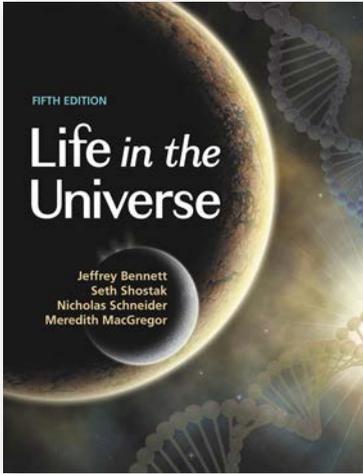


Princeton Physics & Astronomy

2023





The world's leading textbook on astrobiology—ideal for an introductory one-semester course and now fully revised and updated

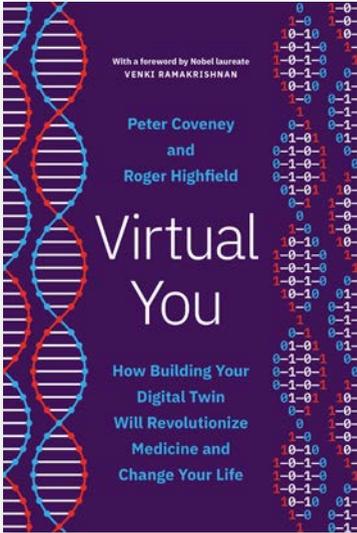
Life in the Universe, Fifth Edition

Are we alone in the cosmos? How are scientists seeking signs of life beyond our home planet? Could we colonize other planets, moons, or even other star systems? This introductory textbook, written by a team of four renowned science communicators, educators, and researchers, tells the story of how modern science is seeking the answers to these and other fascinating questions. They are the questions that are at the heart of the highly interdisciplinary field of astrobiology, the study of life in the universe.

- An acclaimed text designed to inspire students of all backgrounds to explore foundational questions about life in the cosmos
- Completely revised and updated to include the latest developments in the field, including recent exploratory space missions to Mars, frontier exoplanet science, research on the origin of life on Earth, and more
- Enriched with helpful learning aids, including in-chapter Think about It questions, optional Do the Math and Special Topic boxes, Movie Madness boxes, end-of-chapter exercises and problems, quick quizzes, and much more
- Supported by instructor's resources, including an illustration package and test bank, available upon request

Jeffrey Bennett is an astrophysicist and educator whose publications include the bestselling textbook *The Cosmic Perspective* as well as an award-winning series of children's books. **Seth Shostak** is a senior astronomer at the SETI Institute and the author of *Confessions of an Alien Hunter*. **Nicholas Schneider** is a professor of astrophysical and planetary sciences at the University of Colorado Boulder and coauthor of *The Cosmic Perspective* and other bestselling textbooks. **Meredith MacGregor** is an assistant professor of astrophysical and planetary sciences at the University of Colorado Boulder.

2022, 544 pages, 393 color illus., 21 tables
 Paperback 9780691241784 \$100.00 | £84.00 ebook 9780691241791



The visionary science behind the digital human twins that will enhance our health and our future

Virtual You

Virtual You is a panoramic account of efforts by scientists around the world to build digital twins of human beings, from cells and tissues to organs and whole bodies. These virtual copies will usher in a new era of personalized medicine, one in which your digital twin can help predict your risk of disease, participate in virtual drug trials, shed light on the diet and lifestyle changes that are best for you, and help identify therapies to enhance your well-being and extend your lifespan—but thorny challenges remain.

In this deeply illuminating book, Peter Coveney and Roger Highfield reveal what it will take to build a virtual, functional copy of a person in five steps. Along the way, they take you on a fantastic voyage through the complexity of the human body, describing the latest scientific and technological advances—from multiscale modeling to extraordinary new forms of computing—that will make “virtual you” a reality, while also considering the ethical questions inherent to realizing truly predictive medicine.

With an incisive foreword by Nobel Prize–winning biologist Venki Ramakrishnan, *Virtual You* is science at its most astounding, showing how our virtual twins and even whole populations of virtual humans promise to transform our health and our lives in the coming decades.

Peter Coveney is director of the Centre for Computational Science at University College London, professor at the Informatics Institute, University of Amsterdam, and adjunct professor at the Yale School of Medicine. **Roger Highfield** is science director at the Science Museum Group, a member of the Medical Research Council, and visiting professor at University College London and the Dunn School, University of Oxford. They are the authors of *Frontiers of Complexity* and *The Arrow of Time*.

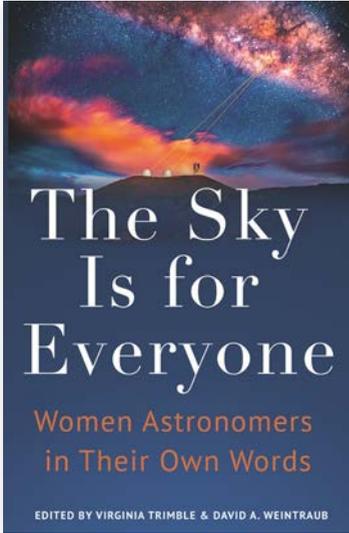
March 2023, 336 pages, 54 b/w and 15 color illus.

Hardback 9780691223278

\$29.95 | £25.00

ebook 9780691223407

Audiobook 9780691251097



An inspiring anthology of writings by trailblazing women astronomers from around the globe

The Sky Is for Everyone

The Sky Is for Everyone is an internationally diverse collection of autobiographical essays by women who broke down barriers and changed the face of modern astronomy. Virginia Trimble and David Weintraub vividly describe how, before 1900, a woman who wanted to study the stars had to have a father, brother, or husband to provide entry, and how the considerable intellectual skills of women astronomers were still not enough to enable them to pry open doors of opportunity for much of the twentieth century. After decades of difficult struggles, women are closer to equality in astronomy than ever before. Trimble and Weintraub bring together the stories of the tough and determined women who flung the doors wide open. This triumphant anthology serves as an inspiration to current and future generations of women scientists while giving voice to the history of a transformative era in astronomy.

With contributions by Neta A. Bahcall, Beatriz Barbuy, Ann Merchant Boesgaard, Jocelyn Bell Burnell, Catherine Cesarsky, Poonam Chandra, Xuefei Chen, Cathie Clarke, Judith Gamora Cohen, France Anne Córdova, Anne Pyne Cowley, Božena Czerny, Wendy L. Freedman, Yilen Gómez Maqueo Chew, Gabriela González, Saeko S. Hayashi, Martha P. Haynes, Roberta M. Humphreys, Vicky Kalogera, Gillian Knapp, Shazrene S. Mohamed, Carole Mundell, Priyamvada Natarajan, Dara J. Norman, Hiranya Peiris, Judith Lynn Pipher, Dina Prialnik, Anneila I. Sargent, Sara Seager, Gražina Tautvaišienė, Silvia Torres-Peimbert, Virginia Trimble, Meg Urry, Ewine F. van Dishoeck, Patricia Ann Whitelock, Sidney Wolff, and Rosemary F. G. Wyse.

Virginia Trimble is professor of physics and astronomy at the University of California, Irvine. An award-winning astronomer, she earned her PhD at Caltech in 1968, when some leading universities did not admit women. **David A. Weintraub** is professor of astronomy, history, and the communication of science and technology at Vanderbilt University. His books include *Life on Mars: What to Know Before We Go* (Princeton).

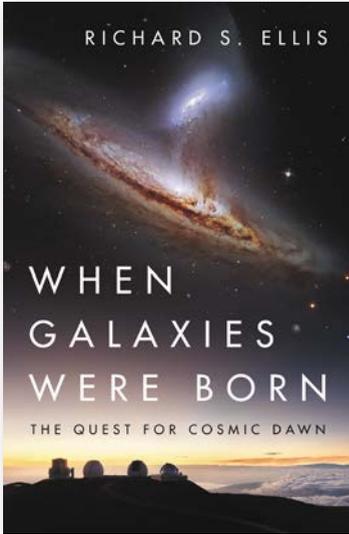
2022. 504 pages. 72 b/w illus.

Hardback 9780691207100

\$29.95 | £25.00

ebook 9780691237367

Audiobook 9780691243696



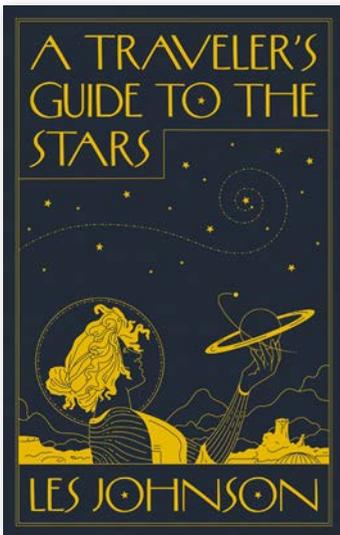
One of today's leading astronomers takes readers inside the decades-long search for the first galaxies and the origin of starlight

When Galaxies Were Born

Astronomers are like time travelers, scanning the night sky for the outermost galaxies that first came into being when our universe was a mere fraction of its present age. *When Galaxies Were Born* is Richard Ellis's firsthand account of how a generation of scientists harnessed the world's largest telescopes to decipher the history of the universe and witness cosmic dawn. Stunningly illustrated, *When Galaxies Were Born* is a scientific adventure enlivened by personal insights and anecdotes that enable readers to share in the discovery at the frontiers of astronomy.

