

賀 正  
**Yurinsha  
Book News**

*EMS Series of Lectures in Mathematics,*

**Khalkhali, M.:**

439-068

**Basic Noncommutative Geometry**

The book can be used either as a textbook for a graduate course on the subject or for self-study. It will be useful for graduate students and researchers in mathematics and theoretical physics and all those who are interested in gaining an understanding of the subject.

One feature of this book is the wealth of examples and exercises that help the reader to navigate through the subject.

While background material is provided in the text and in several appendices, some familiarity with basic notions of functional analysis, algebraic topology, differential geometry and homological algebra at a first year graduate level is helpful.

Developed by Alain Connes since the late 1970s, noncommutative geometry has found many applications to long-standing conjectures in topology and geometry and has recently made headways in theoretical physics and number theory.

The book starts with a detailed description of some of the most pertinent algebra-geometry correspondences by casting geometric notions in algebraic terms, then proceeds in the second chapter to the idea of a noncommutative space and how it is constructed.

The last two chapters deal with homological tools: cyclic cohomology and Connes-Chern characters in K-theory and K-homology, culminating in one commutative diagram expressing the equality of topological and analytic index in a noncommutative setting.

Dec. 2009

239 pp.

9783037190616

7,270.

**European Mathematical Society**

<http://www.yurinsha.com>

ホームページは毎月25日更新予定です

**No. 439**

**Jan. 2010**

敬理科学 **友 隣 社** 洋書専門

*Contemporary Mathematics,*

**Vol. 509: Acosta-Humanez, P. /Marcellan, F. (eds.):** 439-045  
**Differential Algebra,**  
**Complex Analysis and Orthogonal Polynomials**

This volume represents the 2007-2008 Jairo Charris Seminar in Algebra and Analysis on Differential Algebra, Complex Analysis and Orthogonal Polynomials, which was held at the Universidad Sergio Arboleda in Bogota, Colombia.

It provides the state of the art in the theory of Integrable Dynamical Systems based on such approaches as Differential Galois Theory and Lie Groups as well as some recent developments in the theory of multivariable and  $q$ -orthogonal polynomials, weak Hilbert's 16th Problem, Singularity Theory, Tournaments in flag manifolds, and spaces of bounded analytic functions on the unit circle.

The reader will also find survey presentations, an account of recent developments, and the exposition of new trends in the areas of Differential Galois Theory, Integrable Dynamical Systems, Orthogonal Polynomials and Special Functions, and Bloch-Bergman classes of analytic functions from a theoretical and an applied perspective.

Apr. 2010

235 pp.

9780821848869

10,660.

**Vol. 508: Berz, M. /Shamseddine, K. (eds.):** 439-050  
**Advances in  $p$ -Adic and**  
**Non-Archimedean Analysis**

This volume contains the proceedings of the Tenth Int'l Conference on  $p$ -adic and non-Archimedean Analysis, held at Michigan State University in East Lansing, Michigan, on June 30-July 3, 2008.

This volume contains a kaleidoscope of papers based on several of the more important talks presented at the meeting. It provides a cutting-edge connection to some of the most important recent developments in the field. Through a combination of survey papers, research articles, and extensive references to earlier work, this volume allows the reader to quickly gain an overview of current activity in the field and become acquainted with many of the recent sub-branches of its development.

Mar. 2010

269 pp.

9780821847404

12,010.

*Graduate Studies in Mathematics,*

**Vol. 113: Liggett, T.:** 439-191  
**Continuous Time Markov Processes**

Markov processes are among the most important stochastic processes for both theory and applications. This book develops the general theory of these processes, and applies this theory to various special examples.

The initial chapter is devoted to the most important classical example— one dimensional Brownian motion.

This, together with a chapter on continuous time Markov chains, provides the motivation for the general setup based on semigroups and generators. Chapters on stochastic calculus and probabilistic potential theory give an introduction to some of the key areas of application of Brownian motion and its relatives. A chapter on interacting particle systems treats a more recently developed class of Markov processes that have as their origin problems in physics and biology.

Apr. 2010

278 pp.

9780821849491

7,420.

**A. M. S.**

*Graduate Studies in Mathematics,***Vol. 112: Troltsch, F.:**

439-134

**Optimal Control of Partial Differential Equations**

This book focuses on optimal control problems where the state equation is an elliptic or parabolic partial differential equation.

