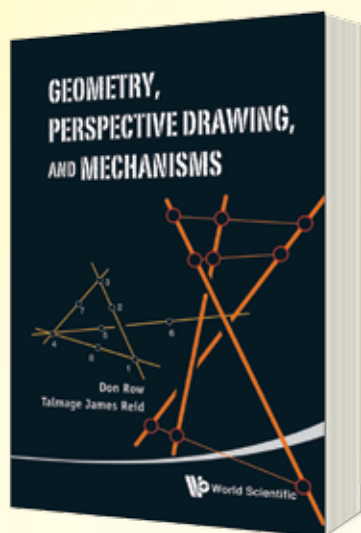


Geometry & Topology

2011/12



Editor's Pick

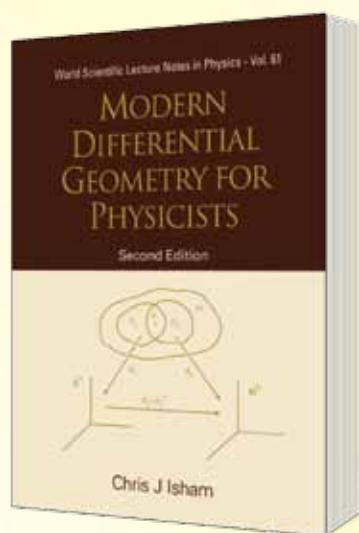
GEOMETRY, PERSPECTIVE DRAWING, AND MECHANISMS

by **Donald Row** (University of Tasmania, Australia) & **Talmage James Reid** (University of Mississippi, USA)

The aim of this book is to examine the geometry of our world and, by blending theory with a variety of every-day examples, to stimulate the imagination of the readers and develop their geometric intuition. It tries to recapture the excitement that surrounded geometry during the Renaissance as the development of perspective drawing gathered pace, or more recently as engineers sought to show that all the world was a machine.

Contents: Combinatorial Figures; Combinatorial Geometries; Planar Geometries and Projective Planes; Non-Planar Geometries and Projective Spaces; Perspective Drawings; Binocular Vision and Stereograms; Scene Analysis; Distortion and Anamorphic Art; Planar Bar-and-Joint Mechanisms; Non-Planar Hinged-Panel Mechanisms; Graphs; Spherical Polyhedra; Scene Analysis; Matroids.

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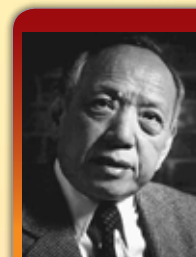
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S S Chern's
Works P4-5

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COMPLEX ANALYTIC GEOMETRY

by **Tatsuo Suwa** (*Hokkaido University, Japan*)

Complex Analytic Geometry is one of the most important fields of Mathematics. It has a long history that culminated in the Cauchy integral formula in the 19th century. The theory was vastly developed and closely related to many other fields of Mathematics as well as the Sciences, where numerous applications have been found.

The profound consequences of this subject will make the book useful for mathematical students on fields as diverse as Algebraic Geometry, Differential Geometry, Topology, Complex Dynamical Systems and Mathematical Physics.

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HAMILTON–JACOBI THEORY VIA CARTAN GEOMETRY

by **Raymond G McLenaghan** (*University of Waterloo, Canada*)
& **Roman G Smirnov** (*Dalhousie University, Canada*)

The central theme of the book is the fusion of two classical theories that were extensively developed in the course of the twentieth century, namely the Hamilton–Jacobi theory of separation of variables and Cartan geometry. The core concepts of the latter, notably the method of moving frames, are used to establish and develop the underlying ideas of Hamilton–Jacobi theory. The book is self-contained, beginning with an introduction to classical Riemannian geometry from Cartan’s viewpoint aimed at developing the requisite background to be used in the study of Hamilton–Jacobi theory.

The book is suitable for a one-year graduate course in applicable differential geometry. It is well illustrated with numerous examples, applications and exercises. It will also be useful to experts in various areas of mathematical physics who are interested in applications of Cartan geometry.

Contents: Introduction to Riemannian Geometry; Lie Groups and Moving Frames; Hamiltonian Mechanics; Hamilton–Jacobi Theory via Moving Frames; Applications.

