

# Yurinsha Book News

*Lecture Notes in Mathematics,*

*Vol. 2011: Andrews, B. /Hopper, C.:* <sup>448-113</sup>

## The Ricci Flow in Riemannian Geometry:

### A Complete Proof of the Differentiable 1/4-Pinching Sphere Theorem

This book focuses on Hamilton's Ricci flow, beginning with a detailed discussion of the required aspects of differential geometry, progressing through existence and regularity theory, compactness theorems for Riemannian manifolds, and Perelman's noncollapsing results, and culminating in a detailed analysis of the evolution of curvature, where recent breakthroughs of Bohm and Wilking and Brendle and Schoen have led to a proof of the differentiable 1/4-pinching sphere theorem.

#### Table of contents

1 Introduction.- 2 Background Material.- 3 Harmonic Mappings.- 4 Evolution of the Curvature.- 5 Short-Time Existence.- 6 Uhlenbeck's Trick.- 7 The Weak Maximum Principle.- 8 Regularity and Long-Time Existence.- 9 The Compactness Theorem for Riemannian Manifolds.- 10 The F-Functional and Gradient Flows.- 11 The W-Functional and Local Noncollapsing.- 12 An Algebraic Identity for Curvature Operators.- 13 The Cone Construction of Bohm and Wilking.- 14 Preserving Positive Isotropic Curvature.- 15 The Final Argument

Dec. 2010

276 pp.

9783642162855

7,550.

**Springer**

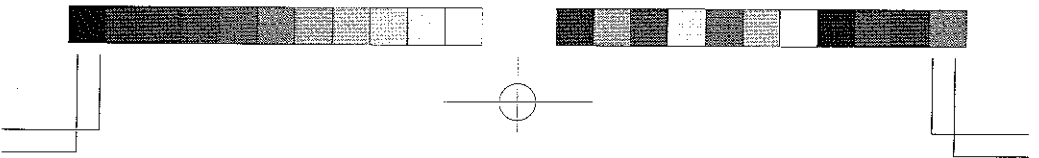
<http://www.yurinsha.com>

ホームページは毎月25日更新予定です

No. 448

Oct. 2010

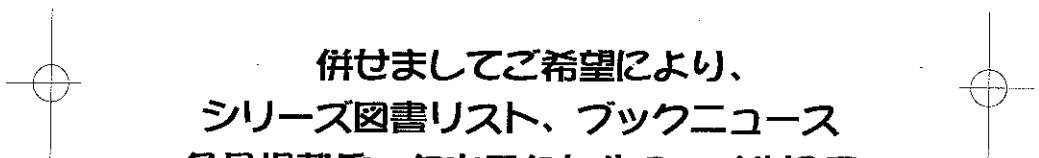
数理科学 **友 隣 社** 洋書専門



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**(株) 友 隣 社**

*Fields Institute Communications,***Vol. 58: Murty, K. (ed.):**

448-101

**Algebraic Curves and Cryptography**

It is by now a well-known paradigm that public-key cryptosystems can be built using finite Abelian groups and that algebraic geometry provides a supply of such groups through Abelian varieties over finite fields. Of special interest are the Abelian varieties that are Jacobians of algebraic curves. All of the articles in this volume are centered on the theme of point counting and explicit arithmetic on the Jacobians of curves over finite fields. The topics covered include Schoof's  $\ell$ -adic point counting algorithm, the  $p$ -adic algorithms of Kedlaya and Denef-Vercauteren, explicit arithmetic on the Jacobians of  $C_{\text{ab}}$  curves and zeta functions.

This volume is based on seminars on algebraic curves and cryptography held at the GANITA Lab of the University of Toronto during 2001-2008.

Nov. 2010

133 pp.

9780821843116

10,270.

*IAS/Park City Mathematics Series,***Vol. 17: McNeal, J./Mustata, M. (eds.):**

448-189

**Analytic and Algebraic Geometry:  
Common Problems, Different Methods**

Analytic and algebraic geometers often study the same geometric structures but bring different methods to bear on them.

While this dual approach has been spectacularly successful at solving problems, the language differences between algebra and analysis also represent a difficulty for students and researchers in geometry, particularly complex geometry.

