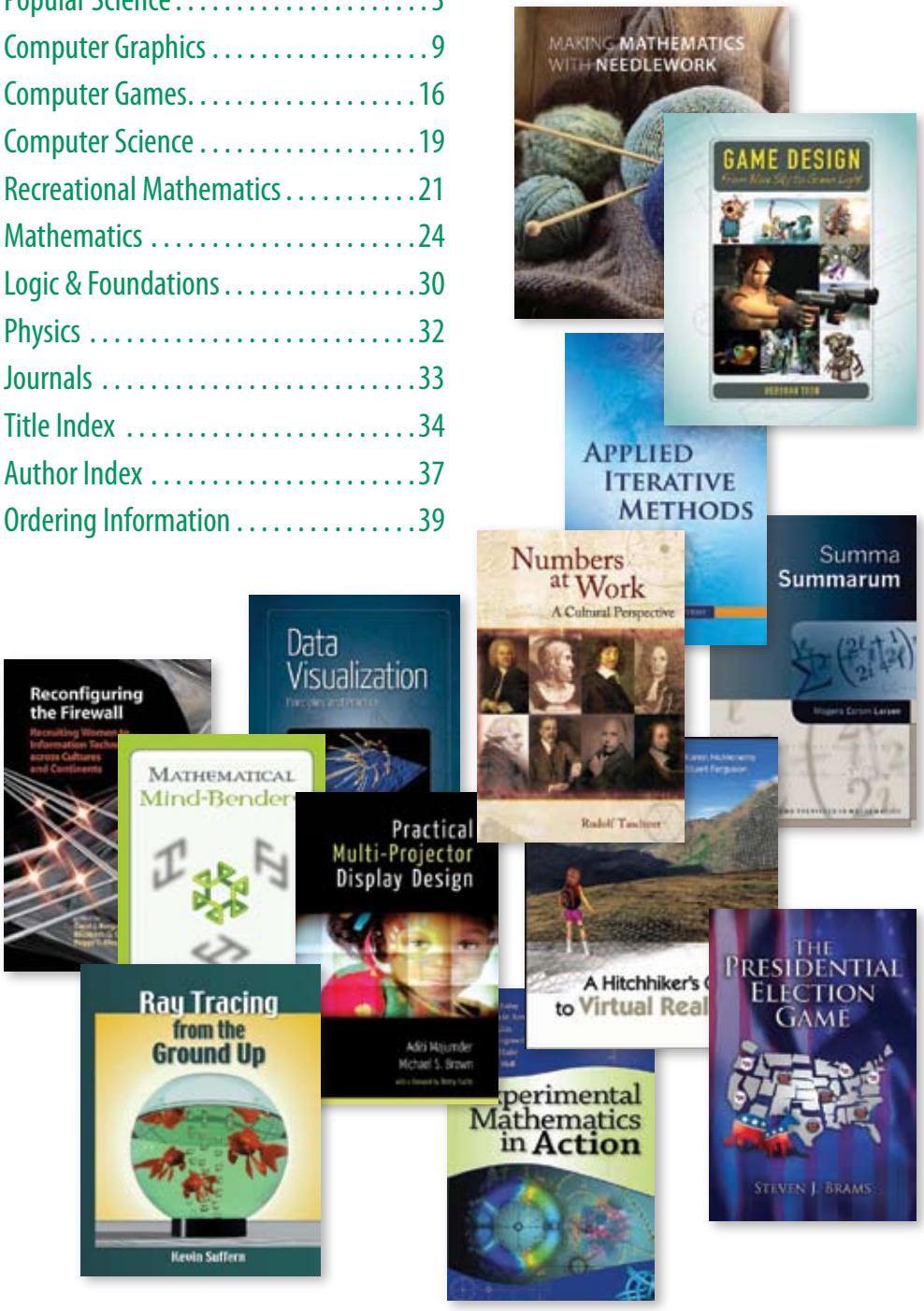
A K Peters, Ltd.

Complete Catalog
2008

Table of Contents



Beyond the Nanoworld

NEW

Quarks, Leptons, and Gauge Bosons

Hans Günter Dosch

Beyond the world of atoms, at scales smaller than the smallest nuclei, a new world comes into view, populated by an array of colorful elementary particles: strange and charmed quarks, muons and neutrinos, gluons and photons, and many others, all interacting in beautifully intricate patterns. *Beyond the Nanoworld* tells the story of how this new realm was discovered. From the first discoveries of subatomic structure to the present-day hunt for the Higgs particle, the reader is invited to follow the twin branches of experimental and theoretical research as they wind through the twentieth century, culminating in the most successful physical theory of all time: the standard model of particle physics.

"The story of how elementary particle physics evolved, over the course of the twentieth century, from primitive beginnings into the strange, brilliantly successful yet clearly unfinished world-theory of today is a great unsung epic of human adventure. *Beyond the Nanoworld* tells the tale with clarity and style."

—Frank Wilczek, Herman Feshbach Professor of Physics, MIT; 2004 Nobel Laureate

January 2008; ISBN 978-1-56881-345-5
Hardcover; 292 pp.; $39.00

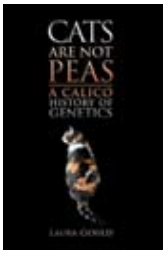
Cats Are Not Peas

NEW

A Calico History of Genetics

SECOND EDITION

Laura Gould



Do you remember learning about dominant and recessive genes in biology class? About Gregor Mendel and his experiments with peas? The logic of genetics that came from those experiments supports the "well-known fact" that only female cats can be calico. When faced with an impossibility—an adopted cat that was definitely male and definitely calico—Laura Gould began to investigate the genetic facts behind her pet's existence. This charmingly written book offers an easily-accessible description of basic genetics and an exploration of the history of calico cats. The second edition includes an appendix outlining advances in genetics, particularly those related to cats, over the ten years since the publication of the first edition.

"Distinctly masculine because he has the tell-tale gender Y-chromosome in his body's cells, distinctly a domestic feline because of his 18 pairs of autosomes, mottled (orange, black & white) adorable George is a male calico cat. His body flagrantly, but superficially, disobeys Mendel's laws of heredity. Laura Gould's delightful tale, compelling but never pedantic, reveals he is not a closet female but rather a 'mosaic': half his body's myriad cells carry an extra X-chromosome. Her retold story enlightens our genetic, karyological and literary sensibilities."

—Lynn Margulis, Distinguished University Professor, Dept. of Geosciences, University of Massachusetts-Amherst

January 2008; ISBN 978-1-56881-320-2
Hardcover; 312 pp.; $39.00

Crimes and Mathdemeanors

Leith Hathout

This collection of short detective stories, written by an award-winning young mathematician, provides exciting challenges for young adults who have graduated beyond the ever-popular *Encyclopedia Brown* mysteries series. The main character, Ravi, is a 14-year-old math genius who helps the local police solve cases by applying clever mathematical ideas and physical principles. Each chapter is a detective story with a mathematical puzzle at its core that Ravi is able to solve; the author invites the reader to solve the case on his or her own and then explains the mathematics used to find a solution to the puzzle.

2007; ISBN 978-1-56881-260-1 **Paperback; 150 pp. ; $14.95**

Emmy Noether

NEW

The Mother of Modern Algebra

M. B. W. Tent

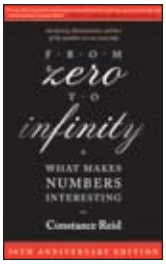
This is the life story of Emmy Noether, the most important female mathematician who ever lived. Because no one expected her to grow into an important scientist, the records of her early life are sketchy. After all, it was assumed that she would grow up to be a wife and mother. Instead, she was a genius who chose a distinctive path. The author has woven this charming story of Emmy Noether's life around the events that appear in the oral and written records, fleshing out the story with details about life in Germany at the time and what we know about how bright children explore mathematics.

April 2008; ISBN 978-1-56881-430-8
Hardcover; approx. 100 pp.; $24.95

From Zero to Infinity
What Makes Numbers Interesting

50TH ANNIVERSARY EDITION

Constance Reid



After half a century in print, this small classic—like mathematics itself—is still "as fresh as May." You may have seen films, read novels, and applauded plays that have attempted to convey the beauty and power of mathematics. Now it's time for a glimpse of the real thing. *From Zero to Infinity* can be read with pleasure by anyone of any age who is mathematically inclined. All that is needed is a bit of algebra. It is a book that has on occasion changed lives. Buy one for yourself and one for a gift. You may make a youngster into a mathematician.

"No one today writes about mathematics and mathematicians with more grace, knowledge, skill, and clarity than Constance Reid."

—Martin Gardner, author of *Mathematical Games*

2006; ISBN 978-1-56881-273-1 **Paperback; 208 pp.; $19.95**

Guaranteed Heartbreak NEW
Loving and Hating Mathematics

Reuben Hersh, Vera John-Steiner

Guaranteed Heartbreak reveals the emotional side of mathematical life, both for beginning learners and for the most illustrious. Narratives about famous and lesser known mathematicians tell of fascination and frustration, dejection and elation. The amazing life story of Alexander Grothendieck is a cautionary tale. The authors debunk the myth that math is a "young man's game." They explore mathematical beginnings, mathematical friendships, and mathematical culture, examine what it means to be an "insider" in mathematics, and tell about "outsiders" trying to balance their sense of marginality with their passionate engagement. This exploration of a neglected side of mathematical life will be of interest to researchers, educators, and anyone else who is interested in mathematics.

August 2008; ISBN 978-1-56881-237-3
Hardcover; approx. 250 pp.; $29.95

History of the International Congress of Mathematicians NEW

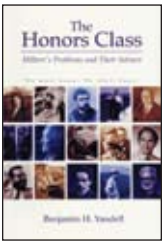
Guillermo Curbera

The International Congress of Mathematicians (ICM) has been held 24 times since the first one was held in Zurich in 1897. This book presents a pictorial history of the ICM, emphasizing the human side. The uniqueness of the images alone makes this book worth adding to your collection.

July 2008; ISBN 978-1-56881-330-1
Hardcover; approx. 300 pp.; $45.00

The Honors Class
Hilbert's Problems and Their Solvers

Ben Yandell



This eminently readable book focuses on the people of mathematics and draws the reader into their fascinating world. In a monumental address, given to the International Congress of Mathematicians in Paris in 1900, David Hilbert, perhaps the most respected mathematician of his time, developed a blueprint for mathematical research in the new century. Jokingly called a natural introduction to thesis writing with examples, this collection of problems has indeed become a guiding inspiration to many mathematicians, and those who succeeded in solving or advancing their solutions form an Honors Class among research mathematicians of this century. In a remarkable labor of love and with the support of many of the major players in the field, Ben Yandell has written a fascinating account of the achievements of this Honors Class, covering mathematical substance and biographical aspects.

2003; ISBN 978-1-56881-216-8 **Paperback; 486 pp.; $24.95**

Julia Robinson and Hilbert's Tenth Problem NEW DVD

George Csicsery

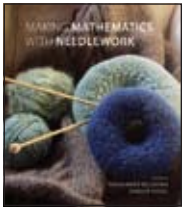
A one-hour biographical documentary, *Julia Robinson and Hilbert's Tenth Problem* tells the story of a pioneer among American women in mathematics. Julia Robinson was the first woman elected to the mathematical section of the National Academy of Sciences, and the first woman to become president of the American Mathematical Society. Her work, and the exciting story of the path that led to the solution of Hilbert's tenth problem in 1970, produced an unusual friendship between Russian and American colleagues at the height of the cold war. In this film, Robinson's major contribution to the solution of H10 triggers a tour of 20th century mathematics that moves from Paris in 1900, through the United States, to the Soviet Union, and back. The film covers important events in the history of modern mathematics, while conveying the motivations of mathematicians and exploring the relationship between mathematical research and the development of computers. Julia Robinson's story, and the presence of prominent women in mathematics in the film, is an inspiration to young women to pursue educational opportunities and careers in mathematics.

Documentary Film, 55 minutes
January 2008; ISBN 978-1-56881-428-5 **DVD; $29.95**

Making Mathematics with Needlework

Ten Papers and Ten Projects **NEW**

Edited by sarah-marie belcastro, Carolyn Yackel



The focus of this book, written for mathematicians, needleworkers, and teachers of mathematics, is on the relationship between mathematics and the fiber arts (including knitting, crocheting, tatting, and quilting). Following a review of the mathematics that arises in the fiber arts, each chapter covers a specific mathematical concept and a needlework project, presented at a level where needleworkers can understand the mathematical concepts and mathematicians can understand the basics of the needlework. In addition, each chapter contains technical sections on mathematics, introducing the mathematics in the classroom through needlework, and needlework instructions where the pattern will exemplify the interplay between the craft and the mathematics.

2007; ISBN 978-1-56881-331-8 **Hardcover; 200 pp.; $30.00**

Mathematical People **NEW**

Profiles and Interviews

SECOND EDITION

Donald Albers, Gerald L. Alexanderson

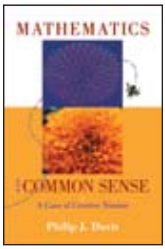
This unique collection contains extensive and in-depth interviews with mathematicians who have shaped the field of mathematics in the twentieth century. Collected by two mathematicians respected in the community for their skill in communicating mathematical topics to a broader audience and for their skillful exploration of mathematical lives, the book is also rich with photographs and includes an introduction by Philip J. Davis.

April 2008; ISBN 978-1-56881-340-0
Hardcover; approx. 450 pp.; $49.00

Mathematics and Common Sense

A Case of Creative Tension

Philip J. Davis



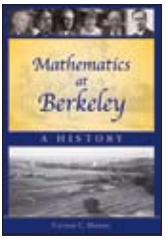
Mathematics and its applications are amphibians that live between common sense and the irrelevance of common sense, between what is intuitive and what is counterintuitive, between the obvious and the esoteric. The tension that exists between these pairs of opposites is a source of the creative strength of mathematics. Addressed to all who are curious about mathematics and who wonder about its nature and the role it plays in society, this book provides discussions and examples from the simple to the more abstruse. What is mathematical intuition? If mathematics says "No," does it really mean it? Why is counting impossible? Phil Davis answers these questions and more as he explores the confusing relationship between mathematics and common sense.

2006; ISBN 978-1-56881-270-0 **Hardcover; 250 pp.; $34.95**

Mathematics at Berkeley

A History

Calvin C. Moore



In this fascinating history of the mathematics department at the University of California, Berkeley, Moore describes how this institution evolved from a single faculty member at a financially troubled private college into a major research center that is ranked among the very best in the US and in the world. Moore's account spans from its origins in the 1850s to the establishment and early years of the Mathematical Sciences Research Institute (MSRI) in the early to mid 1980s.

