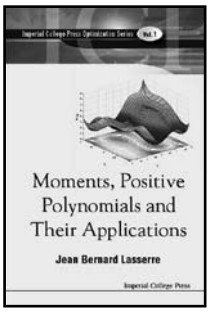
Geometry and Topology 2009

:: Textbook

Imperial College Press Optimization Series – Vol. 1

MOMENTS, POSITIVE POLYNOMIALS AND THEIR APPLICATIONS

by **Jean Bernard Lasserre** *(LAAS-CNRS and Université de Toulouse, France)*



Key Features

- The first book ever written that provides timely update on the recent advances in polynomial optimization from the modern perspective of mathematical programming
- Illustrates the use of the *Generalized Moment Problem* (GMP) in various and diverse applications
- The Matlab-based software GloptiPoly to solve the GMP is also described in this book

Contents: ***Moments and Positive Polynomials:*** The Generalized Moment Problem; Nonnegative Polynomials; Moments; Algorithms for Moment Problems; ***Applications:*** Optimization over Polynomials; Systems of Polynomial Equations; Applications to Probability and Markov Chains; Application to Mathematical Finance; Applications and more.

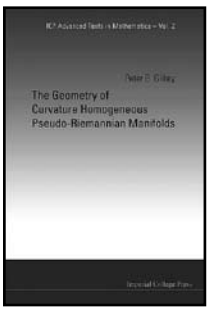
300pp (approx.)	**Jul 2009**	
978-1-84816-445-1	**US$75**	**£56**
978-1-84816-446-8(pbk)	**US$98**	**£74**

ICP Advanced Texts in Mathematics – Vol. 2

THE GEOMETRY OF CURVATURE HOMOGENEOUS PSEUDO-RIEMANNIAN MANIFOLDS

by **Peter B Gilkey** *(University of Oregon, USA)*

"This book represents an essential reference tool for research mathematicians and physicists, and it also serves as a useful introduction to students entering this rapidly growing field."
Mathematical Reviews



Key Features

- A comprehensive and self-contained discussion of curvature homogeneity in the context of pseudo-Riemannian geometry
- Examples which are k-curvature homogeneous of arbitrary order are provided
- Contains a classification of complex Osserman algebraic curvature tensors given by Clifford families as well as a discussion of Stanilov–Tsankov–Videv theory
- Contains a comprehensive bibliography

Contents: The Geometry of the Riemann Curvature Tensor; Curvature Homogeneous Generalized Plane Wave Manifolds; Other Pseudo-Riemannian Manifolds; The Curvature Tensor; Complex Osserman Algebraic Curvature Tensors; Stanilov–Tsankov Theory.

388pp	**Apr 2007**	
978-1-86094-785-8	**US$119**	**£68**

:: Textbook

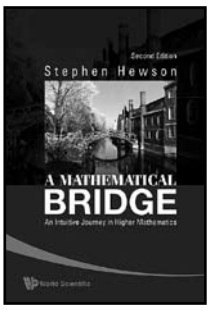
A MATHEMATICAL BRIDGE Second Edition

An Intuitive Journey in Higher Mathematics

by **Stephen Hewson**

Reviews of the First Edition

"This book is written in a way that is suitable not only for the student looking forward and the graduate in reflective mode, but also for schoolteachers seeking material on which to base their accounts of mathematics ... The book concludes with a substantial body of exercises that aims to reinforce and extend the material."
Times Higher Education



Key Features

- Inclusion of a new introductory chapter covering material on the foundations of mathematics, mathematical thought processes, thinking styles and problem solving skills
- Extension of the chapter on Probability to include material on financial mathematics and the Black–Scholes equation
- Incorporation of new material on the history of mathematics and the achievements of the greatest mathematicians

672pp	**Jan 2009**	
978-981-283-407-2	**US$104**	**£61**
978-981-283-408-9(pbk)	**US$61**	**£36**

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Advanced Series in Mathematical Physics

OPERADS, STRINGS AND DELIGNE'S CONJECTURE

A Text for Mathematicians and Physicists

by **Ralph M Kaufmann** *(University of Connecticut, USA)*

Operads provide a universal language to relate several disciplines in mathematics and physics. The focus of this book, which is the first of its kind, is the particularly striking relation between algebra, topology and string theory that is mediated by operads of graphs and surfaces in their role as a model of the correlation functions of quantum field theory. The text supplies all the necessary background material, including discussions of the relevant aspects of operads, cell models, moduli spaces, deformation quantization, graph Feynman rules and topological and conformal field theory in their open/closed versions.