Included are topics such as the existence of optimal solutions, necessary optimality conditions and adjoint equations, second-order sufficient conditions, and main principles of selected numerical techniques.

Feb. 2010

408 pp.

9780821849040

9,310.

**Vol. 111: Brendle, S.:**

439-144

**Ricci Flow and the Sphere Theorem**

In 1982, R. Hamilton introduced a nonlinear evolution equation for Riemannian metrics with the aim of finding canonical metrics on manifolds. This evolution equation is known as the Ricci flow, and it has since been used widely and with great success, most notably in Perelman's solution of the Poincare conjecture.

Furthermore, various convergence theorems have been established.

This book provides a concise introduction to the subject as well as a comprehensive account of the convergence theory for the Ricci flow.

Feb. 2010

176 pp.

9780821849385

6,340.

**Vol. 108: Outerelo, E. /Ruiz, J.:**

439-159

**Mapping Degree Theory**

This textbook treats the classical parts of mapping degree theory, with a detailed account of its history traced back to the first half of the 18th century. After a historical first chapter, the remaining four chapters develop the mathematics. An effort is made to use only elementary methods, resulting in a self-contained presentation.

Even so, the book arrives at some truly outstanding theorems:

the classification of homotopy classes for spheres and the Poincare-Hopf Index Theorem, as well as the proofs of the original formulations by Cauchy, Poincare, and others.

Dec. 2009

244 pp.

9780821849156

8,370.

*Courant Lecture Notes,***Vol. 20: Esposito, P. /Ghoussoub, N. /Guo, Y.:**

439-108

**Mathematical Analysis of  
Partial Differential Equations****Modeling Electrostatic MEMS**

Micro- and nanoelectromechanical systems (MEMS and NEMS), which combine electronics with miniature-size mechanical devices, are essential components of modern technology.

It is the mathematical model describing "electrostatically actuated" MEMS that is addressed in this monograph. Even the simplified models that the authors deal with still lead to very interesting second- and fourth-order nonlinear elliptic equations and to nonlinear parabolic equations. While nonlinear eigenvalue problems—where the stationary MEMS models fit—are a well-developed field of PDEs, the type of inverse square nonlinearity that appears here helps shed a new light on the class of singular supercritical problems and their specific challenges.

Feb. 2010

318 pp.

9780821849576

6,750.

**A. M. S.**

*Oberwolfach Seminars,***Vol. 43: Hacon, C./Kovacs, S.:**

439-066

**Higher Dimensional Algebraic Geometry**

This book focuses on recent advances in the classification of complex projective varieties. It is divided into two parts. The first part gives a detailed account of recent results in the minimal model program. In particular, it contains a complete proof of the theorems on the existence of flips, on the existence of minimal models for varieties of log general type and of the finite generation of the canonical ring.

The second part is an introduction to the theory of moduli spaces. It includes topics such as representing and moduli functors, Hilbert schemes, the boundedness, local closedness and separatedness of moduli spaces and the boundedness for varieties of general type.

Apr. 2010

200 pp.

9783034602891

5,040.

*Monografie Matematyczne,***Vol. 70: Positselski, L.:**

439-082

**Homological Algebra of Semimodules and Semicontra-Modules**

This is a monograph in semi-infinite homological algebra, concentrated mostly on the semi-infinite theory of associative algebraic structures, but including also some material on the semi-infinite homology and cohomology of Lie algebras and topological groups.

The main objects of study are the double-sided derived functors  $\text{SemiExt}$  and  $\text{SemiTor}$ , and the phenomenon of comodule-contramodule correspondence, connecting them with the more conventional, one-sided  $\text{Ext}$  and  $\text{CtrTor}$ .

Contramodules, introduced originally by Eilenberg and Moore in 1960's but almost forgotten for four decades, play a very prominent role in this book, with many versions of them introduced and discussed.

Jan. 2010

300 pp.

9783034604352

13,120.

**Birkhauser***Publications of the Scuola Normale Superiore/Theses,***Vol. 14: Della Sala, G.:**

439-146

**Geometric properties of non-compact CR manifolds**

The book deals with some questions related to the boundary problem in complex geometry and CR geometry.

After a brief introduction summarizing the main results on the extension of CR functions, it is shown in chapters 2 and 3 that, employing the classical Harvey-Lawson theorem and under suitable conditions, the boundary problem for non-compact maximally complex real submanifolds of  $C_n$ ,  $n=3$  is solvable. In chapter 4, the regularity of Levi flat hypersurfaces  $C_n$  ( $n=3$ ) with assigned boundaries is studied in the graph case, in relation to the existence theorem proved by Dolbeault, Tomassini and Zaitsev.

