7(ebook)	US\$141	£110	

Series on Advances in Mathematics for Applied Sciences - Vol 91

Fractal Analysis

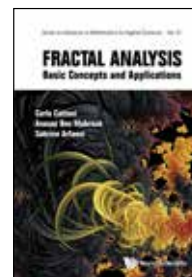
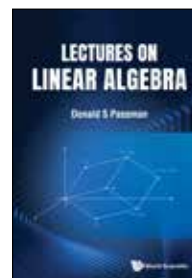
Basic Concepts and Applications

by **Carlo Cattani** (*University of Tuscia, Italy*),
Anouar Ben Mabrouk (*University of Monastir, Tunisia & University of Kairouan, Tunisia & University of Tabuk, Saudi Arabia*) &
Sabrina Arfaoui (*University of Monastir, Tunisia & University of Tabuk, Saudi Arabia*)

The aim of this book is to provide a basic and self-contained introduction to the ideas underpinning fractal analysis. The book illustrates some important applications issued from real data sets, real physical and natural phenomena as well as real applications in different fields, and consequently, presents to the readers the opportunity to implement fractal analysis in their specialties according to the step-by-step guide found in the book.

Readership: Young researchers at master's level in sciences; researchers in PhD studies in pure and applied mathematical/physical sciences

244pp	Mar 2022		
978-981-123-943-4	US\$98	£85	
978-981-123-944-1(ebook)	US\$157	£135	



Basic Abstract Algebra

Exercises and Solutions

This book is mainly intended for first-year University students who undertake a basic abstract algebra course, as well as instructors. It contains the basic notions of abstract 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.

Key Features

- This book contains a variety of exercises
- There is a specially designed "true or false" section, and the solutions are very detailed

Readership: First and second year mathematics and computer science students interested in abstract algebra. Also good for instructors.

212pp	Mar 2022		
978-981-125-249-5(pbk)	US\$38	£30	
978-981-125-210-5	US\$68	£55	
978-981-125-211-2(ebook)	US\$109	£90	



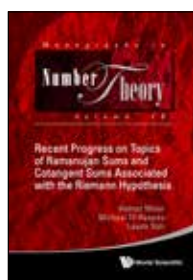
Monographs in Number Theory - Vol 10

Recent Progress on Topics of Ramanujan Sums and Cotangent Sums Associated with the Riemann Hypothesisby **Helmut Maier** (University of Ulm, Germany),
Michael Th Rassias (Hellenic Military Academy, Greece)
& **László Tóth** (University of Pécs, Hungary)

In this monograph, we study recent results on some categories of trigonometric/exponential sums along with various of their applications in Mathematical Analysis and Analytic Number Theory. Through the two chapters of this monograph, we wish to highlight the applicability and breadth of techniques of trigonometric/exponential sums in various problems focusing on the interplay of Mathematical Analysis and Analytic Number Theory. We wish to stress the point that the goal is not only to prove the desired results, but also to present a plethora of intermediate Propositions and Corollaries investigating the behaviour of such sums, which can also be applied in completely different problems and settings than the ones treated within this monograph.

Readership: Scientists, researchers, and graduate students in Pure and Applied Mathematics.

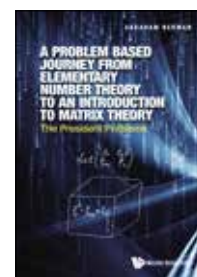
164pp	Feb 2022	
978-981-124-688-3	US\$68	£55
978-981-124-689-0(ebook)	US\$109	£90

**A Problem Based Journey from Elementary Number Theory to an Introduction to Matrix Theory**

The President Problems

by **Abraham Berman** (Technion-Israel Inst of Tech, Israel)

The book is based on lecture notes of a course "from elementary number theory to an introduction to matrix theory" given at the Technion to gifted high school students. It is problem based, and covers topics in undergraduate mathematics that can be introduced in high school through solving challenging problems. These topics include Number theory, Set Theory, Group Theory, Matrix Theory, and applications to cryptography and search engines.

**Key Feature**

- Challenging problems, interesting mathematics, the book will appeal to high school and university students who love mathematics and their teachers

Readership: High school students who love mathematics and mathematics teachers. Also good for professors of mathematics and maths education, students in the mathematical sciences and pre-service math teachers.

164pp	Nov 2021	
978-981-123-487-3	US\$38	£35
978-981-123-488-0(ebook)	US\$98	£80

Problems in Linear Algebra and Matrix Theoryby **Fuzhen Zhang** (Nova Southeastern University, USA)

"This is a large collection of good problems of varied levels of difficulty. They offer readers many opportunities for thinking of clever ways to apply classic theorems."

Jane Day
San Jose State University

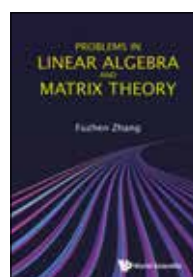
This new edition contains about fifty-five examples and many new problems, based on the author's lecture notes of *Advanced Linear Algebra* classes at Nova Southeastern University (NSU-Florida) and short lectures *Matrix Gems* at Shanghai University and Beijing Normal University.

Key Features

- This is a collection of gem problems in linear algebra and matrix theory for students
- Each chapter starts with important facts and interesting results as examples to show basic skills and techniques on the topic, followed by carefully selected problems

Readership: College/university students and instructors in mathematics, physics, statistics, computer science, etc. Upper division/beginning graduate level.

476pp	Nov 2021	
978-981-123-908-3(pbk)	US\$58	£50
978-981-123-979-3	US\$118	£105
978-981-123-909-0(ebook)	US\$189	£170

**An Introduction to Abstract Algebra**

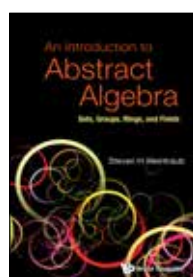
Sets, Groups, Rings, and Fields

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

The book 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. Each of its chapters concludes with a variety of exercises ranging from the straightforward to the challenging in order to reinforce students' knowledge of the subject.

Key Feature: Designed for use as a text for introductory course in abstract algebra**Readership:** Advanced undergraduate and beginning graduate students in mathematics, suitable for introductory abstract algebra course in general

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



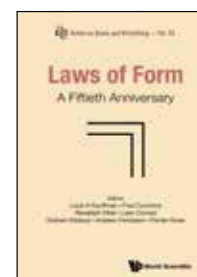
Series on Knots and Everything - Vol 72

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**, **Graham Ellsbury**, **Andrew Crompton** (University of Liverpool, UK) & **Florian Grote** (CODE University of Applied Sciences, Germany)

This is a seminal work in foundations of logic, mathematics and philosophy published by G Spencer-Brown in 1969. The book provides a new point of view on form and the role of distinction, markedness and the absence of distinction (the unmarked state) in the construction of any universe.

**Key Features**

- This book can serve as companion and as an introduction to Spencer-Brown's book *Laws of Form*
- The reader will find significant new mathematics that has grown from *Laws of Form* and significant philosophical articulations that grow from this ground

Readership: Academic and scientific readers: undergraduate and graduate students and researchers in mathematics, logic, computer science, cybernetics, philosophy, linguistics, physics and natural sciences.

700pp	Oct 2022	
978-981-124-742-2	US\$188	£165
978-981-124-743-9(ebook)	US\$301	£240

eTextbooks Available!

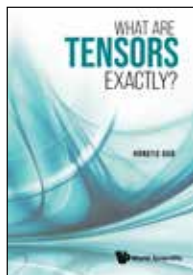
Digital resources made convenient for your students at a lower cost.

Bestselling Textbook

What Are Tensors Exactly?

by **Hongyu Guo** (University of Houston-Victoria, USA)

"I use tensors in computer vision and for years I had to deal with deciphering various definitions of tensors on my own. Professor Hongyu Guo's book is the first to unify many different and often confusing definitions of tensors, as well as presenting their properties in the context of machine learning, but also in mechanics, electrodynamics and general relativity. I highly recommend it to both mathematicians and physicists but above all to a wide group of practitioners. I really enjoy reading it."



Bogusław Cyganek
AGH University of Science and Technology, Poland

The goal of this book is to elucidate the concepts in an intuitive way but without loss of rigor, to help students gain deeper understanding. As a result, they will not need to recite those definitions in a parrot-like manner any more. This volume answers common questions and corrects many misconceptions about tensors. A large number of illuminating illustrations helps the reader to understand the concepts more easily.

Readership: Researchers, professionals, academics, graduate students and undergraduate students in physics, AI, machine learning, and relativity and gravitation.

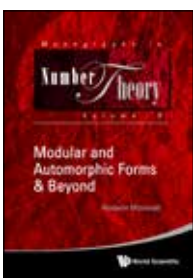
248pp	Jun 2021		
978-981-124-101-7	US\$58	£50	
978-981-124-102-4(ebook)	US\$98	£80	

Monographs in Number Theory - Vol 9

Modular and Automorphic Forms & Beyond

by **Hossein Movasati** (IMPA, Brazil)

The guiding principle in this monograph is to develop a new theory of modular forms which encompasses most of the available theory of modular forms in the literature, such as those for congruence groups, Siegel and Hilbert modular forms, many types of automorphic forms on Hermitian symmetric domains, Calabi – Yau modular forms, with its examples such as Yukawa couplings and topological string partition functions, and even go beyond all these cases. Its main ingredient is the so-called "Gauss – Manin connection in disguise".



Readership: Graduate students and researchers.

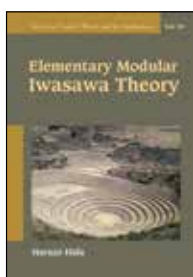
324pp	Oct 2021		
978-981-123-867-3	US\$108	£95	
978-981-123-868-0(ebook)	US\$173	£150	

Series on Number Theory and Its Applications - Vol 16

Elementary Modular Iwasawa Theory

by **Haruzo Hida** (University of California, Los Angeles, USA)

This book is the first to provide a comprehensive and elementary account of the new Iwasawa theory innovated via the deformation theory of modular forms and Galois representations. The deformation theory of modular forms is developed by generalizing the cohomological approach discovered in the author's 2019 AMS Leroy P. Steele Prize-winning article without using much algebraic geometry.



Key Feature

- The results found in the book are at the cutting edge of the present research

Readership: Advanced undergraduate and graduate students, researchers and practitioners in the fields of algebraic/analytic number theory and arithmetic geometry.

448pp	Oct 2021		
978-981-124-136-9	US\$138	£120	
978-981-124-137-6(ebook)	US\$221	£190	

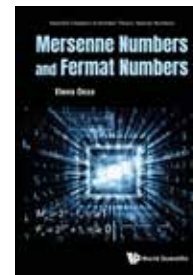
Selected Chapters of Number Theory:

Special Numbers - Vol 1

Mersenne Numbers and Fermat Numbers

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

This book contains a complete detailed description of two classes of special numbers closely related to classical problems of the Theory of Primes. There is also extensive discussions of applied issues related to Cryptography.



Mersenne and Fermat numbers have many other interesting properties. Long and rich history, many arithmetic connections (with perfect numbers, with construction of regular polygons etc.), numerous modern applications, long list of open problems allow us to provide a broad perspective of the Theory of these two classes of special numbers, that can be useful and interesting for both professionals and the general audience.

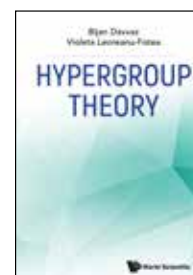
Readership: Advanced undergraduate, graduate students, researchers and the general public interested in Arithmetic, Number Theory, General Algebra, Cryptography and related fields.

328pp	Aug 2021		
978-981-123-031-8	US\$108	£95	
978-981-123-032-5(ebook)	US\$173	£150	

Hypergroup Theory

by **Bijan Davvaz** (Yazd University, Iran) & **Violeta Leoreanu-Fotea** (Alexandru Ioan Cuza University of Iasi, Romania)

The book presents an updated study of hypergroups, being structured on 12 chapters in starting with the presentation of the basic notions in the domain: semihypergroups, hypergroups, classes of subhypergroups, types of homomorphisms, but also key notions: canonical hypergroups, join spaces and complete hypergroups. A detailed study is dedicated to the connections between hypergroups and binary relations, starting from connections established by Rosenberg and Corsini. Various types of binary relations are highlighted, in particular equivalence relations and the corresponding quotient structures, which enjoy certain properties: commutativity, cyclicity, solvability.



Readership: Advanced undergraduate and graduate students, researchers and practitioners in the fields of algebra, group theory and algebraic hyperstructures.

300pp	Feb 2022		
978-981-124-938-9	US\$98	£85	
978-981-124-939-6(ebook)	US\$157	£135	

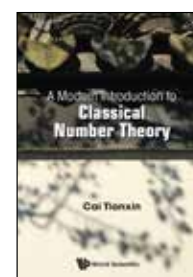
A Modern Introduction to Classical Number Theory

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

Natural numbers are the oldest human invention. This book describes their nature, laws, history and current status.

One feature of the book is the supplementary material after each section, there by broadening the reader's knowledge and imagination. These contents either discuss the rudiments of some aspects or introduce new problems or conjectures and their extensions, such as perfect number problem, Egyptian fraction problem, Goldbach's conjecture, the twin prime conjecture, the $3x + 1$ problem, Hilbert Waring problem, Euler's conjecture, Fermat's Last Theorem, Landau's problem and etc.

Readership: Students and professionals who are interested in number theory, also good for general public to read up.



432pp	Aug 2021		
978-981-121-829-3	US\$138	£120	
978-981-121-830-9(ebook)	US\$221	£190	

DIFFERENTIAL & INTEGRAL EQUATIONS

Essential Interdisciplinary Applied Textbook

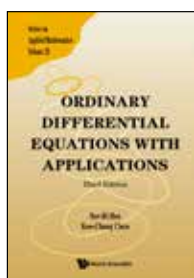
Series on Applied Mathematics - Vol 23

Ordinary Differential Equations with Applications (3rd Edition)by **Sze-Bi Hsu & Kuo-Chang Chen**
(National Tsing Hua University, Taiwan)

This volume presents an abundance of examples in physical and biological sciences, and engineering to illustrate the applications of the theorems in the text. Readers are introduced to some important theorems in Nonlinear Analysis, for example, Brouwer fixed point theorem and fundamental theorem of algebras. A chapter on Monotone Dynamical Systems takes care of the new developments in Ordinary Differential Equations and Dynamical Systems.

Readership: Advanced undergraduate and graduate students in mathematics, applied mathematics, physical sciences and engineering. Researchers in the fields of ordinary differential equations and dynamical systems.

376pp	Sep 2022	
978-981-125-074-3	US\$68	£60
978-981-125-075-0(ebook)	US\$109	£85



Series on Analysis, Applications and Computation - Vol 10

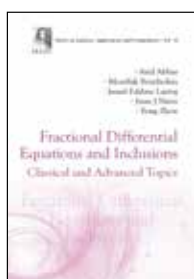
Fractional Differential Equations and Inclusions

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** (Universidad de Santiago de Compostela, Spain) & **Yong Zhou** (Xiangtan University, China & Macau University of Science and Technology, China)

Readers will find the book self-contained and unified in presentation. It provides the necessary background material required to go further into the subject. Each chapter concludes with a section devoted to notes and bibliographical remarks and all abstract results are illustrated by examples.

Key Feature: This monograph is devoted to the existence and stability for various classes of functional differential equations or inclusions involving the Hadamard or Hilfer fractional derivative. There are very few systematic discussions on these contents in published books

270pp	Feb 2023	
978-981-126-125-1	US\$88	£70
978-981-126-126-8(ebook)	US\$141	£110

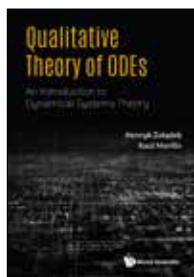
**Qualitative Theory of ODEs**

An Introduction to Dynamical Systems Theory

by **Henryk Żoładek** (University of Warsaw, Poland) & **Raul Murillo** (Complutense University of Madrid, Spain)

The Qualitative Theory of Ordinary Differential Equations (ODEs) occupies a rather special position both in Applied and Theoretical Mathematics. The main idea of the qualitative analysis of differential equations is to be able to say something about the behavior of solutions of the equations, without solving them explicitly. Therefore, in the first place such properties like the stability of solutions stand out. It is the stability with respect to changes in the initial conditions of the problem. Each chapter contains a series of problems (with varying degrees of difficulty) and a self-respecting student should solve them.

252pp	Oct 2022	
978-1-80061-268-6	US\$98	£80
978-1-80061-269-3(ebook)	US\$157	£125

**Hörmander Operators**by **Marco Bramanti** (Politecnico di Milano, Italy) & **Luca Brandolini** (Università degli Studi di Bergamo, Italy)

Hörmander operators are a class of linear second order partial differential operators with nonnegative characteristic form and smooth coefficients, which are usually degenerate elliptic-parabolic, but nevertheless hypoelliptic, that is highly regularizing. Motivations for the study of Hörmander operators come for instance from Kolmogorov-Fokker-Planck equations arising from modeling physical systems governed by stochastic equations and the geometric theory of several complex variables. The aim of this book is to give a systematic exposition of a relevant part of the theory of Hörmander operators and vector fields, together with the necessary background and prerequisites.

Readership: Advanced undergraduate and graduate students, researchers.

720pp	Oct 2022	
978-981-126-168-8	US\$198	£160
978-981-126-169-5(ebook)	US\$317	£255

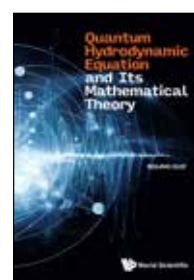
**Quantum Hydrodynamic Equation and Its Mathematical Theory**by **Boling Guo** (Institute of Applied Physics and Computational Mathematics, China)

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.

Key Feature: This book will help the readers to sort out issues that are not clarified in previous books and literatures, and enable the readers to carry out basic research with the help of the relevant references when they are interested in specific aspects of the problem

Readership: For graduate students, doctoral students and researchers.

280pp	Sep 2022	
978-981-126-083-4	US\$108	£85
978-981-126-084-1(ebook)	US\$173	£140



Series on Concrete and Applicable Mathematics - Vol 22

Bloch-Type Periodic Functions

Theory and Applications to Evolution Equations

by **Yong-Kui Chang** (Xidian University, China), **Gaston M N'Guérékata** (Morgan State University, USA) & **Rodrigo Ponce** (Universidad de Talca, Chile)

This monograph aims to provide for the first time a unified and homogenous presentation of the recent works on the theory of Bloch periodic functions, their generalizations, and their applications to evolution equations.

Key Features

- Lays down both the foundation of the theory of periodic functions of the Bloch-type
- Applications of the theory of Bloch-type periodic functions to several evolution equations are presented

Readership: Graduate students and beginning researchers.

208pp	Aug 2022	
978-981-125-435-2	US\$78	£60
978-981-125-436-9(ebook)	US\$125	£100



Essential Textbooks in Mathematics

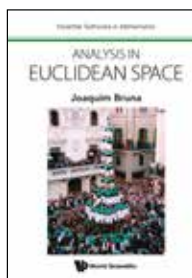
Analysis in Euclidean Space

by **Joaquim Bruna** (*Universitat Autònoma de Barcelona, Spain & Barcelona Graduate School of Mathematics, Spain*)

Based on notes written during the teacher's many years of teaching, This book mainly covers Differentiation and Integration theory in several real variables, but also an array of closely related areas including measure theory, differential geometry, classical theory of curves geometric measure theory, integral geometry, and others. With several original results, new approaches and an emphasis on concepts and rigorous proofs, the book is suitable for undergraduate students, particularly in mathematics and physics. There are many examples and exercises inserted in the text for the student to work independently.

Readership: A textbook for undergraduate students studying differentiation theory, measure and integration and related courses. Graduate students may use this book for an introduction to geometric measure theory and integral geometry.

560pp	Sep 2022	
978-1-80061-171-9	US\$158	£140
978-1-80061-172-6(ebook)	US\$253	£200



Variational Convergence and Stochastic Homogenization of Nonlinear Reaction-Diffusion Problems

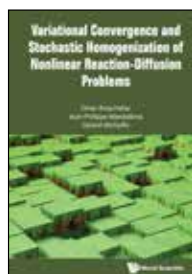
by **Omar Anza Hafs** (*Université de Nîmes, France*), **Jean-Philippe Mandallena** (*Université de Nîmes, France*) & **G  rard Michaille** (*Universit   de Montpellier, France & Universit   de Montpellier, France & Universit   de N  mes, France*)

A substantial number of problems in physics, chemical physics, and biology, are modeled through reaction-diffusion equations to describe temperature distribution or chemical substance concentration. For problems arising from ecology, sociology, or population dynamics, they describe the density of some populations or species. In this book the state variable is a concentration, or a density according to the cases.

The first part of the book is devoted to the convergence of these sequences in a sense made precise in the book. The second part is dedicated to the specific case when the reaction-diffusion problems depend on a small parameter ϵ_n , intended to tend towards 0.

Readership: Graduate students and researchers.

320pp	Jul 2022	
978-981-125-848-0	US\$108	��85
978-981-125-849-7(ebook)	US\$173	��140



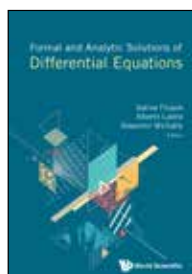
Formal and Analytic Solutions of Differential Equations

edited by **Galina Filipuk** (*University of Warsaw, Poland*), **Alberto Lastra** (*University of Alcal  , Spain*) & **  lawomir Michalik** (*Cardinal Stefan Wyszy  ski University in Warsaw, Poland*)

The book provides the reader with an overview of the actual state of research in ordinary and partial differential equations in the complex domain. Topics include summability and asymptotic study of both ordinary and partial differential equations, and also q -difference and differential-difference equations. This book will be of interest to researchers and students who wish to expand their knowledge of these fields. With the latest results and research developments and contributions from experts in their field, *Formal and Analytic Solutions of Differential Equations* provides a valuable contribution to methods, techniques, different mathematical tools, and study calculations.

Readership: Researchers and graduate students in mathematics.

