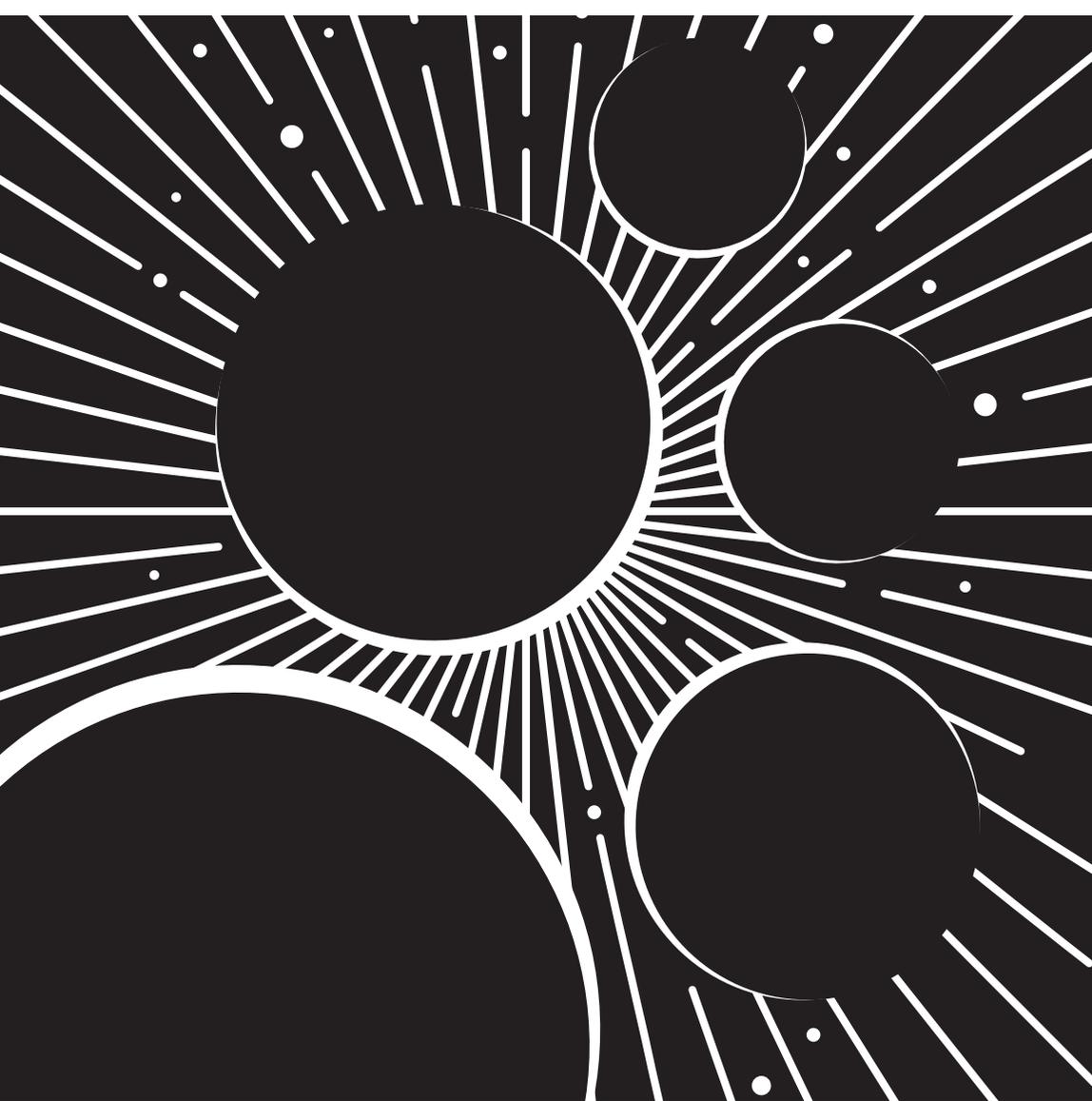
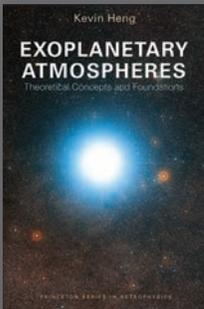
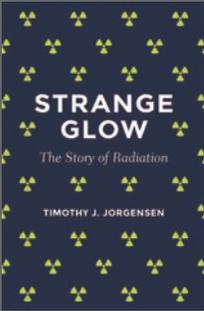
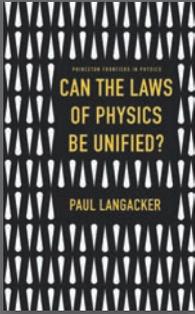
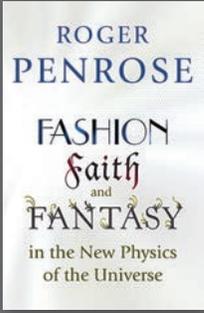


Physics & Astrophysics
2017





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"All three [authors] write in informal, conversational tones, and the text is sprinkled with genuinely funny non sequiturs, such as a brief rumination on dwarfs versus dwarves and commentary on English-speaking aliens in *Star Trek*... What the book does very well is to present not just what we know about the universe but how we know it."