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by **Peter B Gilkey** (*University of Oregon, USA*), **Miguel Brozos Vázquez** (*Universidad de Coruña, Spain*) & **Stana Nikčević** (*University of Belgrade, Serbia*)

The book organizes, in one coherent volume, the results of research completed by many different investigators over the past 30 years. Complete proofs are given of results that are often only outlined in the original publications. Whereas the original results are usually in the positive definite (Riemannian setting), here the authors extend the results to the pseudo-Riemannian setting and then further, in a complex framework, to para-Hermitian geometry as well. In addition to that, new results are obtained as well, making this an ideal text for anyone wishing to further their knowledge of the science of curvature.

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& **Corrado Sinigaglia** (*Università degli Studi di Milan, Italy*)

This volume focuses on the interactions between mathematics, physics, biology and neuroscience by exploring new geometrical and topological modelling in these fields. Among the highlights are the central roles played by multilevel and scale-change approaches in these disciplines. The integration of mathematics with physics, as well as molecular and cell biology and the neurosciences, will constitute the new frontier of 21st century science, where breakthroughs are more likely to span across traditional disciplines.



328pp May 2011

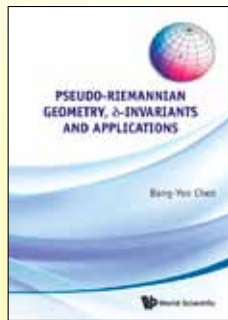
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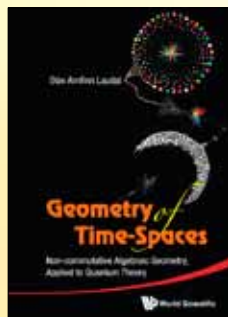
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The Henstock-Kurzweil integral, which is also known as the generalized Riemann integral, arose from a slight modification of the classical Riemann integral more than 50 years ago. This relatively new integral is known to be equivalent to the classical Perron integral; in particular, it includes the powerful Lebesgue integral. This book presents an introduction of the multiple Henstock-Kurzweil integral. Along with the classical results, this book contains some recent developments connected with measures, multiple integration by parts, and multiple Fourier series. The book can be understood with a prerequisite of advanced calculus.

Contents: The One-Dimensional Henstock-Kurzweil Integral; The Multiple Henstock-Kurzweil Integral; Lebesgue Integrable Functions; Further Properties of Henstock-Kurzweil Integrable Functions; The Henstock Variational Measure; Multipliers for the Henstock-Kurzweil Integral; Some Selected Topics in Trigonometric Series; Some Applications of the Henstock-Kurzweil Integral to Double Trigonometric Series.

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by **Stefan P Ivanov** (*University of Sofia "St Kliment Ohridski", Bulgaria*)

& **Dimiter N Vassilev** (*The University of New Mexico, USA*)

The aim of this book is to give an account of some important new developments in the study of the Yamabe problem on quaternionic contact manifolds. This book covers the conformally flat case of the quaternionic Heisenberg group or sphere, where complete and detailed proofs are given, together with a chapter on the conformal curvature tensor introduced very recently by the authors. The starting point of the considered problems is the well-known Folland-Stein Sobolev type embedding and its sharp form that is determined based on geometric analysis.

