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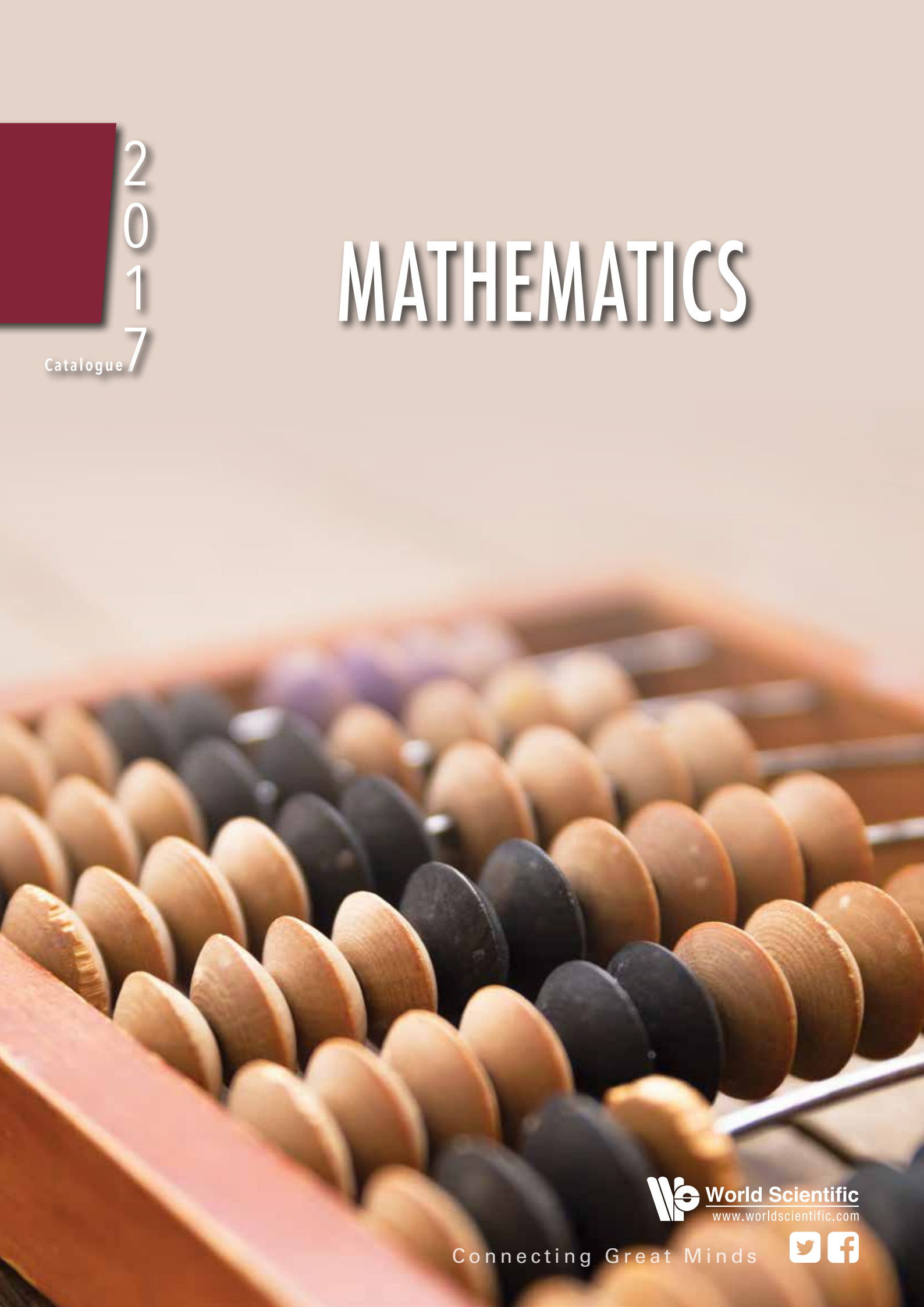

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Mathematics Catalogue 2017

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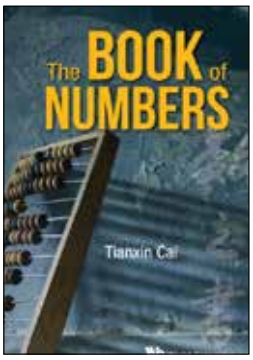

by **Tianxin Cai**
(Zhejiang University, China) **&**
translated by **Jiu Ding**
(University of Southern Mississippi, USA)

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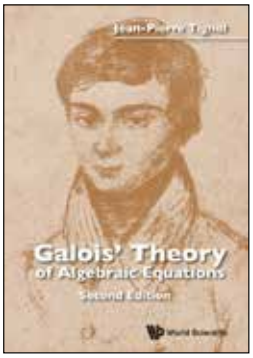

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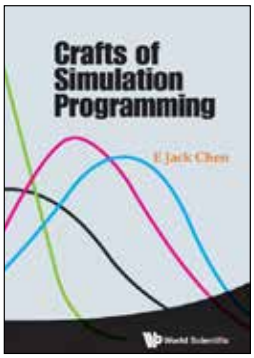

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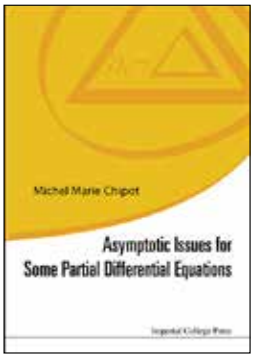

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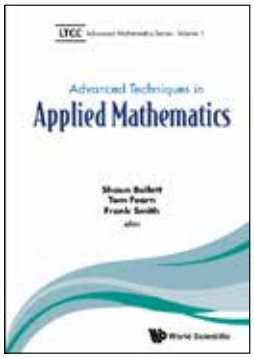

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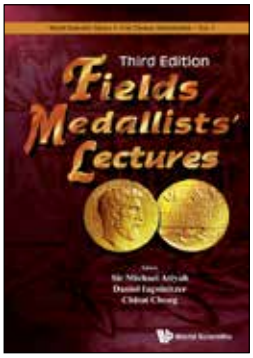

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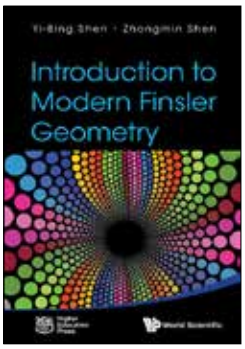

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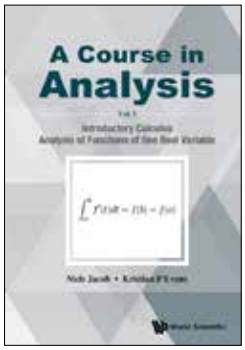

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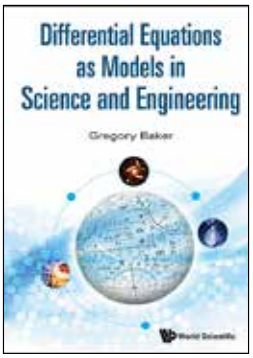

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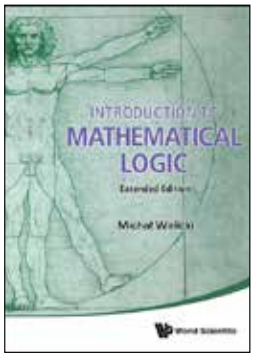

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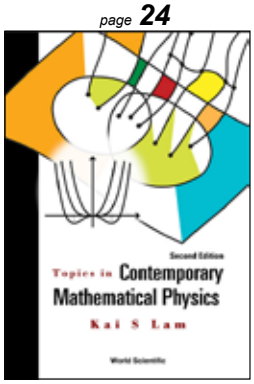

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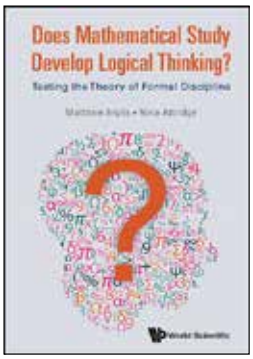

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Michael McCourt
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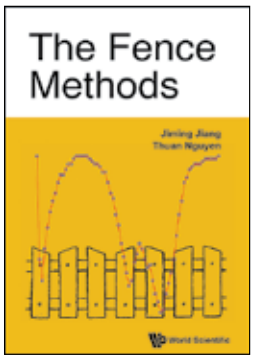

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Thuan Nguyen
(Oregon Health & Science University, USA)

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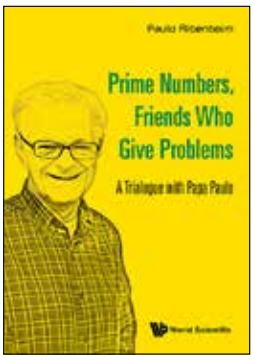

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Mathematics

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ALGEBRA & RELATED TOPICS

Crystal Bases

Representations and Combinatorics

by **Daniel Bump** *(Stanford)*, **Anne Schilling** *(UC Davis)*

This unique book provides the first introduction to crystal base theory from the combinatorial point of view. Crystal base theory was developed by Kashiwara and Lusztig from the perspective of quantum groups. Its power comes from the fact that it addresses many questions in representation theory and mathematical physics by combinatorial means. This book approaches the subject directly from combinatorics, building crystals through local axioms (based on the ideas by Stembridge) and virtual crystals.

Readership: Graduate students and researchers interested in understanding from a viewpoint of combinatorics on crystal base theory.

200pp	**Mar 2017**	
978-981-4733-43-4	**US$68**	**£45**
978-981-4733-44-1(pbk)	**US$38**	**£25**

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** *(Informatics Forum, Scotland)* & **Dmitri Piontlovski** *(National Research University, Russia)*

Key Features:

- The first book that describes Gröbner–Shirshov bases method for Lie algebra in full details
- The first book that covers all main results for classical decision problems for groups using Gröbner–Shirshov bases method and the modular machines
- The first book that covers connections of Gröbner–Shirshov bases method with homological algebra

Readership: Researchers in algebra and combinatorics.

450pp	**Feb 2017**	
978-981-4619-48-6	**US$162**	**£117**
978-981-4619-49-3(ebook)	**US$211**	**£152**

:: New Edition

Series on University Mathematics

Lectures on Lie Groups (2nd Edition)

by **Wu-Yi Hsiang** *(UC Berkeley & Hong Kong University of Science and Technology, Hong Kong)*

This volume consists of nine lectures on selected topics of Lie group theory. We provide the readers a concise introduction as well as a comprehensive "tour of revisiting" the remarkable achievements of S Lie, W Killing, É Cartan and H Weyl on structural and classification theory of semi-simple Lie groups, Lie algebras and their representations; and also the wonderful duet of Cartans' theory on Lie groups and symmetric spaces. With the benefit of retrospective hindsight, we develop the above theory via a route quite different from most other books.

Readership: Advanced undergraduate and graduate students, and researchers in group theory.

170pp	**Jan 2017**	
978-981-4740-70-8	**US$68**	**£45**
978-981-4740-71-5(pbk)	**US$38**	**£25**
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Series on Number Theory and Its Applications

An Introduction to Non-Abelian Class Field Theory

Automorphic Forms of Weight 1 and 2-Dimensional Galois Representations

by **Toyokazu Hiramatsu** *(Hosei University, Japan)*, **Seiken Saito** *(Waseda University, Japan)*

This monograph provides a brief exposition of automorphic forms of weight 1 and their applications to arithmetic, especially to Galois representations. One of the outstanding problems in arithmetic is a generalization of class field theory to non-abelian Galois extension of number fields. In this volume, we discuss some relations between this problem and cusp forms of weight 1.

Readership: Advanced undergraduate and graduate students, and researchers in number theory.

188pp	**Jan 2017**	
978-981-3142-26-8	**US$98**	**£71**
978-981-3142-27-5(ebook)	**US$127**	**£92**

A Graduate Course in Algebra (In 2 Volumes)

by **Ioannis Farmakis & Martin Moskowitz** *(City University of New York, USA)*

This comprehensive 2 volume book deals with algebra, broadly conceived. Volume 1 (Chapters 1 – 6) comprises what should be taught in a first year graduate course in algebra, offering the instructor a number of options in designing such a course. Moreover, Volume 1 provides an excellent basis for study for the qualifying exam in algebra in most American and European universities. Volume 2 (Chapters 7 – 13) forms the basis for a second year graduate course in topics in algebra. As the table of contents shows (see inside), here we have provided ample material to satisfy many diverse notions and ideas for the contents of such a course. To facilitate matters for the reader, there is a chart showing the interdependence of the chapters.

Readership: Graduate students and researchers in Algebra and related areas.

700pp	**Dec 2016**	
978-981-3142-60-2(Set)	**US$178**	**£128**
978-981-3142-61-9(Set)(pbk)	**US$98**	**£71**

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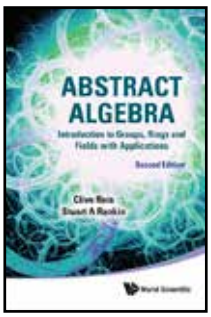
Abstract Algebra (2nd Edition)

Introduction to Groups, Rings and Fields with Applications

by **Clive Reis & Stuart A Rankin** *(University of Western Ontario, Canada)*



"What makes this book more than just a safe journey from square one to the usual results such as Lagrange's theorem and the Sylow theorems is the discussion of several applications, illustrating both the amazing power of these concepts and the diversity of fields where abstract algebra can prove helpful: Latin squares, Polya – Burnside enumeration and isometries in Euclidean space."

Times Higher Education

Readership: Undergraduates from approximately 2nd to 4th year. Familarity with linear algebra is required.

550pp	**Nov 2016**	
978-981-4730-53-2	**US$148**	**£98**
978-981-4730-54-9(pbk)	**US$68**	**£45**

The Book on Numbers

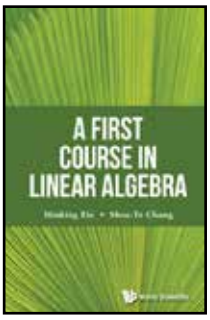
by **Tianxin Cai** *(Zhejiang University, China)*
translated by **Jiu Ding** *(University of Southern Mississippi, USA)*

Natural numbers are the oldest human inventions. This volume describes their nature, laws, history and current status. It is an entry level book on basic number theory, and also an academic monograph that contains wonderful questions and profound results. It contains many illustrations and tables. Originally published in Chinese, this book written for anyone who loves natural numbers. The author is a mathematician, and a literary and science writer with more than 20 books published, many of which were translated into 20 languages.

Readership: Researchers and students on number theory and general mathematics.

300pp	**Oct 2016**	
978-981-4759-43-4	**US$58**	**£48**
978-981-4759-44-1(ebook)	**US$75**	**£62**

A First Course in Linear Algebra



by **Minking Eie & Shou-Te Chang** *(National Chung Cheng University, Taiwan)*

This book prepares students with no background in Linear Algebra. Students, after mastering the materials in this textbook, can already understand any Linear Algebra used in more advanced books and research papers in Mathematics or in other scientific disciplines. It uses straightforward and simple English and is especially useful for students who are not native speakers of English. The amount of exercises provide a rigorous coverage of the subject compared to most of the textbooks in the market. It is theoretically oriented while it also includes applications to show the power of Linear Algebra.

Readership: Undergraduates who are interested in learning linear algebra and its applications.

384pp	**Sep 2016**	
978-981-3143-10-4	**US$88**	**£63**
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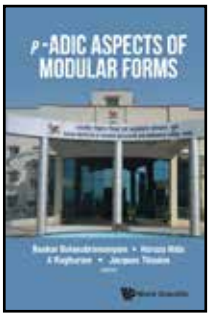

edited by **Haruzo Hida** *(UCLA)*, **Jacques Tilouine** *(Universite Paris 13, France)*, **A Raghuram & Baskar Balasubramanyam** *(IISER Pune, India)*

This book aims to give a systematic exposition of results in important cases where p-adic families and p-adic L-functions are studied. The articles are written by some of the foremost experts and contains cutting-edge material for professional researchers. We first look at p-adic families in the following: general linear groups, symplectic groups and definite unitary groups. We also look at applications of this theory to modularity lifting problems. We finally consider p-adic L-functions for GL(2), p-adic adjoint L-functions and some cases of higher GL(n).

Readership: Researchers in algebra and number theory.

340pp	**Aug 2016**	
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Contemporary Developments in Finite Fields and Applications

edited by **Anne Canteaut** *(INRIA, France)*, **Gove Effinger** *(Skidmore College, USA)*, **Sophie Huczynska** *(University of St Andrews, UK)*, **Daniel Panario** *(Carleton University, Canada)* & **Leo Storme** *(Ghent University, Belgium)*

Finite fields are central to modern cryptography and secure digital communication. Hence, it must evolve rapidly to keep pace with new technologies. Contributors will include: Antoine Joux (Fondation Partenariale de l'UPMC, France), Gary Mullen (Penn State University, USA), Gohar Kyureghyan (Otto-von-Guericke Universität, Germany), Gary McGuire (University College Dublin, Ireland), Michel Lavrauw (Università degli Studi di Padova, Italy), Kirsten Eisentraeger (Penn State University, USA), Renate Scheidler (University of Calgary, Canada) and Michael Zieve (University of Michigan, USA).

Readership: Researchers in combinatorics, graph theory, numerical analysis, computational mathematics, and coding theory.

372pp	**Aug 2016**	
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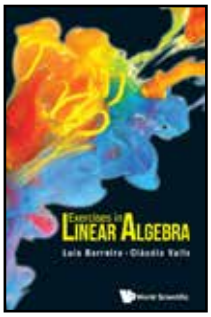
Exercises in Linear Algebra



by **Luis Barreira & Claudia Valls** *(Universidade de Lisboa, Portugal)*

This is a book of exercises in Linear Algebra. Through a systematic detailed discussion of 200 solved exercises, important concepts and topics are reviewed. The student is led to make a systematic review of topics from the basics to more advanced material, with emphasis on points that often cause the greatest difficulties. The solved exercises are followed by an additional 200 proposed exercises (with answers), thus guiding the student to a systematic consolidation of all topics. The variety of exercises allows the adjustment to different levels in each topic. The contents follow closely the majority of the introductory courses of Linear Algebra, for example in degrees of Engineering, Physics, Economics and Mathematics.

Readership: Undergraduates studying linear algebra.

232pp	**Jul 2016**	
978-981-3143-03-6	**US$78**	**£56**
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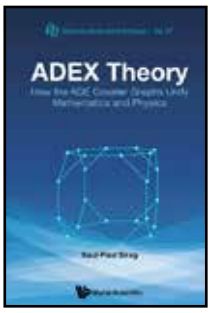
Series on Knots and Everything - Vol 57

ADEX Theory



How the ADE Coxeter Graphs Unify Mathematics and Physics

by **Saul-Paul Sirag**

This book shows how the ADE Coxeter graphs unify at least 20 different types of mathematical structures. These mathematical structures are of great utility in unified field theory, string theory, and other areas of physics.

Readership: Researchers.

276pp	**Apr 2016**	
978-981-4656-49-8	**US$114**	**£82**
978-981-4656-50-4(ebook)	**US$148**	**£107**

Fundamentals of Modern Algebra

A Global Perspective

by **Robert G Underwood** *(Auburn University at Montgomery, USA)*

The purpose of this book is to provide a concise yet detailed account of fundamental concepts in modern algebra. It covers a broad range of topics in modern algebra and includes chapters on groups, rings, modules, algebraic extension fields, and finite fields. Each chapter begins with an overview which provides a road map for the reader showing what material will be covered. At the end of each chapter we collect exercises which review and reinforce the material in the corresponding sections. These exercises range from straightforward applications of the material to problems designed to challenge the reader. We also include a list of "Questions for Further Study" which pose problems suitable for master's degree research projects.

Readership: Graduate students in algebra.

232pp	**Feb 2016**	
978-981-4730-28-0	**US$95**	**£63**
978-981-4730-29-7(pbk)	**US$48**	**£35**

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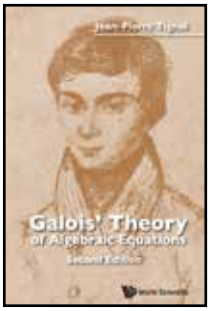
Galois' Theory of Algebraic Equations (2nd Edition)

by **Jean-Pierre Tignol** *(Université Catholique de Louvain, Belgium)*



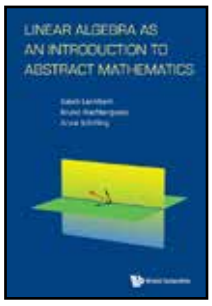
"Generally speaking, mathematics teaching nowadays has a problem with history ... Tignol finds just the right balance between the extremes of a historical exposition and philological reconstruction. Tignol lets both the triumphs and limitations of the past illuminate our modern understanding."

CHOICE

Readership: Upper level undergraduates, graduate students and mathematicians in algebra.

324pp	**Feb 2016**	
978-981-4704-69-4	**US$78**	**£51**

Linear Algebra as an Introduction to Abstract Mathematics



by **Isaiah Lankham** *(California State University, USA)*, **Bruno Nachtergaele & Anne Schilling** *(UC Davis)*

This is an introductory textbook with an emphasis on abstraction and in particular, the concept of proofs in the setting of linear algebra. Typically such a student would have taken calculus, though the only prerequisite is suitable mathematical grounding. The purpose of this book is to bridge the gap between the more conceptual and computational oriented undergraduate classes to the more abstract oriented classes. The book begins with systems of linear equations and complex numbers, then relates these to the abstract notion of linear maps on finite-dimensional vector spaces, and covers diagonalization, eigenspaces, determinants, and the Spectral Theorem. Each chapter concludes with both proof-writing and computational exercises.

Readership: Undergraduates in mathematics.

208pp	**Feb 2016**	
978-981-4730-35-8	**US$70**	**£46**
978-981-4723-77-0(pbk)	**US$36**	**£24**

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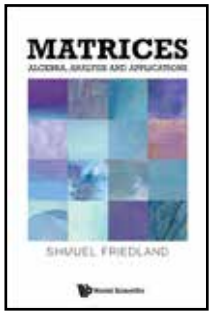


Algebra, Analysis and Applications

by **Shmuel Friedland** *(University of Illinois at Chicago, USA)*

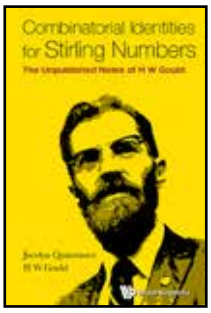
"People who do, or who plan to do, research in the topics in linear algebra that are covered here, will undoubtedly find this to be a very valuable book."

Mathematical Association of America

Readership: Graduate students, researchers in mathematics, applied mathematics, statistics, computer science, bioinformatics, engineering, and physics.