—*Science*

"Reading through is akin to receiving a private museum tour from an expert scientist."

—*Publishers Weekly*

"Their laudable goal is communicating vast, cosmic ideas in ways that are accessible without being simplistic."

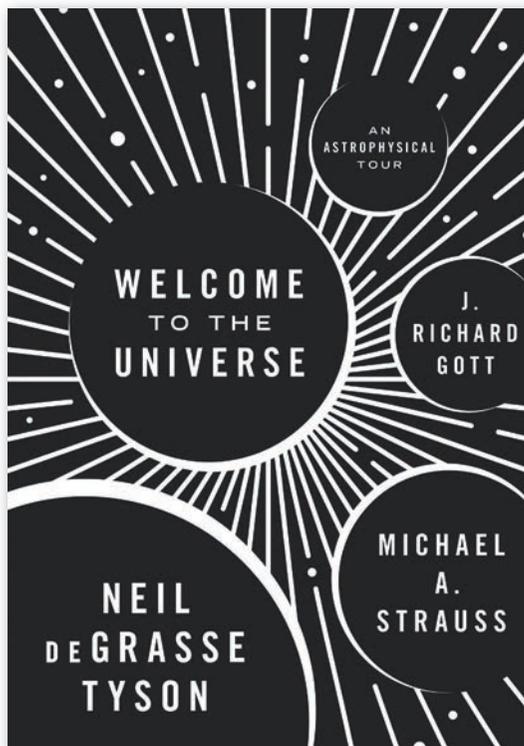
—*Washington Post*

"The authors maintain the individual charms of their distinct voices chapter by chapter so the reader has the visceral sense of science shared, passed from one mind to another, almost as though through an oral history—ultimately, a warm welcome to the universe."

—Janna Levin, author of *Black Hole Blues and Other Songs from Outer Space*

"All three of these authors are experts in the field, and they are also engaging writers. This is a very good book. There is nothing on the market that quite matches it."

—Sean Carroll, author of *The Particle at the End of the Universe*



New

Welcome to the Universe

An Astrophysical Tour

Neil deGrasse Tyson, Michael A. Strauss & J. Richard Gott

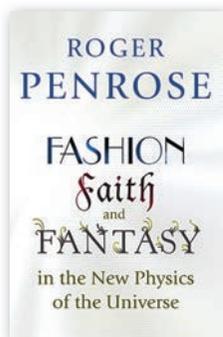
Welcome to the Universe is a personal guided tour of the cosmos by three of today's leading astrophysicists. Inspired by the enormously popular introductory astronomy course that Neil deGrasse Tyson, Michael A. Strauss, and J. Richard Gott taught together at Princeton, this book covers it all—from planets, stars, and galaxies to black holes, wormholes, and time travel.

Describing the latest discoveries in astrophysics, the informative and entertaining narrative propels you from our home solar system to the outermost frontiers of space. How do stars live and die? Why did Pluto lose its planetary status? What are the prospects of intelligent life elsewhere in the universe? How did the universe begin? Why is it expanding and why is its expansion accelerating? Is our universe alone or part of an infinite multiverse? Answering these and many other questions, the authors open your eyes to the wonders of the cosmos, sharing their knowledge of how the universe works.

Breathtaking in scope and stunningly illustrated throughout, *Welcome to the Universe* is for those who hunger for insights into our evolving universe that only world-class astrophysicists can provide.

2016. 472 pages. 95 color illus.

Cl: 978-0-691-15724-5 \$39.95 | £29.95



New

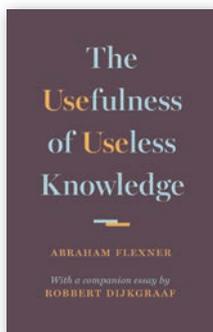
Fashion, Faith, and Fantasy in the New Physics of the Universe Roger Penrose

"The book is replete with phenomenal visual representations of the physics under discussion, a reminder of Penrose's ability to see and describe physics in a unique way... Ultimately, what is most valuable about the book is the excellent example he offers in how to ask questions."

—Chanda Prescod-Weinstein,
Physics World

What can fashionable ideas, blind faith, or pure fantasy possibly have to do with the scientific quest to understand the universe? Surely, theoretical physicists are immune to mere trends, dogmatic beliefs, or flights of fancy? In fact, acclaimed physicist and bestselling author Roger Penrose argues that researchers working at the extreme frontiers of physics are just as susceptible to these forces as anyone else. In this provocative book, he argues that fashion, faith, and fantasy, while sometimes productive and even essential in physics, may be leading today's researchers astray in three of the field's most important areas—string theory, quantum mechanics, and cosmology.