400pp	Mar 2022	
978-1-80061-135-1	US\$148	��120
978-1-80061-136-8(ebook)	US\$237	��190



Contemporary Mathematics and Its Applications: Monographs, Expositions and Lecture Notes - Volume 6

Generalized Radon Transforms and Imaging by Scattered Particles

Broken Rays, Cones, and Stars in Tomography by **Ga  k Ambartsoumian** (*The University of Texas at Arlington, USA*)

This book will cover, in a detailed manner, the relevant imaging modalities, their mathematical models, and the related generalized Radon transforms. The discussion of the latter will comprise a thorough exploration of their known mathematical properties, including injectivity, inversion, range description and microlocal analysis, as well as numerical examples, and description of open problems.

Readership: Advanced undergraduate and graduate students, mathematicians, engineers and physicists.

250pp	Feb 2023	
978-981-124-243-4	US\$88	��75
978-981-124-244-1(ebook)	US\$141	��115



Semigroup Approach to Nonlinear Diffusion Equations

by **Viorel Barbu** (*"Al I Cuza" University of Ia  i, Romania & Romanian Academy, Romania*)

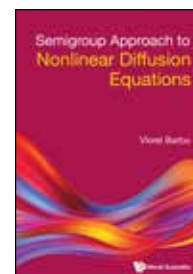
This book is concerned with functional methods (nonlinear semigroups of contractions, nonlinear m -accretive operators and variational techniques) in the theory of nonlinear partial differential equations of elliptic and parabolic type. In particular, applications to the existence theory of nonlinear parabolic equations, nonlinear Fokker-Planck equations, phase transition and free boundary problems are presented in details. Emphasis is put on functional methods in partial differential equations (PDE) and less on specific results.

Key Features

- The book is self-contained and the general theory is confined to essentials necessary for the treatment of nonlinear partial differential equations
- It contains many new results which appear for the first time in a book form

Readership: Specialists in the theory of partial differential equations and mathematical physics. .

220pp	Oct 2021	
978-981-124-651-7	US\$88	��75
978-981-124-652-4(ebook)	US\$141	��120



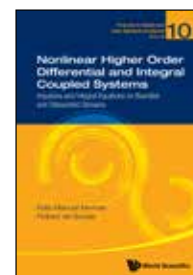
Trends in Abstract and Applied Analysis - Vol 10

Nonlinear Higher Order Differential and Integral Coupled Systems

Impulsive and Integral Equations on Bounded and Unbounded Domains by **Feliz Manuel Minh  s** (*Universidade   vora, Portugal*) & **Robert de Sousa** (*Universidade de Cabo Verde, Cape Verde*)

Boundary value problems on bounded or unbounded intervals, involving two or more coupled systems of nonlinear differential and integral equations with full nonlinearities, are scarce in the literature. The present work by the authors desires to fill this gap. The systems covered here include differential and integral equations of Hammerstein-type with boundary constraints, on bounded or unbounded intervals. These are presented in several forms and conditions. This would be the first time that differential and integral coupled systems are studied systematically. Parallel to the theoretical explanation of this work, there is a range of practical examples and applications involving real phenomena which researchers and students will find useful.

244pp	May 2022	
978-981-122-512-3	US\$98	��85
978-981-122-513-0(ebook)	US\$157	��125



GEOMETRY & TOPOLOGY

Series on Knots and Everything

One-Cocycles and Knot Invariantsby **Thomas Fiedler** (*Université Paul Sabatier, France*)

One-Cocycles and Knot Invariants is about classical knots, i.e. smooth oriented knots in three-space. It introduces discrete combinatorial analysis in knot theory in order to solve a global tetrahedron equation. This new technique is then used in order to construct combinatorial one-cocycles in a certain moduli space of knot diagrams. The construction of the moduli space makes use of the meridian and of the longitude of the knot. The combinatorial 1-cocycles are then lifts of the well-known Conway polynomial of knots and they can be calculated in polynomial time.

Readership: Useful for academic researchers and PhD students.

338pp	Nov 2022	
978-981-126-299-9	US\$128	£100
978-981-126-300-2(ebook)	US\$205	£165

**A Royal Road to Topology**

Convergence of Filters

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

Topological spaces are a special case of convergence spaces. This textbook introduces topology within a broader context of convergence theory. The title alludes to advantages of the present approach, which is more gratifying than many traditional ones: you travel more comfortably through mathematical landscapes and you see more. 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.

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

500pp	Sep 2022	
978-981-123-210-7	US\$158	£140
978-981-123-211-4(ebook)	US\$253	£200

**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*)

Volume I contains a long article by Misha Gromov based on his many years of involvement in this subject. It came from lectures delivered in Spring 2019 at IHES. Many topics in the field are presented, and many open problems are discussed.

For Volume II, many people in areas of mathematics and physics, whose work is somehow related to scalar curvature, were asked to write about this in any way they pleased. This gives rise to a wonderful collection of articles, some with very broad and historical views, others which discussed specific fascinating subjects.

Readership: Professional mathematicians and physicists, and certainly graduate students.

1131pp	Nov 2022	
978-981-124-935-8(Set)	US\$248	£220
978-981-124-936-5(Set)(ebook)	US\$397	£315

**New Horizons in Differential Geometry and its Related Fields**edited by **Toshiaki Adachi** (*Nagoya Institute of Technology, Japan*) & **Hideya Hashimoto** (*Meijo University, Japan*)

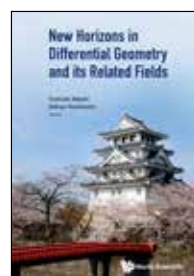
This volume presents recent developments in geometric structures on Riemannian manifolds and their discretizations. With chapters written by recognized experts, these discussions focus on contact structures, Kähler structures, fiber bundle structures and Einstein metrics. It also contains works on the geometric approach on coding theory.

Key Features

- Contains works that treat geometric structures concretely
- Invaluable not only for researchers in this area but also for graduate students as a guide to explore further in this area

Readership: Graduate students and researchers in the fields of differential geometry and discrete mathematics.

256pp	May 2022	
978-981-124-809-2	US\$88	£75
978-981-124-810-8(ebook)	US\$141	£115

**Essential Textbook**

Essential Textbooks in Mathematics

A First Course in Algebraic Geometry and Algebraic Varietiesby **Flaminio Flamini** (*University of Rome "Tor Vergata", Italy*)

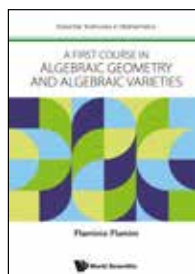
"This book provides a self-contained and well-organized introduction to a variety of fundamental concepts of Algebraic Geometry. It further helps readers to access Algebraic Geometry with minimal prerequisites. Thus, I highly recommend it as a textbook for Algebraic Geometry in undergraduate courses."

Seonja Kim, Professor in Geometry
Chungwoon University, Incheon - Republic of Korea

"A thorough, but gentle, introduction to classical Algebraic Geometry, with plenty of examples and solved exercises, as well as all the necessary background in Commutative Algebra."

Andreas L Knutsen, Professor in Mathematics
University of Bergen - Norway

300pp	Oct 2022	
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*)

For more than thirty years the senior author has been trying to learn algebraic geometry. In the process he discovered that many of the classic textbooks in algebraic geometry require substantial knowledge of cohomology, homological algebra, and sheaf theory. In an attempt to demystify these abstract concepts and facilitate understanding for a new generation of mathematicians, he along with co-author wrote this book for an audience who is familiar with basic concepts of linear and abstract algebra, but who never has had any exposure to the algebraic geometry or homological algebra.

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



Elements of Digital Geometry, Mathematical Morphology, and Discrete Optimization

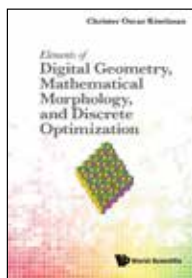
by **Christer Oscar Kiselman**
(Uppsala University, Sweden)

The author presents three distinct but related branches of science in this book: digital geometry, mathematical morphology, and discrete optimization. They are united by a common mindset as well as by the many applications where they are useful. In addition to being useful, each of these relatively new branches of science is also intellectually challenging.

The book contains a systematic study of inverses of mappings between ordered sets, and so offers a uniquely helpful organization in the approach to several phenomena related to duality.

Readership: Advanced undergraduate and graduate students, researchers.

488pp	Feb 2022	
978-981-124-829-0	US\$158	£125
978-981-124-830-6(ebook)	US\$253	£200



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	Apr 2023	
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

Essential Textbook

Algebraic Topology

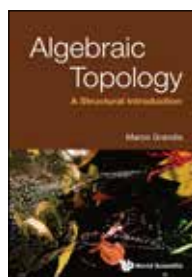
A Structural Introduction
by **Marco Grandis** (Università di Genova, Italy)

The main subject of this book is singular homology, the simplest of these translations. Studying this theory and its applications, we also investigate its underlying structural layout - the topics of Homological Algebra, Homotopy Theory and Category Theory which occur in its foundation.

This book is an introduction to a complex domain, with references to its advanced parts and ramifications. It is written with a moderate amount of prerequisites — basic general topology and little else — and a moderate progression starting from a very elementary beginning. A consistent part of the exposition is organised in the form of exercises, with suitable hints and solutions.

Readership: Graduate students, PhD students and Researchers in Mathematics and Physics interested in Algebraic Topology.

372pp	Feb 2022	
978-981-124-835-1	US\$98	£85
978-981-124-836-8(ebook)	US\$157	£135



Infinity Operads and Monoidal Categories with Group Equivariance

by **Donald Yau** (The Ohio State University at Newark, USA)

This is the first monograph that provides a coherent development of operads, infinity operads, and monoidal categories, equipped with equivariant structures encoded by an action operad. In the first three parts of this monograph, we establish a foundation for group operads and for their higher coherent analogues called infinity group operads. Examples include planar, symmetric, braided, ribbon, and cactus operads, and their infinity analogues.

In Part 4 we define general monoidal categories equipped with an action operad equivariant structure and provide a unifying treatment of coherence and strictification for them.

Readership: Graduate students and researchers with an interest in operads and categories.

488pp	Dec 2021	
978-981-125-092-7	US\$158	£140
978-981-125-093-4(ebook)	US\$253	£225



Series in Algebraic and Differential Geometry - Vol 1

Differential Geometry of Curves and Surfaces with Singularities

by **Masaaki Umehara** (Tokyo Institute of Technology, Japan), **Kentaro Saji** (Kobe University, Japan) & **Kotaro Yamada** (Tokyo Institute of Technology, Japan)

Translated by **Wayne Rossman**
(Kobe University, Japan)

This book provides a unique and highly accessible approach to singularity theory from the perspective of differential geometry of curves and surfaces. It is written by three leading experts on the interplay between two important fields — singularity theory and differential geometry.

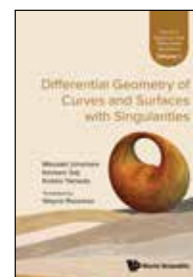
The book introduces singularities and their recognition theorems, and describes their applications to geometry and topology, restricting the objects of attention to singularities of plane curves and surfaces in the Euclidean 3-space

Key Feature

- The book covers a spectrum of material from the most basic facts to advanced research topics, in a way that naturally brings the reader through the different levels

Readership: Advanced undergraduate and graduate students, and researchers interested in the singularity theory from the perspective of differential geometry of curves and surfaces.

388pp	Dec 2021	
978-981-123-713-3	US\$128	£115
978-981-123-714-0(ebook)	US\$205	£185



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



Details on
page 40



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or scan the QR code



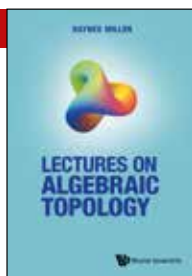
**Bestselling Essential Textbook****Lectures on Algebraic Topology**by **Haynes Miller** (*Massachusetts Institute of Technology, USA*)

Algebraic Topology and basic homotopy theory form a fundamental building block for much of modern mathematics. These lecture notes represent a culmination of many years of leading a two-semester course in this subject at MIT.

The style is engaging and student-friendly, but precise. Every lecture is accompanied by exercises. It begins slowly in order to gather up students with a variety of backgrounds, but gains pace as the course progresses, and by the end the student has a command of all the basic techniques of classical homotopy theory.

Readership: Ideal for a beginning graduate course, aimed at students familiar with general topology and basic modern algebra; also good for researchers who need to use the methods of algebraic topology, in mathematics at large and in theoretical physics.

404pp	Oct 2021	
978-981-123-285-5(pbk)	US\$58	£50
978-981-123-124-7	US\$138	£120
978-981-123-125-4(ebook)	US\$221	£190

**Basic Lessons on Isometries, Similarities and Inversions in the Euclidean Plane**

A Synthetic Approach

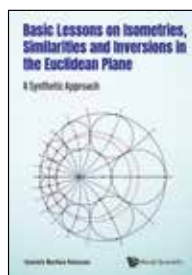
by **Ioannis Markos Roussos** (*Hamline University, USA*)

The aim of this book is to provide a complete synthetic exposition of plane isometries, similarities and inversions to readers who are interested in studying, teaching, and using this material.

The topics developed in this book can provide new proofs and solutions to many results and problems of classical geometry, which are presented with different proofs in the literature. Their applications are numerous and some, such as the Steiner Chains and Point, are useful to engineers.

Readership: College and high school students in mathematics, computational geometry, computational sciences.

500pp	Sep 2021	
978-981-124-037-9(pbk)	US\$78	£70
978-981-123-985-4	US\$148	£130
978-981-123-986-1(ebook)	US\$237	£210

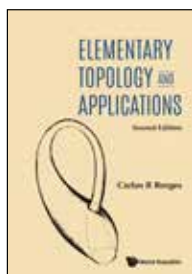
**Elementary Topology and Applications (2nd Edition)**by **Carlos R Borges** (*University of California, Davis, USA*)

The textbook is a very good start into the mathematical field of topology. A variety of topological concepts with some elementary applications are introduced. It is organized in such a way that the reader gets to significant applications quickly.

This revised version corrects the many discrepancies in the earlier edition. The emphasis is on the geometric understanding and the use of new concepts, indicating that topology is really the language of modern mathematics.

Readership: Advanced undergraduates and graduates in differential geometry and topology.

176pp	Aug 2021	
978-981-123-742-3	US\$58	£50
978-981-123-743-0(ebook)	US\$98	£80

**MATHEMATICAL ANALYSIS****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. The materials covered, which includes practically all the information on functional analysis that may be necessary for those working in various areas of mathematics applications, as well as the simplicity of presentation, differentiates this book from others. The method and style of presentation of materials make it digestible and easily understood by readers. This second edition includes new and updated 300 examples and more than 500 problems to help readers understand and master the theories presented.

800pp	Feb 2023	
978-981-3203-18-1(pbk)	US\$88	£73
978-981-3203-17-4	US\$178	£48

**Essential Interdisciplinary Applied Textbook****Applied Analysis**

Mathematics for Science, Technology, Engineering (3rd Edition)

by **Takashi Suzuki** (*Osaka University, Japan*)

This book is to be a new edition of Applied Analysis. Several fundamental materials of applied and theoretical sciences are added, which are needed by the current society, as well as recent developments in pure and applied mathematics. New materials in the basic level are the mathematical modelling using ODEs in applied sciences, elements in Riemann geometry in accordance with tensor analysis used in continuum mechanics, combining engineering and modern mathematics, detailed description of optimization, and real analysis used in the recent study of PDEs.

Readership: Undergraduate students studying mathematics, physics, chemistry, engineering; graduate students specialized in mathematical analysis, real analysis, theory of partial differential equations; researchers and specialists in the theory of nonlinear partial differential equations.

688pp	Jun 2022	
978-981-125-735-3	US\$148	£120
978-981-125-736-0(ebook)	US\$237	£190

**Norbert Wiener**

A Mathematician among Engineers

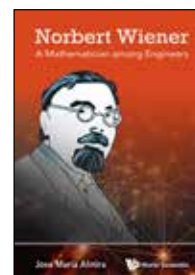
by **Jose Maria Almira** (*University of Murcia, Spain*)

"Writing a book about Norbert Wiener is a most delicate task. Jose María Almira has achieved this challenge with tact, accuracy and sharpness. This book presents a very fair analysis and description of the complex personality of Norbert Wiener, mixed with a pedagogical and illuminating description of his mathematical contributions. The book will be of interest to anybody interested in the human aspects of mathematics and sciences in the XXth century, and on their role in society"

Jean Mawhin, Professeur Ordinaire Émérite
Institute of Mathematics and Physics
Université catholique de Louvain, Belgium

Readership: Undergraduate and graduate students, researchers and practitioners in the fields of mathematics, physics, electrical and electronic engineering, and even biologists, physicians, and philosophers..

300pp	Nov 2022	
978-981-125-936-4	US\$68	£55
978-981-125-937-1(ebook)	US\$109	£85



Essential Textbook

Modern Mathematical Methods for Scientists and Engineers

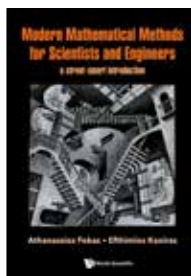
A Street-Smart Introduction

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

Despite the efforts of many famous mathematicians, physicists and engineers, the solution of partial differential equations remains a challenge. This book's authors introduce a novel method, the unified transform, which greatly facilitates this challenge. This book is a modern introduction to basic topics in mathematics at the undergraduate level, with emphasis on explanations and applications to real-life problems. There are also "Application" sections at the end of each chapter, with topics drawn from a variety of areas, including neural networks, fluid dynamics, and many more.

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 interdisciplinary mathematical courses.

512pp	Aug 2022	
978-1-80061-183-2(pbk)	US\$68	£60
978-1-80061-180-1	US\$148	£130
978-1-80061-181-8(ebook)	US\$237	£190



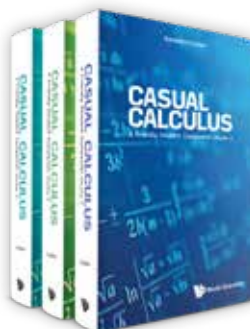
Casual Calculus: A Friendly Student Companion (In 3 Volumes)

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, it contains exposition on each topic, with an introduction, rationale, train of thought, and solved examples with accompanying suggested exercises. Exercises are structured in three sets to force multiple encounters with each topic. Solved examples in the text are accompanied by "You Try It" problems, then there are "Practice Problems". Finally, each section has Challenge Problems — these lean to being equally or a bit more difficult than the others.

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

1764pp	Oct 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



Special Techniques for Solving Integrals

Examples and Problems

by **Khristo N Boyadzhiev** (Ohio Northern University, USA)

This volume contains techniques of integration which are not found in standard calculus and advanced calculus books. It can be considered as a map to explore many classical approaches to evaluate integrals. It is intended for students and professionals who need to solve integrals or like to solve integrals and yearn to learn more about the various methods they could apply.

The volume contains numerous solved examples and problems for the reader.

Readership: Graduate and undergraduate students, professors and researchers in mathematics related to calculus, advanced calculus, mathematical analysis, real analysis, and mathematical physics; physics, and engineering.

400pp	Dec 2021	
978-981-123-625-9(pbk)	US\$58	£50
978-981-123-575-7	US\$98	£85
978-981-123-576-4(ebook)	US\$157	£135



Problems and Solutions in Banach Spaces, Hilbert Spaces, Fourier Transform, Wavelets, Generalized Functions and Quantum Mechanics

by **Willi-Hans Steeb** (University of Johannesburg, South Africa) & **Wolfgang Mathis** (Leibniz Universität Hannover, Germany)

This book presents a collection of problems and solutions in functional analysis with applications to quantum mechanics. Emphasis is given to Banach spaces, Hilbert spaces and generalized functions.

The material of this volume is self-contained, whereby each chapter comprises an introduction with the relevant notations, definitions, and theorems. The approach in this volume is to provide students with instructive problems along with problem-solving strategies. Programming problems with solutions are also included.

Key Features

- Summarizes the different topics in Functional Analysis with applications to Quantum Theory
- Further includes Supplementary Problems and Programming Problems with Solutions

Readership: Advanced undergraduate, graduate and post-graduate students in mathematics and theoretical physics. The book is also suitable for those taking courses in functional analysis and quantum theory.

452pp	Sep 2022	
978-981-124-683-8(pbk)	US\$68	£60
978-981-124-572-5	US\$138	£120
978-981-124-573-2(ebook)	US\$221	£175



Lectures in Nonlinear Functional Analysis

Synopsis of Lectures Given at the Faculty of Physics of Lomonosov Moscow State University

by **Maxim O Korpusov**, **Alexey V Ovchinnikov** & **Alexander A Panin** (Lomonosov Moscow State University, Russia)

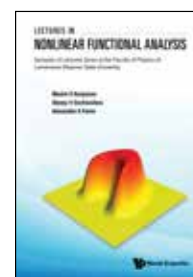
This book is a systematic presentation of basic notions, facts, and ideas of nonlinear functional analysis and their applications to nonlinear partial differential equations.

Key Features

- In this book, the most famous methods of nonlinear analysis and its applications 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
- The presentation of the material is closed and accompanied by a large number of examples; this makes it easier to understand the material and for beginners to quickly enter into the circle of ideas discussed

Readership: For graduate and postgraduate students specialized in functional analysis, nonlinear partial differential equations, and mathematical physics. It is also useful for mathematicians and physicists working in these and related areas. The volume of the book corresponds to an annual lecture course.

376pp	Feb 2022	
978-981-124-892-4	US\$128	£115
978-981-124-893-1(ebook)	US\$205	£185



MATHEMATICAL PHYSICS & RELATED TOPICS

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**

Mathematics is the 'queen of all sciences', but students encounter many obstacles in learning the subject — familiarization with the proofs of hundreds of theorems, mysterious symbols, and technical routines for which the usefulness is not obvious upfront. Those interested in the physical sciences could lose motivation, not seeing the wood for the trees. This book is an attempt to engage these learners, presenting mathematical methods in simple terms, with more of an emphasis on skills as opposed to technical knowledge. Based on intuition and common sense rather than mathematical rigor, it teaches students from scratch using pertinent examples, many taken across the physical sciences.

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.

750pp	Dec 2022	
978-1-80061-279-2	US\$168	£135
978-1-80061-297-6(pbk)	US\$98	£80
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.

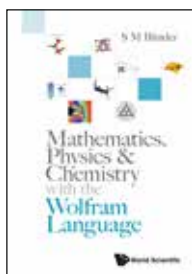
Readership: Advanced undergraduate and graduate students, physicists, astrophysicists and mathematicians interested in nonlinear field theories.