2007; ISBN 978-1-56881-302-8 **Hardcover; 376 pp.; $39.00**

N is a Number **DVD/VHS**

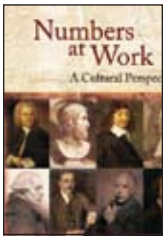
A Portrait of Paul Erdős

George Csicsery

A man with no home and no job, Paul Erdös was the most prolific mathematician who ever lived. Born in Hungary in 1913, Erdös wrote and co-authored over 1,500 papers and pioneered several fields in theoretical mathematics. At the age of 83 he still spent most of his time on the road, going from math meeting to math meeting, continually working on problems. He died on September 20, 1996 while attending such a meeting in Warsaw, Poland. The film opens at Cambridge University's 1991 honorary doctorate ceremony, where Erdös received an award he says he would gladly trade for a "nice new proof." For Erdös, the meaning of life is "to prove and conjecture." To pursue this life of wandering and pure scholarship, Erdös relied on a network of other renowned mathematicians-all of whom regarded him as an international treasure. As the film progresses it becomes clear that mathematicians around the world had more than a professional stake in caring for Erdös. In different ways, each of the many prominent mathematicians in the film expresses dedication to and love for Erdös.Documentary film, 57 minutes

ISBN 978-1-56881-088-1 **VHS/NTSC; $29.95**
ISBN 978-1-56881-094-2 **PAL; $35.00**
ISBN 978-1-56881-233-5 **DVD; $29.95**

Numbers at Work
A Cultural Perspective
Rudolf Taschner



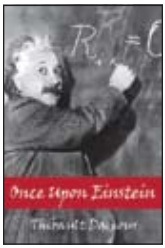
Drawing primarily from historical examples, this book explains the tremendous role that mathematics and, in particular, numbers play in all aspects of our civilization and culture. The lively style and illustrative examples will engage the reader who wants to understand the many ways in which mathematics enables science, technology, art, music, politics, and rational foundations of human thought. Each chapter focuses on the influence of mathematics in a specific field and on a specific historical figure, such as "Pythagoras: Numbers and Symbol"; "Bach: Numbers and Music"; and "Descartes: Numbers and Space."

"A fascinating reading on the history and use of numbers. A deeper background in mathematics is not necessary in order to read, enjoy and learn from this book. Recommended to all readers interested in the world around us and wanting to understand the importance of numbers in our daily lives."

--European Mathematical Society Newsletter

2007; ISBN 978-1-56881-290-8 **Hardcover; 224 pp.; $39.00**

Once Upon Einstein
Thibault Damour



Everyone knows that Einstein created the physics of the twentieth century through his work on relativity and quantum theory. But what do we really know about the essence of Einstein's ideas and how do we perceive the depth of their conceptual revolution? Through the choice of concrete scenes from the life of Einstein, the author lets us relive the formation of his theories. The book involves us in a reflection on their philosophical impact. How does one experience time after the theory of relativity, which removes any sense of "now" and shows that twins can be of different age? The book accompanies Einstein through his life and scientific work, and points out daily applications of his ideas: from Lasers to Global Positioning Systems.

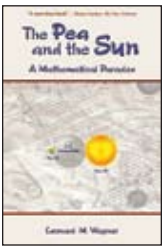
"*Once Upon Einstein* takes the reader on a novel and enjoyable stroll through the well-trodden byways of Einstein's revolutionary breakthroughs. Both novice and expert alike will be entertained and enlightened by Damour's masterful insights."

—Brian Greene, author of *The Fabric of the Cosmos* and *The Elegant Universe*

2006; ISBN 978-1-56881-289-2 **Paperback; 199 pp.; $27.00**

The Pea and the Sun
A Mathematical Paradox
Leonard M. Wapner

NOW IN PAPERBACK



The Banach-Tarski Theorem is regarded by some as the most surprising result of modern mathematics. Also known as the Banach-Tarski Paradox, or the "Pea and the Sun" paradox, the theorem asserts that a solid ball can be decomposed into a finite number of pieces, then be reassembled to form two balls, each identical in size to the original. Paradoxical as this may appear, the theorem is generally regarded as true. The presentation includes brief biographies of the "main characters," mathematical recreations similar in appearance to the Banach-Tarski Paradox, and an interpretation of the theorem's stunning conclusion.

2007; ISBN 978-1-56881-327-1 **Paperback; 232 pp.; $19.95**
2005; ISBN 978-1-56881-213-7 **Hardcover; 232 pp.; $34.00**

The Presidential Election Game

NEW

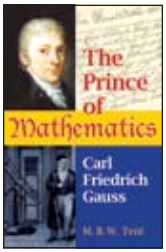
SECOND EDITION

Steven J. Brams

The Presidential Election Game may change the way you think about presidential elections and, for that matter, American politics in general. This analytic treatment of strategy in the race for the presidency, from the primaries to the general election, uses modern game theory and decision theory to demonstrate why certain campaign strategies are more effective than others. Brams supports his thorough analysis with historical evidence, and in applying scientific modeling to presidential elections in clear and understandable language, Brams adds a new dimension to the study of this important aspect of American politics.

December 2007; ISBN 978-1-56881-348-6
Paperback; 224 pp.; $29.00

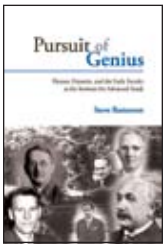
The Prince of Mathematics
Carl Friedrich Gauss
M. B. W. Tent



The author narrates the life of Carl Friedrich Gauss, the 18th century mathematician, from his prodigious childhood to his extraordinary achievements that earned him the title "Prince of Mathematics." Along the way, the author introduces her readers to a different culture, the era of small states in Germany where advancement on merits, such as Gauss', was supported by enlightened rulers, competing for intellectual excellence and economic advantage through scientific progress in their small states. Based on extensive research of original and secondary sources, the author has created an historical narrative that will inspire young readers and even curious adults with a story full of human touch and personal achievement.

2006; ISBN 978-1-56881-261-8 **Hardcover; 264 pp.; $29.00**

Pursuit of Genius
Flexner, Einstein, and the Early Faculty at the Institute for Advanced Study
Steve Batterson



The United States first attained its dominant standing in mathematical research when, in 1933, the Institute for Advanced Study opened in Princeton. Suddenly a New Jersey town surpassed the legendary European centers. Among the scholars taking up residence in the Institute's School of Mathematics were Albert Einstein, John von Neumann, Hermann Weyl, and Kurt Gödel. Two other schools soon joined Mathematics to broaden the Institute for Advanced Study's curriculum. The great art historian Erwin Panofsky and several archeologists were selected to staff the School of Humanistic Studies. Meanwhile the School of Economics and Politics opened with ambitious objectives. This book relies primarily on archival sources to explore the origin of the Institute for Advanced Study and its selection of subjects and personnel. Particular attention is devoted to the School of Mathematics. Its development is contrasted with that of the other two schools amidst the challenges of the Great Depression and available resources.

2006; ISBN 978-1-56881-259-5 **Hardcover; 314 pp.; $39.00**

Robots Unlimited
Life in a Virtual Age
David Levy

Consider this: Robots will one day be able to write poetry and prose so touching that it will make men weep; compose dozens or even hundreds of symphonies in the exact same style as Beethoven or Mozart; carry on a conversation as though from a persona of a Nobel winning scientist or a punk rocker; judge a court case with absolute impartiality and fairness; have humans fall in love with and marry them. Thought provoking and controversial? Certainly. But far-fetched? Not at all. David Levy presents a history of Artificial Intelligence, considers recent developments, and speculates about the future of AI in this engaging and informative book.

2005; ISBN 978-1-56881-239-7 **Hardcover; 466 pp.; $39.00**

Saunders Mac Lane
A Mathematical Autobiography
Saunders Mac Lane

Saunders Mac Lane's life has covered nearly a century of mathematical developments. During the earlier part of the 20th century, he participated in the exciting happenings in Göttingen—the Mecca of mathematics. Later, he contributed to the more abstract and general mathematical viewpoints developed in the 20th century. Perhaps the most outstanding accomplishment during his long and extraordinary career was creating the concept of categories together with Sam Eilenberg and developing them into a theory that has broad applications in different areas of mathematics, in particular topology and foundations. He was also a keen observer and active participant in the social and political themes of the 20th century. As a member and vice president of the National Academy of Science and an advisor to the Administration, he exerted considerable influence on science and education policies in the post-war period. Mac Lane's autobiography takes the reader on a journey through the most important milestones of the mathematical world in the 20th century.

2005; ISBN 978-1-56881-150-5 **Hardcover; 354 pp; $39.00**

Tangents and Hyperbolas NEW

A Collection of Mathematical Love Poems

Sarah Glaz, JoAnne Growney

Tangents and Hyperbolas is a collection of about 150 poems (from various time periods) with strong links to mathematics in content, form, or imagery. The common theme is love, and the editors draw from its various manifestations—romantic love, spiritual love, humorous love, love between parents and children, mathematicians in love, love of mathematics. The poets include literary masters as well as celebrated mathematicians and scientists. The collection will include an index of poems by math subject, a glossary of math terms, and biographical sketches of poets.

October 2008; ISBN 978-1-56881-341-7
Hardcover; approx. 250 pp.; $25.00

The Wraparound Universe NEW

Jean-Pierre Luminet

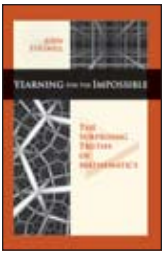
With the appearance of Einstein's theory of general relativity in the twentieth century, our understanding of the universe and its history was revolutionized, and cosmology was born as a scientific discipline. This book provides an engaging overview of the history of the subject and the science behind it for the general reader, leading to a question at the very frontier of research: what is the overall shape of the universe? Could the universe be wrapped around and reconnected to itself, leading to mirage stars as light twists along repeated paths through space? As the author explains, this is a question that modern experiments have started to address.

February 2008; ISBN 978-1-56881-309-7
Hardcover; approx. 350 pp.; $39.00

Yearning for the Impossible

The Surprising Truths of Mathematics

John Stillwell



This book is a novel introduction to mathematics and its history. It puts the difficulties of the subject up front by enthusiastically tackling the most important ones: the seemingly impossible concepts of irrational and imaginary numbers, the fourth dimension, curved space, and infinity. Related "impossibilities" arise in art, literature, philosophy, and physics—as the book shows—but only mathematics has the precision to separate the actual impossibilities from those that are only apparent. By focusing reason and imagination on several apparent impossibilities, the book aims to widen the horizons of beginning students, whose textbooks are necessarily rather narrow. It will also interest and delight readers with a good background in high school mathematics, provided they have the curiosity and perseverance to grapple with surprising ideas.

"One of the best expositors in mathematics achieves the almost impossible: to write a wonderful and readable story of the truly impossible." —Piergiorgio Odifreddi, Columbia University, author of *The Mathematical Century: The 30 Greatest Problems of the Last 100 Years*

2006; ISBN 978-1-56881-254-0 **Hardcover; 244 pp.; $29.95**

The Education of a Mathematician

Philip J. Davis

2000; ISBN; 978-1-56881-116-1 **Hardcover; 368 pp.; $39.00**

From Trotsky to Gödel

The Life of Jean van Heijenoort

Anita Burdman Feferman

2001; ISBN 978-1-56881-148-2 **Paperback; 432 pp.; $39.00**

How Noble in Reason

Alyn Rockwood

"What appeals to me is the question: is destroying a sentient—that is, self-aware, conscious, feeling—computer the same as murder? After pondering this in the course of the novel, I rather think it is." —Piers Anthony

2006; ISBN 978-1-56881-288-5 **Hardcover; 150 pp.; $24.95**

Logical Dilemmas

The Life and Work of Kurt Gödel

John Dawson

2005; ISBN 978-1-56881-256-4 **Paperback; 376 pp.; $34.00**

Machines Who Think

SECOND EDITION—25TH ANNIVERSARY UPDATE

Pamela McCorduck

2004; ISBN 978-1-56881-205-2 **Paperback; 576 pp.; $29.00**

Advanced Global Illumination **TEXT**

SECOND EDITION

Philip Dutré, Kavita Bala, Philippe Bekaert

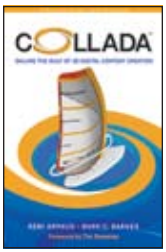
This book provides the reader with a fundamental understanding of global illumination algorithms. It discusses a broad class of algorithms for realistic image synthesis and introduces a theoretical basis for the algorithms presented.This completely updated second edition includes exercises for each chapter, new material on environment map sampling, lightcuts and precomputed radiance transfer, and expanded material on human perception.

2006; ISBN 978-1-56881-307-3 **Hardcover; 384 pp.; $59.00**

COLLADA

Sailing the Gulf of 3D Digital Content Creation

Remi Arnaud, Mark Barnes



COLLADA is a COLLAborative Design Activity for establishing an open standard Digital Asset schema for interactive 3D applications. It is aimed to be the centerpiece of Digital Asset tool chains. The COLLADA project was initiated by Sony Computer Entertainment during SIGGRAPH 2003, with the intent of raising the quality and ease of use of content for its next generation game platform, the Playstation 3. COLLADA was accepted by the Khronos Group as an industry standard, along with OpenGL, ES, and other APIs. The COLLADA schema is publicly accessible on the Internet for online content validation. COLLADA covers a large range of features such as animation, skinning, shader effects and physics in addition to the basics (geometry, material, transforms, and meta-data). This book explains in detail how to use the COLLADA technology in a project utilizing 3D assets, and ultimately how to create an effective content creation pipeline for the most complex development.

"This book makes available the results of a joint industry effort, spearheaded by Sony Computer Entertainment, Inc., to create a standard for digital asset exchange that enables Playstation® 3 to bring more realistic content to life and into the home like never before."

—Ken Kutaragi, President and CEO Sony Computer Entertainment

2006; ISBN 978-1-56881-287-8 **Hardcover; 250 pp.; $54.00**

Color Imaging **NEW**

Fundamentals and Applications

Erik Reinhard, Erum Arif Khan, Ahmet Oguz Akyüz, Garrett Johnson

This book provides the reader with an understanding of what color is, where color comes from, and how color can be used correctly in many different applications. The authors first treat the physics of light and its interaction with matter at the atomic level, so that the origins of color can be appreciated. The intimate relationship between energy levels, orbital states, and electromagnetic waves helps to explain why diamonds shimmer, rubies are red, and the feathers of the Blue Jay are blue. Then, color theory is explained from its origin to the current state of the art, including image capture and display as well as the practical use of color in disciplines such as computer graphics, computer vision, photography, and film.