Richard S. Ellis is professor of astrophysics at University College London and a world-renowned observational astronomer who has made numerous discoveries about the nature and evolution of the universe.

November 2022. 280 pages. 56 color + 18 b/w illus.
Hardback 9780691211305 \$33.00 | £28.00 ebook 9780691241678



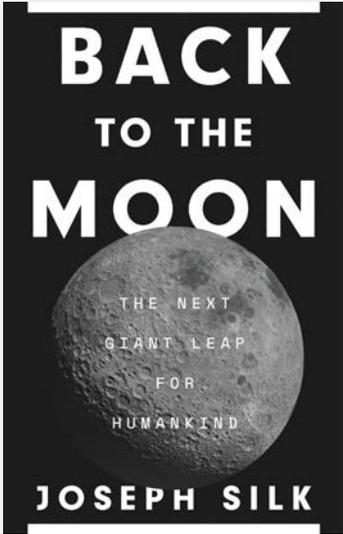
A brief guide to the real science of interstellar travel

A Traveler's Guide to the Stars

With known exoplanets now numbering in the thousands and initiatives like 100 Year Starship and Breakthrough Starshot advancing the idea of interstellar travel, the age-old dream of venturing forth into the cosmos and perhaps even colonizing distant worlds may one day become a reality. *A Traveler's Guide to the Stars* reveals how. *A Traveler's Guide to the Stars* is your passport to the next great frontier of human discovery, providing a rare inside look at the remarkable breakthroughs in science and technology that will help tomorrow's space travelers chart a course for the stars.

Les Johnson serves as principal investigator for NASA's first interplanetary solar sail space missions, Near-Earth Asteroid Scout and Solar Cruiser, and lives in Madison, Alabama.

2022. 240 pages. 14 b/w illus.
Hardback 9780691212371 \$27.95 | £22.00 ebook 9780691240077



A scientist's inspiring vision of our return to the Moon as humanity's next thrilling step in space exploration

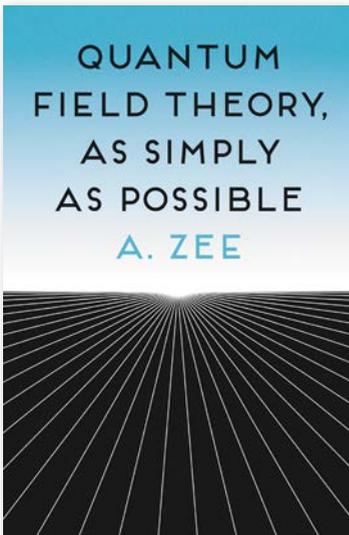
Back to the Moon

Just over half a century since Neil Armstrong first stepped foot on the lunar surface, a new space race to the Moon is well underway and rapidly gaining momentum. Laying out a vision for the next fifty years, *Back to the Moon* is astrophysicist Joseph Silk's persuasive and impassioned case for putting scientific discovery at the forefront of lunar exploration. Addressing both the daunting challenges and the immense promise of lunar exploration and exploitation, *Back to the Moon* reveals how prioritizing science, and in particular lunar astronomy, will enable us to address the deepest cosmic mysteries.

Joseph Silk is Bloomberg Research Professor at Johns Hopkins University and a researcher at the Institute of Astrophysics in Paris and the Beecroft Institute for Particle Astrophysics and Cosmology at the University of Oxford.

November 2022. 304 pages. 10 b/w illus.

Hardback 9780691215235 \$29.95 | £25.00 ebook 9780691242880



An exceptionally accessible introduction to quantum field theory

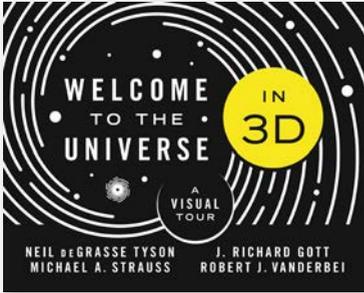
Quantum Field Theory, as Simply as Possible

Quantum field theory is by far the most spectacularly successful theory in physics, but also one of the most mystifying. *Quantum Field Theory, as Simply as Possible* provides an essential primer on the subject, giving readers the conceptual foundations they need to wrap their heads around one of the most important yet baffling subjects in physics. A unique and valuable introduction for students and general readers alike, *Quantum Field Theory, as Simply as Possible* explains how quantum field theory informs our understanding of the universe, and how it can shed light on some of the deepest mysteries of physics.

A. Zee is professor of physics at the Kavli Institute for Theoretical Physics at the University of California, Santa Barbara.

January 2023. 392 pages. 95 b/w illus.

Hardback 9780691174297 \$39.95 | £35.00 ebook 9780691239279



New York Times bestseller

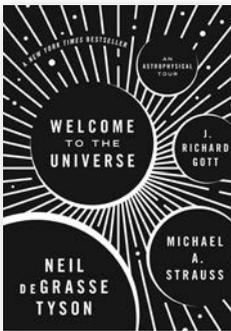
Journey into the universe through the most spectacular sights in astronomy in stereoscopic 3D

Welcome to the Universe in 3D

Welcome to the Universe in 3D takes you on a grand tour of the observable universe, guiding you through the most spectacular sights in the cosmos—in breathtaking 3D. Presenting a rich array of stereoscopic color images, which can be viewed in 3D using a special stereo viewer that folds easily out of the cover of the book, this book reveals your cosmic environment as you have never seen it before. The dramatic 3D images in this one-of-a-kind book will astonish you, extending your vision out to the farthest reaches of the universe. You will never look up into the night sky the same way again.

Neil deGrasse Tyson is director of the Hayden Planetarium at the American Museum of Natural History and the author of many books. **Michael A. Strauss** is professor of astrophysical sciences at Princeton University. **J. Richard Gott** is professor emeritus of astrophysical sciences at Princeton. **Robert J. Vanderbei** is a professor at Princeton.

2022. 208 pages. 70 color illus.
Hardback 9780691194073 \$29.95 | £25.00



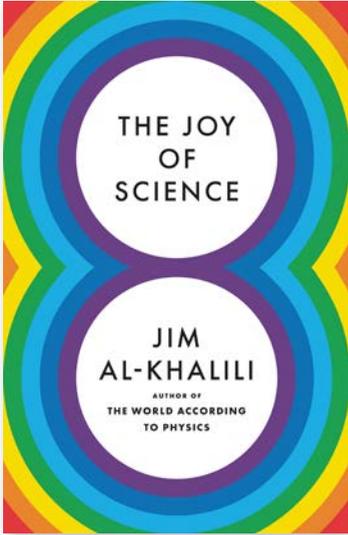
Welcome to the Universe
Neil deGrasse Tyson, Michael A. Strauss & J. Richard Gott
Hardback 9780691157245 \$39.95 | £35.00
ebook 9781400883226



Welcome to the Universe: The Problem Book
Neil deGrasse Tyson, Michael A. Strauss & J. Richard Gott
Paperback 9780691177816 \$38.00 | £32.00
ebook 9781400888993



A Brief Welcome to the Universe
Neil deGrasse Tyson, Michael A. Strauss, & J. Richard Gott
Paperback 9780691219943 \$14.95 | £12.99
ebook 9780691223612



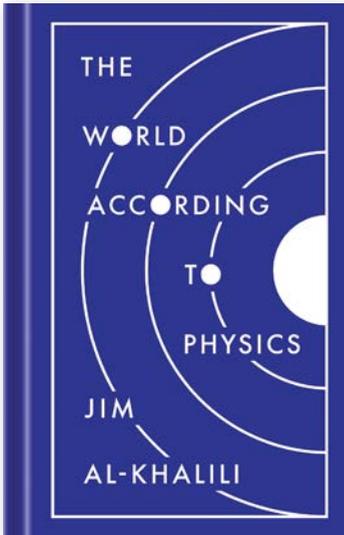
Quantum physicist, *New York Times* bestselling author, and BBC host Jim Al-Khalili reveals how 8 lessons from the heart of science can help you get the most out of life

The Joy of Science

Today's world is unpredictable and full of contradictions, and navigating its complexities while trying to make the best decisions is far from easy. *The Joy of Science* presents 8 short lessons on how to unlock the clarity, empowerment, and joy of thinking and living a little more scientifically. Acclaimed physicist Jim Al-Khalili invites readers to engage with the world as scientists have been trained to do. This book will empower you to think more objectively, see through the fog of your own preexisting beliefs, and lead a more fulfilling life.