320pp	Jun 2023	
978-981-126-411-5	US\$118	£105
978-981-126-412-2(ebook)	US\$189	£165

Mathematics, Physics & Chemistry with the Wolfram Language

by **S M Blinder** (University of Michigan, USA & Wolfram Research, USA)

"This book will be of great help for instructors teaching math, physics and chemistry classes. While the topics covered can be found in other textbooks, the uniqueness of this book lies in translating them into interactive Mathematica code. This makes it possible for students and instructors to interact with the problem dynamically in a manner that is not possible when using more traditional graphical aids.

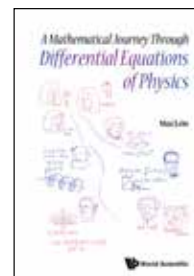


Eitan Geva
Professor, University of Michigan, USA

The Wolfram language is the programming language of Mathematica, used increasingly by scientists due to its ease of learning and user-friendliness. This book focuses on applications of the Wolfram language to applied mathematics, physics and chemistry.

444pp	Mar 2022	
978-981-124-718-7	US\$148	£120
978-981-124-719-4(ebook)	US\$237	£190

A Mathematical Journey Through Differential Equations of Physics

by **Max Lein** (Tohoku University, Japan)

Mathematics is the language of physics, and over time physicists have developed their own dialect. The main purpose of this book is to bridge this language barrier, and introduce the readers to the beauty of mathematical physics. Rather than focussing on a particular topic, the book showcases conceptual and mathematical commonalities across different physical theories. It translates physical problems to concrete mathematical questions, shows how to answer them and explains how to interpret the answers physically. The book alternates between mathematics- and physics-centric chapters, and includes plenty of concrete examples from physics throughout as well as 76 exercises with solutions.

Readership: Advanced undergraduate and graduate students. Instructors can use it to design a comprehensive course on differential equations after paring down some of the material.

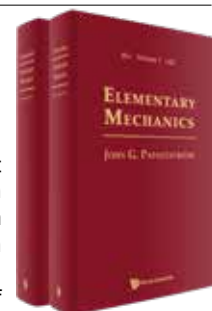
440pp	Oct 2022	
978-981-122-766-0(pbk)	US\$68	£60
978-981-122-537-6	US\$118	£105
978-981-122-538-3(ebook)	US\$189	£150

Elementary Mechanics

(In 2 Volumes)

by **John G Papastavridis**

(Georgia Institute of Technology, USA)



This is a comprehensive and state-of-the-art compendium of classical or Newtonian (non relativistic and non quantum) mechanics from an advanced and unified viewpoint, namely, from the continuum, or field, form of the fundamental principles of linear and angular momentum of Euler, Cauchy, Hamel et al. The title adjective "elementary" simply means no Lagrangean and no Hamiltonian theories and methods. Yet, in spite of its high level, this extensive work of more than 1450 dense pages of text, and more than 350 pages of galleries is eminently readable and inclusive. The overall style is informal, all ahistorical and intuition-deadening jargon and formalisms ("epsilonics") have been intentionally avoided. The mathematics, typically an Achilles heel of modern mechanics books, especially those in applied or multi-body mechanics, has been kept to the simplest necessary for a work of this level and scope.

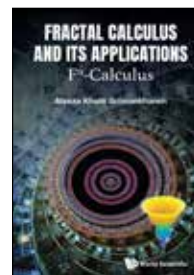
Readership: Teachers, and Researchers.

1680pp	Dec 2022	
978-981-4603-04-1(Set)	US\$384	£319
978-981-4603-05-8(Set)(ebook)	US\$614	£490

Fractal Calculus and its Applications

F^α-Calculusby **Alireza Khalili Golmankhaneh**

(Islamic Azad University, Iran)



Fractal calculus is the simple, constructive, and algorithmic approach to natural processes modeling using fractals that was impossible for smooth differentiable structure and usual modeling tools. It is the calculus of the future and will have many applications. This book is the first to introduce fractal calculus and provide a basis for research and development of this framework.

Readership: Undergraduate and graduate students in mathematics and physics who has mastered general mathematics, quantum physics, and statistical mechanics; researchers dealing with fractal structures in various disciplines

300pp	Sep 2022	
978-981-126-110-7	US\$118	£95
978-981-126-111-4(ebook)	US\$189	£150

Algebraic Bethe Ansatz and Correlation Functions

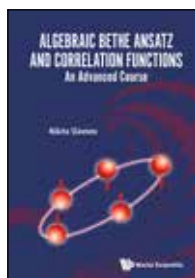
An Advanced Course

by **Nikita Slavnov** (*Steklov Mathematical Institute, Russia*)

This book presents the state-of-the-art research in the field of algebraic Bethe ansatz. Along with the results that have already become classic, the book also contains the results obtained in recent years. The reader will get acquainted with the solution of the spectral problem and more complex problems that are solved using this method. Various methods for calculating scalar products and form factors are described in detail. Special attention is paid to applying the algebraic Bethe ansatz to the calculation of the correlation functions of quantum integrable models. The book also elaborates on multiple integral representations for correlation functions and examples of calculating the long-distance asymptotics of correlations.

Readership: Advanced undergraduate and graduate students, researchers in mathematical physics and theoretical physics.

400pp	Jun 2022	
978-981-125-425-3	US\$148	£120
978-981-125-426-0(ebook)	US\$237	£190



Differential Equations and Their Applications

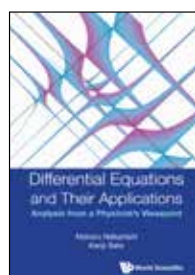
Analysis from a Physicist's Viewpoint

by **Noboru Nakanishi** (*Kyoto University, Japan*) & **Kenji Seto** (*Hokkai-Gakuen University, Japan*)

This book consists of two parts. Part I presents the theory of analysis in which the mathematical theory is described not as an accomplished palace, but as a building under construction. It uncovers how a theory has been or is being constructed. In Part II, the theory of differential equations is applied to interesting practical problems, such as pursuit-line and tractrix, attack on an object from an airplane, an insect crawling along a stretching rubber rod, the SIR model of a virus infection, string vibration, circular membrane vibration, as well as the wind ripple, sand dune and wave phenomena on a highway.

Readership: Undergraduate students, postgraduate students and researchers interested in the theory and applications of differential equations in mathematics and the natural sciences.

396pp	Jun 2022	
978-981-124-745-3	US\$98	£80
978-981-124-746-0(ebook)	US\$167	£135



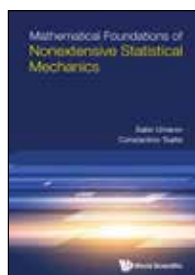
Mathematical Foundations of Nonextensive Statistical Mechanics

by **Sabir Umarov** (*University of New Haven, USA*) & **Constantino Tsallis** (*Centro Brasileiro de Pesquisas Fisicas, Brazil*)

The book is devoted to the mathematical foundations of nonextensive statistical mechanics. This is the first book containing the systematic presentation of the mathematical theory and concepts related to nonextensive statistical mechanics, a current generalization of Boltzmann-Gibbs statistical mechanics introduced in 1988 by one of the authors and based on a nonadditive entropic functional extending the usual Boltzmann-Gibbs-von Neumann-Shannon entropy. Main mathematical tools like the q-exponential function, q-Gaussian distribution, q-Fourier transform, q-central limit theorems, and other related objects are discussed rigorously with detailed mathematical rational.

Readership: Advanced undergraduate and graduate students, researchers, and practitioners in the fields of probability theory, statistical mechanics, dynamical systems, mathematical modeling, and financial mathematics.

336pp	Apr 2022	
978-981-124-515-2	US\$118	£105
978-981-124-516-9(ebook)	US\$189	£170



Analytic Hyperbolic Geometry and Albert Einstein's Special Theory of Relativity

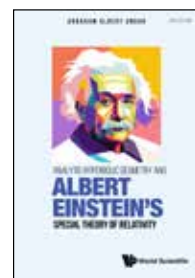
(2nd Edition)

by **Abraham Albert Ungar** (*North Dakota State University, USA*)

This book presents a powerful way to study Einstein's special theory of relativity and its underlying hyperbolic geometry in which analogies with classical results form the right tool. The book also presents, for the first time, the relativistic center of mass of an isolated system of noninteracting particles that coincided at some initial time $t = 0$. It turns out that the invariant mass of the relativistic center of mass of an expanding system (like galaxies) exceeds the sum of the masses of its constituent particles. This excess of mass suggests a viable mechanism for the formation of dark matter in the universe, which has not been detected but is needed to gravitationally "glue" each galaxy in the universe.

Readership: The book is structured so it can be enjoyed equally by undergraduates, graduate students, researchers and academics in geometry, algebra, mathematical physics, theoretical physics and astronomy.

776pp	Mar 2022	
978-981-124-410-0	US\$198	£175
978-981-124-411-7(ebook)	US\$317	£280



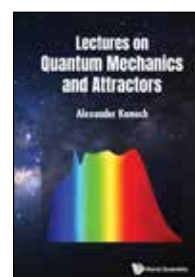
Lectures on Quantum Mechanics and Attractors

by **Alexander Komech** (*Russian Academy of Sciences, Russia*)

This book gives a concise introduction to Quantum Mechanics with a systematic, coherent, and in-depth explanation of related mathematical methods from the scattering theory and the theory of Partial Differential Equations. The book utilizes elementary mathematical derivations. Key topics include the Schrödinger, Pauli, and Dirac equations, the corresponding conservation laws, spin, the hydrogen spectrum, and the Zeeman effect, scattering of light and particles, photoelectric effect, electron diffraction, and relations of quantum postulates with attractors of nonlinear Hamiltonian PDEs.

Readership: Discipline/profession: Physics and Mathematics. Sector: university, academia and industry. Level: Graduate students and advanced undergraduate students physicists, chemists and mathematicians, lecturers in Quantum Mechanics.

272pp	Mar 2022	
978-981-124-889-4	US\$88	£75
978-981-124-890-0(ebook)	US\$141	£120



Slowly Varying Oscillations and Waves

From Basics to Modernity

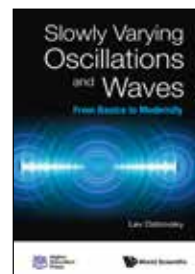
by **Lev Ostrovsky** (*University of Colorado, Boulder, USA*)

This book describes a variety of problems associated with oscillations and waves with slowly varying parameters. Among them the nonlinear and parametric resonances, self-synchronization, attenuated and amplified solitons, self-focusing and self-modulation, and reaction-diffusion systems. For oscillators, the physical examples include the van der Pol oscillator and a pendulum, models of a laser. For waves, examples are taken from oceanography, nonlinear optics, acoustics, and biophysics.

Key Feature: The book is unique in that it covers a broad range of problems related to linear and nonlinear oscillators and waves, from simplified approximations to various applications to more consistent mathematical schemes.

Readership: Advanced undergraduate, graduate students, researchers

372pp	May 2022	
978-981-124-748-4	US\$128	£115
978-981-124-749-1(ebook)	US\$205	£185



The Mathematics of Open Quantum Systems

Dissipative and Non-Unitary Representations and Quantum Measurements

by **Konstantin A. Makarov** (University of Missouri, USA) & **Eduard Tsekanovskii** (Niagara University, USA)

In the first part of the book, the uniqueness theorems for the solutions to the restricted Weyl commutation relations braiding unitary groups and semi-groups of contractions are discussed. The second part of the book is devoted to mathematical problems of the quantum measurements under continuous monitoring.

Key Feature: The book provides a comprehensive description of simplest symmetric and dissipative solutions to Canonical Commutation Relations of Quantum Mechanics on metric graphs with applications to Quantum Measurement Theory.

Readership: Graduates and Researchers.

300pp	Feb 2022	
978-981-124-122-2	US\$98	£85
978-981-124-123-9(ebook)	US\$157	£135



A Mathematical Introduction to General Relativity

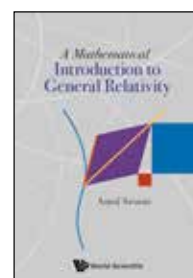
by **Amol Sasane** (London School of Economics, UK)

"The book can be used as a textbook for a course on either differential geometry or general relativity (or both) for undergraduate or beginning graduate mathematics or physics students, and is also well suited for autonomous study ... This book is a valuable addition to the general relativity literature for mathematicians, and one which I highly recommend."

EMS Magazine

Readership: Advanced undergraduate and beginning graduate students in Mathematics and Physics.

500pp	Aug 2021	
978-981-125-672-1(pbk)	US\$78	£60
978-981-124-377-6	US\$158	£140
978-981-124-378-3(ebook)	US\$253	£225



An Introduction to the Lattice Boltzmann Method

A Numerical Method for Complex Boundary and Moving Boundary Flows
by **Takaji Inamuro** (Kyoto University, Japan), **Masato Yoshino** (Shinshu University, Japan) & **Kosuke Suzuki** (Shinshu University, Japan)

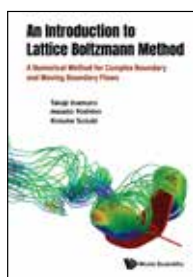
The book introduces the fundamentals and applications of the lattice Boltzmann method (LBM) for incompressible viscous flows.

Key Features

- The relation between the LBM and the Navier-Stokes equation is derived by using the asymptotic expansion with a diffusive time scale (the authors' original work).
- The LKS (authors' original work) is an extension method of the LBM and needs no velocity distribution functions. Also, an improved LKS can stably simulate high Reynolds number flows
- The IB-LBM (authors' original work) is useful for simulations of moving boundary flows. For numerical examples, free flight simulations of butterfly-like and dragonfly-like flapping wing-body models are illustrated

Readership: Advanced undergraduate and graduate students, researchers and practitioners.

168pp	Dec 2021	
978-981-124-051-5	US\$58	£45
978-981-124-052-2(ebook)	US\$98	£80



Mathematical Feynman Path Integrals and Their Applications

(2nd Edition)

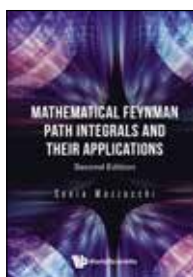
by **Sonia Mazzucchi** (University of Trento, Italy)

Reviews of the First Edition:

"This book is written clearly, with great detail, and is accessible to graduate students and researchers alike." **Zentralblatt MATH**

This second edition presents a detailed discussion of the general theory of complex integration on infinite dimensional spaces, providing on one hand a unified view of the various existing approaches to the mathematical construction of Feynman path integrals and on the other hand a connection with the classical theory of stochastic processes. This book bridges between the realms of stochastic analysis and the theory of Feynman path integration. It is accessible to both mathematicians and physicists.

360pp	Dec 2021	
978-981-121-478-3	US\$88	£70
978-981-121-479-0(ebook)	US\$141	£110



Series on Knots and Everything - Vol 67

On Complementarity

A Universal Organizing Principle
by **Jack Avrin**

This book arose as an outgrowth of the author's previous book entitled "Knots, Braids and Moebius Strips," published in 2015. At that point, the possibility of an even wider utilization of that expression of Complementarity arose. The current book, features Complementarity, in which the matrix algebra is extended to characterize not only DNA itself but the well-known process of its replication, a most gratifying outcome. The book then goes on to explore Complementarity, with and without its matrix expression, as it occurs, not only in much of physics but in its extension to cosmology as well.

Readership: Undergraduate and graduate students in Mathematics and Physics.

280pp	Aug 2021	
978-981-3278-97-4	US\$88	£75
978-981-3278-98-1(ebook)	US\$141	£120



Fractals and Dynamics in Mathematics, Science, and the Arts: Theory and Applications - Vol 4

Quantized Number Theory, Fractal Strings and the Riemann Hypothesis

From Spectral Operators to Phase Transitions and Universality

by **Hafedh Herichi** (Santa Monica College, USA) & **Michel L. Lapidus** (University of California, Riverside, USA)

One of the main themes of the book is to provide a rigorous framework within which the corresponding question "Can one hear the shape of a fractal string?" or, equivalently, "Can one obtain information about the geometry of a fractal string, given its spectrum?" can be further reformulated in terms of the invertibility or the quasi-invertibility of the spectral operator.

Furthermore, the authors provide a 'quantum analog' of Voronin's classical theorem about the universality of the Riemann zeta function. Moreover, they obtain and study quantized counterparts of the Dirichlet series and of the Euler product for the Riemann zeta function, which are shown to converge (in a suitable sense) even inside the critical strip.

Readership: Researchers in fractal geometry, analysis and differential equations, complex analysis, harmonic analysis, operator theory, spectral theory, mathematical physics, algebra and number theory.

496pp	Aug 2021	
978-981-3230-79-8	US\$148	£130
978-981-3230-80-4(ebook)	US\$237	£210

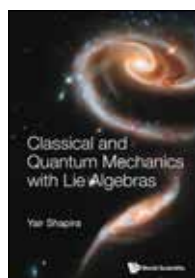


Classical and Quantum Mechanics with Lie Algebras

by **Yair Shapira** (*Technion - Israel Institute of Technology, Israel*)

How to see physics in its full picture? This book offers a new approach: start from math, in its simple and elegant tools: discrete math, geometry, and algebra, avoiding heavy analysis that might obscure the true picture. This will get you ready to master a few fundamental topics in physics: from Newtonian mechanics, through relativity, towards quantum mechanics. Each chapter ends with a lot of relevant exercises. The exercises are an integral part of the chapter: they teach new material and are followed by complete solutions. This is a new pedagogical style: the reader takes an active part in discovering the new material, step by step, exercise by exercise.

712pp	Aug 2021		
978-981-124-145-1(pbk)	US\$78	£70	
978-981-124-005-8	US\$178	£155	
978-981-124-006-5(ebook)	US\$285	£250	



Series on Advances in Mathematics for Applied Sciences - Vol 90

Advanced Mathematical and Computational Tools in Metrology and Testing XII

edited by **F Pavese** (*IMEKO TC21, Italy*),
A B Forbes (*National Physical Laboratory, UK*),
N F Zhang (*National Institute of Standards and Technology, USA*) & **A G Chunovkina** (*Institute for Metrology "D I Mendeleyev", Russia*)

This volume contains original, refereed contributions by researchers from national metrology institutes, universities and laboratories across the world involved in metrology and testing. The papers cover topics in numerical analysis and computational tools, statistical inference, regression, calibration and metrological traceability, computer science and data provenance, and describe applications in a wide range of application domains. Description of state-of-the-art techniques for modeling measurement systems and analyzing measurement data.

Readership: Researchers, graduate students, academics and quality engineers working in metrology and its applications to manufacturing, environment, health and life sciences.

548pp	Feb 2022		
978-981-124-237-3	US\$178	£155	
978-981-124-238-0(ebook)	US\$285	£250	



The Collected Works of Anatole Katok

(In 2 Volumes)

edited by **Svetlana Katok** (*The Pennsylvania State University, USA*),
Bassam Fayad (*Institut de Mathématiques de Jussieu-Paris Rive Gauche, France*), **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*)

These volumes collect most of the papers of Anatole Katok, one of the founders of the modern theory of dynamical systems. Katok's work reflects half a century of research in mathematics and includes ergodic theory, hyperbolic, elliptic, and parabolic smooth dynamics, as well as higher-rank actions. Katok's papers cover an extremely broad range of topics in dynamics, and they contain many seminal contributions that had great impact on later developments and are now widely recognized as classical.



2000pp	Oct 2022		
978-981-123-806-2(Set)	US\$480	£420	
978-981-123-807-9(Set)(ebook)	US\$768	£615	

NUMERICAL ANALYSIS & APPROXIMATION

Functional Distribution of Anomalous and Nonergodic Diffusion

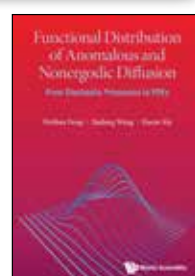
From Stochastic Processes to PDEs

by **Weihua Deng** (*Lanzhou University, China*),
Xudong Wang (*Nanjing University of Science and Technology, China*) & **Daxin Nie** (*Lanzhou University, China*)

This volume presents a pedagogical review of the functional distribution of anomalous and nonergodic diffusion and its numerical simulations, starting from the studied stochastic processes to the deterministic partial differential equations governing the probability density function of the functionals. In recent decades, anomalous and nonergodic diffusions which are non-Brownian become topical issues, such as fractional Brownian motion, Lévy process, Lévy walk, among others. This volume examines the statistical properties of the non-Brownian functionals, derives the governing equations of their distributions, and shows some algorithms for solving these equations numerically.

Readership: Graduate, postgraduate students, as well as researchers.

260pp	Jul 2022		
978-981-125-049-1	US\$98	£85	
978-981-125-050-7(ebook)	US\$157	£125	



Essential Textbook

Explorations in Numerical Analysis

Python Edition

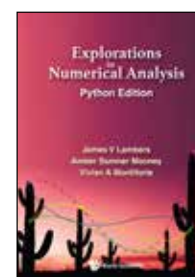
by **James V Lambers** (*The University of Southern Mississippi, USA*),
Amber Sumner Mooney (*William Carey University, USA*) & **Vivian A Montiforte** (*The University of Southern Mississippi, USA*)

This textbook is intended to introduce advanced undergraduate and early-career graduate students to the field of numerical analysis. This field pertains to the design, analysis, and implementation of algorithms for the approximate solution of mathematical problems that arise in applications spanning science and engineering, and are not practical to solve using analytical techniques such as those taught in courses in calculus, linear algebra or differential equations.

This text is suitable for a year-long sequence in numerical analysis, and can also be used for a one-semester course in numerical linear algebra.

Readership: Advanced undergraduate or beginning graduate students.

692pp	Jan 2021		
978-981-122-934-3(pbk)	US\$68	£60	
978-981-122-793-6	US\$148	£130	
978-981-122-794-3(ebook)	US\$237	£210	



PROBABILITY & STATISTICS

Essential Textbook

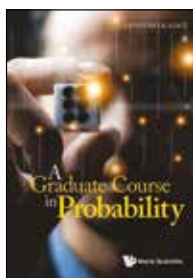
A Graduate Course in Probability

by Liviu I Nicolaescu (University of Notre Dame, USA)

This book grew out of the notes for a one-semester basic graduate course in probability. The book covers the topics that are part of the culture of an aspiring probabilist and it is guided by the author's personal belief that probability was and is a theory driven by examples. The examples form the main attraction of this subject. For this reason, a large book is devoted to an eclectic collection of examples, from classical to modern, from mainstream to "exotic". The text is complemented by nearly 200 exercises, quite a few nontrivial, but all meant to enhance comprehension and enlarge the reader's horizons.

