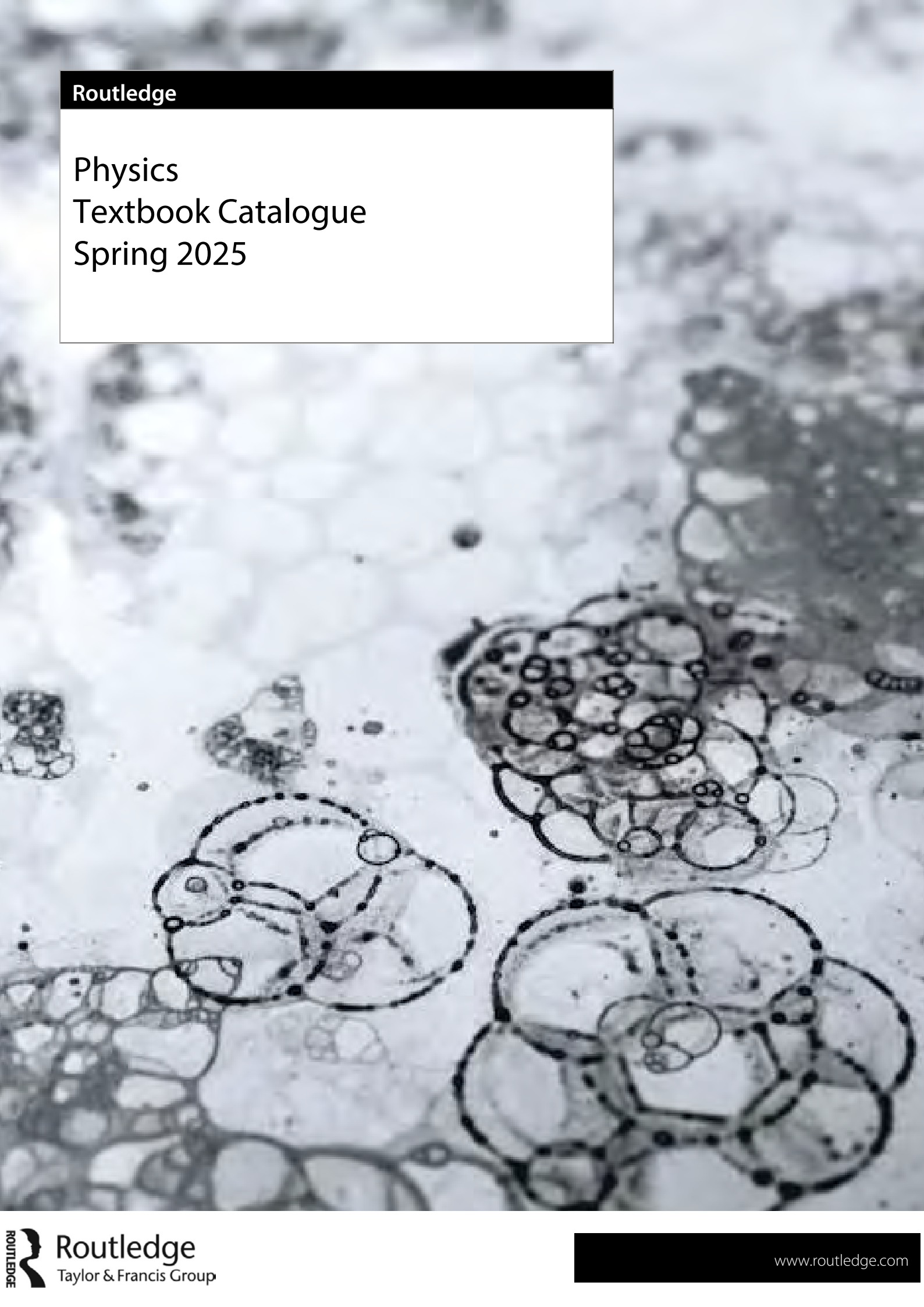


A black and white microscopic image of plant cells, showing various cell structures and organelles. The cells are arranged in clusters, with some showing prominent nuclei and others showing more complex internal structures. The image is used as a background for the cover of the Routledge Physics Textbook Catalogue.

Routledge

Physics
Textbook Catalogue
Spring 2025

Welcome

Welcome to the Taylor and Francis Physics Textbook Catalogue.

eBooks

We have over 50,000 eBooks available across the Humanities, Social Sciences, Behavioural Sciences, Built Environment, STM and Law, from leading Imprints, including Routledge, Focal Press and Psychology Press. These eBooks are available for both individual and institutional purchase.

INDIVIDUALS

Our eBooks are available from Amazon, Apple iBookstore, Google eBooks, Ebooks.com, Kobo, Barnes & Noble, Waterstones, Mobipocket, VitalSource, and CourseSmart.

LIBRARIES AND INSTITUTIONS

Subscribe to or purchase a wide range of eBook packages or pick and mix your own from our complete collection (a minimum number of titles applies). FREE TRIALS are available. For more information, please visit www.tandfebooks.com or contact your local sales team.

eUpdates

Register your email at www.tandf.co.uk/eupdates to receive information on books, journals and other news within your area of interest.

an **informa** business

Prices, publication dates and content are correct at time of going to press, but may be subject to change without notice.

Partnership Opportunities at Routledge

At Routledge we always look for innovative ways to support and collaborate with our readers and the organizations they represent.

If you or your organization would like to discuss partnership opportunities, from reciprocal marketing activities to commercial enterprises, please do get in touch on partnerships@routledge.com.

Considering Books for Course Use?



This symbol shows books that are available as complimentary exam copies for lecturers or faculty considering them for course adoption. To obtain your copy visit the URL listed beneath the title in the catalog and select your choice of print or electronic copy.

Visit www.routledge.com or in the US you can call 1-800-634-7064.



This symbol shows books that are available as electronic inspection copies only.

For a complete list, visit: www.routledge.com/representatives.

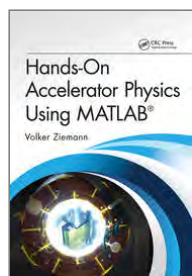
Trade Customers' Representatives, Agents and Distribution

For a complete list, visit:
www.routledge.com/representatives.

Contents

Accelerator Physics	2	Quantum Mechanics / Quantum Field Theory, Advanced	58
Astrobiology	3	Radiation	59
Astronomy	4	Radiation Physics	60
Astrophysics	6	Radiology	61
Atomic Physics	7	Relativity	62
Biomedical Engineering	8	Science Communication / General Skills	64
Biophysics	9	Scientific computing / Computational Physics	65
Biophysics, Advanced	12	Semiconductor Physics	66
Classical and Quantum Mechanics	14	Sensors	67
Climate Physics / Green Physics	16	Solid State Physics	68
Computational Physics	17	Spectroscopy	69
Conceptual & Theoretical Physics	19	Spintronics	70
Condensed and Soft Matter	21	Statistical Physics and Mechanics	71
Condensed Matter Physics / Materials Science	22	Statistical Thermodynamics	72
Cosmology	24	Superconductivity	73
Econophysics	25	Supersymmetry	74
Electricity and Magnetism	26	Supersymmetry and Standard Model	75
Electrodynamics	27	Sustainable Energy / Energy Physics	76
Gauge Theory & String Theory	28	Thermodynamics	77
General & Introductory Physics	29	Waves and Fluids	79
Imaging	32	Index	80
Interdisciplinary / Research Skills	33		
Life Sciences	34		
Materials Science	35		
Mathematical Physics	36		
Mechanics/Classical Mechanics	39		
Medical Imaging	40		
Medical Physics	41		
Microscopy	43		
Nanomaterials	44		
Nuclear Physics	46		
Optics	47		
Optics, Advanced	48		
Particle and High Energy Physics	50		
Particle and High Energy Physics, Advanced	52		
Particle Physics	53		
Planetary Physics	54		
Plasma Physics	55		
Plasma Physics, Advanced	56		
Quantum Mechanics	57		

Hands-On Accelerator Physics Using MATLAB®



Volker Ziemann

This book provides an introduction into the methods by which accelerators are designed and how they operate. All theoretical concepts and key components are explained with the help of commonly used MATLAB® code. This unique approach provides a look at what goes on 'under the hood' inside modern accelerators and presents readers with the tools to perform their own investigations in their independent research or student labs. This book will be of interest to graduate students and postgraduate researchers studying accelerator physics.

CRC Press

March 2021 : 372pp

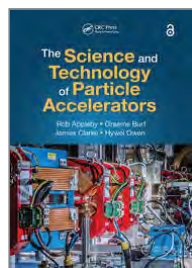
Pb: 978-0-367-77989-4 : **£47.99**

Hb: 978-1-138-58994-0 : **£180**

eBook: 978-0-429-49129-0

* For full contents and more information, visit: www.routledge.com/9780367779894

The Science and Technology of Particle Accelerators



Rob Appleby , Graeme Burt , James Clarke , Hywel Owen

This book provides integrated coverage of accelerator science and technology, this book presents the fundamental concepts alongside detailed engineering discussions and extensive practical guidance, including many numerical examples. For each topic, the authors provide a description of the physical principles, a guide to the practical application of those principles, and a discussion of how to design the components that allow the application to be realised.

CRC Press

August 2022 : 318pp

Pb: 978-1-032-39984-3 : **£45.99**

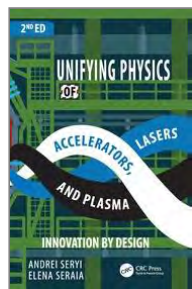
Hb: 978-1-138-49987-4 : **£120**

eBook: 978-1-351-00796-2

* For full contents and more information, visit: www.routledge.com/9781032399843

2ND EDITION

Unifying Physics of Accelerators, Lasers and Plasma



Andrei Seryi John Adams Institute for Accelerator Science, University of Oxford, UK, **Elena Seraia**

Unifying Physics of Accelerators, Lasers and Plasma outlines a path from idea to practical implementation of scientific and technological innovation. This second edition has been updated throughout, with new content on superconducting technology, linacs, energy recovery, polarization, various topics of advanced technology, etc., making it relevant for the Electron-Ion Collider project, as well as for advanced lights sources, including energy recovery-based FELs .

CRC Press

March 2023 : 450pp

Pb: 978-1-032-35250-3 : **£58.99**

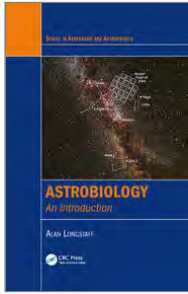
Hb: 978-1-032-35035-6 : **£145**

eBook: 978-1-003-32607-6

* For full contents and more information, visit: www.routledge.com/9781032352503

Astrobiology

An Introduction



Alan Longstaff

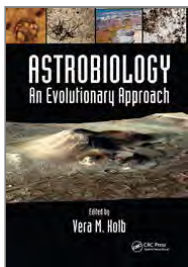
This textbook provides a full introduction to astrobiology suitable for university students at all levels. Reflecting a multiscience approach, the text covers topics such as stellar evolution, cosmic chemistry, planet formation, habitable zones, terrestrial biochemistry, and exoplanetary systems. The book discusses the origin, evolution, distribution, and future of life in the universe in an accessible manner, sparing calculus, curly arrow chemistry, and modeling details. It contains problems and worked examples, and includes a solutions manual with qualifying course adoption.

