

# Yurinsha Book News

*Cambridge Studies in Advanced Mathematics,*

**Vol. 153: Beals, R. / Wong, R.:**

500-116

## **Special Functions and Orthogonal Polynomials**

The subject of special functions is often presented as a collection of disparate results, rarely organized in a coherent way. This book emphasizes general principles that unify and demarcate the subjects of study.

The authors' main goals are to provide clear motivation, efficient proofs, and original references for all of the principal results. The book covers standard material, but also much more. It shows how much of the subject can be traced back to two equations - the hypergeometric equation and confluent hypergeometric equation - and it details the ways in which these equations are canonical and special.

There is extended coverage of orthogonal polynomials, including connections to approximation theory, continued fractions, and the moment problem, as well as an introduction to new asymptotic methods.

There are also chapters on Meijer G-functions and elliptic functions. The final chapter introduces Painlevé transcendents, which have been termed the 'special functions of the twenty-first century'.

June 2016

500 pp.

9781107106987

16,580.

**Cambridge**

**<http://www.yurinsha.com>**

ホームページは毎月25日更新予定です

**No. 500**

**Mar. - Apr. 2016**

敬理科学 **友 隣 社** 洋書専門

*Contemporary Mathematics,*

**Vol. 656: De La Pena, J. / Lopez-Mimbela, A. / Nakamura, M. / Petean, J. (Eds.):** 500-041

**Mathematical Congress of the Americas**

This volume contains the proceedings of the First Mathematical Congress of the Americas, held from August 5-9, 2013, in Guanajuato, Mexico. With the participation of close to 1,000 researchers from more than 40 countries, the meeting set a benchmark for mathematics in the two continents.

Feb. 2016 201 pp.  
9781470423100 19,330.

**Vol. 657: Barcenas, N. / Galaz-Garcia, F. / Moreno Rocha, M. (eds.):** 500-061

**Mexican Mathematicians Abroad: Recent Contributions**

This volume contains the proceedings of the First Workshop "Matematicos Mexicanos Jovenes en el Mundo", held from August 22-24, 2012, at Centro de Investigacion en Matematicas (CIMAT) in Guanajuato, Mexico.

Feb. 2016 237 pp.  
9781470421922 19,330.

*Colloquium Publications,*

**Vol. 62: Olsson, M.:** 500-095

**Algebraic Spaces and Stacks**

This book is an introduction to the theory of algebraic spaces and stacks intended for graduate students and researchers familiar with algebraic geometry at the level of a first-year graduate course. The first several chapters are devoted to background material including chapters on Grothendieck topologies, descent, and fibered categories. Following this, the theory of algebraic spaces and stacks is developed. The last three chapters discuss more advanced topics including the Keel-Mori theorem on the existence of coarse moduli spaces, gerbes and Brauer groups, and various moduli stacks of curves. Numerous exercises are included in each chapter ranging from routine verifications to more difficult problems, and a glossary of necessary category theory is included as an appendix.

Apr. 2016 .... 15,750.  
9781470427986

**Gel'fand, I. / Shilov, G. / Vilenkin, N. / Graev, M. / Pyatetskii-Shapiro, I.:** 500-016

**Generalized Functions, Vols. 1 -6 6 Vols. Set**

(Now in Paperback ed.) 1967 Printing

The first systematic theory of generalized functions (also known as distributions) was created in the early 1950s, although some aspects were developed much earlier, most notably in the definition of the Green's function in mathematics and in the work of Paul Dirac on quantum electrodynamics in physics.

The six-volume collection, Generalized Functions, written by I. M. Gel'fand and co-authors and published in Russian between 1958 and 1966, gives an introduction to generalized functions and presents various applications to analysis, PDE, stochastic processes, and representation theory. -

Apr. 2016 2165 pp.  
9781470428853 44,750.

**A. M. S. /Chelsea**

Yurinsha Book News

*Graduate Studies in Mathematics,*

**Vol. 170: Yau, D.:**

500-108

**Colored Operads**

The subject of this book is the theory of operads and colored operads, sometimes called symmetric multicategories.

A (colored) operad is an abstract object which encodes operations with multiple inputs and one output and relations between such operations.

The theory originated in the early 1970s in homotopy theory and quickly became very important in algebraic topology, algebra, algebraic geometry, and even theoretical physics (string theory).

Topics covered include basic graph theory, basic category theory, colored operads, and algebras over colored operads.

Free colored operads are discussed in complete detail and in full generality.

The intended audience of this book includes students and researchers in mathematics and other sciences where operads and colored operads are used.

Apr. 2016

428 pp.

9781470427238

15,930.

*Proceedings of Symposia in Pure Mathematics,*

**Vol. 91: Sidoravicius, V. / Smirnov, S. (eds.):**

500-227

**Probability and Statistical Physics in**

**St. Petersburg**

This book brings a reader to the cutting edge of several important directions of the contemporary probability theory, which in many cases are strongly motivated by problems in statistical physics.

The authors of these articles are leading experts in the field and the reader will get an exceptional panorama of the field from the point of view of scientists who played, and continue to play, a pivotal role in the development of the new methods and ideas, interlinking it with geometry, complex analysis, conformal field theory, etc., making modern probability one of the most vibrant areas in mathematics.

Apr. 2016

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9781470422486

21,480.

*IAS/Park City Mathematics Series,*

**Vol. 22: Bray, H. / Galloway, G. /**

**Mazzeo, R. / Sesum, M. (eds.):**

500-183

**Geometric Analysis**

This volume includes expanded versions of the lectures delivered in the Graduate Minicourse portion of the 2013 Park City Mathematics Institute session on Geometric Analysis.

The papers give excellent high-level introductions, suitable for graduate students wishing to enter the field and experienced researchers alike, to a range of the most important areas of geometric analysis.

These include: the general issue of geometric evolution, with more detailed lectures on Ricci flow and Kahler-Ricci flow, new progress on the analytic aspects of the Willmore equation as well as an introduction to the recent proof of the Willmore conjecture and new directions in min-max theory for geometric variational problems, the current state of the art regarding minimal surfaces in  $R^3$ , the role of critical metrics in Riemannian geometry, and the modern perspective on the study of eigenfunctions and eigenvalues for Laplace-Beltrami operators.