Readership: Graduate students, advanced undergraduates, mathematicians. Suitable for a first year graduate course in probability.

500pp	Oct 2022	
978-981-125-508-3	US\$118	£95
978-981-125-509-0(ebook)	US\$189	£150

**How to Cheat with Statistics — and Get Away with It**

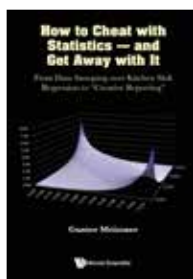
From Data Snooping over Kitchen Sink Regression to "Creative Reporting" by Gunter Meissner (University of Hawaii, USA)

"Dr Meissner does a great job to tell us how to detect right statistics from wrong statistics and explains in simple and intuitive language how to catch 'statistics cheaters' even though the book title suggests the opposite. I would recommend this book to everyone who wants to understand critical statistical concepts and who wants to catch malevolent statisticians."

David Li, PhD in Statistics
Chinese Academy for Financial Research
Shanghai Advanced Institute of Finance

The author came across many weaknesses and flaws in statistics through 30 years of teaching. These weaknesses allow a malevolent researcher to manipulate the inputs, the calculations, and the reporting of results to derive a desired outcome. In addition, the book comes with 18 Excel spreadsheets and 7 Python codes. There are also questions and problems at the end of each chapter. Answers to the questions and problems are available to instructors.

160pp	Sep 2022	
978-981-125-248-8(pbk)	US\$28	£20
978-981-125-171-9	US\$58	£45
978-981-125-172-6(ebook)	US\$98	£80

**Anisotropic Scaling of Random Fields with Long-Range Dependence**

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

In the case of a random field indexed by two-dimensional parameter, both types of scaling can be anisotropic, meaning that the horizontal and vertical axes are scaled at different rate determined by the ratio $\gamma > 0$ of the scaling exponents along the axes. The natural questions under such scaling are whether the scaling limits exist for any $\gamma > 0$, and what are these limits are. The book tries to answer these questions. It introduces the concept of scaling transition and discusses its existence for a natural class of planar random fields including Gaussian, linear and some nonlinear ones. The scaling limits are identified and exhibit a surprising trichotomy at a critical point γ_0 , with 'unbalanced' limits having unusual path properties and dependence structure along one of the coordinate axes.

280pp	Jan 2023	
978-981-124-941-9	US\$98	£85
978-981-124-942-6(ebook)	US\$157	£125

Stochastic Partial Differential Equations with Additive Gaussian Noise

Analysis and Inference

by Ciprian A Tudor (University of Lille, France)

The stochastic partial differential equations (SPDEs) arise in many applications of the probability theory. This monograph will focus on two particular (and probably the most known) equations: the stochastic heat equation and the stochastic wave equation. The focus is on the relationship between the solutions to the SPDEs and the fractional Brownian motion (and related processes). An important point of the analysis is the study of the asymptotic behavior of the p-variations of the solutions to the heat or wave equations driven by space-time Gaussian noise or by a Gaussian noise with a non-trivial correlation in space.

Readership: Undergraduate, graduate students and researchers working in various areas of probability theory and mathematical statistics.

200pp	Nov 2022	
978-981-126-445-0	US\$88	£75
978-981-126-446-7(ebook)	US\$141	£125

World Scientific Series on Probability Theory and Its Applications - Vol 4

Stationary Stochastic Models

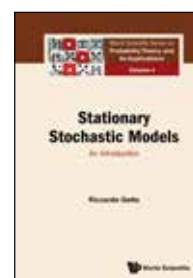
An Introduction

by Riccardo Gatto (University of Bern, Switzerland)

This volume provides a unified mathematical introduction to stationary time series models and to continuous time stationary stochastic processes. The analysis of these stationary models is carried out in time domain and in frequency domain. It begins with a practical discussion on stationarity, by which practical methods for obtaining stationary data are described. At the end, some selected topics such as stationary random fields, simulation of Gaussian stationary processes and results of information theory are presented. A detailed appendix containing complementary materials will assist the reader with many technical aspects of the book.

Readership: Upper-level undergraduate and graduate students, for lectures on time series or on stochastic processes with continuous time. Researchers in academia and applied scientists in the industry, in the field of time series or stationary processes.

416pp	Jul 2022	
978-981-125-183-2	US\$138	£110
978-981-125-184-9(ebook)	US\$221	£175



Essential Textbook

An Introduction to Probability

MATHEMATICA®

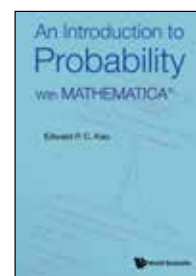
by Edward P C Kao (University of Houston, USA)

The main objective of this text is to facilitate a student's smooth learning transition from a course on probability to its applications in various areas. To achieve this goal, students are encouraged to experiment numerically with problems requiring computer solutions.

Key Features

- Uses MATHEMATICA® as vehicle for experimenting with probability and its applications as opposed to an expository medium for pedagogical purposes
- Places more emphases on applications in various areas — particularly in financial mathematics and data analysis
- Includes transform methods as a staple for working with random variables

392pp	May 2022	
978-981-124-678-4(pbk)	US\$58	£45
978-981-124-543-5	US\$138	£110
978-981-124-544-2(ebook)	US\$236	£190



Essential Textbook

World Scientific Series on Probability Theory and Its Applications - Vol 3

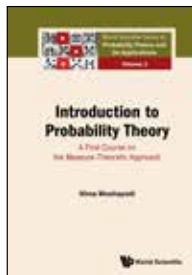
Introduction to Probability Theory

A First Course on the Measure-Theoretic Approach
by **Nima Moshayedi** (*University of California, Berkeley, USA*)

This book provides a first introduction to the methods of probability theory by using the modern and rigorous techniques of measure theory and functional analysis. It is geared for undergraduate students, mainly in mathematics and physics majors, but also for other subject areas. The first part of the book gives a basic introduction to probability theory. It explains the notions of random events and random variables, probability measures, expectation values, distributions, characteristic functions, independence of random variables, as well as different types of convergence and limit theorems. The second part is devoted to some more sophisticated methods such as conditional expectations, martingales and Markov chains. These notions will be fairly accessible after reading the first part.

Readership: Undergraduate students in mathematics and physics majors, particularly those taking any first course in probability theory. Undergraduate students in economy, finance, engineering or any other subject that includes probability theory in the curriculum (e.g., biology, chemistry).

292pp	Apr 2022	
978-981-124-674-6	US\$88	£70
978-981-124-335-6(ebook)	US\$141	£110



Series on Multivariate Analysis - Vol 13

Hilbert and Banach Space-Valued Stochastic Processes

by **Yüichirō Kakiyama** (*California State University, San Bernardino, USA*)

This is a development of the book entitled Multidimensional Second Order Stochastic Processes. It provides a research expository treatment of infinite-dimensional stationary and nonstationary stochastic processes or time series, based on Hilbert and Banach space-valued second order random variables. Stochastic measures and scalar or operator bimeasures are fully discussed to develop integral representations of various classes of nonstationary processes such as harmonizable, V-bounded, Cramér and Karhunen classes as well as the stationary class. A new type of the Radon–Nikodým derivative of a Banach space-valued measure is introduced, together with Schauder basic measures, to study uniformly bounded linearly stationary processes.

Readership: Graduate students in mathematics, probabilists, statisticians, functional analysts, communication engineers and physicists.

540pp	Aug 2021	
978-981-121-174-4	US\$168	£150
978-981-121-175-1(ebook)	US\$269	£240



Essential Book in Math Economics

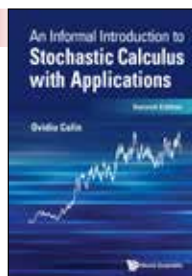
An Informal Introduction to Stochastic Calculus with Applications (2nd Edition)

by **Ovidiu Calin** (*Eastern Michigan University, USA*)

The goal of this book is to present Stochastic Calculus at an introductory level and not at its maximum mathematical detail. The author's goal was to capture as much as possible the spirit of elementary deterministic Calculus, at which students have been already exposed. This edition contains several new features that improved the first edition both qualitatively and quantitatively. First, two more chapters have been added, Chapter 12 and Chapter 13, dealing with applications of stochastic processes in Electrochemistry and global optimization methods. This edition contains also a final chapter material containing 250 fully solved review problems and provides solutions, or at least valuable hints, to all proposed problems.

Readership: Advanced undergraduate and graduate level students in Science, Economics, and Business. It can be used by researchers and practitioners in both academia and industry.

512pp	Dec 2021	
978-981-124-756-9(pbk)	US\$78	£70
978-981-124-709-5	US\$158	£140
978-981-124-710-1(ebook)	US\$253	£225



Essential Textbook

Basic Probability

What Every Math Student Should Know
(2nd Edition)

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

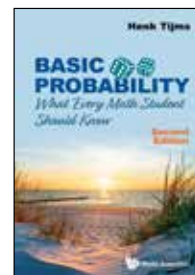
The second edition represents an ongoing effort to make probability accessible to students in a wide range of fields such as mathematics, statistics and data science, engineering, computer science, and business analytics.

While retaining its focus on basic probability, including Bayesian probability and the interface between probability and computer simulation, this edition's significant revisions are as follows:

- Many extra motivational examples and problems
- New material on Bayesian probability, including two famous court cases
- New sections on real-world applications of the Poisson distribution
- New sections on generating functions and the bivariate normal density
- New chapter on Markov chains, including Markov chain Monte Carlo simulation

Readership: Undergraduate students in fields such as mathematics, statistics and data science, engineering, computer science and business analytics. Graduate students in natural and social sciences. Students taking a first course in probability, or a course on probability for statistics and data science.

184pp	Jul 2021	
978-981-123-851-2(pbk)	US\$34	£30
978-981-123-749-2	US\$58	£50
978-981-123-750-8(ebook)	US\$98	£80



Inequalities in Analysis and Probability (3rd Edition)

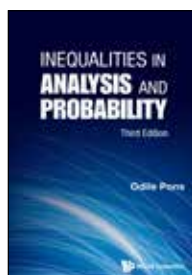
by **Odile Pons** (*National Institute for Agronomical Research, France*)

The book introduces classical inequalities in vector and functional spaces with applications to probability. It develops new analytical inequalities, with sharper bounds and generalizations to the sum or the supremum of random variables, to martingales, to transformed Brownian motions and diffusions, to Markov and point processes, renewal, branching and shock processes.

In this third edition, the inequalities for martingales are presented in two chapters for discrete and time-continuous local martingales with new results for the bound of the norms of a martingale by the norms of the predictable processes of its quadratic variations, for the norms of their supremum and their p -variations.

Readership: Advanced undergraduate and graduate students as well as researchers in probability and integration theory.

372pp	Nov 2021	
978-981-123-134-6	US\$128	£115
978-981-123-135-3(ebook)	US\$205	£185



MATHEMATICAL MODELLING & COMPUTATION

Essential Textbook

Science by Simulation

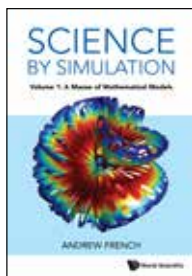
Volume 1: A Mezze of Mathematical Models
by **Andrew French** (Winchester College, UK)

A Mezze of Mathematical Methods is Volume 1 of *Science by Simulation*. It is a recipe book of mathematical models that can be enlivened by the transmutation of equations into computer code. In this volume, the examples chosen are an eclectic mix of systems and stories rooted in common experience, rather than those normally associated with constrained courses on Physics, Chemistry or Biology which are taught in isolation and susceptible to going out of date in a few years.

Rather than a 'what' of Science, this book is aimed at the 'how', readily applied to projects by students and professionals.

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.

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



Climate, Chaos and COVID

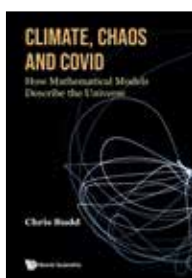
How Mathematical Models Describe the Universe

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

Mathematical models are very much in the news now, as they are used to make decisions about our response to such vital areas as COVID-19 and climate change. By explaining technical mathematical concepts in a way that everyone can understand and appreciate, *This book* sets the record straight and lifts the lid off the mystery of mathematical models. It shows why they work, how good they can be, the advantages and disadvantages of using them and how they make the modern world possible. The readers will be able to see the impact that the use of these models has on their lives, and will be able to appreciate both their power and their limitations.

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.

200pp	Nov 2022	
978-1-80061-304-1	US\$78	£60
978-1-80061-305-8(ebook)	US\$125	£100



Fractional Calculus and Waves in Linear Viscoelasticity

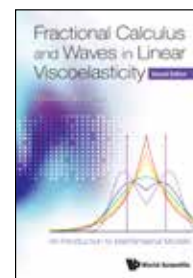
An Introduction to Mathematical Models
(2nd Edition)

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

This is a self-contained treatment of the mathematical theory of linear (uni-axial) viscoelasticity (constitutive equation and waves) with particular regard to models based on fractional calculus. It serves as a general introduction to the above-mentioned areas of mathematical modelling. The explanations in the book are detailed enough to capture the interest of the curious reader, and complete enough to provide the necessary background material needed to delve further into the subject and explore the research literature.

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

650pp	Sep 2022	
978-1-78326-398-1	US\$158	£140
978-1-78326-399-8(ebook)	US\$253	£200



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)

With the spread of COVID-19, Mathematical Biology has gained significant prominence not just among the scientific community but also population-wide. This volume is a collection of state-of-the-art research on this subject. Infectious diseases are highlighted in this volume with novel results on the Zika-dengue interactions, malaria-HIV interactions, and cholera, which in the last decade were the causes of problems in public health. Readers will find chapters that address novel mathematical techniques for studying infectious disease models, such as methods for deriving the basic reproduction numbers in reaction-diffusion epidemic models, and methods for studying epidemic models on networks.

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

600pp	Aug 2023	
978-981-124-912-9	US\$168	£150
978-981-124-913-6(ebook)	US\$269	£215

Introduction to Multiscale Mathematical Modeling

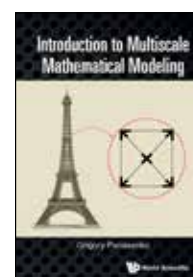
by **Grigory Panasenکو** (Vilnius University, Lithuania)

This book introduces the reader to multiscale mathematical modeling that starts from describing a physical process at the microscopic level, and is followed by the macroscopic description of that process. There are two preliminary chapters introducing the main equations of mathematical physics and serves as revision of all of the necessary mathematical notions needed to navigate the domain of multiscale research.

The author gives a rigorous presentation of the tools of mathematical modeling, as well as an evaluation of the errors of the method allowing readers to analyze the limitations and accuracy of the method.

Readership: Master and PhD students and researchers in mathematics, engineering and biomedical applications.

172pp	Jul 2022	
978-1-80061-231-0	US\$78	£60
978-1-80061-232-7(ebook)	US\$125	£100



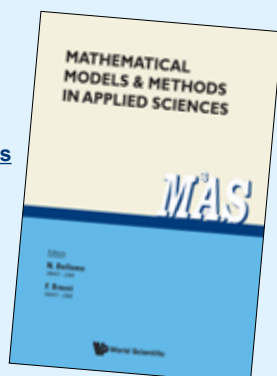
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Details on
page 40



MATHEMATICAL FINANCE & ECONOMICS

Mathematical Game Theory

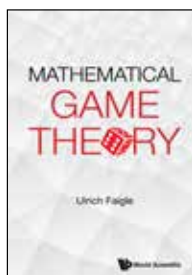
by **Ulrich Faigle** (University of Cologne, Germany)

This book takes a novel approach to the subject. Its focus is on mathematical models that apply to game theory in particular but exhibit a universal character and thus extend the scope of game theory considerably.

This textbook addresses anyone interested in a general game-theoretic view of the world. The reader should have mathematical knowledge at the level of a first course in real analysis and linear algebra. However, possibly more specialized aspects are further elaborated and pointers to relevant supplementary literature are given. Moreover, many examples invite the reader to participate "actively" when going through the material.

Readership: Advanced undergraduate and graduate students, researchers and practitioners in the fields of game theory, operations research, mathematical optimization, economics theory, system theory and mathematical modelling.

240pp	Mar 2022	
978-981-124-669-2	US\$78	£60
978-981-124-670-8(ebook)	US\$125	£95



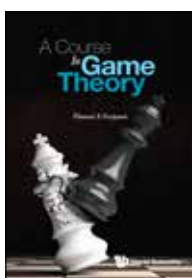
A Course in Game Theory

by **Thomas S Ferguson** (University of California, Los Angeles, USA)

Game theory is a fascinating subject. In this text, we present various mathematical models of games and study the phenomena that arise. In some cases, we will be able to suggest what courses of action should be taken by the players. In others, we hope simply to be able to understand what is happening in order to make better predictions about the future.

Readership: Students in mathematical economics / game theory / econometrics.

408pp	Aug 2020	
978-981-3227-34-7	US\$88	£75
978-981-3227-36-1(ebook)	US\$141	£120



Advanced Series on Statistical Science and Applied Probability - Vol 22

Stochastic Interest Rate Modeling with Fixed Income Derivative Pricing (3rd Edition)

by **Nicolas Privault** (Nanyang Technological University, Singapore)

This book introduces the mathematics of stochastic interest rate modeling and the pricing of related derivatives, based on a step-by-step presentation of concepts with a focus on explicit calculations. The types of interest rates considered range from short rates to forward rates such as LIBOR and swap rates, which are presented in the HJM and BGM frameworks. This third edition represents a significant update on the second edition. Most chapters have been reorganized and largely rewritten with additional details and supplementary solved exercises.

Key Features

- Includes many graphs and code illustrating the modeling of interest rates
- Each chapter is accompanied with exercises and solutions

Readership: Advanced undergraduate and graduate students in finance and actuarial science; researchers and practitioners involved in quantitative analysis of interest rate models.

372pp	Sep 2021	
978-981-122-660-1	US\$118	£105
978-981-122-661-8(ebook)	US\$189	£170



MATHEMATICAL BIOLOGY

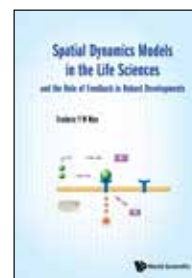
Spatial Dynamics Models in the Life Sciences and the Role of Feedback in Robust Developments

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

This volume starts with simple first order PDE and progresses through higher order equations and systems but with interesting applications, even at the level of a single first order PDE with constant coefficients. 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.

420pp	Nov 2022	
978-981-125-656-1	US\$128	£100
978-981-125-657-8(ebook)	US\$205	£165

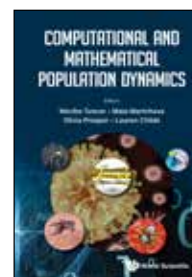


Computational and Mathematical Population Dynamics

edited by **Necibe Tuncer** (Florida Atlantic University, USA), **Maia Martcheva** (University of Florida, USA), **Olivia Prosper** (University of Tennessee, Knoxville, USA) & **Lauren Childs** (Virginia Technology, 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. The book further develops tools for fitting multi-scale models to multi-scale data and studying the practical identifiability of the parameters from multi-scale data.

414pp	Jan 2023	
978-981-126-302-6	US\$148	£120
978-981-126-303-3(ebook)	US\$237	£190

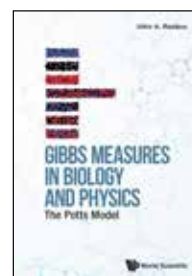


Gibbs Measures in Biology and Physics

The Potts Model
by **Utkir A Rozikov** (V I Romanovskiy Institute of Mathematics, Uzbekistan)

This book presents recently obtained mathematical results on Gibbs measures of the q -state Potts model on the integer lattice and on Cayley trees. It also illustrates many applications of the Potts model to real-world situations in biology, physics, financial engineering, medicine, and sociology. This book informs the reader about what has been (mathematically) done in the theory of Gibbs measures of the Potts model and the numerous applications of the Potts model. The main aim is to facilitate the readers (in mathematical biology, statistical physics, applied mathematics, probability and measure theory) to progress into an in-depth understanding by giving a systematic review of the theory of Gibbs measures of the Potts model and its applications.

368pp	Aug 2022	
978-981-125-123-8	US\$138	£120
978-981-125-124-5(ebook)	US\$221	£175



MATHEMATICAL LOGIC & FOUNDATION

Computability Theory and Foundations of Mathematics

Proceedings of the 9th International Conference on Computability Theory and Foundations of Mathematics
The 9th International Conference on Computability Theory and Foundations of Mathematics

Wuhan, China, 21 – 27 March 2019

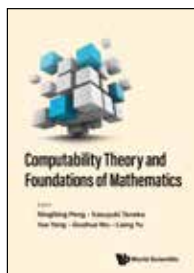
edited by **NingNing Peng** (Wuhan University of Technology, China), **Kazuyuki Tanaka** (Tohoku University, Japan), **Yue Yang** (National University of Singapore, Singapore), **Guohua Wu** (Nanyang Technological University, Singapore) & **Liang Yu** (Nanjing University, China)

This volume features the latest scientific developments in the fields of computability theory and logical foundations of mathematics as well as applications. The scope involves the topics of Computability Theory, Reverse Mathematics, Nonstandard Analysis, Proof Theory, Set Theory, Philosophy of Mathematics, Constructive Mathematics, Theory of Randomness and Computational Complexity Theory.

Key Feature: The contributors are prominent logicians and young leading researchers

Readership: Researchers in mathematical logic and foundation, and theoretical computer science.

196pp	Jun 2022	
978-981-125-928-9	US\$98	£80
978-981-125-929-6(ebook)	US\$157	£125

**Proof and Computation II**

From Proof Theory and Univalent Mathematics to Program Extraction and Verification

edited by **Klaus Mainzer** (Technische Universität München, Germany), **Peter Schuster** (Università degli Studi di Verona, Italy) & **Helmut Schwichtenberg** (Ludwig-Maximilians-Universität München, Germany)

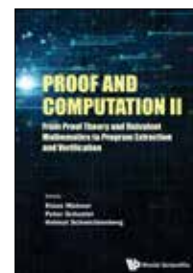
This book is for graduate students and researchers, introducing modern foundational research in mathematics, computer science, and philosophy from an interdisciplinary point of view. Its scope includes proof theory, constructive mathematics and type theory, univalent mathematics and point-free approaches to topology, extraction of certified programs from proofs, automated proofs in the automotive industry, as well as the philosophical and historical background of proof theory.