CRC Press
March 2021 : 468pp
Pb: 978-0-367-78370-9 : **£45.99**
Hb: 978-1-439-87576-6 : **£96.99**
eBook: 978-0-429-15369-3

* For full contents and more information, visit: www.routledge.com/9780367783709

Astrobiology

An Evolutionary Approach



Edited by **Vera M. Kolb** Department of Chemistry,
University of Wisconsin-Parkside, USA

Series: *Series in Astrobiology*

This book provides a full course in astrobiology with an emphasis on abiogenesis and evolution. It presents astrobiology both as a developing science and as the science of the future. The book begins with an overview of astrobiology, the origin of elements, and the formation of the solar system, planets, and exoplanets. Other topics covered include prebiotic synthesis of biochemical compounds, transition from abiotic to biotic, microorganisms in space, the roles of silicon in life, encapsulation of organic materials in protocells, cold and dry limits of life, virology, and more.

CRC Press
August 2014 : 504pp
Pb: 978-1-466-58461-7 : **£96.99**
eBook: 978-0-429-10264-6

* For full contents and more information, visit: www.routledge.com/9781466584617

A Practical Guide to Observational Astronomy



M. Shane Burns

A Practical Guide to Observational Astronomy provides a practical and accessible introduction to the ideas and concepts that are essential to making and analyzing astronomical observations. A key emphasis of the book is on how modern astronomy would be impossible without the extensive use of computers, both for the control of astronomical instruments and the subsequent data analysis.

CRC Press

September 2023 : 174pp

Pb: 978-1-032-06802-2 : **£46.99**

Hb: 978-0-367-76863-8 : **£84.99**

eBook: 978-1-003-20391-9

* For full contents and more information, visit: www.routledge.com/9781032068022

4TH EDITION

Astronomy

Principles and Practice, Fourth Edition (PBK)



A.E. Roy University of Glasgow, Scotland, **D. Clarke**
University of Glasgow, Scotland

Known to many astronomers as simply "Roy & Clarke," the authors revised and extended this edition to account for developments and changes in teaching over the last decade. It introduces the concepts and historical development of astronomy, presents a course on positional measurement and celestial mechanics, and describes the techniques and instrumentation of modern astronomical observation and measurements for undergraduate students studying astronomy, in addition to anyone who has a strong desire to understand the philosophy and applications of the science of astronomy.

CRC Press

June 2003 : 500pp

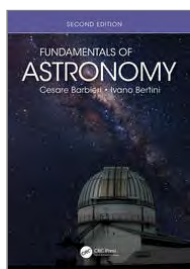
Pb: 978-0-750-30917-2 : **£58.99**

Hb: 978-1-138-40622-3 : **£185**

* For full contents and more information, visit: www.routledge.com/9780750309172

2ND EDITION

Fundamentals of Astronomy



Cesare Barbieri, **Ivano Bertini**

Providing a broad overview of foundational concepts, this second edition of Fundamentals of Astronomy covers topics ranging from spherical astronomy to reference systems, and celestial mechanics to astronomical photometry and spectroscopy. It expounds arguments of classical astronomy that provided the foundation for modern astrometry, whilst presenting the latest results of the very-long-baseline interferometry (VLBI) radio technique, optical interferometers and satellites such as Hipparcos and GAIA, and recent resolutions of the IAU and IERS regarding precession, forced and free nutation, and Earth figure and rotation.

CRC Press

November 2020 : 346pp

Pb: 978-0-367-25320-2 : **£68.99**

Hb: 978-0-367-25349-3 : **£175**

eBook: 978-0-429-28730-5

* For full contents and more information, visit: www.routledge.com/9780367253202

Fundamentals of Radio Astronomy

Observational Methods and Astrophysics - Two Volume Set



Jonathan Marr, **Ronald L. Snell**, **Stanley E. Kurtz**

This two-volume set of introductory textbooks are the first exclusively devoted to radio astronomy, and the telescopes, observation methods, and astrophysical processes that furnish this exciting field. Requiring no prior knowledge of astronomy, the two volumes are ideal textbooks for undergraduate and graduate students on radio astronomy courses, particularly those that emphasize radio wavelength instrumentation and observational techniques or the astrophysics of radio sources. The set enables instructors to pick and choose topics from the two volumes that best fit their courses.

CRC Press

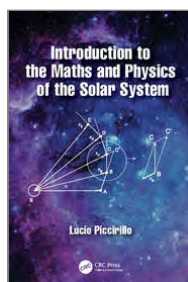
March 2021 : 700pp

Pb: 978-0-367-77795-1 : **£86.99**

Hb: 978-1-498-72581-1 : **£185**

* For full contents and more information, visit: www.routledge.com/9780367777951

Introduction to the Maths and Physics of the Solar System



Lucio Piccirillo University of Manchester, UK

This book provides readers with an understanding of the basic physics and mathematics that governs our solar system. It explores the mechanics of our Sun and planets; their orbits, tides, craters, eclipses and many other fascinating phenomena including asteroids and comets. This book is a valuable resource for undergraduate students studying astronomy and should be used in conjunction with other introductory astronomy textbooks in the field to provide additional learning opportunities.

CRC Press

March 2020 : 237pp

Pb: 978-0-367-00254-1 : **£56.99**

Hb: 978-0-367-02271-6 : **£145**

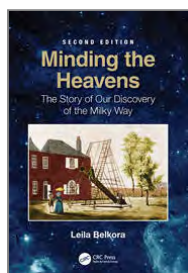
eBook: 978-0-429-40048-3

* For full contents and more information, visit: www.routledge.com/9780367002541

2ND EDITION

Minding the Heavens

The Story of our Discovery of the Milky Way



Leila Belkora

Series: Discovering Physics

This fully updated second edition of Minding the Heavens: The Story of Our Discovery of the Milky Way explores how we learned that we live in a galaxy, in a universe of composed of galaxies and unseen, mysterious dark matter. The story unfolds through short biographies of seven astronomers: Thomas Wright, William Herschel, and Wilhelm Struve of the 18th and 19th centuries; the transitional figure of William Huggins; and Jacobus Kapteyn, Harlow Shapley, and Edwin Hubble of the modern, big-telescope era.

CRC Press

May 2021 : 274pp

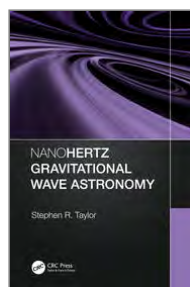
Pb: 978-0-367-41566-2 : **£36.99**

Hb: 978-0-367-41722-2 : **£96.99**

eBook: 978-0-367-81593-6

* For full contents and more information, visit: www.routledge.com/9780367415662

Nanohertz Gravitational Wave Astronomy



Stephen R. Taylor

Nanohertz Gravitational Wave Astronomy explores the exciting hunt for low frequency gravitational waves by using the extraordinary timing precision of pulsars.

CRC Press

November 2021 : 172pp

Pb: 978-0-367-76862-1 : **£58.99**

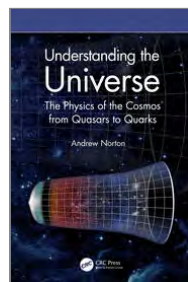
Hb: 978-1-032-14706-2 : **£150**

eBook: 978-1-003-24064-8

* For full contents and more information, visit: www.routledge.com/9780367768621

Understanding the Universe

The Physics of the Cosmos from Quasars to Quarks



Andrew Norton

Understanding the Universe: The Physics of the Cosmos from Quasars to Quarks explores how all areas of physics, from the very smallest scales to the very largest, come together to form our current understanding of the Universe. It takes readers on a fascinating journey, from the Big Bang and how the Universe has evolved, to how it appears now, and the possibilities for how it will continue to evolve in the future. It also explores the latest exciting developments in the area and how they impact our understanding of the Universe, such as quantum chromodynamics, black holes, dark energy, and gravitational waves.

CRC Press

May 2023 : 252pp

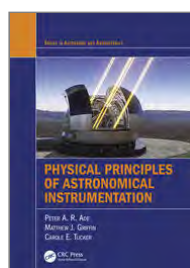
Pb: 978-0-367-75932-2 : **£46.99**

Hb: 978-0-367-74805-0 : **£120**

eBook: 978-1-003-16466-1

* For full contents and more information, visit: www.routledge.com/9780367759322

Physical Principles of Astronomical Instrumentation



Peter A. R. Ade, Matthew J. Griffin, Carole E. Tucker

Cardiff University, School of Physics and Astronomy, United Kingdom

Series: Series in Astronomy and Astrophysics

Offering practical advice on a range of wavelengths and tools, this highly accessible, self-contained book presents a broad overview of astronomical instrumentation, techniques, and tools. It provides a toolbox for observational capabilities across the electromagnetic spectrum and a guide to choosing which tools are best suited to different observations. Drawing on the notes and lessons of the authors' established graduate course, the text reviews basic concepts in astrophysics, spectroscopy, and signal analysis and includes illustrative problems and case studies.

CRC Press

January 2024 : 319pp

Pb: 978-1-032-04003-5 : **£46.99**

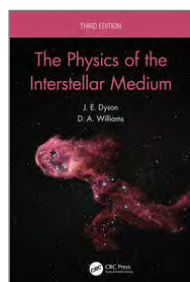
Hb: 978-1-439-87189-8 : **£110**

eBook: 978-1-315-37465-9

* For full contents and more information, visit: www.routledge.com/9781032040035

3RD EDITION

The Physics of the Interstellar Medium



J.E. Dyson Dept of Physics and Astronomy, University of Leeds, UK, **D.A. Williams** Dept of Physics and Astronomy, University of Leeds, UK

This third edition of The Physics of the Interstellar Medium continues to introduce advanced undergraduates to the fundamental processes and the wide range of disciplines needed to understand observations of the interstellar medium and its role in the Milky Way galaxy. The book is suitable for undergraduate students studying physics, astronomy, and astrophysics. The book also provides concise and straightforward discussions of interstellar physics and chemistry that are useful for more experienced readers.

CRC Press

July 2020 : 206pp

Pb: 978-0-367-90423-4 : **£61.99**

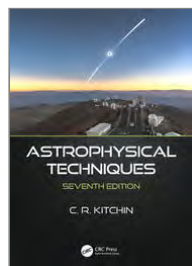
Hb: 978-0-367-45732-7 : **£150**

eBook: 978-1-003-02503-0

* For full contents and more information, visit: www.routledge.com/9780367904234

7TH EDITION

Astrophysical Techniques



C.R. Kitchin

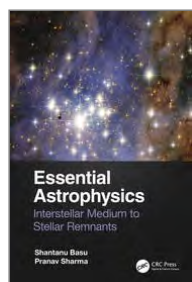
Long used in undergraduate and introductory graduate courses, *Astrophysical Techniques*, Seventh Edition provides an accessible yet comprehensive account of the innovative instruments, detectors, and techniques employed in astronomy and astrophysics. Emphasizing the underlying unity of all astronomical observations, this popular textbook provides a coherent state-of-the-art account of the instruments and techniques used in current astronomy and astrophysics.

CRC Press
July 2020 : 466pp
Pb: 978-1-138-59120-2 : **£86.99**
Hb: 978-1-138-59016-8 : **£215**
eBook: 978-0-429-49113-9

* For full contents and more information, visit: www.routledge.com/9781138591202

Essential Astrophysics

Interstellar Medium to Stellar Remnants



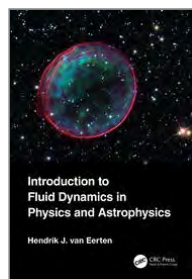
Shantanu Basu , Pranav Sharma

This book takes a reader on a tour of astronomical phenomena: from the vastness of the interstellar medium, to the formation and evolution of stars and planetary systems, through to white dwarfs, neutron stars, and black holes, the final objects of the stellar graveyard.