Apr. 2016

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9781470423131

17,720.

**A. M. S.**

Yurinsha Book News

*Contemporary Matheamticians,*

500-010

Denker, M. /Waymire, E. (eds.):

**Rabi N. Bhattacharya:**

**Selected Papers.**

This volume presents some of the most influential papers published by Rabi N. Bhattacharya, along with commentaries from international experts, demonstrating his knowledge, insight, and influence in the field of probability and its applications.

For more than three decades, Bhattacharya has made significant contributions in areas ranging from theoretical statistics via analytical probability theory, Markov processes, and random dynamics to applied topics in statistics, economics, and geophysics.

Selected reprints of Bhattacharya's papers are divided into three sections: Modes of Approximation, Large Times for Markov Processes, and Stochastic Foundations in Applied Sciences.

Apr. 2016

690 pp.

9783319301884

26,320.

Guillemin, V. /Sjostrand, J. (eds.):

500-021

**Louis Boutet de Monvel Selected Works**

This book features a selection of articles by Louis Boutet de Monvel and presents his contributions to the theory of partial differential equations and analysis.

The works selected here reveal his central role in the development of his field, including three cornerstones: firstly, analytic pseudodifferential operators, which have become a fundamental aspect of analytic microlocal analysis, and secondly the Boutet de Monvel calculus for boundary problems for elliptic partial differential operators, which is still an important tool also in index theory.

June 2016

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9783319279077

27,300.

*Progress in Mathematics,*

**Vol. 316: Moeglin, C. /Waldspurger, J.-L.:**

**Stabilisation de la formule des traces tordue, Vol. 1**

Ce travail en deux volumes donne la preuve de la stabilisation de la formule des trace tordue.

500-091

Stabiliser la formule des traces tordue est la methode la plus puissante connue actuellement pour comprendre l'action naturelle du groupe des points adeliques d'un groupe reductif, tordue par un automorphisme, sur les formes automorphes de carre integrable de ce groupe.

Cette comprehension se fait en reduisant le probleme, suivant les idees de Langlands, a des groupes plus petits munis d'un certain nombre de donnees auxiliaires; c'est ce que l'on appelle les donnees endoscopiques. L'analogie non tordu a ete resolu par J. Arthur et dans ce livre on suit la strategie de celui-ci.

Publier ce travail sous forme de livre permet de le rendre le plus complet possible. Les auteurs ont repris la theorie de l'endoscopie tordue developpee par R. Kottwitz et D. Shelstad et par J.-P. Labesse. Ils donnent tous les arguments des demonstrations meme si nombre d'entre eux se trouvent deja dans les travaux d'Arthur concernant le cas de la formule des traces non tordue.

Oct. 2016

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9783319300481

20,330.

**Birkhauser**

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*Progress in Mathematics,*

**Vol. 315: Faber, C. / Farkas, G. / van der Geer, G. (eds.):  
K3 Surfaces and Their Moduli**

This book provides an overview of the latest developments concerning the moduli of K3 surfaces. 500-073

It is aimed at algebraic geometers, but is also of interest to number theorists and theoretical physicists, and continues the tradition of related volumes like "The Moduli Space of Curves" and "Moduli of Abelian Varieties," which originated from conferences on the islands Texel and Schiermonnikoog and which have become classics.

K3 surfaces and their moduli form a central topic in algebraic geometry and arithmetic geometry, and have recently attracted a lot of attention from both mathematicians and theoretical physicists.

Advances in this field often result from mixing sophisticated techniques from algebraic geometry, lattice theory, number theory, and dynamical systems.

The topic has received significant impetus due to recent breakthroughs on the Tate conjecture, the study of stability conditions and derived categories, and links with mirror symmetry and string theory.

June 2016

400 pp.

9783319299594

21,450.

**Vol. 314: Fischer, V. / Ruzhansky, M.:**

500-074

**Quantization on Nilpotent Lie Groups**

This book presents a consistent development of the Kohn-Nirenberg type global quantization theory in the setting of graded nilpotent Lie groups in terms of their representations.

It contains a detailed exposition of related background topics on homogeneous Lie groups, nilpotent Lie groups, and the analysis of Rockland operators on graded Lie groups together with their associated Sobolev spaces.

For the specific example of the Heisenberg group the theory is illustrated in detail. In addition, the book features a brief account of the corresponding quantization theory in the setting of compact Lie groups.

Mar. 2016

543 pp.

9783319295572

9,750.

**Vol. 313: Llibre, J. / Ramirez, R.:**

500-156

Inverse Problems in

Ordinary Differential Equations and Applications

July 2016

280 pp.

9783319263373

16,570.

**Advanced Courses in Mathematics - CRM Barcelona**

**Bally, V. / Caramellino, L. / Cont, R.:**

500-115

**Stochastic Integration by  
Parts and Functional Ito Calculus**

This volume contains lecture notes from the courses given by Vlad Bally and Rama Cont at the Barcelona Summer School on Stochastic Analysis.

The notes of the course by Vlad Bally, co-authored with Lucia Caramellino, develop integration by parts formulas in an abstract setting, extending Malliavin's work on abstract Wiener spaces.

The results are applied to prove absolute continuity and regularity results of the density for a broad class of random processes.

July 2016

204 pp.

9783319271279

5,850.

**Birkhauser**

Yurinsha Book News

*Operator theory: Advances and Applications,*

**Vol. 253: Koshmanenko, V. /Dudkin, M.:**

**The Method of Rigged Spaces in**

**Singular Perturbation Theory of Self-Adjoint Operators**

All kinds of singular interactions described by potentials supported on small sets admit a rigorous treatment only in terms of the equipped spaces and their scales.

The main idea of the method is to use singular perturbations to change inner products in the starting rigged space, and the construction of the perturbed operator by the Berezansky canonical isomorphism (which connects the positive and negative spaces from a new rigged triplet).

Aug. 2016

9783319295336

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18,520.