2016. 520 pages. 186 line illus.
Cl: 978-0-691-11979-3 \$29.95 | £19.95



Forthcoming

The Usefulness of Useless Knowledge

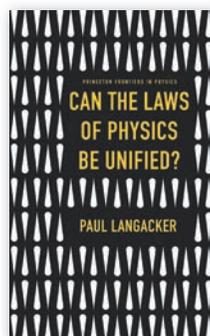
Abraham Flexner
With a companion essay by
Robbert Dijkgraaf

"Flexner's brilliant essay is as valuable today as when it was first published. And Dijkgraaf's eloquent companion essay, which admirably connects the situation facing past and present advocates of basic scientific research, is a pleasure to read. *The Usefulness of Useless Knowledge* will actually be very useful in the intense global debate over this vital topic."

—Neil Turok, Director and Niels Bohr Chair, Perimeter Institute for Theoretical Physics

In his classic essay "The Usefulness of Useless Knowledge," Abraham Flexner describes a great paradox of scientific research. The search for answers to deep questions, motivated solely by curiosity and without concern for applications, often leads not only to the greatest scientific discoveries but also to the most revolutionary technological breakthroughs. This brief book includes a new companion essay by Robbert Dijkgraaf, in which he shows that Flexner's defense of the value of "the unobstructed pursuit of useless knowledge" may be even more relevant today than it was in the early twentieth century.

March 2017. 112 pages.
Cl: 978-0-691-17476-1 \$9.95 | £7.50



Forthcoming

Can the Laws of Physics Be Unified?

Paul Langacker

"This book is a very worthwhile, balanced, and useful summary of our current understanding of the fundamental laws of physics. Langacker covers a large amount of material in a very digestible way."
—Savdeep Sethi, University of Chicago

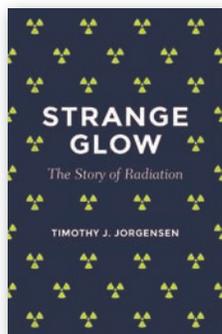
"Langacker has written a useful and informative book that brings the standard model to a broad audience of scientists and aspiring scientists who are interested in the current status of particle physics."

—Tom Lubensky, University of Pennsylvania

The standard model of particle physics describes our current understanding of nature's fundamental particles and their interactions, yet gaps remain. For example, it does not include a quantum theory of gravity, nor does it explain the existence of dark matter. *Can the Laws of Physics Be Unified?* describes the promising theoretical ideas and new experiments that could provide answers and weighs our prospects for establishing a truly unified theory of the smallest constituents of nature and their interactions.

Princeton Frontiers in Physics

March 2017. 284 pages. 11 halftones.
18 line illus. 5 tables.
Cl: 978-0-691-16779-4 \$35.00 | £24.95



New
Strange Glow
 The Story of Radiation
 Timothy J. Jorgensen

“Jorgensen’s lucid writing and strong story-telling skills are demonstrated thoroughly in this book, making it a pleasure to read.... In its simplicity and conciseness, it greatly contributes to removing some of the mystery and misunderstanding that surrounds radiation.... I feel it will become a very useful resource to the general public as well as to radiation experts.”

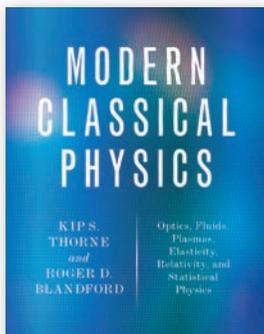
—Jun Deng, *Physics World*

“[U]nbiased, comprehensive information on radiation risk is hard to come by. Timothy J. Jorgensen’s book *Strange Glow* fills this gap, using history to explain how we encounter radiation and how it affects us.... Jorgensen is a good storyteller, with an eye for compelling details.”

—Angela Creager, *Science*

An accessible blend of narrative history and science, *Strange Glow* describes mankind’s extraordinary, thorny relationship with radiation, including the hard-won lessons of how radiation helps and harms our health. Timothy Jorgensen explores how our knowledge of and experiences with radiation in the last century can lead us to smarter personal decisions about radiation exposures today.

2016. 512 pages. 17 halftones. 8 line illus.
 Cl: 978-0-691-16503-5 \$35.00 | £24.95



Forthcoming
Modern Classical Physics
 Optics, Fluids, Plasmas,
 Elasticity, Relativity, and
 Statistical Physics

**Kip S. Thorne &
 Roger D. Blandford**

“Comprehensive, concise, and coherent, this is a marvelous summary of the essence of classical physics, somewhat reminiscent of the classic texts of Landau and Lifshitz, and an essential part of any physicist’s toolkit.”

—David Stevenson, California Institute of Technology

This first-year graduate-level text and reference book covers the fundamental concepts and twenty-first-century applications of six major areas of classical physics that every masters- or PhD-level physicist should be exposed to, but often isn’t: statistical physics, optics (waves of all sorts), elastodynamics, fluid mechanics, plasma physics, and special and general relativity and cosmology. Growing out of a full-year course that the eminent researchers Kip Thorne and Roger Blandford taught at Caltech for almost three decades, this book is designed to broaden the training of physicists. Its six main topical sections are also designed so they can be used in separate courses, and the book is an invaluable reference for researchers.