Jim Al-Khalili is Distinguished Professor of Theoretical Physics at the University of Surrey and one of Britain's best-known science communicators.

2022. 224 pages.
Hardback 9780691211572 \$16.95 | £13.99
ebook 9780691235660 Audiobook 9780691240329



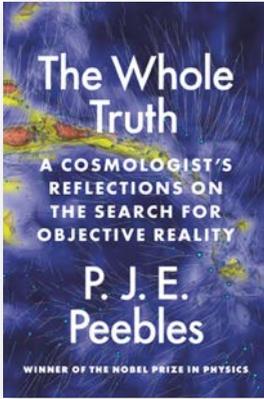
Quantum physicist, *New York Times* bestselling author, and BBC host Jim Al-Khalili offers a fascinating and illuminating look at what physics reveals about the world

The World According to Physics

Shining a light on the most profound insights revealed by modern physics, Jim Al-Khalili invites us all to understand what this important science tells us about the universe and the nature of reality itself. Al-Khalili begins by introducing the fundamental concepts of space, time, energy, and matter, and then describes the three pillars of modern physics, showing how all three must come together if we are ever to have a full understanding of reality. This deeply insightful book illuminates why physics matters to everyone and calls one and all to share in the profound adventure of seeking truth in the world around us.

Jim Al-Khalili

2020. 336 pages. 6 b/w illus.
Hardback 9780691182308 \$16.95 | £13.99
ebook 9780691201672 Audiobook 9780691205052

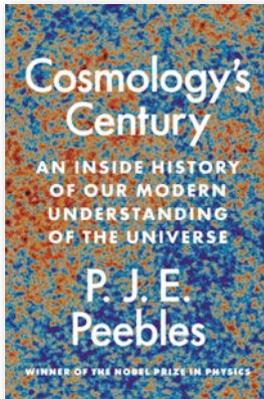


The Whole Truth

A century ago, thoughtful people questioned how reality could agree with physical theories that keep changing. Today, concepts like dark matter and dark energy further complicate and enrich the search for objective reality. *The Whole Truth* is a personal reflection on this ongoing quest by one of the world's most esteemed cosmologists.

P. J. E. Peebles is a Nobel Prize–winning physicist and the Albert Einstein Professor of Science Emeritus in the Department of Physics at Princeton University.

2022. 264 pages. 1 b/w illus. + 2 tables
 Hardback 9780691231358 \$27.95 | £22.00 ebook 9780691231365

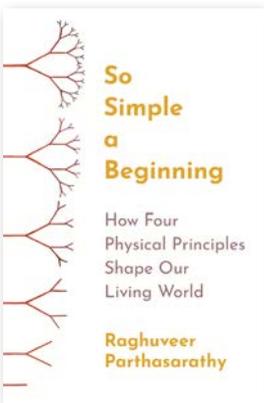


Cosmology's Century

Modern cosmology began a century ago with Albert Einstein's general theory of relativity and his notion of a homogenous, philosophically satisfying cosmos. *Cosmology's Century* is the story of how generations of scientists built on these thoughts and many new measurements to arrive at a well-tested physical theory of the structure and evolution of our expanding universe.

P. J. E. Peebles is a Nobel Prize–winning physicist and the Albert Einstein Professor of Science Emeritus in the Department of Physics at Princeton University.

2022. 440 pages. 16 color + 33 b/w illus. 3 tables.
 Paperback 9780691234472 \$24.95 | £20.00 ebook 9780691201665

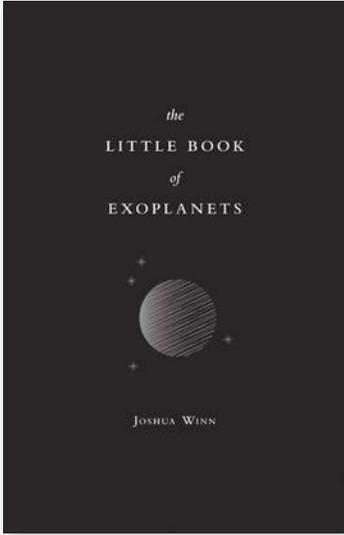


So Simple a Beginning

The living world is a realm of dazzling variety, yet a shared set of physical principles shapes the forms and behaviors of every creature in it. *So Simple a Beginning* shows how the emerging new science of biophysics is transforming our understanding of life on Earth and enabling potentially lifesaving but controversial technologies.

Raghuveer Parthasarathy is the Alec and Kay Keith Professor of Physics at the University of Oregon, where he is a member of the Institute of Molecular Biology and the Materials Science Institute.

2022. 336 pages. 119 color illus. 1 table.
 Hardback 9780691200408 \$35.00 | £30.00
 ebook 9780691231617 Audiobook 9780691234861



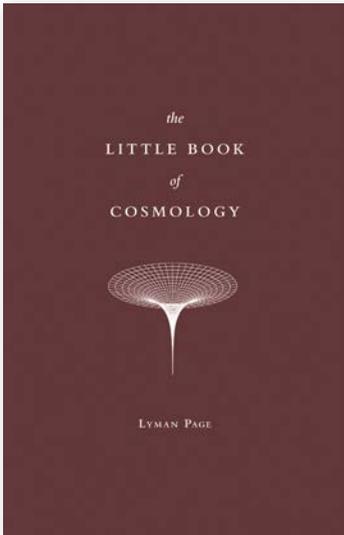
A concise and accessible introduction to exoplanets that explains the cutting-edge science behind recent discoveries

The Little Book of Exoplanets

For centuries, people have speculated about the possibility of planets orbiting distant stars, but only since the 1990s has technology allowed astronomers to detect them. In *The Little Book of Exoplanets*, Princeton astrophysicist Joshua Winn offers a brief and engaging introduction to the search for exoplanets and the cutting-edge science behind recent findings. In doing so, he chronicles the dawn of a new age of discovery—one that has rapidly transformed astronomy and our broader understanding of the universe.

Joshua Winn is professor of astrophysical sciences at Princeton University and a coinvestigator in NASA's ongoing Transiting Exoplanet Survey Satellite mission.

July 2023. 272 pages. 16 page color insert. 37 b/w illus.
Hardback 9780691215471 \$22.95 | £18.99
ebook 9780691221175 Audiobook 9780691251271



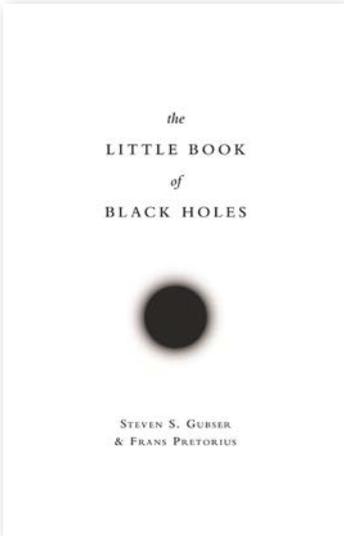
The cutting-edge science that is taking the measure of the universe

The Little Book of Cosmology

Written by one of the world's leading experimental cosmologists, this short but deeply insightful book describes what scientists are revealing through precise measurements of the faint thermal afterglow of the Big Bang—known as the cosmic microwave background, or CMB. Not only does Lyman Page explain current observations and measurements, he describes how they can be woven together into a unified picture to form the Standard Model of Cosmology. Yet much remains unknown, and this incisive book also describes the search for ever deeper knowledge at the field's frontiers—from quests to understand the nature of neutrinos and dark energy to investigations into the physics of the very early universe.

Lyman Page is the James S. McDonnell Distinguished University Professor of Physics at Princeton University.

2020. 152 pages. 9 color + 13 b/w illus. 1 table.
Hardback 9780691195780 \$19.95 | £16.99 ebook 9780691201696



Dive into a mind-bending exploration of the physics of black holes

The Little Book of Black Holes

Black holes have long intrigued scientists and the public with their bizarre and fantastical properties. Although Einstein understood that black holes were mathematical solutions to his equations, he never accepted their physical reality—a viewpoint many shared. This all changed in the 1960s and 1970s, when a deeper conceptual understanding of black holes developed just as new observations revealed the existence of quasars and X-ray binary star systems. *The Little Book of Black Holes* takes readers deep into the mysterious heart of the subject, offering rare clarity of insight into the physics that makes black holes simple yet destructive manifestations of geometric destiny.