August 2008; ISBN 978-1-56881-344-8
Hardcover; approx. 700 pages; $99.00

Computational Photography **NEW**

Mastering New Techniques for Lenses, Lighting, and Sensors

Ramesh Raskar, Jack Tumblin

Computational photography combines plentiful computing, digital sensors, modern optics, actuators, probes, and smart lights to escape the limitations of traditional film cameras and enables novel imaging applications. The computational techniques discussed in this book cover topics in exploiting new ideas in manipulating optics, illumination, and sensors at time of capture. In addition, the authors describe sophisticated reconstruction procedures from direct and indirect pixel measurements that go well beyond the traditional digital dark-room experience. This book provides a practical guide to topics in image capture and manipulation methods for generating compelling pictures for graphics, special effects, scene comprehension, and art.

August 2008; ISBN 978-1-56881-313-4
Hardcover; approx. 200 pp.; $39.00

Computer Facial Animation **NEW**

SECOND EDITION

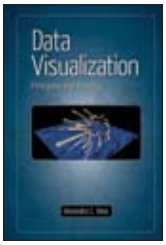
Frederic I. Parke, Keith Waters

Praise for the first edition: "The collaborative effort of computer animation experts Frederic I. Parke and Keith Waters, *Computer Facial Animation* is a fascinating, in-depth, and thoroughly "user friendly" technical guide to the art and craft of three-dimensional computer animation, especially as applied to faces and expressions. An in-depth, exhaustive, and scholarly "how-to" text, *Computer Facial Animation* is an impressively comprehensive, 365-page textbook which is especially recommended for advanced students of graphics, mathematics, and programming." This new edition incorporates many of the new approaches to facial modeling and animation that have been developed over the last decade while refining and updating the essential content of the original book.

August 2008; ISBN 978-1-56881-333-2
Hardcover; approx. 400 pp.; $59.00

Data Visualization
NEW
Principles and Practice
TEXT

Alexandru Telea



This is an introductory textbook to the field of data visualization that allows readers to quickly start working with its techniques. Theory and algorithms for a wide range of visualization techniques and applications are presented, including engineering, medical, and mathematical applications. The book also includes practical examples in C++ and OpenGL.

2007; ISBN 978-1-56881-306-6 **Hardcover; 460 pp.; $64.00**

Essentials of Interactive Computer Graphics
NEW
TEXT
CD-ROM
Concepts and Implementation

Kelvin Sung, Peter Shirley, Steven Baer

This undergraduate computer graphics textbook provides students with conceptual and practical insights into how to approach building a majority of the interactive graphics applications they encounter daily. As each topic is introduced, students are guided in developing a software library that will support fast prototyping of moderately complex applications using a variety of APIs, including OpenGL and DirectX. An accompanying CD contains all of the code from the book.

April 2008; ISBN 978-1-56881-257-1
Hardcover; approx. 400 pp.; $69.00

Fluid Simulation
NEW

Robert Bridson

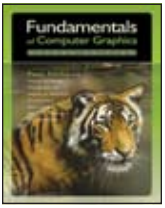
Animating fluids like water, smoke, and fire using physics-based simulation is increasingly important in visual effects, in particular in movies and in computer games. This book provides a practical introduction to fluid simulation for graphics. The focus of this book is on animating fully three-dimensional incompressible flow, from understanding the math and the algorithms to the actual implementation. Some advanced topics such as fire and explosions, adaptive grid methods, real-time-capable algorithms, together with the latest technology in hardware acceleration and non-Newtonian fluids like sand, will also be covered. Intuition and implementation details will be emphasized throughout.

June 2008; ISBN 978-1-56881-326-4
Hardcover; approx. 300 pp.; $59.00

Fundamentals of Computer Graphics
TEXT

SECOND EDITION

Peter Shirley et al.



The second edition of this widely adopted text includes a wealth of new material, with new chapters on Signal Processing (Stephen R. Marschner), Using graphics hardware (Peter Willemsen), Writing graphics applications (Kelvin Sung), Perception (William B. Thompson), Curves (Michael Gleicher), Animation (Michael Ashikhmin), and Tone reproduction (Erik Reinhard). Maintaining the strengths of the first edition, the authors present the mathematical foundations of computer graphics with a focus on geometric intuition, allowing the programmer to understand and apply those foundations to the development of efficient code.

2005; ISBN 978-1-56881-269-4 **Hardcover; 652 pp.; $84.00**

Geometric Data Structures for Computer Graphics

Elmar Langetepe, Gabriel Zachmann

This book provides practitioners in the computer graphics field with a working knowledge of widespread geometric data structures from computational geometry, including some theoretical background. The focus is on algorithms and data structures that have proven to be versatile, efficient, fundamental, and easy to implement. Thus, this book will be a valuable source of information for practitioners' daily work.

2005; ISBN 978-1-56881-235-9 **Hardcover; 369 pp.; $64.00**

Graphics and Visualization
NEW
TEXT
Principles & Algorithms

T. Theoharis, G. Papaioannou, N. Platis, N. Patrikalakis

With contributions by Philip Dutré and Ahmad Nasri

This book encompasses pervasive recent developments in visual computing in a unified approach that bridges established computer graphics and visualization principles and algorithms. All algorithm descriptions are given in a C-like pseudocode in order to make the book as generally applicable as possible.

February 2008; ISBN 978-1-56881-274-8
Hardcover; approx. 600 pp.; $79.00

Graphics Interface Proceedings 2008 NEW

Canadian Human-Computer Communications Society

Edited by Christopher Healey, Edward Lank

Graphics Interface Proceedings is a collection of the papers presented at the annual gathering of the Canadian Human-Computer Communications Society. It is the oldest regularly-scheduled computer graphics and human-computer interaction conference; the first conference was held in 1969.

June 2008; ISBN 978-1-56881-423-0 Paperback; 250 pp.; $70.00

Earlier proceedings available at www.akpeters.com.

Graphics Shaders NEW TEXT

Theory and Practice

Mike Bailey, Steve Cunningham

Shaders are the next hot thing in computer graphics. Knowing how to program graphics shaders will be a required skill in many areas including art, animation, gaming, and visualization. This textbook covers the theory and use of shader programming, using examples in OpenGL and OpenGL Shading Language (GLSL).

August 2008; ISBN 978-1-56881-334-9
Hardcover; approx. 400 pp.; $59.00

Haptic Rendering NEW

Foundations, Algorithms, and Applications

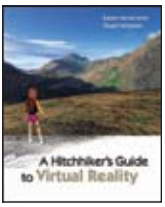
Ming Lin, Miguel Otaduy

Haptic interfaces provide an effective augmentation to graphical display and improve the level of presence in a virtual environment, by exploiting the sense of touch. This book provides an authoritative overview of state-of-the-art haptic-rendering algorithms and their applications. It also covers the psychophysics of haptic rendering,haptic-device design methodologies, force-feedback control and stability analysis, tactile sensing and rendering, and many other system-integration issues. In addition, the book examines different approaches and techniques for designing touch-enabled interfaces for several applications, including medical training, model design and maintainability analysis for virtual prototyping, scientific visualization, and creative processes.

March 2008; ISBN 978-1-56881-332-5
Hardcover; approx 400 pp.; $64.00

A Hitchhiker's Guide to Virtual Reality NEW TEXT CD-ROM

Karen McMenemy, Stuart Ferguson



This book is a two-part guide to the science, technology, mathematics, and practical implementation of virtual reality. Part 1 contains an explanation of what VR is (and what it is not!) and what lies inside the hardware components of a VR system. It also details the theory of many technically challenging aspects of VR in a very coherent manner. These include stereoscopy, computer vision, image-based rendering and inverse kinematics, all of which are central to creating an immersive and interactive VR system. Part 2 of the book concentrates on the actual implementation of a practical VR system. The accompanying CD provides over 30 projects and associated software programs that can be used to implement many aspects of a VR system.

2007; ISBN 978-1-56881-303-5 Paperback; 604 pp.; $79.00

Polygon Mesh Processing NEW

Mario Botsch, Mark Pauly, Leif Kobbelt, Pierre Alliez, Bruno Levy

Polygonal meshes are widely used in computer graphics, geometry processing, and numerical simulation. Besides classical geometric modeling, other major areas frequently employing polygonal meshes are computer games and movie production. This book describes the geometry processing pipeline based on polygonal meshes. The first chapters analyze different surface representations and motivate the discussion about the use of polygonal meshes, followed by mesh generation and mesh repair. Different quality metrics for irregular meshes, with respect to either geometric smoothness or element shapes, are employed for the analysis and optimization of meshes, leading to mesh smoothing, simplification, or general re-meshing. Further topics are parametrization, segmentation, and interactive mesh deformation, complemented by a chapter on efficient solvers for the involved numerical problems. For each of the topics the fundamental concepts are introduced and current state-of-the-art techniques are discussed. In addition, the book is accompanied with source code for most of the topics, which can be used as programming exercises for mesh processing courses.

August 2008; ISBN 978-1-56881-426-1
Hardcover; approx. 250 pp.; $49.00

Practical Multi-Projector Display Design

NEW
CD-ROM

Aditi Majumder, Michael S. Brown

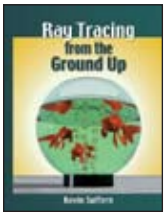
This book provides a thorough description of the state-of-the-art techniques for building affordable and flexible large-area multi-projector displays. The emphasis is on current solutions to the practical issues that must be addressed in large-area display deployment. In addition, the role of multi-projector techniques to other projector-camera based large-scale visualization, virtual reality, computer graphics and vision applications will be discussed.

2007; ISBN 978-1-56881-310-3 **Hardcover; 350 pp.; $69.00**

Ray Tracing from the Ground Up

NEW
TEXT
CD-ROM

Kevin Suffern



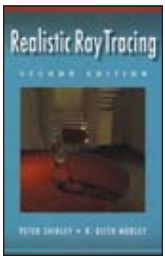
Ray tracing is the most flexible rendering technique because of its unrivaled ability to simulate optical effects. This book takes readers through the whole process of building a modern ray tracer from scratch in C++. All concepts and processes are explained in detail with the aid of hundreds of diagrams, ray traced images, and sample code. The book is self contained as far as graphics is concerned. It's suitable for undergraduate and graduate computer graphics courses and individual programmers who would like to learn ray tracing. The accompanying CD contains a simple ray tracer to get readers started, sample code, and ray traced images with C++ code for constructing each scene.

2007; ISBN 978-1-56881-272-4 **Hardcover; 745 pp.; $84.00**

Realistic Ray Tracing

SECOND EDITION

Peter Shirley, R. Keith Morley



Concentrating on the "nuts and bolts" of writing ray tracing programs, this new and revised edition emphasizes practical and implementation issues and takes the reader through all the details needed to write a modern rendering system. Most importantly, the book adds many C++ code segments and other details to provide the reader with a better intuitive understanding of ray tracing algorithms.

2003; ISBN 978-1-56881-198-7 **Hardcover; 235 pp.; $49.00**

Real-Time Rendering

NEW

THIRD EDITION

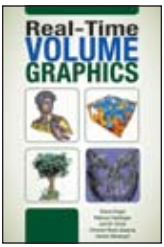
Tomas Akenine-Möller, Eric Haines, Naty Hoffman

This is a thoroughly revised, full-color new edition of *Real-Time Rendering*, focusing on new possibilities allowed by the modern programmable GPU. As the programming interfaces for the GPU are evolving rapidly, the book is now aimed more towards explaining algorithms, rather than discussing particular language constructs. New research has been added to every chapter. New hardware architectures are covered, such as Xbox360 and Playstation 3, as well as new pipeline elements.

August 2008; ISBN 978-1-56881-424-7
Hardcover; approx. 900 pp.; $79.00

Real-Time Volume Graphics

Klaus Engel, Markus Hadwiger, Joe Kniss, Christof Rezk-Salama, Daniel Weiskopf



A comprehensive guide of real-time volume graphics programming using commodity graphics hardware, this book covers both scientific applications, such as medical visualization, and volumetric effects for visual arts and games. Readers will learn to leverage the power of modern graphics processing units (GPUs) and high-level shading languages to create interactive 3D volume rendering applications. Starting off with a thorough introduction to the theory of volumetric effects, all the different solutions for real-time implementations are explained in detail. These basic techniques are improved step-by-step throughout the book, expanding them with a variety of visual effects, including non-photorealistic draw styles, global illumination, and scattering. Special attention is paid to usability aspects, including transfer function design, interaction, modeling, and animation. Detailed code samples are provided in OpenGL and Cg shading language.

2006; ISBN 978-1-56881-266-3 **Hardcover; 515 pp.; $69.00**

Surface Modeling and Parameterization with Manifolds

NEW

Cindy Grimm

Manifolds are mathematical constructs that have not been broadly known in computer graphics and are often perceived as an impractical and complex abstraction. This book presents the basic definitions of manifold theory, demonstrates their computational nature and close connection to applications, and surveys a variety of computer graphics applications in which manifolds appear, with a focus on modeling of surfaces and functions on surfaces.

August 2008; ISBN 978-1-56881-328-8
Hardcover; approx. 400 pp.; $59.00

Spatial Augmented Reality
Merging Real and Virtual Worlds
Oliver Bimber, Ramesh Raskar

Novel approaches have taken augmented reality (AR) beyond traditional eye-worn or hand-held displays, enabling new application areas for museums, edutainment, research, industry, and the art community. This book discusses spatial augmented reality approaches that exploit large optical elements and video-projectors, as well as interactive rendering algorithms, calibration techniques, and display examples. It provides a comprehensive overview, detailed math, code fragments, and implementation instructions that enable interested readers to realize spatial AR displays by themselves.

2005; ISBN 978-1-56881-230-4 **Hardcover; 392 pp.; $64.00**

Video-Based Rendering
Marcus Magnor

This book provides an in-depth introduction to video-based rendering (VBR), the art of interactively rendering realistic views of real-world, dynamic scenes from multi-video recordings alone. State-of-the-art VBR algorithms, such as dynamic light field rendering, real-time visual hull reconstruction, space-time–coherent rendering, passive optical motion capture, and more, are comprehensively explained and compared, revealing the advantages and limitations of various VBR approaches.