300pp (approx.)	**Oct 2009**	
978-981-277-596-2	**US$65**	**£35**

Series on Number Theory and Its Applications – Vol. 3

MULTI-DIMENSIONAL LANGLANDS FUNCTORIALITY PRINCIPLE

Notes on M M Kapranov's Work

by **Kâzım İlham İkeda** *(İstanbul Bilgi University, Turkey)*

This book aims at providing an introductory, detailed and up-to-date study of Kapranov's seminal work, "Analogies between topological quantum field theory and Langlands correspondence", published in 1995, which is the first paper in literature discussing the formal framework and the formulation of higher-dimensional Langlands correspondence, together with closely related recent works of Kazhdan, Parshin and others. This book will be of interest to researchers and graduate students in number theory and related areas.

200pp (approx.)	**Oct 2009**	
978-981-283-831-5	**US$58**	**£44**

Series on Knots and Everything – Vol. 22

THE MATHEMATICS OF HARMONY Forthcoming

From Euclid to Contemporary Mathematics and Computer Science

by **Alexey Stakhov** *(International Club of the Golden Section, Canada)*
assisted by **Scott Olsen**

This volume is a result of the author's four decades of research in the field of Fibonacci numbers and the Golden Section and their applications. It provides a broad introduction to the fascinating and beautiful subject of the "Mathematics of Harmony," a new interdisciplinary direction of modern science. (The "Strategic Mistakes" in the Mathematics Development and the role of the Harmony Mathematics in their overcoming). There are three "key" problems of mathematics on the stage of its origin (a count, a measurement, a harmony) and a new approach to the history of mathematics.

600pp (approx.)	**Oct 2009**	
978-981-277-582-5	**US$114**	**£86**

FEYNMAN MOTIVES

Renormalization, Algebraic Varieties, and Galois Symmetries

by **Matilde Marcolli** *(California Institute of Technology, USA)*

This book presents recent and ongoing research work aimed at understanding the mysterious relation between the computations of Feynman integrals in perturbative quantum field theory and the theory of motives of algebraic varieties and their periods.

- Presents recent and ongoing research work in Feynman Motives
- Used as lecture notes in a graduate course of Caltech

150pp (approx.)	**Aug 2009**	
978-981-4271-20-2	**US$42**	**£32**

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A FIRST STEP TO MATHEMATICAL OLYMPIAD PROBLEMS

by **Derek Holton** *(University of Otago, New Zealand)*

The International Mathematical Olympiad (IMO) is an annual international mathematics competition held for pre-collegiate students. This book is an amalgamation of the first 8 of 15 booklets originally produced to guide students intending to contend for placement on their country's IMO team. The material contained in this book provides an introduction to the main mathematical topics covered in the IMO, which are: Combinatorics, Geometry and Number Theory. In addition, there is a special emphasis on how to approach unseen questions in Mathematics, and model the writing of proofs. Full answers are given to all questions.

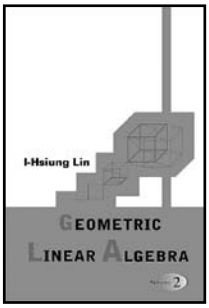
300pp (approx.)	**Aug 2009**	
978-981-4273-86-2	**US$68**	**£51**
978-981-4273-87-9(pbk)	**US$35**	**£26**

:: Textbook

GEOMETRIC LINEAR ALGEBRA

(Volume 2)

by **I-Hsiung Lin** *(National Taiwan Normal University, Taiwan)*



This accessible book for beginners uses intuitive geometric concepts to create abstract algebraic theory with a special emphasis on geometric characterizations. The book applies known results to describe various geometries and their invariants, and presents problems concerned with linear algebra.