**Vol. 252: Alpay, D. /Cipriani, F. /Colombo, F. /Guido, D. /  
Sabadini, I. /Sauvageot, J.-L. (eds.):**

**Noncommutative Analysis,**

**Operator Theory and Applications**

This book illustrates several aspects of the current research activity in operator theory, operator algebras and applications in various areas of mathematics and mathematical physics.

It is addressed to specialists but also to graduate students in several fields including global analysis, Schur analysis, complex analysis,  $C^*$ -algebras, noncommutative geometry, operator algebras, operator theory and their applications.

July 2016

9783319291147

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16,570.

**Gurlebeck, K. /Habetha, K. /Sprosig, W.:**

**Application of Holomorphic Functions in  
Two and Higher Dimensions**

This book presents applications of hypercomplex analysis to boundary value and initial-boundary value problems from various areas of mathematical physics.

Given that quaternion and Clifford analysis offer natural and intelligent ways to enter into higher dimensions, it starts with quaternion and Clifford versions of complex function theory including series expansions with Appell polynomials, as well as Taylor and Laurent series.

Several necessary function spaces are introduced, and an operator calculus based on modifications of the Dirac, Cauchy-Fueter, and Teodorescu operators and different decompositions of quaternion Hilbert spaces are proved.

Finally, hypercomplex Fourier transforms are studied in detail.

Aug. 2016

9783034809627

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18,520.

*Trends in Mathematics*

**de Jeu, M. /de Pagter, B. /van Gaans, O. /Veraar, M. (eds.):**

**Ordered Structures and Applications:**

**Positivity VII (Zaanen Centennial Conference), 2013, Leiden**

This was also the Zaanen Centennial Conference to mark the 100th birth year of Adriaan Cornelis Zaanen, who held the chair of Analysis in Leiden for more than 25 years and was one of the leaders in the field during his lifetime.

May 2016

9783319278407

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27,300.

**Birkhauser**

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Yurinsha Book News

*Lecture Notes in Logic*

Chubb, J. / Eskandarian, A. / Harizanov, V. (eds.):

**Logic and Algebraic Structures in  
Quantum Computing**

500-046

Arising from a special session held at the 2010 North American Annual Meeting of the Association for Symbolic Logic, this volume is an international cross-disciplinary collaboration with contributions from leading experts exploring connections across their respective fields.

Themes range from philosophical examination of the foundations of physics and quantum logic, to exploitations of the methods and structures of operator theory, category theory, and knot theory in an effort to gain insight into the fundamental questions in quantum theory and logic.

A brief introduction provides essential background on quantum mechanics and category theory, which, together with a thematic selection of articles, may also serve as the basic material for a graduate course or seminar.

Feb. 2016

356 pp.

9781107033399

25,060.

*Cambridge Mathematical Textbooks*

Cunningham, D.:

**Set Theory:  
A First Course**

500-047

Set theory is a rich and beautiful subject whose fundamental concepts permeate virtually every branch of mathematics.

One could say that set theory is a unifying theory for mathematics, since virtually all mathematical concepts and results can be formalized within set theory.

This textbook is meant for an upper undergraduate course in set theory. In this text, the fundamentals of abstract sets, including relations, functions, the natural numbers, order, cardinality, transfinite recursion, the axiom of choice, ordinal numbers, and cardinal numbers, are developed within the framework of axiomatic set theory.

The reader will need to be comfortable reading and writing mathematical proofs. The proofs in this textbook are rigorous, clear, and complete, while remaining accessible to undergraduates who are new to upper-level mathematics.

July 2016

222 pp.

9781107120327

10,740.

*New Mathematical Monographs,*

*Vol. 30:* Bobrowski, A.:

500-120

**Convergence of**

**One-Parameter Operator Semigroups**

This book presents a detailed and contemporary account of the classical theory of convergence of semigroups.

The author demonstrates the far-reaching applications of this theory using real examples from various branches of pure and applied mathematics, with a particular emphasis on mathematical biology.

These examples also serve as short, non-technical introductions to biological concepts. The book may serve as a useful reference, containing a significant number of new results ranging from the analysis of fish populations to signaling pathways in living cells.

Mar. 2016

439 pp.

9781107137431

25,060.

**Cambridge**

Yurinsha Book News

*Cambridge Tracts in Mathematics,*

**Vol. 207: Masser, D.:**

500-089

**Auxiliary Polynomials in Number Theory**

This unified account of various aspects of a powerful classical method, easy to understand in its simplest forms, is illustrated by applications in several areas of number theory.

As well as including diophantine approximation and transcendence, which were mainly responsible for its invention, the author places the method in a broader context by exploring its application in other areas, such as exponential sums and counting problems in both finite fields and the field of rationals.

Throughout the book, the method is explained in a 'molecular' fashion, where key ideas are introduced independently.

Each application is the most elementary significant example of its kind and appears with detailed references to subsequent developments, making it accessible to advanced undergraduates as well as Master's students in number theory or related areas.

Aug. 2016

9781107061576

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25,060.

*Cambridge Studies in Advanced Mathematics,*

**Vol. 156: Wall, C.:**

500-208

**Differential Topology**

Exploring the full scope of differential topology, this comprehensive account of geometric techniques for studying the topology of smooth manifolds offers a wide perspective on the field.

Building up from first principles, concepts of manifolds are introduced, supplemented by thorough appendices giving background on topology and homotopy theory.

Deep results are then developed from these foundations through in-depth treatments of the notions of general position and transversality, proper actions of Lie groups, handles (up to the h-cobordism theorem), immersions and embeddings, concluding with the surgery procedure and cobordism theory. Fully illustrated and rigorous in its approach, little prior knowledge is assumed, and yet growing complexity is instilled throughout.

Aug. 2016

9781107153523

330 pp.

13,420.

**Vol. 155: Pisier, G.:**

500-165

**Martingales in Banach Spaces**

This book focuses on the major applications of martingales to the geometry of Banach spaces, and a substantial discussion of harmonic analysis in Banach space valued Hardy spaces is also presented. It covers exciting links between super-reflexivity and some metric spaces related to computer science, as well as an outline of the recently developed theory of non-commutative martingales, which has natural connections with quantum physics and quantum information theory.