Finally, in the last two chapters the structure properties of non-compact Levi-flat submanifolds of  $C_n$  are discussed; in particular, using the theory of the analytic multifunctions, a Liouville theorem for Levi flat submanifolds of  $C_n$  is proved.

Jan. 2010

150 pp.

9788876423482

3,640.

**The Scuola Normale Superiore**

新刊特刊

*Oberwolfach Seminars,*

439-066

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Jan. 2010

150 pp.

9788876423482

3,640.

**The Scuola Normale Superiore**

Page 3

Bar, C.:

439-001

**Elementary Differential Geometry**

The link between the physical world and its visualization is geometry. This easy-to-read, generously illustrated textbook presents an elementary introduction to differential geometry with emphasis on geometric results. Avoiding formalism as much as possible, the author harnesses basic mathematical skills in analysis and linear algebra to solve interesting geometric problems, which prepare students for more advanced study in mathematics and other scientific fields such as physics and computer science. The wide range of topics includes curve theory, a detailed study of surfaces, curvature, variation of area and minimal surfaces, geodesics, spherical and hyperbolic geometry, the divergence theorem, triangulations, and the Gauss-Bonnet theorem.

The section on cartography demonstrates the concrete importance of elementary differential geometry in applications.

Clearly developed arguments and proofs, colour illustrations, and over 100 exercises and solutions make this book ideal for courses and self-study.

May 2010

345 pp.

9780521896719/9780521721493

14,950./7,500. (Paper ed.)

*Lecture Notes in Logic,*

Feferman, S. /Parsons, C. /Simpson, S.:

439-010

**Kurt Godel:****Essays for his Centennial**

Kurt Godel (1906-1978) did groundbreaking work that transformed logic and other important aspects of our understanding of mathematics, especially his proof of the incompleteness of formalized arithmetic. This book on different aspects of his work and on subjects in which his ideas have contemporary resonance includes papers from a May 2006 symposium celebrating Godel's centennial as well as papers from a 2004 symposium. Proof theory, set theory, philosophy of mathematics, and the editing of Godel's writings are among the topics covered. Several chapters discuss his intellectual development and his relation to predecessors and contemporaries such as Hilbert, Carnap, and Herbrand. Others consider his views on justification in set theory in light of more recent work and contemporary echoes of his incompleteness theorems and the concept of constructible set.

Mar. 2010

375 pp.

9780521115148

11,880.

Lerman, M.:

439-038

**A Framework for Priority Arguments**

This book presents a unifying framework for using priority arguments to prove theorems in computability.

Priority arguments provide the most powerful theorem-proving technique in the field, but most of the applications of this technique are ad hoc, masking the unifying principles used in the proofs.

The proposed framework presented isolates many of these unifying combinatorial principles and uses them to give shorter and easier-to-follow proofs of computability-theoretic theorems.

Standard theorems of priority levels 1, 2, and 3 are chosen to demonstrate the framework's use, with all proofs following the same pattern.

Mar. 2010

176 pp.

9780521119696

9,240.

**Cambridge**

*Encyclopedia of Mathematics and its Applications,***Vol. 133: Kornerup, P. /Matula, D.:**

439-070

**Finite Precision Numbers Systems  
and Arithmetic**

Fundamental arithmetic operations support virtually all of the engineering, scientific, and financial computations required for practical applications, from cryptography, to financial planning, to rocket science.

This comprehensive reference provides researchers with the thorough understanding of number representations that is a necessary foundation for designing efficient arithmetic algorithms.

Using the elementary foundations of radix number systems as a basis for arithmetic, the authors develop and compare alternative algorithms for the fundamental operations of addition, multiplication, division, and square root with precisely defined roundings.

Various finite precision number systems are investigated, with the focus on comparative analysis of practically efficient algorithms for closed arithmetic operations over these systems.

Sep. 2010

9780521761352

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16,500.

**Vol. \*\*\*: Crama, Y. /Hammer, P. (eds.):**

439-032

**Boolean Functions, Vol. 2:  
Applications**

This collection of papers presents a series of in-depth examinations of a variety of advanced topics related to Boolean functions and expressions. The chapters are written by some of the most prominent experts in their respective fields and cover topics ranging from algebra and propositional logic to learning theory, cryptography, computational complexity, electrical engineering, and reliability theory.