Key Features

- It makes emerging fields accessible to a wider audience, it will appeal to a broad readership with diverse backgrounds in Mathematics, Computer Science, and Philosophy
- It fills a gap between (under-)graduate level textbooks and state-of-the-art research papers

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

424pp	Aug 2021	
978-981-123-647-1	US\$148	£130
978-981-123-648-8(ebook)	US\$237	£210

**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)

The overall topic of the volume, Mathematics for Computation (M4C), is mathematics taking crucially into account the aspect of computation. This volume also investigates the interaction of mathematics with computation, bridging the gap between mathematics and computation wherever desirable and possible, and otherwise explaining why not.

The volume aims 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.

600pp	Feb 2023	
978-981-124-521-3	US\$198	£175
978-981-124-522-0(ebook)	US\$317	£255

Essential Textbook**Set Theory and Foundations of Mathematics: An Introduction to Mathematical Logic**

Volume II: Foundations of Mathematics
by **Douglas Cenzer** (University of Florida, USA), **Jean Larson** (University of Florida, USA), **Christopher Porter** (Drake University, USA) & **Jindřich Zapletal** (University of Florida, USA)

This book provides an introduction to mathematical logic and the foundations of mathematics. It will help prepare students for advanced study in set theory and mathematical logic as well as other areas of mathematics, such as analysis, topology, and algebra. The presentation of finite state and Turing machines leads to the Halting Problem and Gödel's Incompleteness Theorem, which have broad academic interest, particularly in computer science and philosophy.

Readership: Advanced undergraduate or beginning graduate students interested in mathematical logic, mathematics, computer science, and philosophy.

256pp	Mar 2022	
978-981-124-384-4	US\$68	£55
978-981-124-385-1(ebook)	US\$109	£90



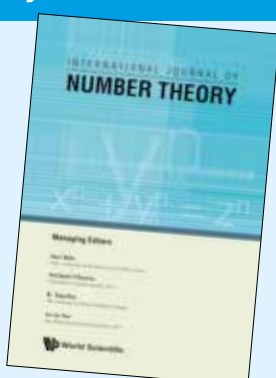
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page 38



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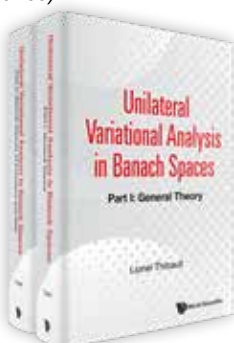
OPTIMIZATION & CONTROL

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. 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.



The second volume is devoted to special classes of non-smooth functions and sets. It expands the theory of subsmooth functions and sets, of semiconvex functions and multimappings, of primal lower regular functions, of singularities of non-smooth mappings, of prox-regular functions and sets in general spaces, of differentiability of projection mapping and others for prox-regular sets.

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

1600pp	Nov 2022	
978-981-125-816-9(Set)	US\$498	£400
978-981-125-817-6(Set)(ebook)	US\$797	£635

Shadows of the Circle

From Conic Sections to Planetary Motion (2nd Edition)

by **Vagn Lundsgaard Hansen** (Technical University of Denmark, Denmark)

In the second edition, the four chapters in the first edition on *conic sections* (two chapters), *isoperimetric problems for plane figures*, and *non-Euclidean geometry*, are treated in four revised chapters with many new exercises added. In three new chapters, the reader is taken through *mathematics in curves*, *mathematics in a Nautilus shell*, and *mathematics in the panorama of the heavens*. In all chapters of the book, the circle plays a prominent role.

Readership: Pure mathematicians; applied mathematicians; science educators; professionals from engineering and science, undergraduate and graduate students in mathematics and science;

224pp	Jan 2023	
978-981-126-092-6	US\$68	£55
978-981-126-096-4(ebook)	US\$109	£85

Series on Optimization and its Applications

Sparse Polynomial Optimization

Theory and Practice

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

Polynomial optimization heavily relies on the moment-sums of squares (moment-SOS) approach proposed by Lasserre, which provides certificates for positive polynomials. On the practical side, however, there is “no free lunch” and such optimization methods usually encompass severe scalability issues. 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 solves concretely large-scale instances.

Readership: Advanced undergraduates and graduate students, engineers, and researchers.

200pp	Mar 2023	
978-1-80061-294-5	US\$88	£70
978-1-80061-295-2(ebook)	US\$141	£110

Bestseller

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

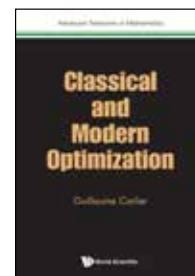
“This fantastic book is a must read for anyone eager to learn modern optimization, with a perfect blend of theory, algorithms and applications. It achieves the tour de force to convey deep mathematical insights on variational calculus and showcase illuminating practical cases.”

Gabriel Peyré, CNRS senior researcher and Professor
École Normale Supérieure de Paris

Key Feature: The book contains more than 200 exercises which may also be useful to anyone teaching a third/fourth year optimization class.

Readership: Research scientists, graduate students, advanced undergraduate students, policy-makers, research funding agencies, private research institutions, government regulators, investors, etc.

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



COMPUTER MATHEMATICS & SCIENCE

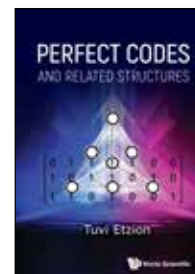
Perfect Codes and Related Structures

by **Tuvi Etzion** (Technion, Israel)

In this monograph, we develop the theory of one of the most fascinating topics in coding theory, namely, perfect codes and related structures. Perfect codes are considered to be the most beautiful structure in coding theory, at least from the mathematical side. The book develops the theory of these codes in various metrics — Hamming, Johnson, Lee, Grassmann, as well as in other spaces and metrics. It also covers other related structures such as diameter perfect codes, quasi-perfect codes, mixed codes, tilings, combinatorial designs, and more. The goal is to give the aspects of all these codes, to derive bounds on their sizes, and present various constructions for these codes.

Readership: Undergraduate and graduate students, researchers in coding theory and mathematicians interested in combinatorics and extremal combinatorics.

436pp	Apr 2022	
978-981-125-587-8	US\$148	£120
978-981-125-588-5(ebook)	US\$237	£190



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** (Princeton University, USA)

The book systematically introduces the basic contents of data science, including data preprocessing 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.

500pp	Nov 2022	
978-981-126-389-7	US\$148	£130
978-981-126-390-3(ebook)	US\$237	£210

World Scientific Series in Information Studies

The Logic of the Third

A Paradigm Shift to a Shared Future for Humanity

by **Wolfgang Hofkirchner** (*The Institute for a Global Sustainable Information Society, Austria*)

This book is a scientific basis for understanding the urgent need for a Great Transformation to a third step in social evolution. Already being a community of common destiny, humanity can form an actual unity through diversity to avoid extinction. This logic is the Logic of the Third — the Third is a meta-structure that emerges in a leap. The agents interact and when they co-act they are likely to form a real meta-structure of organisational relations. Informational agents anticipate this by generating requisite information in their attempt to cope with complex challenges. Such an information is a meta-structure too. The Third helps achieve synergy effects.

300pp	Sep 2022	
978-981-126-101-5	US\$98	£80
978-981-126-102-2(ebook)	US\$157	£125

Bestselling Essential Textbook**Operations Research**

Introduction to Models and Methods
by **Richard J Boucherie** (*University of Twente, The Netherlands*), **Aleida Braaksmā** (*University of Twente, The Netherlands*) & **Henk Tijms** (*Vrije University Amsterdam, The Netherlands*)



The book is well-written, provides a comprehensive review of the subject and is interesting for a quite number of disciplines. It is also useful for self-study and gives a good ground for further, more advanced studies. Any curious student will love this book. I highly recommend this book.

Dr Lodewijk Kallenberg, Professor Emeritus
Mathematical Institute, Leiden University, The Netherlands

The book covers the basic models in both deterministic and stochastic operations research and is a springboard to more specialized texts, either practical or theoretical. The emphasis is on useful models and interpreting the solutions in the context of concrete applications.

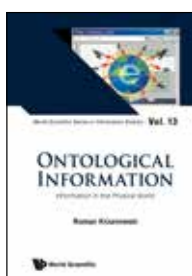
Readership: Undergraduate students in operations research, engineering, business analytics, mathematics, computer science, econometrics and quantitative economics.

512pp	Nov 2021	
978-981-123-981-6(pbk)	US\$60	£55
978-981-123-934-2	US\$158	£140
978-981-123-935-9(ebook)	US\$253	£225

World Scientific Series in Information Studies - Vol 13

Ontological Information

Information in the Physical World

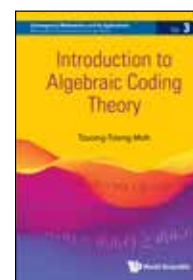
by **Roman Krzanowski** (*The Pontifical University of John Paul II, Poland*)

This book is about the nature of information. It touches on many core issues of philosophy of the mind, ontology, and epistemology, and draws in several domain-specific concepts from physics, mathematics, thermodynamics, computer science, and biology. The terms used in this book, such as the mind, a conscious agent, meaning, and knowledge are used with very precise meanings because they can be easily misinterpreted. A proper understanding of these terms can be gained from the referenced literature. But more specifically, this book is about the concept of information as physical phenomenon. The book provides the detailed analysis and synthesis of the current conceptualizations of information demonstrating the lack of common definition and their incompleteness.

Readership: Research Academic and private commercial institutes, graduate schools, Advanced undergraduate and graduate students, researchers and practitioners.

276pp	Jun 2022	
978-981-124-881-8	US\$88	£75
978-981-124-882-5(ebook)	US\$141	£115

Contemporary Mathematics and Its Applications:
Monographs, Expositions and Lecture Notes - Vol 3

Introduction to Algebraic Coding Theoryby **Tzuong-Tsieng Moh** (*Purdue University, USA*)

An expert in algebra and algebraic geometry, Tzuong-Tsieng Moh covers many essential aspects of algebraic coding theory in this book, such as elementary algebraic coding theories, the mathematical theory of vector spaces and linear algebras behind them, various rings and associated coding theories, a fast decoding method, useful parts of algebraic geometry and geometric coding theories.

Key Feature: Figuratively speaking; the author uses two colors, one for pure Mathematics (namely, Algebra and Algebraic Geometry), the other one for Engineering problems (namely, Coding Theory) to paint an elegant picture

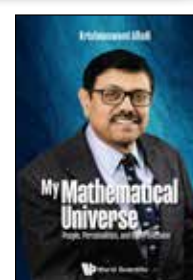
Readership: Advanced college students, graduate students.

268pp	Mar 2022	
978-981-122-096-8	US\$88	£75
978-981-122-097-5(ebook)	US\$141	£120

HISTORY OF MATHEMATICS**My Mathematical Universe**

People, Personalities, and the Profession
by **Krishnaswami Alladi** (*University of Florida, USA*)

Foreword written by **George Andrews**
(*National Academy of Sciences*)



"This is a richly detailed and fascinating account by one of the most influential mathematicians of our time, of the people he has known, the mathematics he has enjoyed, and the challenges he has encountered."

David M Bressoud, Macalester College, Minnesota
Former President of the Mathematical Association of America

"In the style of the hero, a prominent mathematician, and an ingenious writer, this autobiography is cheerful and colorful, gleeful and graceful, resourceful and respectful. The theme is beautifully laid out with unbelievable episodes and unforgettable snapshots of legendary figures and their fairy tales. One sees a vivid and edifying account of the east and the west. Given the exclusive background and the unique angle of the author, this autobiography is a kaleidoscope of the recent decades of mathematics - of the who, what, where, when and why."

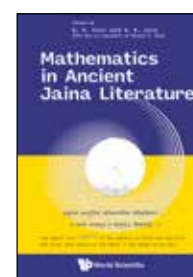
William Y C Chen

Director, Center for Applied Mathematics, and
Vice-President, Tianjin University, Tianjin, China

750pp	Apr 2023	
978-981-126-305-7	US\$98	£80
978-981-126-306-4(ebook)	US\$157	£125

Mathematics in Ancient Jaina Literature

edited by **S G Dani** (*University of Mumbai, India*)
& **S K Jain** (*Ohio University, USA*)



The volume contains selected articles presented in the ZOOM conference on History of Mathematics in Jain Literature. The main objective for the conference was to bring to the attention of historians in mathematics that there is a plenty of literature written by monks and scholars in Jain literature that contains elements of arithmetic, algebra and geometry, independent of discoveries by other cultures in the past. This is our hope that the present volume would fill up the gap on the lack of knowledge of past Jaina contributions.

250pp	Sep 2022	
978-981-125-549-6	US\$98	£80
978-981-125-550-2(ebook)	US\$157	£125

Problem Solving in Mathematics and Beyond - Vol 27

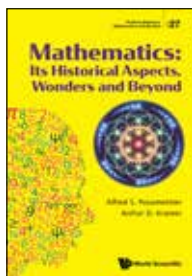
Mathematics: Its Historical Aspects, Wonders and Beyond

by **Alfred S Posamentier** (*The City University of New York, USA*) & **Arthur D Kramer** (*The City University of New York, USA*)

The book offers 101 mathematical gems, some of which may require a modicum of high school mathematics and others, just a desire to carefully apply oneself to the ideas. This book provides a delightful insight into the origin of mathematical symbols like +, -, =, π , ∞ , $\sqrt{\quad}$, Σ and popular theorems such as the Pythagorean Theorem and the Fibonacci Sequence and many more. The book uses a historical and cultural approach to the topics, which greatly adds to its appeal.

Readership: General readership as well as to teachers and students of mathematics at the secondary level.

404pp	Jul 2022	
978-981-124-933-4(pbk)	US\$48	£40
978-981-124-857-3	US\$108	£95
978-981-124-858-0(ebook)	US\$173	£150



International & Multidisciplinary Pedagogy

Discoveries, Innovations, Challenges & Successes

by **Michael A Radin** (*Rochester Institute of Technology, USA*)

The book's primary objectives are to welcome you to the abundant and meaningful international and multidisciplinary education discovery journey. The book will provide practical examples how to design, promote and teach various courses and seminars abroad. Most importantly, the book will focus on applying feedback as vital tools that will guide us to the designing, promoting and teaching mathematics and multidisciplinary courses and seminars. The book's most important goal is to make international and multidisciplinary education accessible to everyone.

Key Features

- The book offers numerous photographs as comparisons and diagrams
- The book provides several practical examples of developing international pedagogy innovations in different educational systems. These include mathematics and multidisciplinary courses

Readership: The primary audience are students, faculty and administrators. The book can be used for various high school courses, pedagogical courses and especially courses that address international or global education, leadership, innovations, advertising and marketing.

200pp	Nov 2022	
978-981-126-211-1(pbk)	US\$38	£30
978-981-126-107-7	US\$78	£60
978-981-126-108-4(ebook)	US\$125	£100

Towards Deep Understanding of Elementary School Mathematics

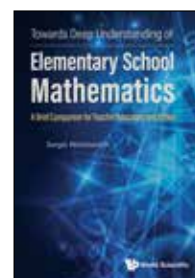
A Brief Companion for Teacher Educators and Others

by **Sergei Abramovich** (*State University of New York at Potsdam, USA*)

Being informed by mathematics teaching and learning standards of the United States, Australia, Canada, Chile, England, Japan, Korea, Singapore, and South Africa, the book can be used internationally. The teaching methods emphasize the power of visualization, the use of physical materials, and support of computer technology including spreadsheet, Wolfram Alpha, and the Geometer's Sketchpad.

Key Feature: Many historical connections and cultural origins of elementary mathematics are highlighted throughout the book.

312pp	Aug 2022	
978-981-125-699-8	US\$98	£80
978-981-125-700-1(ebook)	US\$157	£125



MATHEMATICS TEACHING & RESEARCH

How to Write a Scientific Paper After You Think You've Written It

by **Stacey R Smith?** (*The University of Ottawa, Canada*)

Publications are the currency of academia, and yet many people in the sciences, especially mathematics, are never actually taught how to write. More specifically, they are not taught how to edit, re-draft and revise their material so that the presentation is optimal for the reader. One of the core problems is that most scientists hate writing and put only the bare minimum of effort into it. However, academic writing is a skill like any other that can be broken down into stages. This book will go through the detailed process of all the stages, from first drafts to writing abstracts to revision to responding to reviewers, illustrated with multiple versions of worked examples.

Readership: Undergraduates, graduates and researchers in the field of sciences.

200pp	May 2023	
978-981-124-684-5(pbk)	US\$28	£25
978-981-124-582-4	US\$58	£50
978-981-124-583-1(ebook)	US\$98	£80

World Scientific Series on Science Communication - Vol 3

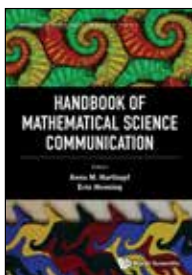
Handbook of Mathematical Science Communication

edited by **Anna Maria Hartkopf** (*Freie Universität Berlin, Germany*) & **Erin Henning** (*Freie Universität Berlin, Germany*)

Mathematical science communication has, as the field of science communication in general, gained momentum over the last decades. It aims at informing the public about contemporary research, enhancing the factual and methodological knowledge, fostering a greater interest and support for the science of mathematics, and enabling the citizens to apply it to their practical life, as well as decision-making on a bigger level. These objectives are met by the various formats and media in which mathematical science communication is brought to the public.

Readership: Researchers and students from all fields who are interested in the basics of communicating mathematical science and technology.

350pp	Sep 2022	
978-981-125-306-5	US\$118	£95
978-981-125-307-2(ebook)	US\$189	£150



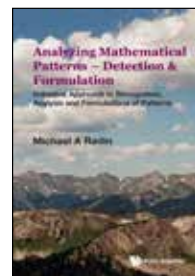
Analyzing Mathematical Patterns — Detection & Formulation

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. The book's goals are to train and expand students' analytical skills by presenting numerous repetitive-type problems that will lead to formulating results inductively and to the proof by induction method. The book's aims are to prepare students to establish a base of recognition and formulation of patterns that will navigate to study further mathematics such as Calculus, Discrete Mathematics, Matrix Algebra, Abstract Algebra, Difference Equations, and to potential research projects.

290pp	Nov 2022	
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



MATHEMATICS TEACHING & STUDYING

Problem Solving in Mathematics and Beyond -
Volume 15

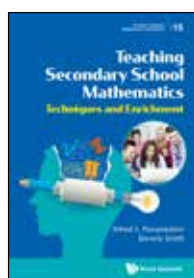
Teaching Secondary School Mathematics

Techniques and Enrichment
by **Alfred S Posamentier & Beverly Smith**
(City University of New York, USA)

The primary aim of this book is to provide teachers of mathematics with all the tools they would need to conduct most effective mathematics instruction. The book guides teachers through the all-important planning process, which includes short and long-term planning as well as constructing most effective lessons, with an emphasis on motivation, classroom management, emphasizing problem-solving techniques, assessment, enriching instruction for students at all levels, and introducing relevant extracurricular mathematics activities. Technology applications are woven throughout the text.

Readership: In-service teachers, students, general public.

1044pp	Sep 2020	
978-981-121-141-6	US\$178	£155
978-981-121-142-3(ebook)	US\$285	£250



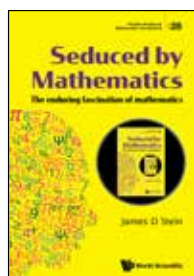
Problem Solving in Mathematics and Beyond

Seduced by Mathematics

The enduring fascination of mathematics
by **James D Stein** (California State University, USA)

This book contains material capable of being appreciated by students in elementary school — as well as some material that will probably be new to even the more mathematically sophisticated. Most of the book can be easily understood by those whose only math courses are algebra and geometry, and who may have missed the magic, enchantment, and wonder that is the special province of mathematics. This book is a collection of the OMG moments that make mathematics so appealing to so many.

224pp	Aug 2022	
978-981-125-635-6(pbk)	US\$28	£20
978-981-125-546-5	US\$58	£45
978-981-125-547-2(ebook)	US\$98	£80

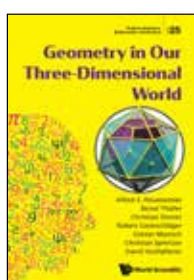


Problem Solving in Mathematics and Beyond - Vol 25
Geometry in Our Three-Dimensional World

by **Alfred S Posamentier** (The City University of New York, USA), **Bernd Thaller** (University of Graz, Austria), **Christian Dorner** (University of Vienna, Austria), **Robert Geretschlager** (BRG Kepler HS, Graz, Austria), **Gunter Maresch** (University of Salzburg, Austria), **Christian Spreitzer** (University College of Teacher Education Lower Austria, Austria) & **David Stuhlfarrar** (University College of Teacher Education Styria, Austria)

The book presents a comprehensive overview of various aspects of three-dimensional geometry that can be experienced on a daily basis. By covering the wide range of topics — from the psychology of spatial perception to the principles of 3D modelling and printing, from the invention of perspective by Renaissance artists to the art of Origami, from polyhedral shapes to the theory of knots, from patterns in space to the problem of optimal packing, and from the problems of cartography to the geometry of solar and lunar eclipses — this book provides deep insight into phenomena related to the geometry of space and exposes incredible nuances that can enrich our lives. More than 420 color illustrations that significantly enhance the perceptions.

440pp	Dec 2021	
978-981-123-774-4(pbk)	US\$48	£40
978-981-123-710-2	US\$118	£105
978-981-123-711-9(ebook)	US\$189	£170

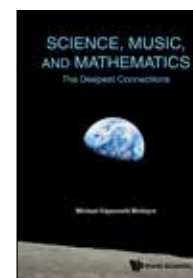


Science, Music, and Mathematics

The Deepest Connections

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

This book by Michael Edgeworth McIntyre, is a truly rare addition to the literature, as it is exceptionally uncommon for someone of such intellect and expertise to commit themselves to writing a book aimed at a young reader audience. I consider this book to be essential reading for any budding scientist, or indeed any young person who is curious about the world around them.



Paul Ashworth

**Director, Researcher Recognition Office
The University of New South Wales**

This book is the coalescence of many years of scientific observation and thought. It contains a wealth of diverse but connected information on visualising and understanding the world and our place in it, through clarity of thought and lucidity of communication.

