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Ranis Ibragimov

Dr. Ranis Ibragimov

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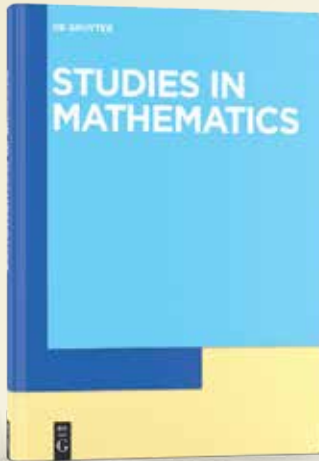
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► page 5



Marcus Laurel, Marius Mitrea

Weighted Morrey Spaces

Calderón-Zygmund Theory and Boundary Problems

Series: De Gruyter Studies in Mathematics 99

September 2024
English, VI, 426 pp., 2 fig.

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This research monograph provides a functional analytic treatment of Muckenhoupt-weighted Morrey spaces and their pre-duals, weighted Block spaces. This includes a robust Calderón-Zygmund theory for these scales of spaces with applications to singular integrals of layer potential type. Ultimately, boundary problems for elliptic systems in rough domains with data arbitrarily prescribed in these scales of spaces are formulated and solved.

Banach Function Space; Boundary Value Problem; Calderón-Zygmund theory; Muckenhoupt weight; Ahlfors regular set

Marius Mitrea, Baylor University, USA;
Marcus Laurel, Baylor University, USA.



Dorina Mitrea, Irina Mitrea,
Marius Mitrea, Michael Taylor

The Hodge-Laplacian

Boundary Value Problems on Riemannian Manifolds

Series: De Gruyter Studies in Mathematics

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English, X, 600 pp., 0 fig.

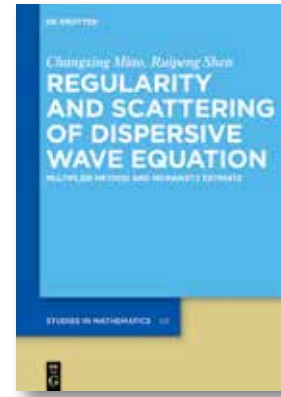
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The second edition significantly sharpens and expands the development of tools to derive well-posedness results in very general geometric settings for elliptic differential operators from the first edition. A new generation of Calderón-Zygmund theory is developed for variable coefficient singular integral operators. At the intersection of PDEs, harmonic analysis and differential geometry this text is suitable for a wide range of researchers, professionals, and Ph.D students.

Laplacian; Boundary value problem; Riemannian space

D. Mitrea and *M. Mitrea*, Univ. of Missouri, USA; *I. Mitrea*, Temple Univ., Philadelphia, USA; *M. Taylor*, Univ. of North Carolina, USA.



Changxing Miao, Ruipeng Shen

Regularity and Scattering of Dispersive Wave Equation

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English, X, 450 pp., 10 fig.

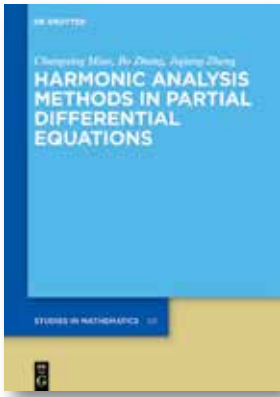
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The book covers the global behavior of dispersive wave equations and illustrates the development of fundamental mathematical tools, such as the energy method and Morawetz estimates, by applying modern harmonic analysis theory. It then discusses the well-posedness and scattering theory of solutions to nonlinear wave and Klein-Gordon/Schrodinger equations.

Well-posedness; Klein-Gordon equations; Schrodinger equations; Global behaviour; Energy method

Changxing Miao, Institute of Applied Physics and Computational Mathematics, China; *Ruipeng Shen*, Tianjin University, China.



Changxing Miao, Bo Zhang, Jiqiang Zheng
**Harmonic Analysis
Methods in Partial
Differential Equations**

Series: De Gruyter Studies in Mathematics

September 2025
English, Approx. XV, 450 pp., 5 fig.

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This volume applies theories of harmonic analysis to the study of nonlinear partial differential equations. It covers consolidation characterizations of differentiable function spaces, and the theory of three generations of C-Z singular integral operators, Fourier restriction estimation, Strichartz estimation, and Littlewood-Paley theory. It combines harmonic analysis methods with the study of partial differential equations.

Harmonic analysis methods; Function spaces; Elliptic equation; Parabolic equations; Dispersive equations

Changxing Miao, Jiqiang Zheng, Inst. of Applied Physics and Computational Mathematics, CN; *Bo Zhang*, Inst. of Applied Mathematics, CN.



Ákos Magyar
Diophantine Equations

With Applications in Analysis and Ergodic Theory

Series: De Gruyter Studies in Mathematics

December 2025
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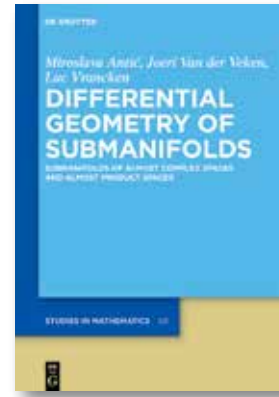
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This book introduces readers to the analytical tools used in the theory of Diophantine equations. It covers related developments in discrete harmonic analysis, ergodic theory and arithmetic combinatorics. It addresses, the distribution and the existence of solutions in special sets of integers, such as the primes or sets of positive upper density.

Diophantine systems; circle method; Waring's problem; Equidistribution; primes

Ákos Magyar, University of Georgia, USA.



Miroslava Antić, Joeri Van der Veken, Luc Vrancken
**Differential Geometry of
Submanifolds**

Submanifolds of Almost Complex Spaces and Almost Product Spaces

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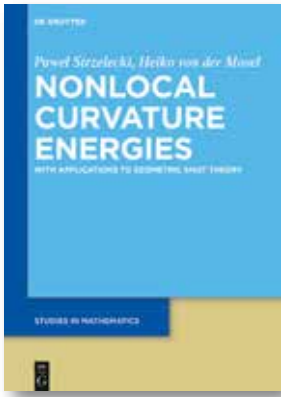
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Although traditionally focused on submanifolds of real or complex spaces, in the last decades submanifold geometry has been extended to several other homogeneous spaces, such as product spaces, the complex quadric, and some nearly Kähler spaces. This book introduces these new spaces in detail and shows how submanifolds therein can be studied, in particular in the case of ambient spaces which admit (almost) product and (almost) complex structures.

Differential Geometry; Homogeneous space; Complex manifold; Manifold; Submanifold

Miroslava Antić, Univ. of Belgrade, Serbia; *Joeri Van der Veken*, KU Leuven, Belgium; *Luc Vrancken*, Univ. de Valenciennes, France.



Paweł Strzelecki, Heiko von der Mosel
Nonlocal Curvature Energies

With Applications to Geometric Knot Theory

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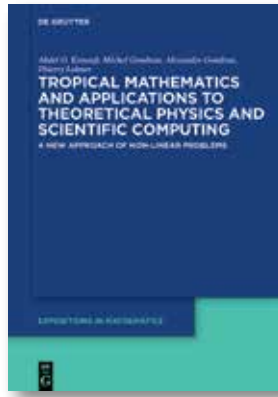
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 PDF ISBN 978-3-11-061035-2
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This authoritative book presents an analytical approach to geometric knot theory, studying knots and their energies from the variational point of view. The first part of the book covers the basics of knot theory, knot energies and their properties, and related regularity issues, while the second part extends the study of such nonlocal curvature functionals to higher dimensions, a much more complicated endeavor and an area of current research.

Geometric Measure Theory; Knot Theory; Curvature; Regularity; Variation Calculation

Paweł Strzelecki, University of Warsaw, Poland; *Heiko von der Mosel*, RWTH Aachen University, Germany.



Abdel O. Kenoufi, Michel Gondran, Alexandre Gondran
Tropical Mathematics and Applications to Theoretical Physics and Scientific Computing

A New Approach of Non-Linear Problems

Series: De Gruyter Expositions in Mathematics 77

February 2025
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Non linear problems; linear problems; theoretical physics; Idempotent mathematics and scientific computing

Abdel O. Kenoufi, Michel Gondran, IEAS, France; *Alexandre Gondran*, ENAC; *Thierry Lehner*, LUTH, France.



Victor V. Przyjalkowski, Constantin Shramov
Weighted Complete Intersections

Series: De Gruyter Expositions in Mathematics

September 2025
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This book discusses geometric properties of smooth weighted intersections in the context of mirror symmetry. It includes a series of open problems in algebraic geometry and mirror symmetry and a series of examples methods and applications. The book will appeal to graduate students and researchers in algebraic geometry.

Analysis; Mirror Symmetry; Algebraic Geometry

Victor V. Przyjalkowski and *Constantin Shramov*, Steklov Math. Institute, of the Russian Academy of Sciences, Russia.



Yen Quang Do

Time-Frequency Analysis

Fourier Series and Multilinear Operators

Series: De Gruyter Expositions in Mathematics

December 2025

English, Approx. XV, 335 pp., 25 fig.

HC *RRP € 139.95/ US\$ 153.99/ £ 127.00

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eBook *RRP € 139.95/ US\$ 153.99/ £ 127.00

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ePUB ISBN 978-3-11-125205-6

The theories supporting time–frequency analysis have recently increased their power to illuminate advances in applications and techniques for simultaneously studying a signal in both the time and frequency domains. This volume provides fundamental information about these theories with in-depth discussion of key topics and recent developments of time frequency theory. Readers learn how functions and their transform representation are connected.

Time Frequency Analysis; Modulation Invariant; Fourier Series; Outer Measure Theory; Multi-linear Operators

Do Quang Yen, University of Virginia, USA.



*Yuri A. Bahturin, Mikhail Kochetov,
Alberto Elduque*

Graded Algebras

Non-Simple and Simple Finite and Infinite Dimensional Algebras and Superalgebras

Series: De Gruyter Expositions in Mathematics

November 2025

English, XV, 535 pp., 10 fig.

