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Highlights

Mathematics Catalogue 2021

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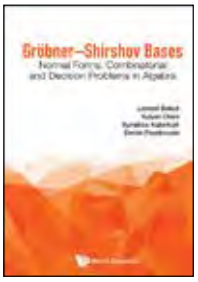
Mathematics

CONTENTS

ALGEBRA & RELATED TOPICS

Gröbner – Shirshov Bases



Normal Forms, Combinatorial and Decision Problems in Algebra

by **Leonid Bokut** *(Sobolev Institute of Mathematics, Russia)*, **Yuqun Chen** *(South China Normal University, China)*, **Kyriakos Kalorkoti** *(University of Edinburgh, United Kingdom)*, **Pavel Kolesnikov** *(Sobolev Institute of Mathematics, Russia)* & **Viktor Lopatkin** *(Saint-Petersburg State University, Russia)*

The book is about (associative, Lie and other) algebras, groups, semigroups presented by generators and defining relations. They play a great role in modern mathematics. It is enough to mention the quantum groups and Hopf algebra theory, the Kac – Moody and Borcherds algebra theory, the braid groups and Hecke algebra theory, the Coxeter groups and semisimple Lie algebra theory, the plactic monoid theory. One of the main problems for such presentations is the problem of normal forms of their elements. The first book that describes Gröbner – Shirshov bases method for Lie algebra in full details

Readership: Researchers in algebra and combinatorics.

308pp	**Jul 2020**	
978-981-4619-48-6	**US$138**	**£120**

Series on Knots and Everything - Vol 65

Mathematics of Harmony as a New Interdisciplinary Direction and "Golden" Paradigm of Modern Science

Volume 1: The Golden Section, Fibonacci Numbers, Pascal Triangle, and Platonic Solids

by **Alexey Stakhov** *(International Club of the Golden Section, Canada & Academy of Trinitarism, Russia)*

Volume I is the first part of the 3-volume book *Mathematics of Harmony as a New Interdisciplinary Direction and "Golden" Paradigm of Modern Science*. "Mathematics of Harmony" rises in its origin to the "harmonic ideas" of Pythagoras, Plato and Euclid, this 3-volume book aims to promote more deep understanding of ancient conception of the "Universe Harmony, " the main conception of ancient Greek science, and implementation of this conception to modern science and education.

Readership: High school, college and university students and teachers, professionals, scientists and investors interested in history of mathematics, Fibonacci numbers, golden section and their generalization.

248pp	**May 2020**	
978-981-120-710-5	**US$88**	**£75**

Invitation to Algebra

A Resource Compendium for Teachers, Advanced Undergraduate Students and Graduate Students in Mathematics

by **Vlastimil Dlab** & **Kenneth S Williams** *(Carleton University, Canada)*

This book presents a compendium style account of a comprehensive mathematical journey from Arithmetic to Algebra. A number of topics that are missing in present-day textbooks, and which may be attractive to students at the graduate or advanced undergraduate level in mathematics, for example, continued fractions, arithmetic progressions of higher order, complex numbers in plane geometry, differential schemes, path semigroups and path algebras, have been carefully presented.

Readership: Graduates, advanced undergraduates in mathematics and professors, teachers of mathematics.

452pp	**Jul 2020**	
978-981-121-997-9	**US$138**	**£120**

Non-Diophantine Arithmetics in Mathematics, Physics and Psychology

by **Mark Burgin** *(University of California, Los Angeles, USA)* & **Marek Czachor** *(Politechnika Gdańska, Poland)*

This book provides a detailed exposition of the theory of non-Diophantine arithmetics and its various applications. Reading this book, the reader will see that on the one hand, non-Diophantine arithmetics continue the ancient tradition of operating with numbers while on the other hand, they introduce extremely original and innovative ideas.

Key Features:

- It is a unique book on this ground-breaking topic, which not only changes people's understanding of numbers and operations with them but also provides diverse applications in different areas, which change not only mathematics and science but also some essential aspects of social functioning

Readership: Researchers and graduate students in mathematics, physics, psycholody, and philosophy.

800pp	**Nov 2020**	
978-981-121-430-1	**US$188**	**£165**

P-adic Analytic Functions

by **Alain Escassut** *(Blaise Pascal University, France)*

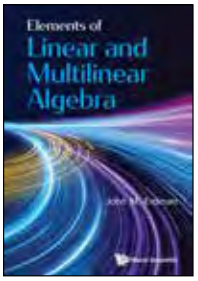
P-adic Analytic Functions describes the definition and properties of *p*-adic analytic and meromorphic functions in a complete algebraically closed ultrametric field. Various properties of *p*-adic exponential-polynomials are examined, such as the Hermite Lindemann theorem in a *p*-adic field, with a new proof. The order and type of growth for analytic functions are studied, in the whole field and inside an open disk. *P*-adic meromorphic functions are studied, not only on the whole field but also in an open disk and on the complemental of a closed disk, using Motzkin meromorphic products. Finally, the *p*-adic Nevanlinna theory is widely explained, with various applications. Small functions are introduced with results of uniqueness for meromorphic functions. The question of whether the ring of analytic functions — in the whole field or inside an open disk — is a Bezout ring is also examined.

Readership: The target audience consists of researchers and post-graduate students in ultrametric analysis and number theory. Also appropriate for researchers in Levi-Civita fields in *p*-adic physics.

350pp	**Jan 2021**	
978-981-122-621-3	**US$128**	**£115**

Essential Textbooks

Elements of Linear and Multilinear Algebra



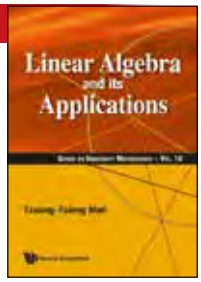
by **John M Erdman** *(Portland State Univ., USA)*

This set of notes is an activity-oriented introduction to linear and multilinear algebra. The great majority of the most elementary results in these subjects are straightforward and can be verified by the thoughtful student. Indeed, that is the main point of these notes — to convince the beginner that the subject is accessible. In the material that follows there are numerous indicators that suggest activity on the part of the reader: words such as "proposition", "example", "theorem", "exercise", and "corollary", if not followed by a proof (and proofs here are very rare) or a reference to a proof, are invitations to verify the assertions made.

Readership: Upper division undergraduates, beginning graduate students, instructors of linear and multilinear algebra.

160pp	**Jan 2021**	
978-981-122-272-6	**US$68**	**£60**

Written by MOH TZUONG-TSIENG



Series on University Mathematics - Vol 10

Linear Algebra and its Applications

by **Tzuong-Tsieng Moh**
(Purdue University, USA)

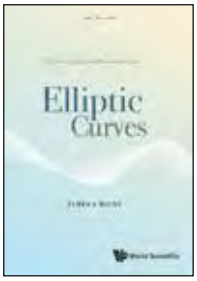
From Tzuong-Tsieng Moh, a long-time expert in algebra, comes a new book for students to better understand linear algebra. Writing from an experienced standpoint, Moh touches on the many facets surrounding linear algebra, including but not limited to, echelon forms, matrix algebra, linear transformations, determinants, dual space, inner products, the Gram – Schmidt Theorem, Hilbert space, and more. It is ideal for both newcomers and seasoned readers who want to attain a deeper understanding on both the basics and advanced topics of linear algebra and its vast applications. The wide range of topics combined with the depth of each discussion make it essential to be on the shelf of every mathematical beginner and enthusiast.

Readership: Graduate students and researchers interested in the basic and advanced topics of linear algebra and its applications.

316pp	**Nov 2020**	
978-981-3235-42-7	**US$98**	**£86**

Elliptic Curves

2nd Edition



by **James S Milne**
(University of Michigan, USA)

This book uses the beautiful theory of elliptic curves to introduce the reader to some of the deeper aspects of number theory. It assumes only a knowledge of the basic algebra, complex analysis, and topology usually taught in first-year graduate courses. The first three chapters develop the basic theory of elliptic curves.

For this edition, the text has been completely revised and updated.

Readership: Graduate students and lecturers in mathematics, specifically number theory courses.

316pp	**Sep 2020**	
978-981-122-183-5	**US$98**	**£85**

Classical and Dynamical Markov and Lagrange Spectra

Dynamical, Fractal and Arithmetic Aspects

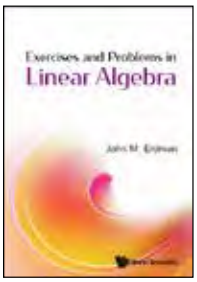
by **Davi Lima** *(Universidade Federal de Alagoas, Brazil)*, **Carlos Matheus** *(CNRS, France)*, **Carlos G Moreira** *(IMPA, Brazil)* & **Sergio Romaña** *(Universidade Federal do Rio de Janeiro, Brazil)*

The book intends to give a modern presentation of the classical Markov and Lagrange spectrum, which are fundamental objects from the theory of Diophantine approximations and of their several generalizations related to Dynamical Systems and Differential Geometry. Besides presenting many classical results, the book includes several topics of recent research on the subject, connecting several fields of Mathematics — Number Theory, Dynamical Systems and Fractal Geometry.

Readership: Graduate students and researchers in Number Theory and Dynamical Systems.

224pp	**Nov 2020**	
978-981-122-528-4	**US$88**	**£75**

Exercises and Problems in Linear Algebra



by **John M Erdman** *(Portland State University, USA)*

This book contains an extensive collection of exercises and problems that address relevant topics in linear algebra. Topics that the author finds missing or inadequately covered in most existing books are also included. The exercises will be both interesting and helpful to an average student. Some are fairly routine calculations, while others require serious thought.

The format of the questions makes them suitable for teachers to use in quizzes and assigned homework. Some of the problems may provide excellent topics for presentation and discussions. Furthermore, answers are given for all odd-numbered exercises which will be extremely useful for self-directed learners.

Readership: Students and teachers of linear algebra.

200pp	**Nov 2020**	
978-981-122-040-1	**US$78**	**£70**
978-981-122-107-1(pbk)	**US$38**	**£35**

Series on Knots and Everything

Mathematics of Harmony as a New Interdisciplinary Direction and "Golden" Paradigm of Modern Science

Volume 2: Algorithmic Measurement Theory, Fibonacci and Golden Arithmetic's and Ternary Mirror-Symmetrical Arithmetic

by **Alexey Stakhov** *(International Club of the Golden Section, Canada & Academy of Trinitarism, Russia)*

Volume II is the second part of the 3-volume book *Mathematics of Harmony as a New Interdisciplinary Direction and "Golden" Paradigm of Modern Science*. "Mathematics of Harmony" rises in its origin to the "harmonic ideas" of Pythagoras, Plato and Euclid, this 3-volume book aims to promote more deep understanding of ancient conception of the "Universe Harmony, " the main conception of ancient Greek science, and implementation of this conception to modern science and education.

(Refer to Page 4 for more information on Volume I)

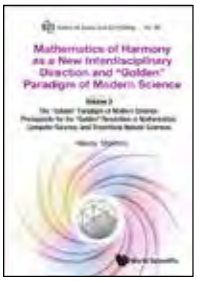
Readership: High school, college and university students, teachers, professionals, scientists and investors interested in history of mathematics, Fibonacci numbers, golden section and their generalization.

300pp	**Sep 2020**	
978-981-121-346-5	**US$98**	**£85**

Series on Knots and Everything

Mathematics of Harmony as a New Interdisciplinary Direction and "Golden" Paradigm of Modern Science

Volume 3: The "Golden" Paradigm of Modern Science: Prerequisite for the "Golden" Revolution in Mathematics, Computer Science, and Theoretical Natural Sciences



by **Alexey Stakhov** *(International Club of the Golden Section, Canada & Academy of Trinitarism, Russia)*

Volume III is the third part of the 3-volume book *Mathematics of Harmony as a New Interdisciplinary Direction and "Golden" Paradigm of Modern Science*. "Mathematics of Harmony" rises in its origin to the "harmonic ideas" of Pythagoras, Plato and Euclid, this 3-volume book aims to promote more deep understanding of ancient conception of the "Universe Harmony, " the main conception of ancient Greek science, and implementation of this conception to modern science and education.

(Refer to Page 4 for more information on Volume I)

Readership: High school, college and university students, teachers, professionals, scientists and investors interested in history of mathematics, Fibonacci numbers, golden section and their generalization.

196pp	**Sep 2020**	
978-981-121-349-6	**US$78**	**£70**

Notable Titles in Algebra and Related Topics (2018-2019)

Higher Dimensional Categories

From Double to Multiple Categories

by **Marco Grandis** *(Università di Genova, Italy)*

The study of higher dimensional categories has mostly been developed in the globular form of 2-categories, *n*-categories, omega-categories and their weak versions. Here we study a different form: double categories, *n*-tuple categories and multiple categories, with their weak and lax versions. This book wants to show the advantages of this form for the theory of adjunctions and limits. Furthermore, this form is much simpler in higher dimension, starting with dimension three where weak 3-categories (also called tricategories) are already quite complicated, much more than weak or lax triple categories.

Readership: Graduate and postgraduate students, researchers.

536pp	**Oct 2019**	
978-981-120-510-1	**US$168**	**£150**

2019 Bestseller

Series on Knots and Everything - Vol 63

Board Games

Throughout the History and Multidimensional Spaces

by **Jorma Kyppö** *(University of Jyväskylä, Finland)*

In this richly illustrated book, Dr Jorma Kyppö explores the history of board games dating back to Ancient Egypt, Mesopotamia, India and China. He provides a description of the evolution and various interpretations of chess. Furthermore, the book offers the study of the old Celtic and Viking board games and the old Hawaiian board game Konane, as well as a new hypothesis about the interpretation of the famous Cretan Phaistos Disk. Descriptions of several chess variations, including some highlights of the game theory and tiling in different dimensions, are followed by a multidimensional symmetrical n-person strategy game model, based on chess. Final chapter (Concluding remarks) offers the new generalizations of the Euler-Poincare's Characteristic, Pi and Fibonacci sequence.

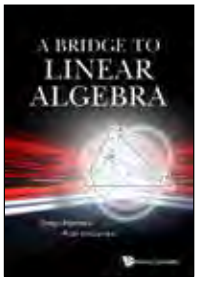
Readership: Researchers in combinatorics, complex manifolds and topology, game theory.

344pp	**Jul 2019**	
978-981-3233-52-2	**US$118**	**£105**

Essential Textbooks

A Bridge to Linear Algebra

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



The book makes a first course in linear algebra more accessible to the majority of students and it assumes no prior knowledge of the subject. It provides a careful presentation of particular cases of all core topics. Students will find that the explanations are clear and detailed in manner. It is considered as a bridge over the obstacles in linear algebra and can be used with or without the help of an instructor. While many linear algebra texts neglect geometry, this book includes numerous geometrical applications. For example, the book presents classical analytic geometry using concepts and methods from linear algebra, discusses rotations from a geometric viewpoint, gives a rigorous interpretation of the right-hand rule for the cross product using rotations and applies linear algebra to solve some nontrivial plane geometry problems.

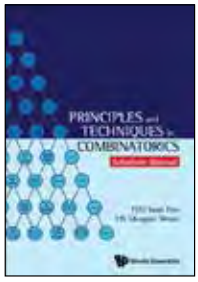
Readership: Undergraduate students taking a first course in linear algebra.

508pp	**Jun 2019**	
978-981-120-022-9	**US$148**	**£130**
978-981-120-146-2(pbk)	**US$78**	**£70**

Principles and Techniques in Combinatorics

Solutions Manual

by **Kean Pew Foo**, **Mingyan** & **Simon Lin** *(University of Illinois at Urbana-Champaign, USA)*



The solutions to each problem are written from a first principles approach, which would further augment the understanding of the important and recurring concepts in each chapter. Moreover, the solutions are written in a relatively self-contained manner, with very little knowledge of undergraduate mathematics assumed. In that regard, the solutions manual appeals to a wide range of readers, from secondary school and junior college students, undergraduates, to teachers and professors.

Readership: Students doing combinatorics.

440pp	**Oct 2018**	
978-981-3238-84-8(Set)(pbk)	**US$45**	**£40**

See Pg34 for Principles and Techniques in Combinatorics

COMPUTER MATHEMATICS & SCIENCE

Linear Algebra and Optimization with Applications to Machine Learning

Volume I: Linear Algebra for Computer Vision, Robotics, and Machine Learning

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

This book provides the mathematical fundamentals of linear algebra to practicers in computer vision, machine learning, robotics, applied mathematics, and electrical engineering. By only assuming a knowledge of calculus, the authors develop, in a rigorous yet down to earth manner, the mathematical theory behind concepts such as: vectors spaces, bases, linear maps, duality, Hermitian spaces, the spectral theorems, SVD, and the primary decomposition theorem. At all times, pertinent real-world applications are provided. This book includes the mathematical explanations for the tools used which we believe that is adequate for computer scientists, engineers and mathematicians who really want to do serious research and make significant contributions in their respective fields.

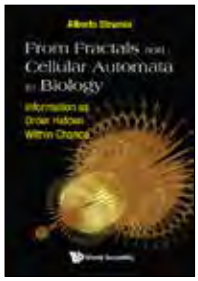
Readership: Undergraduate and graduate students.

824pp	**Feb 2020**	
978-981-120-639-9	**US$198**	**£175**
978-981-120-771-6(pbk)	**US$98**	**£85**

From Fractals and Cellular Automata to Biology

Information as Order Hidden Within Chance

by **Alberto Strumia** *(Istituto Nazionale di Alta Matematica "Francesco Severi", Italy)*



The didactical level of exposition, together with many astonishing images and animations, accompanied by the related simple computer programming codes (in Python and POV-Ray languages) make this book an extremely and unique useful tool to test the power of algorithmic information in generating ordered structure models (2D and 3D) like regular geometric shapes, complex shapes like fractals and cellular automata, and biological systems as the organs of a living body. Informational biologists besides mathematicians and physicists of complexity may learn to test their own capabilities in programming and modelling ordered structures starting from random initial conditions at different scale of each system.

Readership: Mathematicians, Physicists, Biologists, Bioengineers, Computer Programmers, Science philosophers (of all graduate level).

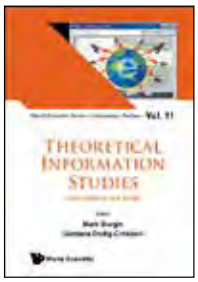
328pp	**Aug 2020**	
978-981-121-715-9	**US$138**	**£120**

World Scientific Series in Information Studies - Vol 11

Theoretical Information Studies

Information in the World

edited by **Mark Burgin** *(University of California, Los Angeles, USA)* & **Gordana Dodig-Crnkovic** *(Chalmers University of Technology, Sweden & Mälardalen University, Sweden)*



The book presents results of collaboration across research fields within info-computational and info-structural frameworks, in attempt to better theoretically and conceptually capture the phenomenon of information and its dynamics (such as computation and communication), as they appear on different levels of organization, on different scales and in different contexts. It covers the broadest range of phenomena related to information, with their structures and processes, as well as meta-level investigation of the nature of the study of information including its logic, metatheory and methodologies

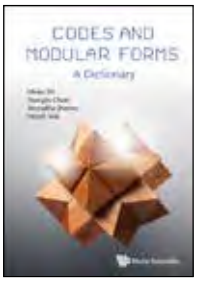
Readership: Graduate students and researchers in Information Theory.

536pp	**Apr 2020**	
978-981-3277-48-9	**US$158**	**£140**

Codes and Modular Forms

A Dictionary

by **Minjia Shi** *(Anhui University, China)*, **YoungJu Choie** *(Pohang University of Science and Technology (POSTECH), South Korea)*, **Anuradha Sharma** *(Indraprastha Institute of Information Technology Delhi, India)* & **Patrick Solé** *(University of Aix Marseille, France)*



There are connections between invariant theory and modular forms since the times of Felix Klein, in the 19th century, connections between codes and lattices since the 1960's. The aim of the book is to explore the interplay between codes and modular forms. Here modular form is understood in a wide sense (Jacobi forms, Siegel forms, Hilbert forms). Codes comprises not only linear spaces over finite fields but modules over some commutative rings. The connection between codes over finite fields and lattices has been well documented since the 1970s. Due to an avalanche of results on codes over rings since the 1990's there is a need for an update at book level.

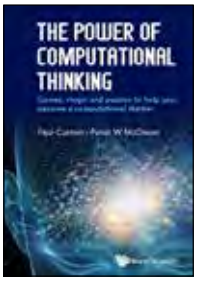
Readership: Graduate students and researchers.

232pp	**Nov 2019**	
978-981-121-291-8	**US$88**	**£75**

The Power of Computational Thinking

Games, Magic and Puzzles to Help You Become a Computational Thinker

by **Paul Curzon** & **Peter W McOwan** *(Queen Mary University of London, UK)*



"A wonderful book full of ideas with which to inspire and engage in computational thinking. Core concepts and principles are brought to life in fun and engaging ways through puzzles, magic tricks and games. This is a must-have book for Computing teachers."
Dr Kevin R Bond, Managing Director, Educational Computing Services Ltd

The book has a unique and enjoyable introduction. The authors describe the elements of computational thinking — such as algorithmic thinking, decomposition, abstraction and pattern matching — in an entertaining and accessible way, using magic tricks, games and puzzles, as well as through real and challenging problems that computer scientists work on.

Readership: Suitable as a general book for all those interested in lay science or recreational maths, or just interested in learning more about computational thinking;

232pp	**Mar 2017**	
978-1-78634-183-9	**US$58**	**£48**
978-1-78634-184-6(pbk)	**US$24**	**£20**

World Scientific Series in Information Studies - Vol 10

Philosophy and Methodology of Information

The Study of Information in the Transdisciplinary Perspective

edited by **Gordana Dodig-Crnkovic** *(Chalmers University of Technology, Sweden & Mälardalen University, Sweden)* & **Mark Burgin** *(University of California, Los Angeles, USA)*

The book gives up-to-date, multi-aspect exposition of the philosophy and methodology of information, and related areas within the nascent field of the study of information. It presents the most recent achievements, ideas and opinions of leading researchers in this domain, as well as from physicists, biologists and social scientists. Collaboration of researchers from different areas and fields opens new perspectives for the understanding of information essential in the innovative development of science, technology and society.

The ideas presented give new insights for those who develop or implement scientific, technological or social applications. They are especially for those who are participating in setting the goals for science in general and sciences of information in particular.

Readership: Graduate students and researchers in Information Theory.

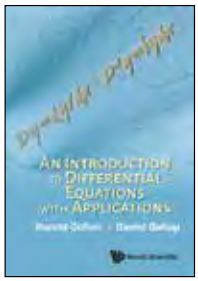
576pp	**May 2019**	
978-981-3277-51-9	**US$158**	**£140**

DIFFERENTIAL & INTEGRAL EQUATIONS

Essential Textbooks

An Introduction to Differential Equations with Applications

by **Harold Cohen** *(California State University, Los Angeles, USA)* & **Daniel Gallup** *(Pasadena City College, USA)*



This book is for students in a first course in ordinary differential equations. The material is organized so that the presentations begin at a reasonably introductory level. Subsequent material is developed from this beginning. The book contains methods of approximation to solutions of various types of differential equations with practical applications, which will serve as a guide to programming so that such differential equations can be solved numerically with the use of a computer. Students who intend to pursue a major in engineering, physical sciences, or mathematics will find this book useful.

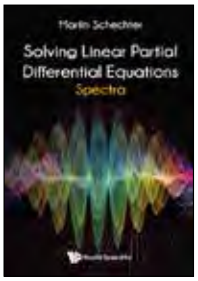
Readership: Undergraduate students studying mathematics, physics, engineering, business, economics and banking.