2005; ISBN 978-1-56881-244-1 **Hardcover; 224 pp.; $49.00**

Andrew Glassner's Other Notebook
Further Recreations in Computer Graphics
Andrew Glassner

2002; ISBN 978-1-56881-171-0 **Paperback; 276 pp.; $49.00**

Cloth Modeling and Animation
Edited by Donald House, David Breen

2000; ISBN 978-1-56881-090-4 **Hardcover; 360 pp.; $59.00**

Curves and Surfaces in Geometric Design
Edited by Pierre-Jean Laurent, Alain Le Méhauté, Larry Schumaker

1994; ISBN 978-1-56881-039-3 **Hardcover; 490 pp.; $89.00**

The Essentials of CAGD **TEXT**
Gerald Farin, Dianne Hansford

2000; ISBN 978-1-56881-123-9 **Hardcover; 248 pp.; $54.00**

A Field Guide to Digital Color
Maureen Stone

2003; ISBN 978-1-56881-161-1 **Paperback; 250 pp.; $54.00**

Fundamentals of Computer Aided Geometric Design
Josef Hoschek, Dieter Lasser

1993; ISBN 978-1-56881-007-2 **Hardcover; 752 pp.; $92.00**

Geometric Concepts for Geometric Design
Wolfgang Boehm, Hartmut Prautzsch

1994; ISBN 978-1-56881-004-1 **Hardcover; 424 pp; $69.00**

Geometric Modeling with Splines
An Introduction
Elaine Cohen, Richard F. Riesenfeld, Gershon Elber

2001; ISBN 978-1-56881-137-6 **Hardcover; 638 pp. $69.00**

Graphics Tools
The jgt Editors' Choice
Edited by Ronen Barzel

2005; ISBN 978-1-56881-246-5 **Hardcover; 376 pp.; $59.00**

Metaprogramming GPUs with Sh
Michael McCool, Stefanus Du Toit

2004; ISBN 978-1-56881-229-8 **Paperback; 307 pp.; $49.00**

Morphs, Mallards, and Montages
Computer-Aided Imagination
Andrew Glassner
2004; ISBN 978-1-56881-231-1 **Paperback; 360 pp.; $54.00**

Multiprocessor Methods for Computer Graphics Rendering
Scott Whitman
1992; ISBN 978-0-86720-229-8 **Hardcover; 232 pp.; $65.00**

Non-Photorealistic Rendering
Bruce Gooch, Amy Gooch
2001; ISBN 978-1-56881-133-8 **Hardcover; 254 pp.; $44.00**

NURBS for Curve and Surface Design
From Projective Geometry to Practical Use
SECOND EDITION
Gerald Farin
1999; ISBN 978-1-56881-084-3 **Hardcover; 282 pp.; $59.00**

A Physical Approach to Color Image Understanding
Gudrun Klinker
1993; ISBN 978-1-56881-013-3 **Hardcover; 192 pp.; $54.00**

Physics-Based Vision: Principles and Practice
Three-Volume Set: $230.00

Radiometry, Vol. 1
Edited by Lawrence B. Wolff, Steven A. Shafer, Glenn E. Healey
1992; ISBN 978-0-86720-294-6 **Hardcover; 424 pp.; $94.00**

Color, Vol. 2
Edited by Steven A. Shafer, Glenn E. Healey, Lawrence B. Wolff
1992; ISBN 978-0-86720-295-6 **Hardcover; 432 pp.; $94.00**

Shape Recovery, Vol. 3
Edited by Lawrence B. Wolff, Steven A. Shafer, Glenn E. Healey
1992; ISBN 978-0-86720-296-0 **Hardcover; 544 pp.; $94.00**

Practical Algorithms for 3D Computer Graphics
TEXT
CD-ROM
R. Stuart Ferguson
2001; ISBN 978-1-56881-154-3 **Paperback; 552 pp.; $59.00**

Practical Parallel Rendering
Edited by Alan Chalmers, Erik Reinhard, Tim Davis
2002; ISBN 978-1-56881-179-6 **Hardcover; 384 pp.; $59.00**

Real-Time Shading
Marc Olano, John Hart, Wolfgang Heidrich, Michael McCool
2002; ISBN 978-1-56881-180-2 **Hardcover; 368 pp.; $59.00**

Realistic Image Synthesis Using Photon Mapping
TEXT
Henrik Wann Jensen
2001; ISBN 978-1-56881-147-5 **Hardcover; 193 pp.; $39.00**

Two- and Three-Dimensional Patterns of the Face
Peter W. Hallinan, Gaile Gordon, A. L. Yuille, Peter Giblin, David Mumford
1999; ISBN 978-1-56881-087-4 **Hardcover; 270 pp.; $59.00**

Wavelets, Images, and Surface Fitting
Edited by Pierre-Jean Laurent, Alain Le Méhauté, Larry Schumaker
1994; ISBN 978-1-56881-040-9 **Hardcover; 544 pp.; $94.00**

Eurographics

A K Peters is pleased to be the distributor of all Eurographics workshop proceedings. Titles published in 2007 are listed below. Details about earlier and forthcoming proceedings are available on our website.

Computational Aesthetics 2007

Edited by Douglas W. Cunningham, Gary Meyer, László Neumann, Alan Dunning, Raquel Paricio

2007; ISBN 978-1-56881-370-7 Paperback; 182 pp.; $59.00

Data Visualization 2007

Edited by Ken Museth, Torsten Möller, Anders Ynnerman

2007; ISBN 978-1-56881-362-2 Paperback; 297 pp.; $74.00

Geometry Processing 2007

Edited by Alexander Belyaev, Michael Garland

2007; ISBN 978-1-56881-365-3 Paperback; 350 pp.; $69.00

Graphics Hardware 2007

Edited by Mark Segal, Timio Aila

2007; ISBN 978-1-56881-369-1 Paperback; 120 pp.; $45.00

Natural Phenomena 2007

Edited by David Ebert, Stéphane Mérillou

2007; ISBN 978-1-56881-402-5 Paperback; 86 pp.; $30.00

Parallel Graphics and Visualization 2007

Edited by Jean M. Favre, Luis Paulo dos Santos, Dirk Reiners

2007; ISBN 978-1-56881-363-9
Paperback; 200 pp.; $39.00

Symposium on Point-Based Graphics 2007

Edited by Mario Botsch, Renato Pajarola

2007; ISBN 978-1-56881-366-0 Paperback; 143 pp.; $49.00

Rendering Techniques 2007

Edited by Jan Kautz, Sumanta Pattanaik

2007; ISBN 978-1-56881-364-6 Paperback; 450 pp.; $79.00

Sketch-Based Interfaces 2007

Edited by Michiel van de Panne, Eric Saund, Joaquim Jorge

2007; ISBN 978-1-56881-401-8 Paperback; 170 pp.; $49.00

Symposium on Computer Animation 2007

Edited by Dimitris Metaxas, Jovan Popović

2007; ISBN 978-1-56881-368-4 Paperback; 284 pp.; $59.00

VAST 2007

Edited by David Arnold, Franco Niccolucci, Alan Chalmers

2007; ISBN 978-1-56881-403-2 Paperback; 160 pp.; $45.00

Virtual Environments 2007

Edited by Bernd Fröhlich, Roland Blach, Robert van Liere

2007; ISBN 978-1-56881-400-1 Paperback; 120 pp.; $49.00

Volume Graphics 2007

Edited by Hans-Christian Hege, Raghu Machiraju

2007; ISBN 978-1-56881-367-7 Paperback; 106 pp.; $39.00

The Complete Guide to Torque X NEW

John Kanalakis

The Torque X game engine can help anyone create a game for the Xbox 360 console. Torque X provides a solid framework for creating games for Windows and the Xbox 360. In this book, you will learn the tools, the methodologies, and the source code that goes into making games with Torque X.

May 2008; ISBN 978-1-56881-421-6
Paperback; approx. 300 pp.; $45.00
A GARAGEGAMES BOOK

Digital Games Canon NEW

Deborah Todd

Industry veteran, Deborah Todd has interviewed game-industry experts and compiled a list of the 100 most important, influential, and groundbreaking video games. She covers the innovations each game brought and why each deserves to be known and understood by anyone wanting to grasp the history of video games.

August 2008; ISBN 978-1-56881-414-8
Paperback; approx. 250 pp. $45.00

Dungeons and Desktops NEW

The History of Computer Role-Playing Games

Matthew Barton

Dungeons and Desktops looks at the history of computer role-playing games (such as Ultima, The Bard's Tale, Pool of Radiance, Diablo, and The Elder Scrolls), and seeks to identify and wrestle with the genre's key issues. Should the player control a single character or a group of characters? Should the player create his own character(s)? How should the game translate abstract concepts like "experience" into numbers and statistics? Should a game "rail" the player into a coherent plot structure, or allow him to roam freely about the world? What will be the consequences of the player's actions; how does the game deal with good and evil? Which perspective is more immersive, first or third person? Throughout the years, developers have responded differently to these questions, and each game is a part of a more general conversation about how computers can serve as a medium for creative and engaging role-playing.

March 2008; ISBN 978-1-56881-411-7
Hardcover; approx. 250 pp.; $39.00

FPS to RTS NEW

A Game Writer's Guide to Genres

Edited by Wendy Despain

This book takes an in-depth look at the unique challenges game writers face when working on different genres of video games, from first-person shooters to real-time strategy games to role-playing games. It gives clear guidance on how to be successful in each genre and provides a specific look at best practices from the writing in recent games.

July 2008; ISBN 978-1-56881-417-9
Paperback; approx. 400 pp.; $49.00

Game Design TEXT

From Blue Sky to Green Light

Deborah Todd

This book takes a real-world, in-depth journey through the game design process, from the initial blue sky sessions to the decision and brainstorming phase, through character development and story wrap, to the creation of content and context outlines, flowcharting game play, creating design docs, and ultimately pitching for a green light. Special features include examples of both classic and contemporary games, plus interviews with many of the game industry's brightest professionals who share their insights on key elements in game design, and their analysis on what makes a game a blockbuster hit.

"We've seen several books that promise to take you inside game design. A few of them have been excellent, but none are better than Deborah Todd's *Game Design: From Blue Sky to Green Light*. This book has the powerful ring of truth that can only come from experience."

—*Read Only*, Barnes and Noble.com

2007; ISBN 978-1-56881-318-9 **Paperback; 304 pages; $45.00**

Creating Games NEW
Mechanics, Content, and Technology TEXT

Morgan McGuire, Odest Chadwicke Jenkins

This book is a comprehensive overview of the technology and mechanisms of game design. It emphasizes the broad view of a games team and teaches you enough about your teammates' areas so that you can work effectively with them. It includes many worksheets and exercises to help get your small indie team off the ground. By the end of the book, you'll have a game!

March 2008; ISBN 978-1-56881-305-9
Hardcover; approx. 300 pp.; $59.00

Game Engine Architecture NEW TEXT

Jason Gregory

This text provides readers with an in-depth exploration of 3D game engine architecture. The book covers state-of-the-art software architecture principles in the context of game engine design, investigates the subsystems typically found in a real production game engine, surveys engine architectures from actual shipping games, and explores how the differences between game genres can affect engine design. A course based on this text will give students the tools and background to work together like a real game development team to design and build their own functional game engine, both by designing and implementing engine subsystems and by integrating 3rd party components. Topics covered include large-scale C++ software architecture in a games context; engine subsystems including rendering, audio, collision, physics and game world models; multi-player engines; tools pipelines for modern games.

November 2008; ISBN 978-1-56881-413-1
Hardcover; approx. 600 pp.; $65.00

The Game Programmer's Guide to Torque

Under the Hood of the Torque Game Engine

Edward F. Maurina III **CD-ROM**

Powerful game engines drive the core technologies in modern 3D games. *The Game Programmer's Guide to Torque* takes readers on an in-depth walkthrough of the Torque Game Engine—one of the most popular, powerful, and easy to use game engines available today. With clear explanations of how to use Torque to create your own games and detailed discussions of the engine's inner workings, this book is a must read for any programmer interested in making games for fun or profit. Step-by-step examples, detailed system descriptions, in-depth references, and practical tips and tricks provide readers all they need to understand and develop advanced 3D games on their own terms.

2006; ISBN 978-1-56881-284-7 **Paperback; 600 pp. $64.00**

A GARAGEGAMES BOOK

Interactive Storytelling

Techniques for 21st Century Fiction

Andrew Glassner

We are on the verge of developing an exciting new kind of interactive story form that will involve audiences as active participants. This book provides a solid foundation in the fundamentals of classical story and game structure and explains why it has been surprisingly difficult to bring these two activities together. With this foundation in place, the book presents several ideas for ways to move forward in this appealing quest.

"The intersection of story and games will be one of the most influential creative impacts in the future of media. Andrew Glassner's book is the most comprehensive and in-depth reference I have seen that examines how both story and games can work in concert to create the future of storytelling." —Christopher Stapleton, Director of Entertainment Research, Institute for Simulation and Training

2004; ISBN 978-1-56881-221-2 **Paperback; 528 pp.; $39.00**

Level Design NEW

Concept, Theory, and Practice

Rudolf Kremers

This book is the first to use a conceptual and theoretical foundation to build a set of practical tools and techniques that can be universally applied within the field of level design. It is tied to no particular technology or genre, so it will be a useful reference for many years to come. It covers many concepts universal to level design, such as interactivity, world building, immersion, sensory perception, pace, and more, and it explains how to apply these concepts in practical ways, with many examples from real games.

May 2008; ISBN 978-1-56881-338-7
Hardcover; approx. 500 pp.; $59.00

Modeling and Simulation Design NEW

Philip Tavel

This introduction to modeling and simulation design has practical applications in the areas of military, academia, serious games, and more. It covers design, programming, and assessment of modeling and simulation technologies, highlighted with real-world examples. The author covers the economics of the modeling and simulation industry, including how and where to get a job.

December 2008; ISBN 978-1-56881-317-2
Hardcover; approx. 400 pp.; $59.00

Multiplayer Gaming and Engine Coding for the Torque Game Engine

NEW

Edward F. Maurina III

Take your Torque skills to the next level with *Multiplayer Gaming and Engine Coding for the Torque Game Engine*. This book leads both the journeyman and the apprentice on a tour of Torque's multiplayer game architecture through advanced scripting discussions and into the depths of the engine source code. Providing clear discussions, detailed references, and full coverage of game debugging and profiling, this book has everything that a Torque game programmer needs to make multiplayer games.

March 2008; ISBN 978-1-56881-422-3
Paperback; approx. 650 pp.; $69

A GARAGEGAMES BOOK

Professional Techniques for Video Game Writing

NEW

Edited by Wendy Despain

This book looks at the process of writing for video games, with chapters on topics such as how to break in to the business, how to work as a team, how to write for various demographics, how to write game documentation, how to write game manuals, and much more.

May 2008; ISBN 978-1-56881-416-2
Paperback; approx. 400 pp.; $49.00

Quests

NEW

Design, Theory, and History in Games and Narratives

TEXT

Jeffrey Howard

Quests are an integral part of many computer games. According to the author, "a quest is a journey across a symbolic, fantastic landscape in which a protagonist or player collects objects and talks to characters in order to overcome challenges and achieve a meaningful goal." For example, Mario is on a quest to save the princess in Super Mario Brothers. This unique take on quests brings together literary and New Media theorizations of the quest in a way that can allow designers to create better games. It shows how quests can be a bridge between seemingly opposed ideas, including game and narrative, gaming and literature, technology and mythology, and meaning and action. The book deals with both the theory and the practice of the four main aspects of quests: spaces, objects, actors and challenges. Each practical section contains accompanying exercises and suggestions useful for designing quests.