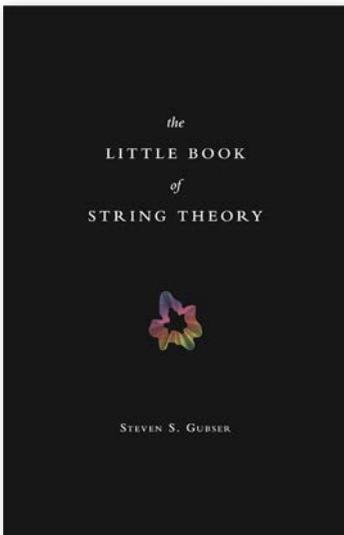
Steven S. Gubser (1972–2019) was professor of physics at Princeton University. **Frans Pretorius** is professor of physics at Princeton.

2017. 200 pages. 29 line illus.

Hardback 9780691163727

\$19.95 | £16.99

ebook 9781400888290



The essential beginner's guide to string theory

The Little Book of String Theory

The Little Book of String Theory offers a short, accessible, and entertaining introduction to one of the most talked-about areas of physics today. String theory has been called the "theory of everything." It seeks to describe all the fundamental forces of nature. It encompasses gravity and quantum mechanics in one unifying theory. But it is unproven and fraught with controversy. In plain English and with a minimum of mathematics, Steve Gubser covers strings, branes, string dualities, extra dimensions, curved spacetime, quantum fluctuations, symmetry, and supersymmetry. *The Little Book of String Theory* is the essential, most up-to-date beginner's guide to this multidimensional field of physics.

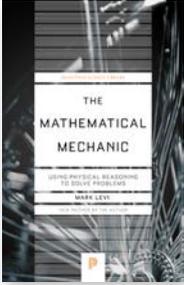
Steven S. Gubser (1972–2019) was professor of physics at Princeton University.

2010. 184 pages. 21 line illus.

Hardback 9780691142890

\$19.95 | £16.99

ebook 9781400834433



The Mathematical Mechanic
Mark Levi

Paper 9780691242057 \$18.95 | £15.99
ebook 9780691244174



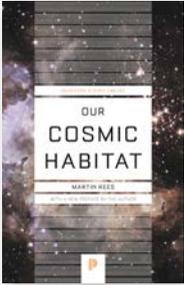
It's About Time
N. David Mermin

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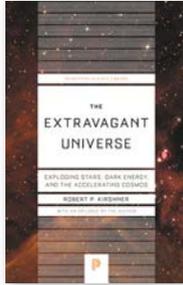
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Michael Nielsen

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ebook 9780691202853



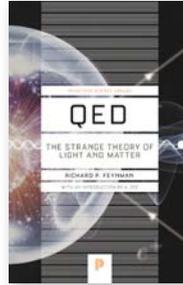
Our Cosmic Habitat
Martin Rees

Paper 9780691178097 \$17.95 | £14.99
ebook 9781400888986



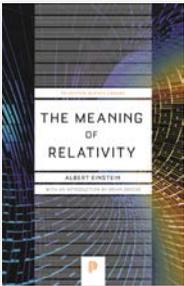
The Extravagant Universe
Robert P. Kirshner

Paper 9780691173184 \$19.95 | £16.99
ebook 9781400888306



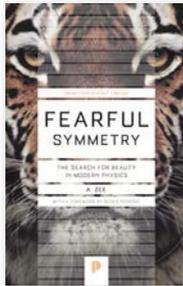
QED
Richard P. Feynman

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*Not for sale in the Commonwealth
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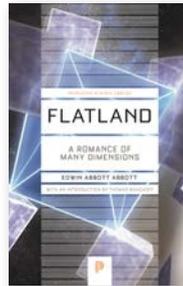
The Meaning of Relativity
Albert Einstein

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ebook 9781400851874
*Not for sale in the Commonwealth
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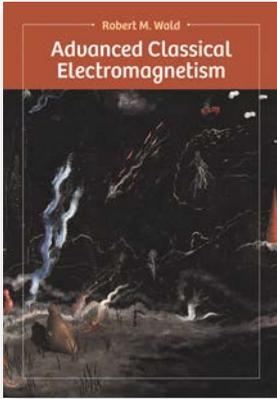
Fearful Symmetry
A. Zee

Paper 9780691173269 \$22.95 | £18.99
ebook 9781400874507



Flatland
Edwin Abbott Abbott

Paper 9780691165554 \$12.95 | £10.99
ebook 9781400866649

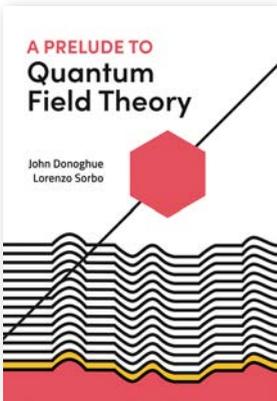


Advanced Classical Electromagnetism

Electromagnetism is usually taught in a quasi-historical fashion, but this tends to promote outdated ways of thinking about the theory. Robert M. Wald begins with Maxwell’s equations together with the formulas for the energy density, momentum density, and stress tensor of the electromagnetic field. He then proceeds through all the major topics in classical electromagnetism.

Robert M. Wald is the Charles H. Swift Distinguished Service Professor in the Department of Physics and the Enrico Fermi Institute at the University of Chicago.

2022. 248 pages. 16 b/w illus.
 Hardback 9780691220390 \$49.95 | £42.00 ebook 9780691230252

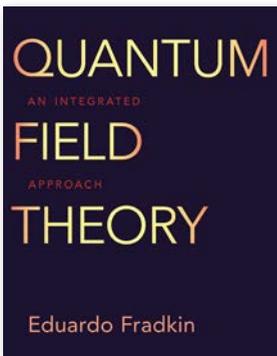


A Prelude to Quantum Field Theory

This textbook introduces the key concepts of quantum field theory in an accessible manner without sacrificing mathematical rigor. The result is a textbook that distills the general properties of the theory without overwhelming students with more advanced applications.

John Donoghue is Distinguished Professor Emeritus of Physics at the University of Massachusetts, Amherst. **Lorenzo Sorbo** is Professor of Physics at the University of Massachusetts, Amherst.

2022. 160 pages. 50 b/w illus.
 Hardback 9780691223490 \$90.00 | £75.00
 Paperback 9780691223483 \$29.95 | £25.00 ebook 9780691223506

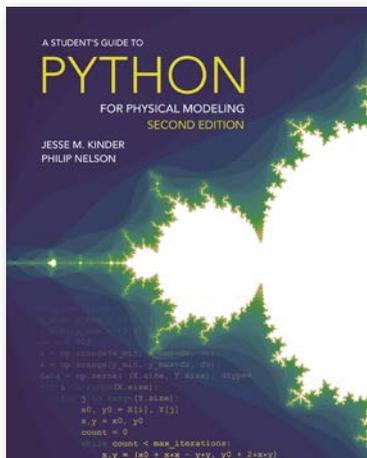


Quantum Field Theory

Quantum field theory was originally developed to describe quantum electrodynamics and other fundamental problems in high-energy physics, but today has become an invaluable conceptual and mathematical framework for addressing problems across physics. Developed from a year-long graduate course Eduardo Fradkin has taught for years to students of high-energy, condensed-matter, and statistical physics, this comprehensive textbook provides a fully “multicultural” approach to quantum field theory.

Eduardo Fradkin is the Donald Biggar Willett Professor of Physics at the University of Illinois, Urbana-Champaign.

2021. 760 pages. 161 b/w illus.
 Hardback 9780691149080 \$85.00 | £70.00 ebook 9780691189550



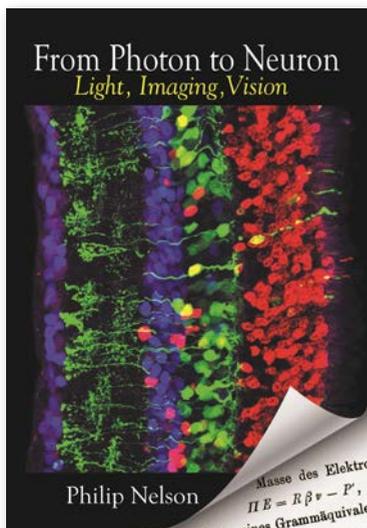
A fully updated tutorial on the basics of the Python programming language for science students

A Student's Guide to Python for Physical Modeling, Second Edition

This fully updated second edition of *A Student's Guide to Python for Physical Modeling* aims to help you, the student, teach yourself enough of the Python programming language to get started with physical modeling. You will learn how to install an open-source Python programming environment and use it to accomplish many common scientific computing tasks: importing, exporting, and visualizing data; numerical analysis; and simulation.

Jesse M. Kinder is associate professor of physics at the Oregon Institute of Technology. **Philip Nelson** is professor of physics at the University of Pennsylvania.