Requiring few prerequisites and providing fully detailed proofs for the main results, this self-contained study is accessible to graduate students with a basic knowledge of real and complex analysis and functional analysis. Chapters can be read independently, with each building from the introductory notes, and the diversity of topics included also means this book can serve as the basis for a variety of graduate courses.

July 2016

9781107137240

560 pp.

13,420.

**Cambridge**

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*London Mathematical Society Lecture Note Series,*

**Vol. 433: Kashiwara, M. /Schapira, P.: 500-199**  
**Regular And Irregular Holonomic D-Modules**

This book, the first devoted specifically to holonomic D-modules, provides a unified treatment of both regular and irregular D-modules.

The authors begin by recalling the main results of the theory of indsheaves and subanalytic sheaves, explaining in detail the operations on D-modules and their tempered holomorphic solutions.

As an application, they obtain the Riemann-Hilbert correspondence for regular holonomic D-modules.

In the second part of the book the authors do the same for the sheaf of enhanced tempered solutions of (not necessarily regular) holonomic D-modules.

Aug. 2016 121 pp.  
9781316613450 12,530.

**Vol. 432: Lauri, J. /Scapellato, R.: 500-087**  
**Topics In**

**Graph Automorphisms & Reconstruction, 2nd ed.**

This in-depth coverage of important areas of graph theory maintains a focus on symmetry properties of graphs.

Standard topics on graph automorphisms are presented early on, while in later chapters more specialised topics are tackled, such as graphical regular representations and pseudosimilarity.

The final four chapters are devoted to the reconstruction problem, and here special emphasis is given to those results that involve the symmetry of graphs, many of which are not to be found in other books.

This second edition expands on several of the topics found in the first edition and includes both an enriched bibliography and a wide collection of exercises.

Clearer proofs are provided, as are new examples of graphs with interesting symmetry properties.

Any student who masters the contents of this book will be well prepared for current research in many aspects of the theory of graph automorphisms and the reconstruction problem.

June 2016 212 pp.  
9781316610442 14,320.

**Vol. 431: Stoll, M.: 500-170**  
**Harmonic and Subharmonic Function Theory on the Hyperbolic Ball**

This comprehensive monograph is ideal for established researchers in the field and also graduate students who wish to learn more about the subject.

The text is made accessible to a broad audience as it does not require any knowledge of Lie groups and only a limited knowledge of differential geometry.

The author's primary emphasis is on potential theory on the hyperbolic ball, but many other relevant results for the hyperbolic upper half-space are included both in the text and in the end-of-chapter exercises.

These exercises

expand on the topics covered in the chapter and involve routine computations and inequalities not included in the text.

The book also includes some open problems, which may be a source for potential research projects.

July 2016 243 pp.  
9781107541481 14,320.

**Cambridge**

Yurinsha Book News

*Textbooks in Mathematics*

Deaconu, V. / Pfaff, D.:

**A Bridge to Higher Mathematics**

This is an introduction to proofs book for the course offering a transition to more advanced mathematics.

It contains logic, sets, functions, relations, the construction of rational, real and complex numbers and their properties.

It also has a chapter on cardinality and a chapter on counting techniques.

The book explains various proof techniques and has many examples which help with the transition to more advanced classes like Real Analysis, Groups, rings and fields or Topology.

July 2016

200 pp.

9781498775250

15,190.

*Discrete Mathematics and Its Applications*

Hofri, M. / Mahmoud, H.:

**Algorithmics of Nonuniformity**

The subject is at the crossroads of Discrete Mathematics and Computer Science, with a strong probabilistic flavor.

The main tools used before are on the one hand analytic (generating functions and complex analysis), and on the other probabilistic (strong laws, central limit theorems, martingales, etc.)

Often, professionals worked with one set of tools or the other.

We offer a reconciliation to espouse these fields to come in hand-in-hand offering a harmonious and beneficial marriage.

Nov. 2016

552 pp.

9781498750714

23,320.

Sziklai, P.:

**Polynomials in Finite Geometry**

The main topic is what the title indicates: to collect, survey and categorize the results and theories achieved in the last 30 years with "polynomial methods", mostly (but not exclusively) in finite geometries.

It contains techniques based on the careful examination of coefficients of polynomials, resultants, algebraic curves, subspaces generated by certain polynomials, random-like behaviour, etc.

Our polynomials are usually defined over a finite field, and they express some combinatorial or geometric property of a combinatorial or geometric structure.

We go through several types of applications of the methods.

There will be more than a hundred exercises with short solutions.

Sep. 2016

304 pp.

9781498735964

15,190.

*Discrete and Combinatorial Mathematics Series*

Meliot, P.-L.:

**Representation Theory of Symmetric Groups**

This book focuses on symmetric groups and representation theory.

The symmetric group is a central object in discrete mathematics.

It can be studied from a combinatorial, algorithmic, or algebraic viewpoint, and the results can be applied in a plethora of other fields, such as physics and computer science. This book is the most up-to-date one on the topic, bringing together new research and results.

Oct. 2016

352 pp.

9781498719124

15,180.

**Chapman & Hall/CRC Press**

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Yurinsha Book News

*IRMA - Lecture Notes in Mathematics and Theoretical Physics,*

**Vol. 26: Papadopoulos, A. (ed.):** 500-030

**Handbook of Teichmüller Theory, Vol. V**

This volume is the fifth in a series dedicated to Teichmüller theory in a broad sense, including the study of various deformation spaces and of mapping class group actions.

It is divided into four parts: Part A: The metric and the analytic theory  
Part B: The group theory Part C: Representation theory and generalized structures Part D: Sources  
The topics that are covered include identities for the hyperbolic geodesic length spectrum, Thurston's metric, the cohomology of moduli space and mapping class groups, the Johnson homomorphisms, Higgs bundles, dynamics on character varieties, and there are many others. Besides surveying important parts of the theory, several chapters contain conjectures and open problems.

Jan. 2016

596 pp.

9783037191606

17,160.