July 2017. 1216 pages. 71 color illus.
 7 halftones. 276 line illus. 14 tables.
 Cl: 978-0-691-15902-7 \$125.00 | £92.95

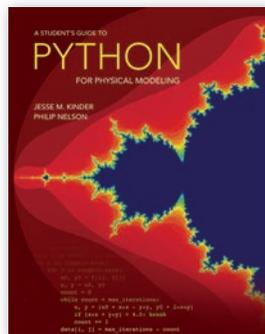
Forthcoming
From Photon to Neuron
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“Engaging and unique. This is an excellent and well-developed textbook on the physics of light as it is processed by biological organisms and on how light can be used to interrogate biological material. *From Photon to Neuron* is poised to become a standard text for both physicists and biologists.”

—Stephanie Palmer, University of Chicago

With its integrated approach, *From Photon to Neuron* can be used as the basis for interdisciplinary courses in physics, biophysics, sensory neuroscience, biophotonics, bioengineering, or nanotechnology.

May 2017. 496 pages. 300 color illus.
 Pa: 978-0-691-17519-5 \$49.50 | £37.95
 Cl: 978-0-691-17518-8 \$110.00 | £81.95

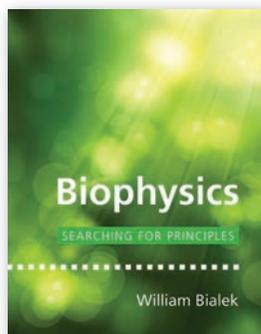


**A Student’s Guide to
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 Jesse M. Kinder
 & Philip Nelson

“A great textbook for a first course in modern scientific programming in any context, and one that I’ll be using myself.”

—Garnet Kin-Lic Chan, Princeton University

2015. 160 pages. 3 color illus.
 Pa: 978-0-691-17050-3 \$24.95 | £18.95



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Searching for Principles
William Bialek

"[T]he book goes beyond being a structured material for readers to learn about biophysics; it takes readers on an incredible journey in discovering fascinating ways in which biological phenomena can be viewed and studied. The technical adroitness and more importantly, the unique way of thinking about biological problems, in the reviewer's opinion, makes the book a must-read for any aspiring biophysicists."

—Angie Ma, *Contemporary Physics*

2012. 640 pages. 62 color illus. 15 halftones.
141 line illus. 1 table.
Cl: 978-0-691-13891-6 \$99.95 | £74.95
Winner of the 2013 Swartz Prize
for Theoretical and Computational
Neuroscience, Society for Neuroscience

New

Data Analysis for Scientists and Engineers

Edward L. Robinson

"With an accessible and consistent style, *Data Analysis for Scientists and Engineers* stands out for its depth of materials and pedagogical presentation. Building from simple concepts, the book's mathematical rigor and accuracy are solid and logical. This book is appropriate for senior undergraduates, graduate students at all levels, and practicing scientists."

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2016. 408 pages. 96 line illus. 7 tables.
Cl: 978-0-691-16992-7 \$75.00 | £55.95

Forthcoming

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Carolyn MacDonald

"This excellent addition to the literature on modern x-ray usage will be a valuable aid to students and professional researchers. It covers the basic physics of x-ray generation and interactions with matter and includes many practical applications of current interest as well as excellent diagrams and photos in every chapter. All major sources of x-rays, optics, coherence, spectroscopy, and diffractions are explained clearly."

—David Attwood, University of California, Berkeley

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June 2017. 360 pages. 36 color illus.
215 line illus. 5 tables.
Cl: 978-0-691-13965-4 \$75.00 | £55.95

Forthcoming

Natural Complexity

A Modeling Handbook

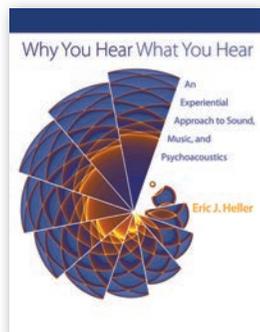
Paul Charbonneau

"*Natural Complexity* takes readers to new frontiers in the physics of complexity."

—Simon DeDeo, Carnegie Mellon University and the Santa Fe Institute

Primers in Complex Systems

May 2017. 304 pages. 62 color illus. 1 halftone.
28 line illus. 19 tables.
Pa: 978-0-691-17035-0 \$49.50 | £37.95
Cl: 978-0-691-17684-0 \$99.50 | £74.95



Why You Hear What You Hear

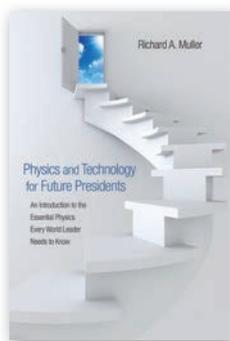
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"This book contains a lot of physical insight, and I think it will be the rare acoustician who does not enjoy reading it.... Acousticians will enjoy its interesting perspectives, and physicists and engineers outside of acoustics will find it an attractive introduction to some important parts of the discipline."