Professor Adam Scaife

**Head of Monthly to Decadal Prediction, Met Office, UK
Dept of Mathematics, University of Exeter, UK**

228pp	Nov 2021	
978-981-124-183-3(pbk)	US\$19.95	£20
978-981-124-073-7	US\$48	£40
978-981-124-074-4(ebook)	US\$98	£80

Problem Solving in Mathematics and Beyond - Vol 21

Adventures in Recreational Mathematics

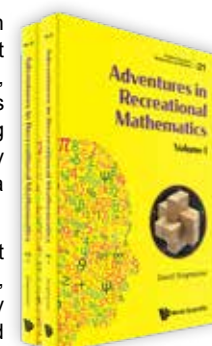
(In 2 Volumes)

by **David Singmaster** (London South Bank University, UK)

This set of two books provides readers with an adventure into previously unknown origins of ancient puzzles, which could be traced back to their Medieval, Chinese, Arabic and Indian sources. The puzzles are fully described, many with illustrations, adding interest to their history and relevance to contemporary mathematical concepts. These are musings of a respected historian of recreational mathematics.

Key Feature: Previously unknown origins of ancient puzzles are traced back to their Medieval, Chinese, Arabic and Indian sources and fully described, many with illustrations, adding interest to their history and relevance to contemporary mathematical concepts.

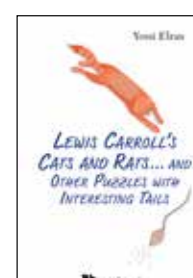
496pp	Nov 2021	
978-981-122-630-4(Set)(pbk)	US\$48	£40
978-981-122-564-2(Set)	US\$108	£95
978-981-125-161-0(Set)(ebook)	US\$173	£150



Lewis Carroll's Cats and Rats ... and Other Puzzles with Interesting Tails

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

"This is a very interesting and exciting book. It is rare for puzzle books to explain so clearly how a puzzle can have multiple solutions, depending on how one looks at it. Yossi Elran shows that problems may be less straightforward than they appear at first. He also presents numerous new or little-known types of problems which will give pleasure to many readers."



David Singmaster

**Celebrated recreational mathematician and historian, and
Professor Emeritus, London South Bank University**

200pp	Jun 2021	
978-981-123-564-1(pbk)	US\$19.90	£20
978-981-123-396-8	US\$38	£35
978-981-123-397-5(ebook)	US\$98	£80

Book Series: PROBLEM SOLVING IN MATHEMATICS & BEYOND

Series Editor
Alfred S Posamentier, PhD

*Distinguished Lecturer
Professor Emeritus of Mathematics Education,
and Former Dean (The City College of New York-City University of New York)*

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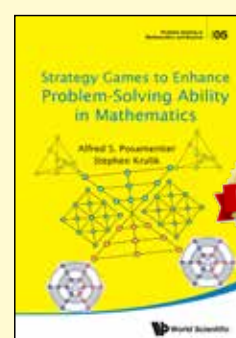
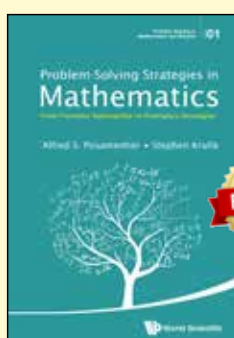
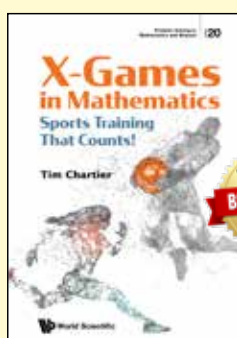
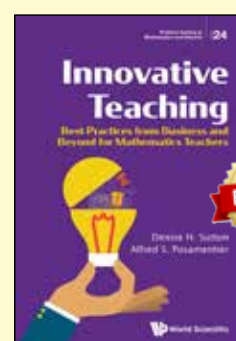
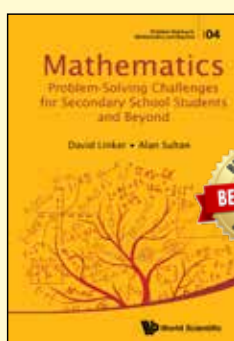
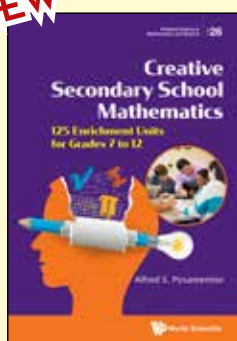


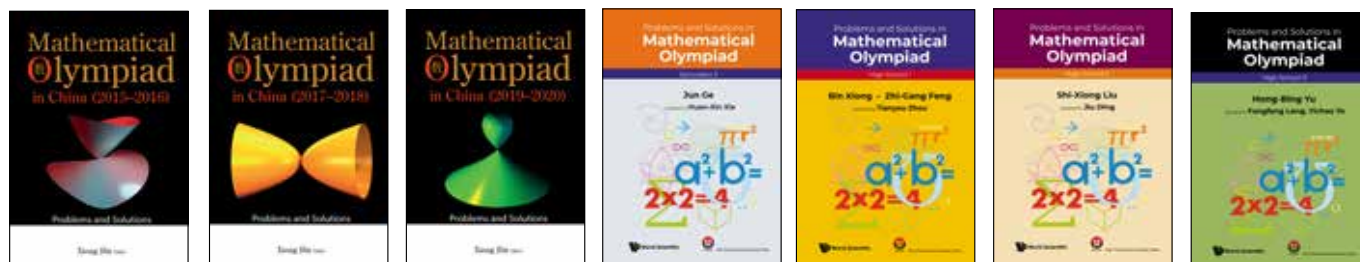
Aims and Scope

There are countless applications that would be considered problem solving in mathematics and beyond. One could even argue that most of mathematics in one way or another involves solving problems. However, this series is intended to be of interest to the general audience with the sole purpose of demonstrating the power and beauty of mathematics through clever problem-solving experiences.

Each of the books will be aimed at the general audience, which implies that the writing level will be such that it will not engulfed in technical language — rather the language will be simple everyday language so that the focus can remain on the content and not be distracted by unnecessarily sophisticated language.

NEW



MATHEMATICS OLYMPIAD (New Releases!)

Mathematical Olympiad Series - Vol 17

Mathematical Olympiad in China (2015 – 2016)

Problems and Solutions

edited by **Bin Xiong** (*East China Normal University, China*)**Readership:** Mathematics students, school teachers, college lecturers, university professors; mathematics enthusiasts.

208pp	Jul 2022	
978-981-125-191-7(pbk)	US\$28	£25
978-981-125-071-2	US\$58	£50
978-981-125-072-9(ebook)	US\$98	£80

Mathematical Olympiad Series - Vol 18

Mathematical Olympiad in China (2017 – 2018)

Problems and Solutions

edited by **Bin Xiong** (*East China Normal University, China*)**Readership:** Mathematics students, school teachers, college lecturers, university professors; mathematics enthusiasts.

260pp	Sep 2022	
978-981-125-738-4(pbk)	US\$38	£30
978-981-125-629-5	US\$78	£60
978-981-125-630-1(ebook)	US\$125	£100

Mathematical Olympiad Series - Vol 19

Mathematical Olympiad in China (2019 – 2020)

Problems and Solutions

edited by **Bin Xiong** (*East China Normal University, China*)**Readership:** Mathematics students, school teachers, college lecturers, university professors; mathematics enthusiasts.

250pp	Sep 2022	
978-981-125-739-1(pbk)	US\$38	£30
978-981-125-632-5	US\$78	£60
978-981-125-633-2(ebook)	US\$125	£100

Problems and Solutions in Mathematical Olympiad

Secondary 3

by **Jun Ge** (*High School Affiliated To Nanjing Normal University, China*)Translated by **Huan-Xin Xie** (*No.2 High School of East China Normal University, China*)**Readership:** Secondary school students engaged in mathematical competition, coaches in mathematics teaching, and teachers setting up math elective courses.

456pp	Jul 2022	
978-981-123-141-4(pbk)	US\$48	£40
978-981-122-982-4	US\$98	£85
978-981-122-983-1(ebook)	US\$157	£125

Problems and Solutions in Mathematical Olympiad

High School 1

by **Bin Xiong** (*East China Normal University, China*) & **Zhi-Gang Feng** (*Shanghai High School, China*)Translated by **Tian-You Zhou** (*Shanghai High School, China*)**Readership:** Secondary school students engaged in mathematical competition, coaches in mathematics teaching, and teachers setting up math elective courses.

580pp	May 2022	
978-981-123-142-1(pbk)	US\$58	£45
978-981-122-985-5	US\$128	£100
978-981-122-986-2(ebook)	US\$205	£165

Problems and Solutions in Mathematical Olympiad

High School 2

by **Shi-Xiong Liu** (*Zhongshan Affiliated School of South China Normal University, China*)Translated by **Jiu Ding** (*University of Southern Mississippi, USA*)**Readership:** Secondary school students engaged in mathematical competition, coaches in mathematics teaching, and teachers setting up math elective courses.

608pp	May 2022	
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978-981-122-988-6	US\$128	£100
978-981-122-989-3(ebook)	US\$205	£165

Problems and Solutions in Mathematical Olympiad

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by **Hong-Bing Yu** (*Suzhou University, China*)Translated by **Fang-Fang Lang** (*Shanghai Qibao Dwight High School, China*) & **Yi-Chao Ye** (*Shanghai Qibao High School, China*)**Readership:** Secondary school students engaged in mathematical competition, coaches in mathematics teaching, and teachers setting up math elective courses.

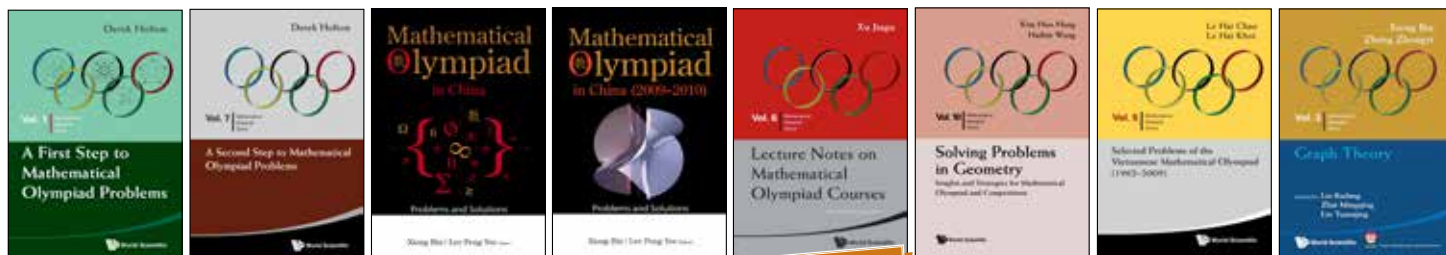
380pp	Apr 2022	
978-981-123-144-5(pbk)	US\$48	£40
978-981-122-991-6	US\$98	£85
978-981-122-992-3(ebook)	US\$157	£135

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A First Step to Mathematical Olympiad Problems

by Derek Holton (University of Otago, New Zealand)

Readership: School students keen to learn more of mathematics and specifically mathematics related to the IMO; coaches and instructors of mathematical competitions.

292pp	Aug 2009	
978-981-4273-87-9(pbk)	US\$35	£29
978-981-4273-88-6(ebook)	US\$98	£80

Mathematical Olympiad Series - Volume 7

A Second Step to Mathematical Olympiad Problems

by Derek Holton (University of Otago, New Zealand & University of Melbourne, Australia)

Readership: School students keen to learn more of mathematics and specifically mathematics related to the IMO; coaches and instructors of mathematical competitions.

312pp	Jul 2011	
978-981-4327-87-9(pbk)	US\$38	£32
978-981-4335-13-3(ebook)	US\$98	£80

Mathematical Olympiad in China

Problems and Solutions

by Xiong Bin (East China Normal University, China) & Lee Peng Yee (Nanyang Technological University, Singapore)

Readership: Researchers, educators, lecturers, and students interested in mathematics and education.

276pp	Jun 2007	
978-981-270-789-5(pbk)	US\$33	£27
978-981-270-979-0(ebook)	US\$98	£80

Mathematical Olympiad Series - Volume 9

Mathematical Olympiad in China (2009-2010)

Problems and Solutions

edited by Bin Xiong (East China Normal University, China) & Peng Yee Lee (NTU, Singapore)

Readership: Mathematics students, school teachers, college lecturers, university professors; mathematics enthusiasts.

204pp	Feb 2013	
978-981-4390-21-7(pbk)	US\$29	£24
978-981-4390-22-4(ebook)	US\$98	£80

Mathematical Olympiad Series - Volume 6

Lecture Notes on Mathematical Olympiad Courses

For Junior Section

(In 2 Volumes)

by Jiagu Xu (Former Professor of Mathematics, Fudan University, China)

Readership: Mathematics students, school teachers, college lecturers, university professors; mathematics enthusiasts.

376pp (SET)	Dec 2009	
978-981-4293-53-2(pbk) (set)	US\$40	£33

Vol. 1 184pp	Dec 2009	
978-981-4293-54-9(pbk)	US\$25	£21

Vol. 2 192pp	Dec 2009	
978-981-4293-55-6(pbk)	US\$25	£21

Mathematical Olympiad Series - Volume 10

Solving Problems in Geometry

Insights and Strategies for Mathematical Olympiad and Competitions

by Kim Hoo Hang (NTU, Singapore) & Haibin Wang (NUS High School of Mathematics and Science, Singapore)

Readership: Students, educators and general public interested in geometry and topology.

356pp	May 2017	
978-981-4583-74-9(pbk)	US\$34	£28
978-981-4590-72-3	US\$58	£48
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156pp	Mar 2010	
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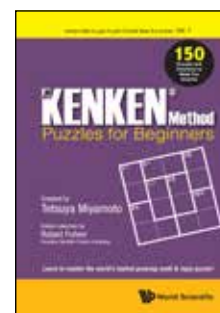
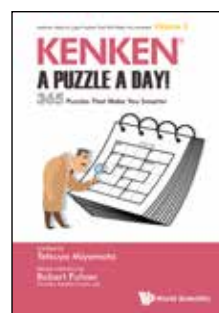
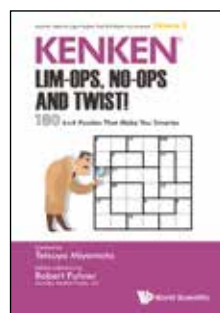
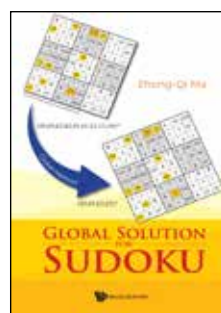
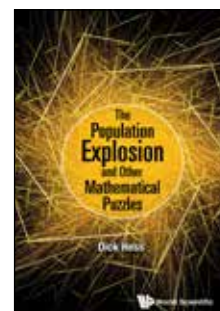
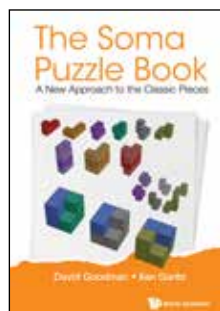
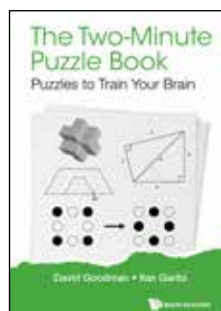


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Interacting particle systems are Markov processes involving infinitely many interacting components. Since their introduction in the 1970s, researchers have found many applications in statistical physics and population biology. Genealogies, which follow the origin of the state of a site backwards in time, play an important role in their studies, especially for the biologically motivated systems. The program Genealogies of Interacting Particle Systems held at the Institute for Mathematical Sciences, National University of Singapore, from 17 July to 18 Aug 2017, brought together experts and young researchers interested in this modern topic.



Readership: Graduate students, university professors, researchers and professional mathematicians interested in probability theory, and models arising from population genetics.

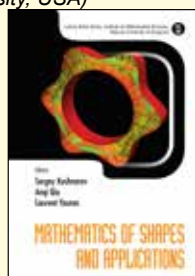
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edited by **Chitat Chong** (*NUS, Singapore*), **Qi Feng** (*Chinese Academy of Sciences, China*), **Theodore A Slaman** (*UC Berkeley*), **W Hugh Woodin** (*Harvard*) & **Yue Yang** (*NUS, Singapore*)



"The book is very well organized and the author presents a very clear picture of the complex relations between the many principles that arise in connection with Ramsey's Theorem. The book has a continuous stream of exercises and extensive references to the literature, which make it very suitable as an introduction to the reverse mathematics and computability theory of combinatorial principles. The book has excellent coverage and the author frequently points to references for further discussion." **Mathematical Reviews Clippings**

"The book gathers together in one place most of the theorems known about where Ramsey Theory and some variants of it fit into the Reverse Mathematics framework. The book also discusses many combinatorial principles that the reader may not realize are really Ramsey Theory, but they are!" **SIGACT News**

Readership: Graduates and researchers in mathematical logic.

232pp	Jul 2014	
978-981-4612-61-6	US\$46	£38
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by **Stevo Todorcevic** (*University of Toronto, Canada*)

edited by **Chitat Chong** (*NUS, Singapore*), **Qi Feng** (*NUS, Singapore*), **Theodore A Slaman** (*UC Berkeley*), **W Hugh Woodin** (*UC Berkeley*) & **Yue Yang** (*NUS, Singapore*)

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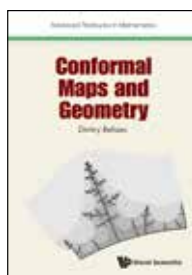
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MathSciNet

Readership: Advanced undergraduate or graduate students in mathematics, especially those interested in analysis or theory of Schramm–Loewner Evolution.

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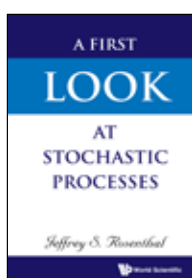
MAA Reviews

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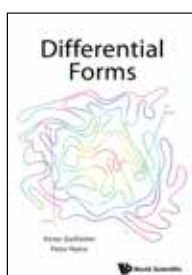
Readership: Senior undergraduate and graduate students in Mathematics, Statistics, Economics, Finance, Computer Science, Engineering, Physics, and Actuarial Science.

212pp	Sep 2019	
978-981-120-897-3(pbk)	US\$38	£35
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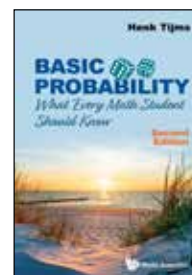
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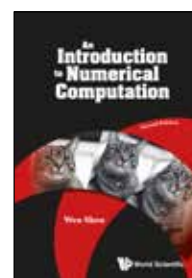
184pp	Aug 2021	
978-981-123-851-2(pbk)	US\$34	£30
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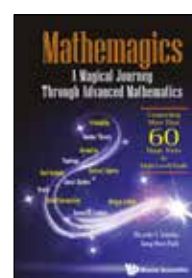
by **Ricardo V Teixeira & Jang-Woo Park** (University of Houston-Victoria, USA)

"This delightful book connects mathematical concepts in a dozen areas to magic tricks. Expositions of the mathematics precede description and analysis of the tricks. The expositions are too short for in-depth learning; the intent is to give sophomores a taste of the content and ideas of later mathematics courses. Each chapter features exercises on the mathematics, and students can have fun practicing the tricks."

Mathematics Magazine

Teixeira and Park present over 60 different magic tricks while introducing students to high-level math areas. Readers will learn really interesting ideas that will better prepare them for future courses and help them finding areas they might want to study deeper. And as a "side effect" students will learn amazing magic tricks, century-old secrets, and details from famous magicians and mathematicians. The material was written to quickly present key concepts in several mathematical areas in direct way. Little or no proficiency in math is assumed. In fact, students do not require any Calculus knowledge.

408pp	May 2020	
978-981-121-530-8(pbk)	US\$48	£40
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978-981-121-451-6(ebook)	US\$157	£135



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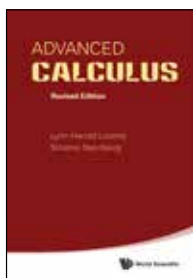
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W Kleinert, Berlin



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978-981-4583-92-3	US\$78	£65
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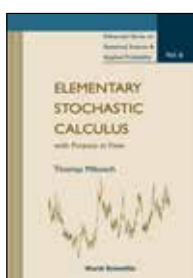
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by Thomas Mikosch (University of Groningen)

"This book under review can be determined as a very successful work ... the author's choice of the material is done with good taste and expertise... It can be strongly recommended to graduate students and practitioners in the field of finance and economics." **Mathematics Abstracts**

Readership: Economists, financial engineers, mathematicians and physicists.

224pp	Nov 1998	
978-981-02-3543-7	US\$58	£48
978-981-238-633-5(ebook)	US\$98	£80



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Mathematical Reviews

312pp	Jul 1992	
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978-981-4355-16-2(ebook)	US\$108	£85



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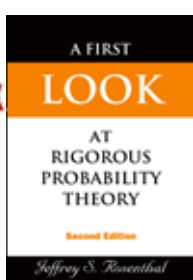
by Jeffrey S Rosenthal (University of Toronto, Canada)

"This is a fine textbook on probability theory based on measure theory. The parts of measure theory that are needed are developed within the book and a teacher of measure theory could find them quite useful. The construction of the Lebesgue measure (extension theorem) is unusual and interesting."

Mathematical Reviews

Readership: Graduate students in mathematics, statistics, economics, management, finance, computer science and engineering.

236pp	Nov 2006	
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978-981-277-253-4(ebook)	US\$98	£80



Series on Knots and Everything - Vol 4

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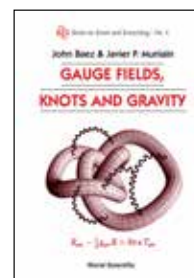
"The book is clearly written and should be accessible to readers who have a good undergraduate preparation in mathematics or physics. Each part of the book ends with a list of references that will enable the reader to pursue the material presented in greater detail."

Mathematical Reviews

This is an introduction to the basic tools of mathematics needed to understand the relation between knot theory and quantum gravity. The book begins with a rapid course on manifolds and differential forms, emphasizing how these provide a proper language for formulating Maxwell's equations on arbitrary spacetimes. The authors then introduce vector bundles, connections and curvature in order to generalize Maxwell theory to the Yang-Mills equations. The relation of gauge theory to the newly discovered knot invariants such as the Jones polynomial is sketched. Riemannian geometry is then introduced in order to describe Einstein's equations of general relativity and show how an attempt to quantize gravity leads to interesting applications of knot theory.