**Vol. 25: Shioya Takashi :**

**Metric Measure Geometry:** 500-169

**Gromov's Theory of Convergence and  
Concentration of Metrics and Measures**

This book studies a new theory of metric geometry on metric measure spaces, originally developed by M. Gromov in his book "Metric Structures for Riemannian and Non-Riemannian Spaces" and based on the idea of the concentration of measure phenomenon due to Levy and Milman. A central theme in this text is the study of the observable distance between metric measure spaces, defined by the difference between 1-Lipschitz functions on one space and those on the other. The topology on the set of metric measure spaces induced by the observable distance function is weaker than the measured Gromov-Hausdorff topology and allows to investigate a sequence of Riemannian manifolds with unbounded dimensions.

Jan. 2016

194 pp.

9783037191583

8,190.

*Heritage of European Mathematics*

**de Saint-Gervais, H.:**

500-043

**Uniformization of Riemann Surfaces:**

**Revisiting a Hundred-Year-Old Theorem**

The present book offers an overview of the maturation process of this theorem. The evolution of the uniformization theorem took place in parallel with the emergence of modern algebraic geometry, the creation of complex analysis, the first stirrings of functional analysis, and with the flowering of the theory of differential equations and the birth of topology. The uniformization theorem was thus one of the lightning rods of 19th century mathematics.

Rather than describe the history of a single theorem, our aim is to return to the original proofs, to look at these through the eyes of modern mathematicians, to enquire as to their correctness, and to attempt to make them rigorous while respecting insofar as possible the state of mathematical knowledge at the time, or, if this should prove impossible, then using modern mathematical tools not available to their authors.

Jan. 2016

512 pp.

9783037191453

15,210.

**European Mathematical Society**

Yurinsha Book News

*Oxford Graduate Texts in Mathematics*

Akbulut, A.:

500-178

#### 4-Manifolds

This book presents the topology of smooth 4-manifolds in an intuitive self-contained way, developed over a number of years by Professor Akbulut. The text is aimed at graduate students and focuses on the teaching and learning of the subject, giving a direct approach to constructions and theorems which are supplemented by exercises to help the reader work through the details not covered in the proofs.

The book contains a hundred colour illustrations to demonstrate the ideas rather than providing long-winded and potentially unclear explanations. Key results have been selected that relate to the material discussed and the author has provided examples of how to analyse them with the techniques developed in earlier chapters.

July 2016

280 pp.

9780198784869

10,800.

Pitaevskii, L. /Stringari, S.:

500-297

#### Bose-Einstein Condensation and Superfluidity.

Ultracold atomic gases is a rapidly developing area of physics that attracts many young researchers around the world.

Written by world renowned experts in the field, this book gives a comprehensive overview of exciting developments in Bose-Einstein condensation and superfluidity from a theoretical perspective. The authors also make sense of key experiments from the past twenty years with a special focus on the physics of ultracold atomic gases.

These systems are characterized by a rich variety of features which make them similar to other important systems of condensed matter physics. At the same time they exhibit very peculiar properties which are the result of their gaseous nature, the possibility of trapping in a variety of low dimensional and periodical configurations, and of manipulating the two-body interaction.

Jan. 2016

592 pp.

9780198758884

15,600.

Vaz, J. /da Rocha, R.:

500-265

#### An Introduction to Clifford Algebras and Spinors

This text explores how Clifford algebras and spinors have been sparking a collaboration and bridging a gap between Physics and Mathematics. This collaboration has been the consequence of a growing awareness of the importance of algebraic and geometric properties in many physical phenomena, and of the discovery of common ground through various touch points: relating Clifford algebras and the arising geometry to so-called spinors, and to their three definitions (both from the mathematical and physical viewpoint).

The main point of contact are the representations of Clifford algebras and the periodicity theorems. Clifford algebras also constitute a highly intuitive formalism, having an intimate relationship to quantum field theory. The text strives to seamlessly combine these various viewpoints and is devoted to a wider audience of both physicists and mathematicians.

May 2016

256 pp.

9780198782926

13,200.

**Oxford University Press**

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Yurinsha Book News

*Springer Collected Works in Mathematics*

Gindikin, S. /Guillemin, V. /Kirillov, A. /Kostant, B. /  
Sternberg, S. (eds.): (Now in Paperback ed.) 1988 Printing  
**Gelfand, Israel M.:  
Collected Papers II** 500-017

I.M. Gelfand (1913 - 2009), one of the world's leading contemporary mathematicians, largely determined the modern view of functional analysis with its numerous relations to other branches of mathematics, including mathematical physics, algebra, topology, differential geometry and analysis.

In this three-volume Collected Papers Gelfand presents a representative sample of his work.

Gelfand's research led to the development of remarkable mathematical theories - most of which are now classics - in the field of Banach algebras, infinite-dimensional representations of Lie groups, the inverse Sturm-Liouville problem, cohomology of infinite-dimensional Lie algebras, integral geometry, generalized functions and general hypergeometric functions.

Dec. 2015

1039 pp.

9783662487204

11,700.

Gindikin, S. /Guillemin, V. /Kirillov, A. /Kostant, B. /  
Sternberg, S. (eds.): (Now in Paperback ed.) 1989 Printing  
**Gelfand, Israel M.:  
Collected Papers III** 500-018

I.M. Gelfand, one of the leading contemporary mathematicians, largely determined the modern view of functional analysis with its numerous relations to other branches of mathematics, including mathematical physics, algebra, topology, differential geometry and analysis.

With the publication of these Collected Papers in three volumes Gelfand gives a representative choice of his papers written in the last fifty years.

Feb. 2016

1075 pp.

9783642308130

11,700.

Brauer, A. /Rohrbach, H. (eds.): 500-005  
(Now in Paperback ed.) 1975 Printing  
**Schur, Issai:  
Gesammelte Abhandlungen II**

Aus dem Vorwort: "Die Ergebnisse, Methoden und Begriffe, die mathematische Wissenschaft dem Forscher ISSAI SCHUR verdankt, haben ihre nachhaltige Wirkung bis in die Gegenwart hinein erwiesen und werden sie unverändert beibehalten.

Feb. 2016

494 pp.

9783662487563

10,930.