Beyond the diversity of the questions raised and investigated in different chapters, a remarkable feature of the collection is the common thread created by the fundamental language, concepts, models, and tools provided by Boolean theory.

May 2010

9780521847520

748 pp.

17,160.

**Ocampo, H. /Pariguan, S. /Paycha, S. (eds.):**

439-158

**Geometric and Topological Methods for  
Quantum Field Theory**

Aimed at graduate students in physics and mathematics, this book provides an introduction to recent developments in several active topics at the interface between algebra, geometry, topology and quantum field theory. The first part of the book begins with an account of important results in geometric topology. It investigates the differential equation aspects of quantum cohomology, before moving on to noncommutative geometry.

This is followed by a further exploration of quantum field theory and gauge theory, describing AdS/CFT correspondence, and the functional renormalization group approach to quantum gravity.

The second part covers a wide spectrum of topics on the borderline of mathematics and physics, ranging from orbifolds to quantum indistinguishability and involving a manifold of mathematical tools borrowed from geometry, algebra and analysis. Each chapter presents introductory material before moving on to more advanced results.

May 2010

9780521764827

450 pp.

16,500.

**Cambridge**

*Research and Exposition in Mathematics,***Vol. 31: Lukacs, G.:**

439-073

**Compact-Like Topological Groups**

The class of compact topological groups is perhaps the most understood part of topological groups. This monograph deals with larger classes defined by properties shared by compact groups.

For instance, if  $G$  is a compact topological group, then for every group  $H$ , the image of every closed subgroup of  $G \times H$  under the second projection is closed in  $H$ .

Topological groups with this property are called *c-compact*.

Is every *c-compact* topological group compact?

Chapter 1 is an elementary introduction to topological groups. Chapter 2 presents cardinal invariants, a more specialized aspect of topological group theory. Chapter 3 focuses on two compactness-like properties, namely, precompactness and minimality. Chapter 4 relates to the main question by proving compactness theorems, open mapping theorems, and reduction theorems.

2009

166 pp.

9783885382317

5,660.

*Sigma Series in Applied Mathematics,***Vol. 7: Butt, R.:**

439-003

**Introduction to Applied  
Linear Algebra with MATLAB**

This book has been written as an introductory and advanced course in applied linear algebra for mathematicians, computer scientists, engineers, and other scientists. The intention is to provide a gentle and sympathetic introduction to many of the problems of scientific computing, and the wide variety of methods used for their solutions.

The presentation of each numerical method is based on the successful teaching methodology of first providing examples and geometric motivation for a method, and a concise statement of the steps to carry out the computation. Only then a mathematical derivation of the process is presented, followed by a discussion of the more theoretical issues that are relevant to the use and understanding of the method.

To provide maximum teaching flexibility, each chapter and each section begins with the basic, elementary material, and gradually builds up to the more advanced material.

May 2008

520 pp.

9783885384076

13,740.

*Berliner Studienreihe zur Mathematik,***Band 20: Flachsmeyer, J.:**

439-011

**Origami und Mathematik**

Origami ist die weltweit verbreitete japanische Kunst des Papierfaltens. Jeder kann sie mit Freude und Gewinn betreiben, das Kind im Kindergarten genauso wie der forschende Mathematiker.

Man benötigt dazu nur buntes Papier. Wer besonders schöne Objekte falten will, nimmt spezielles japanisches Origamipapier. Dieses Buch bietet eine große Zahl von neuen Faltoobjekten, die hier erstmalig vorgestellt werden. Die Faltungen reichen von kinderleicht bis anspruchsvoll.

Die Beschreibung der Faltungsabfolge ist ausführlich und genau.

May 2008

242 pp.

9783885381204

4,060.

**Heldermann**

*Annals of Mathematics Studies,*

Vol. 174: Todorčević, S.:

439-043/044

**Introduction to Ramsey Spaces**

Ramsey theory is a fast-growing area of combinatorics with deep connections to other fields of mathematics such as topological dynamics, ergodic theory, mathematical logic, and algebra.

The area of Ramsey theory dealing with Ramsey-type phenomena in higher dimensions is particularly useful.

Introduction to Ramsey Spaces presents in a systematic way a method for building higher-dimensional Ramsey spaces from basic one-dimensional principles.