2021. 240 pages. 5 color illus.
 Hardback 9780691219288 \$75.00 | £62.00
 Paperback 9780691223650 \$24.95 | £20.00 ebook 9780691223667



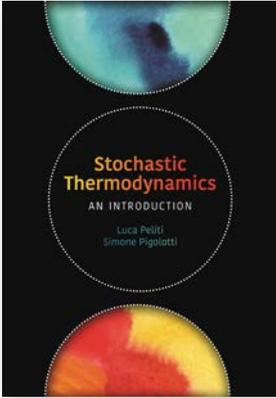
A richly illustrated undergraduate textbook on the physics and biology of light

From Photon to Neuron

From Photon to Neuron provides undergraduates with an accessible introduction to the physics of light and offers a unified view of a broad range of optical and biological phenomena. Along the way, this richly illustrated textbook builds the necessary background in neuroscience, photochemistry, and other disciplines, with applications to optogenetics, superresolution microscopy, the single-photon response of individual photoreceptor cells, and more. 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.

Philip Nelson is professor of physics at the University of Pennsylvania.

2017. 512 pages. 300 color illus.
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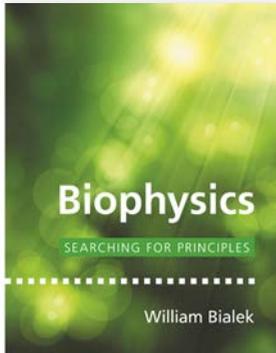


Stochastic Thermodynamics

This textbook provides an up-to-date pedagogical introduction to stochastic thermodynamics, guiding readers from basic concepts in statistical physics, probability theory, and thermodynamics to the most recent developments in the field.

Luca Peliti is deputy director of the Santa Marinella Research Institute and professor emeritus of statistical mechanics at the University of Naples Federico II. **Simone Pigolotti** is associate professor at the Okinawa Institute of Science and Technology, where he leads the Biological Complexity Unit.

2021. 272 pages. 46 b/w illus.
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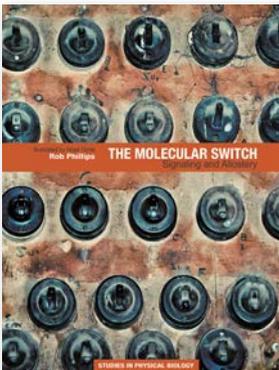


Biophysics

William Bialek provides the first graduate-level introduction to biophysics aimed at physics students. *Biophysics* emphasizes the unifying power of abstract physical principles to motivate new and novel experiments on biological systems.

William Bialek is the John Archibald Wheeler/Battelle Professor in Physics at Princeton University, where he is also a member of the multidisciplinary Lewis-Sigler Institute for Integrative Genomics, and is Visiting Presidential Professor of Physics at the Graduate Center of the City University of New York.

2012. 656 pages. 62 color illus. 14 halftones. 129 line illus.
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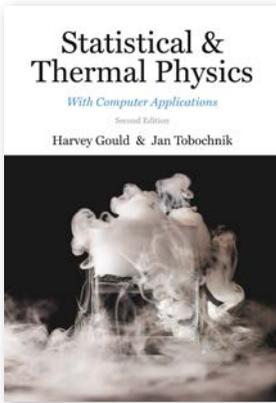


The Molecular Switch

The Molecular Switch articulates a biophysical perspective on signaling, showing how allostery—a powerful explanation of how molecules function across all biological domains—can be reformulated using equilibrium statistical mechanics, applied to diverse biological systems exhibiting switching behaviors, and successfully unify seemingly unrelated phenomena.

Rob Phillips is the Fred and Nancy Morris Professor of Biophysics and Biology at the California Institute of Technology.

2020. 440 pages. 351 color illus.
 Hardback 9780691200248 \$95.00 | £80.00 ebook 9780691200255

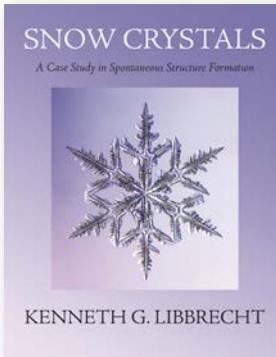


Statistical and Thermal Physics

Statistical and Thermal Physics introduces students to the ideas and techniques used in many areas of contemporary physics. The text requires only a background in introductory mechanics and some basic ideas of quantum theory, discussing material typically found in undergraduate texts as well as topics such as fluids, critical phenomena, and computational techniques.

Harvey Gould is Professor Emeritus of Physics at Clark University. **Jan Tobochnik** is the Dow Distinguished Professor of Natural Science at Kalamazoo College.

2021. 528 pages. 105 line illus. 35 tables.
 Hardback 9780691201894 \$85.00 | £70.00 ebook 9780691230849

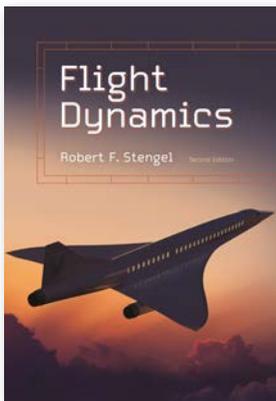


Snow Crystals

In *Snow Crystals*, Kenneth Libbrecht delves into the science of snowflakes, examining why ice crystals grow the way they do, how patterns emerge, and what they illuminate about the fundamental physics of crystal growth, structure formation, and self-assembly. From the molecular dynamics of surface premelting to the aerodynamics of falling snow, *Snow Crystals* chronicles the continuing quest to fully understand this fascinating phenomenon.

Kenneth G. Libbrecht is professor of physics at the California Institute of Technology.

2021. 456 pages. 461 color illus.
 Hardback 9780691200378 \$125.00 | £105.00 ebook 9780691223629

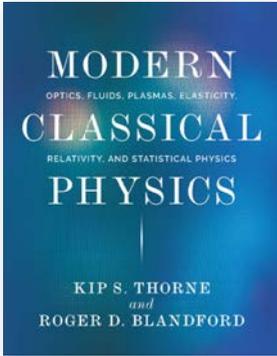


Flight Dynamics, Second Edition

This authoritative book by award-winning aeronautics engineer Robert Stengel presents traditional material in the context of modern computational tools and multivariable methods. The second edition features up-to-date examples; a chapter on control law design for digital fly-by-wire systems; new material on propulsion, aerodynamics of control surfaces, and aeroelastic control; and text boxes that introduce general mathematical concepts.

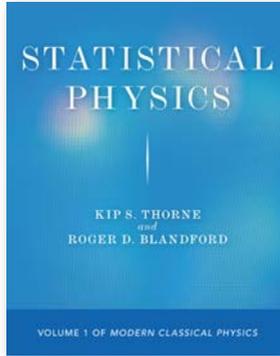
Robert F. Stengel is professor emeritus of mechanical and aerospace engineering and former associate dean of engineering and applied science at Princeton University.

2022. 912 pages. 527 b/w illus. 39 tables.
 Hardback 9780691220253 \$150.00 | £125.00 ebook