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ISBN 978-3-11-116774-9

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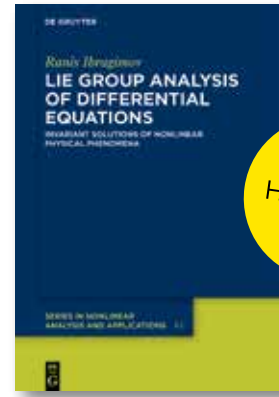
PDF ISBN 978-3-11-116853-1

ePUB ISBN 978-3-11-116854-8

Graded algebras treated in this book cover gradings on not necessarily associative finite-dimensional and infinite-dimensional algebras and superalgebras. These algebras are of interest in geometry, analysis, and physics. Applications considered are in differential geometry, operator theory, and physics. Topics such as connections of the gradings to Classical Class Field Theory and the theory graded polynomial identities and others are discussed.

Associative and nonassociative algebra; group gradings on algebras; actions by groups and Hopf algebras; polynomial identities in algebras; superalgebras and deformations.

Yuri A. Bahturin, Memorial University of Newfoundland, Canada.



Ranis Ibragimov

Lie Group Analysis of Differential Equations

Invariant Solutions of Nonlinear Physical Phenomena

Series: De Gruyter Series in Nonlinear Analysis and Applications 43

March 2024

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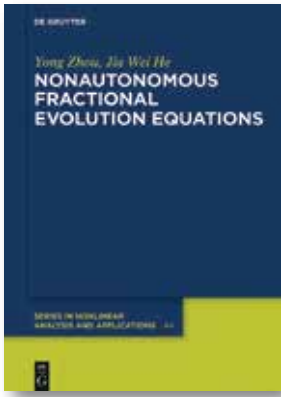
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ePUB ISBN 978-3-11-138780-2

The book is focused on physical interpretation and visualization of the obtained invariant solutions for nonlinear mathematical modeling of atmospheric and ocean waves. This volume represents a unique blend of analytical and numerical methods complemented by the author's developments in ocean and atmospheric sciences and it is meant for researchers and graduate students interested in applied mathematics and mathematical modeling.

Nonlinear mathematical modeling; physical phenomena; atmospheric and ocean waves; Navier-Stokes equations; Invariant and exact solutions; visualization and physical interpretation

Ranis Ibragimov, De Gruyter, USA.



Yong Zhou, Jia Wei He
Nonautonomous Fractional Evolution Equations

Series: De Gruyter Series in Nonlinear Analysis and Applications 44

July 2024
 English, XIV, 244 pp.

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eBook *RRP € 149.95/ US\$ 164.99/ £ 136.50
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Fractional evolution equations describe various complex and nonlocal systems with memory. This volume investigates fractional evolution equations, in infinite intervals. The book covers a range of topics, including the existence, uniqueness, attractivity, and applications to fractional diffusion equations and fractional Schrodinger equations. Researchers and graduate students in pure and applied mathematics will find this a useful reference.

Fractional calculus in differential equations; Nonautonomous fractional evolution problems; applications of Riemann-Liouville derivatives; Caputo fractional derivative solutions; Infinite interval problem with fractional order.

Yong Zhou, Xiangtan University, China;
Jia Wei He, Guangxi University, China.

Dung Le (Ed.)
Diffusion Systems
 Dynamics, Coexistence and Persistence

Series: De Gruyter Series in Nonlinear Analysis and Applications

2. Edition/2nd Edition
 August 2025
 English, 300 pp.

HC *RRP € 179.95/ US\$ 194.99/ £ 161.00
 ISBN 978-3-11-161557-8

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-161567-7
 ePUB ISBN 978-3-11-161587-5

This book discusses cross diffusivity, where a gradient in one species' concentration induces a flux of another in reaction-diffusion systems. The second edition answers questions from the first using breakthrough nonlinear analysis within the Bounded Mean Oscillation space. The upcoming revision will address new inquiries, providing novel insights into equation system solutions and functional spaces.

Strongly coupled; Elliptic/parabolic system; BMO (Bounded Mean Oscillation); Regularity; Steady states

Dung Le, University of Texas, San Antonio, USA.

Divine T. Wanduku, Gangaram S. Ladde, Jay G. Ladde
Epidemiological Processes in the Biological and Social Sciences
 Stochastic Hierarchical Complex Dynamic Network-centric Models

Series: De Gruyter Series in Probability and Stochastics

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 English, VII, 250 pp., 45 fig.

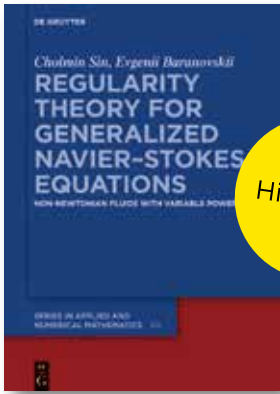
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This book deals with dynamic modeling, qualitative and quantitative analysis of complex stochastic multi-scale network-centric social-biological epidemiological processes. Dynamic models are influenced by both internal and external structural perturbations. The developed results are characterized by system parameters, explicitly, and provide a source for planning, preventing, stabilizing, and monitoring disease-free equilibria.

Markovian Structural Perturbations; Network-Centric Models; Disease Eradication and/or Persistence Processes; Globalizations and Interdependence Processes; Multi-Scale Parametric Conditions for Planning; Stabilizing and Control Disease-Free Equilibria.

Divine Wanduku, Georgia Southern University, USA; *Gangaram Ladde, Jay Ladde*, University of South Florida, USA.



Highlight



Cholmin Sin, Evgenii Baranovskii
**Regularity Theory for
Generalized Navier–Stokes
Equations**

Non-Newtonian Fluids with Variable
Power-Law

Series: De Gruyter Series in Applied and Numerical
Mathematics

May 2025
English, X, 330 pp., 5 fig.

HC *RRP € 154.95/ US\$ 166.99/ £ 138.00
ISBN 978-3-11-150876-4

eBook *RRP € 154.95/ US\$ 166.99/ £ 138.00
PDF ISBN 978-3-11-150890-0
ePUB ISBN 978-3-11-150948-8

This book presents a unified and systematic approach to the regularity theory of Non-Newtonian Fluids with Variable Power-Law, as well as variable power law models associated with boundary value problems. As a result, this book will interest readers in the fields of theoretical and numerical studies of mathematical fluid mechanics and partial differential equations with variable exponents.

**Non-Newtonian Fluids; Variable Exponent;
Regularity; Navier-Stokes Equations; Weak
Solution.**

Cholmin Sin, Institute of Mathematics, DPR
Korea; *Evgenii Baranovskii*, Voronezh State
University, Russia.

Umuridin Dalabaev
**Solution of
Initial-Boundary
Value Problems**

Method of Moving Modes

Series: De Gruyter Series in Applied and Numerical
Mathematics

August 2025
English, Approx. XX, 180 pp., 80 fig.

HC *RRP € 114.95/ US\$ 121.99/ £ 101.00
ISBN 978-3-11-130439-7

eBook *RRP € 114.95/ US\$ 121.99/ £ 101.00
PDF ISBN 978-3-11-130817-3
ePUB ISBN 978-3-11-130873-9

The concept of a movable node presented in this book has the principal novelty based on the possibility to construct a difference-analytical form of an approximate solution of differential equations with boundary conditions. The proposed approach makes it also possible to construct higher-quality discrete analogues, and to obtain an explicit form of the approximation error of differential equations.

**Differential equation; Difference equation;
Approximate analytical solution; Approximation
error; Compact schemes.**

Umuridin Dalabaev, University of World
Economy and Diplomacy, Uzbekistan.

Mauro Di Nasso
Arithmetic Ramsey Theory

Monochromatic Configurations and the
Ultrafilter Method

Series: De Gruyter Series in Logic and Its
Applications

November 2025
English, X, 240 pp., 25 fig.

HC *RRP € 134.95/ US\$ 147.99/ £ 122.00
ISBN 978-3-11-140505-6

eBook *RRP € 134.95/ US\$ 147.99/ £ 122.00
PDF ISBN 978-3-11-140647-3
ePUB ISBN 978-3-11-140650-3

This book provides a gentle introduction to the fundamental results of Arithmetic Ramsey Theory and some relevant topics in number combinatorics, based on the ultrafilter method, a powerful tool that often simplifies complex proofs and clarifies intricate results. The material presented includes all the classical results in this area, including Ramsey's, Rado's, Hindman's, van der Waerden's, and Hales-Jewett's theorems.

**Monochromatic configurations; Arithmetic
Ramsey theory; Combinatorics; Ultrafilters**

Mauro Di Nasso, University of Pisa, Italy.



Dilip Raghavan, Juris Steprāns
**P-Point Ultrafilters
 and their Order Structure**

Series: De Gruyter Series in Logic and Its Applications

September 2025
 English, Approx. XV, 200 pp., 25 fig.

HC *RRP € 164.95/ US\$ 184.99/ £ 144.50
 ISBN 978-3-11-079394-9

eBook *RRP € 164.95/ US\$ 184.99/ £ 144.50
 PDF ISBN 978-3-11-079412-0
 ePUB ISBN 978-3-11-079430-4

The monograph covers theorems and consistency results about ultrafilters, paying special attention to P-points, and various types of mapping between them.

Ultrafilters; P-points; Near coherence; set theory

Juris Steprāns, York University, Canada;
Dilip Raghavan, National University of Singapore, Singapore.



Fateh Mebarek-Oudina (Ed.)
CFD Simulation

Thermo-Fluids and Nanofluids in Engineering and Biomedicine

Series: De Gruyter Series in Mathematics and Life Sciences

August 2025
 English, VIII, 400 pp., 150 fig.