—Joe Wolfe, *Acoustics Australia*

2012. 624 pages. 397 color illus.
Cl: 978-0-691-14859-5 \$115.00 | £85.95

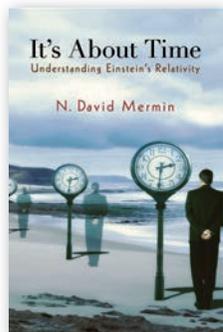


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Leader Needs to Know

Richard A. Muller

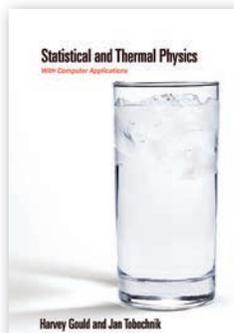
2010. 536 pages. 130 color illus. 15 tables.
Cl: 978-0-691-13504-5 \$69.95 | £51.95
One of Choice's 2010-2011 Significant
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1 table.
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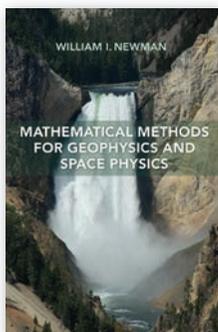
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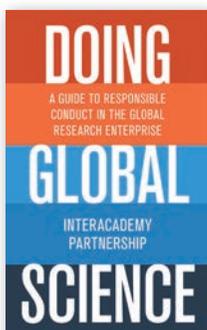


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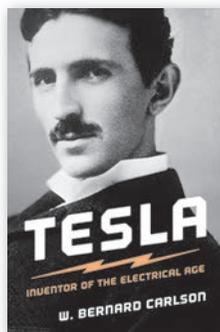


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Titles for 2013
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Edited by Michelle Feynman
With a foreword by Brian Cox
and reflections on
Richard Feynman by Yo-Yo Ma

"[Richard Feynman] combined
scientific genius with regular-guy
language. ... Now his daughter,
Michelle Feynman—born three
years after he received the Nobel
in 1965—has edited a collection
of quotes from his voluminous
output of books, lectures, essays,
articles and scientific papers."

—*Washington Post*

2015. 432 pages. 20 halftones.
Cl: 978-0-691-15303-2 \$24.95 | £18.95

Forthcoming

The Standard Model in a Nutshell

Dave Goldberg

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March 2017. 320 pages. 9 halftones.

66 line illus. 12 tables.

Cl: 978-0-691-16759-6 \$85.00 | £62.95



Statistical Mechanics in a Nutshell

Luca Peliti

2011. 416 pages. 74 line illus. 6 tables.

Cl: 978-0-691-14529-7 \$99.95 | £74.95

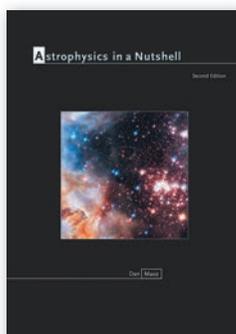
String Theory in a Nutshell

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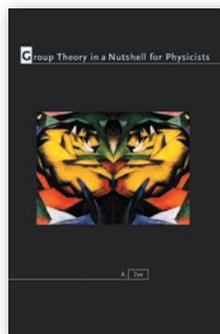
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"Johnson has woven the personal side of being a scientist with rigorous intuition about the techniques used to detect exoplanets. We hear the fresh and articulate voice of a young professor who grew into the shoes of a full-fledged scientist. Johnson's experiences and insights will touch the hearts and minds of readers."

—Debra Fischer, Yale University

How Do You Find an Exoplanet? is an authoritative primer on the four key techniques that today's planet hunters use to detect the feeble signals of planets orbiting distant stars. John Johnson provides you with an insider's perspective on this exciting cutting-edge science, showing how astronomers detect the wobble of stars caused by the gravitational tug of an orbiting planet, the slight diminution of light caused by a planet eclipsing its star, and the bending of space-time by stars and their planets, and how astronomers even directly take pictures of planets next to their bright central stars.

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What Does a Black Hole Look Like?

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2014. 224 pages. 4 halftones. 16 line illus.
Cl: 978-0-691-14882-3 \$35.00 | £24.95



What Are Gamma-Ray Bursts?

Joshua S. Bloom

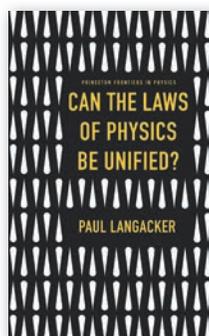
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Astronomical Society



See page 3 for details.