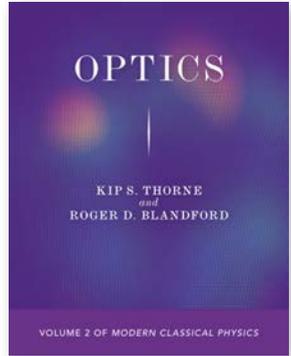
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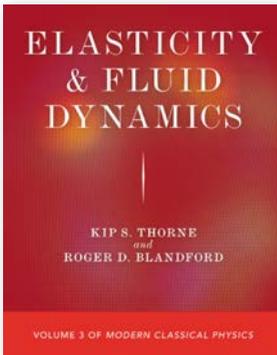
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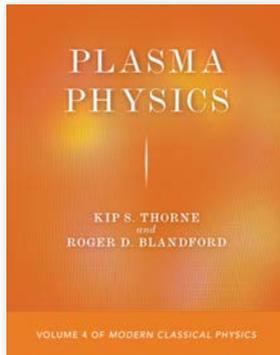
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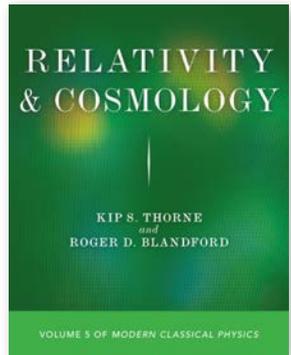
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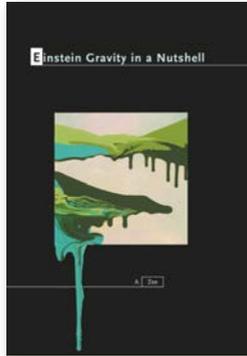
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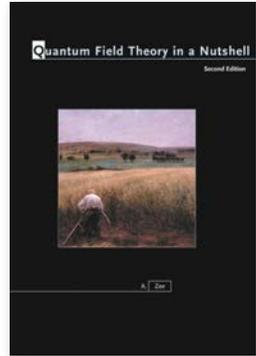
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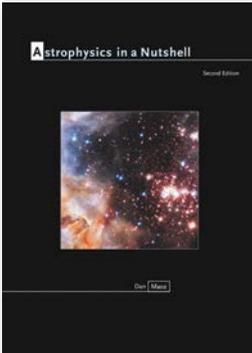
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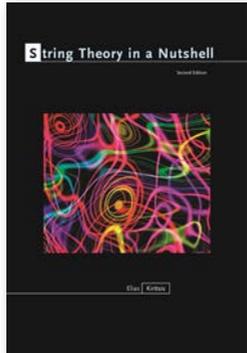
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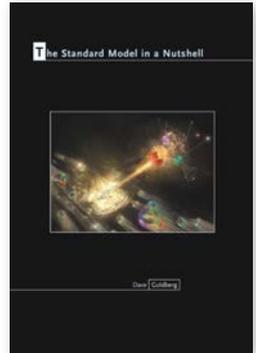
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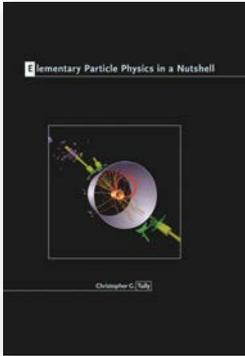
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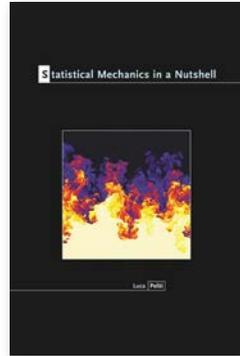
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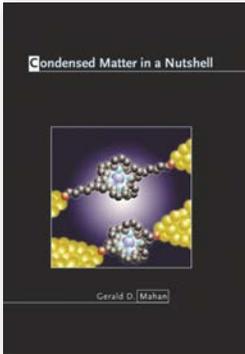
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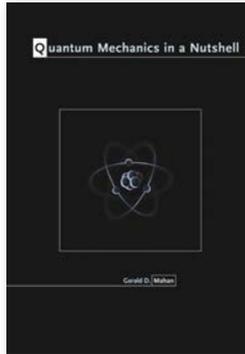
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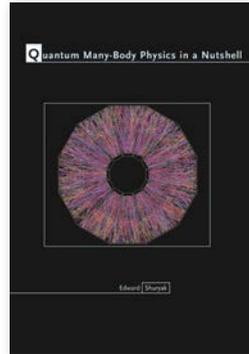
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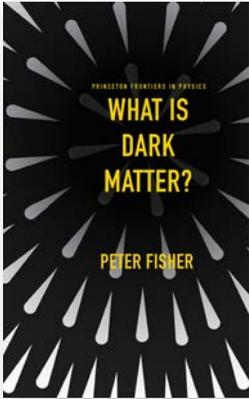
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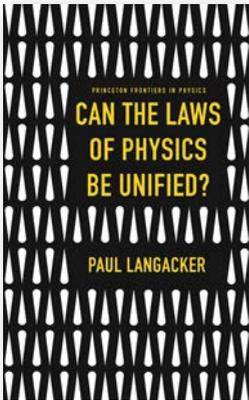


What Is Dark Matter?

In *What Is Dark Matter?*, particle physicist Peter Fisher brings readers quickly up to speed regarding the current state of the dark matter problem, offering relevant historical context as well as a close look at the cutting-edge research focused on revealing dark matter's true nature.

Peter Fisher is the Thomas A. Frank (1977) Professor of Physics and serves as head of the Physics Department at the Massachusetts Institute of Technology.

Princeton Frontiers in Physics
2022. 192 pages. 41 b/w illus.
Hardback 9780691148342 \$35.00 | £30.00 ebook 9780691185910



Can the Laws of Physics Be Unified?

The standard model of particle physics describes our current understanding of nature's fundamental particles and their interactions, yet gaps remain. *Can the Laws of Physics Be Unified?* describes the 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.

Paul Langacker is senior scientist at Princeton University, visitor at the Institute for Advanced Study in Princeton, & professor emeritus of physics at the University of Pennsylvania.

Princeton Frontiers in Physics
2017. 288 pages. 11 halftones. 18 line illus. 5 tables.
Hardback 9780691167794 \$38.00 | £32.00 ebook 9781400885503



How Do You Find an Exoplanet?

Alien worlds have long been a staple of science fiction. But today, the existence of planets outside our solar system—also known as exoplanets—has moved into the realm of science fact. *How Do You Find an Exoplanet?* sheds new light on the prospect of finding life outside our solar system, how surprising new observations suggest that we may not fully understand how planets form, and much more.

John Asher Johnson is professor of astronomy at Harvard University.

Princeton Frontiers in Physics
2015. 200 pages. 1 halftone. 17 line illus.
Hardback 9780691156811 \$38.00 | £32.00 ebook 9781400873999



How Did the First Stars and Galaxies Form?

Cosmology seeks to solve the fundamental mystery of our cosmic origins. This book offers a succinct and accessible primer at a time when breathtaking technological advances promise a wealth of new observational data on the first stars and galaxies.

Abraham Loeb is professor of astronomy and director of the Institute for Theory and Computation at Harvard University.

Princeton Frontiers in Physics
 2010. 216 pages. 14 halftones. 17 line illus.
 Paperback 9780691145167 \$38.00 | £32.00 ebook 9781400834068

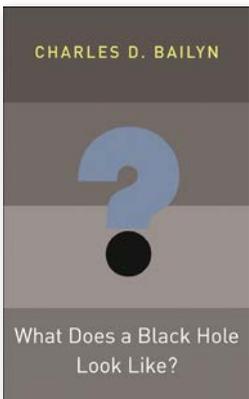


What Are Gamma-Ray Bursts?

Gamma-ray bursts are the brightest—and, until recently, among the least understood—cosmic events in the universe. These evanescent high-energy explosions confounded astronomers for decades. *What Are Gamma-Ray Bursts?* is a succinct introduction to this fast-growing subject, written by an astrophysicist who is at the forefront of today's research into these incredible cosmic phenomena.

Joshua S. Bloom is associate professor of astronomy at the University of California, Berkeley.

Princeton Frontiers in Physics
 2011. 280 pages. 25 line illus.
 Paperback 9780691145570 \$38.00 | £32.00 ebook 9781400837007

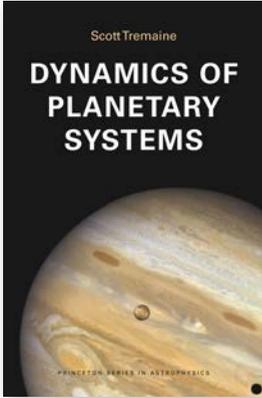


What Does a Black Hole Look Like?

Emitting no radiation or any other kind of information, black holes mark the edge of the universe—both physically and in our scientific understanding. Yet astronomers have found clear evidence for the existence of black holes. In this sophisticated introduction, leading astronomer Charles Bailyn goes behind the theory and physics of black holes to describe how astronomers are observing these enigmatic objects and developing a remarkably detailed picture of what they look like and how they interact with their surroundings.

Charles D. Bailyn is the A. Bartlett Giamatti Professor of Astronomy and Physics at Yale University.

Princeton Frontiers in Physics
 2014. 224 pages. 21 line illus.
 Hardback 9780691148823 \$39.95 | £35.00 ebook 9781400850568

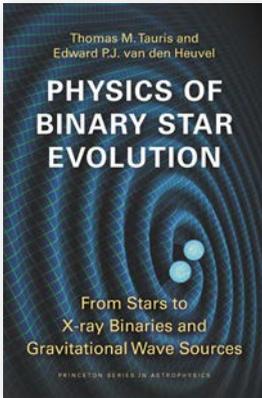


Dynamics of Planetary Systems

Celestial mechanics is one of the oldest subjects in the physical sciences. The book treats both traditional subjects as well as a diverse range of other topics, including chaos in the solar system, comet dynamics, extrasolar planets, planetesimal dynamics, resonances, tidal friction and disruption, and more..

Scott Tremaine is Professor Emeritus at the Institute for Advanced Study in Princeton and a member of the Royal Society of London, the Royal Society of Canada, and the US National Academy of Sciences.

February 2023. 640 pages. 63 b/w illus.
 Hardback 9780691207124 \$150.00 | £125.00
 Paperback 9780691207117 \$75.00 | £62.00 ebook 9780691244228

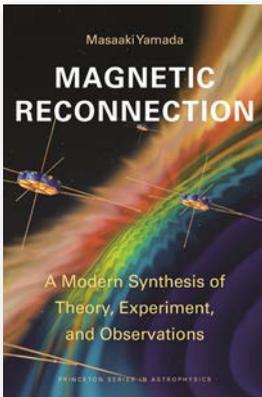


Physics of Binary Star Evolution

This is an up-to-date textbook on the astrophysics and evolution of binary star systems. It covers a range of phenomena and processes, including mass transfer and ejection, common envelopes, novae and supernovae, X-ray binaries, millisecond radio pulsars, and gravitational wave sources, and their links to stellar evolution.