596pp	**Dec 2015**	
978-981-4667-96-8	**US$148**	**£98**
978-981-3141-03-2(pbk)	**US$69**	**£46**
978-981-4667-97-5(ebook)	**US$192**	**£127**

Combinatorial Identities for Stirling Numbers



The Unpublished Notes of H W Gould

by **Jocelyn Quaintance** *(University of Pennsylvania, USA)*, **H W Gould** *(West Virginia University, USA)*

"This book is a unique work that could appeal to a wide audience: from graduate students to specialists in enumerative combinatorics, to enthusiasts of Gould's work."

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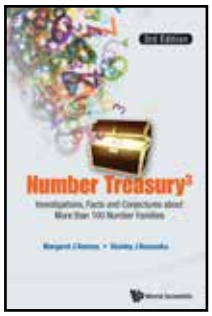
This book is a unique work which provides an in-depth exploration into the mathematical expertise, philosophy, and knowledge of H W Gould. It is written in a style that is accessible to the reader with basic mathematical knowledge, and yet contains material that will be of interest to the specialist in enumerative combinatorics.

Readership: Undergraduates, graduates and researchers interested in combinatorial and algebraic techniques.

276pp	**Dec 2015**	
978-981-4725-26-2	**US$90**	**£65**
978-981-4725-28-6(ebook)	**US$117**	**£85**

:: New Edition

Number Treasury^3 (3rd Edition)



Investigations, Facts and Conjectures about More than 100 Number Families

by **Margaret J Kenney & Stanley J Bezuszka** *(Boston College, USA)*

"It is indeed an extremely rare occasion when a book can be used as a reference through such a broad level of math classes. This one is an existence proof."

Mathematical Association of America

Readership: Secondary and intermediate classroom teacher and tertiary mathematics education instructor; undergraduates whose interest is in teaching mathematics at the pre-tertiary level and the segment of the general public for whom mathematics might be a hobby.

324pp	**Aug 2015**	
978-981-4603-68-3	**US$75**	**£50**
978-981-4603-69-0(pbk)	**US$38**	**£25**
978-981-4603-70-6(ebook)	**US$98**	**£65**

A Non-Hausdorff Completion

The Abelian Category of C-complete Left Modules over a Topological Ring

by **Saul Lubkin** *(University of Rochester, USA)*

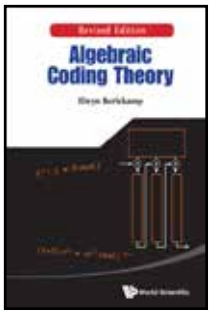
This book introduces entirely new invariants never considered before, in homological algebra and commutative (and even non-commutative) algebra. The new invariants and tools in this book are expected to be used in the study of p-adic cohomology in algebraic geometry; and also in the study of p-adic Banach spaces — by replacing the cumbersome "complete tensor product" of p-adic Banach spaces, with the more sophisticated "C-complete tensor product", discussed in this book. It is also not unlikely that the further study of these new invariants may well develop into a new branch of abstract mathematics — connected with commutative algebra, homological algebra, and algebraic topology.

Readership: Graduate students and researchers in algebra and number theory, geometry and topology.

352pp	**Jul 2015**	
978-981-4667-38-8	**US$88**	**£58**

Algebraic Coding Theory (Revised Edition)

by **Elwyn R Berlekamp** *(UC Berkeley)*



"Practicing engineers, lecturers and scholars will find this book of great value."

Zentralblatt MATH

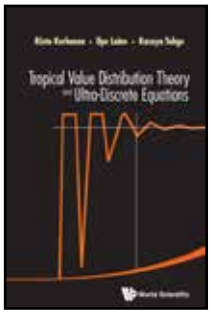
This is the revised edition of a classic monograph and reference book on Coding Theory and Cryptography written by a revered scholar long known for his work in coding theory. It introduces several algorithms which have subsequently dominated engineering practice in this field. Selected chapters of the book became a standard graduate textbook.

Readership: Researchers in coding theory, cryptography, algebra, number theory, and software engineering.

500pp	**May 2015**	
978-981-4635-89-9	**US$118**	**£85**
978-981-4635-90-5(ebook)	**US$153**	**£111**

Tropical Value Distribution Theory and Ultra-Discrete Equations

by **Risto Korhonen, Ilpo Laine** *(University of Eastern Finland, Finland)* & **Kazuya Tohge** *(Kanazawa University, Japan)*



This is the first textbook-type presentation of tropical value distribution theory. It provides a detailed introduction of the tropical version of the Nevanlinna theory, describing growth and value distribution analysis of continuous, piecewise linear functions on the real axis. The book also includes applications of this theory to ultra-discrete equations. Three appendices are given to compare the contents of the theory with the classical counterparts in complex analysis.

Readership: Graduate students, post-graduates and researchers.

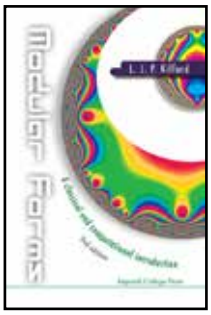
280pp	**May 2015**	
978-981-4632-79-9	**US$114**	**£82**
978-981-4632-80-5(ebook)	**US$148**	**£107**

:: New Edition

Modular Forms (2nd Edition)

A Classical and Computational Introduction

by **L J P Kilford** *(University of Bristol, UK)*



"This fascinating, contemporaneous, and even now unfolding story of current research in a historically brilliant part of mathematics is told with riveting attention to detail ... Almost all aspects one could wish for in the area of holomorphic modular forms are covered, as well as some selected topics about meromorphic modular functions."

The Mathematical Intelligencer

Readership: Graduate students studying or taking a course in modular forms.

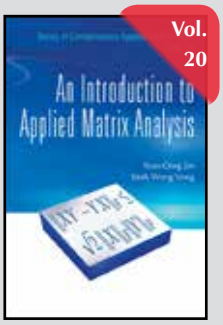
252pp	**Apr 2015**	
978-1-78326-545-9	**US$78**	**£51**

Series in Contemporary Applied Mathematics

http://www.worldscientific.com/series/CAM-BS

An Introduction to Applied Matrix Analysis

by **Xiao Qing Jin & Seak-Weng Vong** *(University of Macau, China)*



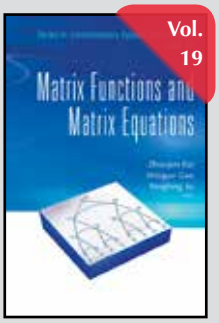
It is well known that most problems in science and engineering eventually progress into matrix problems. This book gives an elementary introduction to applied matrix theory and it also includes some new results obtained in recent years. The material is accessible to students who, in various disciplines, have basic linear algebra, calculus, numerical analysis, and computing knowledge. The book is also useful to researchers in computational science who are interested in applied matrix theory.

Readership: Undergraduate students in linear and multilinear algebra/matrix theory, and numerical analysis.

144pp	**Sep 2016**	
978-981-4749-46-6	**US$48**	**£32**

Matrix Functions and Matrix Equations

edited by **Zhaojun Bai** *(UC Davis)*, **Weiguo Gao & Yangfeng Su** *(Fudan University, China)*



Matrix functions and matrix equations are widely used in science, engineering and social sciences due to the succinct and insightful way in which they allow problems to be formulated and solutions to be expressed. It is also well-suited for self-study. The broad content makes it convenient as a general reference to the subjects. The authors of the chapters are leading experts who are also well-known for their expository skills

Readership: Researchers, advanced undergraduate and graduate students in numerical and computational mathematics.

148pp	**Nov 2015**	
978-981-4675-76-5	**US$90**	**£65**
978-981-4675-77-2(ebook)	**US$117**	**£85**

Notable Backlist

The Golden Ratio and Fibonacci Numbers
Richard A Dunlap *(Dalhousie University, Canada)*

Principles and Techniques in Combinatorics
Chen Chuan-Chong & Koh Khee-Meng *(NUS, Singapore)*

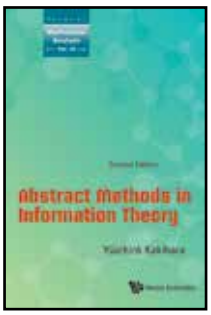
COMPUTER MATHEMATICS & SCIENCE

:: New Edition

Series on Multivariate Analysis - Vol 10

Abstract Methods in Information Theory (2nd Edition)

by **Yûichirô Kakihara** *(California State University, San Bernardino, USA)*



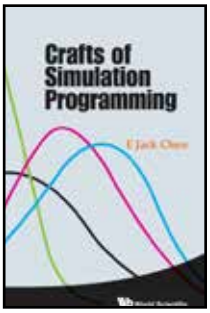
This book presents information channels in the environment of functional analysis and operator theory as well as probability theory. Ergodic, mixing, and AMS channels are also considered in detail with some illustrations. In this edition, channel operators are studied in many aspects, which generalize ordinary channels. Also Gaussian channels are considered in detail together with Gaussian measures on a Hilbert space. The Special Topics chapter deals with features such as generalized capacity, channels with an intermediate noncommutative system, and von Neumann algebra method for channels. Finally, quantum (noncommutative) information channels are examined, which may be regarded as an introduction to quantum information theory.

Readership: Graduate students and researchers from Mathematics and Communication Engineering.

392pp	**Aug 2016**	
978-981-4759-23-6	**US$130**	**£94**
978-981-4759-24-3(ebook)	**US$169**	**£122**

Crafts of Simulation Programming

by **E Jack Chen** *(BASF Corporation, USA)*



This book is a collection of tools, techniques and theories required to develop and implement simulation models on a computer. This timely book provides the various skills and techniques needed in simulation programming with general-purpose languages. The topics range in difficulty, and several latest fields in simulation output analysis are covered such as samples sizes, order statistics, ranking and selection, comparison with a control, selection with constraints, etc.

Readership: Undergraduate, graduate students, researchers and practitioners.

304pp	**May 2016**	
978-981-4740-17-3	**US$130**	**£94**
978-981-4740-18-0(ebook)	**US$169**	**£122**

Notable Backlist

Data Analysis for Network Cyber-Security
Niall Adams & Nicholas Heard *(Imperial College London, UK & University of Bristol, UK)*

Examples in Markov Decision Processes
A B Piunovskiy *(The University of Liverpool, UK)*

Computer Algebra with SymbolicC++
Yorick Hardy *(University of Johannesburg, South Africa)*, Kiat Shi Tan *(Ilog Co., Ltd., Singapore)*, Willi-Hans Steeb *(University of Johannesburg, South Africa)*

Computability in Context: Computation and Logic in the Real World
S Barry Cooper *(University of Leeds, UK)*, Andrea Sorbi *(Universita degli Studi di Siena, Italy)*

Concentration Compactness: Functional-Analytic Grounds and Applications
Kyril Tintarev & Karl-Heinz Fieseler *(Uppsala University, Sweden)*

DIFFERENTIAL & INTEGRAL EQUATIONS

Local and Global Aspects of Quasilinear Degenerate Elliptic Equations

Quasilinear Elliptic Singular Problems

by **Laurent Véron** *(Université François Rabelais, France)*

This book is devoted to the study of elliptic second-order degenerate quasilinear equations, the model of which is the p-Laplacian, with or without dominent lower order reaction term. A series of open problems at the end of each chapter is available. Contents include Regularity; Separable Solutions; Quasilinear Equations with Absorption; Potential Theory and Quasilinear Equations with Absorption; Quasilinear Equations with Source.

Readership: Graduate students and researchers interested in singularities of elliptic nonlinear equations.

300pp	**Aug 2017**	
978-981-4730-32-7	**US$114**	**£82**
978-981-4730-33-4(ebook)	**US$148**	**£107**

Poincaré Inequality and its Applications to PDE

An Advanced Textbook

by **Alexander I Nazarov** *(St. Petersburg Department of Steklov Institute, Russia & St. Petersburg State University, Russia)*, **Sergey V Poborchi** *(St. Petersburg State University, Russia)*

This book presents an introduction to the theory of Sobolev spaces that is a fundamental tool in the modern study of partial differential equations. The authors' approach is based on the Poincaré inequality and demonstrates its importance in function theory and in the theory of PDEs. A number of exercises complement the main text and most are furnished with hints

Readership: Undergraduate and postgraduate students specializing in function theory and the theory of PDE.

170pp	**Feb 2017**	
978-981-4725-87-3	**US$75**	**£50**
978-981-4725-88-0(pbk)	**US$38**	**£25**

An Introduction to the Theory of Wave Maps and Related Geometric Problems

by **Dan-Andrei Geba** *(University of Rochester, USA)*, **Manoussos G Grillakis** *(University of Maryland, College Park, USA)*

The wave maps system is one of the most beautiful and challenging nonlinear hyperbolic systems, which has captured the attention of mathematicians for more than thirty years now. In the study of its various issues, such as the well-posedness theory, the formation of singularities, and the stability of the solitons, in order to obtain optimal results, one has to use intricate tools coming not only from analysis, but also from geometry and topology. Moreover, the wave maps system is nothing other than the Euler – Lagrange system for the nonlinear sigma model, which is one of the fundamental problems in classical field theory. This book aims to give an up-to-date and almost self-contained overview of the main regularity results proved for wave maps. It also aims to introduce, to a wide mathematical audience, physically motivated generalizations of the wave maps system (e.g., the Skyrme model), which are extremely interesting and difficult in their own right.

Readership: Advanced graduate students in mathematics, mathematicians and theoretical physicists.

380pp	**Dec 2016**	
978-981-4713-90-0	**US$68**	**£45**

Special Functions in Fractional Calculus and Related Fractional Differintegral Equations

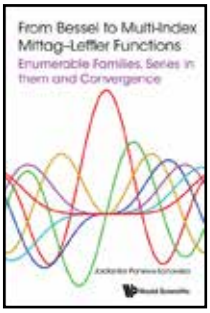
by **Hari M Srivastava** *(University of Victoria, Canada)*, **R K Raina** *(M P University of Agriculture and Technology, India)* & **Xiao-Jun Yang** *(China University of Mining and Technology, China)*

The subject of fractional calculus has gained considerable popularity and importance during the past four decades, due mainly to its demonstrated applications in numerous seemingly diverse and widespread fields of science and engineering. This is the first book coordinating applied mathematics and physical sciences in a useful mannerand would serve a dual purpose: in providing key formulas and identities involving special functions and also in opening up some novel avenues of applications of fractional calculus.

Readership: Researchers in mathematical sciences.

300pp	**Dec 2016**	
978-981-4551-10-6	**US$118**	**£85**
978-981-4551-11-3(ebook)	**US$153**	**£111**

From Bessel to Multi-Index Mittag – Leffler Functions



Enumerable Families, Series in them and Convergence

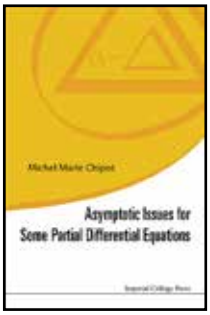
by **Jordanka Paneva-Konovska** *(Technical University of Sofia, Bulgaria)*

Bessel and Mittag – Leffler functions are prominent within mathematical and scientific fields due to increasing interest in non-conventional models within applied mathematics. Since the analytical solutions of many differential and integral equations of arbitrary order can be written as series of special functions of fractional calculus, they are now unavoidable tools for handling various mathematical models of integer or fractional order. This book analyses these through the study of enumerable families of different classes of special functions.

Readership: Pure and applied mathematicians, applied scientists in other natural sciences and engineering.

190pp	**Oct 2016**	
978-1-78634-088-7	**US$102**	**£73**
978-1-78634-089-4(ebook)	**US$133**	**£95**

Asymptotic Issues for Some Partial Differential Equations



by **Michel Marie Chipot** *(University of Zurich, Switzerland)*

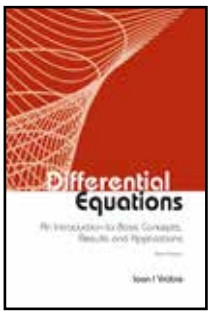
Much progress has been made in recent years on the issue of asymptotic behavior of problems set in cylinders. This book goes one step further by presenting the latest accomplishments on asymptotic behavior in domains which become unbounded. It also investigates new issues which have emerged including existence and uniqueness of solution in unbounded domains, anisotropic singular perturbations, periodic behavior forced by periodic data. These new advances are treated with original techniques developed to investigate the asymptotic behavior of various problems.

Readership: Graduate students and researchers in applied mathematics and engineering.

250pp	**Aug 2016**	
978-1-78326-891-7	**US$82**	**£59**
978-1-78326-892-4(ebook)	**US$107**	**£77**

:: New Edition

Differential Equations (3rd Edition)



An Introduction to Basic Concepts, Results and Applications

by **Ioan I Vrabie** *("Al I Cuza" University of Iasi & "O Mayer" Mathematics Institute of the Romanian Academy, Romania)*

"...one of the basic books in the field of differential equations, which certainly, will be used by students and specialists in this field. The book is an excellent compound of abstract results and concrete examples, which should prove to be a very popular textbook."

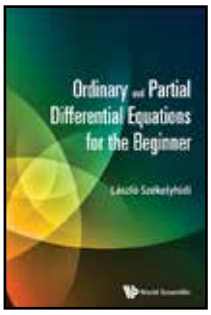
Zentralblatt MATH

This edition adds two new topics: Delay differential equations and differential equations subjected to nonlocal initial conditions. The bibliography has also been updated and expanded.

Readership: Graduate or undergraduate students dealing with analysis and differential equations, Volterra equations, calculus of variations and mathematical modeling.

528pp	**Aug 2016**	
978-981-4749-78-7	**US$98**	**£65**
978-981-4759-20-5(pbk)	**US$45**	**£30**

Ordinary and Partial Differential Equations for the Beginner



by **László Székelyhidi** *(University of Debrecen, Hungary)*

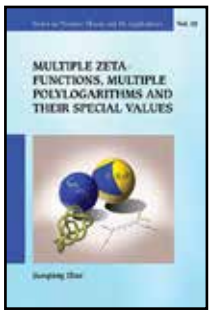
This textbook contains the basic material starting from elementary solution methods for ordinary differential equations to advanced methods for first order partial differential equations. In addition to the theoretical background, solution methods are strongly emphasized. Each section is completed with problems and exercises, and the solutions are also provided.

Readership: College, undergraduate and graduate students interested in ordinary and partial differential equations.

252pp	**Jul 2016**	
978-981-4723-98-5	**US$85**	**£56**
978-981-4723-99-2(pbk)	**US$45**	**£30**

Series on Number Theory and Its Applications - Vol 12

Multiple Zeta Functions, Multiple Polylogarithms and Their Special Values



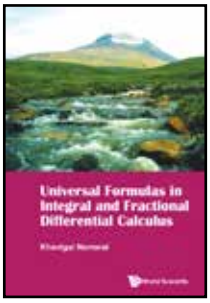
by **Jianqiang Zhao** *(Georgia Southern University, USA)*

This is the first introductory book on multiple zeta functions and multiple polylogarithms which are the generalizations of the Riemann zeta function and the classical polylogarithms, respectively, to the multiple variable setting. It contains all basic concepts and important properties of these functions and their special values. Many exercises contain supplementary materials which deepens the reader's understanding of the text.

Readership: Advanced undergraduates and graduate students in mathematics, mathematicians interested in multiple zeta values.

620pp	**May 2016**	
978-981-4689-39-7	**US$162**	**£117**
978-981-4689-40-3(ebook)	**US$211**	**£152**

Universal Formulas in Integral and Fractional Differential Calculus



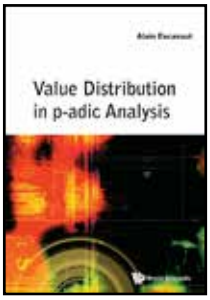
by **Khavtgai Namsrai** *(Mongolian Academy of Sciences, Mongolia)*

This reference book presents unique and traditional analytic calculations, and features more than a hundred universal formulas where one can calculate by hand enormous numbers of definite integrals, fractional derivatives and inverse operators. Despite the great success of numerical calculations due to computer technology, analytical calculations still play a vital role in the study of new, as yet unexplored, areas of mathematics, physics and other branches of sciences.

Readership: Undergraduate and graduate students interested in analytic calculations in integral calculus. Researchers from the fields of modern mathematical analysis, theoretical physics and engineering. Non-experts interested in integrals, fractional derivatives and inverse operators.

296pp	**Feb 2016**	
978-981-4675-59-8	**US$114**	**£82**
978-981-4675-60-4(ebook)	**US$148**	**£107**

Value Distribution in p-adic Analysis



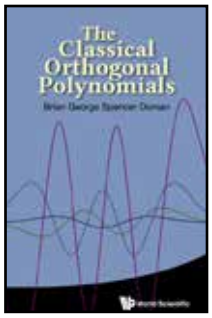
by **Alain Escassut** *(Université Blaise Pascal, France)*

The book first explains the main properties of analytic functions in order to use them in the study of various problems in p-adic value distribution. Certain properties of p-adic transcendental numbers are examined such as order and type of transcendence, with problems on p-adic exponentials. Lazard's problem for analytic functions inside a disk, p-adic meromorphics, sets of range uniqueness in a p-adic field, and the ultrametric Corona problem are studied. Injective analytic elements are characterized. The p-adic Nevanlinna theory is described and many applications are given: p-adic Hayman conjecture, Picard's values for derivatives, small functions, branched values, growth of entire functions, problems of uniqueness, URSCM and URSIM, functions of uniqueness, sharing value problems, Nevanlinna theory in characteristic p>0, p-adic Yosida's equation.

Readership: Graduate students and researchers interested in p-adic analysis.

560pp	**Jan 2016**	
978-981-4730-10-5	**US$190**	**£137**
978-981-4730-11-2(ebook)	**US$247**	**£178**

The Classical Orthogonal Polynomials



by **Brian George Spencer Doman** *(University of Liverpool, UK)*

"This book is well written and it is relatively easy to read. I recommend it to anyone who is interested not only in orthogonal polynomials theory, but also in its physical applications. The book can be also successfully used by instructors of undergraduate courses."

Pure and Applied Geophysics

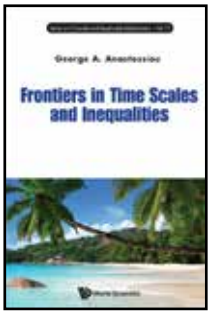
Readership: Undergraduate and graduate students.

176pp	**Nov 2015**	
978-981-4704-03-8	**US$90**	**£65**
978-981-4704-04-5(ebook)	**US$117**	**£85**

Series on Concrete and Applicable Mathematics - Vol 17

Frontiers in Time Scales and Inequalities

by **George A Anastassiou** *(University of Memphis, USA)*



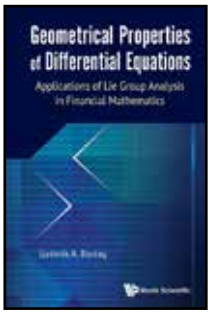
This monograph presents new research on time scales and related inequalities. The results are expected to find applications in many areas of pure and applied mathematics, especially in difference equations and fractional differential equations. The chapters are self-contained and can be read independently, and advanced courses can be taught out of it.

Readership: Advanced graduate students and researchers interested in time scales, inequalities and difference/differential equations.