The PCMI program was designed to partially address this language gulf, by presenting some of the active developments in algebraic and analytic geometry in a form suitable for students on the "other side" of the analysis-algebra language divide. One focal point of the summer school was multiplier ideals, a subject of wide current interest in both subjects.

Nov. 2010

583 pp.

9780821849088

12,870.

*Courant Lecture Notes,***Vol. 21: Hoppensteadt, F.:**

448-140

**Quasi-Static State Analysis of****Differential, Difference, Integral, and Gradient Systems**

This book is based on a course on advanced topics in differential equations given in Spring 2010 at the Courant Institute of Mathematical Sciences.

It describes aspects of mathematical modeling, analysis, computer simulation, and visualization in the mathematical sciences and engineering that involve singular perturbations.

There is a large literature devoted to singular perturbation methods for ordinary and partial differential equations, but there are not many studies that deal with difference equations, Volterra integral equations, and purely nonlinear gradient systems where there is no dominant linear part.

Designed for a one-semester course for students in applied mathematics, it is the purpose of this book to present sufficient rigorous methods and examples to position the reader to investigate singular perturbation problems in such equations.

Nov. 2010

163 pp.

9780821852699

4,030.

*Mathematical Surveys and Monographs,***Vol. 63: Bruner, R. /Greenlees, P.:** 448-083**Connective Real K-Theory of Finite Groups**

This book is about equivariant real and complex topological K-theory for finite groups. Its main focus is on the study of real connective K-theory including  $ko^*(BG)$  as a ring and  $ko_*(BG)$  as a module over it.

In the course of their study the authors define equivariant versions of connective KO-theory and connective K-theory with reality, in the sense of Atiyah, which give well-behaved, Noetherian, uncompleted versions of the theory.

They prove local cohomology and completion theorems for these theories, giving a means of calculation as well as establishing their formal credentials. In passing from the complex to the real theories in the connective case, the authors describe the known failure of descent and explain how the  $\eta$ -Bockstein spectral sequence provides an effective substitute.

Nov. 2010 318 pp. 11,960.  
9780821851890

**Vol. 168: Hazewinkel, M. /Gubareni, N. /Kirichenko, V.:**  
**Algebras, Rings and Modules**

The first chapter can be viewed as a primer on Lie algebras, with the main goal to explain and prove the Gabriel-Bernstein-Gelfand-Ponomarev theorem on the correspondence between the representations of Lie algebras and quivers; this material has not previously appeared in book form.

The next two chapters are also "primers" on coalgebras and Hopf algebras, respectively; they aim specifically to give sufficient background on these topics for use in the main part of the book.

Chapters 4-7 are devoted to four of the most beautiful Hopf algebras currently known: the Hopf algebra of symmetric functions, the Hopf algebra of representations of the symmetric groups (although these two are isomorphic, they are very different in the aspects they bring to the forefront), the Hopf algebras of the nonsymmetric and quasisymmetric functions (these two are dual and both generalize the previous two), and the Hopf algebra of permutations.

The last chapter is a survey of applications of Hopf algebras in many varied parts of mathematics and physics.

Nov. 2010 411 pp. 13,390.  
9780821852620

**Vol. 167: Gekhtman, M. /Shapiro, M. /Vainshtein, A.:**  
**Cluster Algebra and Poisson Geometry**

Cluster algebras, introduced by Fomin and Zelevinsky in 2001, are commutative rings with unit and no zero divisors equipped with a distinguished family of generators (cluster variables) grouped in overlapping subsets (clusters) of the same cardinality (the rank of the cluster algebra) connected by exchange relations.

Examples of cluster algebras include coordinate rings of many algebraic varieties that play a prominent role in representation theory, invariant theory, the study of total positivity, etc.

The theory of cluster algebras has witnessed a spectacular growth, first and foremost due to the many links to a wide range of subjects including representation theory, discrete dynamical systems, Teichmüller theory, and commutative and non-commutative algebraic geometry.