816pp	**Sep 2020**	
978-981-3276-65-9	**US$168**	**£150**

Solving Linear Partial Differential Equations

Spectra

by **Martin Schechter** *(University of California, Irvine, USA)*



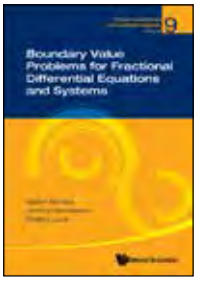
This book examines the general linear partial differential equation of arbitrary order *m*. Even this involves more methods than are known. We ask a simple question: when can an equation be solved and how many solutions does it have? The answer is surprising even for equations with constant coefficients. We begin with these equations, first finding conditions which allow one to solve and obtain a finite number of solutions. It is then shown how to obtain those solutions by analyzing the structure of the equation very carefully.

Readership: Graduate students, researchers and specialists who come across linear partial equations in their work in the fields of mathemetics and the physical sciences.

408pp	**Jul 2020**	
978-981-121-630-5	**US$148**	**£130**

Trends in Abstract and Applied Analysis - Vol 9

Boundary Value Problems for Fractional Differential Equations and Systems



by **Bashir Ahmad** *(King Abdulaziz University, Saudi Arabia)*, **Johnny Henderson** *(Baylor University, USA)* & **Rodica Luca** *("Gheorghe Asachi" Technical University of Iasi, Romania)*

This book is devoted to the study of existence of solutions or positive solutions for various classes of Riemann – Liouville and Caputo fractional differential equations, and systems of fractional differential equations subject to nonlocal boundary conditions. The monograph draws together many of the authors' results, that have been obtained and highly cited in the literature in the last four years.

Readership: Mathematical and scientific researchers, and graduate students in mathematics and science interested in the existence of solutions for fractional differential equations and systems.

328pp	**Feb 2021**	
978-981-122-445-4	**US$118**	**£105**

Series in Contemporary Applied Mathematics - Vol 22

Control and Inverse Problems for Partial Differential Equations

edited by **Gang Bao** *(Zhejiang University, China)*, **Jean-Michel Coron** *(Université Pierre et Marie Curie, France)* & **Tatsien Li** *(Fudan University, China)*

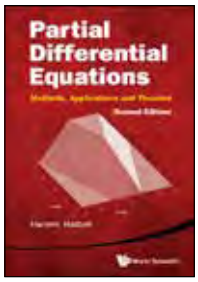
This book is a collection of lecture notes for the LIASFMA Hangzhou Autumn School on "Control and Inverse Problems for Partial Differential Equations" which was held during October 17 – 22, 2016 at Zhejiang University, Hangzhou, China. This autumn school is one of the activities organized by Sino – French International Associate Laboratory in Applied Mathematics (LIASFMA). Established jointly by eight institutions in China and France in 2014, LIASFMA aims at providing a platform for many leading French and Chinese mathematicians to conduct in-depth researches, extensive exchanges, and student training in broad areas of applied mathematics.

Readership: Undergraduate and graduate students and researchers in partial differential equations.

264pp	**Jun 2019**	
978-981-3276-14-7	**US$108**	**£95**

Essential Textbooks

Partial Differential Equations



Methods, Applications and Theories

2nd Edition

by **Harumi Hattori** *(West Virginia University, USA)*

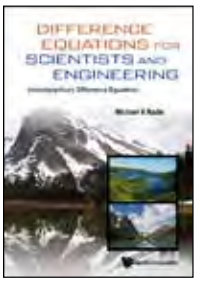
This is an introductory level textbook for partial differential equations (PDEs). It is suitable for a one-semester undergraduate level or two-semester graduate level course in PDEs or applied mathematics. This volume is application-oriented and rich in examples. Going through these examples, the reader is able to easily grasp the basics of PDEs. Partial differential equations are becoming a core subject in Engineering and the Sciences. This textbook will greatly benefit those studying in these subjects by covering basic and advanced topics in PDEs based on applications.

Readership: Undergraduate students in mathematics, science, and engineering.

428pp	**Jul 2019**	
978-981-120-223-0	**US$88**	**£75**
978-981-122-144-6(pbk)	**US$58**	**£50**

Essential Textbooks

Difference Equations for Scientists and Engineering



Interdisciplinary Difference Equations

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

"Radlin has done a nice job in producing a textbook which provides a learner friendly introduction to difference equations. It would suit as a core text for a first year course in the topic, aimed, as the title suggests, at physical science or engineering undergraduates. The student who is prepared to work through the book will get a good grounding in basic techniques and gain a feel for the possible behaviours of standard equations. He will also be given some indication of the usefulness and potential complexity of discrete systems in modern science and engineering." **London Mathematical Society**

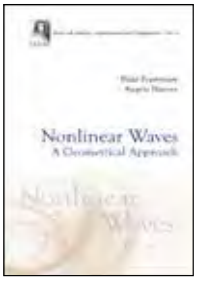
We introduce interdisciplinary research and get students and the audience familiarized with the difference equations; solving them explicitly, determining the long-term behavior of solutions (convergence, boundedness and periodicity). We help to develop intuition in analyzing convergence of solutions in terms of subsequences and analyzing patterns of periodic cycles. Our book helps you learn applications in biology, economics and business, computer science and engineering.

Readership: Students and researchers in mathematics, physics, science and engineering.

332pp	**Oct 2019**	
978-981-120-385-5	**US$118**	**£105**
978-981-120-296-4(pbk)	**US$58**	**£50**

Series on Analysis, Applications and Computation - Vol 9

Nonlinear Waves



A Geometrical Approach

by **Petar Popivanov** & **Angela Slavova** *(Bulgarian Academy of Sciences, Bulgaria)*

This volume provides an in-depth treatment of several equations and systems of mathematical physics, describing the propagation and interaction of nonlinear waves as different modifications of these: the KdV equation, Fornberg – Whitham equation, Vakhnenko equation, Camassa – Holm equation, several versions of the NLS equation, Kaup – Kupershmidt equation, Boussinesq paradigm, and Manakov system, amongst others, as well as symmetrizable quasilinear hyperbolic systems arising in fluid dynamics.

Readers not familiar with the complicated methods used in the theory of the equations of mathematical physics (functional analysis, harmonic analysis, spectral theory, topological methods, *a priori* estimates, conservation laws) can easily be acquainted here with different solutions of some nonlinear PDEs written in a sharp form (waves), with their geometrical visualization and their interpretation. This volume is self-contained and equipped with simple proofs. It contains many exercises and examples arising from the applications in mechanics, physics, optics and, quantum mechanics.

Readership: University and graduate students, mathematicians, physicists, engineers and specialists in the fields of evolution PDEs and their applications.

208pp	**Jan 2019**	
978-981-3271-60-9	**US$88**	**£75**

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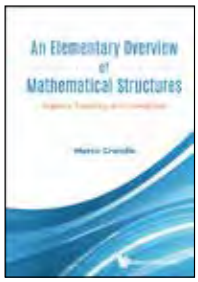
GEOMETRY & TOPOLOGY

Essential Textbooks



An Elementary Overview of Mathematical Structures

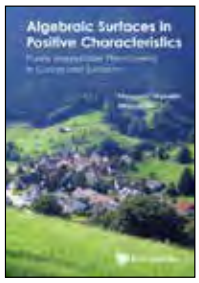
Algebra, Topology and Categories

by **Marco Grandis**
(Università di Genova, Italy)

This book can be used as a textbook for undergraduate studies and for self-study. It can provide students of Mathematics with a unified perspective of subjects which are often kept apart. It is also addressed to students and researchers of disciplines having strong interactions with Mathematics, like Physics and Chemistry, Statistics, Computer Science, Engineering.

Readership: Undergraduate and graduate students in Mathematics, Physics, Computer Sciences, Chemistry, Statistics, Engineering.

385pp	**Sep 2020**	
978-981-122-031-9	**US$118**	**£105**



Algebraic Surfaces in Positive Characteristics

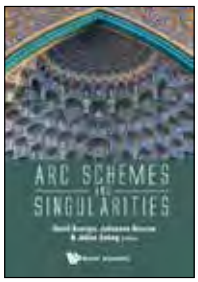
Purely Inseparable Phenomena in Curves and Surfaces

by **Masayoshi Miyanishi** *(Osaka University, Japan)* & **Hiroyuki Ito** *(Tokyo University of Science, Japan)*

This is the first book which explains the phenomena arising from purely inseparable coverings and Artin – Schreier coverings. In most cases, the base surfaces are rational, hence the covering surfaces are unirational. There exists a vast, unexplored world of unirational surfaces. In this book, we explain the Frobenius sandwiches as examples of unirational surfaces.

Readership: Graduate students and researchers in the fields of Algebraic Geometry, Fields and Rings, and Commutative Algebra.

456pp	**Jul 2020**	
978-981-121-520-9	**US$138**	**£120**



Arc Schemes and Singularities

edited by **David Bourqui** *(Université de Rennes 1, France)*, **Johannes Nicaise** *(Imperial College London, UK & University of Leuven, Belgium)* & **Julien Sebag** *(Universitéde Rennes 1, France)*

This title introduces the theory of arc schemes in algebraic geometry and singularity theory, with special emphasis on recent developments around the Nash problem for surfaces. The main challenges are to understand the global and local structure of arc schemes, and how they relate to the nature of the singularities on the variety. Since the arc scheme is an infinite dimensional object, new tools need to be developed to give a precise meaning to the notion of a singular point of the arc scheme.

Other related topics are also explored, including motivic integration and dual intersection complexes of resolutions of singularities. Written by leading international experts, it offers a broad overview of different applications of arc schemes in algebraic geometry, singularity theory and representation theory.

Readership: Graduate students interested in algebraic geometry and the theory of arc schemes and the solution of the Nash problem for surfaces.

312pp	**Apr 2020**	
978-1-78634-719-0	**US$108**	**£95**

Biharmonic Submanifolds and Biharmonic Maps in Riemannian Geometry

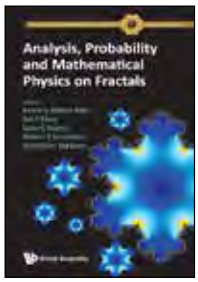
by **Ye-Lin Ou** *(Texas A&M University-Commerce, USA)* & **Bang-Yen Chen** *(Michigan State University, USA)*

Written by 2 experts in the subject, the book aims to present a comprehensive survey on biharmonic submanifolds and maps from the viewpoint of Riemannian geometry. It provides some basic knowledge and tools used in the study of the subject as well as an overall picture of the development of the subject with most up-to-date important results. Since 2000, biharmonic submanifolds and maps have become a vibrant research field with a growing number of researchers around the world, with many interesting results have been obtained.

This book containing basic knowledge, tools for some fundamental problems and a comprehensive survey on the study of biharmonic submanifolds and maps will be greatly beneficial for graduate students and beginning researchers who want to study the subject, as well as researchers who have already been working in the field.

Readership: Graduate students and researchers from the fields of geometry and analysis.

540pp	**Apr 2020**	
978-981-121-237-6	**US$178**	**£155**



Fractals and Dynamics in Mathematics, Science, and the Arts: Theory and Applications - Vol 5

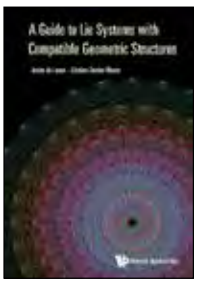
Analysis, Probability and Mathematical Physics on Fractals

edited by **Patricia Alonso Ruiz** *(Texas A&M University, USA)*, **Joe P Chen** *(Colgate University, USA)*, **Luke G Rogers** *(University of Connecticut, USA)*, **Robert S Strichartz** *(Cornell University, USA)* & **Alexander Teplyaev** *(University of Connecticut, USA)*

This book introduces background and recent progress on these problems, from both established leaders in the field and early career researchers. The book gives a broad introduction to several foundational techniques in fractal mathematics, while also introducing some specific new and significant results of interest to experts, such as that waves have infinite propagation speed on fractals. It contains sufficient introductory material that it can be read by new researchers or researchers from other areas who want to learn about fractal methods and results.

Readership: Academic mathematicians and physicists, both pure and applied, working on fractals or rough spaces or interested in fractal media; Scientists from the many areas in which fractal models are important,

596pp	**Mar 2020**	
978-981-121-552-0	**US$158**	**£140**



A Guide to Lie Systems with Compatible Geometric Structures

by **Javier de Lucas** *(University of Warsaw, Poland)* & **Cristina Sardón Muñoz** *(Instituto de Ciencias Matemáticas, Spain)*

The book presents a comprehensive guide to the study of Lie systems from the fundamentals of differential geometry to the development of contemporary research topics. It embraces several basic topics on differential geometry and the study of geometric structures while developing known applications in the theory of Lie systems. The book also includes a brief exploration of the applications of Lie systems to superequations, discrete systems, and partial differential equations. Offering a complete overview from the topic's foundations to the present, this book is an ideal resource for Physics and Mathematics students, doctoral students and researchers.

Readership: The book is aimed at Physics and Mathematics students finishing their degree, doctoral students, and researchers.

424pp	**Feb 2020**	
978-1-78634-697-1	**US$148**	**£130**

Metacyclic Groups and the D(2) Problem

by **Francis E A Johnson**
(University College London, UK)

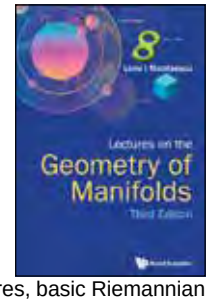
This book solves the $D(2)$ problem for a large, possibly infinite, number of finite metacyclic groups $G(p, q)$. Prior to this the author had solved the $D(2)$ problem for the groups $G(p, 2)$. However, for $q > 2$, the only previously known solutions were for the groups $G(7, 3)$, $G(5, 4)$ and $G(7, 6)$, all done by difficult direct calculation by two of the author's students, Jonathan Remez (2011) and Jason Vittis (2019).

The method employed is heavily algebraic and involves precise analysis of the integral representation theory of $G(p, q)$. Some noteworthy features are a new cancellation theory of modules (Chapters 10 and 11) and a simplified treatment (Chapters 5 and 12) of the author's theory of Swan homomorphisms.

Readership: Academic mathematicians; postgraduate and higher.

280pp	**Jan 2021**	
978-981-122-275-7	**US$85**	**£75**

Lectures on the Geometry of Manifolds (3rd Edition)



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

The goal of this book is to introduce the reader to some of the main techniques, ideas and concepts frequently used in modern geometry. It starts from scratch and it covers basic topics such as differential and integral calculus on manifolds, connections on vector bundles and their curvatures, basic Riemannian geometry, calculus of variations, DeRham cohomology, integral geometry (tube and Crofton formulas), characteristic classes, elliptic equations on manifolds and Dirac operators. The new edition contains a new chapter on spectral geometry presenting recent results which appear here for the first time in printed form.

Readership: Graduate students and researchers in global analysis, differential geometry.

680pp	**Sep 2020**	
978-981-121-481-3	**US$180**	**£160**
978-981-121-595-7(pbk)	**US$98**	**£85**

Geometric Foundations of Design

Old and New

by **Jay Kappraff**
(New Jersey Institute of Technology, USA)

This book is meant to serve either as a textbook for an interdisciplinary course in Mathematics of Design, or as a trade book for designers. It will also be of interest for people interested in recreational mathematics showing the connection between mathematics and design. Topics from the book can also be adapted for use in pre-college mathematics. Each chapter will provide the user with ideas that can be incorporated in a design. Background materials will be provided to show the reader the mathematical principles that lie behind the designs.

Key Features:

- The book is highly graphic oriented with many examples of incorporating mathematics in design
- Additional designs will be offered to the purchaser in a website
- Many topics are novel and have not been presented elsewhere
- Every effort has been made to make the topics accessible to non-mathematicians while at the same time being of interest to experienced mathematicians

Readership: General Public, undergraduates and designers who are interested in seeing the connection between mathematics and design.

275pp	**Oct 2020**	
978-981-121-970-2	**US$98**	**£85**

Singularities — Kagoshima 2017

Proceedings of the 5th Franco-Japanese-Vietnamese Symposium on Singularities
The 5th Franco-Japanese-Vietnamese Symposium on Singularities
Kagoshima, Japan, 27 Oct – 3 Nov 2017
Editors-in-chief: **Masaharu Ishikawa** *(Keio University, Japan)* & **Shoji Yokura** *(Kagoshima University, Japan)*

The main theme of the symposium was Singularity Theory in a broad sense, including complex and real algebraic varieties, functions and mappings, and topology of singularities. This volume includes three surveys of recent trends based on the lectures in the mini-school organized in the first two days of the symposium and articles presenting recent progress in Singularity Theory.

Readership: Graduate students and researchers.

312pp	**Jul 2020**	
978-981-120-602-3	**US$128**	**£115**

Notable Titles in Geometry and Topology

Lectures on Convex Sets (2nd Edition)

by **Valeriu Soltan** *(George Mason University, USA)*

"This is an extremely complete book on the fundamentals of the algebraic and topological properties of convex sets. This is a well-written book, which should be of considerable use to researchers in convex geometry." **Zentralblatt MATH**

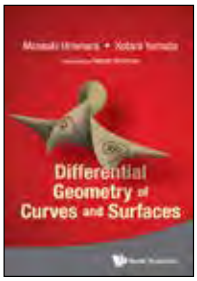
The second edition essentially extends and revises the original book. Every chapter is rewritten, with many new theorems, examples, problems, and bibliographical references included. It contains three new chapters and 100 additional problems with solutions.

Readership: Undergraduate and graduate students in mathematics, optimization and operations research.

612pp	**Jan 2020**	
978-981-120-211-7	**US$148**	**£130**
978-981-120-351-0(pbk)	**US$78**	**£70**

Bestselling Author

Differential Geometry of Curves and Surfaces



by **Masaaki Umehara** & **Kotaro Yamada**
(Tokyo Institute of Technology, Japan)

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

"The book will serve as a very useful reference for a broad range of applied mathematicians, physicists, as well as theoretical geophysicists seeking a precise, systematic presentation of the differential geometry underlying much of modern theory. After reading the book the reader should have a good feeling for the material presented, provided that he has done all the exercises! For mathematically oriented readers, I recommend also the additional material." **Pure and Applied Geophysics**

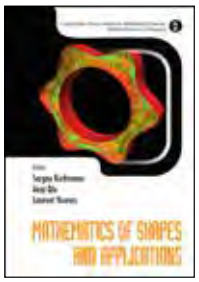
This engrossing volume on curve and surface theories is the result of many years of experience the authors have had with teaching the most essential aspects of this subject. Surface theory from the viewpoint of manifolds theory is explained, and encompasses higher level material that is useful for the more advanced student.

Readership: Undergraduate and graduate students, and researchers interested in differential geometry of curve and surface theories.

328pp	**Jun 2017**	
978-981-4740-23-4	**US$88**	**£73**
978-981-4740-24-1(pbk)	**US$48**	**£42**

Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore - Vol 37

Mathematics of Shapes and Applications



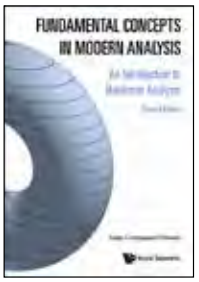
edited by **Sergey Kushnarev** *(Singapore University of Technology and Design, Singapore)*, **Anqi Qiu** *(National University of Singapore, Singapore)* & **Laurent Younes** *(Johns Hopkins University, USA)*

The volume illustrates this wealth of subjects by providing new contributions on the metric structure of diffeomorphism groups and shape spaces, recent developments on deterministic and stochastic models of shape evolution, new computational methods manipulating shapes, and new statistical tools to analyze shape datasets. In addition to these contributions, applications of shape analysis to medical imaging and computational anatomy are discussed, leading, in particular, to improved understanding of the impact of cognitive diseases on the geometry of the brain.

Readership: Graduate students, applied mathematicians, statisticians, computer scientists and biomedical engineers.

220pp	**Nov 2019**	
978-981-120-012-0	**US$88**	**£75**

Fundamental Concepts in Modern Analysis (2nd Edition)



An Introduction to Nonlinear Analysis

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

With: **Poul G Hjorth**

Review of the First Edition:
"It is written in a dense but very deep and conceptual style. Its evident instructive character is also one of the advantages of this textbook." **Mathematics Abstracts**

In this book, students from both pure and applied subjects are offered an opportunity to work seriously with fundamental notions from mathematical analysis that are important not only from a mathematical point of view but also occur frequently in the theoretical parts of, for example, the engineering sciences. It is a useful resource for many sciences that depend on fundamental techniques from mathematical analysis.

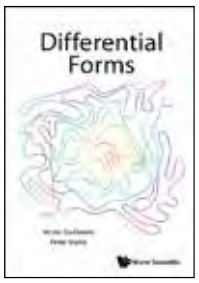
In this edition, the notions of compactness and sequentially compactness are developed with independent proofs for the main results. This edition also covers a new section on partial derivatives, and new material has been incorporated to make a more complete account of higher order derivatives in Banach spaces, including full proofs for symmetry of higher order derivatives and Taylor's formula.

Readership: Lecturers and students in pure and applied mathematics, theoretical engineering and the physical sciences.

304pp	**Nov 2019**	
978-981-120-940-6	**US$98**	**£85**

Bestseller

Differential Forms



by **Victor Guillemin** & **Peter Haine**
(Massachusetts Institute of Technology, USA)

There already exist a number of excellent graduate textbooks on the theory of differential forms as well as a handful of very good undergraduate textbooks on multivariable calculus in which this subject is briefly touched upon but not elaborated on enough. The goal of this textbook is to be readable and usable for undergraduates. It is entirely devoted to the subject of differential forms and explores a lot of its important ramifications.

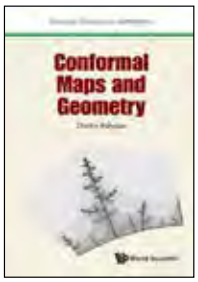
Readership: First-year graduate and advanced undergraduate students in math programs.

272pp	**Mar 2019**	
978-981-3272-77-4	**US$88**	**£75**
978-981-121-377-9(pbk)	**US$48**	**£40**

Essential Textbooks

Advanced Textbooks in Mathematics

Conformal Maps and Geometry



by **Dmitry Beliaev** *(University of Oxford, UK)*

Though Riemann mapping theorem is frequently explored, there are few texts that discuss general theory of univalent maps, conformal invariants, and Loewner evolution. This textbook provides an accessible foundation of the theory of conformal maps and their connections with geometry.

It offers a unique view of the field, as it is one of the first to discuss general theory of univalent maps at a graduate level, while introducing more complex theories of conformal invariants and extremal lengths. This book is an ideal resource for graduate courses in Complex Analysis or as an analytic prerequisite to study the theory of Schramm – Loewner evolution.

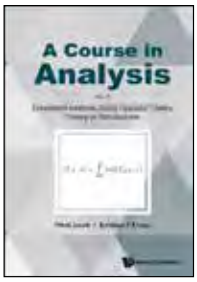
Readership: Advanced undergraduate or graduate students in mathematics, especially those interested in analysis or theory of Schramm – Loewner Evolution.

240pp	**Dec 2019**	
978-1-78634-613-1	**US$88**	**£75**

MATHEMATICAL ANALYSIS

Essential Advance Level Textbooks

A Course in Analysis



Vol. V: Functional Analysis, Some Operator Theory, Theory of Distributions

by **Niels Jacob** & **Kristian P Evans**
(Swansea University, UK)

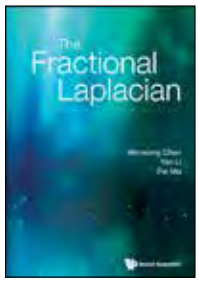
The book is an advanced textbook and a reference text in functional analysis in the wide sense. It provides advanced undergraduate and graduate students with a coherent introduction to the field, and leads them to more demanding topics such as the spectral theorem, Choquet theory, interpolation theory, analysis of operator semigroups, Hilbert – Schmidt operators and Hille – Tamarkin operators, topological vector spaces and distribution theory, fundamental solutions, or the Schwartz kernel theorem.