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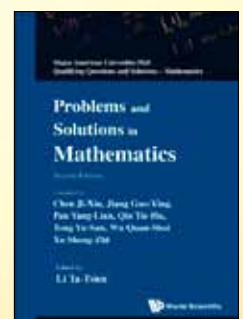
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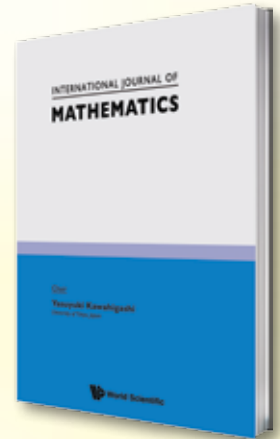
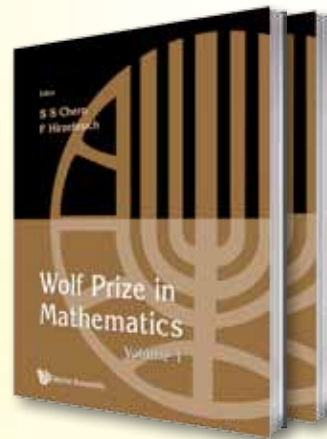
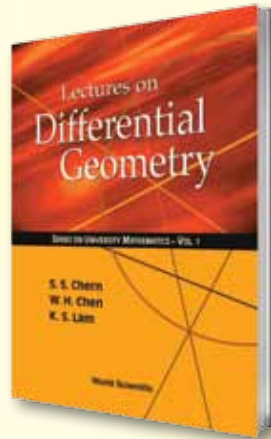
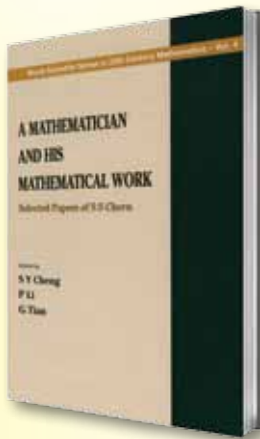
This book contains a selection of more than 500 mathematical problems and their solutions from the PhD qualifying examination papers of more than ten famous American universities. The mathematical problems cover six aspects of graduate school mathematics: Algebra, Topology, Differential Geometry, Real Analysis, Complex Analysis and Partial Differential Equations. While the depth of knowledge involved is not beyond the contents of the textbooks for graduate students, discovering the solution of the problems requires a deep understanding of the mathematical principles plus skilled techniques. For students, this book is a valuable complement to textbooks. Whereas for lecturers teaching graduate school mathematics, it is a helpful reference.



804pp Feb 2011

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Shiing-Shen Chern

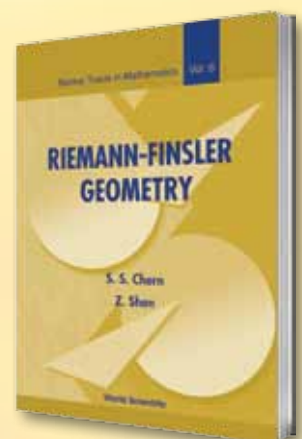
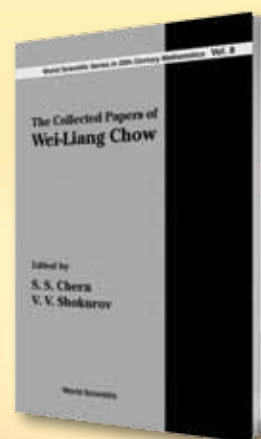
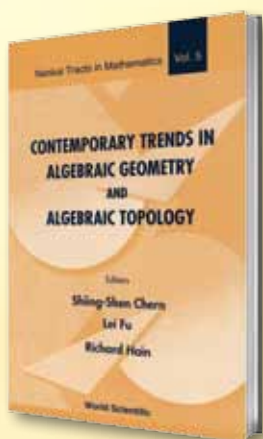
Mathematician **Shiing-Shen Chern**, one of the greatest geometers of the 20th century and the father of modern differential geometry, has worked closely with World Scientific since the 1990s.

Apart from the being the Honorary Editor of the International Journal of Mathematics, Chern published several titles with World Scientific.

In 1996, World Scientific reprinted *A Mathematician and His Mathematical Works - Selected Papers of S S Chern*, which was a volume about Chern's life, a summary of his mathematical works, and personal accounts by friends.

In 1999, World Scientific published the English version of *Lectures on Differential Geometry*, a reputable text by Chern and Professor Wei-Huan Chen. In 2001 and 2002, Chern published the *Wolf Prize in Mathematics* (Volumes 1 & 2) with Professor Friedrich Hirzebruch which featured bibliographies, important papers, and speeches of Wolf Prize winners. Other notable books authored or edited by Chern include *Contemporary Trends in Algebraic Geometry and Algebraic Topology*, *The Collected Papers of Wei-Liang Chow* and *Riemann-Finsler Geometry*.

To commemorate his outstanding contributions to the field of Mathematics, *Inspired by S S Chern - A Memorial Volume in Honor of A Great Mathematician* was published in 2006. Former colleagues, students and friends who were highly-regarded mathematicians in their own right also came together to honor and celebrate his contributions. *Chern and Chinese Mathematics* was published in Chinese in the following year to memorialize his contributions to Chinese mathematics.