It is the first book-length treatment of this area of Ramsey theory, and emphasizes applications for related and surrounding fields of mathematics, such as set theory, combinatorics, real and functional analysis, and topology.

July 2010

296 pp.

9780691145419/9780691145426

8,990./4,520. (Paper ed.)

Vol. 173: Morel, S.:

439-077/078

**On the Cohomology of  
Certain Non-Compact Shimura Varieties**

This book studies the intersection cohomology of the Shimura varieties associated to unitary groups of any rank over  $\mathbb{Q}$ .

In general, these varieties are not compact. The intersection cohomology of the Shimura variety associated to a reductive group  $G$  carries commuting actions of the absolute Galois group of the reflex field and of the group  $G(\mathbb{A}_f)$  of finite adelic points of  $G$ .

The second action can be studied on the set of complex points of the Shimura variety.

In this book, Sophie Morel identifies the Galois action—at good places—on the  $G(\mathbb{A}_f)$ -isotypical components of the cohomology.

Morel uses the method developed by Langlands, Ihara, and Kottwitz, which is to compare the Grothendieck-Lefschetz fixed point formula and the Arthur-Selberg trace formula.

Mar. 2010

256 pp.

9780691142920/9780691142937

7,440./3,970. (Paper ed.)

*London Mathematical Society Monographs,*

Forrester, P.:

439-064

**Log-Gases and Random Matrices**

Log-Gases and Random Matrices gives a comprehensive account of these developments, emphasizing log-gases as a physical picture and heuristic, as well as covering topics such as beta ensembles and Jack polynomials.

Peter Forrester presents an encyclopedic development of log-gases & random matrices viewed as examples of integrable or exactly solvable systems.

Forrester develops not only the application and theory of Gaussian and circular ensembles of classical random matrix theory, but also of the Laguerre and Jacobi ensembles, and their beta extensions.

Prominence is given to the computation of a multitude of Jacobians; determinantal point processes and orthogonal polynomials of one variable; the Selberg integral, Jack polynomials, and generalized hypergeometric functions; Painlevé transcendents; macroscopic electrostatics and asymptotic formulas; nonintersecting paths and models in statistical mechanics; and applications of random matrix theory.

July 2010

808 pp.

9780691128290

9,870.

**Princeton University**

**Ergebnisse der Mathematik und ihrer Grenzgebiete 3 Folge****Band \*\*: Ribes, L. /Zalesskii, P:**

439-084

**Profinite Groups**

The book is reasonably self-contained. Profinite groups are Galois groups. As such they are of interest in algebraic number theory.

Much of recent research on abstract infinite groups is related to profinite groups because residually finite groups are naturally embedded in a profinite group.

In addition to basic facts about general profinite groups, the book emphasizes free constructions (particularly free profinite groups and the structure of their subgroups).

Homology and cohomology is described with a minimum of prerequisites.

Feb. 2010

483 pp.

9783642016417

28,270.

**Lecture Notes in Mathematics,****Vol. 1989: Bomez, I. /Demyanov, V. /**

439-201

**Fletcher, R. /Terlaky, T. /Polik, I.:****Nonlinear Optimization:**

Lectures given at the C.I.M.E. Summer School held in Cetraro, 2007

This volume presents recent advances in continuous optimization; it is authored by four well-known experts in the field and presents classical as well as advanced material on currently active research areas, such as: the family of Sequential Quadratic Programming methods for local constrained optimization, the study of Global Optimization by means of (non-convex) standard quadratic problems, Nonsmooth Optimization, and recent advances in Interior Point Methods for nonlinear optimization.

Feb. 2010

280 pp.

9783642113383

9,080.

**Springer Finance****Profeta, C. /Roynette, B. /Yor, M.:**

439-195

**Option Prices as Probabilities:****A New Look at Generalized Black-Scholes Formulae**

The present volume gives another representation of this formula in terms of Brownian last passages times, which, to our knowledge, has never been made in this sense.

The volume is devoted to various extensions and discussions of features and quantities stemming from the last passages times representation in the Brownian case such as: past-future martingales, last passage times up to a finite horizon, pseudo-inverses of processes... They are developed in eight chapters, with complements, appendices and exercises.

Jan. 2010

250 pp.

9783642103940

12,110.

**Lin, Z. /Bai, Z.:**

(Jointly published with Science Press)

**Probability Inequalities**

439-121

Inequality has become an essential tool in many areas of mathematical research, for example in probability and statistics where it is frequently used in the proofs.