Thomas M. Tauris is professor of theoretical astrophysics at Aalborg University. **Edward P. J. van den Heuvel** is emeritus professor of astrophysics at the University of Amsterdam and the Vrije Universiteit, Brussels.

March 2023. 864 pages. 350 color illus.
 Hardback 9780691179070 \$175.00 | £146.00
 Paperback 9780691179087 \$95.00 | £80.00 ebook 9780691239262



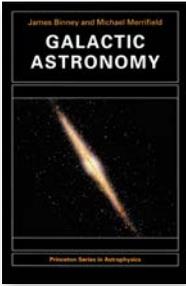
Magnetic Reconnection

In *Magnetic Reconnection*, Masaaki Yamada offers an illuminating synthesis of modern research and advances on this important topic. Aimed at advanced graduate students and researchers in plasma astrophysics, solar physics, and space physics, *Magnetic Reconnection* provides cutting-edge information on a vital area of scientific investigation.

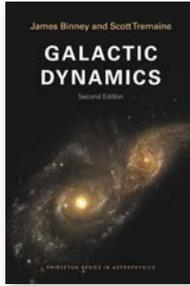
Masaaki Yamada is Distinguished Laboratory Research Fellow at the Princeton Plasma Physics Laboratory and head of the Magnetic Reconnection Experiment.

2022. 312 pages. 8 color + 118 b/w illus.
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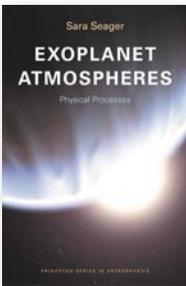
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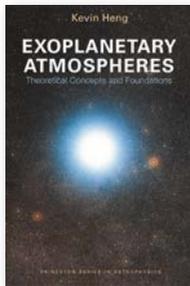
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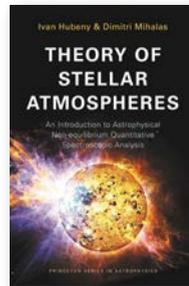
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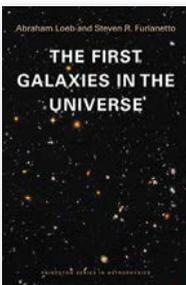
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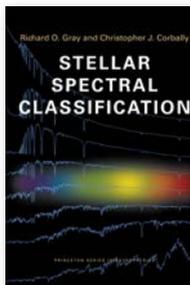
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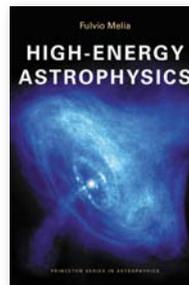
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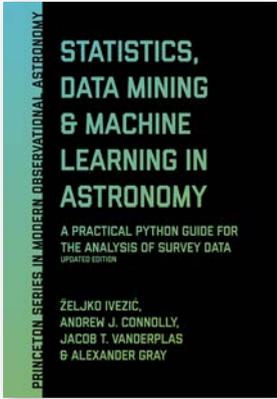
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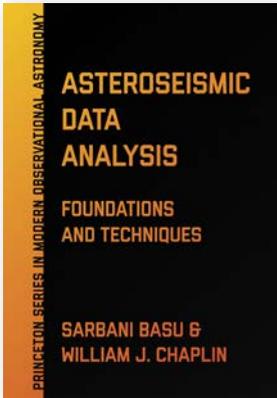


Statistics, Data Mining, and Machine Learning in Astronomy

Now fully updated, this is the essential introduction to the statistical methods needed to analyze complex data sets from astronomical surveys.

Željko Ivezić is professor of astronomy at the University of Washington. **Andrew J. Connolly** is professor of astronomy at the University of Washington. **Jacob T. VanderPlas** is a software engineer at Google. **Alexander Gray** is vice president of AI science at IBM.

2019. 560 pages. 12 color + 187 b/w illus. 13 tables
 Hardback 9780691198309 \$85.00 | £70.00 ebook 9780691197050



AsteroSeismic Data Analysis

AsteroSeismic Data Analysis presents readers with the foundational techniques used in the analysis and interpretation of asteroSeismic data on cool stars that show solar-like oscillations. The first book to describe in detail the different techniques used to analyze the data on stellar oscillations, *AsteroSeismic Data Analysis* offers an invaluable window into the hearts of stars.

Sarbani Basu is a professor in the Department of Astronomy at Yale University. **William J. Chaplin** is a professor in the School of Physics and Astronomy at the University of Birmingham.

2017. 352 pages. 159 line illus. 2 tables.
 Hardback 9780691162928 \$80.00 | £68.00 ebook 9781400888207

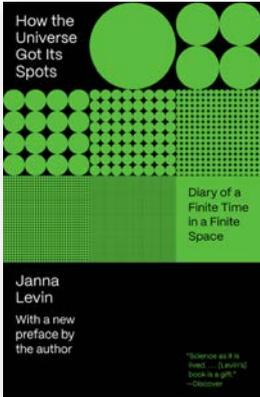


Essential Radio Astronomy

Essential Radio Astronomy is the only textbook on the subject specifically designed for a one-semester introductory course for advanced undergraduates or graduate students in astronomy and astrophysics. It starts from first principles in order to fill gaps in students' backgrounds and provide a useful reference to the essential equations used by practitioners.

James J. Condon and **Scott M. Ransom** are astronomers at the National Radio Astronomy Observatory and research professors of astronomy at the University of Virginia.

2016. 376 pages. 16 color illus. 23 halftones. 132 line illus. 5 tables.
 Hardback 9780691137797 \$85.00 | £70.00 ebook 9781400881161



How the Universe Got Its Spots

With a new preface by the author

Is the universe infinite or just really big? With this question, cosmologist Janna Levin announces the central theme of this book, which established her as one of the most direct, unorthodox, and creative voices in contemporary science.

Janna Levin is professor of physics and astronomy at Barnard College of Columbia University.

January 2023. 224 pages. 68 b/w illus.
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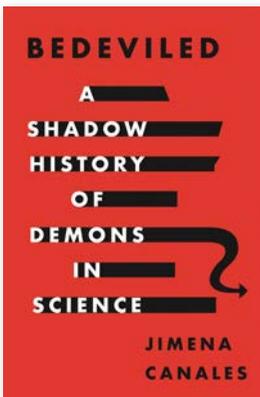
On the Future

With a new preface by the author

Humanity has reached a critical moment. Our world is unsettled and rapidly changing, and we face existential risks over the next century. Various outcomes—good and bad—are possible. In this short, exhilarating book, renowned scientist and bestselling author Martin Rees argues that humanity's prospects depend on our taking a very different approach to planning for tomorrow.

Martin Rees is Astronomer Royal, and has been Master of Trinity College and Director of the Institute of Astronomy at Cambridge University.

2021. 280 pages. 60 b/w illus. 4 tables.
Paperback 9780691231068 \$12.95 | £10.99 ebook 9780691231051

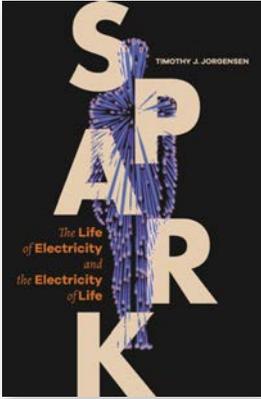


Bedeviled

Science may be known for banishing the demons of superstition from the modern world. Yet just as the demon-haunted world was being exorcized by the enlightening power of reason, a new kind of demon mischievously materialized in the scientific imagination itself. Spanning four centuries of discovery, Jimena Canales tells a shadow history of science and the demons that bedevil it.

Jimena Canales is a writer and faculty member of the Graduate College at the University of Illinois, Urbana-Champaign.

2022. 416 pages. 16 b/w illus.
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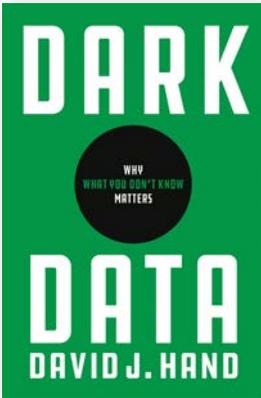


Spark

Life at its essence is nothing if not electrical. The story of how we came to understand electricity's essential role in all life is rooted in our observations of its influences on the body. *Spark* explains the science of electricity from this fresh, biological perspective. Filled with gripping adventures in scientific exploration, *Spark* offers an indispensable look at electricity, how it works, and how it animates our lives from within and without.

Timothy J. Jorgensen is professor of radiation medicine and codirector of the Medical Physics Graduate Program at Georgetown University.