March 2008; ISBN 978-1-56881-347-9
Paperback; approx. 300 pp.; $45.00

Advanced Game Development with Programmable Graphics Hardware

TEXT

Alan Watt, Fabio Policarpo

CD-ROM

2005; ISBN 978-1-56881-240-3 **Hardcover; 384 pp.; $69.00**

Artificial Intelligence for Computer Games

An Introduction

TEXT

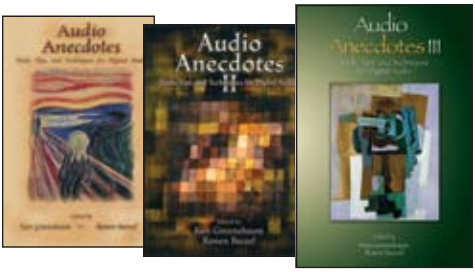
John David Funge

2004; ISBN 978-1-56881-208-3 **Hardcover; 200 pp.; $39.00**

AI for Games and Animation

John David Funge

1999; ISBN 978-1-56881-103-1 **Hardcover; 228 pp; $44.00**



Audio Anecdotes **CD-ROM**

Tools, Tips, and Techniques for Digital Audio

Edited by Ken Greenebaum, Ronen Barzel

2004; ISBN 978-1-56881-104-8 **Hardcover; 512 pp.; $79.00**

Audio Anecdotes II **CD-ROM**

Tools, Tips, and Techniques for Digital Audio

Edited by Ken Greenebaum, Ronen Barzel

2004; ISBN 978-1-56881-214-4 **Hardcover; 456 pp.; $79.00**

Audio Anecdotes III **NEW** **CD-ROM**

Tools, Tips, and Techniques for Digital Audio

Edited by Ken Greenebaum, Ronen Barzel

The third volume in this collection completes the coverage of current methods and techniques in digital audio. The three volumes form a comprehensive library for practitioners as well as researchers and developers who need interdisciplinary knowledge in the field of digital audio and its applications.

2007; ISBN 978-1-56881-215-1 **Hardcover; 504 pp.; $79.00**

Reconfiguring the Firewall **NEW**

Recruiting Women to Information Technology Across Cultures and Continents

Edited by Carol J. Burger, Elizabeth G. Creamer, Peggy S. Meszaros

This edited volume addresses the challenge of recruiting girls and women into majors and careers in information technology. This is explored across cultures and regions, and the studies are both illuminating and prescriptive for designing and implementing intervention programs. The cross-cultural aspect is emphasized, including studies in Europe, Africa, and Australia.

2007; ISBN 978-1-56881-314-1 **Hardcover; 288 pp.; $45.00**

Algebraic 3-D Modeling

Andreas Hartwig

1996; ISBN 978-1-56881-023-2 **Hardcover; 232 pp.; $69.00**

Algorithms and Complexity **TEXT**

SECOND EDITION

Herbert S. Wilf

2002; ISBN 978-1-56881-178-9 **Hardcover; 219 pp.; $49.00**

Augmented Reality

Placing Artificial Objects in Real Scenes

Edited by Reinhold Behringer, Gudrun Klinker, David Mizell

1999; ISBN 978-1-56881-098-0 **Hardcover; 256 pp.; $64.00**

Automating the Design of Computer Systems

William P. Birmingham, Anurag P. Gupta, Daniel P. Siewiorek

1992; ISBN 978-0-86720-241-0 **Hardcover; 296 pp.; $69.00**

Build Your Own Robot!

Karl Lunt

2000: ISBN 978-1-56881-102-4 **Paperback; 592 pp.; $49.00**

C# and Game Programming **CD-ROM**

A Beginner's Guide

SECOND EDITION

Salvatore Buono

2005; ISBN 978-1-56881-236-6 **Paperback; 492 pp.; $59.00**

Computer Algebra and Symbolic Computation **TEXT** **CD-ROM**

Elementary Algorithms

Joel S. Cohen

2002; ISBN 978-1-56881-158-1 **Hardcover; 323 pp.; $59.00**

Computer Algebra and Symbolic Computation **TEXT** **CD-ROM**

Mathematical Methods

Joel S. Cohen

2003; ISBN 978-1-56881-159-8 **Hardcover; 472 pp.; $69.00**

Computer Arithmetic Algorithms

SECOND EDITION

Israel Koren

2002; ISBN 978-1-56881-160-4 **Hardcover; 296 pp.; $59.00**

Developing Semantic Web Services **CD-ROM**
H. Peter Alesso, Craig F. Smith
2004; ISBN 978-1-56881-212-0 **Paperback; 464 pp.; $69.00**

Insight into Images
Principles and Practice for Segmentation, Registration, and Image Analysis
Edited by Terry S. Yoo
A WORK OF THE INSIGHT CONSORTIUM
2004; ISBN 978-1-56881-217-5 **Hardcover; 410 pp.; $69.00**

An Introduction to Scientific, Symbolic, and Graphical Computation
Eugene Fiume
1995; ISBN 978-1-56881-051-5 **Hardcover; 328 pp.; $59.00**

Introductory Lectures on Data-Parallel Computing
P. Takis Metaxas, editor/producer
1996; ISBN 978-1-56881-059-1 **CD; $54.00**

Languages for Developing User Interfaces
Edited by Brad A. Myers
1992; ISBN 978-0-86720-450-6 **Hardcover; 480 pp.; $79.00**

Mobile Robots **TEXT**
Inspiration to Implementation
SECOND EDITION
Joseph L. Jones, Anita M. Flynn, Bruce A. Seiger
1999; ISBN 978-1-56881-097-3 **Paperback; 486 pp.; $44.00**

The Most Complex Machine **TEXT**
A Survey of Computers and Computing
David J. Eck
2000; ISBN 978-1-56881-054-7 **Hardcover; 464 pp.; $39.00**

Real Sound Synthesis for Interactive Applications **CD-ROM**
Perry R. Cook
2002; ISBN 978-1-56881-168-0 **Paperback; 263 pp.; $49.00**

Reliable Computer Systems
Design and Evaluation
THIRD EDITION
Daniel P. Siewiorek, Robert S. Swarz
1998; ISBN 978-1-56881-092-8 **Hardcover; 908 pp.; $79.00**

Robot Teams
From Diversity to Polymorphism
Edited by Tucker Balch, Lynne E. Parker
2001; ISBN 978-1-56881-155-0 **Hardcover; 425 pp.; $59.00**

Sensors for Mobile Robots
H. R. Everett
Foreword by Rodney Brooks
1995; ISBN 978-1-56881-048-5 **Hardcover; 544 pp.; $79.00**

Service Robots
Rolf Dieter Schraft, Gernot Schmierer
2000; ISBN 978-1-56881-109-3 **Hardcover; 228 pp.; $53.00**

Symbolic Computation and Automated Reasoning
The CALCULEMUS-2000 Symposium
Edited by Manfred Kerber, Michael Kohlhase
2001; ISBN 978-1-56881-145-1 **Hardcover; 288 pp.; $66.00**

Games, Puzzles, and Computation NEW

Robert Hearn , Erik D. Demaine

Hearn writes about the deep connections between aspects of games and concepts of computation. He points out that various kinds of games seem to be in direct correspondence with particular models of computation. This has been pointed out before; Hearn's new contribution is a simple, uniform game framework (and model of computation) called Constraint Logic. With this, he has formulated new proofs of game "hardness."

July 2008; ISBN 978-1-56881-322-6
Hardcover; approx. 300 pp.; $45.00

Geometric Puzzle Design NEW

Stewart Coffin

This book, by one of the most original and versatile puzzle designers, discusses how to design "good" geometric puzzles: two-dimensional dissection puzzles, polyhedral dissections, and burrs. Challenges and thoughtful questions, as well as practical design and woodworking tips, are complemented by excursions into the history and philosophy of puzzle design and encourage the reader to build his own puzzles and experiment with his own designs.

2007; ISBN 978-1-56881-312-7 **Hardcover; 220 pp.; $39.00**

Homage to a Pied Puzzler NEW

Edited by Ed Pegg Jr, Alan Schoen, Tom Rodgers

This book contains a unique collection of articles in tribute to Martin Gardner, many of which are a result of presentations given at the 7th *Gathering for Gardner*, March 16–19, 2006. The contributing authors are preeminent puzzle designers, magicians, and mathematicians who have been inspired by the writings and work of Martin Gardner.

May 2008; ISBN 978-1-56881-315-8
Hardcover; approx. 300 pp.; $38.00

Legacy of the Luoshu NEW

The 4000 Year Search for the Meaning of the Magic Square of Order Three

Frank Swetz

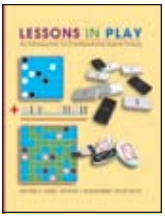
A magic square is an arrangement of numbers where the rows, columns, and two main diagonals add up to the same number. One of the most important squares, the Luoshu, has been studied and revered for its magical properties for centuries. Even today, the Luoshu is key to feng shui, cosmology, the occult, numerology, and mathematical puzzles. This historical examination of the natural magic square of order Three, or Luoshu, covers the origins and uses of the square in both cultural and mathematical contexts, and explores ritual and metaphysical associations.

June 2008; ISBN 978-1-56881-427-8
Paperback; 228 pp, $35.00

Lessons in Play NEW TEXT

An Introduction to Combinatorial Game Theory

Michael H. Albert, Richard Nowakowski, David Wolfe



Lessons in Play is the authoritative textbook on combinatorial game theory. As the perfect complement to *Winning Ways,* it is a formal, yet playful, introduction to the subject and covers the core concepts needed to understand and play combinatorial games. Classic techniques are introduced and applied in novel ways to analyze both old and new games, several appearing for the first time in this book. This book makes an excellent guide for undergraduates or for self-study by the enterprising reader, with a generous collection of exercises and problems scattered throughout the book.

2007; ISBN 978-1-56881-277-9 **Hardcover; 304 pp.; $49.00**

A Lifetime of Puzzles NEW

A Collection of Puzzles in Honor of Martin Gardner's 90th Birthday

Edited by Erik D. Demaine, Martin L. Demaine, Tom Rodgers

Martin Gardner has entertained the world with his puzzles for decades and inspired countless mathematicians and scientists. As he rounds out another decade, his colleagues are paying him tribute with this special collection that contains contributions from some of the most respected puzzlemasters, magicians and mathematicians.

May 2008; ISBN 978-1-56881-245-8
Hardcover; approx. 350 pp.; $39.00

Marvelous Modular Origami NEW

Meenakshi Mukerji

Prompted by hundreds of requests posted to the author's website, *Meenakshi's Modular Mania* (www.origamee.net), the author gathers in this book modular-unit folding diagrams and instructions for building over 30 models as well as photographs of finished models. The author provides origami basics for beginners as well as folding tips and information about polyhedra. The book's appendix offers additional information about mathematical aspects of modular origami and origami in general.

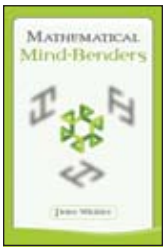
2007; ISBN 978-1-56881-316-5 **Paperback; 92 pp.; $14.95**

Mathematical Puzzles
A Connoisseur's Collection
Peter Winkler

"Winkler's book is a treasure chest filled with a fascinating collection of gems!" —Elwyn R. Berlekamp, Coauthor of *Winning Ways for Your Mathematical Plays*

2004; ISBN 978-1-56881-201-4
Paperback; 180 pp. $18.95

Mathematical Mind-Benders NEW
Peter Winkler



Peter Winkler is at it again. Following the enthusiastic reaction to *Mathematical Puzzles: A Connoisseur's Collection*, Peter has compiled a new collection of elegant mathematical puzzles to challenge and entertain the reader. The original puzzle connoisseur shares these puzzles, old and new, so that you can add them to your own anthology. This book is for lovers of mathematics, lovers of puzzles, lovers of a challenge. Most of all, it is for those who think that the world of mathematics is orderly, logical, and intuitive—and are ready to learn otherwise!

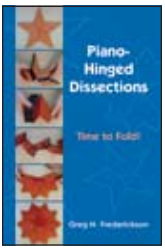
2007; ISBN 978-1-56881-336-3 **Paperback; 160 pp.; $18.95**

Origami Design Secrets
Mathematical Methods for an Ancient Art
Robert J. Lang

Robert Lang, one of the world's foremost origami artists and scientists, presents the never-before-described mathematical and geometric principles that allow anyone to design original origami, something once restricted to an elite few. Existing origami aficionados will find previously unpublished models such as the "Black Forest Cuckoo Clock." Origami novices will appreciate the organization of the book, which begins with easy techniques and progresses with straightforward algorithms for intuitive, concrete examples like rivers, packing of circles, and assembly of tiles. An appendix includes the advanced mathematical concepts. From the theoretical underpinnings to detailed step-by-step folding sequences, this book takes a modern look at the heart of the centuries-old art of origami.

2003; ISBN 978-1-56881-194-9 **Paperback; 594 pp.; $49.00**

Piano-Hinged Dissections NEW CD-ROM
Time to Fold!
Greg N. Frederickson



A piano hinge is a long, narrow hinge that runs the full length of the joint—like the top of a piano—so that one piece flaps on top of or under the other piece. This mechanism can be simulated by folding a piece of paper, so you can test and experiment with piano-hinged dissections without needing special materials: just paper and scissors—and some intuition and creativity! The author provides over 100 dissections and outlines methods for discovering them. The videos on the CD provide demonstrations for creating your own dissections.

2006; ISBN 978-1-56881-299-1 **Hardcover; 320 pp.; $49.00**

The Simple Book of Not-So-Simple Puzzles NEW
Serhiy Grabarchuk, Peter Grabarchuk, Serhiy Grabarchuk, Jr.

This collection of more than 108 brand-new, modern, and highly sophisticated puzzles, presents mini-puzzles that require deductive reasoning and "outside of the box" thinking. Many different kinds of puzzles are represented, including: assembling, math, logical, visual, spatial, number, word, dissection, dividing, dot-connecting, matchstick, coin, and more. Each puzzle is presented in a visually appealing form, and is designed so as to improve problem solving skills, to train geometric, combinatorial, and spatial imagination, visual perception, logical reasoning, manipulative abilities, and to develop problem solving skills, perseverance and self-confidence. All puzzles are provided with solutions presented in clear ways, sometimes with some further explanations and diagrams. All challenges are designed, solved and illustrated by the authors.

February 2008; ISBN 978-1-56881-418-6
Paperback; approx. 100 pp.; $19.00

Twists, Tilings, and Tessellations NEW
Robert J. Lang

While traditional origami focused on representations of nature, modern origami artists have used the principles of origami to create an astonishing variety of geometric shapes incorporating periodic folded patterns reminiscent of Moorish tilings, elaborate twisted forms, and curved and three-dimensional shapes. This book explores both the mathematics and the artistry of this new form of origami, ranging from the underlying principles to detailed folding instructions and numerous photographs.