"Probability Inequalities" covers inequalities related with events, distribution functions, characteristic functions, moments and random variables (elements) and their sum.

Feb. 2010

180 pp.

9783642052606

16,150.

**Springer**

**Understanding Complex Systems**

Thiel, M. /Kurths, J. /Romano, C. /Moura, A. (eds.):  
**Nonlinear Dynamics and Chaos: Advances and Perspectives** 439-308

This book is a collection of contributions on various aspects of active frontier research in the field of dynamical systems and chaos. Each chapter examines a specific research topic and, in addition to reviewing recent results, also discusses future perspectives. The result is an invaluable snapshot of the state of the field by some of its most important researchers. The first contribution in this book, "How did you get into Chaos?", is actually a collection of personal accounts by a number of distinguished scientists on how they entered the field of chaos and dynamical systems, featuring comments and recollections by James Yorke, Harry Swinney, Floris Takens, Peter Grassberger, Edward Ott, Lou Pecora, Itamar Procaccia, Michael Berry, Giulio Casati, Valentin Afraimovich, Robert MacKay, and last but not least, Celso Grebogi, to whom this volume is dedicated.

Feb. 2010 320 pp.  
 9783642046285 24,230.

**Monographs in Theoretical Computer Science. An EATCS Series,**

Doberkat, E.-E.:  
**Stochastic Coalgebraic Logic** 439-033

Coalgebraic logic is an important research topic in the areas of concurrency theory, semantics, transition systems and modal logics. It provides a general approach to modeling systems, allowing us to apply important results from coalgebras, universal algebra and category theory in novel ways. Stochastic systems provide important tools for systems modeling, and recent work shows that categorical reasoning may lead to new insights, previously not available in a purely probabilistic setting. This book combines coalgebraic reasoning, stochastic systems and logics.

Nov. 2009 231 pp.  
 9783642029943 16,150.

**Springer Series in Computational Mathematics,**

Vol. 31: Hairer, E. /Lubich, C. /Wanner, G.: 439-112  
**Geometric Numerical Integration:**

**Structure-Preserving Algorithms for Ordinary Differential Equations, 2nd ed. (Now in Paperback ed.)**  
 Numerical methods that preserve properties of Hamiltonian systems, reversible systems, differential equations on manifolds and problems with highly oscillatory solutions are the subject of this book. A complete self-contained theory of symplectic and symmetric methods, which include Runge-Kutta, composition, splitting, multistep and various specially designed integrators, is presented and their construction and practical merits are discussed.

The long-time behaviour of the numerical solutions is studied using a backward error analysis (modified equations) combined with KAM theory.

Feb. 2010 644 pp.  
 9783642051579 12,110.

Vol. 8: Hairer, E. /Norsett, S. /Wanner, G.: (Now in Paperback ed.)  
**Solving Ordinary Differential Equations I: Nonstiff Problems, 2nd ed.**

Dec. 2009 528 pp. 9783642051630 13,120.

**Springer**

詳報掲載 No. 113

*Wiley Series in Probability and Statistics***Bendat, J.:**

439-170

**Random Data, 4th ed.**

Random Data provides first-rate, practical tools for dynamic data and statistical methods for engineering problems.

This revised bestseller presents the latest developed procedures and a complete rewrite of the Fast Fourier Transforms of applied fields. Plus, this resource includes a new chapter on frequency domain techniques. The updated book explores novel techniques on modern digital data storage, oversampling, and temporal moments.

With new problem sets and examples, this guide is the ideal text and reference for students studying random data analysis theory and applications.

Feb. 2010

608 pp.

9780470248775

18,900.

**Pesarin, F.:**

439-195

**Permutation Tests for Complex Data:**

Complex multivariate testing problems are frequently encountered in many scientific disciplines, such as engineering, medicine and the social sciences. As a result, modern statistics needs permutation testing for complex data with low sample size and many variables, especially in observational studies. The Authors give a general overview on permutation tests with a focus on recent theoretical advances within univariate and multivariate complex permutation testing problems, this book brings the reader completely up to date with today's current thinking.

Mar. 2010

456 pp.

9780470516416

16,200.

**Harry, M.:**

439-185

**The Practitioner's Guide to Statistics and Lean Six Sigma for Process Improvements**

The only textbook of its kind, this authoritative account provides a balanced approach to quantitative and qualitative statistics using the Six Sigma and Lean Sigma methodologies.