June 2023. 456 pages. 26 b/w illus.
 Paperback 9780691248158 \$22.95 | £18.99 ebook 9780691232652

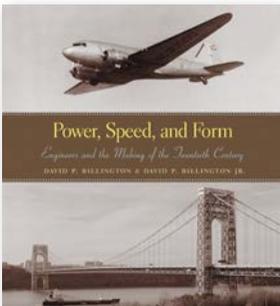


Dark Data

In *Dark Data*, David Hand takes us on a fascinating and enlightening journey into the world of the data we don't see. Examining a wealth of real-life examples, Hand gives us a practical taxonomy of the types of dark data that exist and the situations in which they can arise, so that we can learn to recognize and control for them.

David J. Hand is emeritus professor of mathematics and senior research investigator at Imperial College London, a former president of the Royal Statistical Society, and a fellow of the British Academy.

2022. 344 pages. 6 b/w illus. 6 tables.
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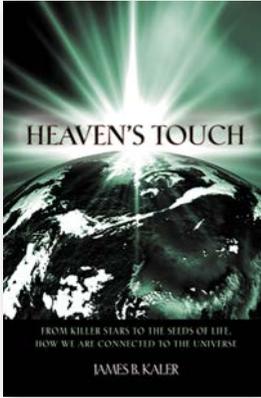


Power, Speed, and Form

Power, Speed, and Form is the first accessible account of the engineering behind eight breakthrough innovations that transformed American life from 1876 to 1939—the telephone, electric power, oil refining, the automobile, the airplane, radio, the long-span steel bridge, and building with reinforced concrete.

David P. Billington is Gordon Y. S. Wu Professor of Engineering at Princeton University. **David P. Billington Jr.** holds a PhD. in modern history from the University of Texas and is an independent scholar.

November 2022. 296 pages. 152 b/w illus.
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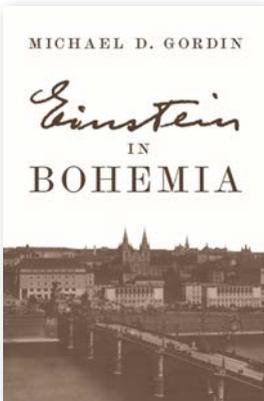


Heaven's Touch

As you gaze into the starry sky, you might feel isolated from the Universe around you—but you're not. This book reveals the startling ways life on Earth is touched by our cosmic environment, and demonstrates why without such contact, life itself wouldn't be possible. Informative and entertaining, *Heaven's Touch* reveals how intimately connected we really are with the dynamic Universe in which we live.

James B. Kaler is professor emeritus of astronomy at the University of Illinois, Urbana-Champaign.

2022. 264 pages. 59 b/w illus.
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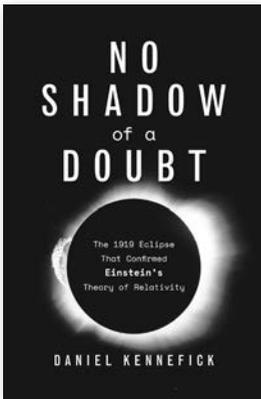


Einstein in Bohemia

In the spring of 1911, Albert Einstein moved with his wife and two sons to Prague, where he accepted a post as a professor of theoretical physics. Though he intended to make Prague his home, he lived there for just sixteen months. *Einstein in Bohemia* sheds light on this transformative period of Einstein's life and career, and brings vividly to life a beguiling city in the last years of the Austro-Hungarian Empire.

Michael D. Gordin is the Rosengarten Professor of Modern and Contemporary History at Princeton University.

2020. 360 pages. 7 b/w illus.
 Hardback 9780691177373 \$29.95 | £25.00 ebook 9780691199849



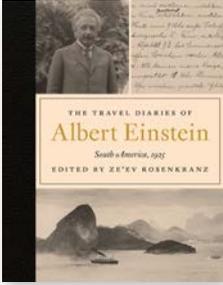
No Shadow of a Doubt

In 1919, British scientists led expeditions to Brazil and Africa to test Albert Einstein's new theory of general relativity in what became the century's most celebrated scientific experiment. Yet the effort to "weigh light" by measuring the gravitational deflection of starlight during the May 29, 1919, solar eclipse has become clouded by myth and skepticism. By chronicling the expeditions and their impact in greater detail than ever before, *No Shadow of a Doubt* reveals a story that is even richer than previously known.

Daniel Kennefick is associate professor of physics at the University of Arkansas, Fayetteville.

2019. 416 pages. 25 b/w illus.
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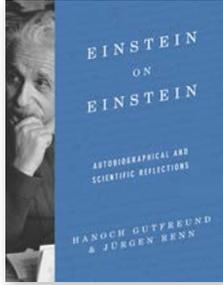
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The Travel Diaries of Albert Einstein

Albert Einstein

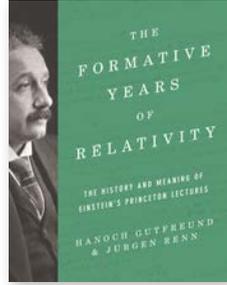
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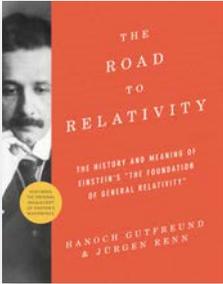
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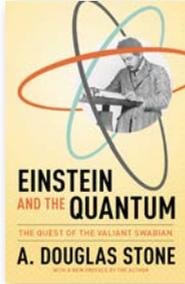
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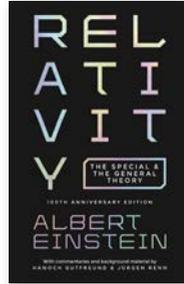
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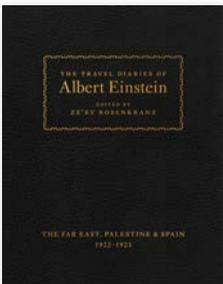
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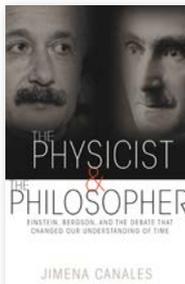
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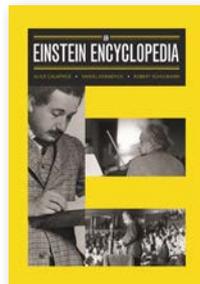
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June 2021. 1128 pages. 28 b/w illus. Cloth
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The Digital Einstein Papers

The Digital Einstein Papers is an exciting new free, open-access website that puts *The Collected Papers of Albert Einstein* online for the very first time, bringing the writings of the twentieth century’s most influential scientist to a wider audience than ever before. This unique, authoritative resource provides full public access to the complete transcribed, annotated, and translated contents of each print volume of *The Collected Papers*. The volumes are published by Princeton University Press, sponsored by the Hebrew University of Jerusalem, and supported by the California Institute of Technology. The contents of each new volume will be added to the website approximately eighteen months after print publication. Eventually, the website will provide access to all of Einstein’s writings and correspondence accompanied by scholarly annotation and apparatus, which are expected to fill thirty volumes.

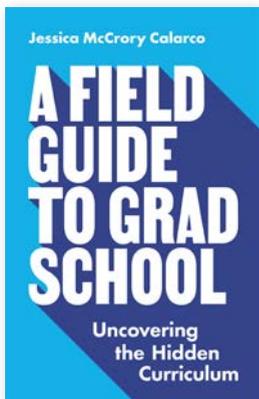


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Now fully updated and expanded, *The Scientist's Guide to Writing* offers practical advice on such topics as generating and maintaining writing momentum, structuring a scientific paper, revising a first draft, handling citations, responding to peer reviews, managing coauthorships, and more.

Stephen B. Heard is professor of biology at the University of New Brunswick in Canada.

2022. 368 pages. 17 b/w illus.
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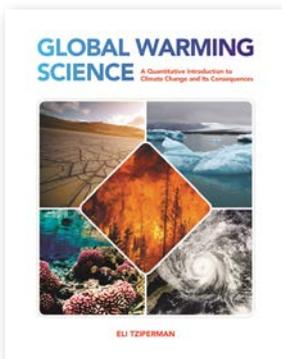


A Field Guide to Grad School

In this comprehensive survival guide for grad school, Jessica McCrory Calarco walks you through the secret knowledge and skills that are essential for navigating every critical stage of the post-graduate experience, from deciding whether to go to grad school in the first place to finishing your degree and landing a job. *A Field Guide to Grad School* will save you grief—and help you thrive—in school and beyond.

Jessica McCrory Calarco is associate professor of sociology at Indiana University.

Skills for Scholars
 2020. 480 pages. 18 b/w illus. 2 tables.
 Paperback 9780691201092 \$17.95 | £14.99 ebook 9780691201108



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Eli Tziperman is professor of oceanography and applied physics in the Department of Earth and Planetary Sciences and the School of Engineering and Applied Sciences at Harvard University.

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