HC *RRP € 174.95/ US\$ 188.99/ £ 156.00
 ISBN 978-3-11-140454-7

eBook *RRP € 174.95/ US\$ 188.99/ £ 156.00
 PDF ISBN 978-3-11-140509-4
 ePUB ISBN 978-3-11-140523-0

The book provides a comprehensive and easily understandable collection of chapters on fluid dynamics and nanofluid dynamics, presenting new findings that will be of great interest to engineering and biomedicine students, engineers, and researchers. The book focuses on CFD simulations of different aspects of fluids, nanofluids, and hybrid nanofluids.

Thermo-fluids; Blood Flow Dynamics; Nanofluid dynamics; Magnetohydrodynamics; Computational fluid dynamics

Fateh Mebarek-Oudina, University of 20 Août 1955-Skikda, Algeria.



*Satya Prakash Yadav, Abhishek Kumar,
 Ashutosh Kumar Dubey, Victor Hugo C. de
 Albuquerque, Adrian Rodriguez-Aguiñaga,
 Angeles Quezada (Eds.)*
Medical Image Processing

Multimodal Fusion Techniques

Series: Mathematical Methods in the Digital Age 1

September 2024
 English, XIV, 383 pp.

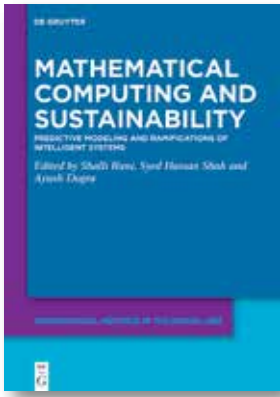
HC *RRP € 144.95/ US\$ 159.99/ £ 132.00
 ISBN 978-3-11-139549-4

eBook *RRP € 144.95/ US\$ 159.99/ £ 132.00
 PDF ISBN 978-3-11-143597-8
 ePUB ISBN 978-3-11-143599-2

This book develops a high-resolution multi-spectral image that both contain high-resolution panchromatic spatial information and multi-spectral image color information for denoising, reconstruction, classification, color image hallucination, feature extraction and dimension reduction.

Medical Image Fusion; Fusion Techniques; Multimodal Fusion; Deep Learning Model; Feature Extraction

Yadav, GLBITM, IN; *Kumar, Dubey*, Chitkara Univ. IN; *de Albuquerque*, GPAR, BR; *Aguiñaga*, SDGKU, USA; *Quezada*, Inst. Tijuana, MX.



Shalli Rani, Syed Hassan Shah, Ayush Dogra (Eds.)

Mathematical Computing and Sustainability

Predictive Modeling and Ramifications of Intelligent Systems

Series: Mathematical Methods in the Digital Age

June 2025
English, VII, 300 pp., 40 fig.

HC *RRP € 169.95/ US\$ 182.99/ £ 151.00
ISBN 978-3-11-161111-2

eBook *RRP € 169.95/ US\$ 182.99/ £ 151.00
PDF ISBN 978-3-11-161203-4
ePUB ISBN 978-3-11-161232-4

The book provides an interdisciplinary and comprehensive connection between Computational Intelligence (CI), Mathematical Computing, and Sustainability. It links theoretical frameworks with practical applications, offering a guide to addressing long-term challenges. Through case studies and examples, the book illustrates how advanced technologies and mathematical models can be utilized to analyze and resolve real-world sustainability issues.

Computational Intelligence (CI); Mathematical Computing; Sustainability Paradigm; Predictive Modelling; Ramifications of Intelligent Systems

Shalli Rani, Ayush Dogra, Chitkara University, India; *Syed Hassan Shah*, California State University, USA.



Hemant Kumar Saini, S.B. Goyal, Sardar M.N. Islam, T. Ananth Kumar (Eds.)

Quantum Unmanned Aerial Vehicle

Achieving Cybersecurity and AI Strategies

Series: Mathematical Methods in the Digital Age

October 2025
English, Approx. VII, 420 pp., 70 fig.

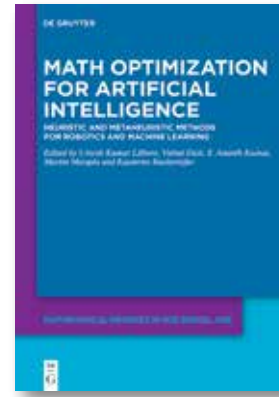
HC *RRP € 179.95/ US\$ 194.99/ £ 161.00
ISBN 978-3-11-161930-9

eBook *RRP € 179.95/ US\$ 194.99/ £ 161.00
PDF ISBN 978-3-11-161932-3
ePUB ISBN 978-3-11-161935-4

Current research trends are focusing on transforming communications into safety using quantum AI, ML, and blockchains, securing paradigms that sustain quantum drone delivery systems, quicker internet on air and weather forecasting, etc. This book deeply explores various applications of quantum secure UAVs, quantum attacks, quantum genetic algorithms, and the significance of post-quantum and quantum-safe cryptography.

Quantum Artificial Intelligence; Quantum Machine Learning; Quantum Unmanned Aerial Vehicle; Quantum Resilience; QQuantum-Based Genetic Heuristic

Saini, CU, IN; *Goyal*, City University of Malaysia, MY; *Islam*, Victoria University, AU; *Kumar*, IFET College of Engineering, IN.



Umesh Kumar Lilhore, Vishal Dutt, T. Ananth Kumar, Martin Margala, Kaamran Raahemifar (Eds.)

Math Optimization for Artificial Intelligence

Heuristic and Metaheuristic Methods for Robotics and Machine Learning

Series: Mathematical Methods in the Digital Age 2

March 2025
English, Approx. VII, 250 pp., 40 fig.

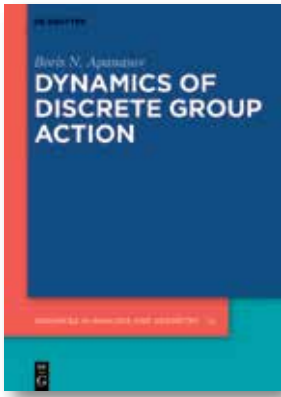
HC *RRP € 149.95/ US\$ 164.99/ £ 136.50
ISBN 978-3-11-143605-0

eBook *RRP € 149.95/ US\$ 164.99/ £ 136.50
PDF ISBN 978-3-11-143618-0
ePUB ISBN 978-3-11-143624-1

This book explains the importance of AI mathematical optimization. It covers AI optimization's fundamental concepts, methodologies, and practical applications in machine learning, automation, NLP, and real-world scenarios. The described optimization techniques can be employed to solve complex AI problems, and readers can gain insight into the challenges and opportunities presented by integrating mathematical principles and AI.

Mathematical Optimization; Artificial Intelligence; Machine Learning; Heuristic and Metaheuristic Methods ; Robotics

U. Lilhore, M. Margala, ULL, USA; *V. Dutt*, AVN, India; *T. Kumar*, IFET, India; *K. Raahemifar*, PSU, USA.



Boris N. Apanasov
Dynamics of Discrete Group Action

Series: Advances in Analysis and Geometry 10

July 2024
English, XVI, 518 pp., 130 fig.

HC *RRP € 240.00 / US\$ 270.00 / £ 204.50
ISBN 978-3-11-078403-9

eBook *RRP € 240.00 / US\$ 270.00 / £ 204.50
PDF ISBN 978-3-11-078410-7
ePUB ISBN 978-3-11-078413-8

Provides the first systematic study of geometry and topology of locally symmetric rank one manifolds and dynamics of discrete action of their fundamental groups. In addition to geometry and topology, this study involves several other areas of Mathematics – from algebra of varieties of groups representations and geometric group theory, to geometric analysis including classical questions from function theory.

Riemannian Geometries; Homeomorphisms; Hyperbolic lattices; locally symmetric spaces

Boris N. Apanasov, University of Oklahoma, USA.



Wilson Zúñiga-Galindo
p-Adic Analysis

Stochastic Processes and Pseudo-Differential Equations

Series: Advances in Analysis and Geometry 11

December 2024
English, Approx. X, 170 pp., 0 fig.

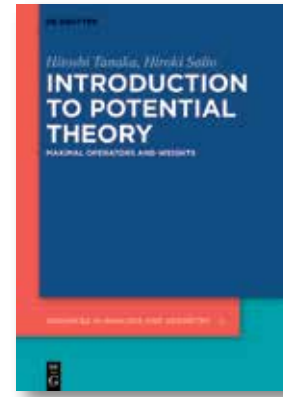
HC *RRP € 144.95 / US\$ 159.99 / £ 132.00
ISBN 978-3-11-157833-0

eBook *RRP € 144.95 / US\$ 159.99 / £ 132.00
PDF ISBN 978-3-11-157868-2
ePUB ISBN 978-3-11-157904-7

This book provides a fast, interdisciplinary introduction to the basic results of p-adic analysis and its applications. The book revolves around the p-adic heat equations and ultradiffusion, fundamental solutions and local zeta functions, Riesz kernels and quadratic forms, Sobolev-type spaces, and pseudo-differential evolution equations. The book includes numerous examples, exercises, and snapshots of several mathematical theories

p-Adic Analysis; Local Zeta Functions; Fundamental Solutions; Stochastic Processes on Ultrametric Spaces; Pseudo-Differential Operators

Wilson Zúñiga-Galindo, University of Texas Rio Grande Valley, USA.



Hitoshi Tanaka, Hiroki Saito
Introduction to Potential Theory

Maximal Operators and Weights

Series: Advances in Analysis and Geometry 12

December 2024
English, Approx. XV, 150 pp., 10 fig.

HC *RRP € 102.95 / US\$ 118.99 / £ 94.00
ISBN 978-3-11-072596-4

eBook *RRP € 102.95 / US\$ 118.99 / £ 94.00
PDF ISBN 978-3-11-072603-9
ePUB ISBN 978-3-11-072610-7

This monograph is devoted to harmonic analysis and potential theory. The authors study these essentials carefully and present recent researches based on the papers including by authors in an accessible manner for graduate students and researchers in pure and applied analysis.