**princeton landmarks
in mathematics & physics**

General Theory of Relativity
P.A.M. Dirac

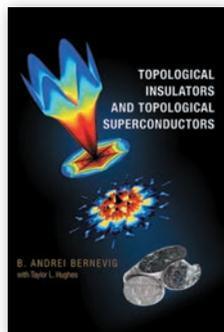
"[A]n elegant, well-organized introduction to the basic mathematics and physics of curved space."
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Physics Notes
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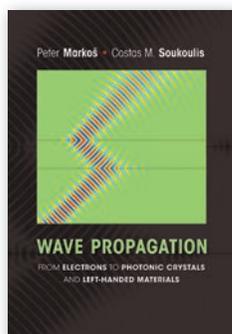
Topological Insulators and Topological Superconductors

B. Andrei Bernevig
With Taylor L. Hughes

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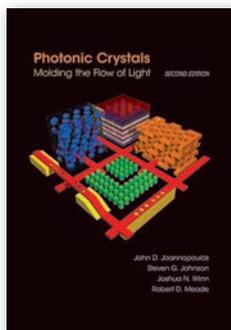
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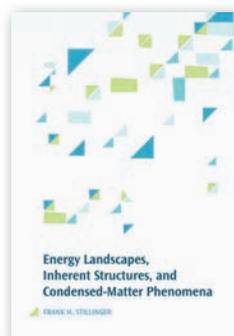
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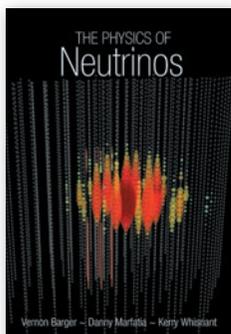
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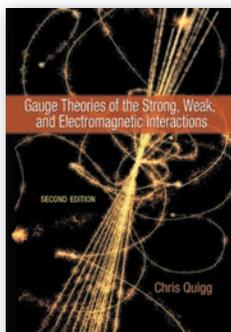
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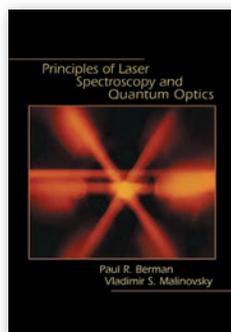
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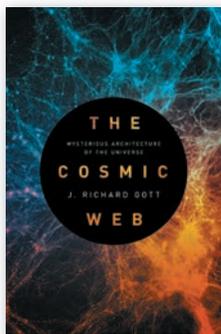
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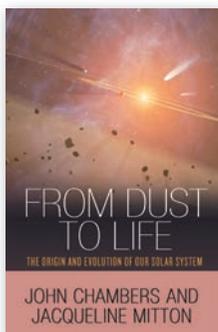
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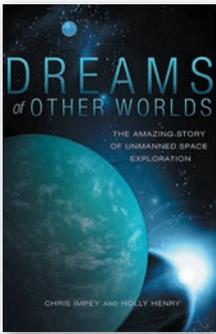
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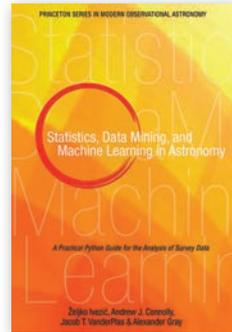
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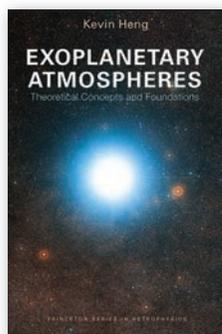
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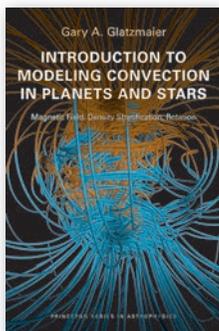
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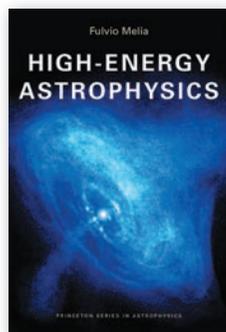


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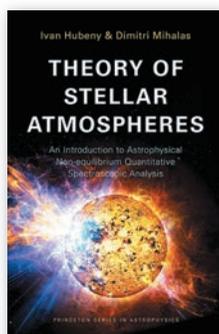
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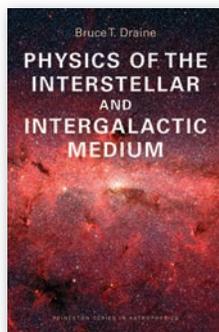
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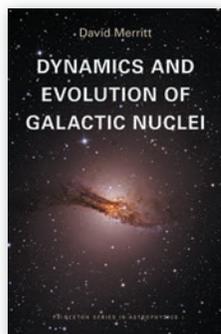