832pp	**May 2008**	
978-981-270-775-8(pbk)	**US$105**	**£63**

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Pure Mathematics

edited by **N S Narasimha Sastry**, **Mohan Delampady**, **B Rajeev** & **T S S R K Rao** *(Indian Statistical Institute, India)*

This book presents a collection of invited articles by distinguished Mathematicians on the occasion of the Platinum Jubilee Celebrations of the Indian Statistical Institute, during the year 2007.

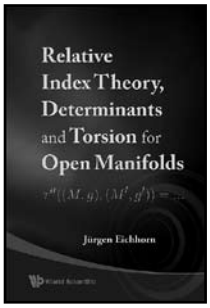
- Covers a wide range of topics in Mathematics
- Provides articles with a survey nature, thus enhancing its utility as a reference volume
- Includes articles which are particularly useful to new researchers

280pp (approx.)	**Jun 2009**	
978-981-4273-64-0	**US$75**	**£56**

:: Textbook

RELATIVE INDEX THEORY, DETERMINANTS AND TORSION FOR OPEN MANIFOLDS

by **Jürgen Eichhorn** *(Universität Greifswald, Germany)*



The goal of this monograph is to establish for open manifolds, structures and differential operators an applicable theory of number-valued relative invariants. This is of great use in the theory of moduli spaces for nonlinear partial differential equations and mathematical physics. The book is self-contained: in particular, it contains an outline of the necessary tools from nonlinear Sobolev analysis.

250pp (approx.)	**Jun 2009**	
978-981-277-144-5	**US$69**	**£52**

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Atlantis Studies in Mathematics – Vol. 2

SELECTED TOPICS IN MEASURE THEORY

The Measure Extension Problem and Related Questions

by **Alexander Kharazishvili** *(Razmadze Mathematical Institute, Republic of Georgia)*

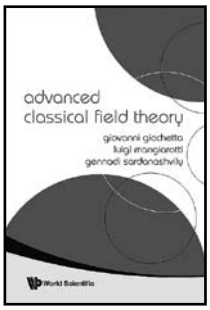
Key Features

- An original treatment of the measure extension problem
- Highlights deep connections with set theory, general topology and group theory
- Some new approaches in the study of invariant and quasi-invariant measures
- Underlines the role of some pathological functions in various constructions of real analysis and measure theory
- A self-contained book that can be used as a textbook for set theory, real analysis, measure theory and general topology

420pp (approx.)	**May 2009**	
978-90-78677-20-8	**US$125**	**£94**

ADVANCED CLASSICAL FIELD THEORY

by **Giovanni Giachetta**, **Luigi Mangiarotti** *(University of Camerino, Italy)* & **Gennadi Sardanashvily** *(Moscow State University, Russia)*



This book aims to provide a complete mathematical foundation of Lagrangian classical field theory and its BRST extension for the purpose of quantization. Based on the standard geometric formulation of theory of nonlinear differential operators, Lagrangian field theory is treated in a very general setting.

500pp (approx.)	**Apr 2009**	
978-981-283-895-7	**US$98**	**£74**

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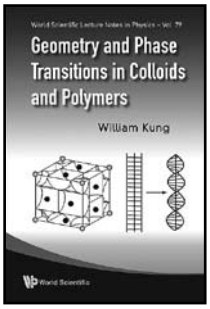
by **William Kung** *(Northwestern University, USA)*



Key Features

- Pedagogical exposition of introductory solid geometry and topology in the context of soft-condensed matter physics
- The only monograph on the author's original research works, in collaboration with his thesis advisor Randall D Kamien from University of Pennsylvania