Potential Theory; Harmonic Analysis

Hitoshi Tanaka, National University Corporation Tsukuba University of Technology; *Hiroki Saito*, Nihon University, Japan.



Giovanni Bellettini, Shokhrukh Kholmatov
**Minimizing Movements
for Mean Curvature Flow**

Series: Advances in Analysis and Geometry

August 2025
English, Approx. X, 500 pp., 20 fig.

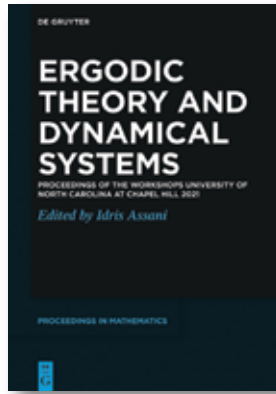
HC *RRP € 199.95 / US\$ 230.00 / £ 177.00
ISBN 978-3-11-078208-0

eBook *RRP € 199.95 / US\$ 230.00 / £ 177.00
PDF ISBN 978-3-11-078211-0
ePUB ISBN 978-3-11-078227-1

This book is intended to study a weak notion of mean curvature flow, using the minimizing movements method, obtained approximating the evolution with a sequence of discrete minimum problems associated to the perimeter perturbed by a non-symmetric bulk term. Properties such as comparison and consistency with classical solutions are presented. Variants and generalizations as well as the comparison with other notions of weak solutions are covered.

Mean curvature flow; convex sets and functions; minimizing movements; anisotropic mean curvature flow

Giovanni Bellettini, University of Siena, Italy; *Shokhrukh Kholmatov*, University of Vienna, Austria.



Idris Assani (Ed.)
**Ergodic Theory and
Dynamical Systems**

Proceedings of the Workshops University of North Carolina at Chapel Hill 2021

Series: De Gruyter Proceedings in Mathematics

June 2024
English, VIII, 148 pp., 0 fig.

HC *RRP € 139.95 / US\$ 153.99 / £ 127.00
ISBN 978-3-11-143503-9

eBook *RRP € 139.95 / US\$ 153.99 / £ 127.00
PDF ISBN 978-3-11-143550-3
ePUB ISBN 978-3-11-143581-7

This book grew out of the 2021 Chapel Hill Ergodic Theory Workshop (<https://ergwork.web.unc.edu/schedule-of-talks-201/>) during which young and senior researchers presented recent advances in ergodic theory and dynamical systems. Included are original research and survey articles devoted to various topics in Ergodic Theory and Dynamical Systems. Some are from presenters at this workshop. This book attracts young and senior researchers alike.

Dynamical systems; Minimality; Hyperbolic Geometry; Glivenko-Cantelli theorem; Categorical Dynamical System

Idris Assani, University of North Carolina at Chapel Hill, USA.



Joseph Brennan, Aron Simis (Eds.)
Commutative Algebra

The Mathematical Legacy of Wolmer V. Vasconcelos

Series: De Gruyter Proceedings in Mathematics

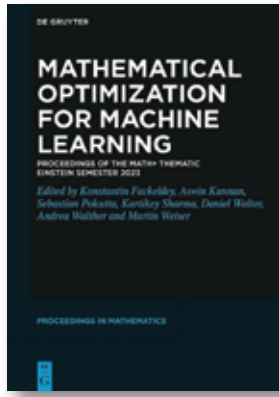
July 2025
English, Approx. XV, 435 pp.

HC *RRP € 199.95 / US\$ 230.00 / £ 177.00
ISBN 978-3-11-100009-1

eBook *RRP € 199.95 / US\$ 230.00 / £ 177.00
PDF ISBN 978-3-11-099936-5
ePUB ISBN 978-3-11-100060-2

Wolmer Vasconcelos was one of the giants in the development of Commutative Algebra in the latter half of the twentieth century and the first decades of the twenty-first century. This work collects in one place essays illustrating the important developments of his work particularly in commutative algebra that permits the reader to see the development of his important ideas and how they influence the development of mathematics today.
commutative algebra; computer; approximation; multiplicities; R-sequences

Joseph Brennan, University of Central Florida, USA; *Aron Simis*, Federal University of Pernambuco, Brazil.



Open Access

Bruce M. Landman, Florian Luca, Melyvn Nathanson, Jaroslav Nešetřil, Aaron Robertson (Eds.)

Combinatorial Number Theory

Proceedings of the Integers Conference 2023

Series: De Gruyter Proceedings in Mathematics

November 2024
English, VIII, 280 pp., 32 fig.

HC *RRP € 174.95 / US\$ 188.99 / £ 156.00
ISBN 978-3-11-139540-1

eBook *RRP € 174.95 / US\$ 188.99 / £ 156.00
PDF ISBN 978-3-11-139559-3
ePUB ISBN 978-3-11-139562-3

This volume consists of twenty articles stemming from presentations given at the 2023 Integers Conference. They represent a variety of active areas of research in combinatorial number theory, including additive number theory, multiplicative number theory, elementary number theory, the theory of partitions, Ramsey theory, sequences, algebraic combinatorics, enumerative combinatorics, and Diophantine equations.

Number Theory; Combinatorics; Ramsey Theory; Sequences; Partitions

B. Landman, USA; *F. Luca*, South Africa; *M. Nathanson*, USA; *J. Nešetřil*, USA; *A. Robertson*, USA.

Aswin Kannan, Konstantin Fackeldey, Sebastian Pokutta, Kartikey Sharma, Daniel Walter, Andrea Walther, Martin Weiser (Eds.)

Mathematical Optimization for Machine Learning

Proceedings of the MATH+ Thematic Einstein Semester 2023

Series: De Gruyter Proceedings in Mathematics

June 2025
English, Approx. X, 400 pp., 50 fig.

HC *RRP € 159.95 / US\$ 175.99 / £ 145.50
ISBN 978-3-11-137585-4

eBook
PDF ISBN 978-3-11-137677-6
ePUB ISBN 978-3-11-137774-2

Mathematical optimization and machine learning are closely related. This proceedings volume of the Thematic Einstein Semester 2023 of the Berlin Mathematics Research Center MATH+ collects recent progress on their interplay in topics such as discrete optimization, nonlinear programming, optimal control, first-order methods, multilevel optimization, machine learning in optimization, physics-informed learning, and fairness in machine learning.

Mathematical optimization; Machine learning; Nonlinear optimization; Discrete optimization; Physics informed learning

M. Weiser, S. Pokutta, K. Sharma, ZIB, Germany; *K. Fackeldey*, TU Berlin; *A. Kannan, D. Walter, A. Walther*, Humboldt-Univ. Germany.

Oleg V. Kaptsov, Evgeniy I. Kaptsov (Eds.)
Mathematical Models and Integration Methods

Seminar Proceedings on Applications to Mechanics and Physics

Series: De Gruyter Proceedings in Mathematics

September 2024
English, XII, 168 pp., 53 fig.

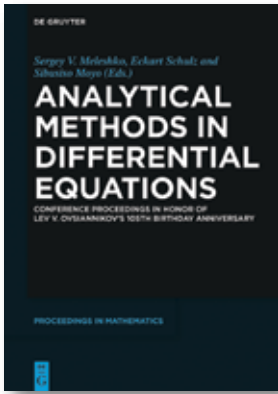
HC *RRP € 148.95 / US\$ 163.99 / £ 135.50
ISBN 978-3-11-154625-4

eBook *RRP € 148.95 / US\$ 163.99 / £ 135.50
PDF ISBN 978-3-11-154666-7
ePUB ISBN 978-3-11-154680-3

The main goal of the seminar is to attract leading world-renowned experts in differential equations, modeling, and modern methods of integration. This book is a collection of seminar proceedings designed to present recent advancements in this field by scientists from Russia, the USA, Canada, Great Britain, Australia, Brazil, Bulgaria, Thailand, and other countries.

Differential Equations; Exact Solutions; Fluid Dynamics; Numerical Modeling; Lie Group Analysis

Oleg V. Kaptsov, ICM SB RAS, Russia; *Evgeniy I. Kaptsov*, Suranaree University of Technology, Thailand.



Sergey V. Meleshko, Eckart Schulz, Sibusiso Moyo (Eds.)

Analytical Methods in Differential Equations

Conference Proceedings in Honor of Lev V. Ovsiannikov's 105th Birthday Anniversary

Series: De Gruyter Proceedings in Mathematics

March 2025
English, VII, 220 pp., 50 fig.

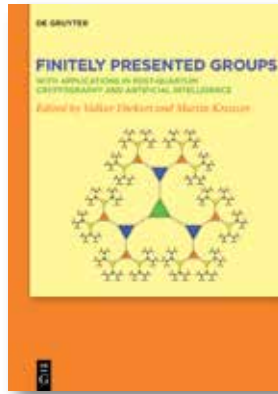
HC *RRP € 159.95/ US\$ 175.99/ £ 145.00
ISBN 978-3-11-156913-0

eBook *RRP € 159.95/ US\$ 175.99/ £ 145.00
PDF ISBN 978-3-11-157051-8
ePUB ISBN 978-3-11-157063-1

This book is a collection of selected papers presented at the conference 'Advances in Applications of Analytical Methods in Solving Differential Equations' held in honor of Academician Lev V. Ovsiannikov's 105th birthday anniversary. It includes articles on recent advancements of applications of analytical methods to the construction of novel mathematical models and the solution of nonlinear problems.

Differential Equations; Lie Group Analysis; Delay Differential Equations; Fluid Dynamics; Numerical Modeling

Sergey V. Meleshko, Eckart Schulz, Suranaree University of Technology, Thailand; *Sibusiso Moyo,* Stellenbosch University, South Africa.



Volker Diekert, Martin Kreuzer (Eds.)

Finitely Presented Groups

With Applications in Post-Quantum Cryptography and Artificial Intelligence
October 2024
English, X, 242 pp., 7 fig.