288pp	**Oct 2015**	
978-981-4704-43-4	**US$106**	**£76**
978-981-4704-44-1(ebook)	**US$138**	**£99**

Geometrical Properties of Differential Equations

Applications of the Lie Group Analysis in Financial Mathematics



by **Ljudmila A Bordag** *(University of Applied Sciences Zittau/Görlitz, Germany)*

This textbook is a short comprehensive and intuitive introduction to Lie group analysis of ordinary and partial differential equations. This practical-oriented material contains a large number of examples and problems accompanied by detailed solutions and figures. It can be used as a textbook for regular or compact lecture courses or as a book for a convenient self-study.

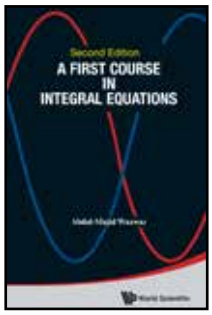
Readership: Advanced undergraduate students and graduate students in financial mathematics, mathematical economics or applied mathematics.

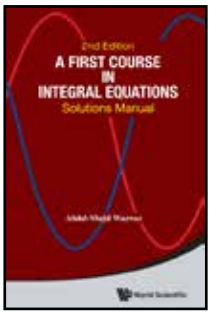
340pp	**Jul 2015**	
978-981-4667-24-1	**US$78**	**£51**

:: New Edition

A First Course in Integral Equations (2nd Edition)

by **Abdul-Majid Wazwaz** *(Saint Xavier University, USA)*





This edition integrates newly developed methods with classical techniques to give both modern and powerful approaches for solving integral equations. Numerous well-explained applications, examples, and practical exercises are presented to guide readers. Selected applications from various disciplines are investigated by using the newly developed methods.

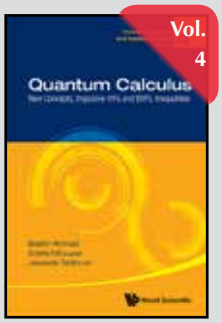
Readership: Advanced undergraduates, graduate students, and researchers in mathematics, science and engineering.

328pp	**Jul 2015**	
978-981-4675-11-6	**US$88**	**£58**
978-981-4675-12-3(pbk)	**US$48**	**£32**
Solutions Manual		
184pp	**Jul 2015**	
978-981-4675-15-4(pbk)	**US$38**	**£25**

Trends in Abstract and Applied Analysis

http://www.worldscientific.com/series/TAAA

Quantum Calculus



New Concepts, Impulsive IVPs and BVPs, Inequalities

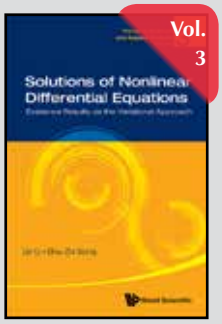
by **Bashir Ahmad** *(King Abdulaziz University, Saudi Arabia)*, **Sotiris Ntouyas** *(University of Ioannina, Greece)* & **Jessada Tariboon** *(King Mongkut's University of Technology, Thailand)*

This is the first book dealing with quantum calculus on finite intervals. The material is new and will attract many researchers working on this topic. It contains enough material as a guideline for further work on the topic. In particular, it has a special attraction for the researchers who focus on impulsive and fractional differential equations to exploit the ideas presented in this book to enhance their work in the context of quantum calculus

Readership: Mathematics and physics researchers.

290pp	**Aug 2016**	
978-981-3141-52-0	**US$95**	**£68**
978-981-3141-53-7(ebook)	**US$124**	**£88**

Solutions of Nonlinear Differential Equations



Existence Results via the Variational Approach

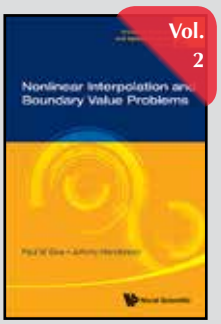
by **Lin Li & Shu-Zhi Song** *(Chongqing Technology and Business University, China)*

Variational methods are very powerful techniques in nonlinear analysis and are extensively used in many disciplines of pure and applied mathematics (including ordinary and partial differential equations, mathematical physics, gauge theory, and geometrical analysis). In our first chapter, we gather the basic notions and fundamental theorems that will be applied throughout the chapters. Subsequent chapters deal with how variational methods can be used in fourth-order problems, Kirchhoff problems, nonlinear field problems, gradient systems, and variable exponent problems. A very extensive bibliography is also included.

Readership: Graduate students and researchers interested in variational methods.

364pp	**Jun 2016**	
978-981-3108-60-8	**US$132**	**£95**
978-981-3108-61-5(ebook)	**US$172**	**£124**

Nonlinear Interpolation and Boundary Value Problems



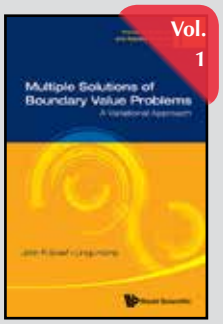
by **Paul W Eloe** *(University of Dayton, USA)*, **Johnny Henderson** *(Baylor University, USA)*

This book is the only comprehensive treatment of boundary value problems for nonlinear ordinary differential equations and nonlinear interpolation. The purpose of this book is two-fold. First, the results that have been generated in the past 50 years are collected for the first time to produce a comprehensive and coherent treatment of what is now a well-defined area of study in the qualitative theory of ordinary differential equations. Second, methods and technical tools are sufficiently exposed so that the interested reader can contribute to the study of nonlinear interpolation.

Readership: Graduate students and researchers interested in boundary value problems for nonlinear ordinary differential equations.

248pp	**Feb 2016**	
978-981-4733-47-2	**US$106**	**£76**
978-981-4733-48-9(ebook)	**US$138**	**£99**

Multiple Solutions of Boundary Value Problems



A Variational Approach

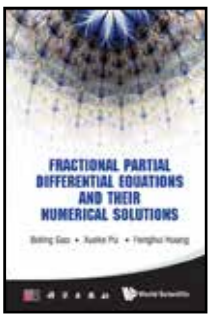
by **John R Graef & Lingju Kong** *(The University of Tennessee at Chattanooga, USA)*

Variational methods and their generalizations have been verified to be useful tools in proving the existence of solutions to a variety of boundary value problems for ordinary, impulsive, and partial differential equations as well as for difference equations. In this monograph, we look at how variational methods can be used in all these settings. The basic tools needed to explore these kinds of problems are gathered into one place. Currently, no other book focuses on applying variational methods to solving various types of boundary value problems

Readership: Graduate students and researchers interested in applying variational methods to a variety of boundary value problems.

292pp	**Oct 2015**	
978-981-4696-54-8	**US$106**	**£76**
978-981-4696-55-5(ebook)	**US$138**	**£99**

Fractional Partial Differential Equations and Their Numerical Solutions



by **Boling Guo** *(Institute of Applied Physics and Computational Mathematics, China)*, **Xueke Pu** *(Chongqing University, China)* & **Fenghui Huang** *(South China University of Technology, China)*

This book aims to introduce some new trends and results on the study of the fractional differential equations, and to provide a good understanding of this field to beginners interested in this field. It describes theoretical and numerical aspects of the fractional partial differential equations.

Readership: Graduate students and researchers in mathematical physics, numerical analysis and computational mathematics.

348pp	**May 2015**	
978-981-4667-04-3	**US$118**	**£85**
978-981-4667-05-0(ebook)	**US$153**	**£111**

Notable Backlist

Partial Differential Equations for Scientists and Engineers
Geoff Stephenson *(Imperial College, University of London, UK)*

Lectures, Problems and Solutions for Ordinary Differential Equations
Yuefan Deng *(Stony Brook University, USA)*

Second Order Parabolic Differential Equations
G M Lieberman *(Iowa State University)*

Special Functions
Z X Wang & D R Guo *(Peking University)*

LTCC Advanced Mathematics Series

http://www.worldscientific.com/series/LTCCAMS

This series is the first to provide advanced introductions to mathematical science topics to advanced students of mathematics. Edited by the three joint heads of the London Taught Course Centre for PhD Students in the Mathematical Sciences (LTCC), each book supports readers in broadening their mathematical knowledge outside of their immediate research disciplines while also covering specialized key areas.

Analysis and Mathematical Physics

Vol. 6

edited by **Shaun Bullett** *(Queen Mary University of London, UK)*, **Tom Fearn & Frank Smith** *(University College London, UK)*

This is a concise reference book on analysis and mathematical physics, leading readers from a foundation to advanced level understanding of the topic. This is the perfect text for graduate or PhD mathematical-science students looking for support in topics such as distributions, Fourier transforms and microlocal analysis, C* Algebras, value distribution of meromorphic functions, noncommutative differential geometry,differential geometry and mathematical physics, mathematical problems of general relativity, and special functions of mathematical physics.

Readership: Researchers, graduate or PhD mathematical-science students.

200pp	**Mar 2017**	
978-1-78634-098-6	**US$88**	**£63**
978-1-78634-100-6(ebook)	**US$114**	**£82**

Dynamical and Complex Systems

Vol. 5

edited by **Shaun Bullett** *(Queen Mary University of London, UK)*, **Tom Fearn & Frank Smith** *(University College London, UK)*

This book leads readers from a basic foundation to an advanced level understanding of dynamical and complex systems. It is the perfect text for graduate or PhD mathematical-science students looking for support in topics such as applied dynamical systems, Lotka-Volterra dynamical systems, applied dynamical systems theory, dynamical systems in cosmology, aperiodic order, and complex systems dynamics.

Readership: Researchers, graduate or PhD mathematical-science students.

200pp	**Mar 2017**	
978-1-78634-102-0	**US$88**	**£63**
978-1-78634-104-4(ebook)	**US$114**	**£82**

Geometry in Advanced Pure Mathematics

Vol. 4

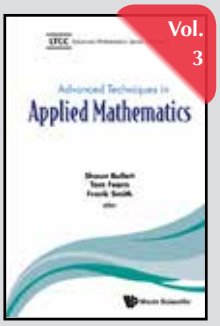
edited by **Shaun Bullett** *(Queen Mary University of London, UK)*, **Tom Fearn & Frank Smith** *(University College London, UK)*

This book leads readers from a basic foundation to an advanced level understanding of geometry in advanced pure mathematics. Chapter by chapter, readers will be led from a foundation level understanding to advanced level understanding. This is the perfect text for graduate or PhD mathematical-science students looking for support in algebraic geometry, geometric group theory, modular group, holomorphic dynamics and hyperbolic geometry, syzygies and minimal resolutions, and minimal surfaces.

Readership: Researchers, graduate or PhD mathematical-science students.

200pp	**Mar 2017**	
978-1-78634-106-8	**US$88**	**£63**
978-1-78634-108-2(ebook)	**US$114**	**£82**

Advanced Techniques in Applied Mathematics



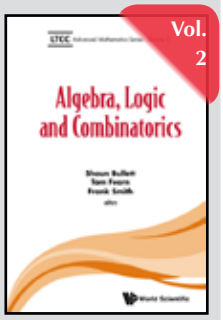
edited by **Shaun Bullett** *(Queen Mary University of London, UK)*, **Tom Fearn & Frank Smith** *(University College London, UK)*

This book is a guide to advanced techniques used widely in applied mathematical sciences research. Chapter by chapter, readers will be led from a foundation level understanding to advanced level understanding. This is the perfect text for graduate or PhD mathematical-science students looking for support in techniques such as practical analytical methods, finite elements and symmetry methods for differential equations.

Readership: Researchers, graduate or PhD mathematical-science students.

204pp	**Jul 2016**	
978-1-78634-021-4	**US$75**	**£50**
978-1-78634-022-1(pbk)	**US$38**	**£25**
978-1-78634-023-8(ebook)	**US$98**	**£65**

Algebra, Logic and Combinatorics



edited by **Shaun Bullett** *(Queen Mary University of London, UK)*, **Tom Fearn & Frank Smith** *(University College London, UK)*

This book leads readers from a basic foundation to an advanced level understanding of algebra, logic and combinatorics. Perfect for graduate or PhD mathematical-science students looking for help in understanding the fundamentals of the topic, it also explores more specific areas such as invariant theory of finite groups, model theory, and enumerative combinatorics.

Readership: Researchers, graduate or PhD mathematical-science students

184pp	**Jun 2016**	
978-1-78634-029-0	**US$90**	**£65**
978-1-78634-030-6(pbk)	**US$38**	**£25**
978-1-78634-031-3(ebook)	**US$117**	**£85**

Fluid and Solid Mechanics

edited by **Shaun Bullett** *(Queen Mary University of London, UK)*, **Tom Fearn & Frank Smith** *(University College London, UK)*

This book leads readers from a basic foundation to an advanced-level understanding of fluid and solid mechanics. Perfect for graduate or PhD mathematical-science students looking for help in understanding the fundamentals of the topic, it also explores more specific areas such as multi-deck theory, time-mean turbulent shear flows, non-linear free surface flows, and internal fluid dynamics.

Readership: Researchers, graduate or PhD mathematical-science students.

228pp	**May 2016**	
978-1-78634-025-2	**US$75**	**£50**
978-1-78634-026-9(pbk)	**US$38**	**£25**
978-1-78634-027-6(ebook)	**US$98**	**£65**

GENERAL PURE & APPLIED MATHEMATICS

The Selected Works of Roderick S C Wong (In 3 Volumes)

edited by **Dan Dai, Hui-Hui Dai, Tong Yang & Ding-Xuan Zhou** *(City University of Hong Kong, Hong Kong)*

This collection presents the scientific achievements of Roderick S C Wong, spanning 45 years of his career. It provides a comprehensive overview of the author's work which includes significant discoveries and pioneering contributions, such as his deep analysis on asymptotic approximations of integrals and uniform asymptotic expansions of orthogonal polynomials and special functions; his important contributions to perturbation methods for ordinary differential equations and difference equations; and his advocation of the Riemann – Hilbert approach for global asymptotics of orthogonal polynomials. The book is an essential source of reference for mathematicians, statisticians, engineers, and physicists.

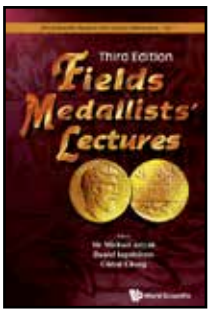
Readership: Undergraduates, graduates and researchers.

1560pp	**Oct 2015**	
978-981-4656-04-7(Set)	**US$474**	**£341**
978-981-4656-05-4(Set)(ebook)	**US$616**	**£443**

:: New Edition

World Scientific Series in 21st Century Mathematics - Vol 1

Fields Medallists' Lectures (3rd Edition)



edited by **Sir Michael Atiyah** *(University of Edinburgh, UK)*, **Daniel Iagolnitzer** *(CEA-Saclay, France)* & **Chitat Chong** *(NUS, Singapore)*

The equivalent of the Nobel Prizes in the mathematical field, Fields medals are highly regarded by many in the field. This collection provides a bird's eye view of the major developments and the evolution of work in the field of mathematics over the last 80 years. This new edition features additional 14 collection lectures or articles of the following: John W Milnor (1962), Enrico Bombieri (1974), Gerd Faltings (1986), Andrei Okounkov (2006), Terence Tao (2006), Cédric Villani (2010), Elon Lindenstrauss (2010), NgôBảo Châu (2010), Stanislav Smirnov (2010).

Readership: Mathematicians and mathematical physicists.

1116pp	**Oct 2015**	
978-981-4696-17-3	**US$96**	**£63**
978-981-4696-18-0(pbk)	**US$58**	**£38**

Fractals and Dynamics in Mathematics, Science, and the Arts: Theory and Applications - Vol 1

Benoit Mandelbrot

A Life in Many Dimensions

edited by **Michael Frame** *(Yale)*, **Nathan Cohen** *(Fractal Antenna Systems, Inc., USA)*

"What makes this book unique is that many of the articles spend a lot of time talking about Mandelbrot's personal involvement in these areas. The authors often offer personal glimpses of how their interactions with him led to their advances. This book offers a good overview of the many different areas that Mandelbrot worked in. Many of the articles are aimed at a very wide audience and can be understood by all."

Mathematical Reviews Clippings

Readership: People interested in the life work of Benoit Mandelbrot.

580pp	**Apr 2015**	
978-981-4366-06-9	**US$186**	**£134**
978-981-4366-07-6(ebook)	**US$242**	**£174**

GEOMETRY & TOPOLOGY

Differential Geometrical Foundations of Information Geometry

Geometry of Statistical Manifolds and Divergences

by **Hiroshi Matsuzoe** *(Nagoya Institute of Technology, Japan)*

This monograph gives foundations of information geometry from the viewpoint of differential geometry. In information geometry, a statistical manifold structure is important, which is related to geometry of a pair of dual affine connections and an asymmetric distance called divergence. First, we summarize geometry of statistical manifolds. As applications, we explain statistical inferences and information criterions from the viewpoint of differential geometry.

Readership: Graduate students, researchers and professionals in Geometry.

350pp	**Aug 2017**	
978-981-4618-76-2	**US$130**	**£94**
978-981-4618-77-9(ebook)	**US$169**	**£122**

New Topological Invariants for Real and Angle Valued Maps

An Alternative to Morse – Novikov Theory

by **Dan Burghelea** *(Ohio State University, USA)*

This book presents an alternative to what the topologists refer to as "Morse – Novikov theory", a mathematical theory which belongs to the fields of geometry and topology. The theory presented here is new and not available anywhere else as a self-contained presentation. All needed mathematics is sufficiently summarized to use this theory. This theory is a refinement of "topological persistence" which already had many applications in data analysis, so it will be no surprise that this refinement will be equally useful in applications

Readership: Graduate students and researchers in geometry and topology, topologists, geometers, experts in dynamics, computer scientists and data analysts.

180pp	**Mar 2017**	
978-981-4618-24-3	**US$66**	**£48**
978-981-4618-25-0(ebook)	**US$86**	**£62**

Spectral Geometry of the Laplacian

Spectral Analysis and Differential Geometry of the Laplacian

by **Hajime Urakawa** *(Tohoku University, Japan)*

The totality of the eigenvalues of the Laplacian of a compact Riemannian manifold is called the spectrum. We describe how the spectrum determines a Riemannian manifold. The continuity of the eigenvalue of the Laplacian, Cheeger and Yau's estimate of the first eigenvalue, the Lichnerowicz – Obata's theorem on the first eigenvalue, the Cheng's estimates of the kth eigenvalues, and Payne – Polya – Weinberger's inequality of the Dirichlet eigenvalue of the Laplacian are also described. Then, the theorem of Colin de Verdier, that is, the spectrum determines the totality of all the lengths of closed geodesics is described. We give the V Guillemin and D Kazhdan's theorem which determines the Riemannian manifold of negative curvature.

Readership: Researchers in differential geometry and partial differential equations.

350pp	**Feb 2017**	
978-981-3109-08-7	**US$118**	**£85**
978-981-3109-09-4(ebook)	**US$153**	**£111**

Differential Geometry of Curves and Surfaces

by **Masaaki Umehara & Kotaro Yamada** *(Tokyo Institute of Technology, Japan)*
translated by **Wayne Rossman** *(Kobe University, Japan)*

This textbook 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. It succeeds in elucidating detailed explanations of fundamental material, where the most essential basic notions stand out clearly, but does not shy away from the more advanced topics needed for research in this field. It provides a large collection of mathematically rich supporting topics. Further material is included, for example, closed curves, enveloping curves, curves of constant width, the fundamental theorem of surface theory, constant mean curvature surfaces, and existence of curvature line coordinates.

Readership: Undergraduates, graduate students, and researchers.

300pp	**Feb 2017**	
978-981-4740-23-4	**US$88**	**£58**
978-981-4740-24-1(pbk)	**US$45**	**£30**

Dynamical Scale Transform in Tropical Geometry

by **Tsuyoshi Kato** *(Kyoto University, Japan)*

This book provides comprehensive analysis of dynamical systems in tropical geometry. Tropical geometry is a kind of dynamical scale transform which connects real rational dynamics with piecewise linear one presented by max and plus algebras. A comparison method is given which estimates orbits corresponding to different rational dynamics by reduction to the piecewise linear dynamics.Both rational and piecewise linear dynamics appear in many important branches of mathematics. Tropical geometry can play a role or function to bridge between different subjects in mathematics. This book contains detailed accounts of basic strategy on how to apply tropical geometry to analysis in various mathematical subjects by presenting several applications

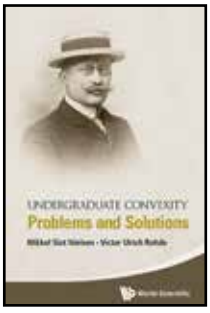
Readership: Graduate students and researchers in geometry.

250pp	**Feb 2017**	
978-981-4635-36-3	**US$78**	**£56**
978-981-4635-37-0(ebook)	**US$101**	**£73**

Undergraduate Convexity

Problems and Solutions

by **Mikkel Slot Nielsen & Victor Ulrich Rohde** *(Aarhus University, Denmark)*



This solutions manual thoroughly goes through the exercises found in Undergraduate Convexity: From Fourier and Motzkin to Kuhn and Tucker. Several solutions are accompanied by detailed illustrations and intuitive explanations. This book will pave the way for students to easily grasp the multitude of solution methods and aspects of convex sets and convex functions.

Readership: Undergraduates focusing on convexity and optimization.

184pp	**Dec 2016**	
978-981-3146-21-1	**US$68**	**£49**
978-981-3143-64-7(pbk)	**US$38**	**£27**

:: New Edition

Introductory Topology (2nd Edition)

Exercises and Solutions

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

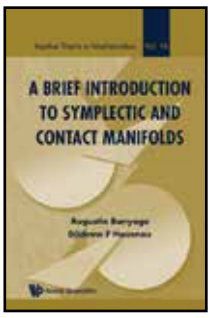
The book offers a good introduction to topology through solved exercises. It contains very detailed solutions, diversity of exercises and a generous review of the needed topics and notions. In the second edition, some significant changes have been made. Other than the additional exercises, there are also additional proofs (as exercises) of many results. The section "Essential Background", which was originally named "What You Need To Know", has also been improved. Indeed, it has been considerably beefed up as it now includes more remarks and results for readers convenience. The interesting sections "True or False" and "Tests" have remained as they were, apart from a very few changes.

Readership: Undergraduate students and lecturers in topology.

372pp	**Dec 2016**	
978-981-3146-93-8	**US$88**	**£63**
978-981-3148-02-4(pbk)	**US$48**	**£35**

Nankai Tracts in Mathematics - Volume 15

A Brief Introduction to Symplectic and Contact Manifolds



by **Augustin Banyaga** *(The Pennsylvania State University, USA)*, **Djideme F Houenou** *(International Centre for Theoretical Physics, Italy)*

The book introduces the basic notions in Symplectic and Contact Geometry at the level of the second year graduate student. It contains many exercises, some of which are solved only in the last chapter. We begin with the linear theory, then give the definition of symplectic manifolds and some basic examples, review advanced calculus, discuss Hamiltonian systems, tour rapidly group and the basics of contact geometry, and solve problems. There is no book, going from the very elementary part to the very advanced level, like this one.