250pp (approx.)	**Apr 2009**	
978-981-283-496-6	**US$70**	**£53**

Nankai Tracts in Mathematics – Vol. 11

INSPIRED BY S S CHERN

A Memorial Volume in Honor of A Great Mathematician

edited by **Phillip A Griffiths** *(Institute for Advanced Study, Princeton, USA)*

Shiing-Shen Chern (1911–2004) was one of the leading differential geometers of the twentieth century. Chern's works span all the classic fields of differential geometry. Inspired by Chern and his work, former colleagues, students and friends — themselves highly regarded mathematicians in their own right — come together to honor and celebrate Chern's huge contributions.

528pp	**Nov 2006**	
978-981-270-061-2	**US$104**	**£66**
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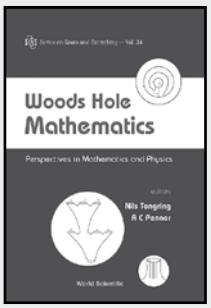

"This is quite an interesting collection which the reviewer is pleased to recommend to the reader."

Zentralblatt MATH

The central theme of this volume is the contemporary mathematics of geometry and physics, but the work also discusses the problem of the secondary structure of proteins, and an overview of arc complexes with proposed applications to macromolecular folding is given.

360pp	**Dec 2004**	
978-981-256-021-6	**US$122**	**£78**

Nankai Tracts in Mathematics – Vol. 4

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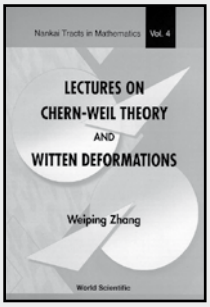
by **Weiping Zhang** *(Nankai Institute of Mathematics, Tianjin, P R China)*



"… the book's main strength is its clear presentation of analytic deformation techniques much simpler than those in the original work of Bismut and his collaborators (including the author), and Helffer Sjöstand … the book gives an excellent introduction to these analytic techniques …"

Mathematical Reviews

This invaluable book is based on the notes of a graduate course on differential geometry which the author gave at the Nankai Institute of Mathematics.

132pp	**Sept 2001**	
978-981-02-4685-3	**US$36**	**£29**
978-981-02-4686-0(pbk)	**US$15**	**£13**

:: Textbook

Series on University Mathematics – Vol. 8

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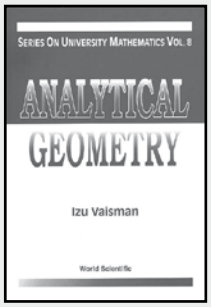
by **Izu Vaisman** *(University of Haifa, Israel)*



This volume discusses the classical subjects of Euclidean, affine and projective geometry in two and three dimensions, including the classification of conics and quadrics, and geometric transformations. These subjects are important both for the mathematical grounding of the student and for applications to various other subjects. They may be studied in the first year or as a second course in geometry.

296pp	**Nov 1997**	
978-981-02-3158-3	**US$51**	**£38**

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This journal is devoted to topology and analysis, broadly defined to include, for instance, differential geometry, geometric topology, geometric analysis, geometric group theory, index theory, noncommutative geometry, and aspects of probability on discrete structures, and geometry of Banach spaces.

Journal of Knot Theory and Its Ramifications (JKTR)

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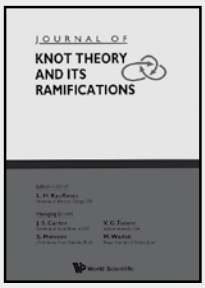

This Journal is intended as a forum for new developments in knot theory, particularly developments that create connections between knot theory and other aspects of mathematics and natural science. The stance is interdisciplinary due to the nature of the subject.

Proceedings

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DIFFERENTIAL GEOMETRY - PROCEEDINGS OF THE VIII INTERNATIONAL COLLOQUIUM	ALVAREZ LOPEZ JESUS & GARCIA-RIO EDUARDO	27-Apr-09	9789814261166	98	79
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CE-CC-05-09-19-W