The emphasis is on applications and the implementation of data analyses as they relate to Six Sigma.

The primary purpose of the book is to serve as a reference guide and textbook for both experienced practitioners and new students of Six Sigma.

Feb. 2010

832 pp.

9780470114940

17,550.

**Le, C.:**

439-190

**Applied Categorical Data Analysis and Translational Research, 2nd ed.**

An updated treatment of categorical data analysis in the biomedical sciences that now explores applications to translational research. Thoroughly updated with the latest advances in the field, *Applied Categorical Data Analysis and Translational Research, Second Edition* maintains the accessible style of its predecessor while also exploring the importance of translational research as it relates to basic scientific findings within clinical practice.

With its easy-to-follow style, updated coverage of major methodologies, and broadened scope of coverage, this new edition provides an accessible guide to statistical methods involving categorical data and the steps to their application in problem solving in the biomedical sciences.

Nov. 2009

416 pp.

9780470371305

12,820.

**Wiley**

Mickens, R.:

439-124

**Truly Nonlinear Oscillations:  
Harmonic Balance, Parameter Expansions,  
Iteration, and Averaging Methods**

This unique book provides a concise presentation of many of the fundamental strategies for calculating approximations to the oscillatory solutions of "truly nonlinear" (TNL) oscillator equations.

The volume gives a general overview of the author's work on harmonic balance, iteration and combined linearization-averaging methods.

However, full discussions are also presented on parameter expansion procedures and a first-order averaging technique for TNL oscillators. The calculational basis of each method is clarified by applying them to a set of standard TNL oscillator equations.

This allows a direct comparison to be made among the various methods.

Apr. 2010

200 pp.

9789814291651

10,660.

Anciaux, H.:

439-137

**Minimal Submanifolds in  
Pseudo-Riemannian Geometry**

Since the foundational work of Lagrange on the differential equation to be satisfied by a minimal surface of the Euclidean space, the theory of minimal submanifolds have undergone considerable developments, involving techniques from related areas, such as the analysis of partial differential equations and complex analysis.

On the other hand, the relativity theory has led to the study of pseudo-Riemannian manifolds, which turns out to be the most general framework for the study of minimal submanifolds.

However, most of the recent books on the subject still present the theory only in the Riemannian case.

For the first time, this textbook provides a self-contained and accessible introduction to the subject in the general setting of pseudo-Riemannian geometry, only assuming from the reader some basic knowledge about manifold theory.

Several classical results, such as the Weierstrass representation formula for minimal surfaces, and the minimizing properties of complex submanifolds, are presented in full generality without sacrificing the clarity of exposition.

Apr. 2010

150 pp.

9789814291248

6,480.

*Atlantis Studies in Mathematics for Engineering and Science,*

**Vol. 5: Lakshmikantham, V. /Leela, S. /Mcrae, F. /Drici, Z.:**

**Theory of Causal Differential Equations**

This is the first book which describes the theory of CDE as an independent discipline, incorporating the recent general theory of CDE and introducing several new ideas.

This book is a timely introduction to the subject in a more generalised frame work.

439-120

The present monograph collects recent works in this broad area and provides possible extensions to other dynamic systems involving causal operators such as CDE in abstract spaces, CDE with memory, CDE with fractional derivatives and causal set differential equations-giving initial apparatus, for further study in this important branch of nonlinear analysis.

Oct. 2009

200 pp.

9789078677321

11,470.

**World Scientific Pub.**

Alsina, C. /Sikorska, J. /Tomas, S.:

439-094

**Norm Derivatives and Characterizations of Inner Product Spaces**

The book provides a comprehensive overview of the characterizations of real normed spaces as inner product spaces based on norm derivatives and generalizations of the most basic geometrical properties of triangles in normed spaces.

Since the appearance of Jordan-von Neumann's classical theorem in 1935, the field of characterizations of inner product spaces has received a significant amount of attention in various literature texts.

Moreover, the techniques arising in the theory of functional equations have shown to be extremely useful in solving key problems in the characterizations of Banach spaces as Hilbert spaces.

This book presents, in a clear and detailed style, state-of-the-art methods of characterizing inner product spaces by means of norm derivatives.

It brings together results that have been scattered in various publications over the last two decades and includes more new material and techniques for solving functional equations in normed spaces.

Nov. 2009

190 pp.