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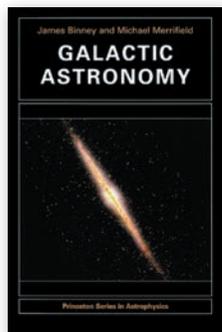
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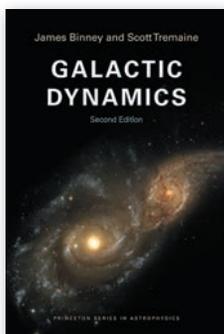
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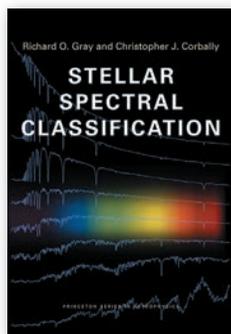
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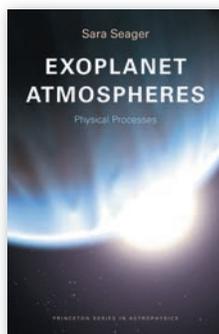
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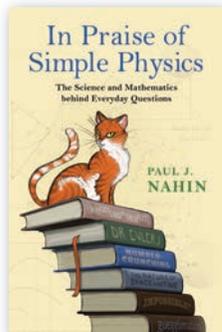
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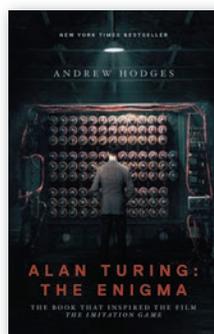
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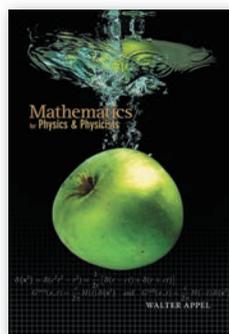
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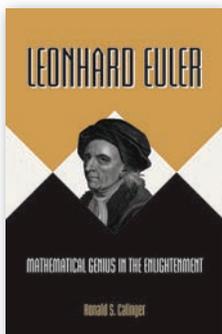
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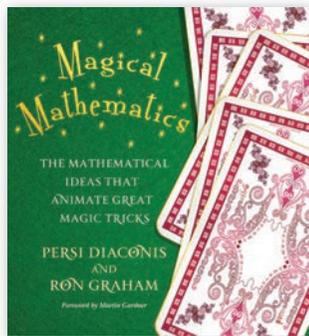
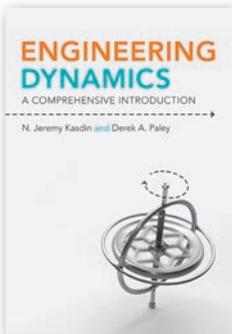


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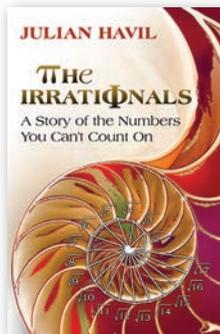
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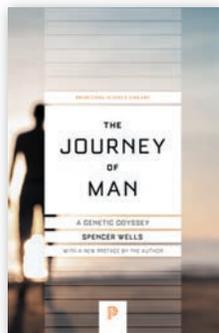


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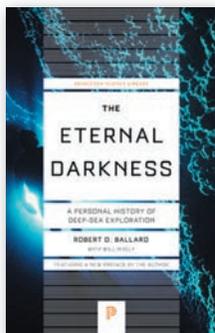
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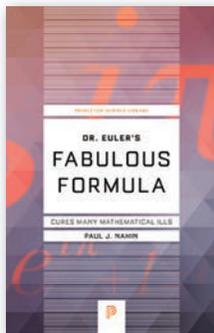
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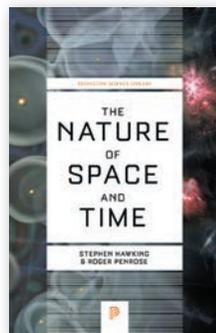
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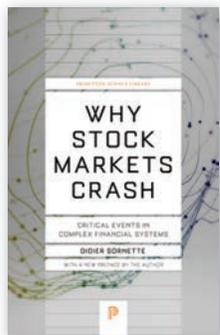
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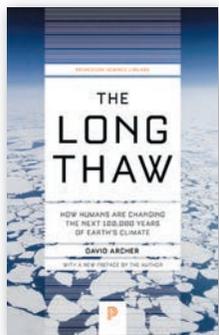
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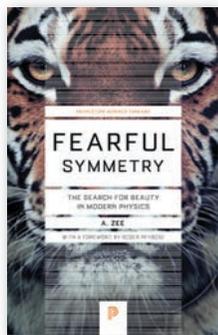
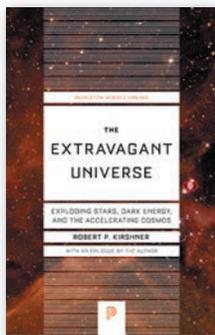
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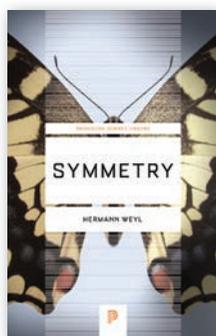
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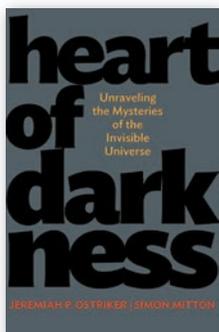