Nov. 2010 246 pp. 10,660.  
9780821849729

A. M. S.

*Progress in Mathematics,**Vol. 286: Abbes, A.:*

448-077

**Elements de Geometrie Rigide, Vol. 1:****Construction et Etude Geometrique des Espaces Rigides**

This book is the first volume of a treaty that presents a systematic development of rigid geometry following the approach of M. Raynaud, based on formal schemes up to admissible blow-ups.

This volume is dedicated to the construction of rigid spaces in a relative situation and to the study of their geometric properties.

Emphasis is put on the study of the admissible topology of a coherent rigid space, analogue of the Zariski topology of a scheme.

Some of the topics treated are the study of coherent sheaves and their cohomology, the flattening theorem by admissible blow-ups that generalizes to the formal-rigid setting a theorem of Raynaud-Gruson in the algebraic setting, and the GAGA type comparison theorem for coherent sheaves.

This volume contains also an extensive review and complements on Grothendieck's formal geometry.

Nov. 2010

495 pp.

9783034800112

14,320.

*Monografie Matematyczne,**Vol. 71: Bukovsky, L.:*

448-117

**The Structure of the Real Line**

The rapid development of set theory in the last fifty years, mainly in obtaining plenty of independence results, strongly influenced an understanding of the structure of the real line.

This book is devoted to the study of the real line and its subsets taking into account the recent results of set theory.

Whenever possible the presentation is done without the full axiom of choice.

Since the book is intended to be self-contained, all necessary results of set theory, topology, measure theory, descriptive set theory are revisited with the purpose to eliminate superfluous use of an axiom of choice.

The duality of measure and category is studied in a detailed manner.

Nov. 2010

520 pp.

9783034800051

16,790.

*Probability and its Applications,***Gawarecki, L. /Mandrekar, V.:**

448-135

**Stochastic Differential Equations in Infinite Dimensions:****With Applications to Stochastic Partial Differential Equations**

The systematic study of existence, uniqueness, and properties of solutions to stochastic differential equations in infinite dimensions arising from practical problems characterizes this volume that is intended for graduate students and for pure and applied mathematicians, physicists, engineers, professionals working with mathematical models of finance.

Major methods include compactness, coercivity, monotonicity, in a variety of set-ups.

The authors emphasize the fundamental work of Gikhman and Skorokhod on the existence and uniqueness of solutions to stochastic differential equations and present its extension to infinite dimension. They also generalize the work of Khasminskii on stability and stationary distributions of solutions.

Dec. 2010

274 pp.

9783642161933

8,390.

**Birkhauser**

*Progress in Probability,*

**Vol. 63: Dalang, R. /Marco, D. /Russo, F. (eds.): 448-126**  
**Seminar on Stochastic Analysis,**  
**Random Fields and Applications VI:**  
**Centro Stefano Franscini, Ascona, May 2008**

This volume contains refereed research or review papers presented at the 6th Seminar on Stochastic Processes, Random Fields and Applications, which took place at the Centro Stefano Franscini (Monte Verita) in Ascona, Switzerland, in May 2008.

The seminar focused mainly on stochastic partial differential equations, especially large deviations and control problems, on infinite dimensional analysis, particle systems and financial engineering, especially energy markets and climate models.

The book will be a valuable resource for researchers in stochastic analysis and professionals interested in stochastic methods in finance.

Dec. 2010

492 pp.

9783034800204

16,630.

*Frontiers in Mathematics*

**Dragovic, V. /Radnovic, M.: 448-087**  
**Poncelet Porisms and Beyond:**  
**Integrable Billiards,**  
**Hyperelliptic Jacobians and Pencils of Quadrics**

The goal of the book is to present, in a complete and comprehensive way, areas of current research interlacing around the Poncelet porism: dynamics of integrable billiards, algebraic geometry of hyperelliptic Jacobians, and classical projective geometry of pencils of quadrics.

The most important results and ideas, classical as well as modern, connected to the Poncelet theorem are presented, together with a historical overview analyzing the classical ideas and their natural generalizations.

Special attention is paid to the realization of the Griffiths and Harris programme about Poncelet-type problems and addition theorems.

Nov. 2010

290 pp.

9783034800143

8,390.

**Gratzer, G.: 448-093**  
**Lattice Theory:**  
**Foundation**

This book started with *Lattice Theory, First Concepts*, in 1971. Then came *General Lattice Theory, First Edition*, in 1978, and the Second Edition twenty years later.