Readership: Advanced undergraduate students, graduate students, researchers in analysis.

856pp	**Mar 2020**	
978-981-121-549-0	**US$198**	**£175**
978-981-121-633-6(pbk)	**US$98**	**£85**

Bestselling Author

The Fractional Laplacian



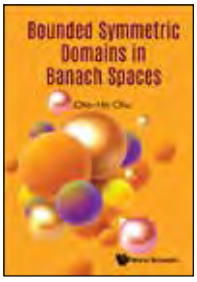
by **Wenxiong Chen** *(Yeshiva University, USA)*, **Yan Li** *(Yeshiva University, USA)* & **Pei Ma** *(Nanjing Forestry University, China)*

This is a unique book that provides a comprehensive understanding of nonlinear equations involving the fractional Laplacian as well as other nonlocal operators. Beginning from the definition of fractional Laplacian, it gradually leads the readers to the frontier of current research in this area. The explanations and illustrations are elementary enough so that first year graduate students can follow easily, while it is advanced enough to include many new ideas, methods, and results that appeared recently in research literature, which researchers would find helpful. It focuses on introducing direct methods on the nonlocal problems without going through extensions, such as the direct methods of moving planes, direct method of moving spheres, direct blowing up and rescaling arguments, and so on.

Readership: Graduate students and researchers interested in analysis and differential equations.

344pp	**Jul 2020**	
978-981-3223-99-8	**US$128**	**£113**

Bounded Symmetric Domains in Banach Spaces



by **Cho-Ho Chu** *(Queen Mary, University of London, UK)*

This timely book exposes succinctly recent advances in the geometric and analytic theory of bounded symmetric domains. A unique feature is the unified treatment to both finite and infinite dimensional symmetric domains, using Jordan theory in tandem with Lie theory. The highlights include a generalized Riemann mapping theorem, which realizes a bounded symmetric domain as the open unit ball of a complex Banach space with a Jordan structure. Far-reaching applications of this realization in complex geometry and function theory are discussed. This monograph is intended to be a convenient reference for researchers and graduate students in geometric analysis, infinite dimensional holomorphy as well as functional analysis and operator theory.

Readership: Graduate students and researchers in diverse mathematical fields including complex geometry, function theory, functional analysis and operator theory. It would also appeal to algebraists who are interested in the applications of Jordan and Lie algebras.

404pp	**Oct 2020**	
978-981-121-410-3	**US$98**	**£85**

Lectures on Functional Analysis and Applications (2nd Edition)

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

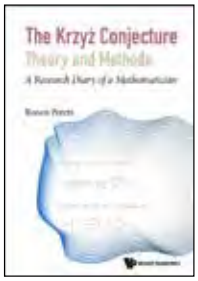
This volume is not only intended for mathematicians who deal with applications of functional analysis, but also for those having only a moderate background in mathematics in their areas of work. The materials covered, which includes practically all the information on functional analysis that may be necessary 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. In addition, necessary improvements for bringing the contents more up to date with current fundamental and applied developments in Chapters 1 – 10 were made.

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

800pp	**Jun 2021**	
978-981-3203-17-4	**US$178**	**£148**
978-981-3203-18-1(pbk)	**US$88**	**£73**

Krzyż Conjecture: Theory and Methods



A Research Diary of a Mathematician
by **Ronen Peretz** *(Ben Gurion University of the Negev, Israel)*

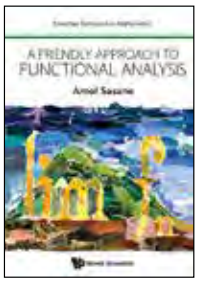
This book is about one of the beautiful topics in mathematics. It describes an on-going research on bounded analytic functions which are defined on the unit disc. This is a very active topic that belongs to the theory of complex analysis in a single complex variable. It contains the analytic theory of functions, the geometric function theory among other theoretical areas, as well as many applications. Some applications originate in other fields of mathematics: geometry, topology, arithmetic and number theory in general, algebra etc. Other applications originate in other scientific and engineering disciplines: physics, dynamical systems, electrical engineering etc.

The book includes much more than just a review on the *Krzyż Conjecture*. It includes topics on inner functions within the context of problems that are different from the *Krzyż Conjecture* as well as other topics on general bounded analytic functions.

Readership: Complex Analysis, Geometric Function Theory, Extremal problems, for graduate students and experts in those areas.

583pp	**Apr 2021**	
978-981-122--637-3	**US$158**	**£140**

Bestseller



Essential Textbooks in Mathematics

A Friendly Approach to Functional Analysis

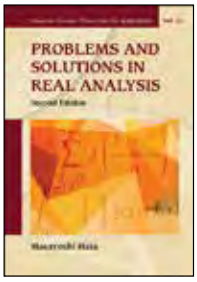
by **Amol Sasane** *(London School of Economics, UK)*

"This is a nice and modern introduction to the topic ... If the reader is a student who wants to be become proficient in the subject, then solving the exercises, or as many as possible, is an excellent way to acquire the necessary skills. The flexible possibilities provided — the text can be used as lecture notes for a course, or as a tool for self study, and even as a handbook to look up some definitions or theorems." **European Mathematical Society**

This book constitutes a concise introductory course on Functional Analysis for students who have studied calculus and linear algebra. The topics covered are Banach spaces, continuous linear transformations, Frechet derivative, geometry of Hilbert spaces, compact operators, and distributions. In addition, the book includes selected applications of functional analysis to differential equations, optimization, physics (classical and quantum mechanics), and numerical analysis. The book contains 197 problems, meant to reinforce the fundamental concepts. The inclusion of detailed solutions to all the exercises makes the book ideal also for self-study.

Readership: Graduate students in functional analysis, operator theory and mathematical physics.

396pp	**Apr 2017**	
978-1-78634-333-8	**US$118**	**£98**
978-1-78634-334-5(pbk)	**US$68**	**£56**



Series on Number Theory and Its Applications - Vol 14

Problems and Solutions in Real Analysis (2nd Edition)

by **Masayoshi Hata**
(Kyoto University, Japan)

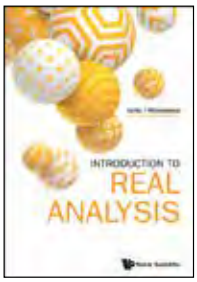
This second edition introduces an additional set of new mathematical problems with their detailed solutions in real analysis. It also provides numerous improved solutions to the existing problems from the previous edition, and includes very useful tips and skills for the readers to master successfully. There are three more chapters that expand further on the topics of Bernoulli numbers, differential equations and metric spaces.

Problems and Solutions in Real Analysis can be treated as a collection of advanced exercises by undergraduate students during or after their courses of calculus and linear algebra. It is also instructive for graduate students who are interested in analytic number theory. Readers will also be able to completely grasp a simple and elementary proof of the Prime Number Theorem through several exercises. This volume is also suitable for non-experts who wish to understand mathematical analysis.

Readership: Undergraduates and graduate students in mathematical analysis.

376pp	**Feb 2017**	
978-981-3142-81-7	**US$88**	**£73**
978-981-3142-82-4(pbk)	**US$48**	**£40**

Introduction to Real Analysis



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

This is a text that develops calculus "from scratch", with complete rigorous arguments. Its aim is to introduce the reader not only to the basic facts about calculus but, as importantly, to mathematical reasoning. It covers in great detail calculus of one variable and multivariable calculus. Additionally it offers a basic introduction to the topology of Euclidean space. It is intended to more advanced or highly motivated undergraduates.

Key Features:

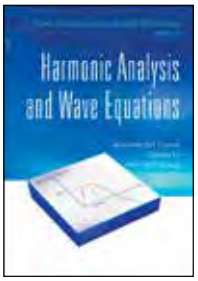
- Many detailed classical nontrivial examples
- Unlike the traditional American texts, the key concept of limit is introduced via through sequences. This presents the concept in the cleanest form, free of extraneous details and has a further payoff when dealing with the topology of Euclidean spaces
- All the results in the book have complete proofs.

Readership: More advanced undergraduate students and professionals who is interested in calculus and mathematical analysis.

684pp	**Dec 2019**	
978-981-121-038-9	**US$158**	**£140**
978-981-121-075-4(pbk)	**US$78**	**£70**

Series in Contemporary Applied Mathematics - Vol 23

Harmonic Analysis and Wave Equations



edited by **Jean-Michel Coron** *(Université Pierre et Marie Curie, France)*, **Tatsien Li** *(Fudan University, China)* & **Wei-Min Wang** *(CNRS, France & Université de Cergy-Pontoise, France)*

This book is a collection of lecture notes for the LIASFMA School and Workshop on "Harmonic Analysis and Wave Equations" which was held on May 8 – 18, 2017 at Fudan University, in Shanghai, China. The aim of the LIASFMA School and Workshop is to bring together Chinese and French experts to discuss and dissect recent progress in these related fields; and to disseminate state of art, new knowledge and new concepts, to graduate students and junior researchers.

Readership: Undergraduate, graduate students and researchers interested in equations of mathematical physics.

220pp	**Oct 2019**	
978-981-120-836-2	**US$88**	**£75**

Metric in Measure Spaces

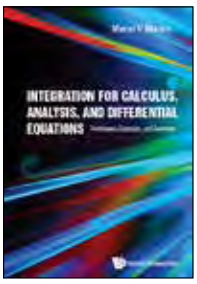
by **J Yeh** *(University of California, Irvine, USA)*

Measure and metric are two fundamental concepts in measuring the size of a mathematical object. Yet there has been no systematic investigation of this relation. The book closes this gap and is written clearly and very readable.

Readership: Mathematicians and graduate students in mathematics.

308pp	**Jan 2020**	
978-981-3200-39-5	**US$98**	**£81**
978-981-3200-40-1(pbk)	**US$58**	**£48**

Integration for Calculus, Analysis, and Differential Equations



Techniques, Examples, and Exercises

by **Marat V Markin** *(California State University, Fresno, USA)*

The book assists Calculus students to gain a better understanding and command of integration and its applications. It reaches to students in more advanced courses such as Multivariable Calculus, Differential Equations, and Analysis, where the ability to effectively integrate is essential for their success.

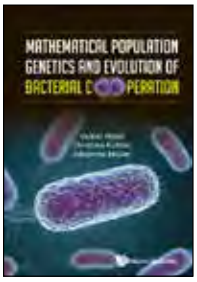
Keeping the reader constantly focused on the three principal epistemological questions: "*What for?*", "*Why?*", and "*How?*", the book is designated as a supplementary instructional tool and consists of 9 Chapters treating the three kinds of integral: indefinite, definite, and improper. Also covering various aspects of integral calculus from abstract definitions and theorems (with complete proof whenever appropriate) through various integration techniques to applications,

Readership: Undergraduates, advanced undergraduates and members of the public with an interest in integration and its applications.

176pp	**Sep 2018**	
978-981-3272-03-3	**US$58**	**£50**
978-981-3275-15-7(pbk)	**US$38**	**£35**

MATHEMATICAL BIOLOGY

Mathematical Population Genetics and Evolution of Bacterial Cooperation



by **Volker Hösel**, **Christina Kuttler** & **Johannes Müller** *(Technical University Munich, Germany)*

Social life of bacteria is in the focus of recent research. Bacteria are simple enough to be accessible by science, but still complex enough to show cooperation, division of labor, bet-hedging, cross-talk and synchronized activities, and a rich variety of social traits. A central question of evolutionary theory is the explanation why this social life did develop, and why these systems are evolutionary stable. This book introduces the reader into the theory of evolution, covering classical models and as well as recent developments. The theory developed is used to represent the up-to-date understanding of social bacteria.

Readership: Graduate students, lecturers and researchers interested in mathematical evolutionary theory.

580pp	**Apr 2020**	
978-981-120-549-1	**US$158**	**£140**

Medical Statistics

A Practical Approach

by **Tze-San Lee** *(Western Ilinois University, USA)*

This book is suitable to be used as a textbook for all levels of students in medical school. It is also useful as a reference book for students interested in the application of biostatistics in medicine. Materials from the Introduction to Chapter 6 are similar to those of an elementary statistical textbook.

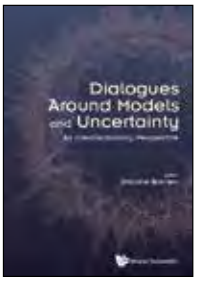
In this book, biostatistics and epidemiologic concepts are nicely blended. In contrast to the fallacy of the p-value, it introduces the Bayes factor as a measure of the evidence hidden in the sample data. It illustrates the application of the regression to the mean in medicine. Many epidemiologic concepts such as sensitivity and specificity of the diagnostic test, classification and discrimination, types of bias, etc. are discussed in the book.

Readership: Undergraduates and graduates in medicine, all practising physicians.

300pp	**Nov 2020**	
978-981-121-751-7	**US$98**	**£85**
978-981-121-842-2(pbk)	**US$48**	**£40**

MATHEMATICAL COMPUTATION & MODELING

Dialogues Around Models and Uncertainty



An Interdisciplinary Perspective

edited by **Pauline Barrieu** *(London School of Economics and Political Science, UK)*

This book helps develop a better understanding of how researchers from different scientific backgrounds view models and uncertainty. It provides key steps in fostering and encouraging interdisciplinary research, which is vital in addressing several big issues that society faces today, such as climate change, longevity, financial and actuarial risk management. To make progress in these areas, researchers must develop an understanding of differing perspectives and methods of those working in other disciplines.

This title presents the views and understandings of eminent people in their respective fields through interviews on the topic of modelling and uncertainty. It helps to bridge some of the gaps encountered by those carrying out inter- and multi-disciplinary research and suggests new approaches to modelling and uncertainty quantification.

Readership: Mathematicians interested in modelling, uncertainty, and conversations with researchers working in this field.

376pp	**May 2020**	
978-1-78634-774-9	**US$118**	**£105**

Computational Modeling of the COVID-19 Disease

Numerical ODE Analysis with R Programming

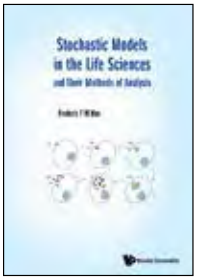
by **William E Schiesser** *(Lehigh University, USA)*

The book is intended for readers who are interested in learning about the use of computer-based modelling of the COVID-19 disease. It provides a basic introduction to a five-ordinary differential equation (ODE) model by providing a complete statement of the model, including a detailed discussion of the ODEs, initial conditions and parameters, followed by a line-by-line explanation of a set of R routines (R is a quality, scientific programming system readily available from the Internet).

Readership: General public interested in COVID-19 treatment and control. Research scientists and readers who are interested in the research, treatment and prevention of COVID-19.

108pp	**Jul 2020**	
978-981-122-287-0	**US$48**	**£40**

Stochastic Models in the Life Sciences and Their Methods of Analysis



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

"... the volume is impressively accessible. The result is a book that is valuable and approachable for biologists at all levels, including those interested in deepening their skills in mathematical modeling and those who seek an overview to aid them in communicating with collaborators in mathematics and statistics. The former group of readers may especially appreciate the first chapter, an introduction to key concepts in probability, and the set of ten assignments provided as an appendix." **CHOICE**

A principal goal of this volume is to provide a working knowledge of SDE based on the premise that familiarity with the basic elements of a stochastic calculus for random processes is unavoidable. Through some SDE models of familiar biological phenomena, the book shows how stochastic methods developed for other areas of science and engineering are also useful in the life sciences.

Readership: Undergraduates, graduates, research students, professionals with interests in mathematical biology, stochastic processes and infectious diseases.

476pp	**Sep 2019**	
978-981-3274-60-0	**US$118**	**£105**

Simulation Methods for Rubber Antivibration Systems

by **Robert Keqi Luo** *(Trelleborg, AVS, UK)*

This book is intended for engineers who work in industry on the simulation, design and applications of rubber anti-vibration systems. In addition, it can serve as a reference book for scientists.

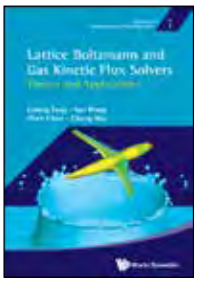
This book is the Second Edition of the book entitled "Numerical Prediction & Case Validation for Rubber Anti-vibration System" (in both English and Chinese). The newly added content contains predictions on idealized Mullins effect without data fitting; creep/relaxation variations from temperature change, loading, hardness and different component and dynamic interaction between solid rubber and fluid.

Readership: Graduate students in engineering and science, chemical engineers.

250pp	**Nov 2020**	
978-981-122-146-0	**US$98**	**£85**

Advances in Computational Fluid Dynamics - Vol 1

Lattice Boltzmann and Gas Kinetic Flux Solvers



Theory and Applications

by **Liming Yang** *(National University of Singapore, Singapore)*, **Yan Wang** *(Nanjing University of Aeronautics and Astronautics, China)*, **Zhen Chen** *(National University of Singapore, Singapore)* & **Chang Shu** *(National University of Singapore, Singapore)*

This unique compendium documents the recent developments in CFD based on kinetic theories, introducing flux reconstruction strategies of kinetic methods for the simulation of complex incompressible and compressible flows, namely the lattice Boltzmann and the gas kinetic flux solvers (LBFS or GKFS). LBFS and GKFS combine advantages of both Navier-Stokes (N-S) solvers and kinetic solvers. Detailed derivations, evaluations and applications of LBFS and GKFS, and their advantages over conventional flux reconstruction strategies are analyzed and discussed in the volume.

Readership: Professionals, academics, researchers, and graduate students in mechanical engineering, aerospace engineering, engineering mechanics and mathematical physics.

380pp	**Aug 2020**	
978-981-122-468-3	**US$138**	**£120**

Complexity Science

An Introduction

edited by **Mark A Peletier** *(Eindhoven University of Technology, The Netherlands)*, **Rutger A van Santen** *(Eindhoven University of Technology, The Netherlands)* & **Erik Steur** *(Delft University of Technology, The Netherlands)*

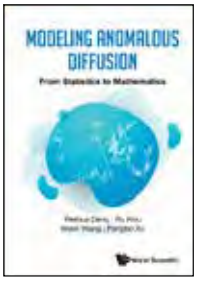
This book on complexity science comprises a collection of chapters on methods and principles from a wide variety of disciplinary fields — from physics and chemistry to biology and the social sciences.

In this two-part volume, the first part is a collection of chapters introducing different aspects in a coherent fashion, and providing a common basis and the founding principles of the different complexity science approaches; the next provides deeper discussions of the different methods of use in complexity science, with interesting illustrative applications.

Readership: A wide spectrum of graduate students and researchers interested in complexity ranging from mathematical and chemical to biology and social sciences.

428pp	**Apr 2019**	
978-981-3239-59-3	**US$138**	**£120**

Modeling Anomalous Diffusion



From Statistics to Mathematics

by **Weihua Deng**, **Ru Hou**, **Wanli Wang** & **Pengbo Xu** *(Lanzhou University, China)*

This book focuses on modeling the anomalous diffusion phenomena, being ubiquitous in the natural world. Both the microscopic models (stochastic processes) and macroscopic models (partial differential equations) have been built up. The relationships between the two kinds of models are clarified, and based on these models, some statistical observables are analyzed. From statistics to mathematics, the built models show their power with their associated applications.

Readership: Advanced undergraduate and graduate students, and researchers in mathematics, physics, chenistry, amongst others, who are interested in the anomalous diffussion phenomena.

268pp	**Jan 2020**	
978-981-121-299-4	**US$98**	**£85**

Cryptology for Engineers

An Application-Oriented Mathematical Introduction

by **Robert Schmied**

(Bundeswehr University Munich, Germany)

Cryptology for Engineers is a study of digital security in communications systems. The book covers the cryptographical functionalities of ciphering, hash generation, digital signature generation, key management and random number generation, with a clear sense of the mathematical background on the one hand and engineers' requirements on the other. Numerous examples computable by hand or with a small additional cost in most cases are provided inside.

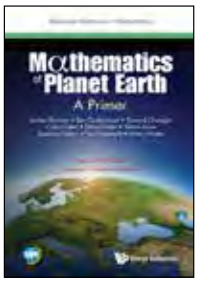
Readership: This book is suitable for advanced undergraduate and graduate students, researchers and practitioners in the fields of cryptology, mathematics and engineering.

384pp	**Apr 2020**	
978-981-120-804-1	**US$98**	**£85**

Bestseller

Advanced Textbooks in Mathematics

Mathematics of Planet Earth



A Primer

by **Jochen Bröcker** *(University of Reading, UK)*, **Ben Calderhead** *(Imperial College London, UK)*, **Davoud Cheraghi** *(Imperial College London, UK)*, **Colin Cotter** *(Imperial College London, UK)*, **Darryl Holm** *(Imperial College London, UK)*, **Tobias Kuna** *(University of Reading, UK)*, **Beatrice Pelloni** *(Heriot-Watt University, UK)*, **Ted Shepherd** *(University of Reading, UK)* & **Hilary Weller** *(University of Reading, UK)*

edited by **Dan Crisan** *(Imperial College London, UK)*

This textbook introduces the fundamental topics of MPE to advanced undergraduate and graduate students in mathematics, physics and engineering while explaining their modern usages and operational connections. In particular, it discusses the links between partial differential equations, data assimilation, dynamical systems, mathematical modelling and numerical simulations and applies them to insightful examples. The text also complements advanced courses in geophysical fluid dynamics (GFD) for meteorology, atmospheric science and oceanography. It links the fundamental scientific topics of GFD with their potential usage in applications of climate change and weather variability.

Readership: Advanced undergraduate and graduate students in mathematics, physics and engineering; geophysical fluid dynamics (GFD) for meteorology, atmospheric science and oceanography.

372pp	**Sep 2017**	
978-1-78634-382-6	**US$118**	**£104**
978-1-78634-383-3(pbk)	**US$40**	**£35**

Advanced Series on Ocean Engineering - Vol 50

Tsunami

Engineering Perspective for Mitigation, Protection and Modeling

by **V Sundar**, **S A Sannasiraj**, **K Murali** & **V Sriram** *(IIT Madras, India)*

The most pertinent tsunami related issues such as water borne debris during tsunami flooding, design loads to incorporate for impact forces on coastal zone infrastructure, detection and warning are meticulously incorporated in this book. Modelling of various coastal processes have proven to be successful in the recent past, which includes extreme events such as storm surge, cyclone, etc. The possible provisions for computational/numerical tsunami modelling and real physical modelling in laboratory are elaborated. The propagation, evolution and run-up of tsunami waves and their associated non-linear dynamics are discussed.

Readership: Researchers and graduate students interested in tsunamis, tsunami mitigation, tsunami protection and modelling.

292pp	**Jun 2020**	
978-981-121-605-3	**US$98**	**£85**

Mathematical Music Theory

Algebraic, Geometric, Combinatorial, Topological and Applied Approaches to Understanding Musical Phenomena

edited by **Mariana Montiel** *(Georgia State University, USA)* & **Robert W Peck** *(Louisiana State University, USA)*

Questions about variation, similarity, enumeration, and classification of musical structures have long intrigued both musicians and mathematicians. Mathematical models can be found from theoretical analysis to actual composition or sound production. Increasingly in the last few decades, musical scholarship has incorporated modern mathematical content. One example is the application of methods from Algebraic Combinatorics, or Topology and Graph Theory, to the classification of different musical objects. However, these applications of mathematics in the understanding of music have also led to interesting open problems in mathematics itself.

Readership: Students and researchers in Mathematical Music Theory.

372pp	**Dec 2018**	
978-981-3235-30-4	**US$128**	**£115**
978-981-122-138-5(pbk)	**US$68**	**£60**

MATHEMATICAL FINANCE & ECONOMICS

Understanding Game Theory

Introduction to the Analysis of Many Agent Systems with Competition and Cooperation **(2nd Edition)**

by **Vassili N Kolokoltsov** *(The University of Warwick, UK & St. Petersburg State University, Russia)* & **Oleg A Malafeyev** *(St. Petersburg State University, Russia)*

The book gives a concise but wide-ranging introduction to games including older (pre-game theory) party games and more recent topics like elections and evolutionary games and is generously spiced with excursions into philosophy, history, literature and politics. A distinguished feature is the clear separation of the text into two parts: elementary and advanced, which makes the book ideal for study at various levels.