Readership: Graduate students, researchers and more advanced mathematicians.

140pp	**Oct 2016**	
978-981-4696-70-8	**US$66**	**£48**
978-981-4696-71-5(ebook)	**US$86**	**£62**

Series on Analysis, Applications and Computation - Vol 7

The "Golden" Non-Euclidean Geometry

Hilbert's Fourth Problem, "Golden" Dynamical Systems, and the Fine-Structure Constant

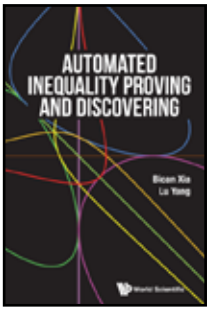
by **Alexey Stakhov** *(International Club of the Golden Section, Canada & Academy of Trinitarism, Russia)*, **Samuil Aranson** *(The Russian Academy of Natural Sciences, Russia)* assisted by **Scott Olsen** *(College of Central Florida, USA)*

This unique book overturns our ideas about non-Euclidean geometry and the fine-structure constant, and attempts to solve long-standing mathematical problems.

Readership: Advanced undergraduate and graduate students in mathematics and theoretical physics, mathematicians and scientists of different specializations interested in history of mathematics and new mathematical ideas.

250pp	**Oct 2016**	
978-981-4678-29-2	**US$114**	**£82**
978-981-4678-30-8(ebook)	**US$148**	**£107**

Automated Inequality Proving and Discovering



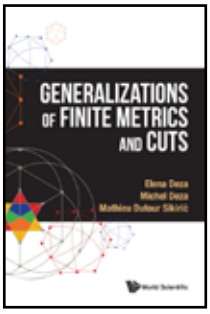
by **Bican Xia** *(Peking University, China)*,
Lu Yang *(Chinese Academy of Sciences, China)*

This is the first book that focuses on practical algorithms for polynomial inequality proving and discovering. Besides brief introduction to some classical results and related work in corresponding chapters, the book mainly focuses on the algorithms such as real root counting, real root classification, improved CAD projection, dimension-decreasing algorithm, difference substitution, and so on. All the algorithms were rigorously proved and the implementations are demonstrated by lots of examples in various backgrounds such as algebra, geometry, biological science, and computer science.

Readership: Researchers and graduate students in computational real algebraic geometry, optimization and artificial intelligence.

348pp	**Aug 2016**	
978-981-4759-11-3	**US$118**	**£85**
978-981-4759-12-0(ebook)	**US$153**	**£111**

Generalizations of Finite Metrics and Cuts



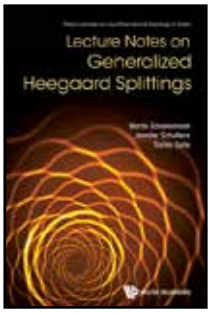
by **Elena Deza** *(Moscow State Pedagogical University, Russia)*,
Michel Deza *(Ecole Normale Supérieure, France)* & **Mathieu Dutour Sikirić** *(Ruder Bošković Institute, Croatia)*

This book introduces oriented version of metrics and cuts and their multidimensional analogues, as well as partial metrics and weighted metrics. It constructs the full theory of main classes of finite generalized metrics and their polyhedral aspects.

Readership: Students and researchers in discrete geometry, discrete mathematics, computation mathematics, finite geometry and related fields.

320pp	**Jul 2016**	
978-981-4740-39-5	**US$128**	**£92**
978-981-4740-40-1(ebook)	**US$166**	**£120**

Lecture Notes on Generalized Heegaard Splittings



by **Martin Scharlemann** *(UC Santa Barbara)*,
Jennifer Schultens *(UC Davis)* & **Toshio Saito** *(Joetsu University of Education, Japan)*

In the standard schematic diagram for generalized Heegaard splittings, Heegaard splittings are stacked on top of each other in a linear fashion. This can cause confusion in those cases in which generalized Heegaard splittings possess interesting connectivity properties. Fork complexes were invented in an effort to illuminate some of the more subtle issues arising in the study of generalized Heegaard splittings. The purpose of this book lays in familiarizing the audience with the basics of 3-manifold theory and introducing some topics of current research.

Readership: Graduate students and researchers in topology.

140pp	**Jun 2016**	
978-981-3109-11-7	**US$58**	**£42**
978-981-3109-12-4(ebook)	**US$75**	**£55**

Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore - Vol 31

Geometric Analysis Around Scalar Curvatures

edited by **Fei Han, Xingwang Xu** *(NUS, Singapore)* & **Weiping Zhang** *(Nankai University, China)*

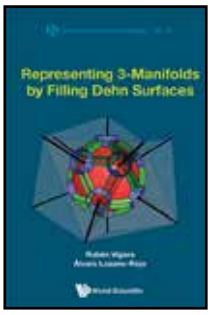
The first chapter surveys the recent developments on the fourth-order equations with negative exponent from geometric points of view such as positive mass theorem and uniqueness results. The next chapter deals with the recent important progress on several conjectures such as the existence of non-flat smooth hyper-surfaces and Serrin's over-determined problem. And the final chapter induces a new technique to handle the equation with critical index and the sign change coefficient as well as the negative index term.

Readership: Advanced undergraduates, graduate students and researchers interested in the study of conformal geometry and geometric partial differential equations.

220pp	**Jun 2016**	
978-981-3100-54-1	**US$106**	**£76**
978-981-3100-55-8(ebook)	**US$138**	**£99**

Series on Knots and Everything - Vol 58

Representing 3-Manifolds by Filling Dehn Surfaces



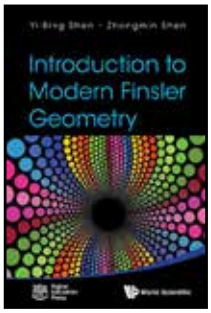
by **Rubén Vigara & Álvaro Lozano-Rojo** *(Centro Universitario de la Defensa - IUMA, Spain)*

This book provides an introduction to the beautiful and deep subject of filling Dehn surfaces in the study of topological 3-manifolds. It is mostly self-contained requiring only basic knowledge on topology and homotopy theory. The complete and detailed proofs are illustrated with a set of more than 600 spectacular pictures, in the tradition of low-dimensional topology books. The book uses topological and combinatorial tools developed throughout the twentieth century making the volume a trip along the history of low-dimensional topology.

Readership: Graduate students and researchers.

300pp	**May 2016**	
978-981-4725-48-4	**US$132**	**£95**
978-981-4725-49-1(ebook)	**US$172**	**£124**

Introduction to Modern Finsler Geometry



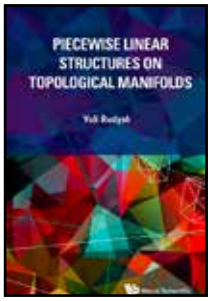
by **Yi-Bing Shen** *(Zhejiang University, China)*,
Zhongmin Shen *(Indiana University – Purdue University Indianapolis, USA)*

This comprehensive book is an introduction to the basics of Finsler geometry with recent developments in its area. It includes local geometry as well as global geometry of Finsler manifolds. In Part I, the authors discuss differential manifolds, Finsler metrics, the Chern connection, Riemannian and non-Riemannian quantities. Part II is written for readers who would like to further their studies in Finsler geometry. It covers projective transformations, comparison theorems, fundamental group, minimal immersions, harmonic maps, Einstein metrics, conformal transformations, amongst other related topics.

Readership: Senior undergraduates, graduates and researchers interested in Finsler geometry.

408pp	**Apr 2016**	
978-981-4704-90-8	**US$80**	**£53**

Piecewise Linear Structures on Topological Manifolds



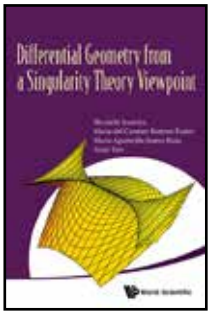
by **Yuli Rudyak** *(University of Florida, USA)*

The study of triangulations of topological spaces has always been at the root of geometric topology. Among the most studied triangulations are piecewise linear triangulations of high-dimensional topological manifolds. Their study culminated in the late 1960s – early 1970s in a complete classification in the work of Kirby and Siebenmann. It is this classification that we discuss in this book, including the celebrated Hauptvermutung and Triangulation Conjecture.

Readership: Researchers working in manifolds, algebraic topology, and K-theory.

128pp	**Feb 2016**	
978-981-4733-78-6	**US$94**	**£68**
978-981-4733-79-3(ebook)	**US$122**	**£88**

Differential Geometry from a Singularity Theory Viewpoint



by **Shyuichi Izumiya** *(Hokkaido University, Japan)*, **Maria del Carmen Romero Fuster** *(Universitat de València, Spain)*, **Maria Aparecida Soares Ruas & Farid Tari** *(University of São Paulo, Brazil)*

This book provides a new look at the fascinating and classical subject of the differential geometry of surfaces in Euclidean spaces. It uses singularity theory to capture some key geometric features of surfaces. It describes the theory of contact and its link with the theory of caustics and wavefronts. It then uses the powerful techniques of these theories to deduce geometric information about surfaces embedded in 3, 4 and 5-dimensional Euclidean spaces. Recent work of the authors and their collaborators on the geometry of sub-manifolds in Minkowski spaces is also included.

Readership: Advanced undergraduates, post-graduates, and researchers.

384pp	**Dec 2015**	
978-981-4590-44-0	**US$103**	**£74**
978-981-4590-45-7(ebook)	**US$134**	**£96**

Series on Concrete and Applicable Mathematics - Vol 18

Differential Sheaves and Connections

A Natural Approach to Physical Geometry

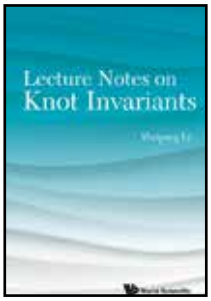
by **Anastasios Mallios & Elias Zafiris** *(National and Kapodistrian University of Athens, Greece)*

This unique book serves both the newcomer and the experienced researcher in undertaking a background-independent, natural and relational approach to "physical geometry". In this manner, this book is situated at the crossroads between the foundations of mathematical analysis with a view toward differential geometry and the foundations of theoretical physics with a view toward quantum mechanics and quantum gravity.

Readership: Graduate students, post-graduates in mathematics/physics; theoretical/mathematical physicists, pure and applied mathematicians, general system scientists and philosophers of mathematics/physics.

304pp	**Nov 2015**	
978-981-4719-46-9	**US$114**	**£82**
978-981-4719-47-6(ebook)	**US$148**	**£107**

Lecture Notes on Knot Invariants



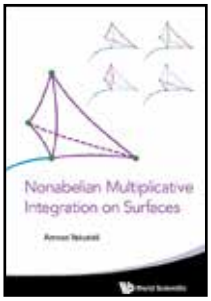
by **Weiping Li** *(Southwest Jiaotong University, China & Oklahoma State University, USA)*

The volume is focused on the basic calculation skills of various knot invariants defined from topology and geometry. With the approach of an explicit computational point of view on knot invariants, this user-friendly volume will benefit readers to easily understand low-dimensional topology from examples and computations, rather than only knowing terminologies and theorems.

Readership: Undergraduate and graduate students interested in learning topology and low dimensional topology.

244pp	**Oct 2015**	
978-981-4675-95-6	**US$75**	**£50**
978-981-4675-96-3(pbk)	**US$38**	**£25**
978-981-4675-97-0(ebook)	**US$98**	**£65**

Nonabelian Multiplicative Integration on Surfaces



by **Amnon Yekutieli** *(Ben Gurion University, Israel)*

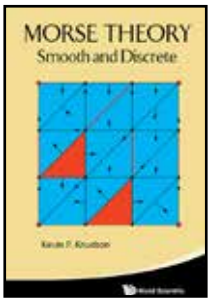
Nonabelian multiplicative integration on curves is a classical theory. This volume is about the 2-dimensional case, which is much more difficult. The main result of this work is the 3-dimensional nonabelian Stokes theorem. This result is new; only a special case of it was predicted (without proof) in papers in mathematical physics. Our constructions and proofs are of a straightforward nature. There are plenty of illustrations to clarify the geometric constructions. Our volume touches on some of the central issues (e.g., descent for nonabelian gerbes) in an unusually down-to-earth manner, involving analysis, differential geometry, combinatorics and Lie theory — instead of the 2-categories and 2-functors that other authors prefer.

Readership: Graduate students, algebraic topologists, mathematical physicists and theoretical physicists.

188pp	**Sep 2015**	
978-981-4663-84-7	**US$70**	**£50**
978-981-4663-85-4(ebook)	**US$91**	**£65**

Morse Theory

Smooth and Discrete



by **Kevin P Knudson** *(University of Florida, USA)*

"The book fills a gap existing in the literature. His book covers both theories in an introductory way. It is self-contained. In addition, many detailed and motivational examples are included, so even the non-specialist reader will find the text clear and user-friendly. This book could be a nice text for a course on Morse theory in a wide sense. Researchers interested specifically in an introduction to discrete Morse theory can now avoid looking for various papers or sections of several books."

Mathematical Reviews Clippings

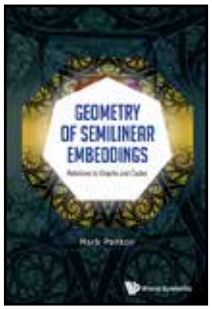
Readership: Graduate students in geometry and topology.

196pp	**Aug 2015**	
978-981-4630-96-2	**US$65**	**£43**

Geometry of Semilinear Embeddings

Relations to Graphs and Codes

by **Mark Pankov** *(University of Warmia and Mazury, Poland)*



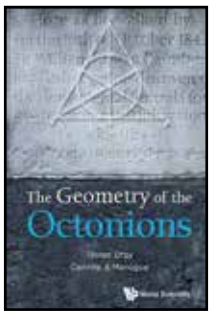
This volume covers semilinear embeddings of vector spaces over division rings and the associated mappings of Grassmannians. In contrast to classical books, we consider a more general class of semilinear mappings and show that this class is important. A large portion of the material will be formulated in terms of graph theory, that is, Grassmann graphs, graph embeddings, and isometric embeddings. Some relations to linear codes will be described.

Readership: Graduate students and researchers interested in the field of semilinear embeddings.

180pp	**Jul 2015**	
978-981-4651-07-3	**US$94**	**£68**
978-981-4651-08-0(ebook)	**US$122**	**£88**

The Geometry of the Octonions

by **Tevian Dray & Corinne A Manogue** *(Oregon State University, USA)*



This book provides an elementary introduction to the properties of the octonions, with emphasis on their geometric structure. Elementary applications covered include the rotation groups and their spacetime generalization, the Lorentz group, as well as the eigenvalue problem for Hermitian matrices. In addition, more sophisticated applications include the exceptional Lie groups, octonionic projective spaces, and applications to particle physics including the remarkable fact that classical supersymmetry only exists in particular spacetime dimensions.

Readership: Advanced undergraduate and graduate students and faculty in mathematics and physics; non-experts with moderately sophisticated mathematics background.

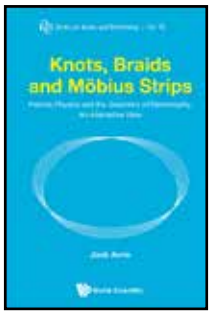
228pp	**Jun 2015**	
978-981-4401-81-4	**US$114**	**£82**
978-981-4401-82-1(ebook)	**US$148**	**£107**

Series on Knots and Everything - Vol 55

Knots, Braids and Möbius Strips

Particle Physics and the Geometry of Elementarity: An Alternative View

by **Jack Avrin**



Elementary particles in this book exist as Solitons in-and-of the fabric of spacetime itself. As such they are characterized by their geometry, that is their topology and configuration which lead directly to their physical attributes and behavior as well as to a simplification and reduction of assumptions and the importation of parameter values. The emphasis of the book is thus on that geometry, the algebraic geometry associated with taxonomical issues and the differential geometry that determines the physics as well as on simplifying the results.

Readership: Researchers in geometry and topology, particle physics.

356pp	**May 2015**	
978-981-4616-00-3	**US$118**	**£85**
978-981-4616-01-0(ebook)	**US$153**	**£111**

Notable Backlist

Lectures on Differential Geometry
S S Chern *(UC Berkeley, USA)*, W H Chen *(Beijing University)*, K S Lam *(California State Polytechnic University)*

An Introduction to Differential Manifolds
Dennis Barden & Charles Thomas *(University of Cambridge, UK)*

MATHEMATICAL ANALYSIS

:: New Edition

Weighted Inequalities of Hardy Type (2nd Edition)

by **Alois Kufner** *(Academy of Sciences, Czech Republic)*, **Lars-Erik Persson** *(Luleå University of Technology, Sweden & UiT, The Arctic University of Norway, Norway)* & **Natasha Samko** *(Luleå University of Technology, Sweden)*

"This book is very readable. There are informative endnotes in each chapter which give the history of and sometimes the connections to other theorems. The proofs are well planned and executed ... I recommend this book to anyone interested in this kind of inequality or its applications."

SIAM Review

Readership: Postgraduates and researchers in mathematical analysis, engineering, numerical analysis and applied mathematics.

450pp	**May 2017**	
978-981-3140-64-6	**US$128**	**£92**

Series in Real Analysis

Kurzweil – Stieltjes Integral

Theory and Applications

by **Milan Tvrdý, Giselle Antunes Monteiro** *(Academy of Sciences of the Czech Republic)* & **Antonín Slavík** *(Charles University in Prague, Czech Republic)*

The book is primarily devoted to the theory of the Kurzweil – Stieltjes integral and its important applications in functional analysis and the theory of various kinds of generalized differential equations, including the dynamical equations on time scales. It presents results in a thoroughly updated form and, simultaneously, it is written in a widely understandable way, so that it can be used as a textbook.

Readership: Advanced undergraduates, graduate students and researchers in mathematical analysis and differential equations.

350pp	**Mar 2017**	
978-981-4641-77-7	**US$132**	**£95**
978-981-4641-78-4(ebook)	**US$172**	**£124**

:: New Edition

Lipschitz Algebras (2nd Edition)

by **Nik Weaver** *(Washington University in St. Louis)*

This is the standard reference on algebras of Lipschitz functions, written by the leading figure in the field. The second edition includes new chapters on nonlinear Banach space geometry, differentiability in metric measure spaces, and quantum metrics. This latest material reflects the importance of spaces of Lipschitz functions in a diverse range of current research directions. Every functional analyst should have some knowledge of this subject. It is the only in-depth treatment of a topic of wide and growing interest.

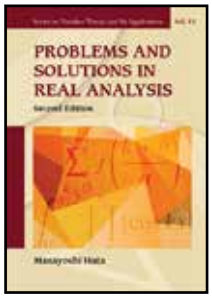
Readership: Graduate students and specialists in functional analysis.

340pp	**Feb 2017**	
978-981-4740-63-0	**US$118**	**£85**
978-981-4740-64-7(ebook)	**US$153**	**£111**

:: New Edition

Series on Number Theory and Its Applications

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.

Readership: Undergraduates and graduate students in mathematical analysis.

356pp	**Feb 2017**	
978-981-3142-81-7	**US$88**	**£63**
978-981-3142-82-4(pbk)	**US$48**	**£35**

A Quick Introduction to Complex Analysis

by **Kalyan Chakraborty** *(Harish-Chandra Research Institute, India)*, **Shigeru Kanemitsu** *(Kindai University, Japan)* & **Takako Kuzumaki** *(Gifu University, Japan)*

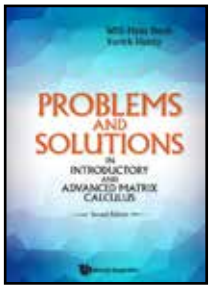
The raison d'être of this book is that it is extremely reader-friendly while keeping rigor of serious mathematics and in-depth analysis of practical applications to various subjects. If the reader is in a hurry, he can browse the quickest introduction to complex analysis at the beginning of Chapter 1, which explains the very basics of the theory. Readers who want to learn more about applied calculus can read Chapter 2, where a lot of practical applications are given. Readers can go through examples and solve problems following the patterns given in the examples.

Readership: Advanced undergraduate mathematics, physics and engineering students; researchers in the field of complex analysis; also suitable for self-study.

190pp	**Nov 2016**	
978-981-3108-50-9	**US$75**	**£50**
978-981-3108-51-6(pbk)	**US$38**	**£25**

:: New Edition

Problems and Solutions in Introductory and Advanced Matrix Calculus (2nd Edition)



by **Willi-Hans Steeb & Yorick Hardy** *(University of Johannesburg & University of South Africa, South Africa)*

This book provides an extensive collection of problems with detailed solutions in introductory and advanced matrix calculus. Supplementary problems in each chapter will challenge and excite the reader. The coverage includes systems of linear equations, linear differential equations, integration and matrices, Kronecker product and vec-operation as well as functions of matrices. Many of the problems are related to applications for group theory, Lie algebra theory, wavelets, graph theory and matrix-valued differential forms. Computer algebra programs in Maxima and SymbolicC++ have also been provided.

Readership: Undergraduate and graduate students and researchers in mathematics, physics and engineering.

600pp	**Oct 2016**	
978-981-3143-78-4	**US$148**	**£107**
978-981-3143-79-1(pbk)	**US$68**	**£49**

Course in Analysis

Vol. I: Introductory Calculus, Analysis of Functions of One Real Variable

Vol. II: Differentiation and Integration of Functions of Several Variables, Vector Calculus

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

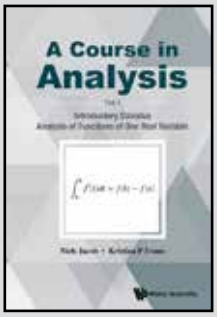
"This is a very good book for anyone interested in learning analysis. I highly recommend this book to anyone teaching or studying analysis at an undergraduate level."

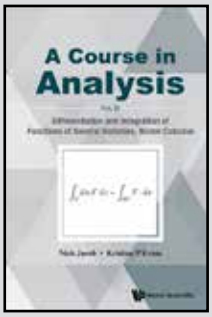
Zentralblatt MATH

This project, namely to write and publish a whole course on analysis consisting of up to 6 volumes, aims to provide students and lecturers with a coherent text, which will provide a unique companion for the entire analysis education. The Course can also be used as a standard reference work and contains a fair balance of absolute core and optional material. Remarkably, Volume I contains ca. 360 problems with complete, detailed solutions. Volume II offers more than 260 problems solved in complete detail.

Readership: Undergraduate students in mathematics.