September 2008; ISBN 978-1-56881-232-8
Paperback; approx. 500 pp.; $60.00

Winning Ways for Your Mathematical Plays

SECOND EDITION

Elwyn R. Berlekamp, John H. Conway, Richard K. Guy

In the quarter of a century since three mathematicians and game theorists collaborated to create *Winning Ways for Your Mathematical Plays*, the book has become the definitive work on the subject of mathematical games. Now carefully revised and broken down into four volumes to accommodate new developments, the Second Edition retains the original's wealth of wit and wisdom. The authors' insightful strategies, blended with their witty and irreverent style, make reading a profitable pleasure.

Volume 1

2001; 978-ISBN 1-56881-130-7 **Paperback; 296 pp.; $54.00**

Volume 2

2003; ISBN 978-1-56881-142-0 **Paperback; 212 pp.; $43.00**

Volume 3

2003; ISBN 978-1-56881-143-7 **Paperback; 362 pp.; $54.00**

Volume 4

2004; ISBN 978-1-56881-144-4 **Paperback; 224 pp.; $43.00**

Connection Games

Variations on a Theme

Cameron Browne

2005; ISBN 978-1-56881-224-3 **Paperback; 416 pp.; $59.00**

The Dots-and-Boxes Game

Sophisticated Child's Play

Elwyn Berlekamp

2000; ISBN 978-1-56881-129-1 **Paperback; 144 pp.; $19.95**

A Gardner's Workout

Training the Mind and Entertaining the Spirit

Martin Gardner

2001; ISBN 978-1-56881-120-8 **Hardcover; 330 pp.; $39.00**

Hex Strategy

Making the Right Connections

Cameron Browne

2000; ISBN 978-1-56881-117-8 **Paperback; 384 pp.; $49.00**

Luck, Logic, and White Lies

The Mathematics of Games

Jörg Bewersdorff

2005; ISBN 978-1-56881-210-6 **Paperback; 504 pp.; $59.00**

The Mathemagician and Pied Puzzler

Edited by Elwyn Berlekamp, Tom Rodgers

1999; ISBN 978-1-56881-075-1 **Hardcover; 266 pp.; $35.00**

Mathematical Go

Chilling Gets the Last Point

Elwyn Berlekamp, David Wolfe

1994; ISBN 978-1-56881-032-4 **Hardcover; 256 pp.; $44.00**

On Numbers and Games

SECOND EDITION

John H. Conway

2001; ISBN 978-1-56881-127-7 **Hardcover; 256 pp.; $49.00**

Puzzlers' Tribute

A Feast for the Mind

Edited by David Wolfe, Tom Rodgers

2002; ISBN 978-1-56881-121-5 **Hardcover; 436 pp. $39.00**

Puzzles 101

A Puzzlemaster's Challenge

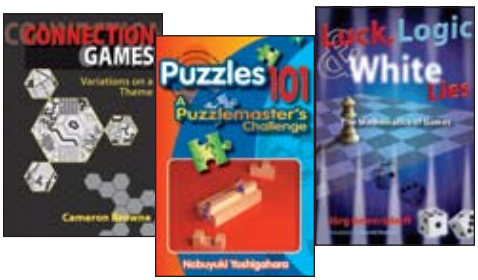
Nob Yoshigahara

2004; ISBN 978-1-56881-206-9 **Paperback; 125 pp.; $15.00**

Tribute to a Mathemagician

Edited by Barry Cipra, Erik Demaine, Martin Demaine, Tom Rodgers

2004; ISBN 978-1-56881-204-5 **Hardcover; 350 pp.; $39.00**



Algebraic Combinatorics and Coinvariant Spaces

NEW
TEXT

François Bergeron

CMS TREATISES IN MATHEMATICS

This book is an introduction to algebraic combinatorics, the goal of which is to study various deep interactions between combinatorics, representation theory, algebraic geometry, and other classical subfields of algebra. The focus is on the study of interesting n!-dimensional spaces of polynomials that naturally appear in all of these contexts. The prerequisites have been kept to a minimum, but basic linear algebra and undergraduate group theory are required. This text is intended for beginning graduate students as well as for researchers in other fields.

May 2008; ISBN 978-1-56881-324-0
Hardcover; approx. 200 pp.; $35.00

Applied Iterative Methods

NEW

Charles L. Byrne

Applied Iterative Methods provides a comprehensive overview of the design and implementation of these algorithms, from their underlying mathematics to their implementation in real-world applications. Many of the algorithms in the book are presented here together for the first time. The mathematical treatment is self-contained and accessible to researchers in many different fields. Starting from the basics of finite-dimensional vector spaces, the book describes a variety of fundamental algorithms and then further develops them in the course of studying stability, optimization, convex sets, and other important features.

2007; ISBN 978-1-56881-342-4 **Hardcover; 396 pp.; $79.00**

Communicating Mathematics in the Digital Era

NEW

Jonathan Borwein, Eugénio A. M. Rocha, José Francisco Rodrigues

While not a traditional proceedings, this book includes many of the contributions delivered and discussed at the ICM 2006 satellite meeting entitled "Communicating Mathematics in the Digital Era" (CMDE2006), which took place at the University of Aveiro in Portugal, August 15-18, 2006. The ideas presented at this conference offered new paradigms/mechanisms for producing, searching and exploiting scientific and technical scholarship in mathematics.

May 2008; ISBN 978-1-56881-410-0
Hardcover; approx. 300 pp.; $49.00

Computational Aspects of Polynomial Identities

Alexei Kanel-Belov, Louis Halle Rowen

RESEARCH NOTES IN MATHEMATICS

Polynomial Identities are used to study the properties of algebras through polynomial conditions. Starting from simple properties such as commutativity a beautiful theory has evolved that studies algebras through the set of all their identities or classes of algebras satisfying a given set of identities. The goal of this book is to expose the more mature aspects of PI-theory to the general mathematical community, covering the important advances in the past 20 years.

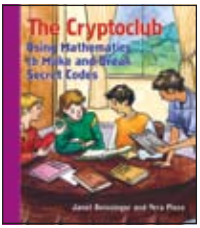
2005; ISBN 978-1-56881-163-5 **Hardcover; 400 pp.; $79.00**

The Cryptoclub

TEXT

Using Mathematics to Make and Break Secret Codes

Janet Beissinger, Vera Pless



Join the Cryptokids as they apply basic mathematics to make and break secret codes. This book has many hands-on activities that have been tested in both classrooms and informal settings. Ciphers include classic ciphers such as Caesar, substitution, Vigenère, and multiplicative, as well as the modern RSA. Math topics include addition and subtraction with negative numbers, decimals, and percent; factorization; modular arithmetic; exponentiation; prime numbers; and frequency analysis.

2006; ISBN 978-1-56881-223-6 **Paperback; 215 pp.; $35.00**

The Cryptoclub Workbook

Using Mathematics to Make and Break Secret Codes

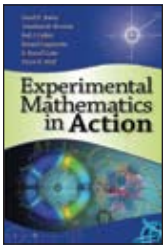
Janet Beissinger, Vera Pless

This workbook provides students with problems related to each section in the book to help them master the concepts introduced throughout the book.

2006; ISBN 978-1-56881-298-4 **Paperback; 80 pp.; $14.00**

Experimental Mathematics in Action NEW

David H. Bailey, Jonathan M. Borwein, Neil Calkin, Roland Girgensohn, Russell Luke, Victor Moll

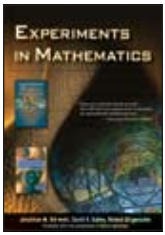


The emerging field of experimental mathematics has expanded to encompass a wide range of studies, all unified by the aggressive utilization of modern computer technology in mathematical research. This volume presents a number of case studies of experimental mathematics in action, together with some high-level perspectives, all written by leading researchers in the field. Specific studies addressed in the book include: (1) analytic evaluation of integrals by means of symbolic and numeric computing techniques, (2) evaluation of Apery-like summations, (3) finding dependencies among high-dimension vectors (with applications to factoring large integers), (4) inverse scattering (reconstruction of physical objects based on electromagnetic or acoustic scattering), and (5) investigation of continuous but nowhere differentiable functions. In addition to these case studies, the book includes some background on the computational techniques used in these analyses.

2007; ISBN 978-1-56881-271-7 **Hardcover; 337 pp.; $49.00**

Experiments in Mathematics CD CD-ROM

Jonathan M. Borwein, David H. Bailey, Roland Girgensohn



In the short time since the first edition of *Mathematics by Experiment: Plausible Reasoning in the 21st Century* and *Experimentation in Mathematics: Computational Paths to Discovery*, there has been a noticeable upsurge in interest in using computers to do real mathematics. The authors have updated and enhanced the book files and have now made them available in PDF format on a CD-ROM. The CD includes several "smart" enhancements, including: hyperlinks for all numbered equations; hyperlinks for all Internet URLs; hyperlinks for bibliographic references; an enhanced search facility, which assists one with a search for a particular mathematical formula or expression. These enhancements will significantly improve the usability of these files and the CD-ROM itself will enhance the reader's experience.

2005; ISBN 978-1-56881-283-0 **CD-ROM; $49.00**

Factorization NEW
Unique and Otherwise TEXT

Steven H. Weintraub

CMS TREATISES IN MATHEMATICS

The concept of factorization, familiar in the ordinary system of whole numbers that can be written as a unique product of prime numbers, plays a central role in modern mathematics and its applications. This exposition of the classic theory leads the reader to an understanding of the current knowledge of the subject and its connections to other mathematical concepts, for example in algebraic number theory. The book can be used as a text for a first course in number theory or for self-study by motivated high school students or readers interested in modern mathematics.

April 2008; ISBN 978-1-56881-241-0
Hardcover; approx. 250 pp.; $39.00

generatingfunctionology

THIRD EDITION

Herbert S. Wilf

Generating functions are one of the most important tools in combinatorics, and they have application to large numbers of counting problems. This book, in the words of Richard Stanley's review, "is the first book suitable for undergraduates to be devoted exclusively to this topic. It performs an admirable job of conveying the essential features of generating functions.".

2006; ISBN 978-1-56881-279-3 **Hardcover; 192 pp.; $43.00**

How Mathematics Works, Really NEW
From Experiment to Proof

Jonathan Borwein, Keith Devlin

A book for math buffs (but not necessarily mathematicians) that describes how modern mathematics works: from performing experiments, to formulating conjectures, and finally (though not always) to laying out an "official" proof. The "hidden" focus will be on explaining experimental mathematics to a general audience, or how computers are used in mathematics in general. There will be activities that provide an opportunity for the interested reader to try his hand at experimental mathematics.

November 2008; ISBN 978-1-56881-343-1
Hardcover; approx. 200 pp.; $30.00

Origami[4] NEW

Edited by Robert J. Lang

Select proceedings from the *Fourth International Conference on Origami in Science, Mathematics, and Education* (4OSME), held September 8–10, 2006, in Pasadena, CA (sponsored by OrigamiUSA, in collaboration with the California Institute of Technology). The conference has been held approximately once every five years (since the first one in 1989), and it focuses on the mathematics of origami and applications of origami in the sciences.

June 2008; ISBN 978-1-56881-346-2
Paperback; approx. 400 pp.; $59.00

Project Origami
Activities for Exploring Mathematics
Thomas Hull

The art and technique of origami provides a surprising range of tools for explaining complicated mathematical concepts. Based on years of experience, the author has created an entertaining workbook that can be used in a variety of mathematics classes to visualize the solutions to mathematical problems. Using origami, learn about: Dividing a Length into Equal Nths: Fujimoto Approximation • Solving Cubic Equations • Buckyballs and PHiZZ Units • Impossible Crease Patterns • Gaussian Curvature • Designing your own origami folding patterns, and much more!

2006; ISBN 1-56881-258-8 **Paperback; 272 pp.; $30.00**

Real Analysis
NEW
TEXT
Paul Zorn

Elementary real analysis is often the "bridge" course for math majors from more routine and calculation-based mathematics to more theoretical and concept-based mathematics, which include rigorous proofs and definitions and more complex mathematical language. The author, drawing from 20 years of experience teaching the course, aims to distinguish his book from other analysis texts by addressing what he sees as errors in their teaching methods: (1) he won't assume knowledge or sophistication that he feels other analysis books do unfairly; (2) he will explicitly address the language of mathematical logic and proof formalities (mastering technical language is often a hurdle for students); (3) he will provide a variety of exercises, including open-ended questions; (4) he includes Mathematica and/or Maple tools for computer-aided experimentation. Hints and solutions for selected exercises will also be included.

December 2008; ISBN 978-1-56881-415-5
Hardcover; approx. 300 pp.; $49.00

Scientific Computing and Visualization
NEW
TEXT
Gerald Farin, Dianne Hansford

This textbook is not a traditional introduction to the mathematics of scientific computation. Instead, it describes the principles behind the major methods, from statistics, applied mathematics, scientific visualization, and elsewhere, in a way that is accessible to a large part of the scientific community. Many examples using *Mathematica* are included in favor of any proofs, but not only those examples that actually work—it is often more important to understand and learn from failed attempts than from successful ones. A companion website includes all illustrations and code from the book, as well as a complete set of classroom presentations.

May 2008; ISBN 978-1-56881-321-9
Hardcover; approx. 300 pp.; $59.00

Semigroups for Delay Equations
András Bátkai, Susanna Piazzera
RESEARCH NOTES IN MATHEMATICS

The authors provide an overview of semigroup theory, including recent new results, discuss abstract delay equations and the solutions of delay equations from semigroups, study the qualitative behavior of the solutions, and finish with second order Cauchy problems. Topics addressed include Banach spaces, Cauchy problems, and properties such as well-posedness, regularity, and asymptotic almost periodicity.

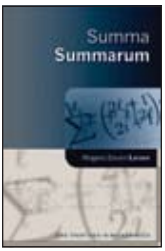
2005; ISBN 978-1-56881-243-4 **Hardcover; 272 pp.; $59.00**

Signal Processing
TEXT
A Mathematical Approach
Charles L. Byrne

This book provides the necessary mathematical background to understand and employ signal processing techniques in an applied environment. The author addresses Fourier series and transforms in one and several variables, applications to acoustic and electromagnetic propagation models, transmission and emission tomography and image reconstruction, optimization techniques, high resolution methods, and more. The book will serve as a reference for professors and graduate students in applied mathematics and electrical engineering and can be used as a text for some undergraduate mathematics and physics courses.

2005; ISBN 978-1-56881-242-7 **Hardcover; 397 pp.; $79.00**

Summa Summarum
NEW
Mogens Esrom Larsen
CMS TREATISES IN MATHEMATICS



Every mathematician needs to know how to manipulate sums or to find and handle combinatorial identities. So do many other users of mathematics. In this book, the author provides a coherent tour of many known finite algebraic sums and offers a guide for devising simple ways of changing a given sum to a standard form that can be evaluated. *Summa Summarum* serves as both an introduction and a reference for researchers, graduates, upper-level undergraduate students, and non-specialists: from tools as distinct as the most classical ideas of Euler to the recent effective computer algorithms by Gosper and Wilf-Zeilberger. The book is self-contained with relatively few prerequisites and is accessible to a very broad readership.