Readership: Undergraduates and graduate students in applied mathematics, economics, business, finances and systems biology; non-experts interested in the application of mathematical methods and ideas in natural and social sciences, business and life.

412pp	**Sep 2020**	
978-981-121-485-1	**US$128**	**£115**

A Course in Game Theory

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

Games are characterized by a number of players or decision makers who interact, possibly threaten each other and form coalitions, take actions under uncertain conditions, and finally receive some benefit or reward or possibly some punishment or monetary loss. 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**

Time Series Econometrics

(In 2 Volumes)

Volume 1: Unit Roots and Trend Breaks Volume 2: Structural Change

edited by **Pierre Perron** *(Boston University, USA)*

Volume 1 covers statistical methods related to unit roots, trend breaks and their interplay. The book covers important topics such as the Phillips-Perron unit root test and theoretical analyses about their properties, how this and other tests could be improved, and ingredients needed to achieve better tests and the proposal of a new class of tests. This book also deals with the issue of trend breaks and their effect on unit root tests. This research agenda fostered by the author showed that trend breaks and unit roots can easily be confused. Hence, the need for new testing procedures, which are covered.

Volume 2 is about statistical methods related to structural change in time series models. The approach adopted is off-line whereby one wants to test for structural change using a historical dataset and perform hypothesis testing. A distinctive feature is the allowance for multiple structural changes. The methods discussed have, and continue to be, applied in a variety of fields including economics, finance, life science, physics and climate change.

Readership: Graduate students and researchers interested in theoretical and applied time series analysis.

1736pp			**Apr 2019**	
978-981-3237-85-8(Set)			**US$358**	**£315**
Vol. 1	**764pp**	**978-981-3237-86-5**	**US$188**	**£165**
Vol. 2	**972pp**	**978-981-3237-89-6**	**US$188**	**£165**

Mathematical Modeling and Computation in Finance

With Exercises and Python and MATLAB Computer Codes

by **Cornelis W Oosterlee** *(Centrum Wiskunde & Informatica (CWI), The Netherlands & Delft University of Technology, The Netherlands)*, **Lech A Grzelak** *(Delft University of Technology, The Netherlands)*

This book discusses the interplay of stochastics (applied probability theory) and numerical analysis in the field of quantitative finance. The book presents several models for stock prices, interest rates as well as foreign-exchange rates, with increasing complexity across the chapters. As is said in the industry, "do not fall in love with your favorite model." The book covers equity models before moving to short-rate and other interest rate models.

Readership: MSc and PhD students of quantitative finance, academic researchers, and quants in the financial industry.

576pp	**Nov 2019**	
978-1-78634-794-7	**US$98**	**£85**
978-1-78634-805-0(pbk)	**US$58**	**£50**

Time Series in High Dimensions

The General Dynamic Factor Model

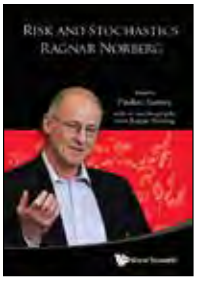
edited by **Marc Hallin** *(Université libre de Bruxelles, Belgium)*, **Marco Lippi** *(Einaudi Institute for Economics and Finance, Italy)*, **Matteo Barigozzi** *(London School of Economics and Political Science, UK)*, **Mario Forni** *(University of Modena and Reggio Emilia, Italy)* & **Paolo Zaffaroni** *(Imperial College London, UK)*

Factor models have become the most successful tool in the analysis and forecasting of high-dimensional time series. This monograph provides an extensive account of the so-called General Dynamic Factor Model methods. The topics covered include: asymptotic representation problems, estimation, forecasting, identification of the number of factors, identification of structural shocks, volatility analysis, and applications to macroeconomic and financial data.

Readership: Graduate students and researchers in the fields of econometrics, macroeconomics and statistics.

764pp	**Sep 2020**	
978-981-3278-00-4	**US$228**	**£200**

Risk and Stochastics



Ragnar Norberg

edited by **Pauline Barrieu** *(London School of Economics and Political Science, UK)*

with an autobiography from **Ragnar Norberg**

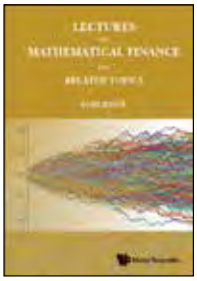
This collection of articles is written by speakers of the conference, themselves respected academics who have influenced and been influenced by the life and work of Professor Norberg. His professional and academic achievements are celebrated here, most significantly the instrumental work he put into setting up the world-renowned Risk and Stochastics Enterprise at the London School of Economics (LSE).

Aimed at graduate level students and researchers interested in the life and work of Ragnar Norberg, this book provides a unique opportunity to reflect on and understand key findings and ground-breaking research in modern actuarial and financial mathematics and their interface.

Readership: For graduate level students and researchers interested in the life and work of Ragnar Norberg and in modern actuarial and financial mathematics and their interface.

320pp	**May 2019**	
978-1-78634-194-5	**US$98**	**£85**

Lectures on Mathematical Finance and Related Topics



by **Yuri Kifer** *(Hebrew University of Jerusalem, Israel)*

Rigorous mathematical finance relies strongly on two additional fields: optimal stopping and stochastic analysis. This book is the first one which presents not only main results in the mathematical finance but also these "related topics" with all proofs and in a self-contained form. The book treats both discrete and continuous time mathematical finance. Some topics, such as Israeli (game) contingent claims, and several proofs have not appeared before in a self-contained book form. The book contains exercises with solutions at the end of it and it can be used for a yearlong advanced graduate course for mathematical students.

Readership: It can be used for a yearlong advanced graduate course for mathematical students.

344pp	**Jan 2020**	
978-981-120-956-7	**US$118**	**£105**

World Scientific Lecture Notes in Economics and Policy - Vol 7

Economics, Game Theory and International Environmental Agreements

The Ca' Foscari Lectures

by **Henry Tulkens** *(Université catholique de Louvain, Belgium & Università Ca' Foscari Venezia, Italy)*

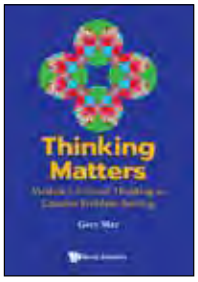
This is a book that offers a reasonably-sized synthesis of the multidimensional societal problems of transfrontier pollution, particularly of climate change. It uses mathematical modeling of economic and game theory concepts to examine these environmental issues and demonstrate many results in an accessible fashion. Readers interested in understanding the links between ecology and economics, as well as the connection between economics and institutional decision-making, will find in this text not only answers to many of their queries but also questions for further thinking.

Readership: Students and researchers who are interested in learning more about transboundary environmental issues, such as transfrontier pollution and climate change, from an environmental economics and game theory perspective.

460pp	**Jul 2019**	
978-981-3141-22-3	**US$118**	**£105**
978-981-3143-01-2(pbk)	**US$58**	**£50**

MATHEMATICAL LOGIC & FOUNDATIONS

Thinking Matters



Module I Critical Thinking as Creative Problem Solving

by **Gary Mar** *(Stony Brook University, USA)*

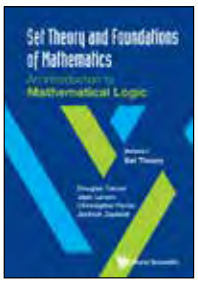
The goals of *Thinking Matters* are to help you:

- To be more creative, fluid, and perceptive in solving problems;
- To identify the implicit premises, fallacies, or moral principles that are presupposed in the arguments of others;
- To understand the logic of scientific testing to distinguish between science and pseudo-science;

Readership: Undergraduates in Logical and Critical Thinking courses, general public with interests in Logical Puzzles. Mathematical Magic, Logic Games, Creative Problem Solving, Computational Thinking.

190pp	**Nov 2020**	
978-981-121-684-8	**US$88**	**£75**
978-981-121-624-4(pbk)	**US$48**	**£40**

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



Volume I: Set Theory

by **Douglas Cenzer** *(University of Florida, USA)*, **Jean Larson** *(University of Florida, USA)*, **Christopher Porter** *(Drake University, USA)* & **Jindrich Zapletal** *(University of Florida, USA)*

Key Features:

- An introduction to Ramsey Theory
- A discussion of the models of fragments of ZF Set Theory
- Detailed presentation of transfinite recursion and induction with examples including ordinal arithmetic
- The authors are leading researchers in set theory and mathematical logic

Readership: Upper level undergraduate or beginning graduate students interested in set theory and mathematical logic.

224pp	**Apr 2020**	
978-981-120-192-9	**US$58**	**£50**

Structure and Randomness in Computability and Set Theory

edited by **Douglas Cenzer** *(University of Florida, USA)*, **Christopher Porter** *(Drake University, USA)* & **Jindrich Zapletal** *(University of Florida, USA)*

This volume presents some exciting new developments occurring on the interface between set theory and computability as well as their applications in algebra, analysis and topology. These include effective versions of Borel equivalence, Borel reducibility and Borel determinacy. It also covers algorithmic randomness and dimension, Ramsey sets and Ramsey spaces. Many of these topics are being discussed in the NSF-supported annual Southeastern Logic Symposium.

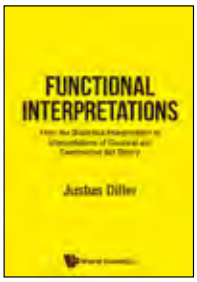
Key Features:

- Prominent contributors and institutions: such as George Barmpalias (Chinese Acad. Sci. and U. Wellington, NZ), Andreas Blass (Fellow of AMS, U. Michigan), Andy Lewis-Pye (London School of Economics)

Readership: Graduate students and researchers interested in the interface between set theory and computability.

200pp	**Nov 2020**	
978-981-3228-22-1	**US$98**	**£86**

Functional Interpretations



From the Dialectica Interpretation to Functional Interpretations of Analysis and Set Theory

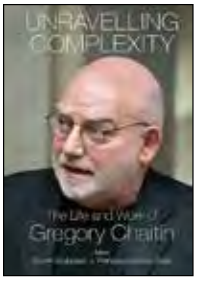
by **Justus Diller** *(University of Münster, Germany)*

This book gives a detailed treatment of functional interpretations of arithmetic, analysis, and set theory. The subject goes back to Gödel's Dialectica interpretation of Heyting arithmetic which replaces nested quantification by higher type operations and thus reduces the consistency problem for arithmetic to the problem of computability of primitive recursive functionals of finite types. Regular functional interpretations, in particular the Dialectica interpretation and its generalization to finite types, the Diller-Nahm interpretation, are studied on Heyting as well as Peano arithmetic in finite types and extended to functional interpretations of constructive as well as classical systems of analysis and set theory.

Readership: Researchers in mathematical logic, in particular in proof theory of constructive systems, and set theory.

248pp	**Nov 2019**	
978-981-4551-39-7	**US$98**	**£81**

Unravelling Complexity



The Life and Work of Gregory Chaitin

edited by **Shyam Wuppuluri** *(R N Podar Institute, India)* & **Francisco Antonio Doria** *(Universidade Federal do Rio de Janeiro, Brazil)*

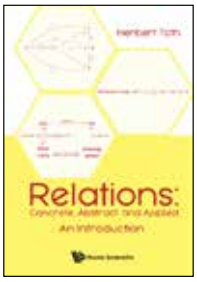
The revolutions that Gregory Chaitin brought within the fields of science are well known. From his discovery of algorithmic information complexity to his work on Gö del's theorem, he has contributed deeply and expansively to such diverse fields.

This book attempts to bring together a collection of articles written by his colleagues, collaborators and friends to celebrate his work in a festschrift. It encompasses various aspects of the scientific work that Chaitin has accomplished over the years. Topics range from philosophy to biology, from foundations of mathematics to physics, from logic to computer science, and all other areas Chaitin has worked on.

Readership: Students, professors and researchers in mathematics, computer science, biology, philosophy and physics. And readers who are interested in the scientific works and biographical accounts of Gregory Chaitin.

444pp	**Mar 2020**	
978-981-120-006-9	**US$148**	**£130**

Relations: Concrete, Abstract, and Applied



An Introduction
by **Herbert Toth**

The book is intended as an invitation to the topic of relations on a rather general basis. It fills the gap between the basic knowledge offered in countless introductory papers and books (usually comprising orders and equivalences) and the highly specialized monographs on mainly relation algebras, many-valued (fuzzy) relations, or graphs. This is done not only by presenting theoretical results but also by giving hints to some of the many interesting application areas (also including their respective theoretical basics).

This book is a new — and the first of its kind — compilation of known results on binary relations. It offers relational concepts in both reasonable depth and broadness, and also provides insight into the vast diversity of theoretical results as well as application possibilities beyond the commonly known examples.

Readership: Students and researchers in mathematics and computer science.

572pp	**Jul 2020**	
978-981-122-034-0	**US$168**	**£150**

How to Measure the Infinite

Mathematics with Infinite and Infinitesimal Numbers
by **Vieri Benci** & **Mauro Di Nasso**
(Università di Pisa, Italy)

"This text shows that the study of the almost-forgotten, non-Archimedean mathematics deserves to be utilized more intently in a variety of fields within the larger domain of applied mathematics." **CHOICE**

"In recent years the authors have produced a body of results based on a new construction of such extensions, alpha theory, and on a closely related theory of numerosities. This book collects and organizes these results and others into a single coherent volume." **Mathematical Reviews Clippings**

This book contains an original introduction to the use of infinitesimal and infinite numbers, namely, the Alpha-Theory, which can be considered as an alternative approach to nonstandard analysis. The basic principles are presented in an elementary way by using the ordinary language of mathematics; this is to be contrasted with other presentations of nonstandard analysis where technical notions from logic are required since the beginning.

Readership: Advanced undergraduate and graduate students in mathematics and philosophy.

348pp	**Feb 2019**	
978-981-283-637-3	**US$118**	**£105**

Proof and Computation

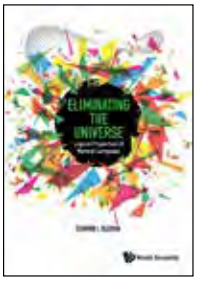
Digitization in Mathematics, Computer Science, and Philosophy
edited by **Klaus Mainzer** *(Technische Universität München, Germany)*, **Peter Schuster** *(Università degli Studi di Verona, Italy)* & **Helmut Schwichtenberg** *(Ludwig-Maximilians-Universität München, Germany)*

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 Predicative Foundations, Constructive Mathematics and Type Theory, Computation in Higher Types, Extraction of Programs from Proofs, and Algorithmic Aspects in Financial Mathematics. By filling the gap between (under-)graduate level textbooks and advanced research papers, the book gives a scholarly account of recent developments and emerging branches of the aforementioned fields.

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

300pp	**Jul 2018**	
978-981-3270-93-0	**US$98**	**£85**

Eliminating the Universe



Logical Properties of Natural Language
by **Edward L Keenan** *(University of California, Los Angeles, USA)*

This book synthesizes the author's work (1980s – 2015) on the logical expressive power of natural language. It extends the tools and concepts of model theory as used in (higher order) predicate logic to the study of natural language semantics. It focuses on boolean structure, generalized quantification (separated from variable binding), covering some cases of anaphora. Different categories — predicates, adjective, quantifiers — are modeled by non-isomorphic boolean lattices. Also of novel logical interest are entailment paradigms that depend on relations between pairs or triples of generalized quantifier denoting expressions, ones that are in some cases inherently vague. In addition we note novel binary quantifiers that lie beyond the "Frege boundary" in that they are provably not identical to any iterated application of unary quantifiers.

Readership: Researchers in mathematical logic and artificial intelligence.

184pp	**Aug 2018**	
978-981-4719-83-4	**US$88**	**£75**

Logic in Wonderland

An Introduction to Logic through Reading *Alice's Adventures in Wonderland* — Teacher's Guidebook
by **Nitsa Movshovitz-Hadar** *(Technion - Israel Institute of Technology, Israel)* & **Atara Shriki** *(Oranim Academic College of Education, Israel)*

Learning is based on reading *Alice's Adventures in Wonderland*, and discussing quotes from that book as a trigger for developing basic notions in Logic. This guidebook includes the student's worksheets with exemplary solutions, the background in elementary logic, and pedagogical comments. There is a student's workbook that accompanies this guidebook which includes the student's worksheets without solutions. Ordinary textbooks for such a course are purely mathematical in their nature, and students usually find the course difficult, boring and very technical. Our approach is likely to motivate the students through reading the classic novel *Alice's Adventures in Wonderland*, written by Lewis Carroll who was not only one of the best storytellers but also a logician.Click here for Students' Workbook

Readership: Professional college mathematics teachers and prospective teachers of high school mathematics.

332pp	**Nov 2018**	
978-981-3208-62-9	**US$98**	**£81**
978-981-3209-81-7(pbk)	**US$48**	**£40**

Logic in Wonderland

An Introduction to Logic through Reading *Alice's Adventures in Wonderland* — Student's Workbook
by **Nitsa Movshovitz-Hadar** *(Technion - Israel Institute of Technology, Israel)*, **Atara Shriki** *(Oranim Academic College of Education, Israel)*

This is a student's workbook that accompanies the teacher's guidebook of the same title. It is for students who take a course in Introduction to Logic at a teachers college, whose instructor decides to provide students with a learning environment based on reading *Alice's Adventures in Wonderland*, and discussing quotes from that book as a trigger for developing basic notions in Logic.

Readership: Professional college mathematics teachers, high school mathematics teachers, and high school students capable and interested in logic.

256pp	**Nov 2018**	
978-981-3208-67-4(pbk)	**US$38**	**£35**

MATHEMATICAL PHYSICS & RELATED TOPICS

Essential Textbooks in Physics

How to Derive a Formula

Volume 1: Basic Analytical Skills and Methods for Physical Scientists

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

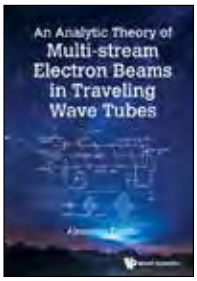
"For many science undergraduates, the teaching of mathematics is divorced from the real business of learning about science. For them, mathematics is just a mental hurdle that has to be overcome in exams. In contrast, this book shows the student that mathematics is, and has always been, the language of science because it is only through mathematical analysis that a model for phenomenon or process can be constructed and tested against experiment. By embedding the leaning of mathematics in science, this book shows the student how understanding in science is developed and what it entails" **Adrian Sutton FRS, Emeritus Professor of Physics, Imperial College London**

The authors of this book argue that there is still a vital role in formulating them to make sense of the laws of nature. To derive a formula one needs to follow a series of steps; last of all, check that the result is correct, primarily through the analysis of limiting cases. The book is about unravelling this machinery. Based on intuition and common sense rather than mathematical rigor, it teaches students from scratch using pertinent examples, many taken across the physical sciences. This book provides an interesting new perspective of what a mathematics textbook could be, including historical facts and humour to complement the material.

Readership: Advanced and enthusiastic school students preparing for universities; science related undergraduate students; university lecturers.

704pp	**Apr 2020**	
978-1-78634-634-6	**US$158**	**£140**
978-1-78634-644-5(pbk)	**US$88**	**£75**

An Analytic Theory of Multi-stream Electron Beams in Traveling Wave Tubes



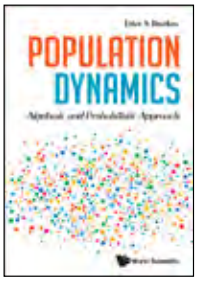
by **Alexander Figotin** *(University of California, Irvine, USA)*

The Traveling Wave Tubes (TWT) is a powerful vacuum electronic device used to amplify radio-frequency (RF) signals as well as numerous applications such as radar, television and telephone satellite communications. This monograph is devoted to the author's original theoretical developments in the theory of a traveling wave tube (TWT). Most of the monograph is the author's original work on an analytical theory of TWTs. It is a constructive Lagrangian field theory of TWT in which the electron beam (e-beam) is represented by one-dimensional multi-stream electron flow and the guiding slow-wave structure is represented by possibly non-uniform multi-transmission line (MTL). The proposed analytic theory accounts for a number of electron plasma phenomena including space-charge effects such as electron-to-electron repulsion (debunching), convective instabilities, wave-particle interaction, amplifying waves and more. It allows, in particular, to (i) identify origins of the wave-particle interaction and the system convective instability (exponential growth); (ii) evaluate the energy transfer rate from the e-beam to the electromagnetic radiation; (iii) identify instability modal branches which under condition of sufficiently strong coupling between the e-beam and the MTL can cover ideally all frequencies.

Readership: Graduate students and researchers in plasma physics, electrical engineering and mathematical physicist interested in vacuum electronics. As well as those interested in scope of subjects related to physics of electron beams.

450pp	**Oct 2020**	
978-981-120-919-2	**US$148**	**£130**

Population Dynamics



Algebraic and Probabilistic Approach

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

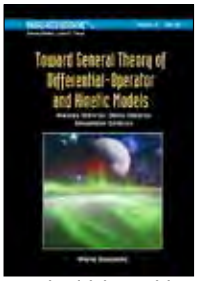
The main mathematical problem for a given population is to carefully examine the evolution (time dependent dynamics) of the population. The mathematical methods used in the study of this problem are based on probability theory, stochastic processes, dynamical systems, nonlinear differential and difference equations, and (non-)associative algebras. The book presents algebraic and probabilistic approaches in the theory of population dynamics. It also includes several dynamical systems of biological models such as dynamics generated by Markov processes of cubic stochastic matrices; dynamics of sex-linked population; dynamical systems generated by a gonosomal evolution operator; dynamical system and an evolution algebra of mosquito population; and ocean ecosystems.

Readership: Post-graduate students, academics and researchers in the field of population dynamics and its applications.

460pp	**May 2020**	
978-981-121-122-5	**US$148**	**£130**

World Scientific Series on Nonlinear Science Series A - Vol 97

Toward General Theory of Differential-Operator and Kinetic Models



by **Nikolay Sidorov** *(Irkutsk State University, Russia)*, **Denis Sidorov** *(Russian Academy of Sciences, Russia)* & **Alexander Sinitsyn** *(Universidad Nacional de Colombia, Bogotá, Colombia)*

This volume provides a comprehensive introduction to the modern theory of differential-operator and kinetic models including Vlasov – Maxwell, Fredholm, Lyapunov – Schmidt branching equations to name a few. This book will bridge the gap in the considerable body of existing academic literature on the analytical methods used in studies of complex behavior of differential-operator equations and kinetic models. This monograph will be of interest to mathematicians, physicists and engineers interested in the theory of such non-standard systems.

Key Features:

- The first book to consider coupling between the investigation of the various kinds of differential-operator, kinetic equation and branching theory
- Reviews the authors' recent developments in these fields

Readership: Graduate students and researchers interested in mathematical physics, differential equations and mathematical modeling.

496pp	**Mar 2020**	
978-981-121-374-8	**US$148**	**£130**

Mathematical Theory of Liquid Interfaces

Liquid Layers, Capillary Interfaces, Floating Drops and Particles

by **Erich Miersemann** *(Universität Leipzig, Germany)*

This book lays a unique and straightforward mathematical foundation on the aspects of liquid layers, capillary interfaces, floating drops and particles. For the first time, these topics are studied in a joint framework. Readers will acquire deeper comprehension and gain results. Practical interest are presented, making it beneficial to engineers and physicists as well as mathematicians. It contains 70 problems where some are exercises, while others are open problems. It is also illustrated with 95 figures and photographs for further understanding.