Vol. 1		
768pp	**Oct 2015**	
978-981-4689-08-3	**US$135**	**£89**
978-981-4689-09-0(pbk)	**US$65**	**£43**
Vol. 2		
780pp	**Aug 2016**	
978-981-3140-95-0	**US$148**	**£107**
978-981-3140-96-7(pbk)	**US$78**	**£56**

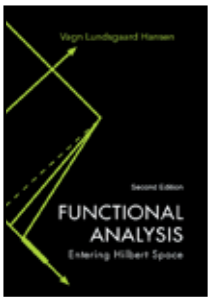




:: New Edition

Functional Analysis (2nd Edition)

Entering Hilbert Space



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

"This is a well-written student-friendly basic introduction to functional analysis and Hilbert space ... "

MAA Online Book Review

In this edition, the author has expanded material on normed vector spaces and their operators to include proofs of the Open Mapping Theorem, the Closed Graph Theorem and the Hahn – Banach Theorem.

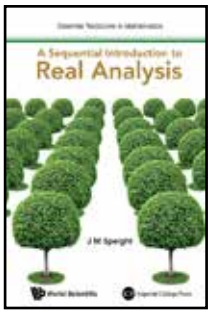
Readership: Undergraduates in mathematical and physical sciences; mechanical, electrical and electronic engineering.

192pp	**Feb 2016**	
978-981-4733-92-2	**US$58**	**£38**

Essential Textbooks in Mathematics - Vol 1

A Sequential Introduction to Real Analysis

by **J M Speight** *(University of Leeds, UK)*



This book gives a fresh take on real analysis by formulating all the underlying concepts in terms of convergence of sequences. The result is a coherent, mathematically rigorous, but conceptually simple development of the standard theory of differential and integral calculus ideally suited to undergraduate students learning real analysis for the first time. This book can be used as the basis of an undergraduate real analysis course, or used as further reading material to give an alternative perspective within a conventional real analysis course.

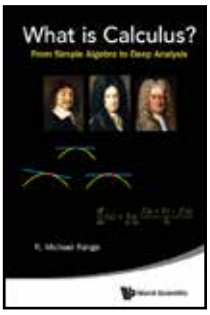
Readership: Undergraduate mathematics students taking a course in real analysis.

276pp	**Dec 2015**	
978-1-78326-782-8	**US$75**	**£50**
978-1-78326-783-5(pbk)	**US$38**	**£25**

What is Calculus?

From Simple Algebra to Deep Analysis

by **R Michael Range** *(State University of New York at Albany, USA)*



"It certainly would provide excellent corrective revision of calculus for those who have been taught it simplistically. Another attractive feature of the book is its historical element, which includes reference to the algebraic/geometric method of Apollonius for finding tangents etc. This, together with the above-mentioned features, make this book a uniquely imaginative introduction to real analysis alongside a cogent account of the principles, and applications, of differentiation and the Riemann integral."

MAA

Readership: Undergraduates, high school students, instructors and teachers, and scientifically literate readers.

372pp	**Oct 2015**	
978-981-4644-47-1	**US$78**	**£51**
978-981-4644-48-8(pbk)	**US$38**	**£25**

MATHEMATICAL BIOLOGY

Mathematical Modeling of Biological Phenomena and the Underlying Scientific Issues

Volume I: Dynamical Systems Models

by **Frederic Y M Wan** *(UC Irvine)*

When mathematical techniques new to the readers are introduced and taught in this volume, they are initiated and motivated by specific questions on biological phenomena. Hence, they can see the need for the relevant mathematics in life sciences. Furthermore, nearly all mathematical methods introduced to analyze specific models can be traced back to, and explained in terms of basic calculus and/or matrix operations familiar to the readers. By asking different questions about the same biological phenomenon, a familiar model is routinely extended or modified to a different level of complexity to motivate the need for more mathematics.

Readership: Undergraduates in mathematical biology, mathematical modeling of dynamical systems, optimization and control, viral dynamics (infectious diseases), oncology.

290pp	**May 2017**	
978-981-3143-33-3	**US$95**	**£68**
978-981-3143-70-8(pbk)	**US$45**	**£32**

MATHEMATICAL COMPUTATION & MODELING

Series on Knots and Everything

Geometry, Language and Strategy

The Dynamics of Decision Processes, Volume 2

by **Gerald H Thomas** *(Milwaukee School of Engineering, USA)*

Vol. 1 extended concepts of Game Theory, replacing static equilibrium with a deterministic dynamic theory. It opened up many applications that were briefly touched on. To study consequences of the deterministic approach in contrast to standard Bayesian approaches, the richness of applications requires an engineering foundation and discipline, which this volume supplies. It provides a richer list of applications, such as Prisoner's Dilemma, which extends the resonant behavior of Vol. 1 to more general time-dependent and transient behaviors.

Readership: Researchers in game theory, optimization, control theory, fluid mechanics, electrical engineering.

850pp	**Apr 2017**	
978-981-4719-92-6	**US$222**	**£160**
978-981-4719-93-3(ebook)	**US$289**	**£208**

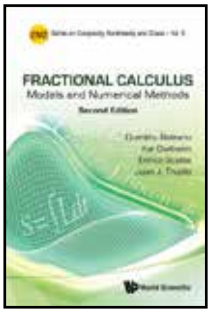
:: New Edition

Series on Complexity, Nonlinearity and Chaos - Vol 5

Fractional Calculus (2nd Edition)

Models and Numerical Methods

by **Dumitru Baleanu** *(Çankaya University, Turkey & Institute of Space Science, Romania)*, **Kai Diethelm** *(Technische Universität Braunschweig & Gesellschaft für numerische Simulation mbH, Germany)*, **Enrico Scalas** *(University of Sussex, UK & Basque Center for Applied Mathematics, Spain)* & **Juan J Trujillo** *(University of La Laguna, Spain)*



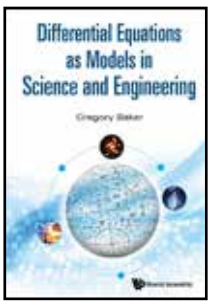
This book helps readers find very important mathematical tools for working with fractional models and solving fractional differential equations. Applied topics are introduced, in particular fractional variational methods which are used in physics, engineering or economics. There is a large collection of numerical methods for different problems, including the source codes for implementation of associated computer programs.

Readership: Undergraduates, graduates, researchers in mathematics, applied mathematics and sciences.

500pp	**Dec 2016**	
978-981-3140-03-5	**US$178**	**£128**
978-981-3140-04-2(ebook)	**US$231**	**£166**

Differential Equations as Models in Science and Engineering

by **Gregory Baker** *(The Ohio State University, USA)*



This textbook develops a coherent view of differential equations by progressing through a series of typical examples in science and engineering that arise as mathematical models. All steps of the modeling process are covered: formulation of a mathematical model; development and use of mathematical concepts that lead to constructive solutions; validation of solutions; and consideration of consequences. The volume engages students in thinking mathematically, while emphasizing the power and relevance of mathematics in science and engineering.

Readership: Undergraduates in science and engineering studying differential equations.

392pp	**Sep 2016**	
978-981-4656-96-2	**US$95**	**£63**
978-981-4656-97-9(pbk)	**US$48**	**£32**

Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore - Vol 32

Mathemusical Conversations

Mathematics and Computation in Music Performance and Composition

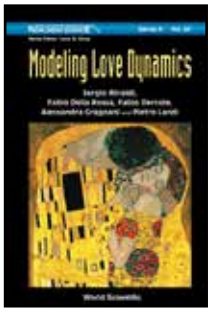
edited by **Jordan B L Smith** *(National Institute for Advanced Industrial Research and Technology (AIST), Japan)*, **Elaine Chew** *(Queen Mary University of London, UK)*, & **Gérard Assayag** *(Sciences and Technologies of Music and Sound Lab (STMS) & Institut de Recherche et de Coordination Acoustique/Musique (IRCAM) & French National Centre for Scientific Research (CNRS) & Pierre and Marie Curie University (UMPC), France)*

This book celebrates the understanding of music through mathematics, and vice versa. Contributors include world experts and leading scholars, all writing on the intersection of music and mathematics. They also focus on performance and composition, both foundational to understanding human creativity and to creation of tomorrow's music technologies.

Readership: Graduate students, researchers, mathematicians and musicians interested in mathematical music.

316pp	**Sep 2016**	
978-981-3140-09-7	**US$128**	**£92**
978-981-3140-10-3(ebook)	**US$166**	**£120**

World Scientific Series on Nonlinear Science Series A - Vol 89



Modeling Love Dynamics

by **Sergio Rinaldi** *(Politecnico di Milano, Italy & International Institute for Applied Systems Analysis, Austria)*, **Fabio Della Rossa, Fabio Dercole, Alessandra Gragnani** *(Politecnico di Milano, Italy)* & **Pietro Landi** *(Stellenbosch University, South Africa)*

"In many respects the book evolves around the two most powerful products of the human mind: art and science. Clearly, the arts are superior when it comes to capturing the depth of love affairs. Yet, the bare bones of the drivers of stable love, transient affairs and neurotic dynamics are captured powerfully by the disarmingly simple math. What topic would be better suited to seduce a broad audience to play with equations?"

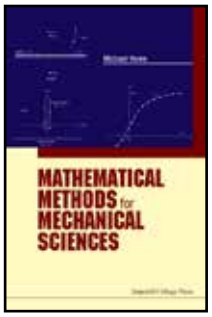
A View from the Bridge, Nature's Books and Arts Blog

Readership: Undergraduate and graduate students, researchers and academics in applied mathematics; systems analysts, theoretical psychologists and social scientists.

256pp	**Dec 2015**	
978-981-4696-31-9	**US$114**	**£82**
978-981-4696-32-6(ebook)	**US$148**	**£107**

Mathematical Methods for Mechanical Sciences

by **Michael Howe** *(Boston University, USA)*



This book supplies the undergraduate engineer with the basic mathematical tools for developing and understanding such models, and is also suitable as a review for engineering graduate students. A firm grasp of the topics covered will also enable the working engineer (educated to bachelor's degree level) to understand, write and otherwise make sensible use of technical reports and papers.

Readership: Engineering graduate and undergraduate students, and working engineers.

332pp	**Oct 2015**	
978-1-78326-664-7	**US$88**	**£58**

MATHEMATICAL LOGIC & FOUNDATIONS

Logical Properties of Natural Language

Eliminating the Universe

by **Edward L Keenan** *(UCLA)*

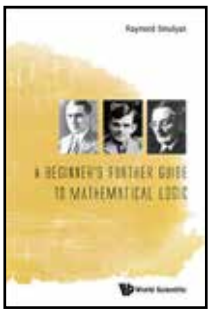
This book synthesizes the author's work (1980s – 2015) on the logical expressive power of natural language. It extends the tools and concepts of model theory as used in (higher order) predicate logic to the study of natural language semantics. It focuses on boolean structure, generalized quantification (separated from variable binding), covering some cases of anaphora. Different categories — predicates, adjective, quantifiers — are modeled by non-isomorphic boolean lattices.

Readership: Researchers in mathematical logic and artificial intelligence.

250pp	**Jun 2017**	
978-981-4719-83-4	**US$126**	**£91**
978-981-4719-84-1(ebook)	**US$164**	**£118**

A Beginner's Further Guide to Mathematical Logic

by **Raymond Smullyan**



The present volume begins with a bit more on propositional and first-order logic, followed by a "fein" chapter, which simultaneously generalizes some results from recursion theory, first-order arithmetic systems, and a "decision machine". Then come five chapters on formal systems, recursion theory and metamathematical applications in a general setting. The concluding five chapters are on the beautiful subject of combinatory logic, which is not only intriguing in its own right, but has important applications to computer science. After studying this volume, readers will be amply prepared to study more advanced topics.

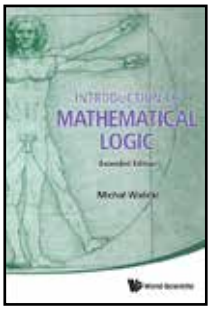
Readership: Undergraduates in mathematics.

350pp	**May 2017**	
978-981-4730-99-0	**US$58**	**£38**
978-981-4725-72-9(pbk)	**US$24**	**£16**

:: New Edition

Introduction to Mathematical Logic (Extended Edition)

by **Michał Walicki** *(University of Bergen, Norway)*



This is a systematic and well-paced introduction to mathematical logic. Excellent as a course text, the book presupposes only elementary background and can be used also for self-study by more ambitious students. This revised edition contains, besides many new exercises, a new chapter on semantic paradoxes. An equivalence of logical and graphical representations allows us to see vicious circularity as the odd cycles in the graphical representation and can be used as a simple tool for diagnosing paradoxes in natural discourse.

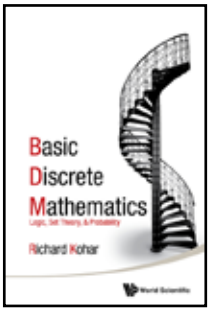
Readership: Undergraduates learning logic, lecturers teaching logic, any professionals who are non-experts in the subject but wish to learn and understand more about logic.

292pp	**Oct 2016**	
978-981-4719-95-7	**US$85**	**£56**
978-981-4719-96-4(pbk)	**US$48**	**£32**

Basic Discrete Mathematics

Logic, Set Theory, and Probability

by **Richard Kohar** *(Royal Military College of Canada, Canada)*



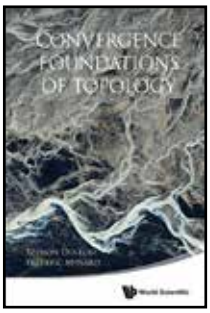
This lively introductory text exposes studenst in the humanities to the world of discrete mathematics. A problem-solving based approach grounded in the ideas of George Pólya are at the heart of this book. Students learn to handle and solve new problems on their own. A straightforward, clear writing style and well-crafted examples with diagrams invite students to develop into precise and critical thinkers. Particular attention has been given to materials that some students find challenging, such as proofs. It illustrates how to spot invalid arguments, to enumerate possibilities, and to construct probabilities. It also presents case studies to students about the possible detrimental effects of ignoring these basic principles. Full solutions to all exercises included.

Readership: Undergraduates in humanities studying probability and statistics, logic and set theory.

732pp	**Aug 2016**	
978-981-4730-39-6	**US$148**	**£107**
978-981-3147-54-6(pbk)	**US$78**	**£56**

Convergence Foundations of Topology

by **Szymon Dolecki** *(Mathematical Institute of Burgundy, France)*, **Frédéric Mynard** *(New Jersey City University, USA)*



This textbook is an alternative to a classical introductory book in point-set topology. The approach, however, is radically different from the classical one. It is based on convergence rather than on open and closed sets.

Convergence of filters is a natural generalization of the basic and well-known concept of convergence of sequences, so that convergence theory is more natural and intuitive to many, perhaps most, students than classical topology. On the other hand, the framework of convergence is easier, more powerful and far-reaching which highlights a need for a theory of convergence in various branches of analysis.

Readership: Undergraduates, graduates and academia in the fields of analysis and topology.

568pp	**Jul 2016**	
978-981-4571-51-7	**US$145**	**£96**
978-981-4571-52-4(pbk)	**US$78**	**£51**

Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore - Vol 29

Forcing, Iterated Ultrapowers, and Turing Degrees

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

These are notes based on short courses given by three leading experts - Moti Gitik (Tel-Aviv University, Israel), Richard A Shore (Cornell, USA) and John Steel (UC Berkeley). The major topics covered set theory and recursion theory, with particular emphasis on forcing, inner model theory and Turing degrees, offering a wide overview of ideas and techniques introduced in contemporary research in the field of mathematical logic.

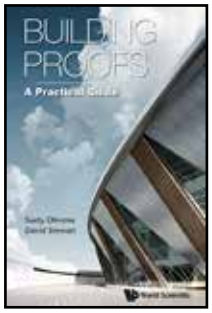
Readership: Graduate students in mathematics, and researchers in logic, set theory and computability theory.

184pp	**Sep 2015**	
978-981-4699-94-5	**US$90**	**£65**
978-981-4699-95-2(ebook)	**US$117**	**£85**

Building Proofs

A Practical Guide

by **Suely Oliveira & David Stewart** *(The University of Iowa, USA)*



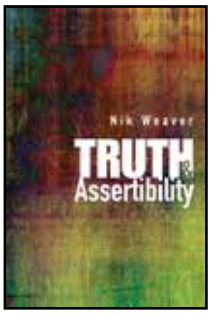
Just beyond the standard introductory courses on calculus, theorems and proofs become central to mathematics. Students often find this emphasis difficult and new.This book introduces students to the art and craft of writing proofs, beginning with the basics of writing proofs and logic, and continuing on with more in-depth issues and examples of creating proofs in different parts of mathematics, as well as introducing proofs-of-correctness for algorithms. The creation of proofs is covered for theorems in both discrete and continuous mathematics, and in difficulty ranging from elementary to beginning graduate level.

Readership: Undergraduates, graduates students, teachers, high school students and general readers.

176pp	**Aug 2015**	
978-981-4641-29-6	**US$58**	**£38**
978-981-4641-30-2(pbk)	**US$24**	**£16**

Truth and Assertibility

by **Nik Weaver** *(Washington University in St. Louis, USA)*



The book is a research monograph on the notions of truth and assertibility as they relate to the foundations of mathematics. It is aimed at a general mathematical and philosophical audience. The central novelty is an axiomatic treatment of the concept of assertibility. This provides us with a device that can be used to handle difficulties that have plagued philosophical logic for over a century. The approach in this book will be of interest not only for the uses the author has put it to, but also as a flexible tool that may have many more applications in logic and the foundations of mathematics.

Readership: Undergraduates, graduates and researchers in mathematics, logic and philosophy.

204pp	**Jun 2015**	
978-981-4619-95-0	**US$98**	**£71**
978-981-4619-97-4(ebook)	**US$127**	**£92**

Notable Backlist

Forcing for Mathematicians
Nik Weaver *(Washington University in St. Louis, USA)*

Saturated Model Theory (2nd Edition)
Gerald E Sacks *(Harvard University, USA)*

Mathematical Logic in the 20th Century
Gerald E Sacks *(Harvard University & Massachusetts Institute of Technology, USA)*

Discrete Mathematics: Proof Techniques and Mathematical Structures
R C Penner *(University of Southern California)*

MATHEMATICAL PHYSICS & RELATED TOPICS

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 Newtonian-Eulerian mechanics, from an advanced and unified viewpoint. Yet, the presentation is eminently readable and inclusive. It is complemented by many remarks and completely solved nontrivial examples, along with many problems (all with their answers and many with hints). No volume of such comprehensiveness, level, readability (multiple complementary notations, clear figures) and extensive list of references / bibliography has ever been written, in any language. The author, based on his experience with his other mechanics books, can confidently state that this unique, rigorous, yet reader-friendly, work will become quite popular and, properly marketed, a best seller in the field.

Readership: Teachers and researchers in engineering, physics, and applied mathematics.

1680pp	**Jun 2017**	
978-981-4603-04-1(Set)	**US$384**	**£276**
978-981-4603-05-8(Set)(ebook)	**US$499**	**£359**

Strong Uniformity and Large Dynamical Systems

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

It is the first book about a new aspect of Uniform distribution, called Strong Uniformity. Besides developing the theory of Strong Uniformity, the book also includes novel applications in the underdeveloped field of Large Dynamical Systems.

Readership: Researchers in dynamical systems and ergodic theory and statistical physics.

230pp	**May 2017**	
978-981-4740-74-6	**US$114**	**£82**
978-981-4740-75-3(ebook)	**US$148**	**£107**

Quantum Systems over Local Fields and Finite Approximations

by **Trond Digernes** *(The Norwegian University of Science and Technology (NTNU), Norway)*

In this volume various aspects of non-Archimedean quantum systems are discussed, such as spectral properties of their Schrödinger operators, and their ability to be approximated by finite systems. Non-Archimedean stochastic methods are also discussed. These will be illustrated by numerical results and graphics

Readership: Researchers in mathematical physics, quantum physics and quantum mechanics.

150pp	**Mar 2017**	
978-981-4713-49-8	**US$90**	**£65**
978-981-4713-50-4(ebook)	**US$117**	**£85**

Dynamics of Mechatronics Systems

Modelling, Simulation, Control, Optimization and Experimental Investigations

by **Jan Awrejcewicz, Donat Lewandowski & Paweł Olejnik** *(Lodz University of Technology, Poland)*

This book describes interplay of mechanics, electronics, electrotechnics, automation and or biomechanics. It provides a theoretical background of analysis of various kinds of mechatronics or systems, and it presents their computational analysis, control, optimization as well as or laboratory investigations. It captures problems ranging from applied physics, mechanics, electronics, electrotechnics, hydro/pneumomechanics, piezoelectricity, biomechanics, and hence is aimed at a wide range of readers.

Readership: Advanced undergraduate and graduate students, researchers and academics interested in dynamical systems.

350pp	**Jan 2017**	
978-981-3146-54-9	**US$118**	**£85**
978-981-3146-55-6(ebook)	**US$153**	**£111**

Lecture Notes in Topics in Path Integrals and String Representations

by **Luiz C L Botelho** *(Federal Fluminense University, Brazil)*

Functional Integrals is well-established in mathematical physics, especially those mathematical methods used in modern non-perturbative quantum field theory and string theory. This book presents a unique, original and modern treatment of strings representations on Bosonic Quantum Chromodynamics and Bosonization theory on 2d Gauge Field Models, besides of rigorous mathematical studies on the analytical regularization scheme on Euclidean quantum field path integrals and stochastic quantum field theory. It follows an analytic approach based on Loop space techniques, functional determinant exact evaluations and exactly solubility of four dimensional QCD loop wave equations through Elfin Botelho fermionic extrinsic self avoiding string path integrals.

Readership: Applied mathematicians, mathematical physicists and theoretical physicists.

250pp	**Jan 2017**	
978-981-3143-46-3	**US$98**	**£71**
978-981-3143-47-0(ebook)	**US$127**	**£92**

:: New Edition

An Introduction to Geometrical Physics (2nd Edition)

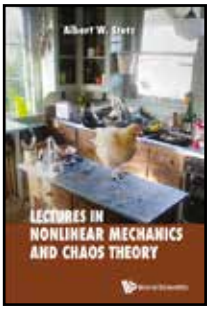
by **Ruben Aldrovandi & José Geraldo Pereira** *(Instituto de Física Teórica - UNESP, Brazil)*

This book focus on the unifying power of the geometrical language in bringing together concepts from many different areas of physics, ranging from classical physics to the theories describing the four fundamental interactions of Nature — gravitational, electromagnetic, strong nuclear, and weak nuclear. It provides a thorough introduction to topology and differential geometry, as well as many applications to both mathematical and physical problems. In addition, it discusses also some recent advances such as de Sitter invariant special relativity, teleparallel gravity and their implications in cosmology.

Readership: Graduate students and profession researchers.

840pp	**Nov 2016**	
978-981-3146-80-8	**US$174**	**£125**
978-981-3146-81-5(pbk)	**US$88**	**£63**
978-981-3146-82-2(ebook)	**US$226**	**£163**

Lectures on Nonlinear Mechanics and Chaos Theory



by **Albert W Stetz** *(Oregon State University, USA)*

Key Features:

- Presents chaos theory as a logical consequence of the traditional formulation of classical mechanics
- Fine-tuned to the requirements of a graduate course in physics
- Contains numerous computer-drawn figures illustrating the behavior of chaotic systems, figures that are not available in any other book
- Contains homework exercises and a selection of more detailed computational projects

Readership: Students who want to learn nonlinear mechanics and chaos theory from first principles.