CRC Press
September 2021 : 172pp
Pb: 978-1-032-10563-5 : **£45.99**
Hb: 978-0-367-76847-8 : **£84.99**
eBook: 978-1-003-21594-3

* For full contents and more information, visit: www.routledge.com/9781032105635

Introduction to Fluid Dynamics in Physics and Astrophysics



Hendrik Jan van Eerten

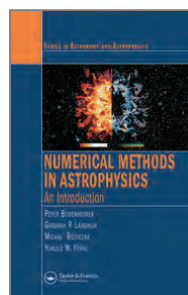
This textbook provides an accessible and self-contained introduction to the physics behind fluid dynamics; exploring the laws of nature describing three out of four fundamental states of matter (liquids, gases, and plasmas). Based on years of teaching of fluid dynamics theory and computation at advanced undergraduate level, it provides readers with the tools to understand and model fluid dynamical systems across a wide range of applications, from dense liquids to dilute space plasmas.

CRC Press
January 2024 : 326pp
Pb: 978-0-367-55235-0 : **£64.99**
Hb: 978-0-367-55777-5 : **£165**
eBook: 978-1-003-09508-8

* For full contents and more information, visit: www.routledge.com/9780367552350

Numerical Methods in Astrophysics

An Introduction



Peter Bodenheimer University of California, Santa Cruz, USA, **Peter Bodenheimer** University of California, USA, **Gregory P. Laughlin** University of California, USA, **Gregory P. Laughlin** University of California, Santa Cruz, USA, **Michal Rozyczka** , **Tomasz Plewa** Florida State University, USA, **Harold. W Yorke** Jet Propulsion Laboratory, PASADENA, USA, **Michal Rozyczka** , **Harold W. Yorke** Jet Propulsion Laboratory, CA, USA

Series: *Series in Astronomy and Astrophysics*

This guide develops many numerical techniques for solving major astrophysics problems. After an introduction to the basic equations and derivations, the book focuses on practical applications of the numerical methods. It explores hydrodynamic problems in one dimension, N-body particle dynamics, smoothed particle hydrodynamics, and stellar structure and evolution. The authors also examine advanced techniques in grid-based hydrodynamics, evaluate the methods for calculating the gravitational forces in an astrophysical system, and discuss specific problems in grid-based methods for radiation transfer. The book incorporates user manuals and a CD-ROM of the numerical codes.

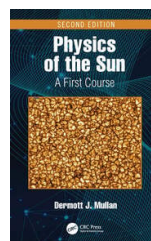
CRC Press
December 2006 : 346pp
Hb: 978-0-750-30883-0 : **£105**
eBook: 978-0-429-14816-3

* For full contents and more information, visit: www.routledge.com/9780750308830

2ND EDITION

Physics of the Sun

A First Course



Dermott J. Mullan University of Delaware, Newark, USA

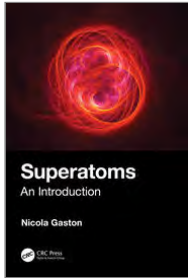
With an emphasis on numerical modelling, *Physics of the Sun: A First Course* presents a quantitative examination of the physical structure of the Sun and the conditions of its extended atmosphere. It gives step-by-step instructions for calculating the numerical values of various physical quantities in different regions of the Sun.

CRC Press
March 2025 : 434pp
Pb: 978-0-367-72032-2 : **£45.99**
Hb: 978-0-367-71039-2 : **£84.99**
eBook: 978-1-003-15311-5

* For full contents and more information, visit: www.routledge.com/9780367720322

Superatoms

An Introduction



Nicola Gaston

This book is designed to be an introduction to the field, covering the history of the concept and related theoretical models from cluster physics. It provides an overview of modern theoretical techniques and presents a survey of recent literature, with particular emphasis on the utilisation of these nanoscale building blocks.

CRC Press

April 2023 : 114pp

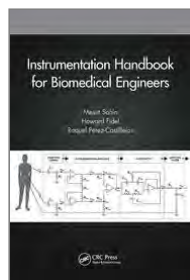
Pb: 978-1-032-41722-6 : **£46.99**

Hb: 978-0-367-76874-4 : **£125**

eBook: 978-1-003-35943-2

* For full contents and more information, visit: www.routledge.com/9781032417226

Instrumentation Handbook for Biomedical Engineers



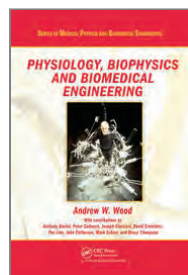
Mesut Sahin New Jersey Institute of Technology, Newark, New Jersey, USA, **Howard Fidel**, **Raquel Perez-Castillejos**

The book fills a void as a textbook with hands-on laboratory exercises designed for biomedical engineering undergraduates in their senior year or the first year of graduate studies specializing in electrical aspects of bioinstrumentation. Each laboratory exercise concentrates on measuring a biophysical or biomedical entity, such as force, blood pressure, temperature, heart rate, respiratory rate, etc., and guides students through all the way from sensor level to data acquisition and analysis on the computer. The book distinguishes itself from others by providing electrical circuits and other measurement setups that have been tested by the authors.

CRC Press
April 2022 : 216pp
Pb: 978-0-367-56668-5 : **£49.99**
Hb: 978-1-466-50466-0 : **£120**
eBook: 978-0-429-19398-9

* For full contents and more information, visit: www.routledge.com/9780367566685

Physiology, Biophysics, and Biomedical Engineering



Edited by **Andrew Wood** Swinburne University of Technology, Hawthorn, Victoria, Australia

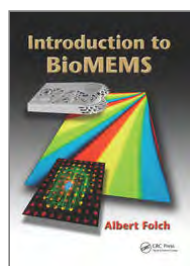
Series: *Series in Medical Physics and Biomedical Engineering*

Showing how biophysics and biomedical engineering have advanced modern medicine, this text provides a multidisciplinary understanding of biological phenomena and the instrumentation for monitoring these phenomena. It also explores the application of physics and engineering methods to medicine and biology. The book includes a range of numerical problems with worked solutions and offers MATLAB® code for advanced mathematical analysis of physiological and clinical monitoring systems. A solutions manual is available with qualifying course adoption.

CRC Press
February 2012 : 782pp
Hb: 978-1-420-06513-8 : **£86.99**
eBook: 978-0-429-09713-3

* For full contents and more information, visit: www.routledge.com/9781420065138

Introduction to BioMEMS



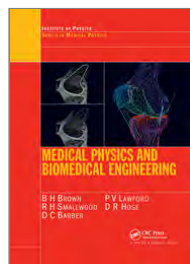
Albert Folch

This classroom-tested book—in color throughout—covers the whole breadth of this dynamic field, including classical microfabrication, microfluidics, tissue engineering, cell-based and noncell-based devices, and implantable systems. It gives readers a real sense of how the field has grown by providing historical perspectives and covering the state of the art. The text contains problem sets, design challenges, key references, and over 400 color figures, most of which are from the original researchers. Downloadable PowerPoint slides are available for instructors.

CRC Press
December 2019 : 528pp
Pb: 978-0-367-86496-5 : **£53.99**
Hb: 978-1-439-81839-8 : **£96.99**
eBook: 978-0-429-19404-7

* For full contents and more information, visit: www.routledge.com/9780367864965

Medical Physics and Biomedical Engineering



B.H. Brown, **R.H. Smallwood** University of Sheffield, England, UK, **D.C. Barber** Royal Hallamshire Hospital, Sheffield, UK, **P.V. Lawford**, **D.R. Hose** University of Sheffield, Sheffield, UK

Series: *Series in Medical Physics and Biomedical Engineering*

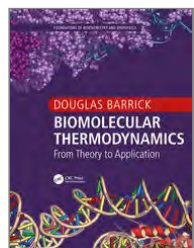
Appropriate for senior undergraduates and graduates, this text presents the underlying physics, electronics, anatomy, and physiology as well as addresses practical applications. The structured approach of the text builds and broadens the material of opening chapters in the later chapters. The book covers biomechanics, image formation techniques, biomedical devices, physiological signals and responses, and respiratory and cardiovascular function and measurement. It includes chapter problems with short questions to test understanding of the main principles and longer questions to test more in-depth knowledge, along with detailed bibliographies that provide references to introductory texts and research materials.

CRC Press
January 1998 : 762pp
Pb: 978-0-750-30368-2 : **£96.99**
eBook: 978-1-315-27560-4

* For full contents and more information, visit: www.routledge.com/9780750303682

Biomolecular Thermodynamics

From Theory to Application



Douglas Barrick Johns Hopkins University, Baltimore, Maryland, USA

Series: Foundations of Biochemistry and Biophysics

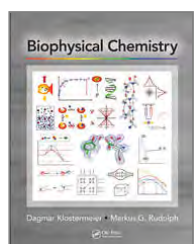
This book introduces the concepts and practical tools necessary to understand the behavior of biological macromolecules at a quantitative level. It begins by describing biochemical phenomena using principles of classical and statistical thermodynamics. Unlike other books, this text goes beyond theory to explain in detail how the equations are applied to the analysis of experimental measurements. This emphasis on real-world applications is continued throughout and is a major feature of the book.

CRC Press
September 2017 : 552pp
Pb: 978-1-439-80019-5 : **£110**
Hb: 978-1-138-06884-1 : **£175**
eBook: 978-1-315-38019-3

* For full contents and more information, visit: www.routledge.com/9781439800195

2ND EDITION

Biophysical Chemistry



Dagmar Klostermeier University of Muenster, Biophysical Chemistry, **Markus G. Rudolph**

This second edition has been fully updated throughout with novel techniques, with a new chapter on advances in cryo-electron microscopy and exciting new content throughout on big data techniques, structural bioinformatics, systems biology and interaction networks, and artificial intelligence and machine learning. The book is organized in four parts, covering thermodynamics, kinetics, molecular structure and stability, and biophysical methods. Cross-references within and between these parts emphasize common themes and highlight recurrent principles.

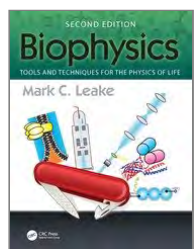
CRC Press
April 2025 : 952pp
Pb: 978-0-367-57238-9 : **£49.99**
Hb: 978-1-032-06083-5 : **£81.99**
eBook: 978-1-315-15691-0

* For full contents and more information, visit: www.routledge.com/9780367572389

2ND EDITION

Biophysics

Tools and Techniques for the Physics of Life



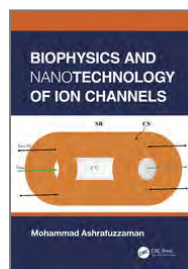
Mark C. Leake Biological Physical Sciences Institute (BPSI), University of York, UK

Biophysics: Tools and Techniques for the Physics of Life covers the experimental, theoretical and computational tools and techniques of biophysics. It addresses the purpose, science, and application of all physical science instrumentation, theoretical analysis and biophysical computational methods used in current research labs. The book first presents the historical background, concepts, and motivation for using a physical science toolbox to understand biology. It then familiarizes undergraduate students from the physical sciences with essential biological knowledge.