Since the publication of the first edition in 1978, *General Lattice Theory* has become the authoritative introduction to lattice theory for graduate students and the standard reference for researchers.

The First Edition set out to introduce and survey lattice theory.

Some 12,000 papers have been published in the field since then; so *Lattice Theory: Foundation* focuses on introducing the field, laying the foundation for special topics and applications.

*Lattice Theory: Foundation*, based on the previous three books, covers the fundamental concepts and results.

The main topics are distributivity, congruences, constructions, modularity and semimodularity, varieties, and free products

Nov. 2010

480 pp.

9783034800174

10,070.

**Birkhauser**

**Berendsen, H.:**

448-005

**A Student's Guide to Data and Error Analysis**

All students taking laboratory courses within the physical sciences and engineering will benefit from this book, whilst researchers will find it an invaluable reference.

This concise, practical guide brings the reader up-to-speed on the proper handling and presentation of scientific data and its inaccuracies.

It covers all the vital topics with practical guidelines, computer programs (in Python), and recipes for handling experimental errors and reporting experimental data.

In addition to the essentials, it also provides further background material for advanced readers who want to understand how the methods work.

Plenty of examples, exercises and solutions are provided to aid and test understanding, whilst useful data, tables and formulas are compiled in a handy section for easy reference.

Jan. 2011

200 pp.

9780521119405/9780521134927

9,360./3,390. (Paper ed.)

**Heller, M. /Woodin, H. (eds.):****Infinity:**

448-026

**New Research Frontiers**

"The infinite! No other question has ever moved so profoundly the spirit of man; no other idea has so fruitfully stimulated his intellect; yet no other concept stands in greater need of clarification than that of the infinite."

- David Hilbert -

This interdisciplinary study of infinity explores the concept through the prism of mathematics and then offers more expansive investigations in areas beyond mathematical boundaries to reflect the broader, deeper implications of infinity for human intellectual thought.

More than a dozen world-renowned researchers in the fields of mathematics, physics, cosmology, philosophy, and theology offer a rich intellectual exchange among various current viewpoints, rather than displaying a static picture of accepted views on infinity.

Dec. 2010

328 pp.

9781107003873

11,580.

**Mathematical Science Research Institute Publications,****Vol. \*\*: Friedman, G. /**

448-091

**Hunsicker, E. /Libgober, A. /Maxim, L. (eds.):****Topology of Stratified Spaces**

Appearance of singularities is pervasive in many problems in topology, differential geometry, and algebraic geometry.

This book concerns the study of singular spaces using techniques from a variety of areas of geometry and topology and the interactions among them.

Expository chapters by well-known experts cover intersection homology, L2 cohomology and differential operators, topology of algebraic varieties, signatures and characteristic classes, mixed Hodge theory, and elliptic genera of singular complex and real algebraic varieties.

The book concludes with a list of open problems.

Contributors: Xianzhe Dai, Gilles Carron, Robert Waelder, Sandor J. Kovacs, Karl Schwede, Anatoly Libgober, Clint McCrory, Adam Parusinski, Laurentiu Maxim, Greg Friedman, Markus Banagl, Filipp Levikov, Matt Kerr, Gregory Pearlstein, Shoji Yokura, Jorg Schurmann

Jan. 2011

452 pp.

9780521191678

11,110.

**Cambridge**

新刊特集

*Studies in Universal Logic*

Beziau, J.-Y. (ed.):

448-066

**Anthology of Universal Logic:  
From Paul Hertz to Dov Gabbay**

A collection of papers from Paul Hertz to Dov Gabbay - through Tarski, Gödel, Kripke - giving a general perspective about logical systems. These papers discuss questions such as the relativity and nature of logic, present tools such as consequence operators and combinations of logics, prove theorems such as translations between logics, investigate the domain of validity and application of fundamental results such as compactness and completeness. Each of these papers is presented by a specialist explaining its context, import and influence.

Dec. 2010

500 pp.

9783034601443

13,430.