150pp	**Aug 2016**	
978-981-3141-35-3	**US$70**	**£50**
978-981-3143-02-9(pbk)	**US$35**	**£25**

Problems and Solutions

Nonlinear Dynamics, Chaos and Fractals

by **Willi-Hans Steeb** *(University of Johannesburg, South Africa)*

This book presents a collection of problems for nonlinear dynamics, chaos theory and fractals. Besides the solved problems, supplementary problems are also added. Each chapter contains an introduction with suitable definitions and explanations to tackle the problems. The material is self-contained, and the topics range in difficulty from elementary to advanced. While students can learn important principles and strategies required for problem solving, lecturers will also find this text useful, either as a supplement or text, since concepts and techniques are developed in the problems.

Readership: Graduate students who focus on chaos, fractals and nonlinear dynamics.

252pp	**May 2016**	
978-981-3109-92-6	**US$68**	**£45**
978-981-3140-87-5(pbk)	**US$35**	**£23**

World Scientific Series on Nonlinear Science Series A - Vol 90

Deterministic Chaos in One-Dimensional Continuous Systems

by **Jan Awrejcewicz** *(Lodz University of Technology, Poland)*, **Vadim A Krysko** *(Saratov State Technical University, Russia)*, **Irina V Papkova** *(Saratov State Technical University, Russia)* **& Anton V Krysko** *(Saratov State Technical University, Russia & Cybernetic Institute, National Research Tomsk Polytechnic University, Russia)*

This book focuses on the computational analysis of nonlinear vibrations of structural members (beams, plates, panels, shells), where the studied dynamical problems can be reduced to the consideration of one spatial variable and time.

Readership: Post-graduates, applied mathematicians, physicists, mechanical and civil engineers.

576pp	**May 2016**	
978-981-4719-69-8	**US$174**	**£125**
978-981-4719-70-4(ebook)	**US$226**	**£163**

Probability and Randomness

Quantum versus Classical

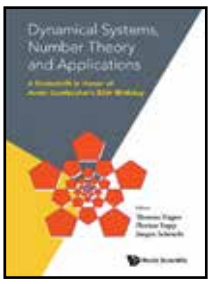
by **Andrei Khrennikov** *(Linnaeus University, Sweden)*

Creating a rigorous mathematical theory of randomness is far from being complete, even in the classical case. This book rectifies this and introduces mathematical formalisms of classical and quantum probability and randomness with brief discussion of their interrelation and interpretational and foundational issues. The book presents the essentials of classical approaches to randomness, enlightens their successes and problems, and then proceeds to essentials of quantum randomness.

Readership: Researchers in mathematical physics, probability and statistics.

300pp	**May 2016**	
978-1-78326-796-5	**US$118**	**£85**
978-1-78326-797-2(ebook)	**US$153**	**£111**

Dynamical Systems, Number Theory and Applications



edited by **Thomas Hagen** *(University of Memphis, USA)*, **Florian Rupp** *(German University of Technology, Oman)* **& Jürgen Scheurle** *(Technische Universität München, Germany)*

This volume consists of a selection of research-type articles on dynamical systems, evolution equations, analytic number theory and closely related topics. A strong emphasis is on a fair balance between theoretical and more applied work, thus spanning the chasm between abstract insight and actual application. Several of the articles are expected to be in the intersection of dynamical systems theory and number theory.

Readership: Researchers in algebra and number theory, dynamical systems and analysis and differential equations.

280pp	**Apr 2016**	
978-981-4699-86-0	**US$114**	**£82**
978-981-4699-87-7(ebook)	**US$148**	**£107**

:: New Edition

Biofluid Mechanics (2nd Edition)

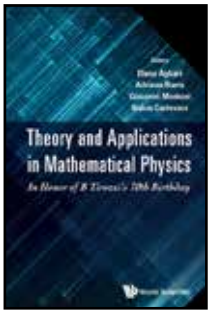
by **Jagannath Mazumdar** *(The University of Adelaide, Australia)*

This new edition presents an engineering analysis of the cardiovascular system relevant to the treatment of cardiovascular diseases and combines engineering principles. Included in the material of this volume are: the emerging interdisciplinary field of tissue engineering, which deals with the principles of engineering and life sciences toward the development of biological substitutes that restore, maintain and improve tissue function, and cellular and molecular bioengineering, which involves the mechanical, electrical and chemical processes of the human cell and tries to explain how cellular behaviour arises from molecular-level interactions.

Readership: Physiologists, Biophysicists, Biomathematicians and Bioengineers.

264pp	**Feb 2016**	
978-981-4713-97-9	**US$64**	**£46**
978-981-4719-00-1(ebook)	**US$83**	**£60**

Theory and Applications in Mathematical Physics



edited by **Elena Agliari, Adriano Barra** *("Sapienza" Universitàdi Roma, Italy),* **Nakia Carlevaro** *(ENEA, Italy)* & **Giovanni Montani** *(ENEA, Italy & "Sapienza" Universitàdi Roma, Italy)*

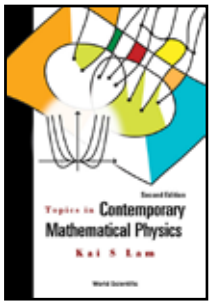
The aim of this volume is to make a connection among advanced mathematical tools and application to real problems. There are many different mathematical structures analyzed in the book and all of them are in important applications, like statistics and biology, neural networks and financial markets, asymptotic methods for partial differential equations and the problem of tsunami propagation.

Readership: Researchers in mathematical physics, complex systems and theoretical physics.

160pp	**Dec 2015**	
978-981-4713-27-6	**US$94**	**£68**
978-981-4713-28-3(ebook)	**US$122**	**£88**

:: New Edition

Topics in Contemporary Mathematical Physics (2nd Edition)



by **Kai S Lam** *(California State Polytechnic University, Pomona, USA)*

"This self-contained work still provides a useful introduction of basic ideas, structures, and results which have made a great impact on the development of mathematical physics."

Zentralblatt MATH

Readership: Upper level undergraduates, graduate students, lecturers and researchers in mathematical and theoretical physics.

852pp	**Nov 2015**	
978-981-4667-79-1	**US$128**	**£84**
978-981-4667-80-7(pbk)	**US$78**	**£51**

Methods of Differential Geometry in Classical Field Theories

k-Symplectic and k-Cosymplectic Approaches

by **Manuel de León** *(Instituto de Ciencias Matemáticas, Spain),* **Modesto Salgado** *(Universidade de Santiago de Compostela, Spain)* & **Silvia Vilariño** *(Centro Universitario de la Defensa, Spain)*

This book is devoted to review two of the most relevant approaches to the study of classical field theories of the first order, say k-symplectic and k-cosymplectic geometry. This approach is also compared with others like multisymplectic formalism.

Readership: Graduate students and researchers in classical field theories.

224pp	**Oct 2015**	
978-981-4699-75-4	**US$106**	**£76**
978-981-4699-76-1(ebook)	**US$138**	**£99**

Notable Backlist

Gauge Fields, Knots and Gravity
John Baez & Javier P Muniain *(UC Riverside)*

Lagrangian and Hamiltonian Mechanics
M G Calkin *(Dalhousie University)*

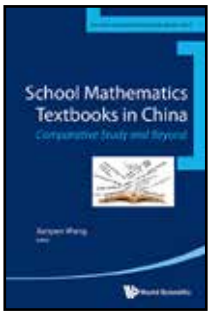
Modern Differential Geometry for Physicists (2nd Edition)
Chris J Isham *(Imperial College)*

MATHEMATICAL EDUCATION

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)*

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 include the representation of basic mathematical thought in school textbooks, a study on compilation features of elementary school textbooks, and a survey of effects in using new elementary school textbooks.

Readership: Researchers in mathematics education.

350pp	**Mar 2017**	
978-981-4713-93-1	**US$110**	**£73**
978-981-4713-94-8(pbk)	**US$58**	**£38**
978-981-4713-95-5(ebook)	**US$143**	**£95**

Does Mathematical Study Develop Logical Thinking?

Testing the Theory of Formal Discipline

by **Matthew Inglis & Nina Attridge** *(Loughborough University, UK)*

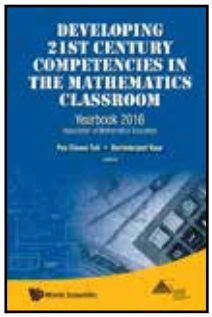
For centuries, educational policymakers believed that studying mathematics is important, in part because it develops general thinking skills that are useful throughout life. This 'Theory of Formal Discipline' (TFD) has been used as justification of mathematics education globally. This book describes a rigorous investigation of TFD. It reviews TFD's history and prior research on the topic, followed by reports on a series of recent empirical studies. It argues that, contrary to the position held by sceptics, advanced mathematical study does develop certain general thinking skills, however these are much more restricted than those typically claimed by TFD proponents.

Readership: Students, researchers and policymakers in education, further education and mathematics.

225pp	**Dec 2016**	
978-1-78634-068-9	**US$102**	**£73**
978-1-78634-069-6(ebook)	**US$133**	**£95**

Developing 21st Century Competencies in the Mathematics Classroom

Yearbook 2016, Association of Mathematics Educators



edited by **Pee Choon Toh & Berinderjeet Kaur** *(NTU, Singapore)*

The aim of this book is to contribute towards literature in the field of mathematics education, specifically the development of 21st century competencies amongst learners of mathematics. The book comprising fourteen chapters, written by renowned researchers in mathematics education, provides readers with approaches and applicable classroom strategies to foster skills and dispositions that will enable learners to thrive in the fast-changing and complex world that we live in today.

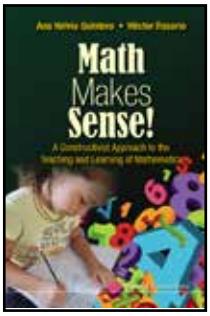
Readership: Graduate students, researchers, practitioners and teachers in mathematics.

300pp	**Jul 2016**	
978-981-3143-60-9	**US$78**	**£56**
978-981-3143-62-3(ebook)	**US$101**	**£73**

Math Makes Sense!

A Constructivist Approach to the Teaching and Learning of Mathematics

by **Ana Helvia Quintero** *(University of Puerto Rico)*, **Héctor Rosario** *(North Carolina School of Science and Mathematics, USA)*



This book makes use of the realistic mathematics education (RME) philosophy, which bridges the gap between informal mathematics learning (such as in day-to-day life) and more formal teaching in school. Many real-life situations as examples for learning are included, as well as different mathematical and logic puzzles that will stimulate learning and foster understanding. The ideas presented are not confined to one national curriculum.

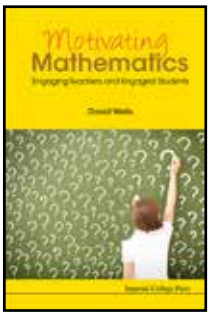
Readership: Teachers, trainee teachers, researchers interested in mathematics education, homeschool parents, and parents with children in primary/ elementary school.

292pp	**Apr 2016**	
978-1-78326-863-4	**US$78**	**£51**
978-1-78326-864-1(pbk)	**US$38**	**£25**
978-1-78326-865-8(ebook)	**US$101**	**£66**

Motivating Mathematics

Engaging Teachers and Engaged Students

by **David Wells** *(Fox & Howard Literary Agency, UK)*



"It is a great tool for everyone interested in mathematics education; Wells's conclusions are worth understanding and provide a valuable resource for teachers who need support in causing a big shift in their classrooms."

Mathematics Teaching
The Association of Teachers of Mathematics

Readership: Students of maths education and interested parents, professional mathematics teachers and teacher trainers (providers of Continuous Professional Development), and policy makers.

312pp	**Dec 2015**	
978-1-78326-752-1	**US$62**	**£41**
978-1-78326-753-8(pbk)	**US$34**	**£22**

Directions for Mathematics Research Experience for Undergraduates

edited by **Mark A Peterson** *(Mount Holyoke College, USA)*, **Yanir A Rubinstein** *(University of Maryland, USA)*

"The US National Science Foundation (NSF) Research Experiences for Undergraduates (REU) program in mathematics is now 25 years old, and it is a good time to think about what it has achieved, how it has changed, and where this idea will go next." The circle of ideas is brought forward here. Among the contributors are Ravi Vakil (Stanford), Haynes Miller (MIT), and Carlos Castillo-Chavez (Arizona, President's Obama Committee on the National Medal of Science 2010 – 2012). This book should serve as a source book for anyone interested in teaching mathematics and in incorporating research-like experiences in mathematics classes at any level, as well as designing research experiences for undergraduates outside of the classroom.

Readership: Undergraduates, practitioners and teachers in mathematics.

252pp	**Dec 2015**	
978-981-4630-31-3	**US$94**	**£68**
978-981-4630-32-0(ebook)	**US$122**	**£88**

Elementary School Mathematics for Parents and Teachers

by **Raz Kupferman** *(The Hebrew University, Israel)*

Volume 1

This book covers the elementary school mathematics curriculum common in most parts of the world. Its aim is to serve educators (teachers and parents) as a guide for teaching mathematics at elementary school level. The book focuses both on content knowledge and on pedagogical content knowledge. It bridges the gap between fundamental mathematical principles and good teaching practices. It also offers the reader a glimpse on how mathematicians perceive elementary mathematics and presents ideas for specific mathematical activities.

Volume 2

This volume focuses on content taught in the higher grades of elementary school. It covers the following topics: multiplication and division of multi-digit numbers, divisibility and primality, divisibility signs, sequences, fractions and their representations, and fraction arithmetic.

Readership: Elementary school teachers; parents of elementary school children (whether through home schooling or in public education, through PTA activity, and others) or anyone who wishes to rediscover the mathematics they studied at a young age from a more mature point of view.

Volume 1

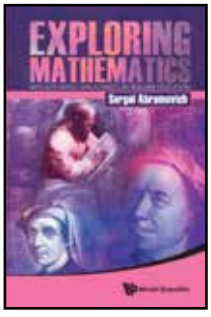
268pp	**Dec 2015**	
978-981-4699-90-7	**US$78**	**£51**
978-981-4699-91-4(pbk)	**US$38**	**£25**

Volume 2

270pp	**Jan 2017**	
978-981-3108-92-9	**US$78**	**£51**
978-981-3108-93-6(pbk)	**US$42**	**£28**

Exploring Mathematics with Integrated Spreadsheets in Teacher Education

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



This book aims to technologically enhance the preparation of mathematics schoolteachers using an electronic spreadsheet integrated with Maple and Wolfram Alpha — digital tools capable of sophisticated symbolic computations. The content is a combination of mathematical ideas and concepts associated with pre-college problem solving curriculum and their extensions into more advanced mathematical topics. Consistent with current worldwide guidelines for technology-enhanced teacher preparation, it emphasizes the integration of context, mathematics, and technology as a method for teaching mathematics. A number of mathematics education documents developed around the world (Australia, Canada, England, Japan, Singapore, United States) are reviewed as appropriate.

Readership: Advanced secondary school students, prospective and practicing teachers of mathematics.

304pp	**Sep 2015**	
978-981-4678-22-3	**US$98**	**£65**
978-981-4689-90-8(pbk)	**US$48**	**£32**

Series on Mathematics Education

http://www.worldscientific.com/series/SME

Mathematics and its Teaching in the Muslim States

Vol. 13

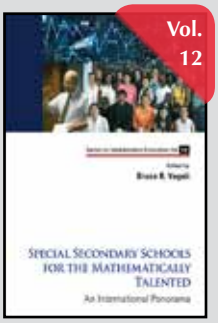
edited by **Bruce R Vogeli** *(Columbia University, USA)*, **Mohamed El Tom** *(Khartoum Technical University, Sudan)*

This anthology reviews the history, current states, and plans for development in fourteen 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.

300pp	**Oct 2016**	
978-981-3146-77-8	**US$128**	**£92**
978-981-3146-78-5(ebook)	**US$166**	**£120**

Special Secondary Schools for the Mathematically Talented



An International Panorama

edited by **Bruce R Vogeli** *(Columbia University, USA)*

"Much of the book appears to be of most use to policy-makers and researchers. It is lucidly written and well-edited to bring together a large number of different voices in a way that is easy to read and understand."

Mathematics in School

Readership: Researchers and general public who are interested about special schools and gifted education in mathematics.

456pp	**Oct 2015**	
978-981-4667-46-3	**US$162**	**£117**
978-981-4667-47-0(ebook)	**US$211**	**£152**

Lesson Study

Challenges in Mathematics Education

edited by **Maitree Inprasitha** *(Khon Kaen University, Thailand)*, **Masami Isoda** *(University of Tsukuba, Japan)*, **Patsy Wang-Iverson** *(The Gabriella & Paul Rosenbaum Foundation, USA)* & **Ban-Har Yeap** *(Marshall Cavendish Institute, Singapore)*

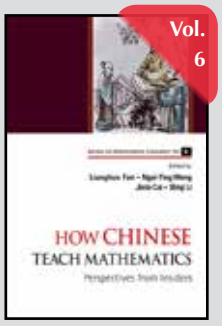
"This book is accessible for teachers who have never used this method as well as those who look to further augment their practice. "

Mathematics Teaching in the Middle School

Readership: Mathematics educators of teacher training colleges, mathematics teachers, prospective teachers (elementary and secondary school) and undergraduate students in mathematics.

392pp	**May 2015**	
978-981-283-540-6	**US$98**	**£65**
978-981-283-541-3(pbk)	**US$48**	**£32**
978-981-283-542-0(ebook)	**US$127**	**£85**

How Chinese Teach Mathematics



Perspectives from Insiders

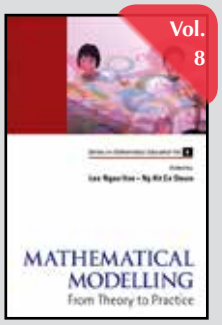
edited by **Lianghuo Fan** *(The University of Southampton, UK)*, **Ngai-Ying Wong** *(The Chinese University of Hong Kong, Hong Kong)*, **Jinfa Cai** *(The University of Delaware, USA)* & **Shiqi Li** *(East China Normal University, China)*

This unique book represents another concerted research effort concerning Chinese mathematics education, with contributions from the world's leading scholars and most active researchers. The book presents the latest original research work with a particular focus on the "teaching" side of Chinese mathematics education to a wide international audience.

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

756pp	**May 2015**	
978-981-4415-81-1	**US$192**	**£138**
978-981-4415-82-8(ebook)	**US$250**	**£179**

Mathematical Modelling



From Theory to Practice

edited by **Ngan Hoe Lee, Dawn Kit Ee Ng** *(National Institute of Education, NTU, Singapore)*

The main goal of Mathematical Modelling Outreach (MMO) was to reach out to Singapore primary and secondary schools and introduce the potentials of mathematical modelling as a platform for eliciting mathematical thinking, communication, and reasoning among students. This book suggests how theoretical perspectives on mathematical modelling can be transformed into actual practice in schools, all within the existing infrastructure of the current Singapore mathematics curriculum.

Readership: Graduate students and researchers in mathematics education; mathematics educators.

256pp	**Mar 2015**	
978-981-4546-91-1	**US$106**	**£76**
978-981-4546-92-8(ebook)	**US$138**	**£99**

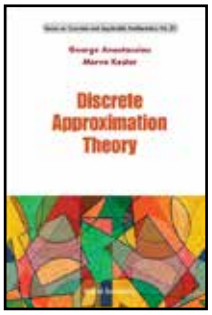
Other titles in this series
Mathematics Education in Korea: Volume 2: Contemporary Trends in Researches in Korea
Mathematics and Its Teaching in the Southern Americas: with An Introduction by Ubiratan D'Ambrosio
Primary Mathematics Standards for Pre-Service Teachers in Chile: A Resource Book for Teachers and Educators
Mathematics Education in Korea: Volume 1: Curricular and Teaching and Learning Practices
Russian Mathematics Education: Programs and Practices
Russian Mathematics Education: History and World Significance
Mathematics Education: The Singapore Journey
How Chinese Learn Mathematics: Perspectives from Insiders

NUMERICAL ANALYSIS & APPROXIMATION

Series on Concrete and Applicable Mathematics - Vol 20

Discrete Approximation Theory

by **George Anastassiou** *(University of Memphis, USA)*, **Merve Kester** *(Tusculum College, USA)*



Here our generalized discrete singular operators are of the following types: Picard, Gauss – Weierstrass and Poisson – Cauchy operators. We treat both the unitary and non-unitary, univariate and multivariate cases of these operators, which are not necessarily positive operators. The book's results are expected to find applications in many areas of pure and applied mathematics, and statistics. Chapters are self-contained and can be read independently and advanced courses can be taught out of this book.

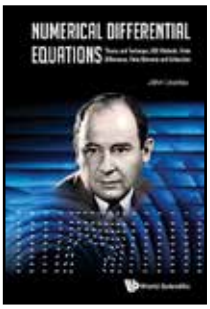
Readership: Graduate students and researchers in approximation theory.

316pp	**Jan 2017**	
978-981-3145-83-2	**US$115**	**£83**
978-981-3145-84-9(ebook)	**US$150**	**£108**

Numerical Differential Equations

Theory and Technique, ODE Methods, Finite Differences, Finite Elements and Collocation

by **John Loustau** *(Hunter College, City University of New York, USA)*



This text includes the three standard approaches to numerical PDE, FDM, FEM and CM, and the two most common time stepping techniques, FDM and Runge-Kutta. We present both the numerical technique and the supporting theory. Most importantly, the terminology is introduced, explained and developed as needed. The examples presented are taken from multiple vital application areas including finance, aerospace, mathematical biology and fluid mechanics.

Readership: Graduate students and researchers.

384pp	**May 2016**	
978-981-4719-49-0	**US$119**	**£86**
978-981-4719-50-6(ebook)	**US$155**	**£112**

Discrete Fourier and Wavelet Transforms

An Introduction through Linear Algebra with Applications to Signal Processing

by **Roe W Goodman** *(Rutgers University, USA)*

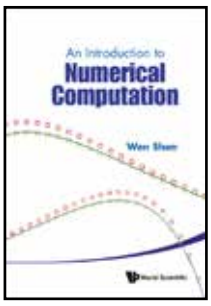
This textbook introduces the theory and applications of discrete Fourier and wavelet transforms using elementary linear algebra, without assuming prior knowledge of signal processing or advanced analysis. It is an accessible account based on ten years of classroom use. Computer explorations of signal and image processing are available in each chapter. Moreover, mathematical concepts clarified by more than 90 figures and 75 exercises with detailed solutions.

Readership: Undergraduate mathematics, science and engineering students interested in the theory and applications of discrete Fourier and wavelet transforms.