CRC Press
December 2023 : 456pp
Pb: 978-1-032-37038-5 : **£57.99**
Hb: 978-1-032-37321-8 : **£155**
eBook: 978-1-003-33643-3

* For full contents and more information, visit: www.routledge.com/9781032370385

Biophysics and Nanotechnology of Ion Channels



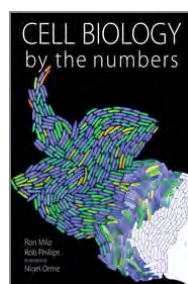
Mohammad Ashrafuzzaman

This book provides a comprehensive review of the biophysics and nanotechnology of ion channels. It details the biological and physiological entities of ion channels in cells and addresses various physical perspectives of ion channel structures and functions.

CRC Press
September 2023 : 318pp
Pb: 978-1-032-07374-3 : **£46.99**
Hb: 978-0-367-44545-4 : **£105**
eBook: 978-1-003-01065-4

* For full contents and more information, visit: www.routledge.com/9781032073743

Cell Biology by the Numbers



Ron Milo, **Rob Phillips**

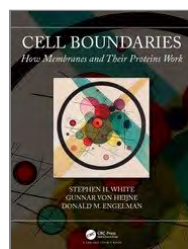
A full color book written as a pocket guide and handy reference for advanced students and practitioners in molecular and cell biology, chemistry, and biophysics. It is based on the BioNumbers website, a peer-reviewed open-source database of numbers, created and curated by author Ron Milo. Well-illustrated and approximately 350 pages long, the book explores some of the key numbers for cell biology, focusing on quantities that help us to think about the sizes, concentrations, rates, energies, information content, and other numbers that describe the living world.

Garland Science
December 2015 : 400pp
Pb: 978-0-815-34537-4 : **£43.99**
eBook: 978-0-429-25877-0

* For full contents and more information, visit: www.routledge.com/9780815345374

Cell Boundaries

How Membranes and Their Proteins Work



Stephen White, **Gunnar von Heijne**, **Donald Engelman** Professor of Molecular Biophysics and Biochemistry, Yale University, USA

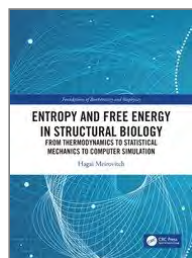
The central themes of Cell Boundaries concern the structural and organizational principles underlying cell membranes, and how these principles enable function. By building a biological and biophysical foundation for understanding the organization of lipids in bilayers and the folding, assembly, stability, and function of membrane proteins, the book aims to broaden the knowledge of bioscience students to include the basic physics and physical chemistry that inform us about membranes. Cell Boundaries was written with advanced undergraduates and beginning graduate students in the biological and physical sciences in mind.

Garland Science
June 2024 : 564pp
Pb: 978-0-367-35716-0 : **£56.99**
Hb: 978-0-815-34216-8 : **£84.99**
eBook: 978-0-429-34132-8

* For full contents and more information, visit: www.routledge.com/9780367357160

Entropy and Free Energy in Structural Biology

From Thermodynamics to Statistical Mechanics to Computer Simulation



Hagai Meirovitch

Series: Foundations of Biochemistry and Biophysics

Computer simulation has become the main engine of development in statistical mechanics. In structural biology, computer simulation constitutes the main theoretical tool for structure determination of proteins and for calculation of the free energy of binding, which are important in drug design. Entropy and Free Energy in Structural Biology leads the reader to the simulation technology in a systematic way. Enhanced by a number of solved problems and examples, this volume will be a valuable resource to advanced undergraduate and graduate students in chemistry, chemical engineering, biochemistry biophysics, pharmacology, and computational biology.

CRC Press
April 2022 : 396pp
Pb: 978-0-367-42745-0 : **£45.99**
Hb: 978-0-367-40692-9 : **£110**
eBook: 978-0-367-85478-2

* For full contents and more information, visit: www.routledge.com/9780367427450

2ND EDITION

Introduction to Fluorescence



David M. Jameson University of Hawaii, Manoa, USA

This Second Edition of Introduction to Fluorescence helps readers acquire a sound understanding of basic fluorescence theory and practice. It describes general principles in a straightforward way and uses examples from a variety of disciplines to demonstrate them. Since the 1st Edition, significant advances in the field have appeared. For examples phasors, both lifetime and spectral phasors, have become very popular and so a chapter dedicated to this topic has been added. Furthermore, significant advances have been made in fluorescence microscopy methods, including super-resolution and single molecule techniques.

CRC Press
March 2025 : 392pp
Hb: 978-1-032-26171-3 : **£74.99**

* For full contents and more information, visit: www.routledge.com/9781032261713

2ND EDITION

Physical Biology of the Cell



Rob Phillips , Jané Kondev Brandeis University, USA,
Julie Theriot Stanford University, USA, **Hernan Garcia**

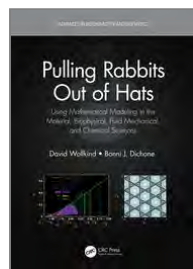
Physical Biology of the Cell is a textbook for a first course in physical biology or biophysics for undergraduate or graduate students. It maps the huge and complex landscape of cell and molecular biology from the distinct perspective of physical biology. As a key organizing principle, the proximity of topics is based on the physical concepts that unite a given set of biological phenomena. The Second Edition features full-color illustrations throughout, two new chapters, a significantly expanded set of end-of-chapter problems, and is available in a variety of e-book formats.

Garland Science
October 2012 : 1088pp
Pb: 978-0-815-34450-6 : **£91.99**
eBook: 978-0-429-16883-3

* For full contents and more information, visit: www.routledge.com/9780815344506

Pulling Rabbits Out of Hats

Using Mathematical Modeling in the Material, Biophysical, Fluid Mechanical, and Chemical Sciences



David Wollkind , Bonni J. Dichone Gonzaga University

Series: Advances in Biochemistry and Biophysics

Pulling Rabbits Out of Hats: Using Mathematical Modeling in the Material, Biophysical, Fluid Mechanical, and Chemical Sciences focuses on those assumptions made during applied mathematical modeling in which the phenomenological data and the model predictions are self-consistent. This comprehensive reference demonstrates how to employ a variety of mathematical techniques to quantify a number of problems from the material, biophysical, fluid mechanical, and chemical sciences. In doing so, methodology of modelling, analysis, and result generation are all covered.

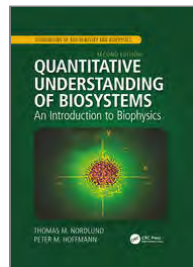
CRC Press
October 2024 : 554pp
Pb: 978-1-032-05007-2 : **£45.99**
Hb: 978-1-032-04787-4 : **£185**
eBook: 978-1-003-19560-3

* For full contents and more information, visit: www.routledge.com/9781032050072

2ND EDITION

Quantitative Understanding of Biosystems

An Introduction to Biophysics, Second Edition



Thomas M. Nordlund , Peter M. Hoffmann

This new edition provides a complete update to the most accessible yet thorough introduction to the physical and quantitative aspects of biological systems and processes involving macromolecules, subcellular structures, and whole cells. It includes two brand new chapters covering experimental techniques, especially atomic force microscopy, complementing the updated coverage of mathematical and computational tools. The authors have also incorporated additions to the multimedia component of video clips and animations, as well as interactive diagrams and graphs.

CRC Press
March 2021 : 632pp
Pb: 978-0-367-77991-7 : **£45.99**
Hb: 978-1-138-63341-4 : **£135**
eBook: 978-1-315-20760-5

* For full contents and more information, visit: www.routledge.com/9780367779917

Textbook of Ion Channels

Three Volume Set



Edited by **Jie Zheng** University of California at Davis, USA,
Matthew C. Trudeau University of Maryland, Baltimore, USA

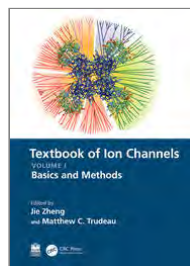
This three-volume textbook provides a wide-ranging reference source on ion channels for students, instructors, and researchers. The modern methods used in the study of ion channels are powerful and diverse, and all three volumes give the reader an introduction to the fundamental concepts of the mechanism of ion channels, a guide to technical research aspects, a modern guide to the properties of major ion channel families, and include key examples of regulatory, physiological, and disease roles for ion channels.

CRC Press
July 2023 : 1064pp
Hb: 978-1-032-42428-6 : **£240**
eBook: 978-1-003-46194-4

* For full contents and more information, visit: www.routledge.com/9781032424286

Textbook of Ion Channels Volume I

Fundamental Mechanisms and Methodologies



Edited by **Jie Zheng** University of California at Davis, USA,
Matthew C. Trudeau University of Maryland, Baltimore, USA

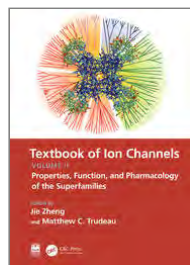
This three-volume textbook provides a wide-ranging reference source on ion channels for students, instructors, and researchers. Volume I covers fundamental topics and basic principles, and offers a practical guide of cardinal methods for researching ion channels. The modern methods used in the study of ion channels are powerful and diverse, and all three volumes give the reader an introduction to the fundamental concepts of the mechanism of ion channels, a guide to technical research aspects, a modern guide to the properties of major ion channel families, and include key examples of regulatory, physiological, and disease roles for ion channels.

CRC Press
June 2023 : 330pp
Hb: 978-0-367-53815-6 : £100
eBook: 978-1-003-09621-4

* For full contents and more information, visit: www.routledge.com/9780367538156

Textbook of Ion Channels Volume II

Properties, Function, and Pharmacology of the Superfamilies



Edited by **Jie Zheng** University of California at Davis, USA,
Matthew C. Trudeau University of Maryland, Baltimore, USA

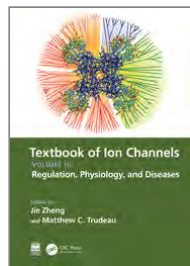
This three-volume textbook provides a wide-ranging reference source on ion channels for students, instructors, and researchers. Volume II covers the physiological role, structural components, gating mechanisms, biophysics, permeation, selectivity, regulation, and pharmacology in disease mechanisms. The modern methods used in the study of ion channels are powerful and diverse, and all three volumes give the reader an introduction to the fundamental concepts of the mechanism of ion channels, a guide to technical research aspects, a modern guide to the properties of major ion channel families, and include key examples of regulatory, physiological, and disease roles for ion channels.

CRC Press
June 2023 : 488pp
Hb: 978-0-367-53816-3 : £100
eBook: 978-1-003-09627-6

* For full contents and more information, visit: www.routledge.com/9780367538163

Textbook of Ion Channels Volume III

Regulation, Physiology, and Diseases



Edited by **Jie Zheng** University of California at Davis, USA,
Matthew C. Trudeau University of Maryland, Baltimore, USA

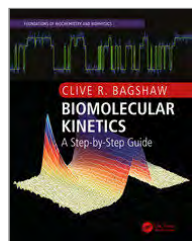
This three-volume textbook provides a wide-ranging reference source on ion channels for students, instructors, and researchers. Volume III covers key ion channel regulators, the role of ion channels in selected physiological systems, and examples of mutations and dysfunction in selected diseases. The modern methods used in the study of ion channels are powerful and diverse, and all three volumes give the reader an introduction to the fundamental concepts of the mechanism of ion channels, a guide to technical research aspects, a modern guide to the properties of major ion channel families, and include key examples of regulatory, physiological, and disease roles for ion channels.