Readership: Advanced undergraduate students, graduate students, researchers and professionals interested in the mathemtical theory of liquid interfaces which has wide applications in modeling surface tension, capillary flow, etc.

224pp	**Mar 2020**	
978-981-121-565-0	**US$88**	**£75**

Infinite Dimensional and Finite Dimensional Stochastic Equations and Applications in Physics

edited by **Wilfried Grecksch** *(Martin-Luther-University, Halle-Wittenberg, Germany)* & **Hannelore Lisei** *(Babeş-Bolyai University, Cluj-Napoca, Romania)*

This volume contains survey articles on various aspects of stochastic partial differential equations (SPDEs) and their applications in stochastic control theory and in physics.

Key Features:

- Prominent authors
- Modern treatments of stochastic partial differential equations with applications in physics
- Study of optimal control problems for stochastic partial differential equations
- This volume brings together modern techniques from the theory of functional analysis, probability, partial differential equations, optimization, random dynamical systems, numerical approximation, and mathematical physics

Readership: Graduate students in mathematics or physics, mathematicians, mathematical physicists, theoretical physicists, and science researchers interested in the physical applications of the theory of stochastic processes.

260pp	**May 2020**	
978-981-120-978-9	**US$98**	**£85**

Adiabatic Thermodynamics of Fluids

From Hydrodynamics to General Relativity

by **Christian Fronsdal** *(University of California, Los Angeles, USA)*

Unlike the traditional approach to thermodynamics, this book begins with a brief exposition of hydrodynamics. At this stage, the development is limited to potential flows, because, until recently, that is all that could be done, but also for didactic reasons. However, the reader will find that the situation has changed radically with the discovery of Conservative Hydrodynamics. This book exists because there is (or was) no satisfactory theory of the dynamical metric interacting with extended distributions of matter. It will be shown that any theory of interacting fields that includes the Einsteinian metric must be based on an action principle.

Readership: Graduates, physicists and engineers interested in hydrodynamics and thermodynamics.

350pp	**Sep 2020**	
978-981-120-067-0	**US$128**	**£115**

Theory of Groups and Symmetries

Representations of Groups and Lie Algebras, Applications

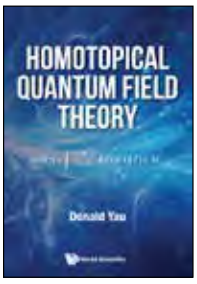
by **Alexey P Isaev** *(Joint Institute for Nuclear Research, Dubna, Russia & M V Lomonosov Moscow State University, Russia)* & **Valery A Rubakov** *(Russian Academy of Sciences, Moscow, Russia & M V Lomonosov Moscow State University, Russia)*

The presentation begins with the Dirac notation, which is illustrated by boson and fermion oscillator algebras and also Grassmann algebra. Then detailed account of finite-dimensional representations of groups SL(2, C) and SU(2) and their Lie algebras is presented. The general theory of finite-dimensional irreducible representations of simple Lie algebras based on the construction of highest weight representations is given. The classification of all finite-dimensional irreducible representations of the Lie algebras of the classical series $s\ell(n, C)$, so(n, C) and sp(2r, C) is exposed. Finite-dimensional irreducible representations of linear groups SL(N, C) and their compact forms SU(N) are constructed on the basis of the Schur – Weyl duality. The representation theory of Brauer algebra (centralizer algebra of SO(p, q) and Sp(p, q) groups in tensor representations) is discussed. Finally, the covering groups Spin(p, q) for pseudo-orthogonal groups $SO^{\uparrow}(p, q)$ are studied.

Readership: Graduate students and researchers in theoretical physics and mathematical physics.

616pp	**Aug 2020**	
978-981-121-740-1	**US$178**	**£155**

Homotopical Quantum Field Theory



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

This book provides a general and powerful definition of homotopy algebraic quantum field theory and homotopy prefactorization algebra using a new coend definition of the Boardman-Vogt construction for a colored operad. All of their homotopy coherent structures are explained in details, along with a comparison between the two approaches at the operad level. With chapters on basic category theory, trees, and operads, this book is self-contained and is accessible to graduate students.

Readership: Graduate students, mathematicians, mathematical physicists.

312pp	**Nov 2019**	
978-981-121-285-7	**US$118**	**£105**

Infinite-Dimensional Analysis

Operators in Hilbert Space; Stochastic Calculus via Representations, and Duality Theory

by **Palle Jorgensen** *(The University of Iowa, USA)* & **James Tian** *(American Mathematics Society, USA)*

The purpose of this book is to make available to beginning graduate students, and to others, some core areas of analysis which serve as prerequisites for new developments in pure and applied areas. We begin with a presentation (Chapters 1 and 2) of a selection of topics from the theory of operators in Hilbert space, algebras of operators, and their corresponding spectral theory. This is a systematic presentation of interrelated topics from infinite-dimensional and non-commutative analysis; again, with view to applications. Chapter 3 covers a study of representations of the canonical commutation relations (CCRs); with emphasis on the requirements of infinite-dimensional calculus of variations, often referred to as Ito and Malliavin calculus, Chapters 4 – 6. This further connects to key areas in quantum physics.

Readership: Undergraduate and graduate students and professionals who want to learn about exciting connections to applied problems in analysis, stochastic processes, dynamical system, representation theory, and mathematical physics.

218pp	**Jan 2021**	
978-981-122-577-2	**US$88**	**£75**

Series on Analysis, Applications and Computation

The Linearised Dam-Break Problem

by **D J Needham**, **S McGovern** & **J A Leach** *(University of Birmingham, UK)*

The monograph addresses a canonical problem in linear water wave theory, through the development-detailed, asymptotic analysis of contour integrals in the complex plane. It is anticipated that the methodology developed in the monograph will have applications to many associated linear wave evolution problems, to which the reader may adapt the approach developed in the monograph. The approach adopted in the monograph is novel, and there are no existing publications for comparison.

Readership: Graduate students and researchers.

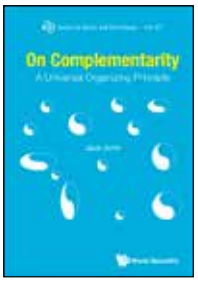
168pp	**Dec 2020**	
978-981-3223-87-5	**US$88**	**£77**

Series on Knots and Everything

On Complementarity

A Universal Organizing Principle

by **Jack Shulman Avrin**



It is not uncommon for the Principle of Complementarity to be invoked in either Science or Philosophy, viz. the ancient oriental philosophy of Yin and Yang whose symbolic representation is portrayed on the cover of the book. Or Niels Bohr's use of it as the basis for the so-called Copenhagen interpretation of Quantum Mechanics. This book arose as an outgrowth of the author's previous book entitled "Knots, Braids and Moebius Strips, " published by World Scientific in 2015, wherein the Principle itself was discovered to be expressible as a simple 2x2 matrix that summarizes the algebraic essence of both the well-known Microbiology of DNA and the author's version of the elementary particles of physics. 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.

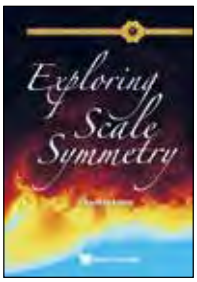
Readership: Undergraduate and graduate students in Mathematics and Physics.

160pp	**Oct 2020**	
978-981-3278-97-4	**US$78**	**£70**

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

Exploring Scale Symmetry

by **Thomas Lowe** *(Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia)*



Find out how this long-neglected element transforms the traditional geometry of lines and planes into a rich landscape of trees, craggy mountains and rolling oceans.

Enjoy a visual exploration through the intricate and elaborate structures of scale-symmetric geometry. See unique fractals, Mandelboxes, and automata and physical behaviors. Take part in the author's forage into the lesser-trodden regions of this landscape, and discover unusual and attractive specimens!

You will also be provided with all the tools needed to recreate the structures yourself.

Readership: Readers with a mathematical background who is interested in fractals, programming, geometry, patterns, 3D rendering, digital art; Undergraduate and graduate students who are keen to explore new areas of scale-symmetric geometry.

200pp	**Mar 2021**	
978-981-3278-54-7	**US$88**	**£75**

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. Despite its high level, this extensive work of more than 1450 dense pages of text 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.

The text is complemented, clarified, and enriched by many remarks, completely solved nontrivial examples, and problems, all of the latter with their answers and many with hints.

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

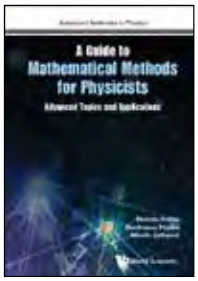
1680pp	**Feb 2021**	
978-981-4603-04-1(Set)	**US$384**	**£319**

Advanced Textbooks in Physics

A Guide to Mathematical Methods for Physicists

Advanced Topics and Applications

by **Michela Petrini** *(Sorbonne Université, Paris, France)*, **Gianfranco Pradisi** *(University of Rome Tor Vergata, Italy)* & **Alberto Zaffaroni** *(University of Milano-Bicocca, Italy)*



This book provides a self-contained and rigorous presentation of the main mathematical tools needed to approach many courses at the last year of undergraduate in Physics and MSc programs, from Electromagnetism to Quantum Mechanics. It complements *A Guide to Mathematical Methods for Physicists* with advanced topics and physical applications. The different arguments are organised in three main sections: Complex Analysis, Differential Equations and Hilbert Spaces, covering most of the standard mathematical method tools in modern physics.

One of the purposes of the book is to show how seemingly different mathematical tools like, for instance, Fourier transforms, eigenvalue problems, special functions and so on, are all deeply interconnected. It contains a large number of examples, problems and detailed solutions, emphasising the main purpose of relating concrete physical examples with more formal mathematical aspects.

Readership: Students and professionals in the field.

308pp	**Oct 2018**	
978-1-78634-548-6	**US$88**	**£77**
978-1-78634-704-6(pbk)	**US$48**	**£40**

MATHEMATICS EDUCATION

Problem Solving in Mathematics and Beyond - Vol 13 & Vol.14

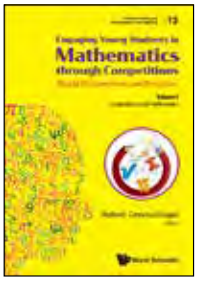
Engaging Young Students in Mathematics through Competitions — World Perspectives and Practices

Volume I — Competition-ready Mathematics; Entertaining and Informative Problems from the WFNMC8 Congress in Semriach/Austria 2018

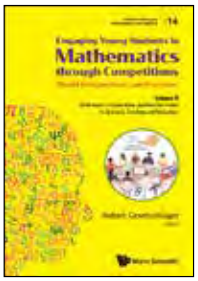
Volume II — Mathematics Competitions and how they relate to Research, Teaching and Motivation; Entertaining and Informative Papers from the WFNMC8 Congress in Semriach/Austria 2018

edited by **Robert Geretschläger** *(BRG Kepler, Austria)*

The two volumes of *Engaging Young Students in Mathematics through Competitions* present a wide scope of aspects relating to mathematics competitions and their meaning in the world of mathematical research, teaching and entertainment. The various chapters were written by the participants of the 8th Congress of the World Federation of National Mathematics Competitions in Austria in 2018.



Volume I contains a wide variety of fascinating mathematical problems of the type often presented at mathematics competitions as well as papers by an international group of authors involved in problem development, in which we can get a sense of how such problems are created in various specialized areas of competition mathematics as well as recreational mathematics.



Volume II contains background information on connections between the mathematics of competitions and the organization of such competitions, their interplay with research, teaching and more. It will be of interest to anyone involved with mathematics competitions at any level, be they researchers, competition participants, teachers or theoretical educators.

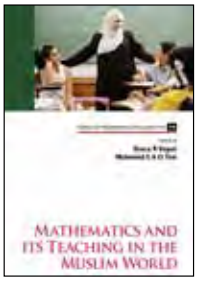
Readership: Students, teachers, researchers, and general public interested in mathematics competition problems.

Vol.1 192pp	**Jan 2020**	
978-981-120-582-8	**US$68**	**£60**
978-981-120-723-5(pbk)	**US$38**	**£35**
Vol.2 300pp	**Apr 2020**	
978-981-120-981-9	**US$98**	**£85**
978-981-121-125-6(pbk)	**US$48**	**£40**

Series on Mathematics Education - Vol 14

Mathematics and its Teaching in the Muslim World

edited by **Bruce R Vogeli** *(Columbia University, USA)* & **Mohamed E A El Tom** *(Ministry of Education, Sudan)*



This anthology reviews the history, current states, and plans for the development of mathematics education in the Muslim States in Africa, the Middle East, and Asia. There is an introduction by Ahmed Djebbar, the most prominent contemporary scholar of Muslim mathematics. The chapters are written by respective national experts in mathematics education.

Readership: Researchers, policy makers, politicians and general public interested in mathematics education in Muslim states.

332pp	**Jul 2020**	
978-981-3146-77-8	**US$128**	**£106**

Mathematics Teaching in Singapore

Vol 1. Theory-informed Practices

edited by **Ngan Hoe Lee** *(Nanyang Technological University, Singapore)*, **Cynthia Seto** *(Ministry of Education, Singapore)*, **Ridzuan Abdul Rahim** *(Ministry of Education, Singapore)* & **Liang Soon Tan** *(Ministry of Education, Singapore)*

This book series will provide readers with the landscape of mathematics teaching practices in Singapore classroom. In this first book of the series, Theory-Informed Practices, the book will have a collection of teachers' classroom practices that are informed by theory. It will provide classroom exemplars of how teachers make use of theories to inform their practices to better cater to the needs of the learners. This book which targets at the practitioners is written in a way that help the practitioners to be better in consuming and applying such efforts in the own classrooms. It provides the interested readers not only the landscape but also the spectrum of pedagogical approaches and strategies that are theoretically informed and adopted by the Singapore mathematics teachers.

Readership: Graduate students, practitioners, mathematics educators and the international mathematics education community who are looking for greater insights to the Singapore mathematics classrooms.

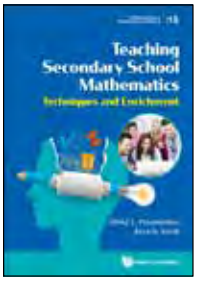
332pp	**May 2020**	
978-981-122-014-2	**US$118**	**£105**

Problem Solving in Mathematics and Beyond - Vol 15

Teaching Secondary School Mathematics

Techniques and Enrichment

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



This book provides both a general overview of effective teaching strategies and specific examples of those strategies. Issues such as teaching through inquiry, developing mathematical literacy, and working with language learners are included. Because technology has changed mathematics teaching with regard to what is taught and how it is taught, appropriate use of technology is woven throughout the book.

Key Features:

- It contains 125 enrichment units presented ready for the classroom
- Features all aspects of instruction e.g. motivation, enrichment of instruction, problem-solving techniques, etc.

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

900pp	**Nov 2020**	
978-981-121-141-6	**US$158**	**£140**
978-981-121-211-6(pbk)	**US$78**	**£70**

The Multifaceted Nature of Creativity in the Teaching of Geometry

edited by **Dorit Patkin** *(Kibbutzim College of Education Technology & Arts, Tel-Aviv, Israel)*, **Atara Shriki** *(Kibbutzim College of Education Technology & Arts, Tel-Aviv, Israel)* & **Ilana Levenberg** *(Gordon-Academic College of Education, Haifa, Israel)*

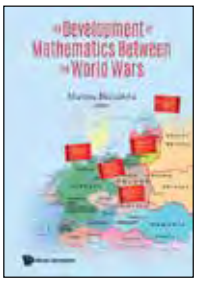
If high education teachers decide to teach the topic of creativity, then this is an excellent textbook for such a course. The book includes also a rich bibliography on creativity. This bibliography can serve researchers who wish to study the field of creativity." **Shlomo Vinner, Professor Emeritus, Hebrew University of Jerusalem, Israel**

This book aims to provide readers with a broad knowledge of the various aspects of creativity and its assessment and to expose them to creative methods and approaches to the teaching of geometry. The content of the book is grounded in the research literature that engages in creativity in general and in creativity in teaching in particular.

Readership: Mathematics teachers and teacher educators, and mathematics education researchers.

368pp	**Sep 2020**	
978-981-121-874-3	**US$128**	**£115**

The Development of Mathematics Between the World Wars



edited by **Martina Bečváová** *(Czech Technical University in Prague, Czech Republic)*

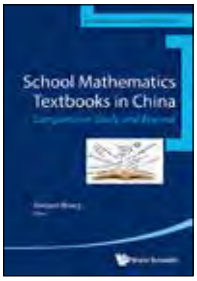
This book traces the transformation of scientific life within mathematical communities during the interwar period in Central and Eastern Europe, specifically in Germany, Russia, Poland, Hungary, and Czechoslovakia. The final four chapters are not restricted to Central and Eastern Europe and deal with the development of mathematics between World War I and World War II. After describing the general state of mathematics at the end of the 19th century and the first third of the 20th century, three case studies dealing with selected mathematical disciplines are presented (set theory, potential theory, combinatorics), in a way accessible to a broad audience of mathematicians as well as historians of mathematics. No title with the same scope is available in English

Readership: Science historians, mathematics historians and any mathematician interested in the history of mathematics. Will also be of interest to general historians and the general public interested in modern history.

570pp	**Apr 2021**	
978-1-78634-930-9	**US$148**	**£130**

East China Normal University Scientific Reports - Vol 2

School Mathematics Textbooks in China



Comparative Studies and Beyond

edited by **Jianpan Wang**

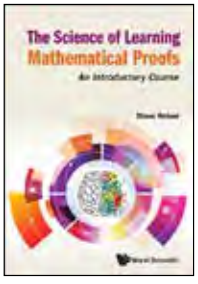
(East China Normal University, China)

Our collected work contains mathematics education research papers. Comparative studies of school textbooks cover content selection, compilation style, representation method, design of examples and exercises, mathematics investigation, the use of information technology, and composite difficulty level, to name a few. Other papers included are about representation of basic mathematical thought in school textbooks, a study on the compilation features of elementary school textbooks, and a survey of the effect of using new elementary school textbooks.

Readership: Researchers in mathematics education.

350pp	**Nov 2020**	
978-981-4713-93-1	**US$110**	**£91**
978-981-4713-94-8(pbk)	**US$58**	**£48**

The Science of Learning Mathematical Proofs



An Introductory Course

by **Elana Reiser** *(St. Joseph's College, USA)*

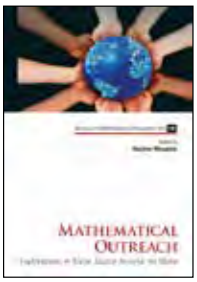
College students struggle with the switch from thinking of mathematics as a calculation based subject to a problem solving based subject. This book describes how the introduction to proofs course can be taught in a way that gently introduces students to this new way of thinking. This introduction utilizes recent research in neuroscience regarding how the brain learns best. Rather than jumping right into proofs, students are first taught how to change their mindset about learning, how to persevere through difficult problems, how to work successfully in a group, and how to reflect on their learning. With these tools in place, students then learn logic and problem solving as a further foundation.

Readership: Undergraduate in mathematics majors, for use in an undergraduate introduction to mathematical proofs course.

200pp	**Feb 2021**	
978-981-122-767-7	**US$88**	**£75**
978-981-122-551-2(pbk)	**US$38**	**£35**

Series on Mathematics Education - Vol 16

Mathematical Outreach



Explorations in Social Justice Around the Globe

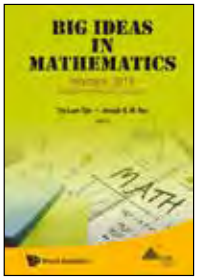
edited by **Hector Rosario** *(Julia Robinson Mathematics Festival, USA & American Institute of Mathematics, USA)*

This groundbreaking anthology is a collection of accounts from leaders in mathematical outreach initiatives. The experiences range from prison education programs to alternative urban and Indian reservation classrooms across the United States, traversing the planet from the Americas to Africa, Asia, and the Indian subcontinent. Their common theme is the need to share meaningful and beautiful mathematics with disenfranchised communities across the globe. Through these stories, the authors share their educational philosophy, personal experiences, and student outcomes. They incorporate anecdotal vignettes since research articles in mathematics education often exclude them.

Readership: Academics, leaders in mathematics outreach programs, social justice organisations and researchers.

296pp	**Nov 2019**	
978-981-121-060-0	**US$88**	**£75**

Big Ideas in Mathematics



Yearbook 2019, Association of Mathematics Educators

edited by **Tin Lam Toh** & **Joseph B W Yeo**

(Nanyang Technological University, Singapore)

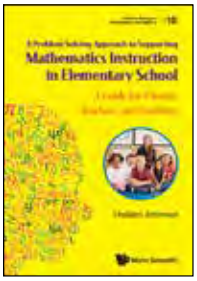
The new emphasis in the Singapore mathematics education is on Big Ideas (Charles, 2005). This book contains more than 15 chapters from various experts on mathematics education that describe various aspects of Big Ideas from theory to practice. It contains chapters that discuss the historical development of mathematical concepts, specific mathematical concepts in relation to Big Ideas in mathematics, the spirit of Big Ideas in mathematics and its enactment in the mathematics classroom. This book presents a wide spectrum of issues related to Big Ideas in mathematics education. On the one end, we have topics that are mathematics content related, those that discuss the underlying principles of Big Ideas, and others that deepen the readers' knowledge in this area, and on the other hand there are practice oriented papers in preparing practitioners to have a clearer picture of classroom enactment related to an emphasis on Big Ideas.

Readership: Graduate students, researchers, practitioners and teachers in mathematics.

404pp	**Jul 2019**	
978-981-120-536-1	**US$98**	**£85**

Problem Solving in Mathematics and Beyond - Vol 10

A Problem-Solving Approach to Supporting Mathematics Instruction in Elementary School



A Guide for Parents, Teachers, and Students

by **Sheldon Rothman** *(Long Island University Post, USA)*

The book takes a problem-solving approach to learning elementary school mathematics and develops concepts by considering examples to uncover patterns. It includes both standard and non-standard problems and exercises, some of which are challenging while others are mainly for reinforcement. The book is written in a relaxed style and includes amusing quotations as well as brief biographies and fun facts about the people who made these quotes. Also included are interesting and surprising applications of mathematics.

Readership: Elementary school teachers, parents and students, college faculty teaching mathematics courses designed for future elementary school teachers, college students majoring in elementary education.

348pp	**Aug 2019**	
978-981-3274-81-5	**US$58**	**£50**
978-981-3275-95-9(pbk)	**US$38**	**£35**

Series on Mathematics Education - Vol 15

Mathematics and its Teaching in the Asia-Pacific Region

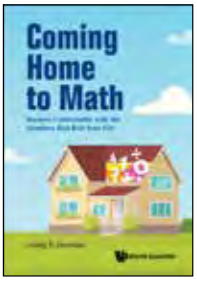
edited by **John Mack** *(Sydney University, Australia)* & **Bruce Vogeli** *(Columbia University, USA)*

This book provides the global mathematics education community with information on the recent and current status of the teaching of mathematics in a group of island nations in the Asia-Pacific region. Sri Lanka, Indonesia, Japan, the Philippines, Australia, Papua New Guinea, New Zealand, and twelve nations in the South Pacific Ocean. It is the third volume in a series conceived by Dr Bruce Vogeli of Columbia University Teachers College and published by WSP, aimed at producing contemporary accounts of mathematics teaching in a world-wide group of nations. Previous volumes have covered Central and South American nations and a selection of Muslim nations respectively.

Readership: Researchers, policy makers, politicians and general public interested in mathematics education in Asia-Pacific region.