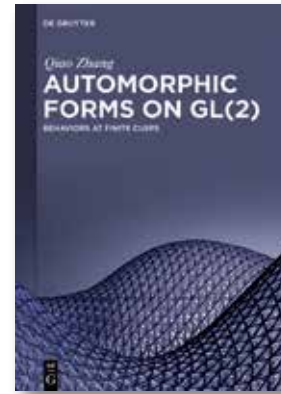
HC *RRP € 119.95/ US\$ 131.99/ £ 109.50
ISBN 978-3-11-147337-6

eBook *RRP € 119.95/ US\$ 131.99/ £ 109.50
PDF ISBN 978-3-11-147357-4
ePUB ISBN 978-3-11-147427-4

This book contains surveys and research articles by leading experts on the state-of-the-art of the theory of finitely generated groups. A particular emphasis is placed on algorithmic aspects, connections to logic and topology, as well as applications in post-quantum cryptography and artificial intelligence.

Combinatorial group theory; Algorithmic group theory; Group-based cryptography; Elementary theory of groups; Applications of group theory

Volker Diekert, Universität Stuttgart, Germany; *Martin Kreuzer,* Universität Passau, Germany.



Qiao Zhang

Automorphic Forms on $GL(2)$

Behaviors at Finite Cusps
November 2025
English, Approx. X, 190 pp., 6 fig.

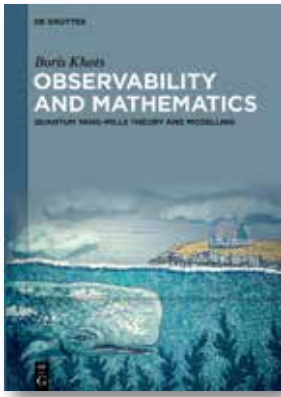
HC *RRP € 129.95/ US\$ 141.99/ £ 117.50
ISBN 978-3-11-137241-9

eBook *RRP € 129.95/ US\$ 141.99/ £ 117.50
PDF ISBN 978-3-11-137310-2
ePUB ISBN 978-3-11-137377-5

Automorphic forms occupy significant positions within the realm of number theory. Extensive research has focused on their behaviors at the infinite cusps, while their properties at finite cusps are relatively unexplored and scattered across research papers. This book endeavors to present the first systematic discussion on this subject. Furthermore, the book can also serve as a concise introduction to classical theories of automorphic forms.

Fourier coefficients; Finite cusps; Modular forms; Maass forms; Theta functions

Qiao Zhang, Texas Christian University, USA.



Boris Khots
Observability and Mathematics

Quantum Yang–Mills Theory and Modelling

July 2024
English, XII, 214 pp.

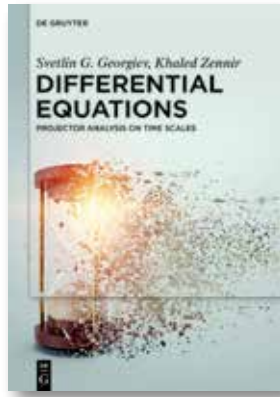
HC *RRP € 159.95 / US\$ 172.99 / £ 142.50
ISBN 978-3-11-139735-1

eBook *RRP € 159.95 / US\$ 172.99 / £ 142.50
PDF ISBN 978-3-11-139843-3
ePUB ISBN 978-3-11-139938-6

The book provides a new approach to the Yang–Mills theory. The novelty consists in replacing the infinity by observers, called the “Mathematics with Observers” theory. This new theory allows us to treat the classical Yang–Mills equations as stochastic equations. The currently open problem of the “mass gap existence” is solved in the frame of the new theory.

Mathematics with Observers; Lie groups and algebras; Yang–Mills stochastic equations; Mass gap; Elementary particles

Boris Khots, IA Iowa, USA.



Svetlin G. Georgiev, Khaled Zennir
Differential Equations

Projector Analysis on Time Scales

April 2024
English, X, 462 pp., 0 fig.

HC *RRP € 159.95 / US\$ 172.99 / £ 142.50
ISBN 978-3-11-137509-0

eBook *RRP € 159.95 / US\$ 172.99 / £ 142.50
PDF ISBN 978-3-11-137715-5
ePUB ISBN 978-3-11-137771-1

This book presents a projector analysis of dynamic systems on time scales. The dynamic systems are classified as first, second, third and fourth kinds. For each classes of dynamic systems the basic matrix chains are constructed. The proposed theory is applied for decoupling of dynamic equations on time scales.

Time scale; Dynamic equations; Projector analysis; Tractability index; Jet

Svetlin Georgiev, Sofia University, Bulgaria;
Khaled Zennir, Qassim University, Saudi Arabia.



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THE
WORLD**

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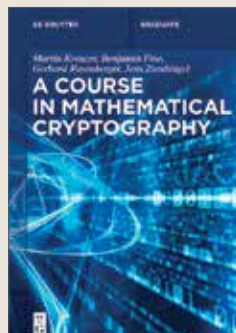
FOR STUDENTS AND RESEARCHERS IN MATHEMATICS TRIED AND TRUSTED TEXTBOOKS



Hans Föllmer, Alexander Schied
STOCHASTIC FINANCE
An Introduction in Discrete Time

09/2025. 5th ed.,
Approx., 650 pp., 20 fig.
Paperback RRP € 84.95 [D]/
US\$ 92.99/£ 72.00
ISBN 978-3-11-104481-1
***eBook** RRP € 699.00 [D]/
US\$ 769.00/£ 599.00
PDF ISBN 978-3-11-104528-3
ePUB ISBN 978-3-11-104635-8

► page 22



*Martin Kreuzer, Benjamin Fine,
Gerhard Rosenberger, Jens Zumbrägel*
**A COURSE IN MATHEMATICAL
CRYPTOGRAPHY**

10/2025. 2nd ed., Approx. 385 pp., 15 fig.
Paperback RRP € 69.95 [D]/
US\$ 78.99/£ 62.00
ISBN 978-3-11-099107-9
***eBook** RRP € 699.00 [D]/
US\$ 769.00/£ 599.00
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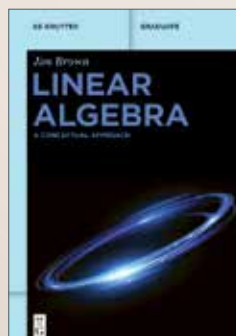
► page 24



René L. Schilling
WAHRSCHEINLICHKEIT
Stochastik: von Abweichungen
bis Zufall

07/2025. 2nd ed.,
Approx. 250 pp., 21 fig.
Paperback RRP € 44.95 [D]/
US\$ 47.99/£ 39.50
ISBN 978-3-11-134211-5
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US\$ 769.00/£ 599.00
PDF ISBN 978-3-11-134225-2
ePUB ISBN 978-3-11-134261-0

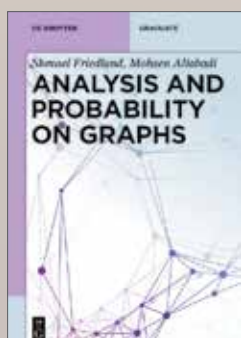
► page 23



Jim Brown
LINEAR ALGEBRA
A Conceptual Approach

08/2025. Approx. 140 pp., 16 fig.
Paperback RRP € 89.95 [D]/
US\$ 94.99/£ 78.50
ISBN 978-3-11-152420-7
***eBook** RRP € 699.00 [D]/
US\$ 769.00/£ 599.00
PDF ISBN 978-3-11-152668-3
ePUB ISBN 978-3-11-152829-8

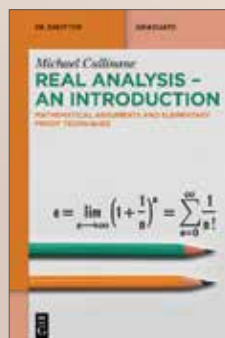
► page 18



Shmuel Friedland, Mohsen Aliabadi
**ANALYSIS AND PROBABILITY
ON GRAPHS**

03/2025. Approx. 240 pp., 10 fig.
Paperback RRP € 64.95 [D]/
US\$ 70.99/£ 58.50
ISBN 978-3-11-133692-3
***eBook** RRP € 699.00 [D]/
US\$ 769.00/£ 599.00
PDF ISBN 978-3-11-133738-8
ePUB ISBN 978-3-11-133809-5

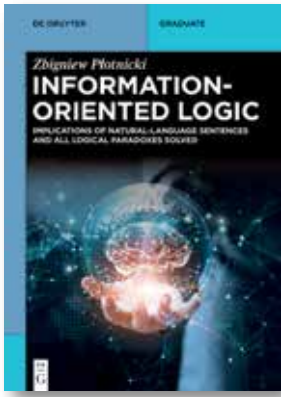
► page 20



Michael Cullinane
**REAL ANALYSIS -
AN INTRODUCTION**
Mathematical Arguments and
Elementary Proof Techniques

10/2025. Approx. 400 pp., 80 fig.
Paperback RRP € 89.95 [D]/
US\$ 94.99/£ 78.50
ISBN 978-3-11-142928-1
***eBook** RRP € 699.00 [D]/
US\$ 769.00/£ 599.00
PDF ISBN 978-3-11-142956-4
ePUB ISBN 978-3-11-142994-6

► page 19



T

Zbigniew Plotnicki
Information-Oriented Logic

Implications of Natural-Language Sentences and All Logical Paradoxes Solved

Series: De Gruyter Textbook

December 2024
 English, Approx. XII, 230 pp., 1 fig.

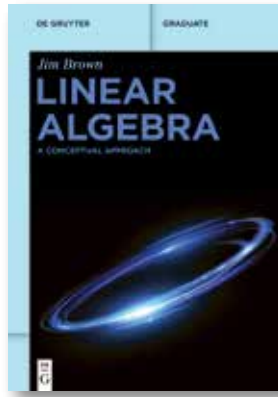
Pb. *RRP € 89.95/ US\$ 94.99/ £ 78.50
 ISBN 978-3-11-144046-0

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-144138-2
 ePUB ISBN 978-3-11-144156-6

This book presents a new concept of logic, called „information-oriented logic”. Traditionally, logic uses declarative sentences (that are symbols) without their referents. The information-oriented logic presented in this book introduces the referent of a sentence which is a statement (a piece of information) in the center of this theory, so every logical expression returns a piece of information as a result.

first information-based logic; information as the referent of a sentence; new approach to logic; set theory and ontology; paradoxes of classical logic; implications of natural language sentences

Zbigniew Plotnicki, Poznan University of Technology, Poland.