CRC Press
June 2023 : 246pp
Hb: 978-0-367-53819-4 : £100
eBook: 978-1-003-31031-0

* For full contents and more information, visit: www.routledge.com/9780367538194

Biomolecular Kinetics

A Step-by-Step Guide



Clive R. Bagshaw University of California at Santa Cruz & University of Leicester

Series: Foundations of Biochemistry and Biophysics

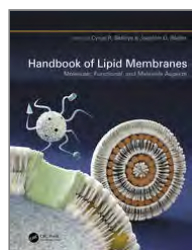
Biomolecular kinetics concerns the measurement and analysis of reaction phenomena as a function of time. This book explains the methods used for measuring how much a reaction gets speeded up, as well as the framework for solving problems such as ligand binding and macromolecular folding. It is a thoroughly modern text, reflecting the groundbreaking impact of our ability to observe reactions at the single-molecule level, as well as the advances in microfluidics, which have given rise to femtoscale studies.

CRC Press
October 2017 : 470pp
Pb: 978-1-498-72723-5 : **£135**
Hb: 978-1-138-06658-8 : **£180**
eBook: 978-1-315-12035-5

* For full contents and more information, visit: www.routledge.com/9781498727235

Handbook of Lipid Membranes

Molecular, Functional, and Materials Aspects



Edited by **Cyrus R. Safinya** University of California, Santa Barbara, USA, **Joachim O. Rädler** Ludwig Maximilians University, Munich, Bavaria, Germany

This Handbook provides a comprehensive overview of lipid membrane fundamentals and applications. It gives the fundamental physical and biochemical aspects of membrane-related processes in living cells, and then relates them to how scientists are building bioinspired, artificial membrane-based systems such as gene delivery vehicles and synthetic membrane interfaces. It highlights the driving mechanism behind lipid self-assembly, membrane shape evolution, and vesicle trafficking, as well as the role of lipid membrane composition in signalling and the structural aspects of membranes in cellular integrity.

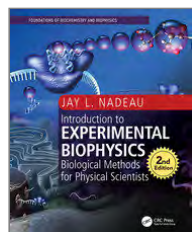
CRC Press
October 2024 : 376pp
Pb: 978-1-032-01441-8 : **£45.99**
Hb: 978-1-466-55572-3 : **£155**
eBook: 978-0-429-19407-8

* For full contents and more information, visit: www.routledge.com/9781032014418

2ND EDITION

Introduction to Experimental Biophysics

Biological Methods for Physical Scientists



Jay L. Nadeau Portland State University, OR, USA

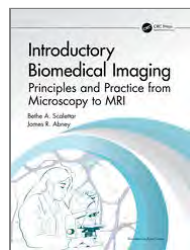
This book provides a starting point for any student or researcher in the physical sciences to gain firm grounding in the techniques employed in molecular biophysics and quantitative biology. As with the first edition, the author will take a practical approach, sharing expert tips and insider's knowledge to simplify potentially confusing techniques as much as possible. The reader will be guided through the basics of experimental set-up, followed by an easy-to-follow example carried out from start to finish, with hints for how to get things right. The emphasis is on building comfort with getting hands 'wet' with basic methods, and understanding how to adapt them to address other questions.

CRC Press
October 2017 : 790pp
Pb: 978-1-498-79959-1 : **£91.99**
Hb: 978-1-138-08815-3 : **£180**
eBook: 978-1-315-15659-0

* For full contents and more information, visit: www.routledge.com/9781498799591

Introductory Biomedical Imaging

Principles and Practice from Microscopy to MRI



Beth A. Scalettar, James R. Abney

Series: Imaging in Medical Diagnosis and Therapy

This undergraduate textbook introduces imaging techniques used in medicine and science, presenting the underlying physics concepts of light microscopy, endoscopy, ultrasound, projection radiography, computed tomography, radionuclide imaging, and magnetic resonance imaging. Theoretical principles are reinforced with illustrative homework problems, applications, activities, and experiments. The book is designed to facilitate the teaching of biomedical imaging courses; it is unique in its coverage of both optical microscopy and medical imaging at an intermediate level, and exceptional in its coverage of material at several levels of sophistication.

CRC Press
May 2024 : 338pp
Pb: 978-1-138-62668-3 : **£45.99**
Hb: 978-1-032-32819-5 : **£110**
eBook: 978-1-315-22313-1

* For full contents and more information, visit: www.routledge.com/9781138626683

2ND EDITION

Physical Biology of the Cell



Rob Phillips, Jané Kondev Brandeis University, USA, **Julie Theriot** Stanford University, USA, **Hernan Garcia**

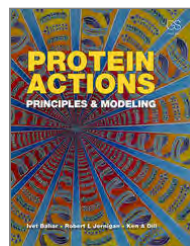
Physical Biology of the Cell is a textbook for a first course in physical biology or biophysics for undergraduate or graduate students. It maps the huge and complex landscape of cell and molecular biology from the distinct perspective of physical biology. As a key organizing principle, the proximity of topics is based on the physical concepts that unite a given set of biological phenomena. The Second Edition features full-color illustrations throughout, two new chapters, a significantly expanded set of end-of-chapter problems, and is available in a variety of e-book formats.

Garland Science
October 2012 : 1088pp
Pb: 978-0-815-34450-6 : **£91.99**
eBook: 978-0-429-16883-3

* For full contents and more information, visit: www.routledge.com/9780815344506

Protein Actions

Principles and Modeling



Ivet Bahar, Robert L. Jernigan, Ken A. Dill

Protein Actions: Principles and Modeling describes the basic principles of protein molecules—their structures; their folding, binding and aggregation; their dynamics and mechanisms; and their evolution—as well as the methods of modeling them, including bioinformatics, physics-based computer simulations, and the tools of drug discovery. It is intended for a one-semester course for biological scientists learning quantitative foundations and for physical scientists learning the biology and chemistry. This text is ideal for graduates, advanced undergraduates, and any professional who seeks an introduction to the biological, chemical, and physical properties of proteins.

Garland Science
February 2017 : 336pp
Pb: 978-0-815-34177-2 : **£105**
eBook: 978-1-315-21221-0

* For full contents and more information, visit: www.routledge.com/9780815341772

Quantitative Bioimaging

An Introduction to Biology, Instrumentation, Experiments, and Data Analysis for Scientists and Engineers



Raimund J. Ober Texas A & M University, Texas, USA, **E. Sally Ward**, **Jerry Chao** Texas A & M University, Texas, USA

Cellular microscopy for live cell imaging has become an indispensable tool for solving biological problems. This textbook provides a truly unique introduction that integrates the concepts and methods of optics, molecular and cellular biology, image analysis, and bioengineering. The coverage spans from essential aspects of molecular and cellular biology to a detailed treatment of practical aspects, addressing such topics as colocalization, intracellular trafficking, 3D reconstruction, and membrane receptor dynamics. The authors take a two-tiered approach in later chapters, providing a survey level overview followed by in-depth discussion that gives more detailed explanations.

CRC Press

January 2022 : 503pp

Pb: 978-0-367-61545-1 : £47.99

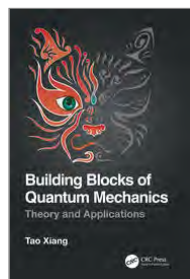
Hb: 978-1-138-59898-0 : £110

eBook: 978-0-429-46989-3

* For full contents and more information, visit: www.routledge.com/9780367615451

Building Blocks of Quantum Mechanics

Theory and Applications



Tao Xiang

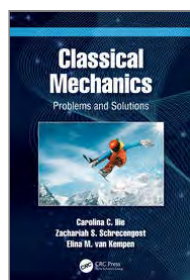
This textbook provides a concise yet comprehensive introduction to the principles, concepts, and methods of quantum mechanics. It covers the basic building blocks of quantum mechanics theory and applications, illuminated throughout by physical insights and examples of quantum mechanics, such as the one-dimensional eigen-problem, the harmonic oscillator, the Aharonov-Bohm effect, Landau levels, the hydrogen atom, the Landau-Zener transition and the Berry phase.

CRC Press
May 2022 : 264pp
Pb: 978-0-367-77150-8 : **£58.99**
Hb: 978-1-032-00610-9 : **£150**
eBook: 978-1-003-17488-2

* For full contents and more information, visit: www.routledge.com/9780367771508

Classical Mechanics

Problems and Solutions



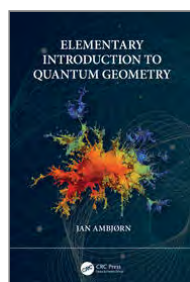
Carolina C. Ilie, Zachariah S. Schrecengost, Elina M. van Kempen

This book of problems and solutions in classical mechanics is dedicated to junior or senior undergraduate students in physics, engineering, applied mathematics, astronomy, or chemistry who may want to improve their problems solving skills, or to freshman graduate students who may be seeking a refresh of the material. The book is structured in ten chapters, starting with Newton's laws, motion with air resistance, conservation laws, oscillations, and the Lagrangian and Hamiltonian Formalisms.

CRC Press
March 2025 : 280pp
Pb: 978-1-032-43099-7 : **£45.99**
Hb: 978-0-367-76844-7 : **£76.99**
eBook: 978-1-003-36570-9

* For full contents and more information, visit: www.routledge.com/9781032430997

Elementary Introduction to Quantum Geometry



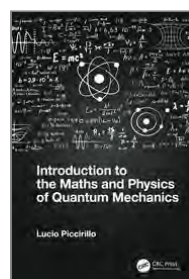
Jan Ambjorn

This graduate textbook provides an introduction to quantum gravity, when spacetime is two-dimensional. The quantization of gravity is the main missing piece of theoretical physics, but in two dimensions it can be done explicitly with elementary mathematical tools, but it still has most of the conceptual riddles present in higher dimensional (not yet known) quantum gravity.

CRC Press
March 2025 : 290pp
Pb: 978-1-032-34100-2 : **£45.99**
Hb: 978-1-032-33555-1 : **£76.99**
eBook: 978-1-003-32056-2

* For full contents and more information, visit: www.routledge.com/9781032341002

Introduction to the Maths and Physics of Quantum Mechanics



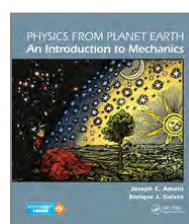
Lucio Piccirillo University of Manchester, UK

This book will appeal to first- and second-year university students in physics, mathematics, engineering and other sciences studying quantum mechanics who will find material and clarifications not easily found in other textbooks. It will also appeal to self-taught readers with a genuine interest in modern physics who are willing to examine the mathematics and physics in a simple but rigorous way.

CRC Press
October 2023 : 246pp
Hb: 978-0-367-70302-8 : **£81.99**
eBook: 978-1-003-14556-1

* For full contents and more information, visit: www.routledge.com/9780367703028

Physics from Planet Earth - An Introduction to Mechanics



Joseph C. Amato Colgate University, Hamilton, New York, USA, **Enrique J. Galvez** Colgate University, Hamilton, New York, USA

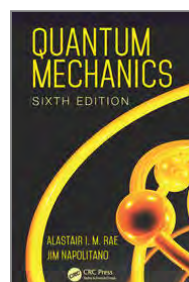
This classroom-tested text provides a one-semester, calculus-based introduction to classical mechanics for first-year undergraduate students. The authors introduce the three conservation laws as fundamental laws of nature from which secondary concepts are derived and organize topics around the conservation laws. They also illustrate many topics through real, contemporary applications in astronomy, planetary science, and space travel. The book includes short exercises throughout the text as well as novel problems at the end of each chapter.