324pp	**Oct 2018**	
978-981-3272-12-5	**US$128**	**£115**

Coming Home to Math



Become Comfortable with the Numbers that Rule Your Life

by **Irving P Herman** *(Columbia University, USA)*

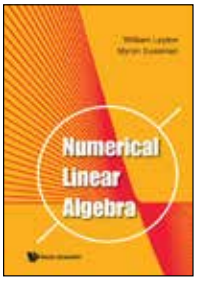
The purpose of *Coming Home to Math* is to make adults with little technical training more comfortable with math, in using it and enjoying it, and to allay their fears of math, enable their numerical thinking, and convince them that math is fun. A range of important math concepts are presented and explained in simple terms, mostly by using arithmetic, with frequent connections to the real world of personal financial matters, health, gambling, and popular culture. As such, *Coming Home to Math* is geared to making the general, non-specialist, adult public more comfortable with math, though not to formally train them for new careers or to teach those first learning math. It may also be helpful to liberal arts college students who need to tackle more technical subjects. The range of topics covered may also appeal to scholars who are more math savvy, though it may not challenge them.

Readership: The general, non-specialist, adult public, liberal arts students in colleges who want to transition to more technical subjects.

444pp	**Apr 2020**	
978-981-120-984-0	**US$108**	**£95**
978-981-121-126-3(pbk)	**US$38**	**£35**

NUMERICAL ANALYSIS & APPROXIMATION

Numerical Linear Algebra



by **William Layton** & **Myron Sussman** *(University of Pittsburgh, USA)*

Many students come to numerical linear algebra from science and engineering seeking modern tools and an understanding of how the tools work and their limitations. Often their backgrounds and experience are extensive in applications of numerical methods but limited in abstract mathematics and matrix theory. Often enough it is limited to multivariable calculus, basic differential equations and methods of applied mathematics. This book introduces modern tools of numerical linear algebra based on this background, heavy in applied analysis but light in matrix canonical forms and their algebraic properties. Each topic is presented as algorithmic ideas and through a foundation based on mostly applied analysis. By picking a path through the book appropriate for the level, it has been used for both senior level undergraduates and beginning graduate classes with students from diverse fields and backgrounds.

Readership: Senior undergraduate and first year graduate in areas related to numerical analysis.

276pp	**Jul 2020**	
978-981-122-389-1	**US$79**	**£70**
978-981-122-484-3(pbk)	**US$49**	**£45**

An Introduction to Numerical Computation

2nd Edition

by **Wen Shen** *(Penn State University, USA)*

Reviews of the First Edition:
"For a compact volume, the homework is ample and well-conceived. Homework problems concluding each chapter include applications, programming tasks, and a list of items to turn in. A complete set of solutions is available for instructor upon request... This is an excellent resource as a semester-long text, textbook adjunct, introduction for self-instruction, or a handy reference for practical implementations." **MAA Reviews**

This book serves as a set of lecture notes for a senior undergraduate level course on the introduction to numerical computation, which was developed through 4 semesters of teaching the course over 10 years. The book requires minimum background knowledge from the students, including only a three-semester of calculus, and a bit on matrices. The book covers many of the introductory topics for a first course in numerical computation, which fits in the short time frame of a semester course. Topics included: Polynomial approximations and interpolation, numerical methods for ODEs and PDEs. The second edition contains a set of selected advanced topics, written in a self-contained manner, suitable for self-learning or as additional material for an honored version of the course.

BUBBLES: Includes: 2 sets of videos, Homework problem sets and complete answer sets available via upon request

Readership: Junior or senior undergraduate students interested in numerical computation and analysis, majoring in mathematics, computer science, physics, engineering, etc.

340pp	**Sep 2019**	
978-981-120-441-8	**US$98**	**£85**
978-981-120-518-7(pbk)	**US$48**	**£40**

Notable Titles in Numerical Analysis & Approximation

Series on Advances in Mathematics for Applied Sciences - Vol 89

Advanced Mathematical and Computational Tools in Metrology and Testing XI

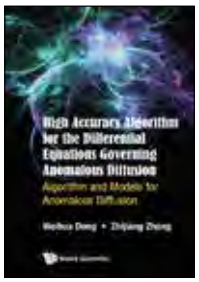
edited by **Alistair B Forbes** *(National Physical Lab., UK)*, **Nien-Fan Zhang** *(National Inst. of Standards and Tech., USA)*, **Anna Chunovkina** *(Institute for Metrology "D I Mendeleyev", Russia)*, **Sascha Eichstädt** *(Physikalisch-Technische Bundesanstalt, Germany)* & **Franco Pavese** *(IMEKO TC21, Italy)*

This volume contains original, refereed contributions by researchers from institutions and laboratories across the world that are involved in metrology and testing. They were adapted from presentations made at the eleventh edition of the *Advanced Mathematical and Computational Tools in Metrology and Testing* conference. The papers present new modeling approaches, algorithms and computational methods for analyzing data from metrology systems and for evaluation of the measurement uncertainty, and describe their applications in a wide range of measurement areas. The book covers the latest computational approaches and describes applications to current measurement challenges in engineering, environment and life sciences.

Readership: Researchers, graduate students, academics and professionals in metrology.

460pp	**Dec 2018**	
978-981-3274-29-7	**US$168**	**£150**

High Accuracy Algorithm for the Differential Equations Governing Anomalous Diffusion



Algorithm and Models for Anomalous Diffusion

by **Weihua Deng** & **Zhijiang Zhang**
(Lanzhou University, China)

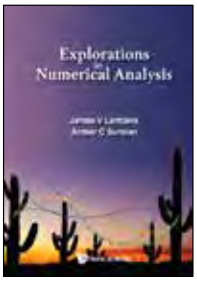
The aim of this book is to extend the application field of 'anomalous diffusion', and describe the newly built models and the simulation techniques to the models.

The book first introduces 'anomalous diffusion' from the statistical physics point of view, then discusses the models characterizing anomalous diffusion and its applications, including the Fokker – Planck equation, the Feymann – Kac equations describing the functional distribution of the anomalous trajectories of the particles, and also the microscopic model — Langevin type equation. The second main part focuses on providing the high accuracy schemes for these kinds of models, and the corresponding convergence and stability analysis.

Readership: Graduate students and researchers in Numerical Analysis, Integral Equations, Partial Differential Equations, Statistical Physics, Computational Physics.

296pp	**Feb 2019**	
978-981-3142-20-6	**US$118**	**£105**

Explorations in Numerical Analysis



by **James V Lambers** & **Amber C Sumner**
(The University of Southern Mississippi, USA)

This textbook introduces 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. Topics covered include error analysis, computer arithmetic, solution of systems of linear equations, least squares problems, eigenvalue problems, polynomial interpolation and approximation, numerical differentiation and integration, nonlinear equations, optimization, ordinary differential equations, and partial differential equations.

For each problem considered, the presentation includes the derivation of solution techniques, analysis of their efficiency, accuracy and robustness, and details of their implementation, illustrated through the MATLAB programming language. 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 and graduate students in numerical analysis, approximations and expansions, linear and multilinear algebra/matrix theory and ordinary differential equations.

676pp	**Nov 2018**	
978-981-3209-96-1	**US$118**	**£98**
978-981-3209-97-8(pbk)	**US$68**	**£56**

OPTIMIZATION & CONTROL

Series on Optimization and its Applications - Vol 4

The Moment-SOS Hierarchy

Lectures in Probability, Statistics, Computational Geometry, Control and Nonlinear PDEs

by **Didier Henrion** *(LAAS-CNRS, France & University of Toulouse, France & Czech Technical University in Prague, Czech Republic)*, **Milan Korda** *(LAAS-CNRS, France & University of Toulouse, France & Czech Technical University in Prague, Czech Republic)* & **Jean Bernard Lasserre** *(LAAS-CNRS, France & Institute of Mathematics, University of Toulouse, France)*

The moment-SOS hierarchy is a powerful methodology that is used to solve the Generalized Moment Problem (GMP) where the list of applications in various areas of Science and Engineering is almost endless. Initially designed for solving polynomial optimization problems (the simplest example of the GMP), it applies to solving any instance of the GMP whose description only involves semi-algebraic functions and sets.

The goal of this book is to describe in a unified and detailed manner how this methodology applies to solving various problems in different areas ranging from Optimization, Probability, Statistics, Signal Processing, Computational Geometry, Control, Optimal Control and Analysis of a certain class of nonlinear PDEs.

Readership: Graduate students, academics and researchers interested in the methodology of the moment-SOS hierarchy and its applications in various fields of science and engineering.

224pp	**Nov 2020**	
978-1-78634-853-1	**US$88**	**£75**

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

Equidistribution of Dynamical Systems

Time-Quantitative Second Law

by **Jozsef Beck** *(Rutgers University, USA)*

We know very little about the time-evolution of many-particle dynamical systems, the subject of our book. Even the 3-body problem has no explicit solution (we cannot solve the corresponding system of differential equations, and computer simulation indicates hopelessly chaotic behaviour).

This book rigorously proves a Time-Quantitative Second Law that works on a realistic time scale. As a by product, we clarify the Loschmidt-paradox and the related reversibility/irreversibility paradox.

Key Features:

- The mathematical foundation of Entropy and the Second Law is a notoriously controversial issue
- This is a pioneering book to clarify the underlying mathematical problems

Readership: Any mathematician working in this field including the PhD students and post-docs in this huge field. Moreover, any physicist who is interested in the mathematical foundation of Statistical Mechanics.

400pp	**Nov 2020**	
978-981-122-555-0	**US$148**	**£130**

Notable Titles Optimization & Control

Passive Network Synthesis

Advances with Inerter

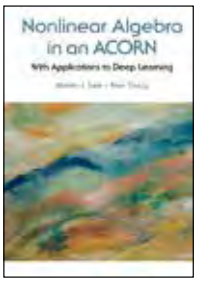
by **Michael Z Q Chen** *(Nanjing University of Science and Technology, China)*, **Kai Wang** *(Jiangnan University, China)* & **Guanrong Chen** *(City University of Hong Kong, China)*

The unique compendium highlights the synthesis of passive electrical or mechanical networks, which is motivated by the vibration control based on a new type of mechanical elements named inerter. It introduces important fundamental concepts of passive network synthesis, and presents recent results on this topic. These new results concern mainly the economical realizations of low-degree functions as RLC networks (damper-spring-inerter networks), the synthesis of *n*-port resistive networks, and the synthesis of low-complexity mechanical networks. They can be directly applied to the optimization and design of various inerter-based mechanical control systems, such as suspension systems, vibration absorbers, building vibration systems, etc.

Readership: Professionals, researchers, academics, and graduate students in circuits & systems, control, systems theory, mechanical engineering, E&E engineering.

256pp	**Oct 2019**	
978-981-121-087-7	**US$98**	**£85**

Nonlinear Algebra in an ACORN



With Applications to Deep Learning

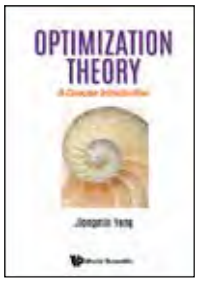
by **Martin J Lee** *(Stanford University, USA)* & **Ken Tsang** *(Beijing Normal University - Hong Kong Baptist University United International College, China)*

A simple algorithm for solving a set of nonlinear equations by matrix algebra has been discovered recently — first by transforming them into an equivalent matrix equation and then finding the solution analytically in terms of the inverse matrix of this equation. With this newly developed ACORN (Adaptive Constrained Optimal Robust Nonlinear) algorithm, it is possible to minimize the objective function [constructed from the functions in the nonlinear set of equations] without computing its derivatives. This book will present the details of ACORN algorithm and how it is used to solve large scale nonlinear equations with an innovative approach ACORN Magic [minimization algorithms gathered in a cloud]. The ultimate motivation of this work is its application to optimization.

Readership: Students and researchers of optimization in solving nonlinear equations in scientific and engineering problems.

92pp	**Nov 2018**	
978-981-3271-51-7	**US$48**	**£40**

Optimization Theory



A Concise Introduction

by **Jiongmin Yong** *(University of Central Florida, USA)*

Mathematically, most of the interesting optimization problems can be formulated to optimize some objective function, subject to some equality and/or inequality constraints. This book introduces some classical and basic results of optimization theory, including nonlinear programming with Lagrange multiplier method, the Karush – Kuhn – Tucker method, Fritz John's method, problems with convex or quasi-convex constraints, and linear programming with geometric method and simplex method. We present nonlinear programming, convex programming, and linear programming in a self-contained manner.

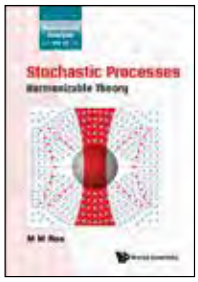
Readership: Undergraduates; graduates and researchers interested in classical and basic optimization theory.

236pp	**Jul 2018**	
978-981-3237-64-3	**US$78**	**£69**

PROBABILITY & STATISTICS

Series on Multivariate Analysis

Stochastic Processes



Harmonizable Theory

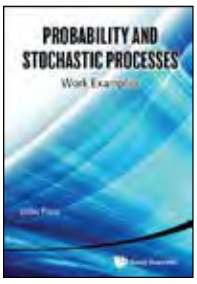
by **M M Rao** *(Univ. of California, Riverside, USA)*

The book presents, for the first time, a detailed analysis of harmonizable processes and fields (in the weak sense) that contain the corresponding stationary theory as a subclass. It also gives the structural and some key applications in detail. These include Levy's Brownian motion, a probabilistic proof of the longstanding Riemann's hypothesis, random fields indexed by LCA and hypergroups, extensions to bistochastic operators, Cramér – Karhunen classes, as well as bistochastic operators with some statistical applications. The material is accessible to graduate students in probability and statistics as well as to engineers in theoretical applications.

Readership: Graduate students and researchers in probability and statistics interested in stochastic processes and harmonizable processes. Electrical-communication engineers as well as other applied professionals in these fields.

338pp	**Nov 2020**	
978-981-121-365-6	**US$128**	**£115**

Probability and Stochastic Processes



Work Examples

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

The book is intended to undergraduate students, it presents exercices and problems with rigorous solutions covering the mains subject of the course with both theory and applications. The book studies a large range of distribution functions for random variables and processes: Bernoulli, multinomial, exponential, Gamma, Beta, Dirichlet, Poisson, Gaussian, Chi2, ordered variables, survival distributions and processes, Markov chains and processes, Brownian motion and bridge, diffusions, spatial processes.

Readership: Undergraduate students interested in more advanced statistics.

260pp	**Mar 2020**	
978-981-121-352-6	**US$88**	**£75**
978-981-121-446-2(pbk)	**US$48**	**£40**

Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore - Vol 38

Genealogies of Interacting Particle Systems

edited by **Matthias Birkner** *(Johannes Gutenberg-Universität Mainz, Germany)*, **Rongfeng Sun** *(National University of Singapore, Singapore)* & **Jan M Swart** *(The Czech Academy of Sciences, Institute of Information Theory and Automation, Czech Republic)*

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. Central to the program were learning sessions where lecturers presented work outside of their own research, as well as a normal workshop. This is reflected in the present volume which contains two types of articles: Lecture notes of the learning sessions, which provide valuable introductions to topics of active interest and Original contributions by participants, which include both survey articles and original research

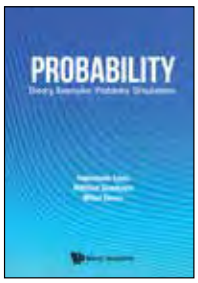
Readership: Graduate students, university professors, researchers and professional mathematicians interested in probability theory, and models arising from population genetics.

364pp	**Mar 2020**	
978-981-120-608-5	**US$128**	**£115**

Probability

Theory, Examples, Problems, Simulations

by **Hannelore Lisei** *(Babeş-Bolyai University, Romania)*, **Wilfried Grecksch** *(Martin-Luther-University Halle-Wittenberg, Germany)* & **Mihai Iancu** *(Babeş-Bolyai University, Romania)*



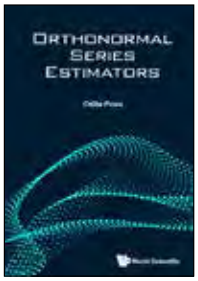
A key pedagogical feature of the textbook is the accessible approach to probability concepts through examples with explanations and problems with solutions. The reader is encouraged to simulate in Matlab random experiments and to explore the theoretical aspects of the probabilistic models behind the studied experiments. By this appropriate balance between simulations and rigorous mathematical approach, the reader can experience the excitement of comprehending basic concepts and can develop the intuitive thinking in solving problems. The current textbook does not contain proofs for the stated theorems, but corresponding references are given.

Readership: Undergraduate and graduate students, professionals and researchers in mathematics, natural sciences, engineering and computer science areas.

364pp	**Mar 2020**	
978-981-120-573-6	**US$108**	**£95**
978-981-120-719-8(pbk)	**US$58**	**£50**

Orthonormal Series Estimators

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



This book presents series estimators defined by projections on bases of functions, they extend the estimators of densities to mixture models, deconvolution and inverse problems, to semi-parametric and nonparametric models for regressions, hazard functions and diffusions. They are estimated in the Hilbert spaces with respect to the distribution function of the regressors and their optimal rates of convergence are proved. Their mean square errors depend on the size of the basis which is consistently estimated by cross-validation. Wavelets estimators are defined and studied in the same models.The choice of the basis, with suitable parametrizations, and their estimation improve the existing methods and leads to applications to a wide class of models.

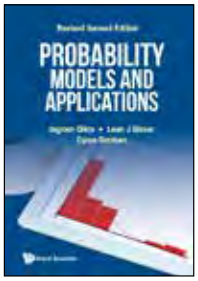
Readership: Graduate students and researchers.

304pp	**Feb 2020**	
978-981-121-068-6	**US$98**	**£85**

Probability Models and Applications

Revised 2nd Edition

by **Ingram Olkin** *(Stanford University, USA)*, **Leon J Gleser** *(University of Pittsburgh, USA)* & **Cyrus Derman** *(Columbia University, USA)*



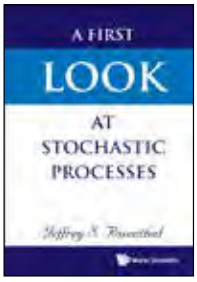
Written by renowned experts in the field, this reissue of a textbook has as its unifying theme the role that probability models have had, and continue to have, in scientific and practical applications. It includes many examples, with actual data, of real-world use of probability models, while expositing the mathematical theory of probability at an introductory calculus-based level. Detailed descriptions of the properties and applications of probability models that have successfully modeled real phenomena are given, as well as an explanation of methods for testing goodness of fit of these models. Readers will receive a firm foundation in techniques for deriving distributions of various summaries of data that will prepare them for subsequent studies of statistics, as well as a solid grounding in concepts such as that of conditional probability that will prepare them for more advanced courses in stochastic processes.

Readership: Undergraduates in probability models, concepts and applications.

732pp	**Sep 2019**	
978-981-3202-03-0	**US$168**	**£150**
978-981-3202-04-7(pbk)	**US$78**	**£65**

A First Look at Stochastic Processes

by **Jeffrey S Rosenthal**
(University of Toronto, Canada)



This textbook introduces the theory of stochastic processes, that is, randomness which proceeds in time. Using concrete examples like repeated gambling and jumping frogs, it presents fundamental mathematical results through simple, clear, logical theorems and examples. It covers in detail such essential material as Markov chain recurrence criteria, the Markov chain convergence theorem, and optional stopping theorems for martingales. The final chapter provides a brief introduction to Brownian motion, Markov processes in continuous time and space, Poisson processes, and renewal theory.

Interspersed throughout are applications to such topics as gambler's ruin probabilities, random walks on graphs, sequence waiting times, branching processes, stock option pricing, and Markov Chain Monte Carlo (MCMC) algorithms. The focus is always on making the theory as well-motivated and accessible as possible, to allow students and readers to learn this fascinating subject as easily and painlessly as possible.

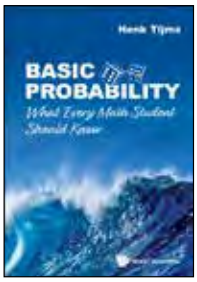
Readership: Senior undergraduate and graduate students in Mathematics, Statistics, Economics, Finance, Computer Science, Engineering, Physics, Actuarial Science, and readers who want to learn the foundations of stochastic processes — including Markov chains, martingales, continuous processes, and a variety of applications.

212pp	**Oct 2019**	
978-981-120-790-7	**US$78**	**£70**
978-981-120-897-3(pbk)	**US$38**	**£35**

Basic Probability

What Every Math Student Should Know

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



"What makes this book unique among books of similar size and scope is that when the author decided to include something in the book, he has treated it in a way similar to the common practice in textbooks, with very detailed and reader-friendly explanations, fully worked-out examples, and even numerous exercises ... There are no prerequisites beyond second-semester calculus and the book can be used for self-study as well as in the classroom." **CHOICE**

Written by international award-winning probability expert Henk Tijms, *Basic Probability: What Every Math Student Should Know* presents the essentials of elementary probability. The book is primarily written for high school and college students learning about probability for the first time. In a highly accessible way, a modern treatment of the subject is given with emphasis on conditional probability and Bayesian probability, on striking applications of the Poisson distribution, and on the interface between probability and computer simulation.

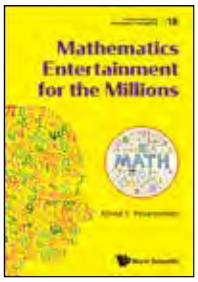
Readership: High school, college and undergraduate students exposed to probability for the first time.

132pp	**Jun 2019**	
978-981-120-235-3	**US$48**	**£40**
978-981-120-376-3(pbk)	**US$28**	**£25**

POPULAR & RECREATIONAL MATHEMATICS

Problem Solving in Mathematics and Beyond - Vol 18

Mathematics Entertainment for the Millions



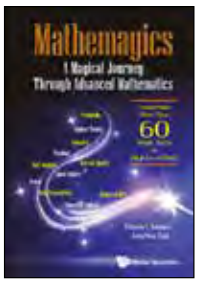
by **Alfred S Posamentier**
(City University of New York, USA)

This book demonstrates to the general audience that mathematics can be entertaining and fun, rather than the sad reputation it has gained over decades from uninspired school instruction that is often devoid of enrichment or motivational considerations. The book is designed in such a way that a reader will need almost no special preparation in mathematics, but to recall some of the most basic concepts that were taught at the lower-secondary-grade level.

Readership: General public, mathematics teachers, mathematics enthusiasts.

304pp	**Aug 2020**	
978-981-121-990-0	**US$78**	**£70**
978-981-121-928-3(pbk)	**US$36**	**£30**

Mathemagics: A Magical Journey Through Advanced Mathematics



Connecting More Than 60 Magic Tricks to High-Level Math

by **Ricardo V Teixeira** & **Jang-Woo Park**
(University of Houston-Victoria, USA)

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.

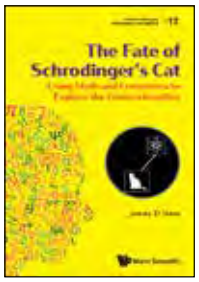
Topics covered include mathematical proofs, probability, abstract algebra, linear algebra, mathematical computing, number theory, coding theory, geometry, topology, real analysis, numerical analysis and history of math.

Readership: High school and college students, general public.

408pp	**Jun 2020**	
978-981-121-450-9	**US$98**	**£85**
978-981-121-530-8(pbk)	**US$48**	**£40**

Problem Solving in Mathematics and Beyond - Vol 17

The Fate of Schrodinger's Cat



Using Math and Computers to Explore the Counterintuitive

by **James D Stein** *(California State University Long Beach, USA)*

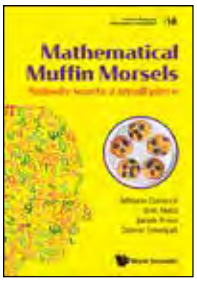
Can we correctly predict the flip of a fair coin more than half the time — or the decay of a single radioactive atom? Our intuition, based on a lifetime of experience, tells us that we cannot, as these are classic examples of what are known to be 50 – 50 guesses. It is possible to devise experiments in which a flipped coin lands heads completely at random half the time, but we can also correctly predict when it will land heads more than half the time. The Fate of Schrodinger's Cat shows how high-school algebra and basic probability theory, with the invaluable assistance of computer simulations, can be used to investigate both the intuitive and the counterintuitive. This book explores fascinating and controversial questions involving prediction, decision-making, and statistical analysis in a number of diverse areas.