Bercovici, H. /Brown, A. /Percy, C.: 500-117  
**Measure and Integration.**

This book covers the material of a one year course in real analysis.

It includes an original axiomatic approach to Lebesgue integration which the authors have found to be effective in the classroom.

Each chapter contains numerous examples and an extensive problem set which expands considerably the breadth of the material covered in the text. Hints are included for some of the more difficult problems.

Mar. 2016

296 pp.

9783319290447

8,770.

**Springer**

**Vol. 2157: Gesztesy, F. /Waurick, M.:**

500-141

**The Callias Index Formula Revisited**

These lecture notes aim at providing a purely analytical and accessible proof of the Callias index formula.

In various branches of mathematics (particularly, linear and nonlinear partial differential operators, singular integral operators, etc.) and theoretical physics (e.g., nonrelativistic and relativistic quantum mechanics, condensed matter physics, and quantum field theory), there is much interest in computing Fredholm indices of certain linear partial differential operators. In the late 1970's, Constantine Callias found a formula for the Fredholm index of a particular first-order differential operator (intimately connected to a supersymmetric Dirac-type operator) additively perturbed by a potential, shedding additional light on the Fedosov-Hormander Index Theorem. As a byproduct of our proof we also offer a glimpse at special non-Fredholm situations employing a generalized Witten index.

June 2016

9783319299761

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6,820.

**Vol. 2155: Delabaere, E.:**

500-131

**Divergent Series, Summability & Resurgence III:****Resurgent Methods and the First Painleve**

The aim of this volume is two-fold. First, to show how the resurgent methods introduced in volume 1 can be applied efficiently in a non-linear setting; to this end further properties of the resurgence theory must be developed. Second, to analyze the fundamental example of the First Painleve equation. The resurgent analysis of singularities is pushed all the way up to the so-called "bridge equation", which concentrates all information about the non-linear Stokes phenomenon at infinity of the First Painleve equation.

The third in a series of three, entitled Divergent Series, Summability and Resurgence, this volume is aimed at graduate students, mathematicians and theoretical physicists who are interested in divergent power series and related problems, such as the Stokes phenomenon.

The prerequisites are a working knowledge of complex analysis at the first-year graduate level and of the theory of resurgence, as presented in volume 1.

June 2016

9783319289991

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8,770.

**Vol. 2154: Loday-Richaud, M.:**

500-132

**Divergent Series, Summability & Resurgence II:****Simple and Multiple Summability**

Addressing the question how to "gsum" a power series in one variable when it diverges, that is, how to attach to it analytic functions the volume gives answers by presenting and comparing the various theories of k-summability and multisummability. These theories apply in particular to all solutions of ordinary differential equations. The volume includes applications, examples and revisits, from a cohomological point of view, the group of tangent-to-identity germs of diffeomorphisms of  $\mathbb{C}$  studied in volume 1.

With a view to applying the theories to solutions of differential equations, a detailed survey of linear ordinary differential equations is provided which includes Gevrey asymptotic expansions, Newton polygons, index theorems and Sibuya's proof of the meromorphic classification theorem that characterizes the Stokes phenomenon for linear differential equations.

2016

9783319290744

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8,770.

**Springer**

Yurinsha Book News

*Lecture Notes in Mathematics,*

**Vol. 2153: Mitschi, C. /Sauzin, D.:  
Divergent Series, Summability & Resurgence I:  
Monodromy and Resurgence**

500-133

Providing an elementary introduction to analytic continuation and monodromy, the first part of this volume applies these notions to the local and global study of complex linear differential equations, their formal solutions at singular points, their monodromy and their differential Galois groups. The Riemann-Hilbert problem is discussed from Bofibrukh's point of view. The second part expounds 1-summability and Ecalle's theory of resurgence under fairly general conditions. It contains numerous examples and presents an analysis of the singularities in the Borel plane via "galien calculus", which provides a full description of the Stokes phenomenon for linear or non-linear differential or difference equations.

The first of a series of three, entitled Divergent Series, Summability and Resurgence, this volume is aimed at graduate students, mathematicians and theoretical physicists interested in geometric, algebraic or local analytic properties of dynamical systems.

It includes useful exercises with solutions. The prerequisites are a working knowledge of elementary complex analysis and differential algebra.

June 2016

9783319287355

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8,770.

*CMS Books in Mathematics*

**Castillo, R. /Rafeiro, H.:**

500-124

**An Introductory Course in Lebesgue Spaces**

This book is devoted exclusively to Lebesgue spaces and their direct derived spaces. Unique in its sole dedication, this book explores Lebesgue spaces, distribution functions and nonincreasing rearrangement.

Moreover, it also deals with weak, Lorentz and the more recent variable exponent and grand Lebesgue spaces with considerable detail to the proofs. The book also touches on basic harmonic analysis in the aforementioned spaces.

June 2016

9783319300320

465 pp.

11,700.

**Noguchi Junjiro :**

500-094

**Analytic Function Theory of Several Variables:  
Elements of Oka's Coherence**

The purpose of this book is to present the classical analytic function theory of several variables as a standard subject in a course of mathematics after learning the elementary materials.

This includes the essential parts of Grauert-Remmert's two volumes, GL227 (236) (Theory of Stein spaces) and GL265 (Coherent analytic sheaves) with a lowering of the level for novice graduate students.

The core of the theory is "Oka's Coherence", found and proved by Kiyoshi Oka. It is indispensable, not only in the study of complex analysis and complex geometry, but also in a large area of modern mathematics.

In this book, just after an introductory chapter on holomorphic functions (Chap. 1), we prove Oka's First Coherence Theorem for holomorphic functions in Chap. 2.

This defines a unique character of the book compared with other books on this subject, in which the notion of coherence appears much later.

Feb. 2016

9789811002892

393 pp.

11,700.