CRC Press
June 2015 : 612pp
Hb: 978-1-439-86783-9 : **£86.99**
eBook: 978-0-429-19447-4

* For full contents and more information, visit: www.routledge.com/9781439867839

6TH EDITION

Quantum Mechanics



Alastair I. M. Rae University of Birmingham, UK, **Jim Napolitano** Temple University, Pennsylvania, USA

This sixth edition builds on its highly praised predecessors to make the text even more accessible to a wider audience. It contains three new chapters that review prerequisite physics and mathematics, laying out the notation, formalism, and physical basis necessary for the rest of the book. Along with more problems, this edition also presents short descriptions of numerous applications relevant to the physics discussed, offering a brief look at what quantum mechanics has made possible industrially and scientifically.

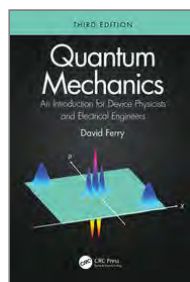
CRC Press
December 2015 : 440pp
Pb: 978-1-482-29918-2 : **£56.99**
Hb: 978-1-138-45833-8 : **£185**
eBook: 978-0-429-15734-9

* For full contents and more information, visit: www.routledge.com/9781482299182

3RD EDITION

Quantum Mechanics

An Introduction for Device Physicists and Electrical Engineers


David Ferry Arizona State University, Tempe, USA

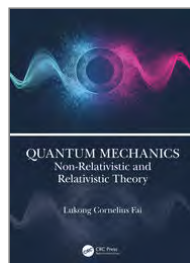
Quantum Mechanics: An Introduction for Device Physicists and Electrical Engineers, Third Edition provides a complete course in quantum mechanics for students of semiconductor device physics and electrical engineering. It provides the necessary background to quantum theory for those starting work on micro- and nanoelectronic structures and is particularly useful for those beginning work with modern semiconductor devices, lasers, and qubits.

CRC Press
December 2020 : 328pp
Pb: 978-0-367-46727-2 : **£79.99**
Hb: 978-0-367-46915-3 : **£210**
eBook: 978-1-003-03194-9

* For full contents and more information, visit: www.routledge.com/9780367467272

Quantum Mechanics

Non-Relativistic and Relativistic Theory


Lukong Cornelius Fai University of Dschang, Cameroon

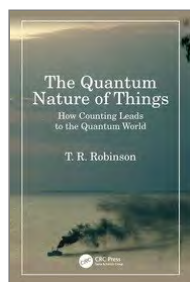
This book provides an accessible treatment of non-relativistic and relativistic quantum mechanics. It is an ideal textbook for undergraduate and graduate physics students, as well as researchers in theoretical physics, quantum mechanics, condensed matter, mathematical physics, quantum chemistry and electronic students.

CRC Press
August 2024 : 552pp
Pb: 978-1-032-22559-3 : **£45.99**
Hb: 978-1-032-22146-5 : **£120**
eBook: 978-1-003-27307-3

* For full contents and more information, visit: www.routledge.com/9781032225593

The Quantum Nature of Things

How Counting Leads to the Quantum World


T R Robinson

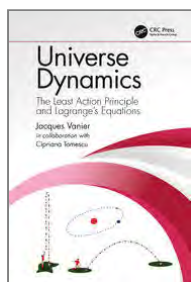
This book offers readers an entirely original and unconventional view of quantum mechanics. It is a view that accepts quantum mechanics as the natural way to think about the way nature works, rather than the view commonly expressed, especially in books on quantum physics, that quantum theory is weird and counterintuitive. It is based on the concept of itemization. From this simple premise, quantities like energy and momentum, both linear and angular emerge naturally, as do configuration space, potentials, the electromagnetic field, many-body dynamics, special relativity and relativistic wave mechanics.

CRC Press
April 2023 : 282pp
Pb: 978-1-032-45546-4 : **£48.99**
Hb: 978-1-032-44623-3 : **£125**
eBook: 978-1-003-37750-4

* For full contents and more information, visit: www.routledge.com/9781032455464

Universe Dynamics

The Least Action Principle and Lagrange's Equations



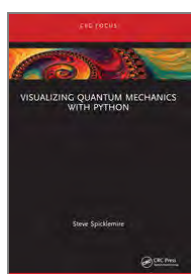
Jacques Vanier Université de Montréal, Québec, Canada,
Cipriana Tomescu Université de Montréal, Québec, Canada

Brought together in one focused and exclusive treatment, this book provides an elementary introduction to the important role and use of the least action principle and the resulting Lagrange's equations in the analysis of the laws that govern the universe. It is an ideal complimentary resource to accompany undergraduate courses and textbooks on classical mechanics.

CRC Press
January 2019 : 184pp
Pb: 978-1-138-33579-0 : **£58.99**
Hb: 978-1-138-33589-9 : **£210**
eBook: 978-0-429-44347-3

* For full contents and more information, visit: www.routledge.com/9781138335790

Visualizing Quantum Mechanics with Python


Steve Spicklemire

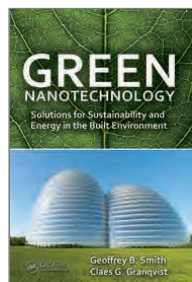
The goal of this book is to reduce the complexity and clarify the abstractions with concrete visual examples driven by simple python programs. It is assumed that the reader is concurrently taking a course in quantum mechanics, or self-studying quantum mechanics, but is looking for supplementary material to help with understanding and visualizing how quantum mechanics works.

CRC Press
June 2024 : 60pp
Pb: 978-1-032-56924-6 : **£21.99**
Hb: 978-0-367-76879-9 : **£52.99**
eBook: 978-1-003-43770-3

* For full contents and more information, visit: www.routledge.com/9781032569246

Green Nanotechnology

Solutions for Sustainability and Energy in the Built Environment



Geoffrey B. Smith University of Technology, Broadway, Australia, **Claes-Goran S. Granqvist** Uppsala University, Sweden

A focused exploration of the role nanotechnology plays in meeting the challenges inherent in minimizing environmental impacts while maximizing energy resources, this book provides an overview of our energy supply, increasing energy production while reducing cost, and offering novel energy sources. It explores the ways in which nanotechnologies can improve structural engineering of energy sources, create novel methods of cooling, and inspire new approaches to water supply and treatment. In addressing these critical issues, the book provides an authoritative resource that provides the foundation for new research and product development.

CRC Press

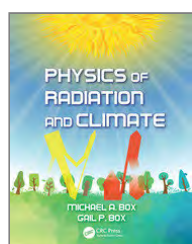
September 2010 : 484pp

Hb: 978-1-420-08532-7 : £175

eBook: 978-0-429-19304-0

* For full contents and more information, visit: www.routledge.com/9781420085327

Physics of Radiation and Climate



Michael A. Box, **Gail P. Box**

This book offers an introduction to the physics of climate science. It is divided into three main sections, with the first providing an introduction to the atmosphere and ocean—their composition, thermodynamics, vertical structure, and basic flow patterns. The next chapters focus on the central physics of interactions between radiation, gases, and particles, addressing the core phenomena of absorption, emission, scattering, and radiative transfer. The final section integrates those principles and how they are applied in the study of weather and climate change.

CRC Press

October 2015 : 514pp

Pb: 978-1-466-57205-8 : £96.99

Hb: 978-1-138-42426-5 : £180

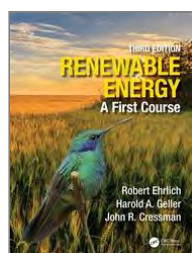
eBook: 978-0-429-19422-1

* For full contents and more information, visit: www.routledge.com/9781466572058

3RD EDITION

Renewable Energy

A First Course



Robert Ehrlich George Mason University, Virginia, USA, **Harold A. Geller** George Mason University, Fairfax, Virginia, USA, **John R. Cressman** George Mason University

This revised edition is fully updated and continues to provide the best in-depth introduction to renewable energy science. It focuses mainly on renewable energy, but also addresses nonrenewable energy (fossil fuels and nuclear technology). The coverage extends from the basic physics to conservation, economic, and public policy issues, with strong emphasis on explaining how things work in practice. The authors avoid technical jargon and advanced math, but address fundamental analytical skills with wide application. Updated statistics, figures, policies, trends, and technological advancements will bring the reader up to speed with the current state of renewable energy.

CRC Press

July 2022 : 562pp

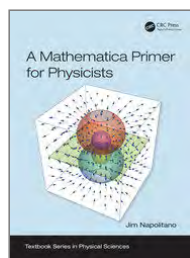
Pb: 978-0-367-76837-9 : £91.99

Hb: 978-1-032-00088-6 : £240

eBook: 978-1-003-17267-3

* For full contents and more information, visit: www.routledge.com/9780367768379

A Mathematica Primer for Physicists



Jim Napolitano Temple University, Pennsylvania, USA

Series: Textbook Series in Physical Sciences

This book offers the most concise and approachable guide for quickly getting into Mathematica and using it for solving common problems. The author addresses a wide range of problems, including numerical calculations, animation, and visualization tools. Each chapter begins with simple commands, and then shows how to apply them. The goal is to give the essentials necessary for readers to get started, without getting bogged down in unnecessary details. The writing is clear and conversational, making it accessible and easy for the reader to follow.

CRC Press

March 2018 : 214pp

Pb: 978-1-138-03509-6 : **£61.99**

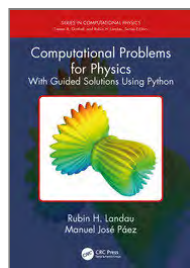
Hb: 978-1-138-48656-0 : **£180**

eBook: 978-1-315-26948-1

* For full contents and more information, visit: www.routledge.com/9781138035096

Computational Problems for Physics

With Guided Solutions Using Python



Rubin H. Landau Distinguished Professor Emeritus, Oregon State University, USA, **Manuel José Páez**

Series: Series in Computational Physics

Our future scientists and professionals must be conversant in computational techniques. In order to facilitate integration of computer methods into existing physics courses, this textbook offers a large number of worked examples and problems with fully guided solutions in Python as well as other languages (Mathematica, Java, C, Fortran, and Maple) on the Web. It's also intended as a self-study guide for learning how to use computer methods in physics. The authors include an introductory chapter on numerical tools and indication of computational as well as a separate chapter with problems for beginning students.

CRC Press

June 2018 : 430pp

Pb: 978-1-138-70541-8 : **£71.99**

Hb: 978-1-138-70591-3 : **£110**

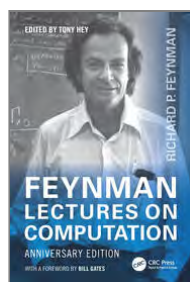
eBook: 978-1-315-20209-9

* For full contents and more information, visit: www.routledge.com/9781138705418

2ND EDITION

Feynman Lectures on Computation

Anniversary Edition



Edited by Tony Hey Microsoft Research

Series: Frontiers in Physics

The last lecture course that Nobel Prize winner Richard P. Feynman gave at Caltech from 1983 to 1986 was not on physics but on computer science. The first edition of this book published in 1996 and provided an overview of standard and not-so-standard topics in computer science given in Feynman's inimitable style. The material is still relevant and interesting, and Feynman's unique philosophy of learning and discovery shines through. For this new edition, editor Tony Hey has updated the lectures with invited chapters from preeminent scholars. This exciting and important work provides key reading for students and scholars in the fields of computer science and computational physics.