*Applied Logic Series,*

*Vol. 37: Brauner, T.:*

448-068

**Hybrid Logic and Its Proof-Theory**

This is the first book-length treatment of hybrid logic and its proof-theory. Hybrid logic is an extension of ordinary modal logic which allows explicit reference to individual points in a model (where the points represent times, possible worlds, states in a computer, or something else).

This is useful for many applications, for example when reasoning about time one often wants to formulate a series of statements about what happens at specific times.

There is little consensus about proof-theory for ordinary modal logic. Many modal-logical proof systems lack important properties and the relationships between proof systems for different modal logics are often unclear. In the present book we demonstrate that hybrid-logical proof-theory remedies these deficiencies by giving a spectrum of well-behaved proof systems (natural deduction, Gentzen, tableau, and axiom systems) for a spectrum of different hybrid logics (propositional, first-order, intensional first-order, and intuitionistic).

Nov. 2010

240 pp.

9789400700017

16,790.

*Undergraduate Texts in Mathematics*

Bloch, E.:

448-082

**Proofs and Fundamentals:**

**A First Course in Abstract Mathematics, 2nd ed.**

This book is designed as a "transition" course to introduce undergraduates to the writing of rigorous mathematical proofs, and to such fundamental mathematical ideas as sets, functions, relations, and cardinality.

This 3 - part work carefully balances Proofs, Fundamentals, and Extras.

Part 1 presents logic and basic proof techniques; Part 2 thoroughly covers fundamental material such as sets, functions and relations; and Part 3 introduces a variety of extra topics such as groups, combinatorics and sequences.

A gentle, friendly style is used, in which motivation and informal discussion play a key role, and yet high standards in rigor and in writing are never compromised.

Nov. 2010

358 pp.

9781441971265

9,570.

**Springer**

*Graduate Texts in Mathematics,*

**Vol. 260: Herzog, J. /Hibi Takayuki :  
Monomial Ideals**

448-095

This book demonstrates current trends in research on combinatorial and computational commutative algebra with a primary emphasis on topics related to monomial ideals.

Providing a useful and quick introduction to areas of research spanning these fields, *Monomial Ideals* is split into three parts.

Part I offers a quick introduction to the modern theory of Grobner bases as well as the detailed study of generic initial ideals. Part II supplies Hilbert functions and resolutions and some of the combinatorics related to monomial ideals including the Kruskal-Katona theorem and algebraic aspects of Alexander duality. Part III discusses combinatorial applications of monomial ideals, providing a valuable overview of some of the central trends in algebraic combinatorics.

Main subjects include edge ideals of finite graphs, powers of ideals, algebraic shifting theory and an introduction to discrete polymatroids.

Nov. 2010 305 pp. 10,190.  
9780857291059

*Lecture Notes in Mathematics,*

**Vol. 2009: Colliot-Thelene, J.-L. /Swinnerton-Dyer, P. /  
Vojta, P. /Corvaja, P. /Gasbarri, C. (eds.):  
Arithmetic Geometry:**

448-085

Lectures given at

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

Arithmetic Geometry can be defined as the part of Algebraic Geometry connected with the study of algebraic varieties over arbitrary rings, in particular over non-algebraically closed fields. It lies at the intersection between classical algebraic geometry and number theory.

A C.I.M.E. Summer School devoted to arithmetic geometry was held in Cetraro, Italy in September 2007, and presented some of the most interesting new developments in arithmetic geometry.

The main topics concern diophantine equations, local-global principles, diophantine approximation and its relations to Nevanlinna theory, and rationally connected varieties.

Nov. 2010 238 pp. 7,550.  
9783642159442

**Lipton, R.:**

448-038

**The P=NP Question and Godel's Lost Letter**

The P=NP question is one of the great problems of science, which has intrigued computer scientists and mathematicians for decades.

Despite the abundant research in theoretical computer science regarding the P=NP question, it has not been solved.

The P=NP Question and Godel's Lost Letter covers historical developments

(including the Godel's Lost letter), the importance of P=NP and

the future of P=NP. This guide is also based on a new blog by the author,

located at <http://rjlipton.wordpress.com>. Jin-Yi Cai, an Associate Professor in

computer science at the University of Wisconsin remarks 'I think it is the single

most interesting web blog I have seen on related topics. He has a great insight

and wit and beautiful way to see things and explain them.