9789814287265

8,770.

*Series on Knots and Everything,*

Vol. 23: Hellerstein, N.:

439-036

**Diamond: A Paradox Logic, 2nd ed.**

This book is about "diamond", a logic of paradox.

In diamond, a statement can be true yet false; an "imaginary" state, midway between being and non-being.

Diamond's imaginary values solve many logical paradoxes unsolvable in two-valued boolean logic.

In this volume, paradoxes by Russell, Cantor, Berry and Zeno are all resolved.

This book has three sections: Paradox Logic, which covers the classic paradoxes of mathematical logic, shows how they can be resolved in this new system; The Second Paradox, which relates diamond to Boolean logic and the Spencer-Brown "modulator"; and Metamathematical Dilemma, which relates diamond to Godelian meta-mathematics and dilemma games.

Jan. 2010

300 pp.

9789814287135

11,470.

Ng, S.-A.:

439-039

**Nonstandard Methods in Functional Analysis**

In the early 1960s, by using techniques from the model theory of first-order logic, Robinson gave a rigorous formulation and extension of Leibniz' infinitesimal calculus.

Since then, the methodology has found applications in a wide spectrum of areas in mathematics, with particular success in the probability theory and functional analysis.

In the latter, fruitful results were produced with Luxemburg's invention of the nonstandard hull construction.

However, there is still no publication of a coherent and self-contained treatment of functional analysis using methods from nonstandard analysis.

This publication aims to fill this gap.

Apr. 2010

300 pp.

9789814287548

11,470.

**World Scientific Pub.**

*Advanced Studies in Pure Mathematics,***Vol. 56: Brasselet, J.-P. /**

439-055

**Ishii Shihoko /Suwa Tatsuo /Vaquie, M.:  
Singularities —Niigata —Toyama 2007**

from Preface: A French mathematician Rene Thom, the founder of singularity theory, and a Japanese mathematician Heisuke Hironaka, the discoverer of the method of resolutions of singularities, were both awarded Fields Medals. After their distinguished works, French and Japanese mathematicians have continued to successfully develop research on singularities. In this regard there has been an excellent relationship between French and Japanese researchers. Numerous researchers have been exchanged and thereby research in the area of singularities has been stimulated in both countries. These activities were supported by JSPS (Japan Society for the Promotion of Science) and CNRS (Centre National de la Recherche Scientifique). This issue is the proceedings of the fourth Franco-Japanese Symposium on Singularities and the workshop on Singularities held in Niigata prior to the fourth Franco-Japanese Symposium.

Nov. 2009

408 pp.

9784931469556

7,239.

**Vol. 55: Bourguignon, J. /Kotani Motoko /**

439-053

**Maeda Yoshiaki /Tose Nobuyuki (eds.):****Noncommutativity and Singularities:  
Proceedings of French -Japanese symposia held at  
IHES in 2006**

from Preface: Two symposia, the Hayashibara Forum and the MJS/IHES Joint Workshop, were held at the Institut des Hautes Etudes Scientifiques (IHES) from November 20 to November 23, 2006, and from November 15 to November 18, 2006.

The programs of the two symposia are listed after the table of contents. The Hayashibara Forum, which was supported by the Hayashibara Foundation, focused on singularity theory, a research area that has, over the years, been well represented at IHES.

Ever since Professor Heisuke Hironaka, who received a Fields Medal for his outstanding solution of the problem of resolution of singularities, was invited to IHES. as the first foreign visitor, IHES and the mathematical community of Japan have developed a long and fruitful relationship.

July 2009

364 pp.

9784931469549

8,096.

**Vol. 53: Elaydi, S. /Nishimura Kazuo /**

439-107

**Shishikura Mitsuhiro /Tose Nobuyuki :****Advances in Discrete Dynamical Systems**

from Preface: The Eleventh International Conference on Difference Equations and Applications (ICDEA 06) was held on the campus of Kyoto University, July 24-28, 2006. These Proceedings include talks given by the maid speakers as well as talks given by the participants. The proceedings cover the most updated developments in the areas of difference equations and discrete dynamical systems with applications in many scientific disciplines, including economics, biology, engineering, and physics. On behalf of the International Society of Difference Equations (ISDE), The Editors wish to express their gratitude to the Mathematical Society of Japan for publishing these proceedings.

June 2009

398 pp.

9784931469495

6,477.

**Mathematical Society of Japan**