CRC Press

May 2023 : 426pp

Pb: 978-0-367-85733-2 : **£52.99**

Hb: 978-1-032-41588-8 : **£135**

eBook: 978-1-003-35881-7

* For full contents and more information, visit: www.routledge.com/9780367857332

Introduction to Bioinformatics and Clinical Scientific Computing



Paul S. Gannney

This textbook provides an introduction to computer science theory, informatics best practice, and the standards and legislation that apply to computing in a healthcare environment. It delivers an accessible discussion of databases (construction, interrogation and maintenance); networking (design and low-level application); programming (best practice rather than the specifics of any one language – design, maintenance, safety).

CRC Press

March 2025 : 404pp

Pb: 978-1-032-32693-1 : **£45.99**

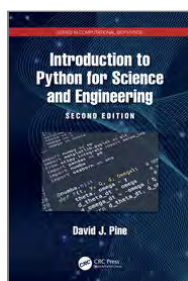
Hb: 978-1-032-32413-5 : **£76.99**

eBook: 978-1-003-31624-4

* For full contents and more information, visit: www.routledge.com/9781032326931

2ND EDITION

Introduction to Python for Science and Engineering



David J. Pine New York University, NY, USA

Series: Series in Computational Biophysics

Introduction to Python for Science and Engineering offers an incisive introduction to the Python programming language for use in any science or engineering discipline. The approach is pedagogical, which means starting with examples and extracting more general principles from that experience. Readers will learn the basics of Python syntax, data structures, input and output, conditionals and loops, user-defined functions, plotting, animation, and visualization. They will also learn how to use Python for numerical analysis, including curve fitting, numerical integration, solutions to differential equations, and fast Fourier transforms.

CRC Press

September 2024 : 444pp

Pb: 978-1-032-67390-5 : **£52.99**

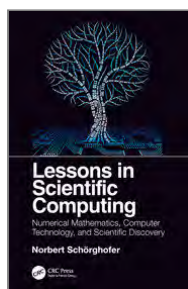
Hb: 978-1-032-65033-3 : **£140**

eBook: 978-1-032-67395-0

* For full contents and more information, visit: www.routledge.com/9781032673905

Lessons in Scientific Computing

Numerical Mathematics, Computer Technology, and Scientific Discovery



Norbert Schorghofer University of Hawaii, USA

Taking an interdisciplinary approach, this new book provides a modern introduction to scientific computing, exploring numerical methods, computer technology, and their interconnections, which are treated with the goal of facilitating scientific research across all disciplines. Each chapter provides an insightful lesson and viewpoints from several subject areas are often compounded within a single chapter. Written with an eye on usefulness, longevity, and breadth, Lessons in Scientific Computing will serve as a "one stop shop" for undergrad students taking a unified course in scientific computing, or seeking a single cohesive text spanning multiple courses.

CRC Press

October 2018 : 204pp

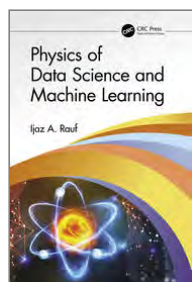
Pb: 978-1-138-07058-5 : **£61.99**

Hb: 978-1-138-07063-9 : **£210**

eBook: 978-1-315-10835-3

* For full contents and more information, visit: www.routledge.com/9781138070585

Physics of Data Science and Machine Learning



Ijaz A. Rauf

Physics of Data Science and Machine Learning links fundamental concepts of physics to data science, machine learning and artificial intelligence for physicists looking to integrate these techniques into their work.

CRC Press

November 2021 : 210pp

Pb: 978-1-032-07401-6 : **£58.99**

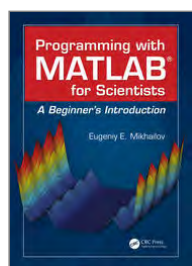
Hb: 978-0-367-76858-4 : **£84.99**

eBook: 978-1-003-20674-3

* For full contents and more information, visit: www.routledge.com/9781032074016

Programming with MATLAB for Scientists

A Beginner's Introduction



Eugeny E. Mikhailov College of William and Mary,
Department of Physics, Williamsburg, Virginia, USA

This book offers an introduction to the basics of MATLAB programming to scientists and engineers. The author leads with engaging examples to build a working knowledge, specifically geared to those with science and engineering backgrounds. The reader is empowered to model and simulate real systems, as well as present and analyze everyday data sets. In order to achieve those goals, the contents bypass excessive “under the hood” details, and instead gets right down to the essential, practical foundations for successful programming and modeling.

CRC Press

January 2018 : 264pp

Pb: 978-1-498-73828-6 : **£64.99**

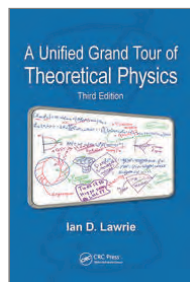
Hb: 978-1-138-57004-7 : **£150**

eBook: 978-1-351-22818-3

* For full contents and more information, visit: www.routledge.com/9781498738286

3RD EDITION

A Unified Grand Tour of Theoretical Physics



Ian D. Lawrie University of Leeds, UK

The third edition of this best-selling text continues to provide an accessible overview of the fundamental ideas underpinning our understanding of theoretical physics. The basic structure of each theory is explained in explicit mathematical detail with emphasis on conceptual understanding rather than on the technical details of specialized applications. Suitable for undergraduate and graduate courses, this new edition includes updates and advancements in string theory and quantum gravity. A supplementary website provides ancillary material and side issues to create a platform for further research and classroom discussion.

CRC Press
November 2012: 711pp
Pb: 978-1-439-88446-1 : £84.99
Hb: 978-1-138-47335-5 : £185
eBook: 978-0-429-11123-5

* For full contents and more information, visit: www.routledge.com/9781439884461

Commonly Asked Questions in Physics



Andrew Rex University of Puget Sound, Tacoma, Washington, USA

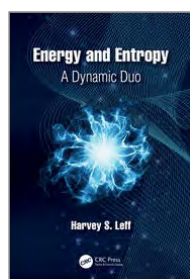
Suitable for a wide audience, this book covers a broad scope of subjects, from classical physics that goes back to the age of Newton to new ideas just formulated in the twenty-first century. The book highlights the core areas of physics that predate the twentieth century, including mechanics, electromagnetism, optics, and thermodynamics. It also focuses on modern physics, covering quantum mechanics, atomic and nuclear physics, fundamental particles, and relativity.

CRC Press
February 2014: 256pp
Pb: 978-1-466-56017-8 : £28.99
Hb: 978-1-138-42956-7 : £180
eBook: 978-0-429-19405-4

* For full contents and more information, visit: www.routledge.com/9781466560178

Energy and Entropy

A Dynamic Duo



Harvey S. Leff

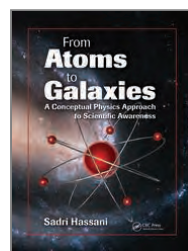
Energy is typically regarded as understandable despite its multiple forms of storage and transfer. Yet entropy is an enigma, in part because of the common view that it represents disorder. That view is flawed and hides entropy's connection with energy. However, macroscopic matter stores internal energy, and that matter's entropy is determined by how the energy is stored. Energy and entropy are intimately linked.

CRC Press
August 2020: 330pp
Pb: 978-0-367-34906-6 : £45.99
Hb: 978-0-367-35141-0 : £120
eBook: 978-0-429-33001-8

* For full contents and more information, visit: www.routledge.com/9780367349066

From Atoms to Galaxies

A Conceptual Physics Approach to Scientific Awareness



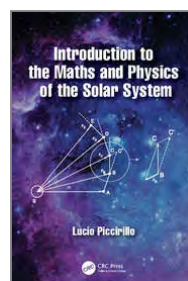
Sadri Hassani

Based on a course given by the author, this text is designed for undergraduates with little science background, demonstrating physical concepts through everyday experiences. Students learn not just how science works, but also how to counter popular misconceptions and pseudoscience. The text presents glossaries, review questions and answers, exercises, numerical problems, and quizzes.

CRC Press
July 2020: 756pp
Pb: 978-0-367-38411-1 : £58.99
Hb: 978-1-439-80849-8 : £175
eBook: 978-0-429-06685-6

* For full contents and more information, visit: www.routledge.com/9780367384111

Introduction to the Maths and Physics of the Solar System



Lucio Piccirillo University of Manchester, UK

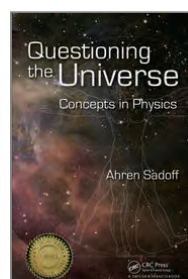
This book provides readers with an understanding of the basic physics and mathematics that governs our solar system. It explores the mechanics of our Sun and planets; their orbits, tides, craters, eclipses and many other fascinating phenomena including asteroids and comets. This book is a valuable resource for undergraduate students studying astronomy and should be used in conjunction with other introductory astronomy textbooks in the field to provide additional learning opportunities.

CRC Press
March 2020: 237pp
Pb: 978-0-367-00254-1 : £56.99
Hb: 978-0-367-02271-6 : £145
eBook: 978-0-429-40048-3

* For full contents and more information, visit: www.routledge.com/9780367002541

Questioning the Universe

Concepts in Physics



Ahren Sadoff Cornell University, Ithaca, New York, USA

Series: Discovering Physics

Written for the nonscientist, this physics primer tells readers the story of what we have found out about nature so far and how we have done it. It delves into basic laws regarding motion, fundamental forces, electromagnetism, and light; introduces major theories pondered by scientists, including relativity, quantum mechanics, and particle physics; describes the key role played by that elemental building block, the atom; and discusses the evolution of the universe. While it requires only the most minimal math, it does require enough of a sense of curiosity to open one's self to consider what are the factors that keep our universe so orderly, operational, and awesomely beautiful.

Chapman & Hall
December 2008: 234pp
Pb: 978-1-420-08258-6 : £64.99
Hb: 978-1-138-42968-0 : £180
eBook: 978-0-429-13812-6

* For full contents and more information, visit: www.routledge.com/9781420082586

3RD EDITION

Superstrings and Other Things

A Guide to Physics

**Carlos I. Calle**

Continuing to take readers on a uniquely accessible journey through physics, *Superstrings and Other Things*, Third Edition, explains the basic concepts of motion, energy, and gravity, right up to the latest theories about the structure of matter, the origin and structure of the universe, and the beginning of time.

CRC Press

May 2020 : 474pp

Pb: 978-1-138-36488-2 : **£61.99**Hb: 978-1-138-36492-9 : **£210**

eBook: 978-0-429-43102-9

* For full contents and more information, visit: www.routledge.com/9781138364882

Essentials of Soft Matter Science



Francoise Brochard-Wyart Institut Curie, Paris, France,
Pierre Nassoy Institut d'Optique d'Aquitaine, Bordeaux,
 France, **Pierre-Henri Puech** Laboratoire Adhésion et
 Inflammation, Inserm, CNRS, France

Authored by world-leading physicists, this introductory textbook explores the basic principles of polymers, colloids, liquid crystals, wetting, and foams. It is a practical 'toolbox' for readers to acquire basic knowledge in the field and facilitate further reading and advanced courses.