Aug. 2010 244 pp. 13,430.  
9781441971548

**Springer**

新刊特種

*Algebra and Applications,*

**Vol. 17: Iohara Kenji/Koga Yoshiyuki :  
Representation Theory of the Virasoro Algebra** 448-096

This book describes some fundamental facts about the representation theory of the Virasoro algebra in a self-contained manner.

Topics include the structure of Verma modules and Fock modules, the classification of (unitarizable) Harish-Chandra modules, tilting equivalence, and the rational vertex operator algebras associated to the so-called minimal series representations.

Covering a wide range of material, this book has three appendices which provide background information required for some of the chapters.

Fundamental results are organized in a unified way and existing proofs refined.

For instance in chapter three, a generalization of Jantzen filtration is reformulated in an algebraic manner, and geometric interpretation is provided.

Statements, widely believed to be true, are collated, and results which are known but not verified are proven, such as the corrected structure theorem of Fock modules in chapter eight.

Nov. 2010

476 pp.

9780857291592

15,110.

**Vol. 15: Peeva, I.:  
Graded Syzygies** 448-104

This book provides a comprehensive overview of the theory of theta functions, as applied to compact Riemann surfaces, as well as the necessary background for understanding and proving the Thomae formulae.

The exposition examines the properties of a particular class of compact Riemann surfaces, i.e., the  $Z_n$  curves, and thereafter focuses on how to prove the Thomae formulae, which give a relation between the algebraic parameters of the  $Z_n$  curve, and the theta constants associated with the  $Z_n$  curve.

Dec. 2010

302 pp.

9780857291769

13,430.

*Developments in Mathematics,*

**Vol. 21: Farkas, H. /Zemel, S.:  
Generalizations of Thomae's Formula for  
 $Z_n$  Curves** 448-090

This book provides a comprehensive overview of the theory of theta functions, as applied to compact Riemann surfaces, as well as the necessary background for understanding and proving the Thomae formulae.

The exposition examines the properties of a particular class of compact Riemann surfaces, i.e., the  $Z_n$  curves, and thereafter focuses on how to prove the Thomae formulae, which give a relation between the algebraic parameters of the  $Z_n$  curve, and the theta constants associated with the  $Z_n$  curve.

Graduate students in mathematics will benefit from the classical material, connecting Riemann surfaces, algebraic curves, and theta functions, while young researchers, whose interests are related to complex analysis, algebraic geometry, and number theory, will find new rich areas to explore. Mathematical physicists and physicists with interests also in conformal field theory will surely appreciate the beauty of this subject.

Dec. 2010

354 pp.

9781441978462

15,110.

**Springer**

Page 9

*Springer Monographs in Mathematics*

Köhler, G.:

448-098

**Eta Products and theta Series Identities**

This monograph deals with products of Dedekind's eta function, with Hecke theta series on quadratic number fields, and with Eisenstein series. The author brings to the public the large number of identities that have been discovered over the past 20 years, the majority of which have not been published elsewhere.

The book will be of interest to graduate students and scholars in the field of number theory and, in particular, modular forms. It is not an introductory text in this field.

Nevertheless, some theoretical background material is presented that is important for understanding the examples in Part II.

In Part I relevant definitions and essential theorems -- such as a complete proof of the structure theorems for coprime residue class groups in quadratic number fields that are not easily accessible in the literature -- are provided. Another example is a thorough description of an algorithm for listing all eta products of given weight and level, together with proofs of some results on the bijection between these eta products and lattice simplices.

Dec. 2010 480 pp. 15,110.  
9783642161513

*Selected Works in Probability and Statistics*

Davis, B. /Song, R. (eds.):

448-010

**Selected Works of Donald L. Burkholder**

Pioneering work by Burkholder and Donald Austin on the discrete time martingale square function led to Burkholder and Richard Gundy's proof of inequalities comparing the quadratic variations and maximal functions of continuous martingales, inequalities which are now indispensable tools for stochastic analysis.

Part of their proof showed how novel distributional inequalities between the maximal function and quadratic variation lead to inequalities for certain integrals of functions of these operators.