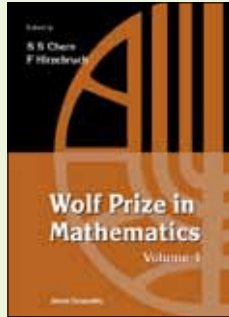
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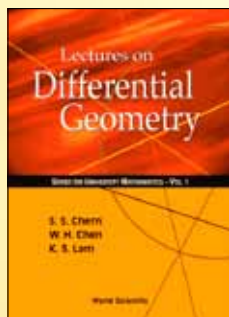
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This invaluable book contains the collected papers of Prof Wei-Liang Chow, an original and versatile mathematician of the 20th Century. Prof Chow's name has become a household word in mathematics because of the Chow ring, Chow coordinates, and Chow's theorem on analytic sets in projective spaces. The Chow ring has many advantages and is widely used in intersection theory of algebraic geometry. Chow coordinates have been a very versatile tool in many aspects of algebraic geometry. Chow's theorem — that a compact analytic variety in a projective space is algebraic — is justly famous; it shows the close analogy between algebraic geometry and algebraic number theory.

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Selected Papers of S S Chern

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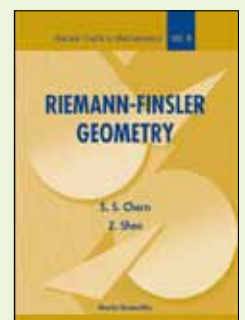
by **S S Chern** (*Chern Institute of Mathematics, Nankai University, China*) & **Zhongmin Shen** (*Indiana University Purdue University Indianapolis, USA*)



"This interesting text is a concise well organized textbook concerning Riemann-Finsler geometry. It is characterized by its clarity and simplicity, on one hand, and its rigor, on the other hand ... this is an excellent book that should take its place in any mathematical library."

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CONTEMPORARY TRENDS IN ALGEBRAIC GEOMETRY AND ALGEBRAIC TOPOLOGY

edited by **S S Chern, Lei Fu** (*Chern Institute of Mathematics, Nankai University, China*) & **Richard Hain** (*Duke University, USA*)



The Wei-Liang Chow and Kuo-Tsai Chen Memorial Conference was proposed and held by Prof S S Chern in Nankai Institute of Mathematics. It was devoted to memorializing those two outstanding and original Chinese mathematicians who had made significant contributions to algebraic geometry and algebraic topology, respectively. This invaluable volume contains the selected papers presented at the conference. The topics include canonical maps of Gorenstein 3-folds, fundamental groups of algebraic curves, Chen's iterated integrals, algebraic fiber spaces, and others.

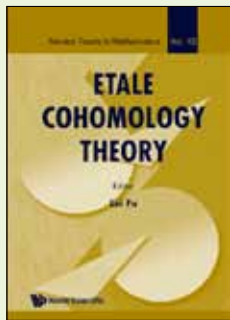
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Etale cohomology is an important branch in arithmetic geometry. This book covers the main materials in SGA 1, SGA 4, SGA 4 1/2 and SGA 5 on etale cohomology theory.



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624pp Jan 2011
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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*)



Chern's works span all the classic fields of differential geometry: the Chern-Simons theory; the Chern-Weil theory, linking curvature invariants to characteristic classes; Chern classes; and other areas such as projective differential geometry and webs that are mathematically rich but currently have a lower profile. He also published work in integral geometry, value distribution theory of holomorphic functions, and minimal submanifolds.

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.

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"The last twenty years have seen widespread interest in the use of analytic techniques to calculate and refine invariants arising in algebraic and differential topology. Insights from mathematical physics have driven much of this activity. The book under review is an introduction to this field. This book is noteworthy for its combination of brevity, clarity, accessibility, and depth. This combination rests in part on the elegance of the writing and in part on the author's insight in using techniques due to J M Bismut and collaborators ... A reader aware of the theorems discussed in the book but looking to understand their proofs through the eyes of an expert will find this book fascinating. This book is a valuable contribution to the literature."