T

Jim Brown
Linear Algebra

A conceptual approach

Series: De Gruyter Textbook

September 2025
 English, Approx. X, 120 pp., 16 fig.

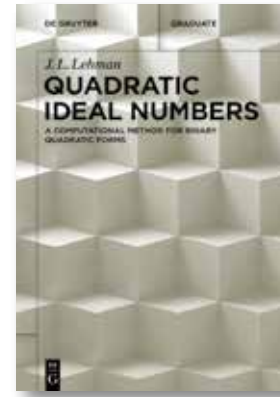
Pb. *RRP € 89.95/ US\$ 94.99/ £ 78.50
 ISBN 978-3-11-152420-7

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-152668-3
 ePUB ISBN 978-3-11-152829-8

This book is focused on a theoretical framework for many of the topics first encountered in an introductory linear algebra text. Vector spaces and linear transformations over fields, structure theorems for linear transformations, inner product spaces, and bilinear and sesquilinear forms are some of the topics covered. Upon reading this book, students will be well prepared for graduate level work in more advanced topics such as module theory.

Vector spaces; Linear transformations; Structure theorems; Inner product spaces; Exterior algebras

Jim Brown, Occidental College, Los Angeles, USA.



T

J. L. Lehman
Quadratic Ideal Numbers

A Computational Method for Binary Quadratic Forms

Series: De Gruyter Textbook

March 2025
 English, Approx. XV, 225 pp., 4 fig.

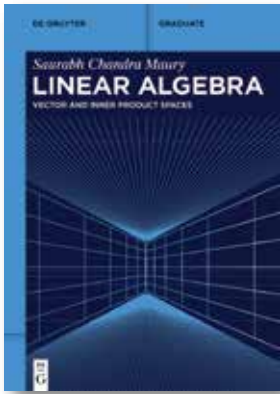
Pb. *RRP € 74.95/ US\$ 82.99/ £ 68.50
 ISBN 978-3-11-131935-3

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-131936-0
 ePUB ISBN 978-3-11-131979-7

This book introduces quadratic ideal numbers as objects of study with applications to binary quadratic forms and other topics. The text requires only minimal background in number theory, much of which is reviewed as needed. Computational methods are emphasized throughout, making this subject appropriate for individual study or research at the undergraduate level or above.

Quadratic forms; continued fractions; ideals; quadratic congruences; computational number theory

J. L. Lehman, Mary Washington University, USA.



T

Saurabh Chandra Maury
Linear Algebra

Vector and Inner Product Spaces

Series: De Gruyter Textbook

December 2024
 English, Approx. X, 310 pp.

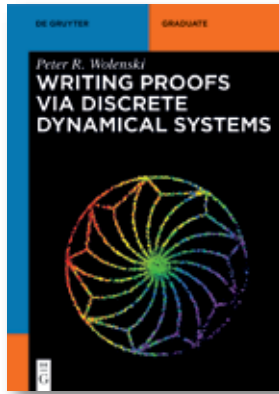
Pb. *RRP € 99.95 / US\$ 105.99 / £ 88.00
 ISBN 978-3-11-151570-0

****eBook** *RRP € 699.00 / US\$ 769.00 / £ 599.00
 PDF ISBN 978-3-11-151603-5
 ePUB ISBN 978-3-11-151688-2

This book represents a balanced combination of step-by-step explained theory content, solved examples, and exercises. This book can be used as a textbook for the Linear Algebra undergraduate and graduate Mathematics, and Engineering Mathematics syllabus at any university. Some of the most recent and challenging questions from competitive exams for higher education, such as NET, GATE, lectureships, etc., are also included in this book.

Vector Spaces; Linear Transformations; Diagonalization of Matrices; Inner Product Spaces; Determinants and Eigenvalues

Saurabh Maury, VIT Chennai, India.



T

Peter R. Wolenski
**Writing Proofs
 via Discrete
 Dynamical Systems**

Series: De Gruyter Textbook

March 2025
 English, Approx. XV, 250 pp., 30 fig.

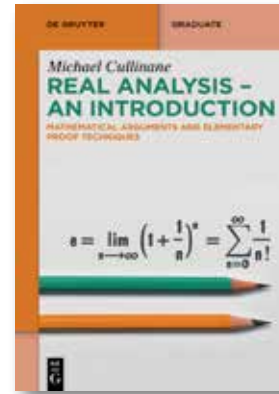
Pb. *RRP € 74.95 / US\$ 82.99 / £ 68.50
 ISBN 978-3-11-134072-2

****eBook** *RRP € 699.00 / US\$ 769.00 / £ 599.00
 PDF ISBN 978-3-11-134142-2
 ePUB ISBN 978-3-11-134145-3

This book is designed for mathematics majors to transition from basic calculations to proof-writing. It focuses on discrete dynamical systems, specifically the quadratic family. The book delves into why real numbers are crucial, the difference between rational and real numbers, and metric spaces. Fractals in 2D are also introduced. The concepts are illustrated with engaging examples and extensive end-of-chapter exercises are included.

Limits; Sequences generated by Iteration; Quadratic maps; Chaos; Fractals

Peter R. Wolenski, Louisiana State University, USA.



T

Michael Cullinane
**Real Analysis -
 An Introduction**

Mathematical Arguments and Elementary Proof Techniques

Series: De Gruyter Textbook

November 2025
 English, Approx. X, 390 pp., 80 fig.

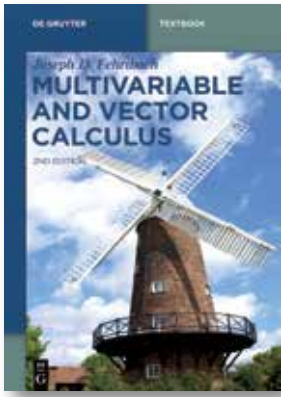
Pb. *RRP € 89.95 / US\$ 94.99 / £ 78.50
 ISBN 978-3-11-142928-1

****eBook** *RRP € 699.00 / US\$ 769.00 / £ 599.00
 PDF ISBN 978-3-11-142956-4
 ePUB ISBN 978-3-11-142994-6

Designed for a broad spectrum of mathematics majors, not only those pursuing graduate school, this book also provides a thorough explanation of undergraduate Real Analysis. Through a developmentally appropriate narrative that integrates informal discussion, motivation, and basic proof writing approaches with mathematical rigor and clarity, the aim is to assist all students in learning more about the real number system and calculus theory.

Theory of calculus; advanced calculus; proofs; real variable theory; real function theory

Michael Cullinane, Keene State College, USA.



Joseph D. Fehribach
**Multivariable
 and Vector Calculus**

Series: De Gruyter Textbook

2. Edition/2nd Edition
 July 2024
 English, XVI, 180 pp., 77 fig.

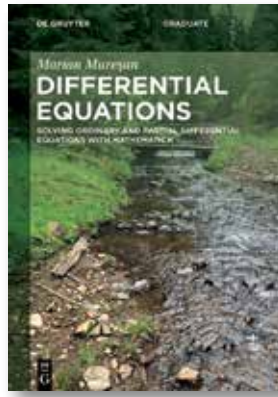
Pb. *RRP € 64.95/ US\$ 70.99/ £ 58.50
 ISBN 978-3-11-139238-7

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-139348-3
 ePUB ISBN 978-3-11-139428-2

This book covers multivariable and vector calculus. It can be used as a textbook for a one-semester course or self-study. It includes worked-through exercises, with answers provided for many of the basic computational ones and hints for the more complex ones.. This second edition features new exercises, new sections on twist and binormal vectors for curves in space, linear approximations, and the Laplace and Poisson equations.

Multivariable calculus; vector fields; vector calculus; integrals; vector functions

Joseph D. Fehribach, Worcester Polytechnic Institute, USA.



Marian Muresan
Differential Equations

Solving Ordinary and Partial Differential Equations with Mathematica®

Series: De Gruyter Textbook

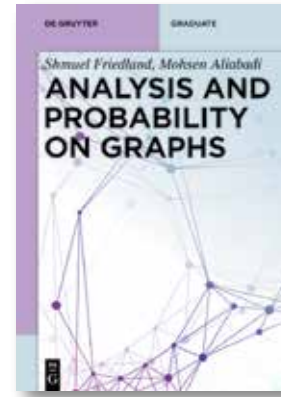
June 2024
 English, XVI, 466 pp., 436 fig.

Pb. *RRP € 104.95/ US\$ 115.99/ £ 96.00
 ISBN 978-3-11-141109-5

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-141139-2
 ePUB ISBN 978-3-11-141204-7

The book includes approximately 650 fully solved ordinary and partial differential equations, some of which have multiple solutions. Each solution is accompanied by at least one graph, many of which are in color. The first chapter explains the mathematical concepts used throughout the book, while the following three chapters focus on ordinary differential equations. The remaining chapters (5-10) are dedicated to partial differential equations. **ordinary differential equation; partial differential equation; Mathematica; analytical; numerical; and graphical solutions**

Marian Muresan, Babes-Bolyai University, Romania.



Shmuel Friedland, Mohsen Aliabadi
**Analysis and Probability
 on Graphs**

Series: De Gruyter Textbook

April 2025
 English, Approx. X, 230 pp., 10 fig.