Readership: Mathematicians, mathematical physicists and theoretical physicists.

480pp	Oct 1994	
978-981-02-2034-1(pbk)	US\$71	£59
978-981-02-1729-7	US\$129	£107
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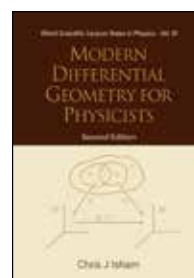
by Chris J Isham (Imperial College)

"This book is carefully written, and attention is paid to rigor and relevant details ... The key notions are discussed with great care and from many points of view, which attenuates the shock of the formalism."

Mathematical Reviews

Readership: Mathematical physicists.

304pp	Mar 1999	
978-981-02-3562-8(pbk)	US\$43	£36
978-981-02-3555-0	US\$82	£68
978-981-238-659-5(ebook)	US\$131	£110



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by Fima C Klebaner (Monash University, Australia)

This book presents a concise and rigorous treatment of stochastic calculus. It also gives its main applications in finance, biology and engineering. In finance, the stochastic calculus is applied to pricing options by no arbitrage. In biology, it is applied to populations' models, and in engineering it is applied to filter signal from noise. Not everything is proved, but enough proofs are given to make it a mathematically rigorous exposition.

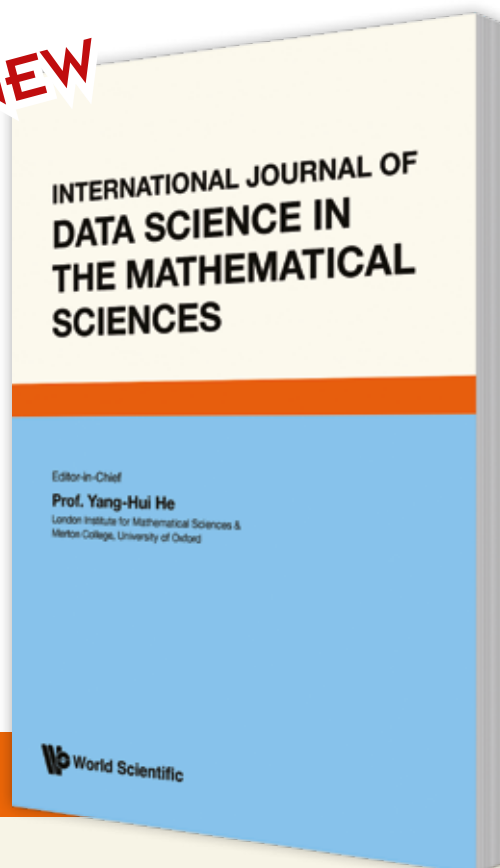
Readership: Academics, mathematicians, advanced undergraduates, graduates, practitioners in finance, risk managers and electrical engineers.

452pp	Mar 2012	
978-1-84816-832-9(pbk)	US\$58	£48
978-1-84816-831-2	US\$98	£81
978-1-84816-833-6(ebook)	US\$157	£130



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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	138	120
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
MATHEMATICS OF TAKEBE KATAHIRO AND HISTORY OF MATHEMATICS IN EAST ASIA - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON TRADITIONAL MATHEMATICS IN EAST ASIA AND RELATED TOPICS	OGAWA TSUKANE & MORIMOTO MITSUO	12-Jul-19	9784864970570	96.3	85
ALGEBRAIC AND GEOMETRIC COMBINATORICS ON LATTICE POLYTOPES - PROCEEDINGS OF THE SUMMER WORKSHOP ON LATTICE POLYTOPES	HIBI TAKAYUKI & TSUCHIYA AKIYOSHI	31-May-19	9789811200472	198	175
PROCEEDINGS OF THE INTERNATIONAL CONGRESS OF MATHEMATICIANS 2018 (ICM 2018) (IN 4 VOLUMES)	SIRAKOV BOYAN ET AL	1-Mar-19	9789813272873	850	750
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As we enter the Age of Data, our lives and works are interconnected by digital data, and the ability to learn from data to acquire knowledge has paved the way for machines to generalise concepts without supervision from massive data to narrow the gap between human and machine in the events of problem solving; initialised by engineers and computer scientists, applied mathematicians have developed this newfound potential into many aspects of our life from medicine to astronomy. You name it, we will find Deep Learning, and Data mining deployed within it. However, to make sense out of these seemingly neck-breaking developments, the pure mathematicians and theoreticians are only begun to be get involved in recent years.

The aim of this new, highly inter-disciplinary journal is to establish a much-needed platform for exchanges of synergy for mathematicians, both pure and applied, as well as data scientists and computer scientists specializing in machine-learning and artificial intelligence to share their views and compare notes. This is beneficial in both directions: (1) to apply state-of-the-art machine learning techniques such as deep neural networks to solve real-world data analytic problems in STEM, ranging from the financial to the healthcare markets, to discoveries in fundamental science, as well as help with conjectures and proofs in pure mathematics; (2) to apply the latest techniques in mathematics and theoretical physics to understand the nature and the broaden the techniques of machine learning and AI.

Rapid advances in social media, online business, internet of things, and rapid improvement in computing power have led to a massive explosion of data in our daily life. The usefulness of this resource for human knowledge is determined by its accessibility and analytics. We sincerely hope this International Journal of Data Science in the Mathematical Sciences will contribute to our understand of underlining rules and laws in Machine Learning.

I have been a long friend of World Scientific. I am on the editorial board for Reviews in Modern Physics and had the honour to co-edit "Topology and Physics" with Professors C. N. Yang and M.-L. Ge. I am currently also editing the book "Machine-Learning in Pure Mathematics and Theoretical Physics" with WS. I trust, together with my friends and colleagues at WS, we will make this new journal a success.

Algebra & Related Topics

**Algebra Colloquium (AC)**

Print / Online ISSN: 1005-3867 / 0219-1733

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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.

Editor-in-Chief**Chongying Dong**, *University of California, Santa Cruz, USA***Managing Editor****Zhongming Tang**, *Suzhou University, China***Discrete Mathematics, Algorithms and Applications (DMAA)**

Print / Online ISSN: 1793-8309 / 1793-8317

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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**Ding-Zhu Du**, *University of Texas, Dallas, USA***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
0.722

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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Print / Online ISSN: 1793-0421 / 1793-7310

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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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Print / Online ISSN: 0219-4988 / 1793-6829

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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.

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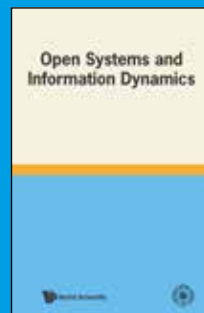
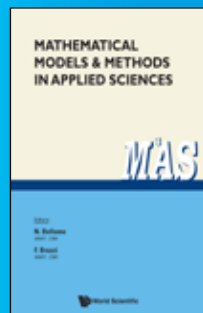
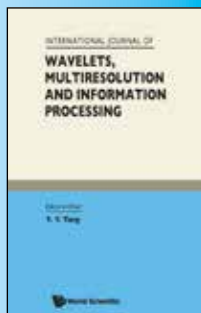
Print / Online ISSN: 2010-3263 / 2010-3271

<https://www.worldscientific.com/rmta>IMPACT FACTOR
1.209

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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Mathematical Analysis



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

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

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

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

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

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

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.

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International Journal of Mathematics for Industry (IJMI)

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

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

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.

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

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

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.

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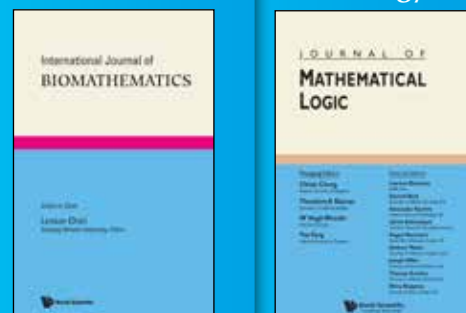
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General Mathematics



Mathematical Logic & Foundations

Mathematical Biology

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Print / Online ISSN: 1793-5571 / 1793-7183

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This is an international journal which is devoted to original research in the field of pure and applied mathematics. The aim of the journal is to provide a medium by which new ideas can be discussed among researchers from diverse fields in mathematics. It publishes high quality research papers in the fields of contemporary pure and applied mathematics with a broad range of topics.

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This peer-reviewed and open access journal will publish original research work of highest quality and of broad interest in all branches of mathematical sciences. It publishes well-written expository articles of exceptional value giving the latest state of the art on a specific topic, and short articles containing significant results of wider interest. It is launched by King Abdulaziz University, Jeddah, Saudi Arabia.

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Print / Online ISSN: 0129-167X / 1793-6519

<https://www.worldscientific.com/ijm>IMPACT FACTOR
0.708

The *International Journal of Mathematics* publishes original research papers of high quality in all topics of pure mathematics. The journal has been published monthly. The first issue appeared in March 1990.

Founding Advisor**Late Prof. S S Chern**, *Chern Institute of Mathematics, Nankai University, China***Chair****Yasuyuki Kawahigashi**, *University of Tokyo, Japan***Communications in Contemporary Mathematics (CCM)**

Print / Online ISSN: 0219-1997 / 1793-6683

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With traditional boundaries between various specialized fields of mathematics becoming less and less visible, *Communications in Contemporary Mathematics* (CCM) presents the forefront of research in the fields of: Algebra, Analysis, Applied Mathematics, Dynamical Systems, Geometry, Mathematical Physics, Number Theory, Partial Differential Equations and Topology, among others. It provides a forum to stimulate interactions between different areas. Both original research papers and expository articles will be published.

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Print / Online ISSN: 1793-5245 / 1793-7159

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2.129

The goal of this journal is to present the latest achievements in biomathematics, facilitate international academic exchanges and promote the development of biomathematics. Its research fields include mathematical ecology, infectious disease dynamical system, biostatistics and bioinformatics.

Editor-in-Chief**Lansun Chen**, *Academy of Mathematics and System Sciences, Academia Sinica, and Xinyang Normal University, China***Journal of Mathematical Logic (JML)**

Print / Online ISSN: 0219-0613 / 1793-6691

<https://www.worldscientific.com/jml>IMPACT FACTOR
1.229

This journal provides an important forum for the communication of original contributions in all areas of mathematical logic and its applications. It aims at publishing papers at the highest level of mathematical creativity and sophistication. JML intends to represent the most important and innovative developments in the subject.

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International Journal of Geometric Methods in Modern Physics (IJGMMP)

Print / Online ISSN: 0219-8878 / 1793-6977
<https://www.worldscientific.com/ijgmmp>

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Journal of Knot Theory and Its Ramifications (JKTR)

Print / Online ISSN: 0218-2165 / 1793-6527
<https://www.worldscientific.com/jktr>

This Journal is intended as a forum for new developments in knot theory, particularly developments that create connections between knot theory and other aspects of mathematics and natural science. The stance is interdisciplinary due to the nature of the subject. Papers include new research in the theory of knots and links, and their applications; new researches in related fields; tutorial and review papers, etc.

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Journal of Topology and Analysis (JTA)

Print / Online ISSN: 1793-5253 / 1793-7167
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This journal is devoted to topology and analysis, broadly defined to include, for instance, differential geometry, geometric topology, geometric analysis, geometric group theory, index theory, noncommutative geometry, and aspects of probability on discrete structures, and geometry of Banach spaces. We welcome all excellent papers that have a geometric and/or analytic flavor that fosters the interactions between these fields. Papers published in this journal should break new ground or represent definitive progress on problems of current interest. On rare occasion, we will also accept survey papers.

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

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Journal of Hyperbolic Differential Equations (JHDE)

Print / Online ISSN: 0219-8916 / 1793-6993
<https://www.worldscientific.com/jhde>

This journal publishes original research papers on nonlinear hyperbolic problems and related topics, of mathematical and/or physical interest. Specifically, it invites papers on the theory and numerical analysis of hyperbolic conservation laws and of hyperbolic partial differential equations arising in mathematical physics.