300pp	**Mar 2016**	
978-981-4725-76-7	**US$98**	**£65**
978-981-4725-77-4(pbk)	**US$48**	**£32**

An Introduction to Numerical Computation

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



Developed during ten years of teaching experience, this book serves as a set of lecture notes for an introductory course on numerical computation. Rather than surveying a large number of algorithms, the book presents the most important computational methods and emphasizes the underlying mathematical ideas. In most chapters, graphs and drawings are relied on, to build up intuition. These notes are supplemented by two sets of videos from the author's Youtube channel. A set of homework problems is included at the end of each chapter. A complete set of solutions is available for instructors, upon request.

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

268pp	**Dec 2015**	
978-981-4730-06-8	**US$78**	**£51**

Interdisciplinary Mathematical Sciences - Vol 19

Kernel-based Approximation Methods using MATLAB

by **Gregory Fasshauer** *(Illinois Institute of Technology, USA)*, **Michael McCourt** *(University of Colorado Denver, USA)*

This book presents modern theoretical results on kernel-based approximation methods and demonstrates their implementation in various settings. Examples are drawn from fields as diverse as function approximation, spatial statistics, boundary value problems, machine learning, surrogate modeling and finance. Researchers from those and other fields can recreate the results within using the documented MATLAB code, also available through the online library. This combination of a strong theoretical foundation and accessible experimentation empowers readers to use positive definite kernels on their own problems of interest.

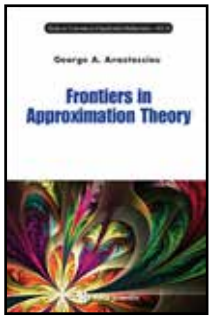
Readership: Graduate students and researchers.

536pp	**Sep 2015**	
978-981-4630-13-9	**US$85**	**£56**

Series on Concrete and Applicable Mathematics - Vol 16

Frontiers in Approximation Theory

by **George A Anastassiou** *(University of Memphis, USA)*



The first part of the book is dedicated to fractional monotone approximation theory introduced for the first time by the author, taking the related ordinary theory of usual differentiation at the fractional differentiation level with polynomials and splines as approximators. Next, it deals with approximation by discrete singular operators of the Favard style. Then, it continues in a very detailed and extensive chapter on approximation by interpolating operators induced by neural networks, a connection to computer science. This book ends with the approximation theory and functional analysis on time scales, a very modern topic, detailing all the pros and cons of this method.

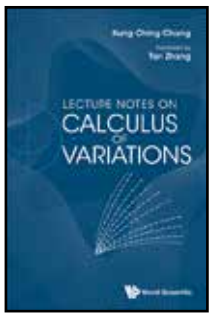
Readership: Graduate students and researchers in approximation theory.

228pp	**Aug 2015**	
978-981-4696-08-1	**US$106**	**£76**
978-981-4696-10-4(ebook)	**US$138**	**£99**

OPTIMIZATION & CONTROL

Lecture Notes on Calculus of Variations

by **Kung Ching Chang** *(Peking University, China)*
translated by **Tan Zhang** *(Murray State University, USA)*



This is based on the course "Calculus of Variations" taught at Peking University. The book contains 20 lectures covering both the theoretical background material as well as an abundant collection of applications. Lectures 1 – 8 focus on the classical theory of calculus of variations. Lectures 9 – 14 introduce direct methods along with their theoretical foundations. Lectures 15 – 20 showcase a broad collection of applications. The book offers a panoramic view of the very important topic on calculus of variations. This is a valuable resource not only to mathematicians, but also to those students in engineering, economics, and management, etc.

Readership: Undergraduates in calculus of variations.

400pp	**Nov 2016**	
978-981-3144-68-2	**US$128**	**£92**
978-981-3146-23-5(pbk)	**US$68**	**£49**

Computational Methods in the Fractional Calculus of Variations

by **Ricardo Almeida** *(University of Aveiro, Portugal)*, **Shakoor Pooseh** *(Technische Universität Dresden, Germany)* & **Delfim F M Torres** *(University of Aveiro, Portugal)*

"The theory developed in the book can be very useful in applications. This well-written monograph presents nontrivial generalizations of the calculus of variations and optimal control that opens doors to new and interesting modern scientific problems. Summing up, the book is suitable for graduate students in mathematics, physics and engineering, as well as for researchers interested in fractional calculus."

Zentralblatt MATH

Readership: Advanced undergraduate, graduate students and researchers in mathematics, physics and applied sciences.

280pp	**May 2015**	
978-1-78326-640-1	**US$78**	**£51**

Notable Backlist

Introduction to the Calculus of Variations (3rd Edition)
Bernard Dacorogna *(Ecole Polytechnique Fédérale Lausanne, Switzerland)*

Introduction to the Fractional Calculus of Variations
Agnieszka B Malinowska *(Bialystok University of Technology, Poland)* & Delfim F M Torres *(University of Aveiro, Portugal)*

Moments, Positive Polynomials and Their Applications
Jean Bernard Lasserre *(LAAS-CNRS & Institute of Mathematics, University of Toulouse, France)*

PROBABILITY & STATISTICS

:: New Edition

Probability Theory and Stochastic Processes with Applications (2nd Edition)

by **Oliver Knill** *(Harvard)*

This second edition has a unique approach that provides a broad and wide introduction into the fascinating area of probability theory. It starts on a fast track with the treatment of probability theory and stochastic processes by providing short proofs. The last chapter is unique as it features a wide range of applications in other fields like Vlasov dynamics of fluids, statistics of circular data, singular continuous random variables, Diophantine equations, percolation theory, random Schrö dinger operators, spectral graph theory, integral geometry, computer vision, and processes with high risk.

Readership: Undergraduate students, graduate students and researchers in probability theory and stochastic processes.

500pp	**May 2017**	
978-981-3109-48-3	**US$128**	**£84**
978-981-3109-49-0(pbk)	**US$58**	**£38**

Research Design and Statistical Analysis for Psychology Students

by **Rory Allen** *(Goldsmiths, University of London, UK)*

This book combines clear explanations of how and why experiments and statistical tests work, with a practical, hands-on training in statistical analysis and data processing. The approach draws on modern language training methods, teaching usable skills at every level and providing motivation for continued learning. It offers readers a single volume containing all they will need to plan, carry out and write up an end of course research project at undergraduate and graduate level. Accompanying the book is a unique set of online audio and visual resources that demonstrate the use of the standard statistical computer package, SPSS.

Readership: Students of undergraduate and graduate level psychology, and academics involved in research.

350pp	**May 2017**	
978-1-78634-064-1	**US$110**	**£73**
978-1-78634-065-8(pbk)	**US$58**	**£38**

Nonparametric Statistics

Theory and Methods

by **Jayant V Deshpande** *(Michigan State University, USA)*, **Uttara Naik-Nimbalkar** *(University of Pune, India)* & **Isha Dewan** *(Indian Statistical Institute, India)*

This book will introduce various types of data encountered in practice and suggest the appropriate nonparametric methods, discuss their properties through null and non-null distributions whenever possible and demonstrate the very minor loss in power and efficiency in the nonparametric method, if any. It will cover almost all topics of current interest such as bootstrapping, ranked set sampling, techniques for censored data and Bayesian analysis under nonparametric set ups.

Readership: Graduate and senior undergraduate students of statistics.

400pp	**May 2017**	
978-981-4663-57-1	**US$118**	**£85**
978-981-4663-58-8(ebook)	**US$153**	**£111**

Transforms in Quantum White Noise

by **Un Cig Ji** *(Chungbuk National University, Korea)*, **Nobuaki Obata** *(Tohoku University, Japan)*

This book is the first comprehensive monograph focusing on the recent developments of quantum white noise calculus and its applications. Quantum white noise calculus is a quantum extension of the Gaussian white noise calculus and provides a useful toolbox for the analysis of operators on Boson Fock space based on an infinite dimensional distribution theory of Schwartz type. The main purpose of this volume is to describe the new concept of quantum white noise derivatives, a kind of functional derivative for white noise operators. This idea leads to a new type of differential equations for white noise operators with applications in stochastic analysis and quantum physics. Development of quantum white noise derivative sheds fresh light on the study of Fock space operators.

Readership: Researchers in mathematical physics, stochastic analysis and quantum physics.

250pp	**Mar 2017**	
978-981-4635-54-7	**US$118**	**£85**
978-981-4635-56-1(ebook)	**US$153**	**£111**

White Noise

Functionals of Gaussian and Other Noises

by **Takeyuki Hida** *(Nagoya University & Meijo University, Japan)*, **Si Si** *(Aichi Prefectural University, Japan)*

We propose a new direction for stochastic analysis. Starting with a noise which is a system of i.i.d. idealized elemental random variables, we form polynomials in the noise and come to the space of generalized functionals of the noise with special emphasis on the Gaussian noise. New tools of analyzing these functionals are introduced. We further establish a harmonic analysis arising from the infinite dimensional rotation group which plays significant roles in white noise analysis. Many applications, in particular to quantum dynamics, have been shown. Functionals of other kind of noises are discussed. As a new approach, we discuss functionals of a space noise. There one can find similarity and dissimilarity as well as duality to the analysis of Poisson noise functionals.

Readership: Researchers in stochastic analysis, probability and statistics and mathematical physics.

300pp	**Mar 2017**	
978-981-4713-58-0	**US$114**	**£82**
978-981-4713-59-7(ebook)	**US$148**	**£107**

Robust Mixed Model Analysis

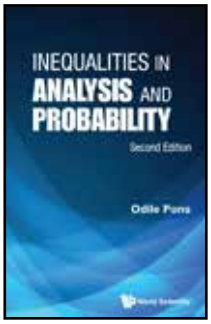
by **Jiming Jiang** *(UC Davis)*

Mixed-effects models have found broad applications in various fields. From a practical standpoint, the methods of inference about these models are robust to violation of model assumptions. Fortunately, there is a full scale of methods currently available that are robust in certain aspects. Learning about these methods is essential for the practice of mixed-effects models. This book provides a comprehensive account of methods of mixed model analysis that are robust in various aspects, such as violation of model assumptions, or to outliers.

Readership: Graduate students and researchers in statistics and biostatistics, and those who use mixed-effects models in genetics, medicine, agriculture, education, and surveys.

220pp	**Feb 2017**	
978-981-4733-83-0	**US$106**	**£76**
978-981-4733-84-7(ebook)	**US$138**	**£99**

Inequalities in Analysis and Probability (2nd Edition)



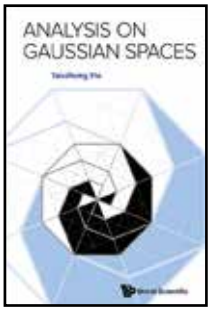
by **Odile Pons** *(French National Institute for Agronomical Research, France)*

This book introduces classical inequalities in vector and functional spaces with applications to probability. It also develops new extensions of the analytical inequalities, with sharper bounds and generalizations to the sum or the supremum of random variables, to martingales and to transformed Brownian motions. The proofs of many new results are presented in great detail. Original tools are developed for spatial point processes and stochastic integration with respect to local martingales in the plane.

Readership: Graduate students and researchers in probability and integration theory.

300pp	**Feb 2017**	
978-981-3143-98-2	**US$110**	**£79**
978-981-3143-99-9(ebook)	**US$143**	**£103**

Analysis on Gaussian Spaces



by **Yaozhong Hu** *(University of Kansas , USA)*

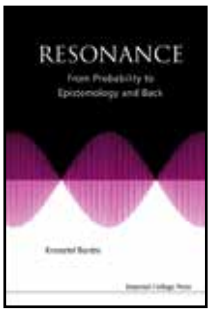
This book presents some fundamental results plus recent progress. We shall present some results on the Gaussian space itself such as the Brunn – Minkowski inequality, Small ball estimates, large tail estimates. The majority part of this book is devoted to the analysis of nonlinear functions on the Gaussian space. Derivative, Sobolev spaces are introduced, while the famous Poincaré inequality, logarithmic inequality, hypercontractive inequality, Meyer's inequality, Littlewood – Paley – Stein – Meyer theory are given in details. This book includes some basic material that cannot be found elsewhere that the author believes should be an integral part of the subject.

Readership: Graduate students and researchers in probability and stochastic processes and functional analysis.

480pp	**Nov 2016**	
978-981-3142-17-6	**US$148**	**£107**
978-981-3142-18-3(ebook)	**US$192**	**£139**

Resonance

From Probability to Epistemology and Back



by **Krzysztof Burdzy** *(University of Washington, USA)*

This book examines some building blocks of epistemology as a prelude to the careful analysis of the foundations of probability. The concept of resonance is introduced to shed light on the philosophical problems of induction, consciousness, intelligence and free will. The same concept is later applied to provide support for a new philosophical theory of probability.

Readership: Philosophers, statisticians and mathematicians, and readers who are interested in the fields of epistemology and probability.

400pp	**Jul 2016**	
978-1-78326-920-4	**US$144**	**£104**
978-1-78326-921-1(ebook)	**US$187**	**£135**

:: New Edition

Series on Quality, Reliability and Engineering Statistics - Vol 16

Lifetime Data (2nd Edition)

Statistical Models and Methods

by **Jayant V Deshpande & Sudha G Purohit** (*University of Pune, India*)

"This book presents a very good background in the analysis of life time data in reliability studies in a very lucid and comprehensive manner ... The reviewer would like to recommend this book to all those (particularly engineers) who intend to know more about the statistical models available for handling life time data of products."

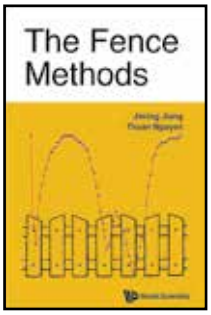
International Journal of Performability Engineering

Readership: Graduate students in probability, statistics, decision sciences, bioinformatics and industrial engineering.

304pp	**Feb 2016**	
978-981-4730-66-2	**US$78**	**£51**

The Fence Methods

by **Jiming Jiang** *(UC Davis)*, **Thuan Nguyen** *(Oregon Health & Science University, USA)*



This book is about a recently developed class of strategies, known as the fence methods, which fits particularly well in non-conventional and complex model selection problems with practical considerations. The idea involves a procedure to isolate a subgroup of what are known as correct models. This is accomplished by constructing a statistical fence, or barrier, to carefully eliminate incorrect models. The optimal model is then selected from amongst those within the fence according to a criterion which can be made flexible. A data-driven approach, called adaptive fence, which can be used in a wide range of problems involving determination of tuning parameters, or constants is introduced.

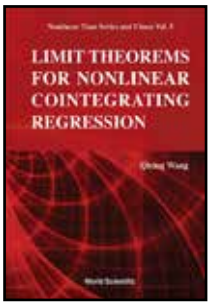
Readership: Graduates and researchers interested in a new class of strategies for model selection.

248pp	**Nov 2015**	
978-981-4596-06-0	**US$96**	**£69**
978-981-4596-07-7(ebook)	**US$125**	**£90**

Nonlinear Time Series and Chaos - Vol 5

Limit Theorems for Nonlinear Cointegrating Regression

by **Qiying Wang** *(The University of Sydney, Australia)*



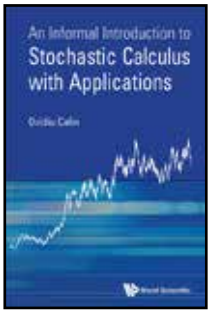
This book provides the limit theorems that can be used in the development of nonlinear cointegrating regression. The topics include weak convergence to a local time process, weak convergence to a mixture of normal distributions and weak convergence to stochastic integrals. This book also investigates estimation and inference theory in nonlinear cointegrating regression.

Readership: Graduate students and researchers interested in nonlinear cointegrating regression.

272pp	**Sep 2015**	
978-981-4675-62-8	**US$118**	**£85**
978-981-4675-63-5(ebook)	**US$153**	**£111**

An Informal Introduction to Stochastic Calculus with Applications

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



"A mathematical textbook has to introduce the necessary notions if it wants to follow the traditional path. The present textbook succeeds in giving a solution to the problem ... It is a useful addition to the literature of stochastic calculus."

Mathematical Reviews Clippings

Readership: Undergraduate and graduate students interested in stochastic processes.

332pp	**Aug 2015**	
978-981-4678-93-3	**US$98**	**£65**
978-981-4689-91-5(pbk)	**US$48**	**£32**
978-981-4678-94-0(ebook)	**US$127**	**£85**

Probability Theory

A Complete One-Semester Course

by **Nikolai Dokuchaev** *(Curtin University, Australia)*

This book provides a systematic, self-sufficient and yet short presentation of the mainstream topics on introductory Probability Theory with some selected topics from Mathematical Statistics. There is a sufficient number of problems and solutions to cover weekly tutorials. Supplementary PDF files of presentation slides are provided for lecturers who adopt the textbook

Readership: Undergraduate students, teachers and lecturers in Mathematics and Statistics.

224pp	**Aug 2015**	
978-981-4678-02-5	**US$48**	**£32**

Advanced Series on Statistical Science and Applied Probability - Vol 21

Change of Time and Change of Measure (2nd Edition)

by **Ole E Barndorff-Nielsen** *(Aarhus University, Denmark)*, **Albert Shiryaev** *(Steklov Mathematical Institute, Russia & Moscow State University, Russia)*

"This book is a beautiful and well-articulated monograph, full of information, where the interplay between deep mathematical ideas and extremely explicit applied financial problems and their solutions is generously exemplified. The style of presentation and the contents makes this enjoyable book ideal for a reader interested in going deeper in understanding the area or in having a panoramic view of it. For that category of readers, this book will certainly provide an opportunity to learn additional results and to establish beautiful connections between them, all of it elegantly illustrated with one of the most relevant and impressive applications of this mathematical field."

EMS Newsletter

Readership: Mathematical researchers, graduate students and practitioners interested in application of probabilistic theories & stochastic processes to economics & finance, and to turbulence.

344pp	**Jul 2015**	
978-981-4678-58-2	**US$68**	**£45**

Notable Backlist

A First Look at Rigorous Probability Theory (2nd Edition)
Jeffrey S Rosenthal *(University of Toronto, Canada)*

Expect the Unexpected: A First Course in Biostatistics
Raluca Balan & Gilles Lamothe *(University of Ottawa, Canada)*

World Scientific Series on Probability Theory and Its Applications

http://www.worldscientific.com/series/WSSPTA

Introduction to Stochastic Processes

Vol. 2

by **Mu-Fa Chen & Yong-Hua Mao** *(Beijing Normal University, China)*

The objective here is to introduce the elements of stochastic processes in a rather concise manner where we present the two most important parts in stochastic processes — Markov chains and stochastic analysis. The readers are lead directly to the core of the topics, and further details are collated in a section containing abundant exercises and more materials for further reading and studying. This volume also features modern probability theory that is used in the non-random fields, such as MCMC, convex geometry and number theory. It provides a new and direct routine for students going through the classical Markov chains to the modern stochastic analysis. It employs more modern techniques, such as coupling and duality, and functional inequalities with Dirichlet form.

Readership: Advanced undergraduate and graduate students in stochastic processes dealing with Markov chains and stochastic analysis.

280pp	**Mar 2017**	
978-981-4740-30-2	**US$78**	**£51**

Random Matrices and Random Partitions

Vol. 1

Normal Convergence

by **Zhonggen Su** *(Zhejiang University, China)*

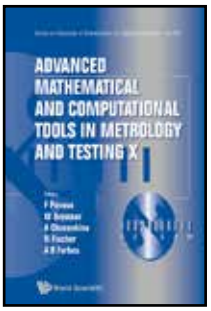
This book treats only second-order normal fluctuations for primary random variables from two classes of special random models. It is written in a clear, concise and pedagogical way. It may be read as an introductory text to further study probability theory of general random matrices, random partitions and even random point processes.

Readership: Graduates and researchers majoring in probability theory and mathematical statistics, especially for those working on Probability Limit Theory.

284pp	**Jun 2015**	
978-981-4612-22-7	**US$106**	**£76**
978-981-4612-23-4(ebook)	**US$138**	**£99**

Series on Advances in Mathematics for Applied Sciences - Vol 86

Advanced Mathematical and Computational Tools in Metrology and Testing X



edited by **Franco Pavese** *(Istituto Nazionale di Ricerca Metrologica, Italy)*, **Wolfram Bremser** *(Bundesanstalt fur Materialforschung und prufung, Germany)*, **Anna Chunovkina** *(Institute for Metrology "D I Mendeleyev", Russia)*, **Nicolas Fischer** *(Laboratoire National de Metrologie et d'Essais, France)* & **Alistair B Forbes** *(National Physical Laboratory, UK)*

"This volume, and indeed the whole series, is an important contribution to the understanding of metrology in the modern, intercontinental world."

CrossMark

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

448pp	**Jun 2015**	
978-981-4678-61-2	**US$158**	**£114**
978-981-4678-62-9(ebook)	**US$205**	**£148**

POPULAR & RECREATIONAL MATHEMATICS

Navigating across Mathematical Cultures and Times

Exploring the Diversity of Discoveries and Proofs

edited by **Ioannis M Vandoulakis** *(The Hellenic Open University, Greece)*, **Dun Liu** *(Chinese Academy of Sciences, China)*

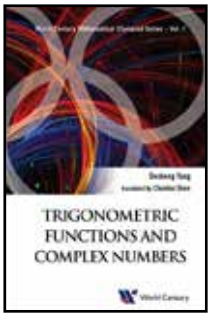
This volume explores how mathematical propositions are discovered, how they are demonstrated in various mathematical cultures — ancient Greece, classical Islam, medieval and modern Europe, India, China, and pre-modern Japan — and how they are shaped in texts and stylistic traditions.

Readership: Advanced undergraduates, graduate, and post-graduate students; Mathematicians; Historians; Philosophers; Specialists in Mathematics Education and in Comparative Cultural Studies.

600pp	**Apr 2017**	
978-981-4689-36-6	**US$113**	**£81**
978-981-4689-37-3(ebook)	**US$147**	**£105**

World Century Mathematical Olympiad Series

Trigonometric Functions and Complex Numbers



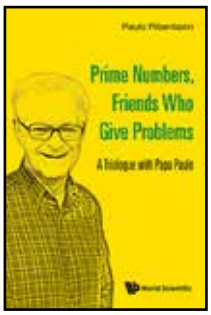
by **Desheng Yang** *(Shanghai Xiangming High School, China)*
translated by **Chunhui Shen** *(Shanghai Xiangming High School, China)*

This book covers the followings areas in the International Mathematical Olympiad (IMO) and other mathematical competitions. Contents include: 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 number, trigonometric form of a complex number, complex number and equation.

Readership: School students, coaches and instructors of mathematical competitions.