Readership: General Public, undergraduate math teachers and students in mathematics, computer programming, quantum mechanics, sports or the advertising business.

172pp	**Jul 2020**	
978-981-121-863-7	**US$58**	**£50**
978-981-121-815-6(pbk)	**US$28**	**£25**

Problem Solving in Mathematics and Beyond - Vol 16

Mathematical Muffin Morsels



Nobody Wants a Small Piece

by **William Gasarch**, **Erik Metz**, **Jacob Prinz** & **Daniel Smolyak** *(University of Maryland, USA)*

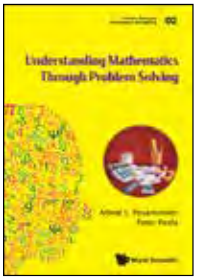
Suppose you have five muffins that you want to divide and give to Alice, Bob, and Carol. You want each of them to get 5/3. You could cut each muffin into 1/3-1/3-1/3 and give each student five 1/3-sized pieces. But Alice objects! She has large hands! She wants everyone to have pieces larger than 1/3. Is there a way to divide five muffins for three students so that everyone gets 5/3, and all pieces are larger than 1/3? Spoiler alert: Yes! In fact, there is a division where the smallest piece is 5/12. Is there a better division? Spoiler alert: No.

Readership: High school and undergraduate students, computer scientists, mathematicians, and anyone interested in recreational mathematics.

228pp	**Jun 2020**	
978-981-121-517-9	**US$58**	**£50**
978-981-121-597-1(pbk)	**US$28**	**£25**

Problem Solving in Mathematics and Beyond - Vol 2

Understanding Mathematics Through Problem Solving



by **Alfred S Posamentier** *(The City University of New York, USA)* & **Peter Poole** *(Mercy College New York, USA)*

This book will present a collection of mathematical problems — lighthearted in nature — intended to entertain the general readership. Problems will be selected largely for the unusual and unexpected solutions to which they lend themselves. Some interesting contents included:

- counterintuitive solutions to simple mathematical problems;
- entertaining mathematical problems;
- important and useful mathematical solutions to problems;
- problem solutions for mathematics to general usage;
- visual mathematical problems;

Readership: General readership in mathematics.

532pp	**May 2020**	
978-981-4663-67-0	**US$118**	**£105**
978-981-4663-25-0(pbk)	**US$48**	**£40**

Origami with Explanations

Having Fun with Folding and Math

by **Jeanine Meyer** *(SUNY Purchase, USA)* & **Takashi Mukoda**

This book will introduce you to origami, starting with a jumping frog and including traditional and modern models. Carefully written instructions, using photos and diagrams, will show you the main origami bases, turn you into a successful folder and stimulate your own creativity. Explanations will include attention to spatial relations, geometry, algebra, and pattern finding. The explanations provide insight into the origami while the folding will help your understanding of mathematics

- Cover Box and Business Card Frog
- Fluttering Butterfly and Star Basket
- Waterbomb, Tulip with Stem, Stellated Octahedron
- Drinking Cup
- Waterbomb Base Ornament and King David Crown

Readership: Public and students in college classrooms.

250pp	**Jan 2021**	
978-981-122-007-4	**US$58**	**£50**
978-981-121-943-6(pbk)	**US$28**	**£25**

More Origami with Explanations

Having Fun with Folding and Math

by **Jeanine Meyer** *(SUNY Purchase, USA)* & **Takashi Mukoda**

This book continues the approach of **Origami with Explanations**; but is independent, with basic instructions repeated. Carefully written instructions, using photos and diagrams, will turn you into a successful folder and stimulate your own creativity. The models in this book include action models, money folds, beautiful and useful containers, and modular origami. Mathematics topics touched on include improving estimates, tessellations, mathematical induction, flat-foldability, and fold-and-cut. The *Explanations* section provide insight into the origami and introduce or re-introduce you to basic and advanced subjects in mathematics.

- Kissy Fish
- Tetrahedron from a strip and Rotating Tetrahedrons
- Heart Locket
- One-Dollar Shirt and Dollar bill Broken Heart
- Dollar Bill Rosette
- Masu Box with Lid and Shen Basket
- Ninja Star and Jackson Cubes and Columbus Cubes
- Betsy Ross One-snip 5-pointed Star and One-Snip Square Letter

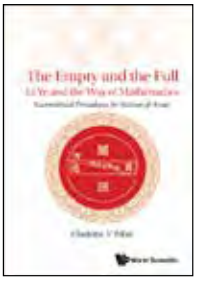
Readership: Public and students in college classrooms.

250pp	**Jan 2021**	
978-981-122-008-1	**US$58**	**£50**
978-981-121-946-7(pbk)	**US$28**	**£25**

The Empty and the Full: Li Ye and the Way of Mathematics

Geometrical Procedures by Section of Areas

by **Charlotte-V Pollet** *(National Chiao-Tung University, Taiwan)*



During Song (960 to 1279) and Yuan (1279 to 1368) dynasties, China experienced a peak in high-level algebraic investigation through the works of famous mathematicians. Among these is Li Ye's short treatise on a curious ancient geometrical procedure: *The Development of Pieces of Areas According to the Collection Augmenting the Ancient Knowledge (Yigu yanduan)*.

The aim of this monography is to contradict traditional scholarship which has long discredited the importance of Li Ye's treatise, considering it a mere popular handbook. The real topic of the study is the exploration of another expression of proof and generality in Chinese mathematics. This book not only completes the edition of Li Ye's works and presents new features of Chinese mathematics, but also fills a gap in the translation of Chinese mathematics treatises. It is the first book entirely dedicated to the diagrammatic practice of algebra in the history of Chinese mathematics. This practice is more important than expected.

Readership: Readers who are interested in the histroy of mathematics, especially the history of Chinese mathematics and the contribution of ancient Chinese mathematicians.

276pp	**Apr 2020**	
978-981-120-947-5	**US$98**	**£85**

Problem Solving in Mathematics and Beyond - Vol 21

Adventures in Recreational Mathematics

Selected Writings on Recreational Mathematics and its History **(In 2 Volumes)**

by **David Singmaster** *(University College London, UK)*

The author believes in the presentation and teaching of mathematics as recreation. When the Rubik's Cube took off in 1978, based on thinly disguised mathematics, he became seriously interested in mathematical puzzles which would provide mental stimulation for students and professional mathematicians.

In these 2-volume books, the readers shall have 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.

Readership: Students and scholars of mathematics and its history, Maths teachers, general public.

500pp	**Feb 2021**	
Vol. 1 300pp		
978-981-122-600-7	**US$78**	**£ 70**
978-981-122-650-2(pbk)	**US$48**	**£ 40**
Vol. 2 200pp		
978-981-122-603-8	**US$68**	**£ 60**
978-981-122-651-9(pbk)	**US$38**	**£ 35**

Problem Solving in Mathematics and Beyond

X Games

Training in Sports to Play in Mathematics

by **Tim Chartier** *(Davidson College, USA)*

Sports analytics has gathered tremendous momentum as one of the most dynamic fields. Diving deep into the numbers of sports can be game changing or simply a fun exercise for fans. How do you get in the game with numbers? What questions can be explored? What actionable insights can be gleaned?

Do you like sports? This book will detail ways to analyze athletics to gain insight that can otherwise be obscured. Like math? You'll find many mathematical topics not involving sports. You'll also see how sports analytics can train you broadly in mathematics.

Readership: General public, youth, secondary Mathematics teachers, professors.

220pp	**Jan 2021**	
978-981-122-383-9	**US$78**	**£70**
978-981-122-487-4(pbk)	**US$38**	**£35**

Global Solution for Sudoku

by **Zhong-Qi Ma** *(Chinese Academy of Sciences, China)*

The present book aims to provide systematic and reliable techniques, called the global solution, for Sudoku puzzles. Any proper Sudoku puzzle, which has one and only one solution of Sudoku, can be solved by anyone following the techniques provided in this book. Specific symbols are introduced to express the 6 basic rules of the Sudoku global solution, as the results, those Sudoku solving techniques are presented similar to the annotations in chess. Finnish mathematician Arto Inkala proposed "the most difficult Sudoku puzzle" in 2007. Then, he designed another difficult Sudoku puzzle in 2012, named "the thing Everest". In the present book the solving process of those two difficult Sudoku puzzles are illustrated reliably by the specific symbols of the global solution step by step.

Readership: People of all ages who are interested in Readership the Sudoku puzzles.

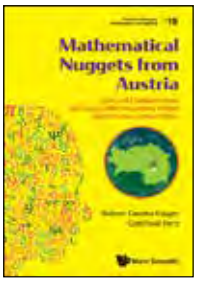
193pp	**Nov 2020**	
978-981-122-460-7	**US$39**	**£35**
978-981-122-461-4(pbk)	**US$14**	**£10**

Problem Solving in Mathematics and Beyond - Vol 19

Mathematical Nuggets from Austria

Selected Problems from the Styrian Mid-Secondary School Mathematics Competitions

by **Robert Geretschläger** *(BRG Keplerstraße, Austria)* &**Gottfried Perz** *(BG/BRG Pestalozzistraße, Austria)*



This book is composed of the most interesting problems from a quarter century of regional mathematics competitions for students aged 11 – 14 in the province of Styria, Austria. The problems presented here range from pure puzzles to a more traditional mathematical type of question, but all are somehow special, posed with the intent of giving the reader something interesting to think about, with the promise of an entertaining moment of elucidation and enlightenment at the end.

Readership: Students, Teachers, Adults interested in solving mathematical puzzles, Trainers for Math Competitions.

300pp	**Oct 2020**	
978-981-121-989-4	**US$78**	**£70**
978-981-121-925-2(pbk)	**US$36**	**£30**

Algebra for Parents

A Book for Grownups about Middle School Mathematics

by **Ron Aharoni** *(Technion, Israel institute of Technology, Israel)*

The book goes through middle school mathematics and techniques and methods of its teaching. It is meant to aid parents who wish to be involved in the mathematical education of their children, as well as teachers who wish to learn principles of mathematics and of its teaching.

Key Features:

- The book is aimed at parents who want to follow the mathematics their children learn in middle school, or to help the child. It is also a "second chance" book, that may enlighten people about the mathematics they learnt long ago, and enhance their understanding

Readership: Parents, educated grownups and teachers.

250pp	**Oct 2020**	
978-981-120-922-2	**US$78**	**£70**
978-981-121-074-7(pbk)	**US$38**	**£35**

OLYMPIAD SERIES

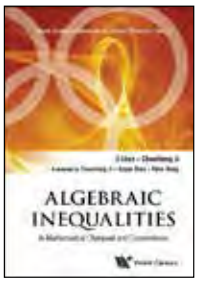
World Century Mathematical Olympiad Series - Vol 2

Algebraic Inequalities

In Mathematical Olympiad and Competitions

by **Ji Chen** & **Chaocheng Ji** *(Ningbo High School, China)*

translated by **Chaocheng Ji** *(Ningbo High School, China)*, **Huyue Shen** *(Zhenhai High School, China)* & **Ruhe Wang** *(Zhenhai High School, China)*



Written by experts in the field, the focus of this book is algebraic inequalities. Not only is it the current Mathematical Olympiad hot topic, it is also the basis of geometric inequalities. In addition, the book involves some analysis on inequality. This book serves as a good reference in the field of algebraic inequalities as faced in problems found in a Mathematical Olympiad.

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

200pp	**Oct 2020**	
978-1-938134-95-1	**US$68**	**£56**
978-1-938134-92-0(pbk)	**US$38**	**£32**

Mathematical Olympiad Series - Vol 16

Sequences and Mathematical Induction

In Mathematical Olympiad and Competitions

2nd Edition

by **Zhigang Feng** *(Shanghai Senior High School, China)*

translated by **Feng Ma** & **Youren Wang**

The author is one of the senior coaches of China's IMO National Team. In the past decade, the students of this school have won the IMO gold medals almost every year. The author attempts to use some common characteristics of sequence and mathematical induction to fundamentally connect Math Olympiad problems to particular branches of mathematics. In doing so, the author hopes to reveal the beauty and joy involved with math exploration and at the same time, attempts to arouse readers' interest of learning math and invigorate their courage to challenge themselves with difficult problems.

Readership: Senior high school students engaged in math contests, math teachers, undergraduates of math major and math enthusiasts.

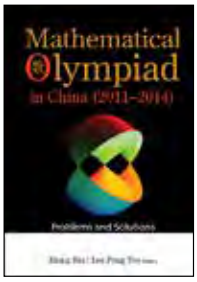
220pp	**Dec 2019**	
978-981-121-103-4	**US$58**	**£50**
978-981-121-207-9(pbk)	**US$28**	**£25**

Mathematical Olympiad Series - Vol 15

Mathematical Olympiad in China (2011 – 2014)

Problems and Solutions

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



This book includes the problems and solutions of the most important mathematical competitions from 2010 to 2014 in China, such as China Mathematical Competition, China Mathematical Olympiad, China Girls' Mathematical Olympiad. These problems are almost exclusively created by the experts who are engaged in mathematical competition teaching and researching. Some of the solutions are from national training team and national team members, their wonderful solutions being the feature of this book. This book is useful to mathematics fans, middle school students engaged in mathematical competition, coaches in mathematics teaching and teachers setting up math elective courses.

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

368pp	**May 2018**	
978-981-3143-74-6	**US$78**	**£65**
978-981-3142-93-0(pbk)	**US$38**	**£32**

Problem Solving in Mathematics and Beyond - Vol 7

A Central European Olympiad

The Mathematical Duel

by **Robert Geretschläger** *(BRG Keplerstrasse, Graz, Austria)*, **Józef Kalinowski** *(University of Silesia in Katowice, Poland)* & **Jaroslav Švrček** *(Palacký University, Olomouc, Czech Republic)*

This book contains the most interesting problems from the first 24 years of the "Mathematical Duel", an annual international mathematics competition between the students of four schools: Gymnázium Mikuláše Koperníka in Bílovec, Czech Republic, Akademicki Zespół Szkół Ogólnokształcących in Chorzó w, Poland, the Bundesrealgymnasium Kepler in Graz, Austria and the Gymnázium Jakuba Škody in Přerov, Czech Republic. The problems are presented by topic, grouped under the headings Geometry, Combinatorics, Number Theory and Algebra, which is typical for olympiad-style competitions.

Readership: General public, students and teachers preparing for olympiad-style mathematical competitions

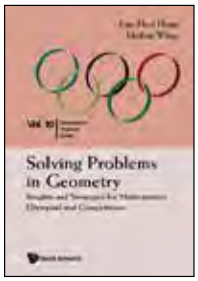
292pp	**Jan 2018**	
978-981-3226-16-6	**US$68**	**£60**
978-981-3223-90-5(pbk)	**US$38**	**£33**

Mathematical Olympiad Series - Vol 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)*



"This book is a useful reference for faculty members involved in contest preparation or teaching Euclidean geometry at the college level." **MAA Reviews**

This new volume of the Mathematical Olympiad Series focuses on the topic of geometry. Basic and advanced theorems commonly seen in Mathematical Olympiad are introduced and illustrated with plenty of examples. Special techniques in solving various types of geometrical problems are also introduced, while the authors elaborate extensively on how to acquire an insight and develop strategies in tackling difficult geometrical problems.

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

356pp	**Jul 2017**	
978-981-4590-72-3	**US$58**	**£48**
978-981-4583-74-9(pbk)	**US$34**	**£28**

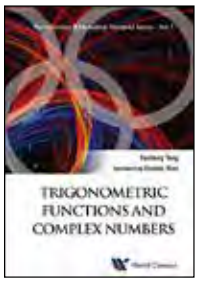
World Century Mathematical Olympiad Series - Vol 1

Trigonometric Functions and Complex Numbers

In Mathematical Olympiad and Competitions

by **Desheng Yang** *(Shanghai Xiangming High School, China)*

translated by **Chunhui Shen** *(Shanghai Xiangming High School, China)*



Trigonometric Functions and Complex Numbers covers the followings areas in the International Mathematical Olympiad (IMO) and other mathematical competitions. Trigonometric identity, graphs and properties of trigonometric equations, inverse trigonometric functions and trigonometric equations, solutions of triangles, trigonometric substitution and trigonometric inequality. The concept and operation of complex numbers, trigonometric form of a complex number, complex number and equation.

The contents are essential for the IMO. A good help for students who want to improve in these areas.

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

424pp	**Nov 2016**	
978-1-938134-76-0	**US$70**	**£58**
978-1-938134-86-9(pbk)	**US$38**	**£32**

PUZZLE SERIES

KenKen: Math & Logic Puzzles That Will Make You Smarter! - Vol 3

KENKEN: A Puzzle A Day!

365 Puzzles That Make You Smarter

Created by: **Tetsuya Miyamoto**

edited by **Robert Fuhrer** *(KenKen Puzzle, LLC, USA)*

This book will challenge KenKen puzzle lovers to improve their puzzling, sharpen their logic and reasoning skills, and to just have fun by solving an all-new puzzle-a-day. It is suitable for ALL puzzle lovers, math and logic aficionados, and anyone who enjoys exercising their brain on a regular basis or who is interested in improving their thought processes. You'll find a BRAND NEW, freshly "Kenerated" KenKen puzzle for every day of the year in this book. That's right — 365 puzzles.

You'll also discover three different types of KenKen puzzles:

Lim-ops puzzles, in which the operations are limited to different combinations

No-ops puzzles, in which there are no operations in the cages, only target numbers;

Twist puzzles, which require you to use a different set of numbers than usual to fill in the grid.

Readership: KenKen Puzzle enthusiasts and all those who like to solve math puzzles

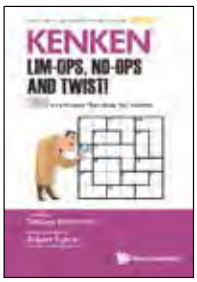
280pp	**Aug 2020**	
978-981-3236-68-4	**US$48**	**£42**
978-981-3235-87-8(pbk)	**US$19**	**£15**

KenKen: Math & Logic Puzzles That Will Make You Smarter! - Vol 2

KENKEN: Lim-Ops, No-Ops and Twist!

180 6 x 6 Puzzles That Make You Smarter

edited by **Robert Fuhrer** *(KenKen Puzzle, LLC, USA)*



This book will challenge seasoned KenKen players, enhance their solving techniques, and provide hours of fun puzzle play and brain training.

NEW RULES ARE INTRODUCED ... Limited-operations puzzles, where puzzles may contain only addition, only subtraction, or a mix of addition and subtraction.

No-operations puzzles, where puzzles will use all four operations including multiplication and division, but YOU have to figure out which operations to use.

... AND A BRAND NEW PUZZLE

Twist puzzles where instead of using 1 to 6 for a 6 x 6 puzzle as you do in regular KenKen, you'll use a different candidate set each time. In one puzzle, you might use {1, 2, 3, 7, 8, 9}; in another, you might use {2, 4, 6, 7, 8, 9}. Different combinations will present exciting new challenges.

No puzzle involves guesswork ... there is always a logical way in!

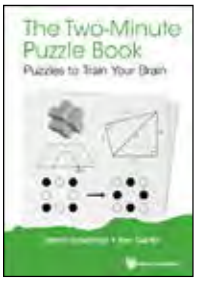
Readership: KenKen Puzzle Enthusiasts at the Intermediate and Advanced Level. Good for all ages!

156pp	**Jun 2020**	
978-981-3236-67-7	**US$38**	**£33**
978-981-3235-84-7(pbk)	**US$12**	**£10**

The Two-Minute Puzzle Book

Puzzles to Train Your Brain

by **David Goodman** & **Ilan Garibi**



LEARN SHORTCUTS Many of the puzzles will seem as though they will take longer than two minutes to solve, but ... there are shortcuts if you can find them!! There are faster ways to solve each problem and dilemma. *The Two-Minute Puzzle Book* will teach you to look for such loopholes and shortcuts!

ENGAGING THEMATIC PUZZLES From Chapter One's "The One and Only" through Chapter Nine's "The Whole Nine Yards", each chapter contains puzzles related to the chapter's theme. For example, in the second chapter, you will find mechanical puzzles with double pieces, riddles about couples, line puzzles and more.

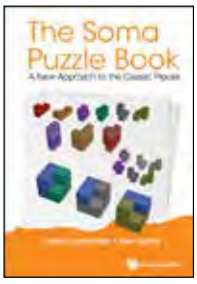
UNIQUE CHALLENGES As with their previous puzzle books, the authors, David Goodman and Ilan Garibi, aim to provide a fresh and original book. Many of the puzzles are coming from their heads and are not retreads!! There are some classic puzzles too, but the authors present them in an original way.

CULTIVATE YOUR BRAIN TO THINK CREATIVELY Crack open this book and allow the puzzles presented to train your brain. Always look for a bypass or shortcut. Find a different point of view. By rephrasing the question, a solution may surface!

Readership: Puzzle and riddle lovers.

164pp	**Feb 2020**	
978-981-121-775-3	**US$68**	**£60**
978-981-121-319-9(pbk)	**US$28**	**£25**

The Soma Puzzle Book



A New Approach to the Classic Pieces
by **David Goodman** & **Ilan Garibi**

"It is a book purely for the fun of solving puzzles ... The current book will add new problems to the existing ones." **European Mathematical Society**

A NEW TWIST ON A POPULAR PUZZLE CUBE! Invented by Piet Hein, the Soma cube is one of the most famous mechanical puzzles in the world. The traditional challenge and outcome is to build a cube or other structures from all seven pieces.

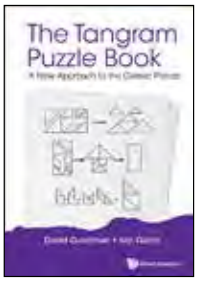
CHANGE THE RULES, CHANGE THE OUTCOME! The puzzles in this unique Soma-inspired collection are no longer predicated upon using all seven pieces at one time! By varying the number of pieces, there are many new and versatile puzzle challenges, from all types of recreational mathematics fields. For example, you will find symmetry puzzles, cover-up puzzles, and even fraction puzzles. The chapters are divided according to the number of pieces used; from single-piece puzzles to puzzles requiring a complete set.

WHY USE THE SOMA CUBE? From the moment our creative team changed their rules of engagement for this new collection, the potential puzzle challenges and their solutions became nearly limitless! There is something magical and enchanting in those seven pieces that enabled us to find many puzzles and challenges!

Readership: Puzzle and riddle lovers.

180pp	**May 2019**	
978-981-3275-94-2(pbk)	**US$28**	**£25**
978-981-3275-31-7	**US$48**	**£40**

The Tangram Puzzle Book



A New Approach to the Classic Pieces
by **David Goodman** & **Ilan Garibi**

THE TANGRAM is one of the oldest types of dissection puzzles in the world that originated from China. It traditionally requires the participant to arrange seven pieces (or "tans") into a shape just by looking at the given silhouette.

LEARN WHILE PLAYING The puzzles in this unique book are fresh, innovative and compelling. The puzzle pieces are building units for puzzles that boost mental dexterity with a variety of challenges from various fields of recreational mathematics. Come on and play with symmetry puzzles, cover-up puzzles and self-similarity puzzles to increase your skill and mental acuity!

NEW PUZZLE DESIGNS To add variety and challenge, some of the puzzles may not use all seven pieces of the Tangram set, while others may use pieces from two or more sets.

The authors utilize a creative twist in this collection that is different from classic Tangram puzzles: **Most of the puzzles do not allow connections between the pieces unless they share a common edge**. With this slight change to the rules, an entirely new universe of Tangram puzzles and challenges is unleashed to delight the puzzle solver!