Mathematics Abstracts

132pp Sep 2001
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INTRODUCTORY LECTURES ON KNOT THEORY

Selected Lectures Presented at the Advanced School and Conference on Knot Theory and Its Applications to Physics and Biology

ICTP, Trieste, Italy, 11 – 29 May 2009

edited by **Louis H Kauffman** (*University of Illinois at Chicago, USA*),

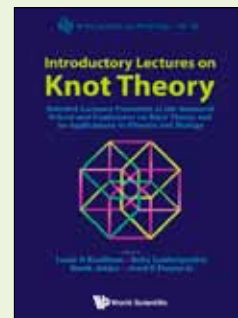
Sofia Lambropoulou (*National Technical University of Athens, Greece*),

Slavik Jablan (*The Mathematical Institute, Serbia*) & **Jozef H Przytycki** (*George Washington University, USA*)



This volume consists primarily of survey papers that evolved from the lectures given in the school portion of the meeting and selected papers from the conference. It is a remarkable fact that knot theory, while very special in its problematic form, involves ideas and techniques that involve and inform much of mathematics and theoretical physics. The subject has significant applications and relations with biology, physics, combinatorics, algebra and the theory of computation.

540pp Sep 2011
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QUANTUM INVARIANTS

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Mathematical Reviews

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Mathematical Reviews

480pp Oct 1994
978-981-02-1729-7 US\$122 £81
978-981-02-2034-1 (pbk) US\$67 £44

JOURNALS

International Journal of Mathematics (IJM)

Print / Online ISSN: 0129-167X / 1793-6519
<http://www.worldscinet.com/ijm>

This journal publishes original papers in mathematics in general, but giving a preference to those in the areas of mathematics represented by the editorial board. The journal has been published monthly except in June and December to bring out new results without delay. Occasionally, expository papers of exceptional value may also be published. The first issue appeared in March 1990.

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International Journal of Geometric Methods in Modern Physics (IJGMMP)

Print / Online ISSN: 0219-8878 / 1793-6977
<http://www.worldscinet.com/ijgmmp>

This journal publishes short communications, research and review articles devoted to the application of geometric methods (including differential geometry, algebraic geometry, global analysis and topology) to quantum field theory, non-perturbative quantum gravity, string and brane theory, quantum mechanics, semi-classical approximations in quantum theory, quantum thermodynamics and statistical physics, quantum computation and control theory.

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Journal of Knot Theory and Its Ramifications (JKTR)

Print / Online ISSN: 0218-2165 / 1793-6527
<http://www.worldscinet.com/jktr>

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. Papers include new research in the theory of knots and links, and their applications; new researches in related fields; tutorial and review papers, etc.

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Print / Online ISSN: 1793-5253 / 1793-7167
<http://www.worldscinet.com/jta>

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. We welcome all excellent papers that have a geometric and/or analytic flavor that fosters the interactions between these fields. Papers published in this journal should break new ground or represent definitive progress on problems of current interest. On rare occasion, we will also accept survey papers.

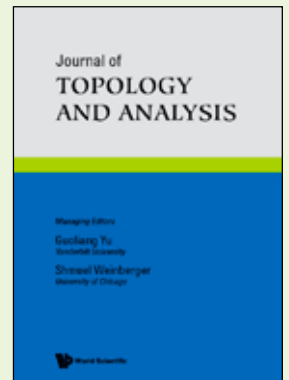
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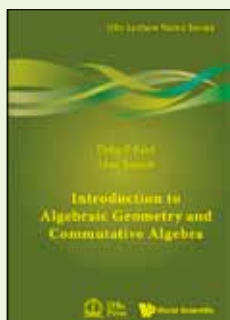
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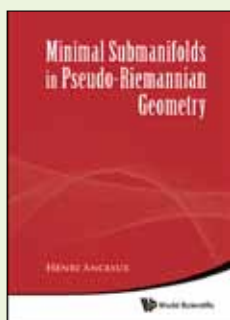
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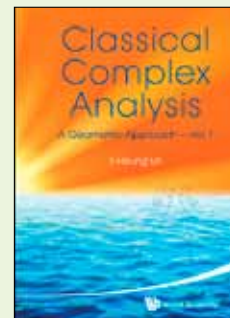
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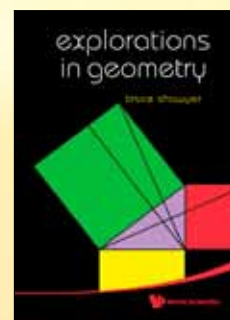
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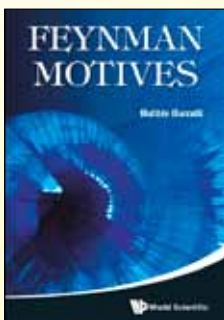
Max-Planck-Institute for Mathematics, Bonn
Chair of the Fields Medal Committee, 1998

"Anyone interested in this rapidly expanding field will have to look through this monograph; for now, it is the only coherent source of information about the project, apart from reading scattered papers, written in different mathematical languages."