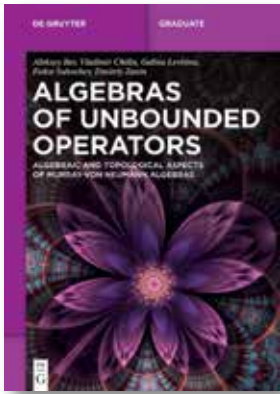
Pb. *RRP € 64.95/ US\$ 70.99/ £ 58.50
 ISBN 978-3-11-133692-3

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-133738-8
 ePUB ISBN 978-3-11-133809-5

Analysis and Probability on graphs is an introduction to random graphs, Markov chains on digraphs, entropy of Markov Chains, and discrete Lyapunov exponents and Hausdorff dimension, requiring only minimal background in probability, mathematical analysis, and graphs. This textbook includes constructive discussions about the motivation of basic concepts, and many worked-out problems in each chapter, making it ideal for classroom use or self-study.

Hausdorff dimension; Lyapunov exponents; Markov chains; random graph; random walk; undirected graph

Shmuel Friedland, University of Illinois;
Mohsen Aliabadi, University of California, USA.



T

Aleksey Ber, Vladimir Chilin, Galina Levitina, Fedor Sukochev, Dmitriy Zanin
Algebras of Unbounded Operators

Algebraic and Topological Aspects of Murray-von Neumann Algebras

Series: De Gruyter Textbook

May 2025
 English, Approx. 400 pp., 0 fig.

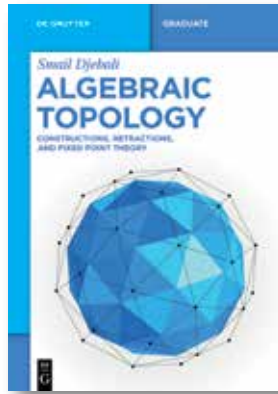
Pb. *RRP € 99.95/ US\$ 105.99/ £ 88.00
 ISBN 978-3-11-159791-1

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-159968-7
 ePUB ISBN 978-3-11-160088-8

The book describes topological, order-theoretic, and analytical aspects of algebras of unbounded operators affiliated with a von Neumann algebra. It presents a complete description of derivations on these algebras. It shows that such a derivation is inner if and only if the von Neumann algebras do not have finite type I_∞ summand. It describes possible extensions of the classical derivation of functions of a real variable.

Murray-von Neumann Algebras; Measurable Operators; Derivations; Noncommutative Integration; Operator Theory

Aleksey Ber, NUUz, UZ; *Vladimir Chilin*, NUUz, UZ; *Galina Levitina*, ANU, AU; *Fedor Sukochev, Dmitriy Zanin*, UNSW, AU.



T

Smail Djebali
Algebraic Topology

Constructions, Retractions, and Fixed Point Theory

Series: De Gruyter Textbook

November 2024
 English, XXII, 396 pp., 80 fig.

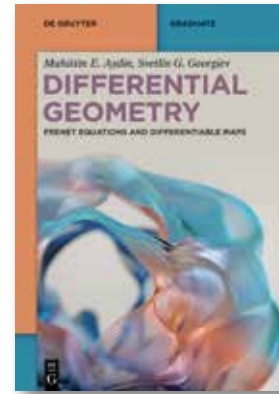
Pb. *RRP € 129.95/ US\$ 141.99/ £ 117.50
 ISBN 978-3-11-151736-0

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-151738-4
 ePUB ISBN 978-3-11-151778-0

This is a primary text for students primarily enrolled in Algebraic Topology courses but also in topology, homological algebra, differential topology, differential geometry, topological geometry. A simple approach is used throughout to introduce several standard constructions of topological spaces. The book aims at providing an applications-oriented presentation, mainly in fixed point theory, of some fundamental concepts in algebraic topology.

Basic Constructions in General Topology; Adjunction Spaces and Similar Constructions; Homeomorphism and Homotopy Equivalences; Homotopy and Homology Groups; Fixed Point Theorems

Smail Djebali, IMSIU, Saudi Arabia.



T

Muhittin E. Aydin, Svetlin G. Georgiev
Differential Geometry

Frenet Equations and Differentiable Maps

Series: De Gruyter Textbook

September 2024
 English, VIII, 282 pp., 44 fig.

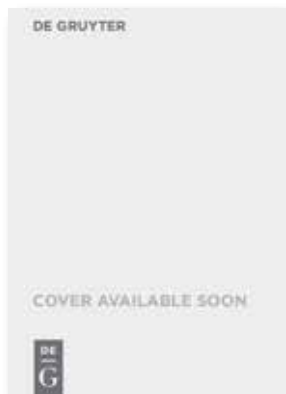
Pb. *RRP € 87.95/ US\$ 96.99/ £ 80.00
 ISBN 978-3-11-150089-8

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-150185-7
 ePUB ISBN 978-3-11-150223-6

This graduate textbook introduces two and three-dimensional curves and surfaces deduced from the Frenet equations. It presents the fundamental theory of tangent planes and normal surfaces by using differentiable maps and differentials. The book also provides the first and second fundamental forms of surfaces and introduces the concepts of minimal surfaces and geodesics. Additionally, it covers covariant derivatives and manifolds.

Frenet Equations; Differentiable maps; Manifolds; Covariant differentiation; Tangent plane

Muhittin Aydin, Firat University, Turkey; *Svetlin Georgiev*, Sorbonne University, France.

**T**

Jem Corcoran
Monte Carlo Methods

Stochastic Simulation with R

Series: De Gruyter Textbook

August 2025
English, Approx. X, 440 pp., 40 fig.

Pb. *RRP € 99.95 / US\$ 105.99 / £ 88.00
ISBN 978-3-11-139550-0

****eBook** *RRP € 699.00 / US\$ 769.00 / £ 599.00
PDF ISBN 978-3-11-139555-5
ePUB ISBN 978-3-11-139561-6

Monte Carlo methods are among the most useful computational tools available for tackling complex problems in science and engineering when analytical solutions are not available. This widely accessible text provides a comprehensive survey of traditional, recent, and even nascent, simulation algorithms, presenting rigorous theory alongside examples and basic recipes that can be easily employed by a wide variety of practitioners.

Monte Carlo and Markov Chains; importance sampling; Metropolis-Hastings; Gibbs sampler and particle filtering

Jem Corcoran, University of Colorado, USA.

**T**

Hans Föllmer, Alexander Schied
Stochastic Finance

An Introduction in Discrete Time

Series: De Gruyter Textbook

5. Edition/5th Edition
September 2025
English, Approx. X, 650 pp., 20 fig.

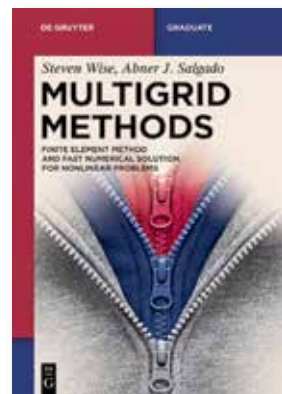
Pb. *RRP € 84.95 / US\$ 92.99 / £ 72.00
ISBN 978-3-11-104481-1

****eBook** *RRP € 699.00 / US\$ 769.00 / £ 599.00
PDF ISBN 978-3-11-104528-3
ePUB ISBN 978-3-11-104635-8

This fifth, newly revised edition of the classical introduction to the mathematics of finance, is based on stochastic models in discrete time. Updates include, new chapter on dynamic portfolio strategies, enhanced graphics with real-world data, improved proofs and updated references and citations.

Arbitrage; Financial mathematics; Hedge funds; Stochastics; Stochastic modeling

Hans Föllmer, Humboldt University, Germany; *Alexander Schied*, University of Waterloo, Canada.

**T**

Steven Wise, Abner J. Salgado
Multigrid Methods

Finite Element Method and Fast Numerical Solution For Nonlinear Problems

Series: De Gruyter Textbook

August 2025
English, Approx. X, 250 pp., 20 fig.

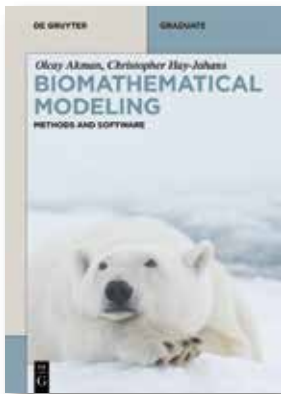
Pb. *RRP € 84.95 / US\$ 93.99 / £ 77.50
ISBN 978-3-11-135419-4

****eBook** *RRP € 699.00 / US\$ 769.00 / £ 599.00
PDF ISBN 978-3-11-135488-0
ePUB ISBN 978-3-11-135523-8

This book introduces the theory of multigrid methods for the fast numerical solution of linear and weakly nonlinear elliptic PDE. It begins with the introduction of the finite element method and discretization. Then it moves to Classical Iterative Methods, Fourier Analysis of the Two-Grid Algorithm and Multigrid as a Multiplicative Process. The topics on Abstract Method of Subspace Corrections and Multilevel Nesterov Methods conclude the book.

Finite element methods; V and W cycle methods; Full approximation storage (FAS) methods for nonlinear problems

Abner Salgado, Steven Wise, University of Tennessee, USA.



T

Olcay Akman, Christopher Hay-Jahans
Biomathematical Modeling

Methods and Software

Series: De Gruyter Textbook

September 2025
 English, Approx. X, 150 pp., 70 fig.

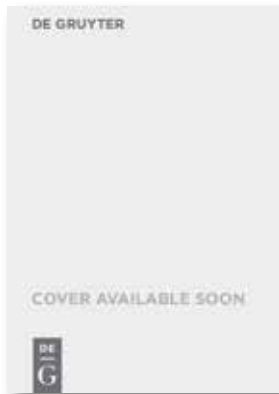
Pb. *RRP € 64.95/ US\$ 70.99/ £ 58.50
 ISBN 978-3-11-160952-2

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-160956-0
 ePUB ISBN 978-3-11-160994-2

This book is for teachers and researchers of mathematical biology and ecology who are interested in exploring methods in mathematical modeling in their fields but who have limited experience in modeling and/or related technology. The book may be used as a resource for researchers, or as a recommended or required resource for students enrolled in an introductory technology-driven project-based course on modeling in mathematical biology or ecology.