The argument used in their proof applies widely and is now called the Burkholder-Gundy good lambda method.

Dec. 2010 580 pp. 25,190.  
9781441972446

Maller, R. /Basawa, I. /Hall, P. /Seneta, E. (eds.):

**Selected Works of C. C. Heyde**

This volume is dedicated to the memory of the late Professor C.C. (Chris) Heyde (1939-2008), distinguished statistician, mathematician and scientist. Chris worked at a time when many of the foundational building blocks of probability and statistics were being put in place by a phalanx of eminent scientists around the world. He contributed significantly to this effort and took his place deservedly among the top-most rank of researchers.

Throughout his career, Chris maintained also a keen interest in applications of probability and statistics, and in the history of the subject.

The magnitude of his impact on his chosen area of research, both in Australia and internationally, was well recognised by the abundance of honours he received within and without the profession.

Oct. 2010 .... 448-040  
9781441958228 25,190.

**Springer**

**Giachetta, G. /Mangiarotta, L. /Sardanashvily, G.:**  
**Geometric Formulation of** 448-285  
**Classical and Quantum Mechanics**

The present book provides the geometric formulation of non-autonomous mechanics in a general setting of time-dependent coordinate and reference frame transformations.

This formulation of mechanics as like as that of classical field theory lies in the framework of general theory of dynamic systems, and Lagrangian and Hamiltonian formalisms on fiber bundles.

The reader will find a strict mathematical exposition of non-autonomous dynamic systems, Lagrangian and Hamiltonian non-relativistic mechanics, relativistic mechanics, quantum non-autonomous mechanics, together with a number of advanced models --- superintegrable systems, non-autonomous constrained systems, theory of Jacobi fields, mechanical systems with time-dependent parameters, non-adiabatic Berry phase theory, instantwise quantization, and quantization relative to different reference frames.

Nov. 2010

400 pp.

9789814313728

12,740.

*World Scientific Series on Nonlinear Science Series, A:*

**Chua, L.:** 448-008

**A Nonlinear Dynamics Perspective of  
 Wolfram's New Kind of Science, Vol. IV**

Volume IV continues the author's odyssey on 1-D cellular automata as chronicled in Volumes I, II and III, by uncovering a novel quasi-ergodicity phenomenon involving orbits meandering among omega-limit orbits of complex (group 5) and hyper (group 6) Bernoulli rules.

This discovery is embellished with analytical formulas characterizing the fractal properties of characteristic functions, as well as explicit formulas for generating colorful and pedagogically revealing isomorphic basin tree diagrams. Many new results were derived and proved by uncovering subtle symmetries endowed by various subsets of the 256 Boolean cubes.

For the first time, rigorous analyses were used to identify 67, out of 256, local rules whose asymptotic behaviors consist of robust period-1 orbits.

Sep. 2010

400 pp.

9789814317306

23,140.

**Belavin, A. /Pugai, Y. /Zamolodchikov, A. (eds.):** 448-004  
**Quantum Field Theories in Two Dimensions:  
 Collected Works of Alexander Zamolodchikov**

Volume 1 is a collection of reprinted works of Alexei Zamolodchikov who was a prominent theoretical physicist of his time. It contains his works on conformal field theories, 2D quantum gravity, and Liouville theory.

These original contributions of Alexei Zamolodchikov have a profound effect on shaping the fast developing areas of theoretical physics.

His ideas are expressed lucidly, such as the recursive relation for conformal blocks and the structure of conformal bootstrap in Liouville theory, including the boundary Liouville theory.

These ideas are at the foundation of the subject and they are of great interest to a wide community of physicists and mathematicians working in diverse areas.

Volume 2 includes Alexei Zamolodchikov's works on non-perturbative methods in 2D quantum field theory, and on integrable models.

Aug. 2011

1130 pp.

9789814324069

32,500.

**World Scientific Pub.**

*Heritage of European Mathematics*

Papadopoulos, A. (ed.):

448-045

**Nikolai I. Lobachevsky: Pangeometry**

Lobachevsky wrote his Pangeometry in 1855, the year before his death. This memoir is a resume of his work on non-Euclidean geometry and its applications, and it can be considered as his clearest account on the subject. It is also the conclusion of his lifework, and the last attempt he made to acquire recognition.