Gunther Cornelissen

University of Utrecht, The Netherlands

236pp	Dec 2009	
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160pp	Nov 2005	
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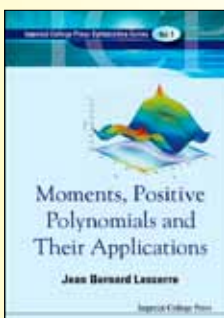
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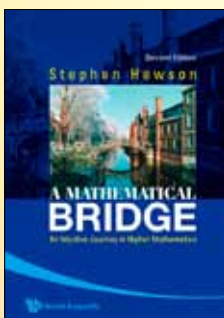
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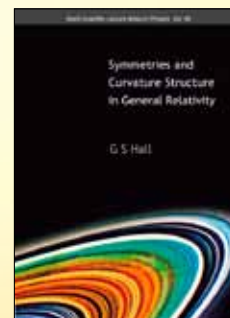
672pp	Jan 2009	
978-981-283-407-2	US\$110	£61
978-981-283-408-9 (pbk)	US\$65	£36



Vol. 1



Vol. 46



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212pp	Jun 2001	
978-981-02-3908-4	US\$78	£51
978-981-02-3909-1(pbk)	US\$41	£27

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660pp	Jun 2000	
978-981-02-4307-4	US\$374	£247
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AN INTRODUCTION TO DIFFERENTIAL GEOMETRY AND TOPOLOGY IN MATHEMATICAL PHYSICS

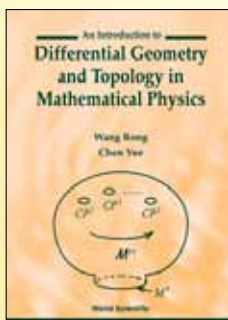
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220pp	Jan 1999	
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Mathematics Abstracts

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228pp	Dec 1998	
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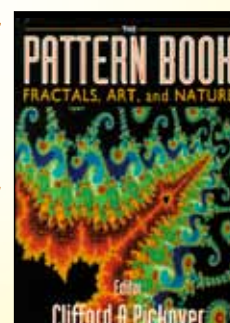
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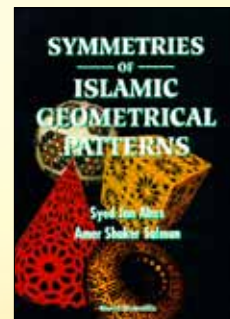
The Chemical Intelligencer

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440pp	Dec 1994	
978-981-02-1704-4	US\$68	£45
978-981-4335-94-2(ebook)	US\$88	

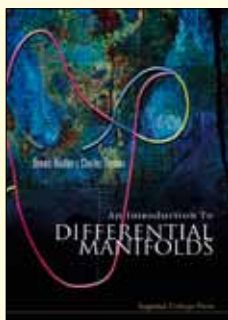


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Acta Scientiarum Mathematicarum

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232pp	Mar 2003	
978-1-86094-354-6	US\$70	£46
978-1-86094-355-3(pbk)	US\$42	£28

DIFFERENTIAL GEOMETRY FOR PHYSICISTS

by **Bo-Yu Hou** (Northwest University, China)
& **Bo-Yuan Hou** (Academia Sinica, China)

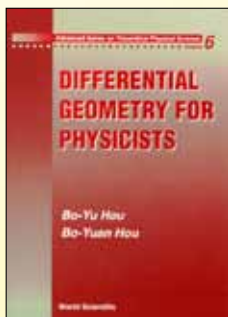


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Mathematical Reviews, 1998

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560pp	Oct 1997	
978-981-02-3105-7	US\$121	£80

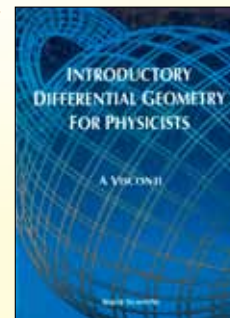


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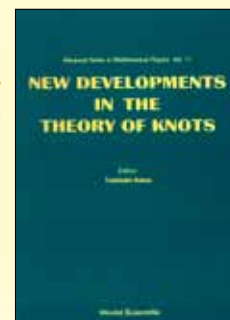
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