Readership: Puzzle and riddle lovers.

164pp	**Jul 2018**	
978-981-3235-20-5(pbk)	**US$28**	**£25**
978-981-3234-00-0	**US$48**	**£40**

The Paper Puzzle Book

All You Need is Paper!
by **Ilan Garibi**, **David Goodman** & **Yossi Elran**

"This is a marvellous book. The diversity of possible puzzles that can be given with these very limited resources, which are basically some paper and scissors, is overwhelming, and the challenges are sometimes very tough. Even the two-star problems may be hard for an untrained puzzler. This is medicine against boredom on long rainy days, but be careful not to get addicted or it may suck up your less empty and sunny days as well." **European Mathematical Society**

ORIGINAL DESIGNS Co-developed by a mathematician, an origami artist and a mechanical puzzle maker, this inventive book provides a unique and invaluable collection of a large, comprehensive and diverse variety of paper puzzles. And they only require a sheet of paper and perhaps a pair of scissors!

LEARNING GEOMETRY, MATHEMATICS AND PROBLEM-SOLVING CHALLENGES CAN BE FUN! For students and teachers; parents and children; amateur and skilled mathematicians, and puzzle lovers.

LEARN CONCEPTS AS YOU GO! Many of the puzzles are new and original, they complement the classic puzzles that are included and all of them come with a solution as well as a mathematical and geometrical explanation that can be easily understood by all.

Readership: Puzzle and riddle lovers, and origami enthusiasts.

264pp	**Mar 2018**	
978-981-3202-41-2(pbk)	**US$28**	**£25**
978-981-3202-40-5	**US$48**	**£42**

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Fractals

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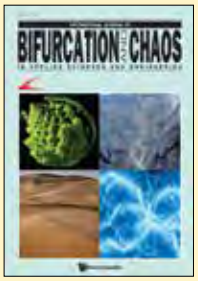
International Journal of Bifurcation and Chaos

Print / Online ISSN: 0218-1274 / 1793-6551
https://www.worldscientific.com/ijbc

IMPACT FACTOR **2.469**



The **International Journal of Bifurcation and Chaos** is widely regarded as a leading journal in the exciting fields of chaos theory and nonlinear science. Represented by an international editorial board comprising top researchers from a wide variety of disciplines, it is setting high standards in scientific and production quality. The journal has been reputedly acclaimed by the scientific community around the world and has featured many important papers by leading researchers from various areas of applied sciences and engineering.

Editor-in-Chief: Guanrong (Ron) Chen *(City Univ. of Hong Kong, Hong Kong)*

Advanced Studies in Pure Mathematics - Vol 82

Differential Geometry and Tanaka Theory — Differential System and Hypersurface Theory —

Proceedings of the International Conference
International Conference on Differential Geometry and Tanaka Theory — Differential System and Hypersurface Theory —
RIMS, Kyoto University, Japan, 24 – 28 January 2011
edited by **Toshihiro Shoda** *(Saga University, Japan)* & **Kazuhiro Shibuya** *(Hiroshima University, Japan)*

195pp **Jan 2001**
978-4-86497-083-9 **US$53.60** **£45**

Advanced Studies in Pure Mathematics - Vol 83

Primitive Forms and Related Subjects — Kavli IPMU 2014

Proceedings of the International Conference
International Conference on Primitive Forms and Related Subjects
Kavli IPMU, University of Tokyo, 10 – 14 February 2014
edited by **Kentaro Hori** *(Kavli IPMU, Japan)*, **Changzheng Li** *(Sun Yat-Sen University, China)*, **Si Li** *(Tsinghua University, China)* & **Kyoji Saito** *(Kavli IPMU, Japan)*

415pp **Jan 2001**
978-4-86497-085-3 **US$82** **£70**

Advanced Studies in Pure Mathematics - Vol 81

Asymptotic Analysis for Nonlinear Dispersive and Wave Equations

Proceedings of the International Conference on Asymptotic Analysis for Nonlinear Dispersive and Wave Equations
International Conference on Asymptotic Analysis for Nonlinear Dispersive and Wave Equations
Osaka University, Osaka, Japan, 6 – 9, September 2014
edited by **Keiichi Kato** *(Tokyo University of Science, Japan)*, **Takayoshi Ogawa** *(Tohoku University, Japan)* & **Tohru Ozawa** *(Waseda University, Japan)*

300pp **Mar 2020**
978-4-86497-081-5 **US$78.20** **£69**

Advanced Studies in Pure Mathematics - Vol 79

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
International Conference on Traditional Mathematics in East Asia and Related Topics
Ochanomizu University, Tokyo, Japan, 25 – 30 August 2014
edited by **Tsukane Ogawa** & **Mitsuo Morimoto** *(Yokkaichi University, Japan)*

561pp **Sep 2019**
978-4-86497-057-0 **US$96.30** **£85**

Advanced Studies in Pure Mathematics - Vol 80

Operator Algebras and Mathematical Physics

Proceedings of the International Conference on Operator Algebras and Mathematical Physics
International Conference on Operator Algebras and Mathematical Physics
Tohoku University, Sendai, Japan, 1 – 12, August 2016
edited by **Masaki Izumi** *(Kyoto University, Japan)*, **Yasuyuki Kawahigashi** *(The University of Tokyo, Japan)*, **Motoko Kotani** *(Tohoku University, Japan)*, **Hiroki Matui** *(Chiba University, Japan)* & **Narutaka Ozawa** *(Kyoto University, Japan)*

Readership: Researchers interested in operator algebras, conformal field theory, quantum groups and quantum statistical mechanics.

218pp **Sep 2019**
978-4-86497-079-2 **US$59.30** **£50**

Advanced Studies in Pure Mathematics - Vol 77

The 50th Anniversary of Gröbner Bases

Proceedings of the 8th Mathematical Society of Japan Seasonal Institute (MSJ SI 2015)
8th Mathematical Society of Japan Seasonal Institute (MSJ SI 2015)
Hotel Nikko Osaka, 1 – 10 July 2015
edited by **Takayuki Hibi** *(Osaka University, Japan)*

432pp **Jan 2001**
978-4-86497-052-5 **US$67.60** **£60**

Advanced Studies in Pure Mathematics - Vol 76

Representation Theory, Special Functions and Painlevé Equations — RIMS 2015

Proceedings of the International Conference
International Conference on Representation Theory, Special Functions and Painlevé Equations
Kyoto University, Japan, 3 – 6 March 2015
edited by **Hitoshi Konno** *(Tokyo University of Marine Science and Technology, Japan)*, **Hidetaka Sakai** *(University of Tokyo, Japan)*, **Junichi Shiraishi** *(University of Tokyo, Japan)*, **Takao Suzuki** *(Kindai University, Japan)* & **Yasuhiko Yamada** *(Kobe University, France)*

541pp **Jan 2001**
978-4-86497-050-1 **US$96** **£85**

Advanced Studies in Pure Mathematics - Vol 84

Various Aspects of Multiple Zeta Functions

In Honor of Professor Kohji Matsumoto's 60th Birthday
Proceedings of the International Conference
International Conference on Various Aspects of Multiple Zeta Functions
Nagoya University, Japan, 21 – 25 August 2017
edited by **Hidehiko Mishou** *(Tokyo Denki University, Japan)*, **Takashi Nakamura** *(Tokyo University of Science, Japan)*, **Masatoshi Suzuki** *(Tokyo Institute of Technology, Japan)* & **Yumiko Umegaki** *(Nara Women's University, Japan)*

411pp **Jan 2001**
978-4-86497-088-4 **US$69** **£60**

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Readership: Undergraduates in mathematics.

596pp	**Mar 2014**	
978-981-4583-92-3	**US$78**	**£65**
978-981-4583-93-0(pbk)	**US$30**	**£25**

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Elementary Stochastic Calculus, with Finance in View

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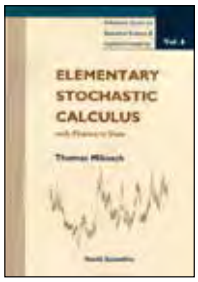

"This book under review can be determined as a very successful work ... the author's choice of the material is done with good taste and expertise ... It can be strongly recommended to graduate students and practitioners in the field of finance and economics." **Mathematics Abstracts**

Readership: Economists, financial engineers, mathematicians and physicists.

224pp	**Nov 1998**	
978-981-02-3543-7	**US$58**	**£48**

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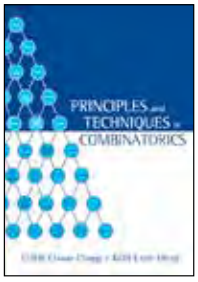
by **Chen Chuan-Chong** *(NUS, Singapore)* & **Koh Khee-Meng** *(NUS, Singapore)*



"This book should be a must for all mathematicians who are involved in the training of Mathematical Olympiad teams, but it will also be a valuable source of problems for university courses." **Mathematical Reviews**

Readership: Undergraduates, graduates and mathematicians.

312pp	**Jul 1992**	
978-981-02-1139-4(Set)(pbk)	**US$39**	**£32**

See Pg6 for the *Solution Manual*

A First Look at Rigorous Probability Theory

2nd Edition

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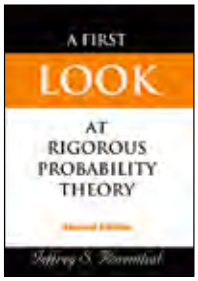

"This is a fine textbook on probability theory based on measure theory. The parts of measure theory that are needed are developed within the book and a teacher of measure theory could find them quite useful. The construction of the Lebesgue measure (extension theorem) is unusual and interesting." **Mathematical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

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

236pp	**Nov 2006**	
978-981-270-370-5	**US$61**	**£51**
978-981-270-371-2(pbk)	**US$33**	**£27**

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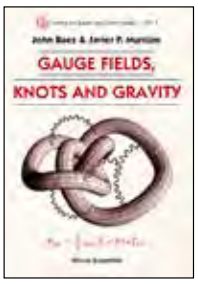

"The book is clearly written and should be accessible to readers who have a good undergraduate preparation in mathematics or physics. Each part of the book ends with a list of references that will enable the reader to pursue the material presented in greater detail." **Mathematical Reviews**

Readership: Mathematicians, mathematical physicists and theoretical physicists.

480pp	**Oct 1994**	
978-981-02-1729-7	**US$129**	**£107**
978-981-02-2034-1(pbk)	**US$71**	**£59**

World Scientific Lecture Notes in Physics - Vol 61

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2nd Edition

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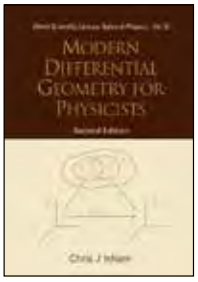


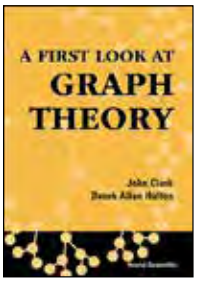
"This book is carefully written, and attention is paid to rigor and relevant details ... The key notions are discussed with great care and from many points of view, which attenuates the shock of the formalism." **Mathematical Reviews**

Readership: Mathematical physicists.

304pp	**Mar 1999**	
978-981-02-3555-0	**US$82**	**£68**
978-981-02-3562-8(pbk)	**US$43**	**£36**

A First Look at Graph Theory

by **John Clark** *(University of Otago, New Zealand)* & **Derek Allan Holton** *(University of Otago, New Zealand)*



This book is intended to be an introductory text for mathematics and computer science students at the second and third year levels in universities. It gives an introduction to the subject with sufficient theory for students at those levels, with emphasis on algorithms and applications.

Readership: Undergraduates in mathematics and computer science.

352pp	**May 1991**	
978-981-02-0489-1	**US$102**	**£85**
978-981-02-0490-7(pbk)	**US$49**	**£41**

Introduction to Stochastic Calculus with Applications

3rd Edition

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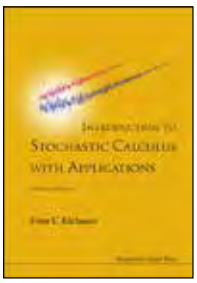

This book presents a concise and rigorous treatment of stochastic calculus. It also gives its main applications in finance, biology and engineering. In finance, the stochastic calculus is applied to pricing options by no arbitrage. In biology, it is applied to populations'models, and in engineering it 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**	
978-1-84816-831-2	**US$98**	**£81**
978-1-84816-832-9(pbk)	**US$58**	**£48**

Proceedings

TITLE	EDITOR	PUB DATE	ISBN13	US$	£
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VARIOUS ASPECTS OF MULTIPLE ZETA FUNCTIONS - IN HONOR OF PROFESSOR KOHJI MATSUMOTO'S 60TH BIRTHDAY - PROCEEDINGS OF THE INTERNATIONAL CONFERENCE	MISHOU HIDEHIKO, NAKAMURA TAKASHI, SUZUKI MASATOSHI & UMEGAKI YUMIKO	14-Jul-20	9784864970884	69	60
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TITLE	AUTHOR	AUTHOR AFFILIATION	PUB. DATE	ISBN	PAGES	US$	£
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MODERN DIFFERENTIAL GEOMETRY FOR PHYSICISTS (2ND EDITION)	ISHAM CHRIS J	IMPERIAL COLLEGE, UK	23-Mar-99	9789810235628	304 pp	43	36
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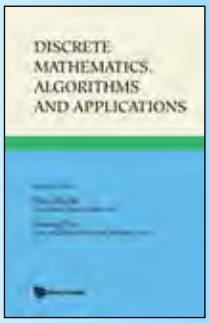
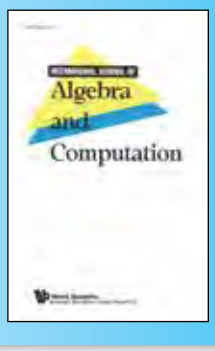
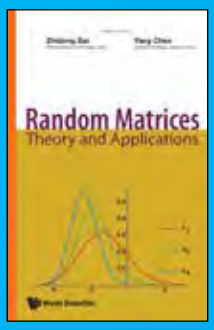
INTRODUCTION TO STOCHASTIC CALCULUS WITH APPLICATIONS (3RD EDITION)	KLEBANER FIMA C	MONASH UNIV, AUSTRALIA	22-Mar-12	9781848168329	452 pp	58	48

Algebra & Related Topics







Algebra Colloquium (AC)

IMPACT FACTOR 0.421

Print / Online ISSN: 1005-3867 / 0219-1733
https://www.worldscientific.com/ac

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

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Discrete Mathematics, Algorithms and Applications (DMAA)

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

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.

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International Journal of Algebra and Computation (IJAC)

IMPACT FACTOR 0.512

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

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

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International Journal of Number Theory (IJNT)

IMPACT FACTOR 0.606

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

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

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Journal of Algebra and Its Applications (JAA)

IMPACT FACTOR 0.61

Print / Online ISSN: 0219-4988 / 1793-6829
https://www.worldscientific.com/jaa

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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Random Matrices: Theory and Applications (RMTA)

IMPACT FACTOR 1.206

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

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

IMPACT FACTOR 0.556

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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Founding Editor
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International Journal of Wavelets, Multiresolution and Information Processing (IJWMIP)

IMPACT FACTOR 0.739

Print / Online ISSN: 0219-6913 / 1793-690X
http:s//www.worldscientific.com/ijwmip

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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Mathematical Models and Methods in Applied Sciences (M3AS)

IMPACT FACTOR 3.044

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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Franco Brezzi, *IMATI - CNR, Italy*

Open Systems & Information Dynamics (OSID)

IMPACT FACTOR 1.96

Print / Online ISSN: 1230-1612 / 1793-7191
https://www.worldscientific.com/osid

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

Editor-in-Chief
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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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Analysis and Applications (AA)

IMPACT FACTOR 1.141

Print / Online ISSN: 0219-5305 / 1793-6861
https://www.worldscientific.com/aa

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

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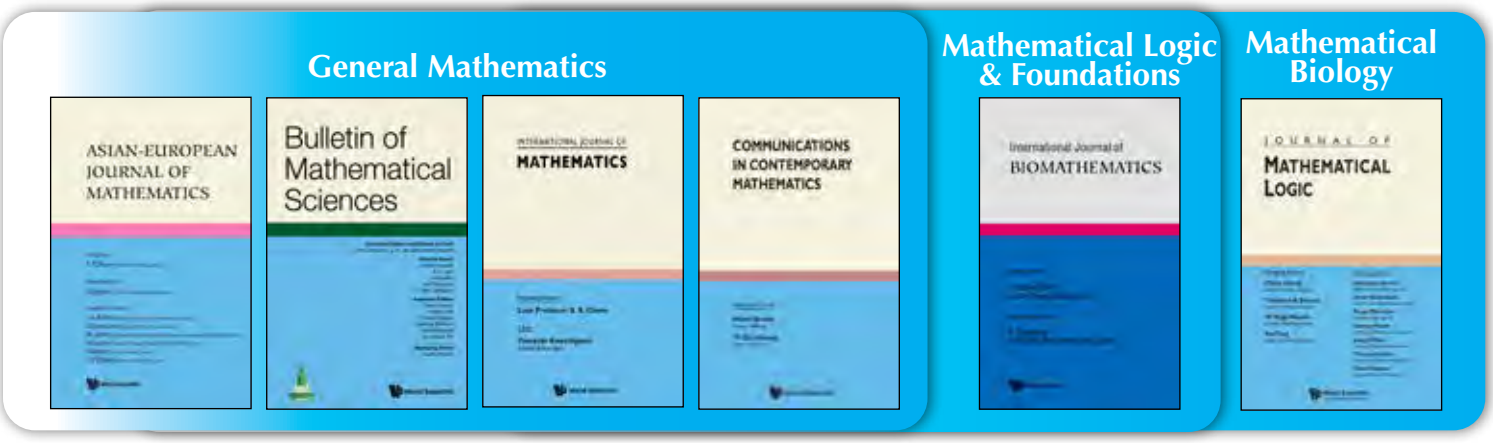

Asian-European Journal of Mathematics (AEJM)

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

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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Bulletin of Mathematical Sciences (BMS)

IMPACT FACTOR 2.241

Print / Online ISSN: 1664-3607 / 1664-3615
https://www.worldscientific.com/bms

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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International Journal of Mathematics (IJM)

IMPACT FACTOR 0.604

Print / Online ISSN: 0129-167X / 1793-6519
https://www.worldscientific.com/ijm

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
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Chair
Yasuyuki Kawahigashi, *University of Tokyo, Japan*

Communications in Contemporary Mathematics (CCM)

IMPACT FACTOR 1.278

Print / Online ISSN: 0219-1997 / 1793-6683
https://www.worldscientific.com/ccm

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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Yi-Zhi Huang, *Rutgers University, USA*

International Journal of Biomathematics (IJB)

IMPACT FACTOR 1.085

Print / Online ISSN: 1793-5245 / 1793-7159
https://www.worldscientific.com/ijb

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
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Journal of Mathematical Logic (JML)

IMPACT FACTOR 1.318

Print / Online ISSN: 0219-0613 / 1793-6691
https://www.worldscientific.com/jml

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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Geometry & Topology

Mathematical Physics

International Journal of Geometric Methods in Modern Physics (IJGMMP)

IMPACT FACTOR 1.287

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

This journal publishes short communications, research and review articles devoted to all applications of geometric methods (including commutative and non-commutative Differential Geometry, Riemannian Geometry, Finsler Geometry, Complex Geometry, Lie Groups and Lie Algebras, Bundle Theory, Homology an Cohomology, Algebraic Geometry, Global Analysis, Category Theory, Operator Algebra and Topology) in all fields of Mathematical and Theoretical Physics.

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Journal of Knot Theory and Its Ramifications (JKTR)

IMPACT FACTOR 0.426

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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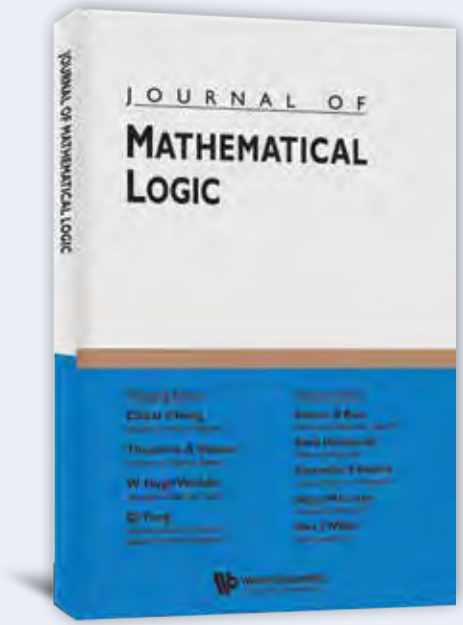

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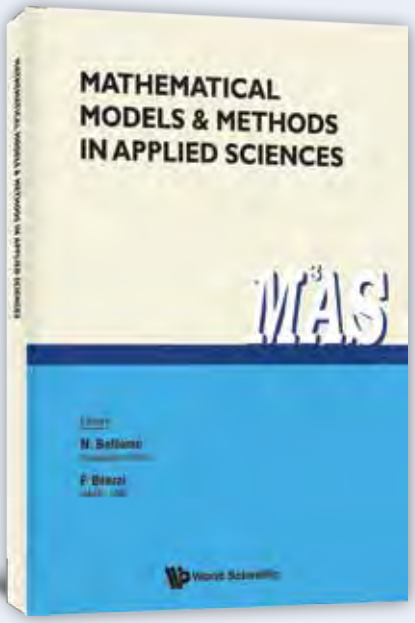

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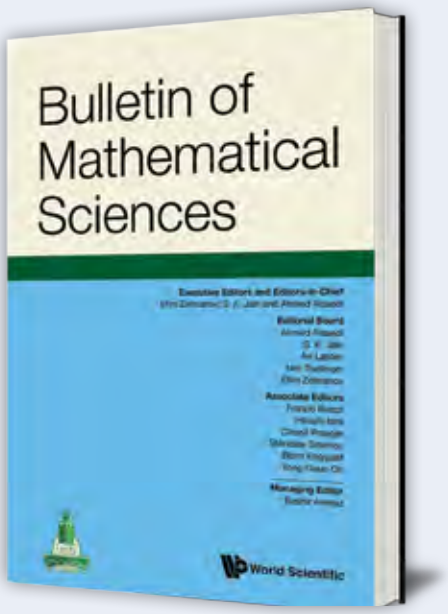

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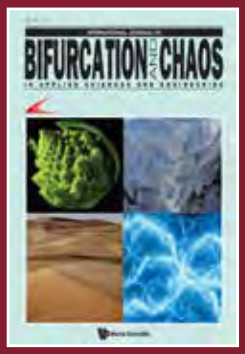

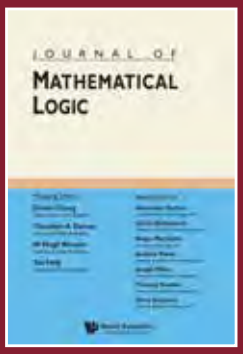

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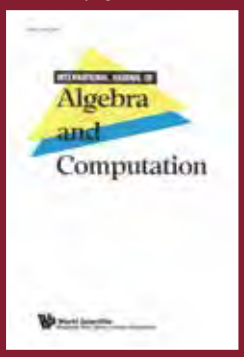

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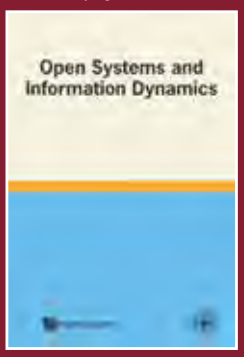

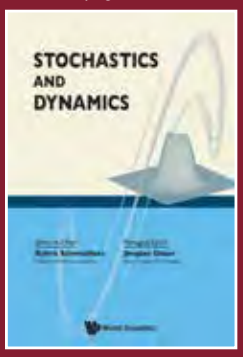

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