300pp	**Dec 2016**	
978-1-938134-86-9(pbk)	**US$35**	**£25**

Prime Numbers, Friends Who Give Problems



A Trialogue with Papa Paulo

by **Paulo Ribenboim** *(Queen's University, Canada)*

This book, written as a trialogue, with two persons who are interested in prime numbers asking the author, Papa Paulo, intelligent questions. Starting at a very elementary level, the book advances steadily, covering all important topics of the theory of prime numbers, up to the most famous problems. Humorous conversations and the inclusion of a back-story add to the book's uniqueness. Concepts and results are explained with great care.

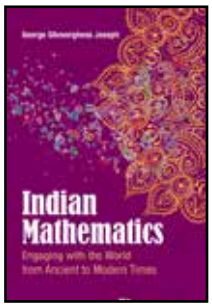
Readership: College students, high school teachers and beginners interested in number theory and important facts about prime numbers.

310pp	**Sep 2016**	
978-981-4725-80-4	**US$75**	**£50**
978-981-4725-81-1(pbk)	**US$38**	**£25**
978-981-4725-82-8(ebook)	**US$98**	**£65**

Indian Mathematics

Engaging with the World from Ancient to Modern Times

by **George Gheverghese Joseph** *(NUS, Singapore & University of Manchester, UK & McMaster University, Canada)*



This book gives an insight into the history of mathematics within a historical global context. It builds on research into the connection between mathematics and the world-wide advancement of economics and technology. Joseph draws out parallel developments in other cultures and carefully examines the transmission of mathematical ideas across geographical and cultural borders.

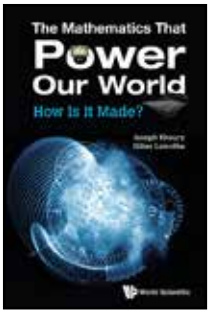
Readership: General audience who have an interest in the global history of mathematical ideas, historians, philosophers and sociologists.

400pp	**Aug 2016**	
978-1-78634-060-3	**US$98**	**£65**
978-1-78634-061-0(pbk)	**US$48**	**£32**
978-1-78634-062-7(ebook)	**US$127**	**£85**

The Mathematics That Power Our World

How Is It Made?

by **Joseph Khoury & Gilles Lamothe** *(University of Ottawa, Canada)*



This book is an attempt to unveil the hidden mathematics behind the functioning of many of the devices we use on a daily basis. Many of the elegant and seemingly theoretical concepts of mathematics are linked to state-of-the-art technologies. The topics of the book are selected carefully to make that link more relevant. They include: digital calculators, basics of data compression and the Huffman coding, the JPEG standard for data compression, the GPS system studied both from the receiver and the satellite ends, image processing and face recognition.

Readership: Advanced high school students, undergraduates and teachers.

204pp	**Jul 2016**	
978-981-4730-84-6	**US$55**	**£40**
978-981-3144-08-8(pbk)	**US$28**	**£20**
978-981-4730-85-3(ebook)	**US$72**	**£52**

Circularity

A Common Secret to Paradoxes, Scientific Revolutions and Humor

by **Ron Aharoni** *(Technion, Israel)*

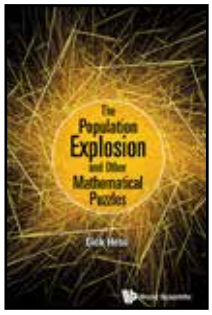
"Circularity" is the story of a Janus-faced conceptual structure, that on the one hand led to deep scientific discoveries, and on the other hand is used to trick the mind into believing the impossible. Alongside mathematical revolutions that eventually led to the invention of the computer, the book describes ancient paradoxes that arise from circular thinking. Another aspect of circularity, its ability to entertain, leads to a surprising insight on the time old question "What is humor".

Readership: Researchers in mathematics, philosophy and general public.

180pp	**Jun 2016**	
978-981-4723-67-1	**US$58**	**£38**
978-981-4723-68-8(pbk)	**US$28**	**£18**
978-981-4723-69-5(ebook)	**US$75**	**£49**

The Population Explosion and Other Mathematical Puzzles

by **Dick Hess**



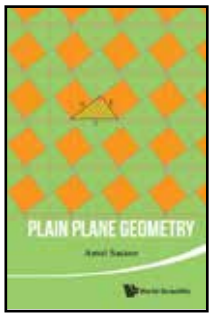
This book is a wonderful addition to Dr Dick Hess's previous successful books. In this latest volume, there are 116 recreational mathematical puzzles and problems that will challenge and entertain bright minds. They are mostly new problems on creative themes, encompassing a wide range of difficulty from amusing to complex. Intended to hone mathematical thinking skills and reasoning ability, solving the puzzles may require considerable perseverance. While most of these puzzles can be solved by pencil and paper analysis, there are some that are best tackled with a computer to find a solution. Be prepared to keep your wits about you!

Readership: Students, general public, professionals.

164pp	**May 2016**	
978-981-4740-97-5	**US$48**	**£32**
978-981-4733-75-5(pbk)	**US$28**	**£18**
978-981-4733-76-2(ebook)	**US$62**	**£42**

Plain Plane Geometry

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



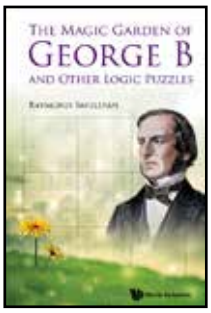
The book constitutes an elementary course on Plane Euclidean Geometry. It is a concise book treating the subject axiomatically, but since it is meant to be a first introduction to the subject, excessive rigour is avoided, making it appealing to a younger audience as well. Each section contains several problems, which are not purely drill exercises, but are intended to introduce a sense of "play" in mathematics, and inculcate appreciation of the elegance and beauty of geometric results. There is an abundance of colour pictures illustrating results and their proofs. A section on hints and a further section on detailed solutions to all exercises are available.

Readership: Advanced high school, pre-university and undergraduate students in mathematics.

288pp	**Feb 2016**	
978-981-4740-43-2	**US$95**	**£63**
978-981-4740-44-9(pbk)	**US$48**	**£32**

The Magic Garden of George B and Other Logic Puzzles

by **Raymond Smullyan** *(Indiana University, USA)*



"This latest book by Raymond Smullyan follows a similar format, offering a mixture of interesting puzzles, "monkey tricks" designed to catch the reader out, dreadful jokes, and insights into serious mathematics. If you have enjoyed Smullyan's previous books this one is self-recommending."

London Mathematical Society Newsletter

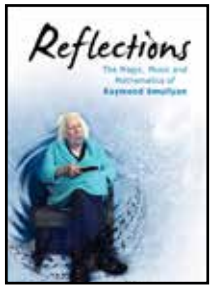
Readership: General public who is interested in logic puzzles, researchers in boolean algebra.

180pp	**Jun 2015**	
978-981-4675-05-5	**US$58**	**£38**
978-981-4678-55-1(pbk)	**US$29**	**£19**
978-981-4675-06-2(ebook)	**US$75**	**£49**

Reflections

The Magic, Music and Mathematics of Raymond Smullyan

by **Raymond Smullyan** *(Indiana University, USA)*



"We read of Smullyan's recollections of incidents in his past that support the images of a man who enjoys logic, music, mathematics, puns etc. If you have enjoyed any of Smullyan's books and wish to know more about the author, you will enjoy this breezy set of reflections as well."

Mathematical Association of America

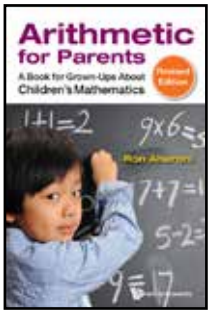
Readership: Music enthusiasts, piano society, math and logic enthusiasts, people interested in magic, people interested in Taoist philosophy, etc.

224pp	**Jun 2015**	
978-981-4644-58-7	**US$65**	**£43**
978-981-4663-19-9(pbk)	**US$29**	**£19**
978-981-4644-59-4(ebook)	**US$85**	**£56**

Arithmetic for Parents (Revised Edition)

A Book for Grown-Ups About Children's Mathematics

by **Ron Aharoni** *(Technion, Haifa, Israel)*



"I highly recommend the book to parents who have math phobias as well as those who want to brush up on their math skills to assist their children with homework assignments. It will give parents the confidence to help their children succeed and thrive in mathematics."

Mathematics Teaching in the Middle School

Readership: Parents whose children study elementary mathematics, practioners who provide mathematical learning, and the general public.

212pp	**May 2015**	
978-981-4602-89-1	**US$58**	**£38**
978-981-4602-90-7(pbk)	**US$26**	**£17**
978-981-4602-91-4(ebook)	**US$75**	**£49**

Problem Solving in Mathematics and Beyond

http://www.worldscientific.com/series/PSMB

Strategy Games to Enhance Problem-Solving Ability in Mathematics

Vol. 5

by **Alfred S Posamentier** *(Long Island University, USA)*, **Stephen Krulik** *(Temple University, USA)*

Games are seen only for recreation. However, this book shows that games can be used to strengthen problem-solving skills and beyond. This book presents strategy games and discusses for each one solutions towards a winning position in the game. In most cases, these strategies are analogous to problem-solving strategies in mathematics. Readers are also exposed to a wide variety of games from several different cultures, which will broaden the perspective of the readers.

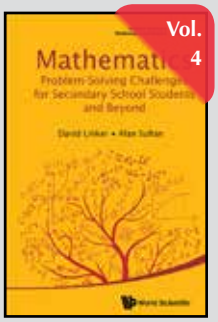
Readership: Students and general public interested in mathematics in strategy games and problem solving.

180pp	**Feb 2017**	
978-981-3146-33-4	**US$45**	**£32**
978-981-3146-34-1(pbk)	**US$24**	**£17**
978-981-3146-35-8(ebook)	**US$59**	**£42**

Mathematics Problem-Solving Challenges for Secondary School Students and Beyond

Vol. 4

by **David Linker & Alan Sultan** *(City University of New York, USA)*



This book is a rare resource consisting of problems and solutions similar to those seen in mathematics contests from around the world. It is an excellent training resource for high school students who plan to participate in mathematics contests, and a wonderful collection of problems that can be used by teachers who wish to offer their advanced students some challenging nontraditional problems to work on to build their problem solving skills. It is also an excellent source of problems for the mathematical hobbyist who enjoys solving problems on various levels.

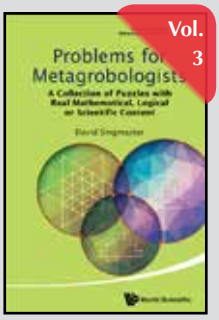
Readership: High school students, teachers and general public interested in exciting mathematics problems.

196pp	**Apr 2016**	
978-981-4730-03-7(pbk)	**US$28**	**£18**
978-981-4730-04-4(ebook)	**US$36**	**£23**

Problems for Metagrobologists

A Collection of Puzzles with Real Mathematical, Logical or Scientific Content

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



This book is a collection of over 200 problems that David Singmaster has composed since 1987. Some of the math problems have appeared in his various puzzle columns for BBC Radio and TV, Canadian Broadcasting, Focus (the UK popular science magazine), Games and Puzzles, the Los Angeles Times, Micromath, the Puzzle a Day memo pad and the Weekend Telegraph. While some of these are already classics, many of the puzzles have not been published elsewhere previously.

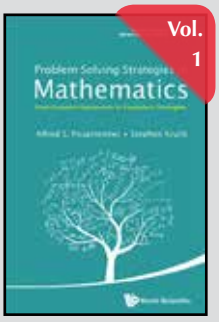
Readership: General public.

248pp	**Apr 2016**	
978-981-4663-63-2	**US$58**	**£38**
978-981-4663-64-9(pbk)	**US$28**	**£18**
978-981-4663-65-6(ebook)	**US$75**	**£49**

Problem-Solving Strategies in Mathematics

From Common Approaches to Exemplary Strategies

by **Alfred S Posamentier** *(Long Island University, USA)*, **Stephen Krulik** *(Temple University, USA)*



"I recommend this book to anyone interested in furthering his or her understanding of problem-solving strategies. I would encourage those individuals to read the book, become familiar with the ten strategies, and then spend some time working through the given problems before reviewing the solutions provided because it will most likely offer some new insight and thinking into the problem."

Mathematics Teaching in the Middle School

Readership: Undergraduates and general public interested in Mathematics.

188pp	**May 2015**	
978-981-4651-62-2	**US$54**	**£36**
978-981-4651-63-9(pbk)	**US$24**	**£16**

Mathematical Olympiad Series

http://www.worldscientific.com/series/MOS

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. 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.

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

350pp	**Feb 2017**	
978-981-3143-74-6	**US$78**	**£56**
978-981-3142-93-0(pbk)	**US$38**	**£27**
978-981-3142-94-7(ebook)	**US$101**	**£73**

Solving Problems in Geometry

Insights and Strategies

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

Vol. 10

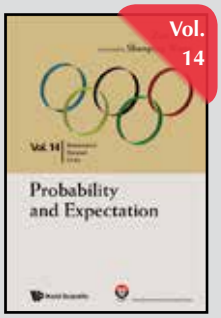
This new volume of the Mathematical Olympiad Series focuses on the topic of geometry. Basic and advanced theorems commonly seen in Mathematical Olympiad are introduced and illustrated with plenty of examples. Special techniques in solving various types of geometrical problems are also introduced, while 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.

350pp	**Dec 2016**	
978-981-4590-72-3	**US$58**	**£38**
978-981-4583-74-9(pbk)	**US$34**	**£22**

Probability and Expectation

by **Zun Shan** *(Nanjing Normal University, China)*
translated by **Shanping Wang** *(East China Normal University, China)*



This book will, in an interesting problem-solving way, explain what probability theory is: its concepts, methods and meanings; particularly, two important concepts — probability and mathematical expectation (briefly expectation) are emphasized. It consists of 65 problems, appended by 107 exercises and their answers. The author is one of the senior coaches of China's IMO National Team, whose students have won many gold medals many times in International Mathematical Olympiad.

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978-981-3141-49-0(pbk)	**US$28**	**£20**

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Bin Xiong *(East China Normal University, China)*

This book explains many basic techniques for proving inequalities such as direct comparison, method of magnifying and reducing, substitution method, construction method, and so on. The author is one of the coaches of China's IMO National Team, whose students have won many gold medals many times in International Mathematical Olympiad.

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Geometric Inequalities

by **Gangsong Leng** *(Shanghai University, China)*
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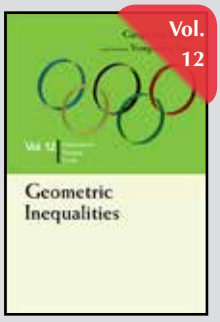

This book elaborates on Geometric Inequality problems such as inequality for the inscribed quadrilateral, the area inequality for special polygons, linear geometric inequalities, etc. The author is one of the coaches of China's IMO National Team, whose students have won many gold medals many times in International Mathematical Olympiad.

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Proceedings

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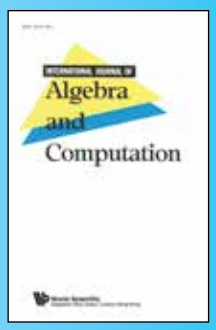

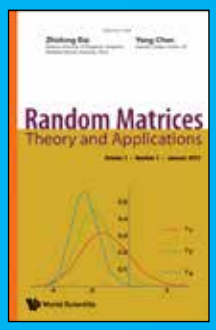

Algebra Colloquium (AC)

Print ISSN: 1005-3867
http://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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Print / Online ISSN: 0219-4988 / 1793-6829
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This journal publishes papers both on theoretical and on applied aspects of Algebra. There is special interest in papers that point out innovative links between areas of Algebra and fields of application. As the field of Algebra continues to experience tremendous growth and diversification, we intend to provide the mathematical community with a central source for information on both the theoretical and the applied aspects of the discipline. While the journal will be primarily devoted to the publication of original research, extraordinary expository articles that encourage communication between algebraists and experts on areas of application as well as those presenting the state of the art on a given algebraic sub-discipline will be considered.

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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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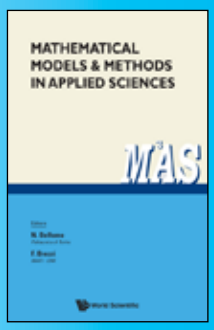

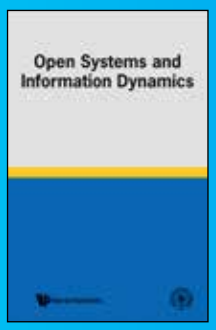

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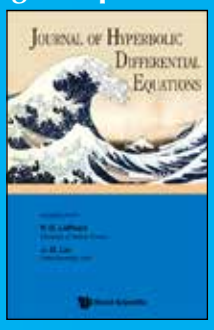

Mathematical Analysis

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http://www.worldscientific.com/idaqp

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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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http://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.

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International Journal of Biomathematics (IJB)

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

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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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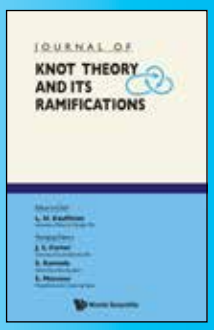

Mathematical Physics

International Journal of Geometric Methods in Modern Physics (IJGMMP)

Print / Online ISSN: 0219-8878 / 1793-6977
http://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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http://www.worldscientific.com/jktr

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Print / Online ISSN: 1793-5253 / 1793-7167
http://www.worldscientific.com/jta

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This journal fills the need for a review journal in the field, but also accepts original research papers of high quality. The review papers - introductory and survey papers - are of relevance not only to mathematical physicists, but also to mathematicians and theoretical physicists interested in interdisciplinary topics.

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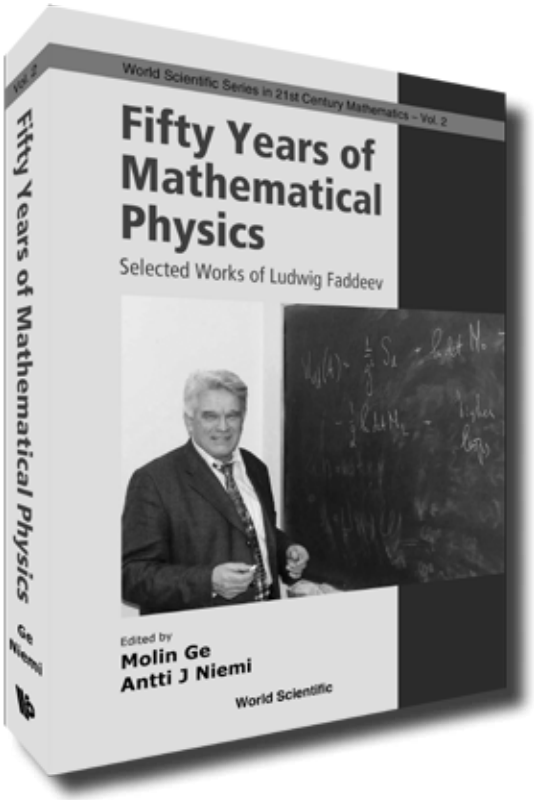

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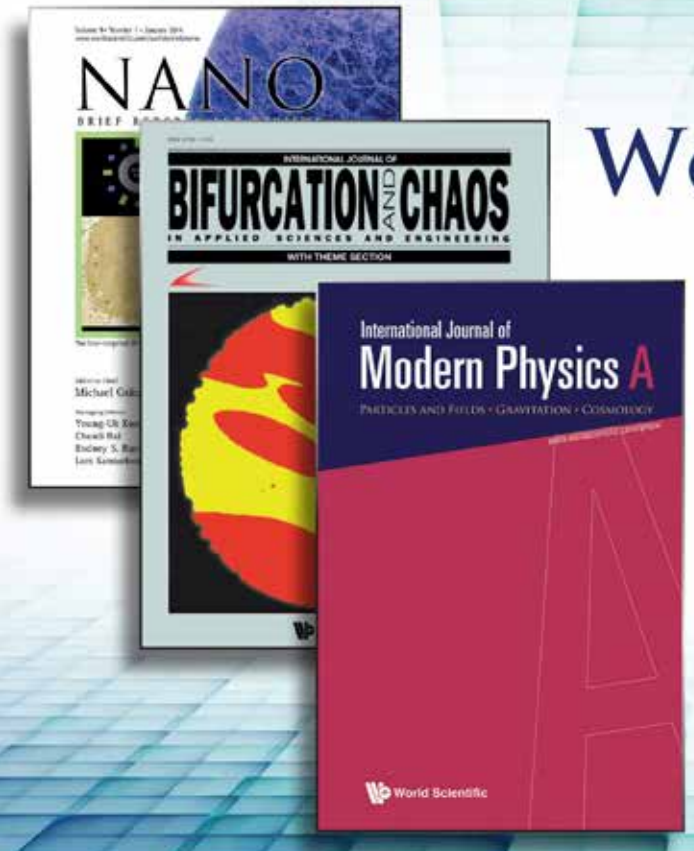

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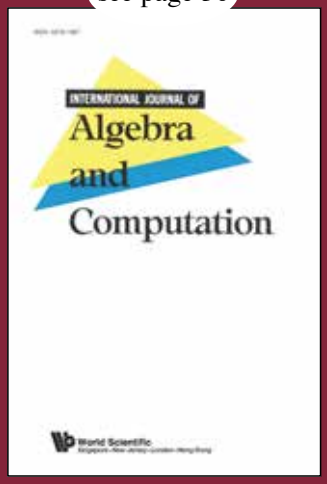

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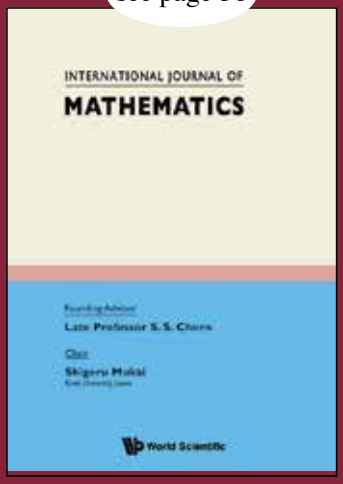

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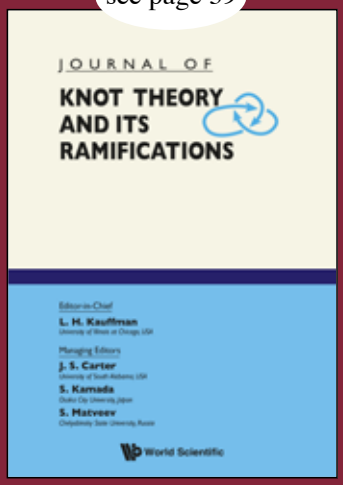

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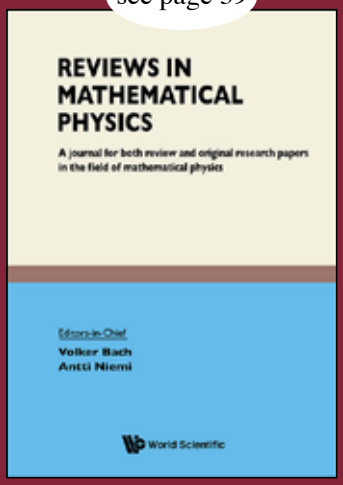

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