**Springer**

Yurinsha Book News

*Applied Mathematical Sciences,*

**Vol. 194: Amari, S.:**

500-180

**Information Geometry and Its Applications**

It consists of four parts, which on the whole can be read independently. A manifold with a divergence function is first introduced, leading directly to dualistic structure, the heart of information geometry. This part (Part I) can be apprehended without any knowledge of differential geometry. An intuitive explanation of modern differential geometry then follows in Part II, although the book is for the most part understandable without modern differential geometry. Information geometry of statistical inference, including time series analysis and semiparametric estimation (the Neyman-Scott problem), is demonstrated concisely in Part III. Applications addressed in Part IV include hot current topics in machine learning, signal processing, optimization, and neural networks. The book is interdisciplinary, connecting mathematics, information sciences, physics, and neurosciences, inviting readers to a new world of information and geometry.

Feb. 2016

374 pp.

9784431559771

18,520.

**Vol. 95: Hackbusch, W.:**

500-145

**Iterative Solution of**

**Large Sparse Systems of Equations, 2nd ed.**

In the second edition of this classic monograph, complete with four new chapters and updated references, readers will now have access to content describing and analysing classical and modern methods with emphasis on the algebraic structure of linear iteration, which is usually ignored in other literature. The necessary amount of work increases dramatically with the size of systems, so one has to search for algorithms that most efficiently and accurately solve systems of, e.g., several million equations. The choice of algorithms depends on the special properties the matrices in practice have. An important class of large systems arises from the discretization of partial differential equations. In this case, the matrices are sparse and well-suited to iterative algorithms. The first edition of this book grew out of a series of lectures given by the author at the Christian-Albrecht University of Kiel to students of mathematics. The second edition includes quite novel approaches.

Aug. 2016

497 pp.

9783319284811

26,320.

*Monographs in Mathematics,*

**Vol. 105: Pruss, J. / Simonett, G.:**

500-166

**Moving Interfaces and  
Quasilinear Parabolic Evolution Equations**

In this monograph the authors develop a comprehensive approach for the mathematical analysis of a wide array of problems involving moving interfaces. It includes an in-depth study of abstract quasilinear parabolic evolution equations, elliptic and parabolic boundary value problems, transmission problems, one- and two-phase Stokes problems, and the equations of incompressible viscous one- and two-phase fluid flows.

Sep. 2016

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9783319276977

21,450.

**Springer**

Page 15



Yurinsha Book News

*Springer Undergraduate Mathematics*

Hazrat, R.:

**Mathematica:**

500- 022

**A Problem-Centered Approach, 2nd ed.**

This textbook introduces the vast array of features and powerful mathematical functions of Mathematica using a multitude of clearly presented examples and worked-out problems. Each section starts with a description of a new topic and some basic examples. The author then demonstrates the use of new commands through three categories of problems

Dec. 2015

318 pp.

9783319275840

6,820.

Kantorovitz, S.:

**Several Real Variables**

500- 152

This undergraduate textbook is based on lectures given by the author on the differential and integral calculus of functions of several real variables. The book has a modern approach and includes topics such as:

- The p-norms on vector space and their equivalence
- The Weierstrass and Stone-Weierstrass approximation theorems
- The differential as a linear functional; Jacobians, Hessians, and Taylor's theorem in several variables
- The Implicit Function Theorem for a system of equations, proved via Banach's Fixed Point Theorem

Mar. 2016

294 pp.

9783319279558

6,820.

*Undergraduate Texts in Mathematics*

Hijab, O.:

500- 146

**Introduction to**

**Calculus & Classical Analysis, 4th ed.**

Involving rigorous analysis, computational dexterity, and a breadth of applications, this text is ideal for an undergraduate honors calculus course or for an introduction to analysis.

This fourth edition includes corrections as well as some additional material. Some features of the text: The text is completely self-contained and starts with the real number axioms; The integral is defined as the area under the graph, while the area is defined for every subset of the plane;

Mar. 2016

424 pp.

9783319283999

8,770.

*Springer Undergraduate Series in Mathematics and Technology*

Meijer, A.:

500- 090

**Algebra for Cryptologists**

Modern cryptology has been described as the science of the integrity of information, covering all aspects like confidentiality, authenticity and non-repudiation and also including the protocols required for achieving these aims. In both theory and practice it requires notions and constructions from three major disciplines: computer science, electronic engineering and mathematics. Within mathematics, group theory, the theory of finite fields, and elementary number theory as well as some topics not normally covered in courses in algebra, such as the theory of Boolean functions and Shannon theory are involved.

July 2016

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9783319303956

6,820.

**Springer**

Reis, C. / Rankin, S.:

500-097

**Abstract Algebra:****An Introduction to Groups, Rings and Fields, 2nd ed.**

This second edition covers essentially the same topics as the first. However, the presentation of the material has been extensively revised and improved. In addition, there are two new chapters, one dealing with the fundamental theorem of finitely generated abelian groups and the other a brief introduction to semigroup theory and automata. This book is appropriate for second to fourth year undergraduates. In addition to the material traditionally taught at this level, the book contains several applications: Polya-Burnside Enumeration, Mutually Orthogonal Latin Squares, Error-Correcting Codes, and a classification of the finite groups of isometries of the plane and the finite rotation groups in Euclidean 3-space, semigroups and automata.

Sep. 2016

550 pp.

9789814730532/9789814730549

26,490./12,170. (Paper ed.)

Tignol, J.-P.:

500-104

**Galois' Theory of Algebraic Equations, 2nd ed.**

The book gives a detailed account of the development of the theory of algebraic equations, from its origins in ancient times to its completion by Galois in the nineteenth century.

The appropriate parts of works by Cardano, Lagrange, Vandermonde, Gauss, Abel, and Galois are reviewed and placed in their historical perspective, with the aim of conveying to the reader a sense of the way in which the theory of algebraic equations has evolved and has led to such basic mathematical notions as "group" and "field".

A brief discussion of the fundamental theorems of modern Galois theory and complete proofs of the quoted results are provided, and the material is organized in such a way that the more technical details can be skipped by readers who are interested primarily in a broad survey of the theory.

In this second edition, the exposition has been improved throughout and the chapter on Galois has been entirely rewritten to better reflect

Galois' highly innovative contributions. The text now follows more closely Galois' memoir, resorting as sparsely as possible to anachronistic modern notions such as field extensions. The emerging picture is a surprisingly elementary approach to the solvability of equations by radicals, and yet is unexpectedly close to some of the most recent methods of Galois theory.