Biomathematics; Modelling; Compartmental Models; Berkeley Madonna; Agent-Based Models; NetLogo; Cluster Analysis

Olcay Akman, Illinois State University, Normal, USA; *Christopher Hay-Jahans*, University of Alaska, Juneau, USA.



T

Dimitrios C. Kravvaritis, Athanasios N. Yannacopoulos
Variational Methods in Nonlinear Analysis

Optimization and Partial Differential Equations Applications

Series: De Gruyter Textbook

2. Edition/2nd Edition
 September 2025
 English, Approx. XXV, 530 pp., 0 fig.

Pb. *RRP € 94.95/ US\$ 103.99/ £ 86.00
 ISBN 978-3-11-133325-0

****eBook** *RRP € 699.00/ US\$ 769.00/ £ 599.00
 PDF ISBN 978-3-11-133329-8
 ePUB ISBN 978-3-11-133335-9

The second edition covers the fundamentals of nonlinear analysis, variational methods and their applications. Also it covers Banach spaces, fixed point theory, nonsmooth analysis, minimax theory, variational calculus and inequalities, critical point theory, monotone, maximal monotone and pseudomonotone operators, and evolution problems. The new edition includes new topics on nonlinear operators, evolution and multivalued problems.

Fixed point theorem; monotonic operator; Nonlinear Functional Analysis; calculus of variations; variational inequality

Dimitrios C. Kravvaritis, National Tech. Univ. Athens; *Athanasios N. Yannacopoulos*, Athens Univ. Econ. Business, Greece.



T

René L. Schilling
Wahrscheinlichkeit

Stochastik: von Abweichungen bis Zufall

[Probability]

Reihe/Series: De Gruyter Studium

2. Edition/2nd Edition
 Juli/July 2025
 Deutsch/German, Ca./Approx. X, 240 S./pp.

Br./Pb. *€ 44.95/ UVP/RRP US\$ 47.99/
 UVP/RRP £ 39.50
 ISBN 978-3-11-134211-5

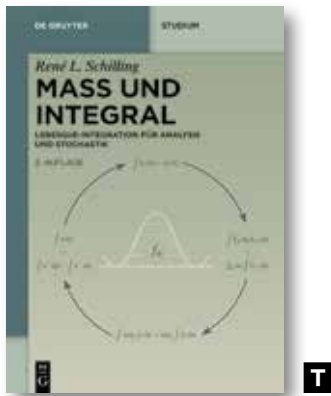
****eBook** *€ 699.00/ UVP/RRP US\$ 769.00/
 UVP/RRP £ 599.00
 PDF ISBN 978-3-11-134225-2
 ePUB ISBN 978-3-11-134261-0

Wahrscheinlichkeitstheorie gehört zu den Grundveranstaltungen fast aller Studiengänge. Dieses Lehrbuch führt schnell, verlässlich und präzise zu den wichtigsten Ergebnissen der Wahrscheinlichkeitstheorie hin. Diese neue überarbeitete und aktualisierte Auflage erweitert die Kapitel über diskrete Wahrscheinlichkeit und enthält ein neues Kapitel über Simulation.

Probability theory is a core course in almost all degree programs. This textbook provides a quick, reliable, and precise introduction to probability theory's most important findings. This revised and updated edition expands its chapters on discrete probability and contains a new chapter on simulation.

Probability theory; combinatorics; random variables; characteristic functions

René L. Schilling, Technische Universität Dresden.



T

René L. Schilling
Maß und Integral

Lebesgue-Integration für Analysis und Stochastik

[Measure and Integral: Lebesgue Integration for Analysis and Stochastics]

Reihe/Series: De Gruyter Studium

2. Edition/2nd Edition
 November/November 2024
 Deutsch/German, XII, 220 S./pp., 19 Abb./fig.

Br./Pb. *€ 44.95/ UVP/RRP US\$ 47.99/
 UVP/RRP £ 39.50
 ISBN 978-3-11-134277-1

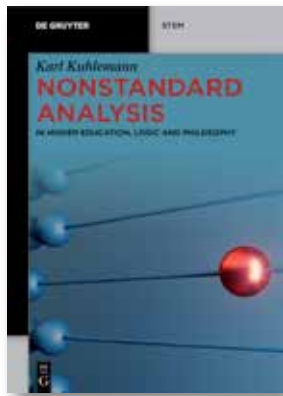
****eBook** *€ 699.00/ UVP/RRP US\$ 769.00/
 UVP/RRP £ 599.00
 PDF ISBN 978-3-11-134289-4
 ePUB ISBN 978-3-11-134306-8

Viele Gebiete der Mathematik und ihrer Anwendungen in Physik, Ökonomie bis hin zur Informatik erfordern solide Kenntnisse aus der Maßtheorie. Dieses Lehrbuch führt schnell, verlässlich und präzise zu den wichtigsten Ergebnissen der Maßtheorie hin.

Many areas of mathematics and its applications in physics, economics and computer science require solid knowledge of measure theory. This textbook provides a quick, reliable, and precise guide to the most important results of measure theory.

Probability theory; integration theory; random variables; measure theory

René Schilling, Technische Universität Dresden.



Karl Kuhlemann
Nonstandard Analysis

In Higher Education, Logic and Philosophy

Series: De Gruyter STEM

December 2024
 English, Approx. X, 260 pp., 9 fig.

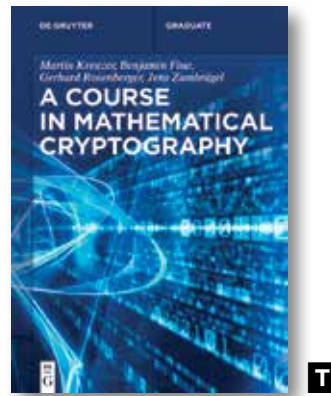
Pb. *RRP € 99.95/ US\$ 105.99/ £ 88.00
 ISBN 978-3-11-142887-1

eBook *RRP € 99.95/ US\$ 105.99/ £ 88.00
 PDF ISBN 978-3-11-142968-7
 ePUB ISBN 978-3-11-143053-9

How can there be infinitesimal real and infinitely large natural numbers? And how can we use such numbers for the teaching of analysis while simultaneously providing interesting insights into the foundations of mathematics? This work provides detailed answers. Nonstandard analysis is not only valuable for teaching but also for understanding standard analysis and mathematics as a whole.

Nonstandard analysis; infinitesimal calculus; foundations of mathematics; philosophy of mathematics

Karl Kuhlemann, Altenberge, Germany.



T

Martin Kreuzer, Benjamin Fine, Gerhard Rosenberger, Jens Zumbrägel
A Course in Mathematical Cryptography

Series: De Gruyter Textbook

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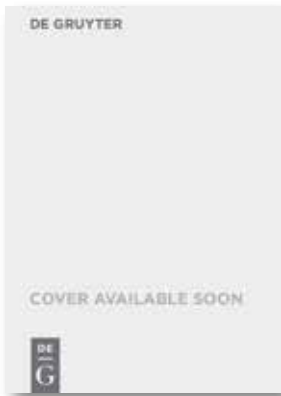
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Cryptography; cryptographic protocols; code-based cryptography; public key cryptography

Martin Kreuzer and Jens Zumbrägel, U. Passau, Germany; **Benjamin Fine**, Fairfield U., USA; **Gerhard Rosenberger**, U. Hamburg, Germany.



Xingjian Wang, Vigor Yang
Emulation of Complex Fluid Flows

Projection-Based Reduced-Order Modeling and Machine Learning

Series: Machine Learning in Science, Technology, Engineering and Mathematics

November 2025
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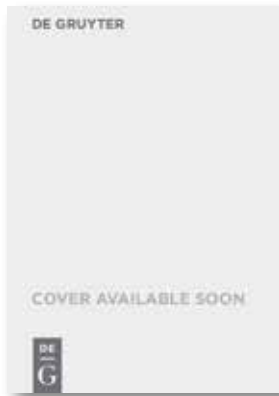
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Projection-Based Machine Learning; Reduced-Order Modeling; Data-Driven Methods in Thermal-Fluid Engineering Sciences; Emulation of Spatio-Temporally Evolving Problems; Machine Learning of Thermal-Fluid Dynamics

Xingjian Wang, Tsinghua University, China;
Vigor Yang, Georgia Institute of Technology, USA.



Yingjie Liu, Haoxiang Huang, Weiming Ding, Vigor Yang
Machine Learning for Partial Differential Equations

Neural Networks with Local Converging Inputs for PDEs

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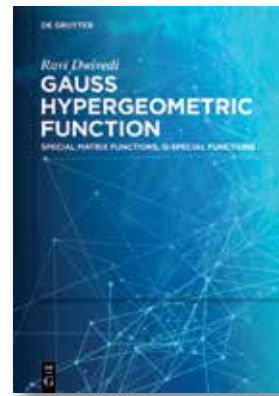
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This book introduces a neural-network technique that significantly reduces the complexity and training costs for solving partial differential equations including the Euler equations, Maxwell's equations, and multi-domain elliptic systems, ideal for researchers, students, and professionals. It offers efficient tools for high-dimensional physics, complex geometries, fine feature extraction, and design optimization.

Neural Networks with Local Converging Inputs; Numerical Methods for PDEs; Machine Learning for PDEs; Neural Networks for PDEs

Yingjie Liu, Haoxiang Huang, Weiming Ding, Vigor Yang, Georgia Institute of Technology, USA.



Ravi Dwivedi
Gauss Hypergeometric Function

Special Matrix Functions, q-Special Functions

December 2024
English, Approx. XX, 350 pp., 0 fig.

HC *RRP € 149.95/ US\$ 164.99/ £ 136.50
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This book represents a novel journey of Gauss hypergeometric function and provides its representation in the form of special matrix functions finite field analogue of special functions. The book also provides a possible extension of this representation for other special functions.

Basic Hypergeometric Functions; Matrix Arguments; Linear and Multilinear Algebra; Finite Field

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