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✓	Title	Page	✓	Title	Page	✓	Title	Page
	ADVANCED MATHEMATICAL AND COMPUTATIONAL TOOLS IN METROLOGY AND TESTING XII	18		HYPERGROUP THEORY	8		PERFECT AND AMICABLE NUMBERS	4
	ADVENTURES IN RECREATIONAL MATHEMATICS (IN 2 VOLS)	27		HYPERIDENTITIES: BOOLEAN AND DE MORGAN STRUCTURES	4		PERFECT CODES AND RELATED STRUCTURES	24
	ALGEBRAIC AND GEOMETRIC COMBINATORICS ON LATTICE POLYTOPES - PROCEEDINGS OF THE SUMMER WORKSHOP ON LATTICE POLYTOPES	35		INEQUALITIES IN ANALYSIS AND PROBABILITY (THIRD EDITION)	20		PERFECT NUMBERS AND FIBONACCI SEQUENCES	4
	ALGEBRAIC BETHE ANSATZ AND CORRELATION FUNCTIONS: AN ADVANCED COURSE	16		INFINITY OPERADS AND MONOIDAL CATEGORIES WITH GROUP EQUIVARIANCE	12		PERSPECTIVES IN SCALAR CURVATURE (IN 2 VOLUMES)	11
	ALGEBRAIC TOPOLOGY: A STRUCTURAL INTRODUCTION	12		INTRODUCTION TO STOCHASTIC CALCULUS WITH APPLICATIONS, AN (SECOND EDITION)	20		POPULATION EXPLOSION AND OTHER MATHEMATICAL PUZZLES, THE	31
	ANALYTIC HYPERBOLIC GEOMETRY AND ALBERT EINSTEIN'S SPECIAL THEORY OF RELATIVITY (SECOND EDITION)	16		INTERNATIONAL & MULTIDISCIPLINARY PEDAGOGY: DISCOVERIES, INNOVATIONS, CHALLENGES & SUCCESSSES	26		PRACTICAL NUMERICAL MATHEMATICS WITH MATLAB: A WORKBOOK AND SOLUTIONS	18
	ANALYZING MATHEMATICAL PATTERNS - DETECTION & FORMULATION: INDUCTIVE APPROACH TO RECOGNITION, ANALYSIS AND FORMULATIONS OF PATTERNS	26		INTRODUCTION TO ABSTRACT ALGEBRA, AN: SETS, GROUPS, RINGS, AND FIELDS	7		PRIMITIVE FORMS AND RELATED SUBJECTS - KAVLI IPMU 2014 - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE	35
	ANISOTROPIC SCALING OF RANDOM FIELDS WITH LONG-RANGE DEPENDENCE: SCALING LIMITS OF RANDOM FIELDS WITH APPLICATIONS	19		INTRODUCTION TO ALGEBRAIC CODING THEORY	25		PROBLEM BASED JOURNEY FROM ELEMENTARY NUMBER THEORY TO AN INTRODUCTION TO MATRIX THEORY, A: THE PRESIDENT PROBLEMS	7
	APPLIED ANALYSIS: MATHEMATICS FOR SCIENCE, TECHNOLOGY, ENGINEERING (THIRD EDITION)	13		INTRODUCTION TO DATA SCIENCE	24		PROBLEMS AND SOLUTIONS IN BANACH SPACES, HILBERT SPACES, FOURIER TRANSFORM, WAVELETS, GENERALIZED FUNCTIONS AND QUANTUM MECHANICS	14
	ASYMPTOTIC ANALYSIS FOR NONLINEAR DISPERSIVE AND WAVE EQUATIONS - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE	35		INTRODUCTION TO MATRIX THEORY: WITH APPLICATIONS IN ECONOMICS AND ENGINEERING (SECOND EDITION)	5		PROBLEMS AND SOLUTIONS IN MATHEMATICAL OLYMPIAD (HIGH SCHOOL 1)	29
	BANACH ALGEBRAS OF ULTRAMETRIC FUNCTIONS	6		INTRODUCTION TO MULTISCALE MATHEMATICAL MODELING	21		PROBLEMS AND SOLUTIONS IN MATHEMATICAL OLYMPIAD (HIGH SCHOOL 2)	29
	BASIC ABSTRACT ALGEBRA: EXERCISES AND SOLUTIONS	6		INTRODUCTION TO PROBABILITY THEORY: A FIRST COURSE ON THE MEASURE-THEORETIC APPROACH	20		PROBLEMS AND SOLUTIONS IN MATHEMATICAL OLYMPIAD (HIGH SCHOOL 3)	29
	BASIC LESSONS ON ISOMETRIES, SIMILARITIES AND INVERSIONS IN THE EUCLIDEAN PLANE: A SYNTHETIC APPROACH	13		INTRODUCTION TO PROBABILITY, AN: WITH MATHEMATICA®	19		PROBLEMS AND SOLUTIONS IN MATHEMATICAL OLYMPIAD (SECONDARY 3)	29
	BASIC LINEAR ALGEBRA: EXERCISES AND SOLUTIONS	5		INTRODUCTION TO THE LATTICE BOLTZMANN METHOD, AN: A NUMERICAL METHOD FOR COMPLEX BOUNDARY AND MOVING BOUNDARY FLOWS	17		PROBLEMS IN LINEAR ALGEBRA AND MATRIX THEORY	7
	BASIC PROBABILITY: WHAT EVERY MATH STUDENT SHOULD KNOW (SECOND EDITION)	20		KENKEN METHOD - PUZZLES FOR BEGINNERS, THE: 150 PUZZLES AND SOLUTIONS TO MAKE YOU SMARTER	31		PROOF AND COMPUTATION II: FROM PROOF THEORY AND UNIVALENT MATHEMATICS TO PROGRAM EXTRACTION AND VERIFICATION	23
	BLOCH-TYPE PERIODIC FUNCTIONS: THEORY AND APPLICATIONS TO EVOLUTION EQUATIONS	9		KENKEN: A PUZZLE A DAY: 365 PUZZLES THAT MAKE YOU SMARTER	31		QUALITATIVE THEORY OF ODES: AN INTRODUCTION TO DYNAMICAL SYSTEMS THEORY	9
	CASUAL CALCULUS: A FRIENDLY STUDENT COMPANION (IN 3 VOLUMES)	14		KENKEN: LIM-OPS, NO-OPS AND TWIST!: 180 6 X 6 PUZZLES THAT MAKE YOU SMARTER	31		QUANTIZED NUMBER THEORY, FRACTAL STRINGS AND THE RIEMANN HYPOTHESIS: FROM SPECTRAL OPERATORS TO PHASE TRANSITIONS AND UNIVERSALITY	17
	CLASSICAL AND MODERN OPTIMIZATION	24		LAWS OF FORM: A FIFTIETH ANNIVERSARY	7		QUANTUM HYDRODYNAMIC EQUATION AND ITS MATHEMATICAL THEORY	9
	CLASSICAL AND QUANTUM MECHANICS WITH LIE ALGEBRAS	18		LECTURE NOTES ON MATHEMATICAL OLYMPIAD COURSES: FOR JUNIOR SECTION - VOLUME 1	30		RECENT PROGRESS ON TOPICS OF RAMANUJAN SUMS AND COTANGENT SUMS ASSOCIATED WITH THE RIEMANN HYPOTHESIS	7
	CLIMATE, CHAOS AND COVID: HOW MATHEMATICAL MODELS DESCRIBE THE UNIVERSE	21		LECTURES IN NONLINEAR FUNCTIONAL ANALYSIS: SYNOPSIS OF LECTURES GIVEN AT THE FACULTY OF PHYSICS OF LOMONOSOV MOSCOW STATE UNIVERSITY	14		RECENT TOPICS IN DIFFERENTIAL GEOMETRY AND ITS RELATED FIELDS - PROCEEDINGS OF THE 6TH INTERNATIONAL COLLOQUIUM ON DIFFERENTIAL GEOMETRY AND ITS RELATED FIELDS	35
	CODE BASED SECRET SHARING SCHEMES: APPLIED COMBINATORIAL CODING THEORY	6		LECTURES ON ALGEBRAIC TOPOLOGY	13		RING AND FIELD THEORY	6
	COLLAPSING K3 SURFACES, TROPICAL GEOMETRY AND MODULI COMPACTIFICATIONS OF SATAKE, MORGAN-SHALEN TYPE	35		LECTURES ON DIFFERENTIAL GEOMETRY	12		RING THEORY 2019 - PROCEEDINGS OF THE EIGHTH CHINA-JAPAN-KOREA INTERNATIONAL SYMPOSIUM ON RING THEORY	35
	COMPUTABILITY THEORY AND FOUNDATIONS OF MATHEMATICS - PROCEEDINGS OF THE 9TH INTERNATIONAL CONFERENCE ON COMPUTABILITY (THEORY AND FOUNDATIONS OF MATHEMATICS)	23		LECTURES ON FUNCTIONAL ANALYSIS AND APPLICATIONS (SECOND EDITION)	13		ROLE OF METRICS IN THE THEORY OF PARTIAL DIFFERENTIAL, THE - PROCEEDINGS OF THE 11TH MATHEMATICAL SOCIETY OF JAPAN, SEASONAL INSTITUTE (MSJ-SI)	35
	COMPUTABILITY THEORY AND FOUNDATIONS OF MATHEMATICS - PROCEEDINGS OF THE 9TH INTERNATIONAL CONFERENCE ON COMPUTABILITY (THEORY AND FOUNDATIONS OF MATHEMATICS)	35		LECTURES ON LINEAR ALGEBRA	6		ROYAL ROAD TO TOPOLOGY, A: CONVERGENCE OF FILTERS	11
	COMPUTATIONAL AND MATHEMATICAL POPULATION DYNAMICS	22		LECTURES ON QUANTUM MECHANICS AND ATTRACTORS	16		SCIENCE BY SIMULATION - VOLUME 1: A MEZZE OF MATHEMATICAL MODELS	21
	COMPUTATIONAL AND MATHEMATICAL POPULATION DYNAMICS	22		LEWIS CARROLL'S CATS AND RATS... AND OTHER PUZZLES WITH INTERESTING TAILS	27		SCIENCE, MUSIC, AND MATHEMATICS: THE DEEPEST CONNECTIONS	27
	CONTEMPORARY RESEARCH IN MATHEMATICAL BIOLOGY: MODELING, COMPUTATION AND ANALYSIS	21		LINEAR ALGEBRA I: BASIC CONCEPTS	5		SECOND STEP TO MATHEMATICAL OLYMPIAD PROBLEMS, A	30
	DEVELOPMENT OF IWASAWA THEORY - THE CENTENNIAL OF K IWASAWA'S BIRTH - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE "IWASAWA 2017"	35		LINEAR ALGEBRA II: ADVANCED TOPICS FOR APPLICATIONS	5		SEDUCTED BY MATHEMATICS: THE ENDURING FASCINATION OF MATHEMATICS	27
	DIFFERENTIAL EQUATIONS AND THEIR APPLICATIONS: ANALYSIS FROM A PHYSICIST'S VIEWPOINT	16		LINEAR ALGEBRA: CORE TOPICS FOR THE SECOND COURSE	4		SELECTED PROBLEMS OF THE VIETNAMESE MATHEMATICAL OLYMPIAD (1962-2009)	30
	DIFFERENTIAL GEOMETRY AND TANAKA THEORY - DIFFERENTIAL SYSTEM AND	35		LOGIC OF THE THIRD, THE: A PARADIGM SHIFT TO A SHARED FUTURE FOR HUMANITY	25		SEMIGROUP APPROACH TO NONLINEAR DIFFUSION EQUATIONS	10
	DIFFERENTIAL GEOMETRY OF CURVES AND SURFACES WITH SINGULARITIES	12		MATHEMATICAL FEYNMAN PATH INTEGRALS AND THEIR APPLICATIONS (SECOND EDITION)	17		SET THEORY AND FOUNDATIONS OF MATHEMATICS: AN INTRODUCTION TO MATHEMATICAL LOGIC - VOLUME II: FOUNDATIONS OF MATHEMATICS	23
	ELEMENTARY MECHANICS (IN 2 VOLUMES)	15		MATHEMATICAL FOUNDATIONS OF NONEXTENSIVE STATISTICAL MECHANICS	16		SHADOWS OF THE CIRCLE: FROM CONIC SECTIONS TO PLANETARY MOTION (SECOND EDITION)	24
	ELEMENTARY MODULAR IWASAWA THEORY	8		MATHEMATICAL GAME THEORY	22		SINGULARITIES - KAGOSHIMA 2017: PROCEEDINGS OF THE 6TH FRANCO-JAPANESE-VIETNAMESE SYMPOSIUM ON SINGULARITIES	35
	ELEMENTARY TOPOLOGY AND APPLICATIONS (SECOND EDITION)	13		MATHEMATICAL INTRODUCTION TO GENERAL RELATIVITY, A	17		SLOWLY VARYING OSCILLATIONS AND WAVES: FROM BASICS TO MODERNITY	16
	ELEMENTS OF DIGITAL GEOMETRY, MATHEMATICAL MORPHOLOGY, AND DISCRETE OPTIMIZATION	12		MATHEMATICAL JOURNEY THROUGH DIFFERENTIAL EQUATIONS OF PHYSICS, A	15		SMOOTH-AUTOMORPHIC FORMS AND SMOOTH-AUTOMORPHIC REPRESENTATIONS	4
	EXPLORATIONS IN NUMERICAL ANALYSIS: PYTHON EDITION	18		MATHEMATICAL OLYMPIAD IN CHINA (2009-2010): PROBLEMS AND SOLUTIONS	30		SOLVING PROBLEMS IN GEOMETRY: INSIGHTS AND STRATEGIES FOR MATHEMATICAL OLYMPIAD AND COMPETITIONS	30
	FIRST COURSE IN ALGEBRAIC GEOMETRY AND ALGEBRAIC VARIETIES, A	11		MATHEMATICAL OLYMPIAD IN CHINA (2015-2016): PROBLEMS AND SOLUTIONS	29		SPARSE POLYNOMIAL OPTIMIZATION: THEORY AND PRACTICE	24
	FIRST STEP TO MATHEMATICAL OLYMPIAD PROBLEMS, A	30		MATHEMATICAL OLYMPIAD IN CHINA (2015-2016): PROBLEMS AND SOLUTIONS	29		SPATIAL DYNAMICS MODELS IN THE LIFE SCIENCES AND THE ROLE OF FEEDBACK IN ROBUST DEVELOPMENTS	22
	FORMAL AND ANALYTIC SOLUTIONS OF DIFFERENTIAL EQUATIONS	10		MATHEMATICAL OLYMPIAD IN CHINA (2017-2018): PROBLEMS AND SOLUTIONS	29		SPECIAL TECHNIQUES FOR SOLVING INTEGRALS: EXAMPLES AND PROBLEMS	14
	FORTY YEARS OF ALGEBRAIC GROUPS, ALGEBRAIC GEOMETRY AND REPRESENTATION THEORY IN CHINA: IN MEMORY OF THE CENTENARY YEAR OF XIHUA CAO'S BIRTH	5		MATHEMATICAL OLYMPIAD IN CHINA (2019-2020): PROBLEMS AND SOLUTIONS	29		STATIONARY STOCHASTIC MODELS: AN INTRODUCTION	19
	FRACTAL ANALYSIS: BASIC CONCEPTS AND APPLICATIONS	6		MATHEMATICAL OLYMPIAD IN CHINA: PROBLEMS AND SOLUTIONS	30		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"	35
	FRACTAL CALCULUS AND ITS APPLICATIONS: Fg-CALCULUS	15		MATHEMATICS FOR COMPUTATION (M4C)	23		STOCHASTIC INTEREST RATE MODELING WITH FIXED INCOME DERIVATIVE PRICING (THIRD EDITION)	22
	FRACTIONAL CALCULUS AND WAVES IN LINEAR VISCOELASTICITY: AN INTRODUCTION TO MATHEMATICAL MODELS (SECOND EDITION)	21		MATHEMATICS IN ANCIENT JAINA LITERATURE	25		TEACHING SECONDARY SCHOOL MATHEMATICS: TECHNIQUES AND ENRICHMENT	27
	FRACTIONAL DIFFERENTIAL EQUATIONS AND INCLUSIONS: CLASSICAL AND ADVANCED TOPICS	9		MATHEMATICS OF OPEN QUANTUM SYSTEMS, THE: DISSIPATIVE AND NON-UNITARY REPRESENTATIONS AND QUANTUM MEASUREMENTS	17		THEORY OF CLEAN RINGS AND MATRICES	4
	FUNCTIONAL DISTRIBUTION OF ANOMALOUS AND NONERGODIC DIFFUSION: FROM STOCHASTIC PROCESSES TO PDES	18		MATHEMATICS OF TAKEBE KATAHIRO AND HISTORY OF MATHEMATICS IN EAST ASIA - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON TRADITIONAL MATHEMATICS IN EAST ASIA AND RELATED TOPICS	35		TOWARDS DEEP UNDERSTANDING OF ELEMENTARY SCHOOL MATHEMATICS - A BRIEF COMPANION FOR TEACHER EDUCATORS AND OTHERS	26
	GENERALIZED RADON TRANSFORMS AND IMAGING BY SCATTERED PARTICLES: BROKEN RAYS, CONES, AND STARS IN TOMOGRAPHY	10		MATHEMATICS: ITS HISTORICAL ASPECTS, WONDERS AND BEYOND	26		TRAVELING FRONT SOLUTIONS IN REACTION-DIFFUSION EQUATIONS	35
	GEOMETRY IN OUR THREE-DIMENSIONAL WORLD	27		MERSENNE NUMBERS AND FERMAT NUMBERS	8		TRILOGY OF NUMBERS AND ARITHMETIC - BOOK 1: HISTORY OF NUMBERS AND ARITHMETIC: AN INFORMATION PERSPECTIVE	5
	GIBBS MEASURES IN BIOLOGY AND PHYSICS: THE POTTS MODEL	22		MODERN INTRODUCTION TO CLASSICAL NUMBER THEORY, A	8		TWO-MINUTE PUZZLE BOOK, THE: PUZZLES TO TRAIN YOUR BRAIN	31
	GLOBAL SOLUTION FOR SUDOKU	31		MODERN MATHEMATICAL METHODS FOR SCIENTISTS AND ENGINEERS: A STREET-SMART INTRODUCTION	14		UNILATERAL VARIATIONAL ANALYSIS IN BANACH SPACES (IN 2 PARTS)	24
	GRADUATE COURSE IN PROBABILITY, A	19		MODULAR AND AUTOMORPHIC FORMS & BEYOND	8		VARIATIONAL CONVERGENCE AND STOCHASTIC HOMOGENIZATION OF NONLINEAR REACTION-DIFFUSION PROBLEMS	10
	GRAPH THEORY: IN MATHEMATICAL OLYMPIAD AND COMPETITIONS	30		MODULI SPACES OF REAL PROJECTIVE STRUCTURES ON SURFACES	35		VARIOUS ASPECTS OF MULTIPLE ZETA FUNCTIONS - IN HONOR OF PROFESSOR KOJI MATSUMOTO'S 60TH BIRTHDAY - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE	35
	HANDBOOK OF MATHEMATICAL SCIENCE COMMUNICATION	26		MY MATHEMATICAL UNIVERSE: PEOPLE, PERSONALITIES, AND THE PROFESSION	25		WHAT ARE TENSORS EXACTLY?	8
	HILBERT AND BANACH SPACE-VALUED STOCHASTIC PROCESSES	20		NEW HORIZONS IN DIFFERENTIAL GEOMETRY AND ITS RELATED FIELDS	11			
	HOMOLOGY, COHOMOLOGY, AND SHEAF COHOMOLOGY FOR ALGEBRAIC TOPOLOGY, ALGEBRAIC GEOMETRY, AND DIFFERENTIAL GEOMETRY	11		NEW TRENDS IN ALGEBRAS AND COMBINATORICS - PROCEEDINGS OF THE THIRD INTERNATIONAL CONGRESS IN ALGEBRAS AND COMBINATORICS (ICAC2017)	35			
	HORMANDER OPERATORS	9		NONLINEAR FIELD THEORIES AND UNEXPLAINED PHENOMENA IN NATURE	15			
	HOW TO CHEAT WITH STATISTICS - AND GET AWAY WITH IT: FROM DATA SNOOPING OVER KITCHEN SINK REGRESSION TO "CREATIVE REPORTING"	19		NONLINEAR HIGHER ORDER DIFFERENTIAL AND INTEGRAL COUPLED SYSTEMS: IMPULSIVE AND INTEGRAL EQUATIONS ON BOUNDED AND UNBOUNDED DOMAINS	10			
	HOW TO DERIVE A FORMULA - VOLUME 2: FURTHER ANALYTICAL SKILLS AND METHODS FOR PHYSICAL SCIENTISTS	15		NORBERT WIENER - A MATHEMATICIAN AMONG ENGINEERS	13			
	HOW TO WRITE A SCIENTIFIC PAPER AFTER YOU THINK YOU'VE WRITTEN IT	26		ON COMPLEMENTARITY: A UNIVERSAL ORGANIZING PRINCIPLE	17			
				ONE-COCYCLES AND KNOT INVARIANTS	11			
				ONTOLOGICAL INFORMATION: INFORMATION IN THE PHYSICAL WORLD	25			
				OPERATIONS RESEARCH: INTRODUCTION TO MODELS AND METHODS	25			
				OPERATOR ALGEBRAS AND MATHEMATICAL PHYSICS - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE	35			
				ORDINARY DIFFERENTIAL EQUATIONS WITH APPLICATIONS (THIRD EDITION)	9			
				PAPER PUZZLE BOOK, THE: ALL YOU NEED IS PAPER!	31			

Author Index

Author	Page	Author	Page	Author	Page	Author	Page
Abbas, Said	9	Fiedler, Thomas	11	Liu, Shi-xiong	29	Rozikov, Utkir A	22
Abdolyousefi, Marjan Sheibani	4	Filipuk, Galina	10	Loomis, Lynn Harold	34	Ruan, Shigui	21
Abramovich, Sergei	26	Flamini, Flaminio	11	Luther, Kenneth	14	Saji, Kentaro	12
Adachi, Toshiaki	11, 35	Fokas, Athanassios	14	Ma, Zhong-qi	31	Sasane, Amol	17
Alladi, Krishnaswami	25	Forbes, Alistair B	18	Mabrouk, Anouar Ben	6	Schuster, Peter Michael	23
Almira, Jose Maria	13	French, Andrew	21	Magron, Victor	24	Schwichtenberg, Helmut	23
Ambartsoumian, Gaik	10	Fuhrer, Robert	31	Maier, Helmut	7	Seto, Kenji	16
Anza Hafsa, Omar	10	Gallier, Jean H	11	Mainardi, Francesco	21	Shapira, Yair	18
Arfaoui, Sabrina	6	Garibi, Ilan	31	Mainzer, Klaus	23	Shen, Wen	33
Asashiba, Hideto	35	Gatto, Riccardo	19	Makarov, Konstantin A	17	Shuai, Zhisheng	21
Atanasiu, Dragu	4	Ge, Jun	29	Mandallena, Jean-philippe	10	Shum, Kar Ping	35
Avrin, Jack Shulman	17	Geretschlager, Robert	27	Maresch, Guenter	27	Singmaster, David	27
Baez, John C	34	Golmankhaneh, Alireza Khalili	15	Martcheva, Maia	21, 22	Sinitsyn, Igor	13
Barbu, Viorel	10	Goodman, David Hillel	31	Mathis, Wolfgang	14	Slavnov, Nikita	16
Beliaev, Dmitry	33	Grandis, Marco	12	Mazzucchi, Sonia	17	Smith, Beverly	27
Benchohra, Mouffak	9	Grobner, Harald	4	Mcintyre, Michael Edgeworth	27	Smith?, Stacey R	26
Benini, Marco	23	Gromov, Mikhail L	11	Meissner, Gunter	19	Sole, Patrick	6
Berman, Abraham	7	Grote, Florian	7	Michaille, Gerard	10	Sousa, Robert De	10
Beyersdorff, Olaf	23	Guillemin, Victor	33	Michalik, Slawomir	10	Spreitzer, Christian	27
Blinder, S M	15	Guo, Boling	9	Mikosch, Thomas	34	Steeb, Willi-hans	14
Bonnecaze, Alexis	6	Guo, Hongyu	8	Mikusinski, Piotr	4	Stein, James D	27
Borges, Carlos R	13	Haine, Peter	33	Miller, Haynes R	13	Sternberg, Shlomo Zvi	34
Boucherie, Richard Johannes	25	Hang, Kim Hoo	30	Minhos, Feliz Manuel	10	Stuhlpfarrer, David	27
Boyadzhiev, Khristo N	14	Hansen, Vagn Lundsgaard	24	Moh, Tzuong-tsieng	25	Sugihara, Masaaki	5
Braaksma, Aleida	25	Hartkopf, Anna Maria	26	Molnar, Mark	5	Surgailis, Donatas	19
Bramanti, Marco	9	Hashimoto, Hideya	11, 35	Molnar, Sandor	5	Sussman, Myron Mike	18
Brandolini, Luca	9	Henning, Erin	26	Montforte, Vivian Ashley	18	Suzuki, Kosuke	17
Bruna, Joaquim	10	Herichi, Hamed	17	Mooney, Amber C Sumner	18	Suzuki, Takashi	13
Budd, Chris	21	Hess, Richard I	31	Mortad, Mohammed Hichem	5, 6	Szidarovszky, Ferenc	5
Burgin, Mark	5	Hibi, Takayuki	35	Moshayed, Nima	20	Tanaka, Kazuyuki	23, 35
Cai, Tianxin	4, 8	Hida, Haruzo	8	Movasati, Hossein	8	Teixeira, Ricardo V	33
Calin, Ovidiu	20	Hofkirchner, Wolfgang	25	Movsisyan, Yuri	4	Thaller, Bernd	27
Calkavur, Selda	6	Holton, Derek Allan	30	Munai, Javier P	34	Thibault, Lionel	24
Cantrell, Robert Stephen	21	Hsu, Sze-bi	9	Murillo, Raul	9	Tijms, Henk	20, 25, 33
Carlier, Guillaume	24	Inamuro, Takaji	17	Murota, Kazuo	5	Toth, Laszlo	7
Cattani, Carlo	6	Isham, Chris J	34	Nakanishi, Noboru	16	Tsekanovskii, Eduard R	17
Cenzer, Douglas	23	Ishikawa, Masaharu	35	Nevai, Andrew	21	Tsuchiya, Akiyoshi	35
Chang, Yong-kui	9	Jain, Surrender K	25	N'guerekata, Gaston Mandata	9	Tudor, Ciprian A	19
Chen, Chuan Chong	34	Kakihara, Yuichiro	20	Nicolaescu, Liviu I	19	Tuncer, Necibe	22
Chen, Huanyin	4	Kao, Edward P C	19	Nie, Daxin	18	Umarov, Sabir	16
Chen, Kuo-chang	9	Kauffman, Louis H	7	Nieto, Juan J	9	Umehara, Masaaki	12
Childs, Lauren	22	Kawata, Shigeto	35	Ostrovsky, Lev	16	Ungar, Abraham Albert	16
Chunovkina, Anna G	18	Kaxiras, Efthimios	14	Ou, Gaoyan	24	Wan, Frederic Y M	22
Conrad, Leon	7	Kim, Nam Kyun	35	Ovchinnikov, Alexey Vitalyevich	14	Wang, Haibin	30
Constantino, Tsallis	16	Kiselman, Christer Oscar	12	Panasenko, Grigory	21	Wang, Jianpan	5
Crompton, Andrew	7	Klebaner, Fima C	34	Panin, Alexander Anatolyevich	14	Wang, Jie	24
Cummins, Fred	7	Koh, Khee-meng	34	Papastavridis, John G	15	Wang, Xudong	18
Dani, S G	25	Kolesnikov, Pavel	35	Park, Jang-woo	33	Weintraub, Steven Howard	7
Davvaz, Bijan	8	Komech, Alexander	16	Passman, Donald S	6	Wong, Anita S M	35
Dela Cruz, Romar	6	Kornyshev, Alexei A	15	Pavese, Franco	18	Wu, Guohua	23, 35
Deng, Weihua	18	Kornyshev, Alexei A	33	Peng, Ningning	23, 35	Xiong, Bin	29, 30
Deza, Elena	4, 8	Korpusov, Maxim Olegovich	14	Ponce, Rodrigo	9	Xu, Jiagu	30
Dible, Randolph	7	Kramer, Arthur D	26	Pons, Odile	20	Yamada, Kotaro	12
Ding, Nanqing	35	Lambers, James V	18	Porter, Christopher	23	Yang, Yue	23, 35
Dolecki, Szymon	11	Lapidus, Michel L	17	Posamentier, Alfred S	26, 27	Yau, Donald	12
Dong, Bin	24	Larson, Jean	23	Privault, Nicolas	22	Yokura, Shoji	35
Dorner, Christian	27	Lastra, Alberto	10	Prosper, Olivia	22	Yoshino, Masato	17
Du, Jie	5	Lawson, Jr., H Blaine	11	Pugachev, V S	13	Yu, Hong-bing	29
E, Weinan	24	Lazreg, Jamal Eddine	9	Quaintance, Jocelyn	11	Yu, Liang	23, 35
Ellsbury, Graham	7	Le, Hai Chau	30	Rabinowitch, Alexander S	15	Zapletal, Jindrich	23
Elran, Yossi	27, 31	Le, Hai Khoi	30	Radin, Michael A	26	Zelmanov, Efim	35
Escassut, Alain	6	Lee, Dominic J O'	15, 33	Rassias, Michael Th	7	Zhang, Fuzhen	7
Etzion, Tuvi	24	Lee, Peng Yee	30	Rathjen, Michael	23	Zhang, Nien Fan	18
Faigle, Ulrich	22	Lein, Max	15	Rosenthal, Jeffrey S	33, 34	Zhao, Kaiming	6
Feng, Zhi-gang	29	Leoreanu-fotea, Violeta	8	Roussos, Ioannis Markos	13	Zheng, Zhongyi	30
Ferguson, Thomas S	22	Lin, Lei	5			Zhou, Yong	9
Fernandes, Rui Loja	12					Zhu, Zhanxing	24
						Zoladek, Henryk	9

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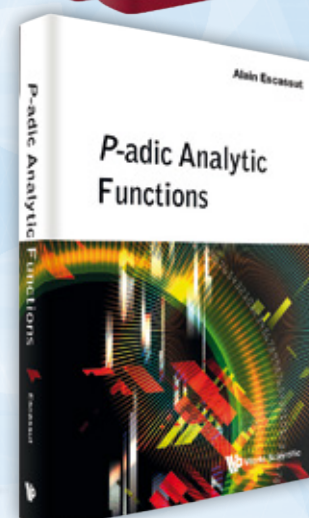
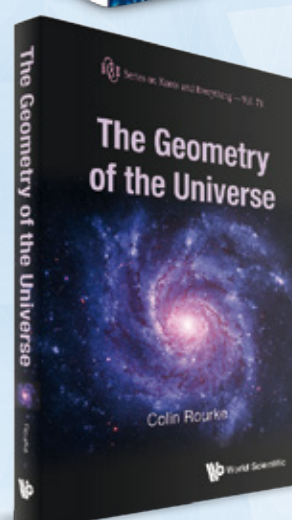
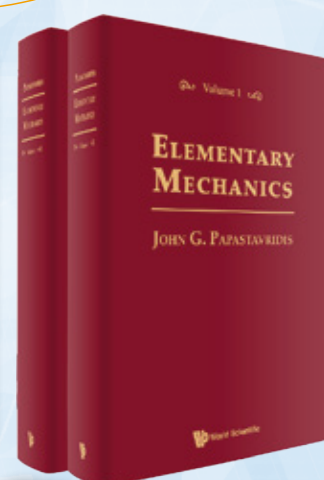
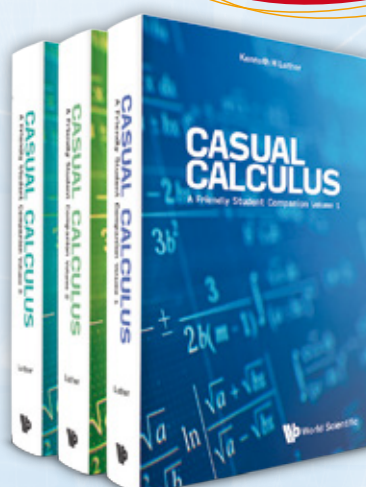
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