The treatise contains basic ideas of hyperbolic geometry, including the trigonometric formulae, the techniques of computation of arc length, of area and of volume, with concrete examples. It also deals with the applications of hyperbolic geometry to the computation of new definite integrals.

The techniques are different from those found in most modern books on hyperbolic geometry since they do not use models.

Besides its historical importance, Lobachevsky's Pangeometry is a beautiful work, written in a simple and condensed style.

Oct. 2010

270 pp.

9783037190876

13,100.

Stedall, J.:

448-056

**From Cardano's Great Art to Lagrange's Reflections:****Filling A Gap in the History of Algebra**

This book is an exploration of a claim made by Lagrange in the autumn of 1771 as he embarked upon his lengthy *Reflexions sur la resolution algebrique des equations*: that there had been few advances in the algebraic solution of equations since the time of Cardano in the mid sixteenth century.

That opinion has been shared by many later historians.

The present study attempts to redress that view and to examine the intertwined developments in the theory of equations from Cardano to Lagrange. A similar historical exploration led Lagrange himself to insights that were to transform the entire nature and scope of algebra.

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Onn, S.:

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### About this book

The present volume grew out of the Heidelberg Knot Theory Semester, organized by the editors in winter 2008/09 at Heidelberg University. The contributed papers bring the reader up to date on the currently most actively pursued areas of mathematical knot theory and its applications in mathematical physics and cell biology. Both original research and survey articles are presented; numerous illustrations support the text. The book will be of great interest to researchers in topology, geometry, and mathematical physics, graduate students specializing in knot theory, and cell biologists interested in the topology of DNA strands.

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Simon, Barry

**Szegő's Theorem and Its Descendants:  
Spectral Theory for  $L^2$  Perturbations of Orthogonal  
Polynomials.**

*Porter Lectures*

Dec. 2010 720 p. 9780691147048 Hardback ¥10,470

This book presents a comprehensive overview of the sum rule approach to spectral analysis of orthogonal polynomials, which derives from Gábor Szegő's classic 1915 theorem and its 1920 extension. Barry Simon emphasizes necessary and sufficient conditions, and provides mathematical background that until now has been available only in journals. Topics include background from the theory of meromorphic functions on hyperelliptic surfaces and the study of covering maps of the Riemann sphere with a finite number of slits removed. This allows for the first book-length treatment of orthogonal polynomials for measures supported on a finite number of intervals on the real line.

In addition to the Szegő and Killip-Simon theorems for orthogonal polynomials on the unit circle (OPUC) and orthogonal polynomials on the real line (OPRL), Simon covers Toda lattices, the moment problem, and Jacobi operators on the Bethe lattice. Recent work on applications of universality of the CD kernel to obtain detailed asymptotics on the fine structure of the zeros is also included. The book places special emphasis on OPRL, which makes it the essential companion volume to the author's earlier books on OPUC.



Kamvar, Sepandar

**Numerical Algorithms for Personalized Search in  
Self-Organizing Information Networks.**

Sept. 2010 160 p. 9780691145037 Hardback ¥4,280

This book lays out the theoretical groundwork for personalized search and reputation management, both on the Web and in peer-to-peer and social networks. Representing much of the foundational research in this field, the book develops scalable algorithms that exploit the graphlike properties underlying personalized search and reputation management, and delves into realistic scenarios regarding Web-scale data.

Sep Kamvar focuses on eigenvector-based techniques in Web search, introducing a personalized variant of Google's PageRank algorithm, and he outlines algorithms--such as the now-famous quadratic extrapolation technique--that speed up computation, making personalized PageRank feasible. Kamvar suggests that Power Method-related techniques ultimately should be the basis for improving the PageRank algorithm, and he presents algorithms that exploit the convergence behavior of individual components of the PageRank vector. Kamvar then extends the ideas of reputation management and personalized search to distributed networks like peer-to-peer and social networks. He highlights locality and computational considerations related to the structure of the network, and considers such unique issues as malicious peers. He describes the EigenTrust algorithm and applies various PageRank concepts to P2P settings. Discussion chapters summarizing results conclude the book's two main sections.