Feb. 2016

324 pp.

9789814704694

13,960.

Nazarov, A. / Poborchii, S.:

**Poincare Inequality and Its Applications to PDE:****An Advanced Textbook**

500-160

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 Poincare inequality and demonstrates its importance in function theory and in the theory of PDEs.

**Contents:** \*Basic Facts from Analysis and Function Theory Classes of Domains \*Generalized Derivatives Sobolev Spaces Poincare \*Inequality Imbedding Theorems and Poincare Inequality in Nonsmooth \*Domains Boundary Traces of Functions with p-Summable Gradient \*Poincare Inequality and Boundary Value Problems for Elliptic Equations \*On Sharp Constants in the Poincare Inequality Comments and Bibliography

Aug. 2016

170 pp.

9789814725873/9789814725880

13,420./6,800. (Paper ed.)

**World Scientific Publishers**

Escassut, A.:

500- 137

**Value Distribution in P-Adic Analysis.**

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 is explained. P-adic meromorphics are studied. Sets of range uniqueness in a p-adic field are examined.

The ultrametric Corona problem is 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.

Jan. 2016

560 pp.

9789814730105

28,280.

Veron, L.:

500- 174

**Local and Global Aspects of  
Quasilinear Degenerate Elliptic Equations:  
Quasilinear Elliptic Singular Problems.**

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 dominant lower order reaction term.

Emphasis is put on three aspects: The existence of separable singular solutions enlightens the description of isolated singularities of general solutions.

The construction of singular solutions is delicate and cannot be done without the understanding of the spherical p-harmonic eigenvalue problem. When the equations are considered on a Riemannian manifold, existence or non-existence of solutions depends on geometric assumptions such as the curvature. A priori estimates and Liouville type problems are analyzed. When the equations are considered with a forcing term in the class of measures, their study is strongly linked to the properties of a class of potentials appearing in harmonic analysis such as the Riesz, the Bessel or the Wolf potentials and to their associated capacities.

Aug. 2017

300 pp.

9789814730327

17,000.

Rudiyak, Y.:

500- 203

**Piecewise Linear Structures on  
Topological Manifolds**

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.

The goal of this book is to provide a readable and well-organized exposition of the subject, which would be suitable for advanced graduate students in topology. An exposition like this is currently lacking.

Feb. 2016

120 pp.

9789814733786

13,960.

**World Scientific Publishers**

*Asterisque,*

**Vol. 375: Faure, F. / Tsujii, M.:**

500-187

**Prequantum Transfer Operator for  
Symplectic Asonov Diffeomorphism**

We define the prequantization of a symplectic Anosov diffeomorphism  $f: M \rightarrow M$  as a  $U(1)$  extension of the diffeomorphism  $f$  preserving a connection related to the symplectic structure on  $M$ . We study the spectral properties of the associated transfer operator with a given potential  $V \in C^\infty(M)$ , called prequantum transfer operator. This is a model of transfer operators for geodesic flows on negatively curved manifolds (or contact Anosov flows). We restrict the prequantum transfer operator to the  $N$ -th Fourier mode with respect to the  $U(1)$  action and investigate the spectral property in the limit  $N \rightarrow \infty$ , regarding the transfer operator as a Fourier integral operator and using semi-classical analysis. In the main result, under some pinching conditions, we show a "band structure" of the spectrum, that is, the spectrum is contained in a few separated annuli and a disk concentric at the origin. We show that, with the special (Holder continuous) potential  $V\theta = \frac{1}{2} \log |\det Df|_{Eu}$ , where  $Eu$  is the unstable subspace, the outermost annulus is the unit circle and separated from the other parts. For this, we use an extension of the transfer operator to the Grassmannian bundle. Using Atiyah-Bott trace formula, we establish the Gutzwiller trace formula with exponentially small reminder for large time.

Feb. 2016

222 pp.

9782856298237

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**Vol. 374: Alazard, T. / Delort, J.-M.:**

500-109

**Sobolev estimates for  
two dimensional gravity water waves**

Our goal in this volume is to apply a normal forms method to estimate the Sobolev norms of the solutions of the water waves equation. We construct a paradifferential change of unknown, without derivatives losses, which eliminates the part of the quadratic terms that bring non zero contributions in a Sobolev energy inequality. Our approach is purely Eulerian: we work on the Craig-Sulem-Zakharov formulation of the water waves equation.

Dec. 2015

241 pp.

9782856298213

価格未定

*Memoires de la Societe Mathematique de France,*

**Numero 143: Danchin, R. / Mucha, P.:**

500-130

**Critical Functional Framework and  
Maximal Regularity in**

**Action on Systems of Incompressible flows**

This memoir is devoted to endpoint maximal regularity in Besov spaces for the evolutionary Stokes system in bounded or exterior domains. The authors get estimates with global-in-time integrability in intersection of Besov spaces. They apply them in particular to solve locally for large data or globally for small data the slightly inhomogeneous Navier-Stokes equations in critical Besov spaces in an exterior domain.

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*Panoramas et synthèses,*

**Vol. 46: Calmes, B. et al.:**

詳報掲載 No. 066

**Autour des schemas en groupes: A celebration of SGA3, Vol. II.**

Dec. 2015

316 pp.

9782856298190

13,060.

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500-187

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### **Introduction to Modern Finsler Geometry**

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

This 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. The authors made great efforts to ensure that the contents are accessible to senior undergraduate students, graduate students, mathematicians and scientists. It is so far the most comprehensive book on Finsler geometry.

400pp  
978-981-4704-90-8

Apr 2016

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

This textbook for undergraduate mathematics, science, and engineering students 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. Mathematical concepts are clarified by more than 90 figures and 75 exercises with detailed solutions. Computer explorations of signal and image processing are present in each chapter.

300pp  
978-981-4725-76-7  
978-981-4725-77-4(pbk)

Mar 2016

### **Fundamentals of Modern Algebra**

A Global Perspective

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

The book 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.

250pp  
978-981-4730-28-0

Feb 2016

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