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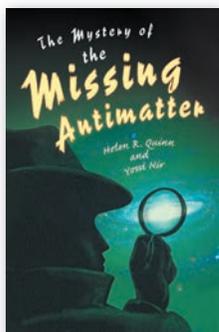
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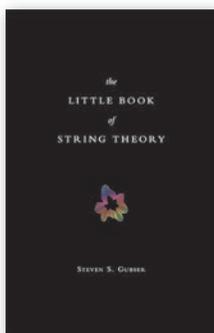


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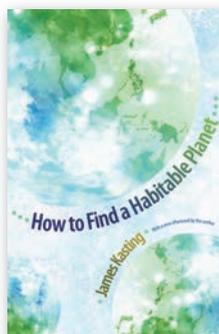


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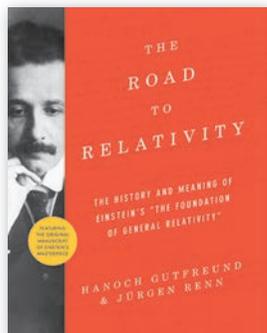


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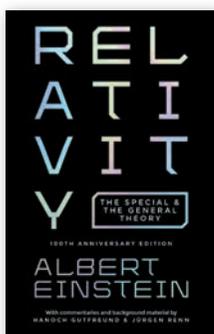
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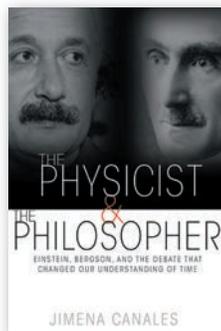
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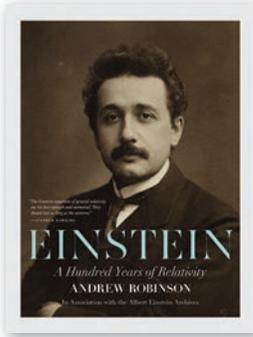
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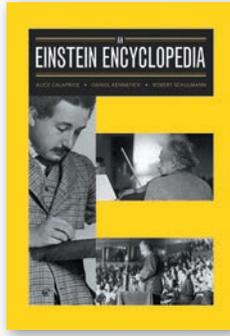
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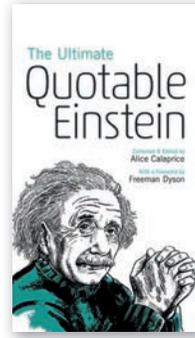
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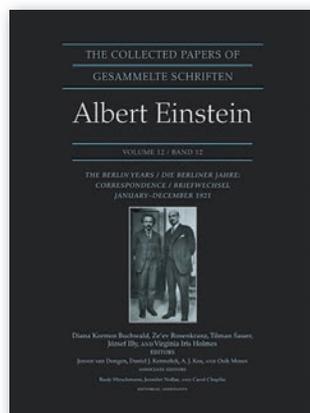
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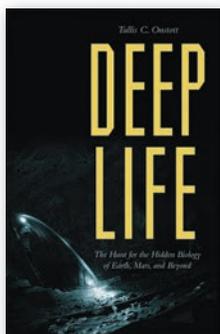
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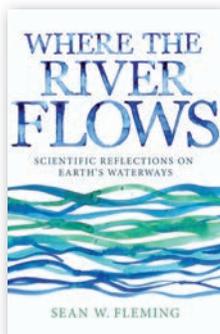
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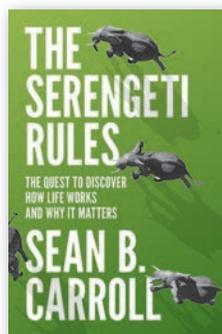
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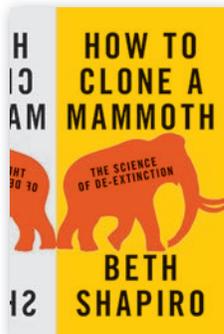
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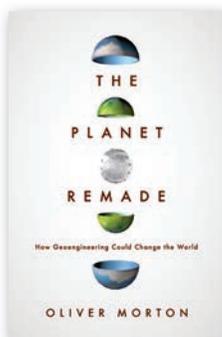
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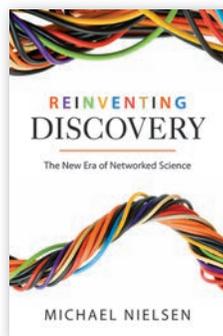
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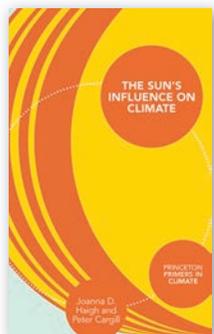
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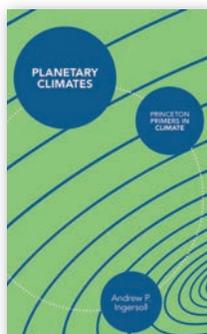
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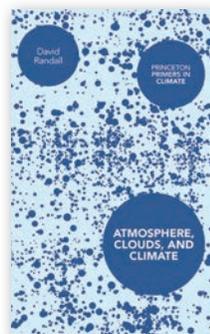
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