2007; ISBN 978-1-56881-323-3 **Hardcover; 240 pp.; $49.00**

The Symmetries of Things NEW

John H. Conway, Heidi Burgiel, Chaim Goodman-Strauss

The authors detail the various types of symmetries that appear in art and geometric patterns (in two and three dimensions) and present a standard notation for describing those symmetries. The notation leads to mathematical operations and theorems involving symmetries. The book is full of colorful illustrations demonstrating the various types of symmetries.

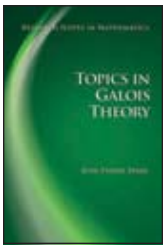
February 2008; ISBN 978-1-56881-220-5
Hardcover; approx. 450 pp.; $65.00

Topics in Galois Theory NEW

SECOND EDITION

Jean-Pierre Serre

RESEARCH NOTES IN MATHEMATICS



These notes are based on Topics in Galois Theory, a course given by the author at Harvard University in the fall semester of 1988 and written down by Henri Darmon. The course focused on the inverse problem of Galois Theory: the construction of field extensions having a given finite group as Galois group. While proofs are not carried out in full detail, the book contains a number of examples, exercises, and open problems. In the first part, classical methods and results, such as the Scholz and Reichardt construction for p-groups, $p \neq 2$, as well as Hilbert's irreducibility theorem and the large sieve inequality, are presented. The second part is devoted to rationality and rigidity criteria and their application in realizing certain groups as Galois groups of regular extensions of Q(T).

2007; ISBN 978-1-56881-412-4 **Hardcover; 120 pp.; $39.00**

A = B

Marko Petkovsek, Herbert Wilf, Doron Zeilberger

Foreword by Donald E. Knuth

1996; ISBN 978-1-56881-063-8 **Hardcover; 224 pp.; $49.00**

Abelian I-adic Representations and Elliptic Curves

Jean-Pierre Serre

RESEARCH NOTES IN MATHEMATICS

1998; ISBN 978-1-56881-077-5 **Hardcover; 208 pp.; $44.00**

Adapted Wavelet Analysis from Theory to Software

Mladen Victor Wickerhauser

1994; ISBN 978-1-56881-041-6 **Hardcover; 504 pp.; $79.00**

Algebra: Groups, Rings, and Fields TEXT

Louis Rowen

1995; ISBN 978-1-56881-028-7 **Hardcover; 264 pp.; $69.00**

Algebraic Number Theory and Fermat's Last Theorem TEXT

THIRD EDITION

Ian Stewart, David Tall

2002; ISBN 978-1-56881-119-2 **Hardcover; 336 pp.; $49.00**

Asymptotics and Special Functions

Frank Olver

1997; ISBN 978-1-56881-069-0 **Hardcover; 592 pp.; $86.00**

The Atiyah-Patodi-Singer Index Theorem

Richard Melrose

RESEARCH NOTES IN MATHEMATICS

1993; ISBN 978-1-56881-002-7 **Hardcover; 392 pp.; $75.00**

Cake Cutting Algorithms

Be Fair if You Can

Jack Robertson, William Webb

1998; ISBN 978-1-56881-076-8 **Hardcover; 177 pp.; $42.00**

Calculus Lite TEXT

THIRD EDITION

Frank Morgan

2001; ISBN 978-1-56881-157-4 **Paperback; 320 pp.; $49.00**

Differential Algebras in Topology

David Anick

RESEARCH NOTES IN MATHEMATICS

1993; ISBN 978-1-56881-001-0 **Hardcover; 304 pp.; $75.00**

Discrete Algorithmic Mathematics TEXT

THIRD EDITION

Stephen B Maurer, Anthony Ralston

2004; ISBN 978-1-56881-166-6 **Hardcover; 600 pp.; $88.00**

Complete Solutions for Discrete Algorithmic Mathematics

Stephen B Maurer, Anthony Ralston, Laurel Evans, Hal Pomeranz, Gil Rosenberg, Brian D. Taylor

Available to instructors with text adoptions.

Selected Solutions for Discrete Algorithmic Mathematics

Stephen B Maurer, Anthony Ralston, Laurel Evans, Hal Pomeranz, Gil Rosenberg, Brian D. Taylor

This manual contains solutions to all problems from *Discrete Algorithmic Mathematics* whose labels are printed in color. The manual is intended for use by students.

2005; ISBN 978-1-56881-255-7 **Paperback; 236 pp.; $30.00**

Discrete Iterated Function Systems
Mario Peruggia
1993; ISBN 978-1-56881-015-7 Hardcover; 200 pp.; $54.00

Drawbridge Up
Mathematics—A Cultural Anathema
Hans Magnus Enzensberger
2001; ISBN 978-1-56881-156-7 Hardcover; 48 pp.; $11.00

Elementary Probability with Applications
Larry Rabinowitz **TEXT**
2004; ISBN 978-1-56881-222-9 Hardcover; 208 pp.; $39.00

Elliptic and Parabolic Methods in Geometry
Edited by Ben Chow, Robert Gulliver, Silvio Levy, John Sullivan
1996; ISBN 978-1-56881-064-5 Hardcover; 216 pp.; $64.00

Erdős on Graphs
His Legacy of Unsolved Problems
Fan Chung, Ron Graham
1998; ISBN 978-1-56881-079-9 Hardcover; 142 pp.; $39.00

Excursions into Mathematics
The Millennium Edition
Anatole Beck, Michael N. Bleicher, Donald W. Crowe
2000; ISBN 978-1-56881-115-4 Paperback; 528 pp.; $49.00

Experimentation in Mathematics
Computational Paths to Discovery
Jonathan Borwein, David Bailey, Roland Girgensohn
2004; ISBN 978-1-56881-136-9 Hardcover; 368 pp.; $59.00

Free Resolutions in Commutative Algebra and Algebraic Geometry
Edited by David Eisenbud, Craig Huneke
RESEARCH NOTES IN MATHEMATICS
1992; ISBN 978-0-86720-285-4 Paperback; 160 pp.; $43.00

Fundamental Groups and Covering Spaces
Elon Lages Lima **TEXT**
2003; ISBN 978-1-56881-131-4 Hardcover; 214 pp.; $54.00

Fundamentals of Abstract Analysis
Andrew Gleason
1991; ISBN 978-0-86720-209-0 Hardcover; 416 pp.; $79.00

The Geometry of Kerr Black Holes
Barrett O'Neill
1995; ISBN 978-1-56881-019-5 Hardcover; 400 pp.; $88.00

Handbook of Integration
Daniel Zwillinger
1992; ISBN 978-0-86720-293-9 Hardcover; 384 pp.; $79.00

How to Win More
Strategies for Increasing a Lottery Win
Norbert Henze, Hans Riedwyl
1998; ISBN 978-1-56881-078-2 Paperback; 149 pp.; $24.95

The Mathematics of Ciphers
Number Theory and RSA Cryptography
S. C. Coutinho
1999; ISBN 978-1-56881-082-9 Hardcover; 198 pp.; $44.00

Matrix Algebra Using MINImal MATlab
Joel Robbin
1995; ISBN 978-1-56881-024-9
Hardcover with 3.5"diskette; 560 pp.; $79.00

Misteaks …and how to find them before the teacher does…
THIRD EDITION
Barry Cipra
2000; ISBN 978-1-56881-122-2 Paperback; 88 pp.; $5.95

Modeling and Simulation
Hartmut Bossel
Includes 3.5"diskette.
1994; ISBN 978-1-56881-033-1 Hardcover; 504 pp.; $79.00
(DISTRIBUTED IN EUROPE BY FRIEDR. VIEWEG & SOHN)

Not Knot **VHS/PAL**
The Geometry Center, University of Minnesota
1991; 16 minutes. VHS video includes paperback supplement.
ISBN 978-1-56881-042-3 VHS/NTSC; $44.00
ISBN 978-1-56881-060-7 PAL; $54.00

Number Theory for the Millennium
Edited by Bruce Berndt et al.
Volume 1
2002; ISBN 978-1-56881-126-0 Hardcover; 480 pp.; $59.00
Volume 2
2002; ISBN 978-1-56881-146-8 Hardcover; 466 pp.; $59.00
Volume 3
2002; ISBN 978-1-56881-152-9 Hardcover; 470 pp.; $59.00

Numerical Methods
Wolfgang Boehm, Hartmut Prautzsch
1993; ISBN 978-1-56881-020-1 Paperback; 196 pp.; $44.00
(DISTRIBUTED IN EUROPE BY FRIEDR. VIEWEG & SOHN)

On Quaternions and Octonions
John H. Conway, Derek A. Smith
2003; ISBN 978-1-56881-134-5 Hardcover; 160 pp.; $34.00

One-Dimensional Spline Interpolation Algorithms
Helmuth Späth
1995; ISBN 978-1-56881-016-4 Hardcover; 416 pp.; $79.00

Operator Algebras, Mathematical Physics, and Low Dimensional Topology
Edited by Richard Herman, Betül Tanbay
RESEARCH NOTES IN MATHEMATICS
1993; ISBN 978-1-56881-027-0 Hardcover; 336 pp.; $75.00

Origami^3
Edited by Thomas Hull
2002; ISBN 978-1-56881-181-9 Paperback; 352 pp.; $49.00

Outside In VHS/PAL
The Geometry Center, University of Minnesota
1994; 22 minutes. VHS video includes paperback supplement.
ISBN 978-1-56881-046-1 VHS/NTSC; $44.00
ISBN 978-1-56881-052-2 PAL; $54.00

Polynomial Invariants of Finite Groups
Larry Smith
1995; ISBN 978-1-56881-053-9 Hardcover; 376 pp.; $69.00

Practical Linear Algebra TEXT
A Geometry Toolbox
Gerald Farin, Dianne Hansford
2005; ISBN 978-1-56881-234-2 Hardcover; 394 pp.; $69.00

The Queen of Mathematics
A Historically Motivated Guide to Number Theory
Jay Goldman
2002; ISBN 978-1-56881-006-5 Hardcover; 525 pp.; $69.00

Regular Sequences and Resultants
Günter Scheja, Uwe Storch
RESEARCH NOTES IN MATHEMATICS
2001; ISBN 978-1-56881-151-2 Hardcover; 142 pp.; $39.00

Riemannian Geometry
A Beginner's Guide
SECOND EDITION
Frank Morgan
1998; ISBN 978-1-56881-073-7 Hardcover; 160 pp.; $39.00

Statistical Curves and Parameters
Choosing an Appropriate Approach
Michael E. Tarter
2000; ISBN: 978-1-56881-105-5 Hardcover, 400 pp; $74.00

A Survey of Modern Algebra
Garrett Birkhoff, Saunders Mac Lane
1997; ISBN 978-1-56881-068-3 Hardcover; 512 pp.; $75.00

Surveys in Number Theory
Papers from The Millennial Conference on Number Theory
Edited by Bruce Berndt et al.
2002; ISBN 978-1-56881-162-8 Paperback; 368 pp.; $39.00

TriMathlon
A Workout Beyond the School Curriculum
Judith Sally, Paul Sally
2003; ISBN 978-1-56881-184-0 Paperback; 200 pp.; $35.00

Two-Dimensional Spline Interpolation Algorithms
Helmuth Späth
1995; ISBN 978-1-56881-017-1 Hardcover; 312 pp.; $79.00

Turning a Sphere Inside Out VHS/PAL
Nelson L. Max
2004; 23 minutes.
ISBN 978-1-56881-218-2 VHS/NTSC; $35.00
ISBN 978-1-56881-228-1 PAL; $45.00

Understanding Probability and Statistics
A Book of Problems
Ruma Falk
1998; ISBN 978-1-56881-071-3 Paperback; 256 pp.; $39.00

Wavelets: A Primer
Christian Blatter
1998; ISBN 978-1-56881-195-6 Paperback; 212 pp.; $39.00

Word Processing in Groups
David B. A. Epstein, et al.
1992; ISBN 978-0-86720-244-1 Hardcover; 352 pp.; $69.00

The World According to Wavelets
The Story of a Mathematical Technique in the Making
SECOND EDITION
Barbara Burke Hubbard
1998; ISBN 978-1-56881-072-0 Hardcover; 286 pp.; $54.00

Aspects of Incompleteness

LECTURE NOTES IN LOGIC 10

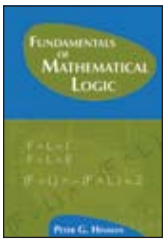
Per Lindström

2003; ISBN 978-1-56881-173-4 **Paperback; 176 pp. $35.00**

PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Fundamentals of Mathematical Logic TEXT

Peter G. Hinman



This introductory graduate text covers modern mathematical logic from propositional, first-order and infinitary logic and Gödel's Incompleteness Theorems to extensive introductions to set theory, model theory and recursion (computability) theory. Based on the author's more than 35 years of teaching experience, the book develops students' intuition by presenting complex ideas in the simplest context for which they make sense. The book is appropriate for use as a classroom text, for self study, and as a reference on the state of modern logic.

2005; ISBN 978-1-56881-262-5 **Hardcover; 896 pp.; $89.00**

Inexhaustibility

A Non-Exhaustive Treatment

LECTURE NOTES IN LOGIC 16

Torkel Franzén

2004; ISBN 978-1-56881-174-1 **Hardcover; 263 pp.; $85.00**
2004; ISBN 978-1-56881-175-8 **Paperback; 263 pp.; $40.00**

PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

The Incompleteness Phenomenon TEXT

Martin Goldstern, Haim Judah

1998; ISBN 978-1-56881-093-5 **Paperback; 264 pp.; $49.00**

Intensionality

LECTURE NOTES IN LOGIC 22

Edited by Reinhard Kahle

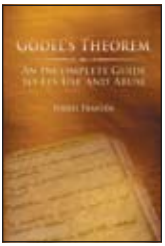
2005; ISBN 978-1-56881-267-1 **Hardcover; 280 pp.; $50.00**
2005; ISBN 978-1-56881-268-7 **Paperback; 280 pp.; $35.00**

PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Gödel's Theorem

An Incomplete Guide to Its Use and Abuse

Torkel Franzén



This book gives an up-to-date explanation of Gödel's incompleteness theorem for a general audience, including a presentation of the topics of computability, complexity, and formal systems. It also comments on a wide selection of arguments invoking the incompleteness theorem, in fields ranging from postmodernism and theology to the philosophy of mathematics. It is a book both for college courses and for the general reader.

2005; ISBN 978-1-56881-238-0; **Paperback; 182 pp.; $27.00**

Gödel '96: Logical Foundations of Mathematics, Computer Science and Physics

Kurt Gödel's Legacy

LECTURE NOTES IN LOGIC 6

Edited by Petr Hájek

2001; ISBN 978-1-56881-153-6 **Paperback; 336 pp.; $50.00**

PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Logic Colloquium '01

LECTURE NOTES IN LOGIC 20

Edited by Matthias Baaz, Sy-David Friedman, Jan Krajícek

2005; ISBN 978-1-56881-247-2 **Hardcover; 504 pp.; $70.00**
2005; ISBN 978-1-56881-248-9 **Paperback; 504 pp.; $40.00**

PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Earlier proceedings available at www.akpeters.com.

Logicism Renewed

Logical Foundations for Mathematics and Computer Science

LECTURE NOTES IN LOGIC 23

Paul C. Gilmore

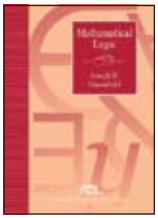
2005; ISBN 978-1-56881-275-5 **Hardcover; 252 pp.; $69.00**
2005; ISBN 978-1-56881-276-2 **Paperback; 252 pp.; $39.00**

PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Mathematical Logic

TEXT

Joseph R. Shoenfield



"This classic text is as fresh and useful today as when first published. Noted for the economy of its presentation, it includes a wealth of basic and key results from all parts of mathematical logic."
–Solomon Feferman, Stanford University

2001; ISBN 978-1-56881-135-2
Paperback; 356 pp.; $39.00
PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Model Theory of Fields, Second Edition

LECTURE NOTES IN LOGIC 5

Dave Marker, Margit Messmer, Anand Pillay

2005; ISBN 978-1-56881-281-6 **Hardcover; 170 pp.; $59.00**
2005; ISBN 978-1-56881-282-3 **Paperback; 170 pp.; $26.00**
PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Model Theory of Stochastic Processes

LECTURE NOTES IN LOGIC 14

Sergio Fajardo, H. Jerome Keisler

2002; ISBN 978-1-56881-167-3 **Hardcover; 140 pp.; $70.00**
2002; ISBN 978-1-56881-172-7 **Paperback; 140 pp.; $32.00**
PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Recursion Theory

LECTURE NOTES IN LOGIC 1

Joseph R. Shoenfield

2001; ISBN 978-1-56881-149-9 **Paperback; 96 pp.; $25.00**
PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Reflections on the Foundations of Mathematics

Essays in Honor of Solomon Feferman

LECTURE NOTES IN LOGIC 15

Edited by Wilfried Sieg, Richard Sommer, Carolyn Talcott

2002; ISBN 978-1-56881-169-7 **Hardcover; 460 pp.; $95.00**
2002; ISBN 978-1-56881-170-3 **Paperback; 460 pp.; $45.00**
PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Reverse Mathematics 2001

LECTURE NOTES IN LOGIC 21

Edited by Stephen G. Simpson

2005; ISBN 978-1-56881-263-2 **Hardcover; 416 pp.; $70.00 2005;**
ISBN 978-1-56881-264-9 **Paperback; 416 pp.; $40.00**
PUBLISHED BY THE ASSOCIATION FOR SYMBOLIC LOGIC

Set Theory

On the Structure of the Real Line

Tomek Bartoszynski, Haim Judah

1995; ISBN 978-1-56881-044-X **Hardcover; 560 pp.; $89.00**

Beyond the Nanoworld

NEW

Quarks, Leptons, and Gauge Bosons

Hans Günter Dosch

Beyond the world of atoms, at scales smaller than the smallest nuclei, a new world comes into view, populated by an array of colorful elementary particles: strange and charmed quarks, muons and neutrinos, gluons and photons, and many others, all interacting in beautifully intricate patterns. *Beyond the Nanoworld* tells the story of how this new realm was discovered. From the first discoveries of subatomic structure to the present-day hunt for the Higgs particle, the reader is invited to follow the twin branches of experimental and theoretical research as they wind through the twentieth century, culminating in the most successful physical theory of all time: the standard model of particle physics.

"The story of how elementary particle physics evolved, over the course of the twentieth century, from primitive beginnings into the strange, brilliantly successful yet clearly unfinished world-theory of today is a great unsung epic of human adventure. *Beyond the Nanoworld* tells the tale with clarity and style."

—Frank Wilczek, Herman Feshbach Professor of Physics, MIT; 2004 Nobel Laureate

January 2008; ISBN 978-1-56881-345-5
Hardcover; 292 pp.; $39.00

Mathematical Physics

NEW

TEXT

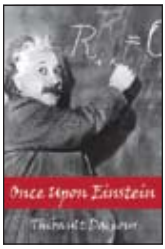
Victor Henner, Tatyana Belozerova, Kyle Forinash

This is a textbook on mathematical physics for upper-level undergraduate students, useful in physics, engineering, and applied mathematics. The book includes a software application that helps in the visualization and solution of differential equations of many different types.

July 2008; ISBN 978-1-56881-335-6
Hardcover; approx. 400 pp.; $59.00

Once Upon Einstein

Thibault Damour



Everyone knows that Einstein created the physics of the twentieth century through his work on relativity and quantum theory. But what do we really know about the essence of Einstein's ideas and how do we perceive the depth of their conceptual revolution? Through the choice of concrete scenes from the life of Einstein, the author lets us relive the formation of his theories. The book involves us in a reflection on their philosophical impact. How does one experience time after the theory of relativity, which removes any sense of "now" and shows that twins can be of different age? The book accompanies Einstein through his life and scientific work, and points out daily applications of his ideas: from Lasers to Global Positioning Systems.

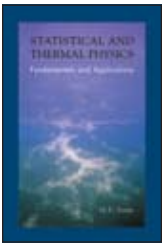
2006; ISBN 978-1-56881-289-2 **Paperback; 199 pp.; $27.00**

Statistical and Thermal Physics

TEXT

Fundamentals and Applications

Michael D. Sturge



This book assumes no previous knowledge of thermodynamics, kinetic energy, or probability—the only prerequisites are an elementary knowledge of classical and modern physics, and of multivariable calculus. The first half of the book introduces the subject inductively, but rigorously, proceeding from the concrete and specific to the abstract and general. In clear physical language the book explains the key concepts, such as temperature, heat, entropy, free energy, chemical potential, and distributions, both classical and quantum. The second half of the book applies these concepts to a wide variety of phenomena, including perfect gases, electrons in metal and semiconductors, phase transitions, heat engines, and transport processes. Each chapter contains fully worked examples and real-world problems drawn from physics, astronomy, biology, chemistry, electronics, and mechanical engineering. An instructor's solutions manual is available.

2003; ISBN 978-1-56881-196-3 **Hardcover; 480 pp.; $69.00**

The Wraparound Universe

NEW

Jean-Pierre Luminet

With the appearance of Einstein's theory of general relativity in the twentieth century, our understanding of the universe and its history was revolutionized, and cosmology was born as a scientific discipline. This book provides an engaging overview of the history of the subject and the science behind it for the general reader, leading to a question at the very frontier of research: what is the overall shape of the universe? Could the universe be wrapped around and reconnected to itself, leading to mirage stars as light twists along repeated paths through space? As the author explains, this is a question that modern experiments have started to address.

February 2008; ISBN 978-1-56881-309-7
Hardcover; approx. 350 pp.; $39.00

Experimental Mathematics

Experimental Mathematics is a journal devoted to experimental aspects of mathematical research. The journal's goal is to make the interplay between mathematical theory and experimentation more fruitful and visible. It also aims to aid in the development of mathematical standards for reporting experimental results such as exist in other sciences. EM publishes formal results inspired by experimentation; conjectures suggested by experiment; descriptions of algorithms and software for mathematical exploration; surveys of areas in mathematics from the experimental point of view; and general articles of interest to the community.

Website: http://www.expmath.org

ISSN 1058-6458
Each Volume consists of 4 issues published quarterly.

Annual Subscription Rate
Volume 17, 2008: $400 per year (single issue: $105.00)
Individual: $160.00
Individual AMS members: $128.00

Shipping/Handling
US: $10.00 • Canada: $17.50 • All other countries: $25.00

Internet Mathematics

This journal publishes research papers that address fundamental problems, both conceptual and algorithmic, that arise in dealing with large complex information networks such as the Internet. Broad in scope, the journal will allow for flexible adjustment to the evolving needs that arise in real-life applications and the theoretical foundations.

Selected Topics Covered: Probabilistic methods • Hypergraph coloring • Spectral methods • Dynamic networks and systems • Coding and information theory • Communication complexity • Network security • Robust control theory • Geometric graph theory and visualization • Game theory, auctions, and e-commerce

Website: http://www.internetmathematics.org

ISSN 1542-7951
Each volume consists of 4 issues published quarterly.

Annual Subscription Rate
Volume 5, 2008: $350.00 per year (single issue: $90.00)
Individual: $140.00
Individual AMS member: $112.00

Shipping/Handling
US: $10.00 • Canada: $17.50 • All other countries: $25.00

Beginning in 2008, new volumes for all journals are delivered in PRINT and ELECTRONICALLY

Beginning in 2008, new volumes for all journals are delivered in PRINT and ELECTRONICALLY

journal of graphics tools

In the spirit of *Graphics Gems*, *jgt* publishes ideas and experiences that translate into immediate applications in your everyday work. Features include: • **Tricks and Hacks**—nuts and bolts methods used by the pros that aren't in the textbooks • **Innovative Techniques and Algorithms**—new ways to solve real problems • **Experience/Advice**—how to make practical use of known results • **Production Notes**—techniques and workplace methodologies • **Novel Research Ideas**—often just an "a-ha" insight that has a straightforward implementation; a forum presents "value-added" in terms of practical advice • **Surveys**—advice for those who may not be experts in the field but need to know their way around • **Tutorials**—basic information about various areas of computer graphics research.

Website: http://jgt.akpeters.com/

ISSN 1086-7651

Each Volume contains 4 issues published quarterly.

Annual Subscription Rate

Volume 13, 2008: $215.00 per year (single issue: $65.00)

Individual: $95.00

Individual AMS member: $85.50

Shipping/Handling

US:$10.00 • Canada: $17.50 • All other countries: $25.00

Title Index

Author Index

A K Peters, Ltd.
888 Worcester St., Ste. 230 • Wellesley, MA 02482 • USA
Tel: (781) 416 2888 • Fax: (781) 416 2889
service@akpeters.com • www.akpeters.com

Place your order by…

Web: www.akpeters.com
Phone: (781) 416-2888
Fax: (781) 416-2889
Email: service@akpeters.com

Payment

Individual customers: Orders must be prepaid by:

- Visa/MasterCard/American Express/Discover Be sure to include both card number and expiration date.
- Check in US $ or International Postal Money Order.

Bookstores: Please contact us at the numbers above for discount schedule, shipping charges, and payment information.

Shipping/Handling

- **In the US:** Add $7.50 for the first title. Add $3.00 for each additional title. We ship via UPS Ground.
- **In Canada:** Add $15.00 for the first title. Add $5.00 for each additional title. Note: Packages shipped using the postal service are not guaranteed—if secure shipping is needed, please contact us for alternate couriers and prices.
- **Other countries:** Call, fax, or email us for exact shipping charges; prices will vary according to country and weight.
- **Rush orders:** Require a $5.00 handling charge in addition to the cost of express shipping. Call, fax, or email us for express charges.

Orders are processed immediately upon receipt. Allow appropriate shipping time for delivery based on location.

Examination Copies

Examination copies for text adoption purposes are available. Please address your request to **marketing@akpeters.com**, including course name, semester offered, enrollment, current text(s), and decision date.

International Distribution

To expedite delivery of your order, please ask your bookseller to order directly from the local supplier:

Australia and New Zealand

Woodslane Pty Ltd
7/5 Vuko Place
Warriewood, NSW, 2102
Telephone: 02-9970-5111
Fax: 02-9970-5002
Email: info@woodslane.com.au
Web: www.woodslane.com.au

Canada

Login Brothers Canada
324 Saulteaux Crescent
Winnipeg, Manitoba R3J 3T2 Canada
Telephone: (800) 665-1148
Fax: (800) 665-0103
Email: sales@lb.ca
Web: www.lb.ca

Europe and United Kingdom

Transatlantic Publishers Group
c/o ORCA Book Services
Stanley House, 3 Fleets Lane
Poole, Dorset BH15 3AJ, United Kingdom
Telephone: +44 (020) 7373 2515
Fax: +44 (020) 7244 1018
Email: richard@tpgltd.co.uk
Web: www.transatlanticpublishers.com

Japan

Neutrino Inc.
Takahashi Bldg
1-44-3 Fuda Chofu-Shi
Tokyo 182-0024
Japan
Phone: 81-424-84-5550
Fax: 81-424-84-5556
Email: import@neutrino.co.jp
Web: http://www.neutrino.co.jp/

Singapore/Malaysia/Indonesia

Apac Publishers Services Pte Ltd
Block 8, #05-02
Lorong Bakar Batu
Singapore 348743
Tel: +65 68447333
Fax: +65 67478916
Email: steven@apacmedia.com.sg

P. R. China/Hong Kong/ Macau/South Korea/Taiwan

Edwin Chu
China Publishers Services Ltd
Room 819, Fortune Commercial Building
362 Sha Tsui Road, Tsuen Wan, N.T. Hong Kong SAR
Tel: 852-2491-1436
Mobile: 852-9193-0534
Fax: 852-2491-1435
Email: edwin@cps-hk.com ; edwinchu@netvigator.com

Indian Representative

Ravindra Saxena
Sara Books Pvt. Ltd.
4832/24 Ansari Road,Daryaganj
New Delhi 110002
India
Phone: 91-11-23266107
Fax: 91-11-23266102
Email: sarabooks@eth.net
Web: www.sarabooksindia.com

Philippines

iGroup
Babes M. Tulud
Project Manager, Print Division
B7 L41 Athena Street corner Carmel Street
North Olympus Subd. Phase 2, Zabarte Road
Novaliches, Quezon City
Philippines 1123
Phone: (632) 962-1170
Fax: (632) 840-2760
Email: bmtulud@philonline.com

Thailand

iGroup
Phanuvat Wongstapornpat
P.O. Box 139 On-Nuj,
Bangkok 10250
Thailand
Phone: 02-3220816
Fax: 02-3220815
Email: phanuvat@igroupnet.com

Vietnam

iGroup
Phung Duc Chien
Info Vietnam - 2fl,
41 Tran Quoc Toan, Hanoi
Vietnam
Phone: 00.84.49435472
Fax: 00.84.49435475
Email: chien@igroupnet.com

A K Peters, Ltd.
888 Worcester St., Suite 230
Wellesley, MA 02482 • USA
Tel: (781) 416 2888
Fax: (781) 416 2889
service@akpeters.com
www.akpeters.com