Undergraduate students in physics, biology, and the medical sciences will learn the basics of soft matter physics, in addition to scaling approaches in the spirit of the Nobel prize laureate in physics in 1991, Pierre-Gilles de Gennes, the inventor of soft matter physics and close collaborator to author Françoise Brochard-Wyart.

CRC Press

September 2019 : 290pp

Pb: 978-1-498-77392-8 : **£79.99**

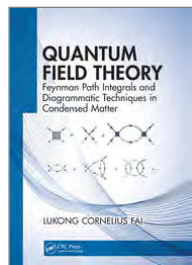
Hb: 978-1-138-74276-5 : **£195**

eBook: 978-0-429-15435-5

* For full contents and more information, visit: www.routledge.com/9781498773928

Quantum Field Theory

Feynman Path Integrals and Diagrammatic Techniques in
 Condensed Matter



Lukong Cornelius Fai

This book explores quantum field theory using the Feynman functional and diagrammatic techniques as foundations to apply Quantum Field Theory to a broad range of topics in physics. This book will be of interest not only to condensed matter physicists but physicists in a range of disciplines as the techniques explored apply to high-energy as well as soft matter physics.

CRC Press

March 2021 : 535pp

Pb: 978-0-367-77959-7 : **£45.99**

Hb: 978-0-367-18574-9 : **£155**

eBook: 978-0-429-19694-2

* For full contents and more information, visit: www.routledge.com/9780367779597

2ND EDITION

Fundamentals of Ceramics



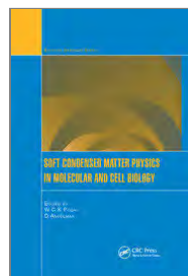
Michel Barsoum

This second edition of *Fundamentals of Ceramics* adds a section on density functional theory calculations for shedding light on properties. It also adds more on applications, including solid oxide fuel cells as a case study and a major overhaul of the last chapter on optical properties. There's also new and extended discussion of such topics as non-parabolic oxidation, dislocation creep, thermal conductivity, ferroelectric ceramics, ferromagnetic ceramics, scattering mechanisms, surface tension, and processing of ceramics from aqueous environments.

CRC Press
June 2022 : 644pp
Pb: 978-1-032-33730-2 : **£45.99**
Hb: 978-1-498-70813-5 : **£120**
eBook: 978-1-498-70816-6

* For full contents and more information, visit: www.routledge.com/9781032337302

Soft Condensed Matter Physics in Molecular and Cell Biology



Edited by **W.C.K. Poon**, **David Andelman**

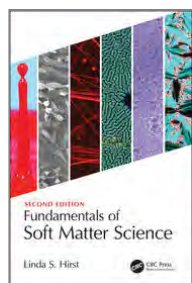
The book provides a thorough grounding in the fundamental nature and properties of soft matter, and then explores its application in biology, especially with regard to DNA investigations, and the study of protein behavior. The final section of the book considers experimental techniques, covering single molecule force spectroscopy of proteins, the use of optical tweezers, and solution scattering.

CRC Press
October 2019 : 344pp
Pb: 978-0-367-39136-2 : **£61.99**
Hb: 978-0-750-31023-9 : **£175**
eBook: 978-0-429-14512-4

* For full contents and more information, visit: www.routledge.com/9780367391362

2ND EDITION

Fundamentals of Soft Matter Science



Linda S. Hirst University of California, Merced, USA

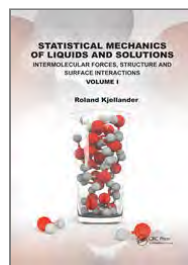
This revised edition continues to provide the most approachable introduction to the structure, characteristics, and everyday applications of soft matter. It begins with a substantially revised overview of the underlying physics and chemistry common to soft materials. Subsequent chapters comprehensively address the different classes of soft materials, from liquid crystals to surfactants, polymers, colloids, and biomaterials, with vivid, full-color illustrations throughout.

CRC Press
August 2019 : 304pp
Pb: 978-1-138-72444-0 : **£86.99**
Hb: 978-1-138-72478-5 : **£220**
eBook: 978-1-315-19238-3

* For full contents and more information, visit: www.routledge.com/9781138724440

Statistical Mechanics of Liquids and Solutions

Intermolecular Forces, Structure and Surface Interactions Volume I



Roland Kjellander University of Gothenburg, Sweden

This book shows how you can start from basic laws for the interactions and motions of microscopic particles and calculate how macroscopic systems of these particles behave, thereby explaining properties of matter at the scale that we perceive. Using this microscopic, molecular approach, the text emphasizes clarity of physical explanations for phenomena and mechanisms relevant to fluids, addressing the structure and behavior of liquids and solutions under various conditions. A notable feature is the author's treatment of forces between particles that include nanoparticles, macroparticles, and surfaces.

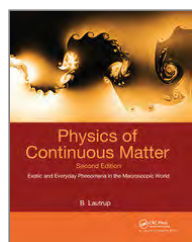
CRC Press
February 2020 : 528pp
Pb: 978-0-367-47790-5 : **£45.99**
Hb: 978-1-482-24401-4 : **£110**
eBook: 978-0-429-19436-8

* For full contents and more information, visit: www.routledge.com/9780367477905

2ND EDITION

Physics of Continuous Matter

Exotic and Everyday Phenomena in the Macroscopic World



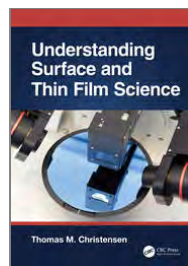
B. Lautrup

This text provides an introduction to the basic ideas of continuum physics and their application to a wealth of macroscopic phenomena. It emphasizes the importance in understanding the physical principles behind equations and the conditions underlying approximations. This edition includes three new chapters on elasticity of slender rods, energy, and entropy. It also offers more illustrations, improved physics arguments and mathematical presentations, and expanded problem sets. Ancillary materials can be found on a companion website. A solutions manual is available for qualifying instructors.

CRC Press
December 2019 : 696pp
Pb: 978-0-367-86511-5 : **£53.99**
Hb: 978-1-420-07700-1 : **£64.99**
eBook: 978-0-429-10950-8

* For full contents and more information, visit: www.routledge.com/9780367865115

Understanding Surface and Thin Film Science



Thomas M. Christensen University of Colorado at Colorado Springs, USA

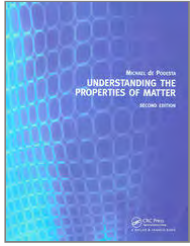
This book is a conceptual overview of surface and thin film science, providing a basic and straightforward understanding of the most common ideas and methods used in these fields. Fundamental scientific ideas, deposition methods and characterization methods are all examined. Thin film science is a natural extension of surface science, especially as applications involve thinner and thinner films; distinct from other literature in the field, this book combines the two topics in a single volume. Simple, conceptual models and figures are used, supported by some mathematical expressions, to convey key ideas to students as well as practicing engineers, scientists, and technicians.

CRC Press
December 2022 : 372pp
Hb: 978-1-482-23303-2 : **£91.99**
eBook: 978-0-429-19454-2

* For full contents and more information, visit: www.routledge.com/9781482233032

2ND EDITION

Understanding the Properties of Matter



Michael de Podesta National Physics Laboratory,
Middlesex, UK

Understanding the Properties of Matter: 2nd Edition is an entertaining and innovative textbook that fulfills the needs of undergraduate physics students and teachers alike. Taking a unique phenomenological approach, this book introduces the properties of matter. After an overview of basic ideas and a reminder of the importance of measurement, the author explores gases, solids, liquids, and phase changes. Students benefit from extensive examples and end-of-chapter exercises, and this edition includes an entire chapter of extended exercises. This approach allows both students and teachers to rediscover a fascination for the subjects that have excited some of the greatest physicists of our age.

CRC Press

April 2002 : 450pp

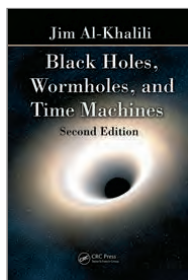
Pb: 978-0-415-25788-6 : **£61.99**

eBook: 978-1-315-27475-1

* For full contents and more information, visit: www.routledge.com/9780415257886

2ND EDITION

Black Holes, Wormholes and Time Machines



Jim Al-Khalili University of Surrey, England, UK

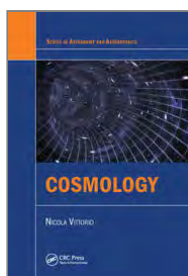
Series: Discovering Physics

While retaining the popular format and style of its best-selling predecessor, this second edition explores the latest developments in high-energy astroparticle physics and Big Bang cosmology. It continues to make the ideas and theories of modern physics easily understood by anyone. Complex concepts, such as quantum mechanics, are explained simply, without the use of scientific jargon. The book takes readers on a journey through space and time, covering space warps, time travel, parallel universes, and other fascinating topics in physics.

CRC Press
December 2011 : 206pp
Pb: 978-1-439-88559-8 : **£43.99**
Hb: 978-1-138-40621-6 : **£185**
eBook: 978-0-429-11313-0

* For full contents and more information, visit: www.routledge.com/9781439885598

Cosmology



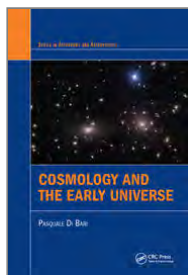
Nicola Vittorio

Modern cosmology has changed significantly over the years, from the discovery to the precision measurement era. The time is right for a fresh new textbook which captures the state-of-the art in cosmology. Written by one of the world's leading cosmologists, this brand new, thoroughly class-tested textbook provides graduate and undergraduate students with coverage of the very latest developments and experimental results in the field. Prof. Nicola Vittorio shows what is meant by precision cosmology, from both theoretical and observational perspectives.

CRC Press
June 2020 : 454pp
Pb: 978-0-367-57269-3 : **£45.99**
Hb: 978-1-498-73132-4 : **£84.99**
eBook: 978-1-315-18139-4

* For full contents and more information, visit: www.routledge.com/9780367572693

Cosmology and the Early Universe



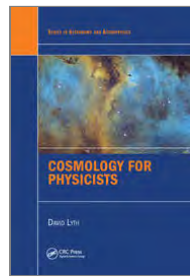
Pasquale Di Bari

This book discusses cosmology from both an observational and a strong theoretical perspective. The first part focuses on gravitation, notably the expansion of the universe and determination of cosmological parameters, before moving onto the main emphasis of the book, the physics of the early universe, and the connections between cosmological models and particle physics. Readers will gain a comprehensive account of cosmology and the latest observational results, without requiring prior knowledge of relativistic theories, making the text ideal for students.

CRC Press
June 2020 : 259pp
Pb: 978-0-367-57170-2 : **£45.99**
Hb: 978-1-498-76170-3 : **£86.99**
eBook: 978-1-138-49690-3

* For full contents and more information, visit: www.routledge.com/9780367571702

Cosmology for Physicists



David Lyth

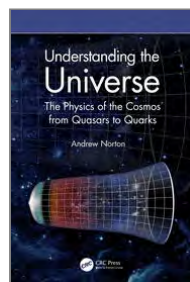
Written by an award-winning cosmologist, this brand new textbook provides advanced undergraduate and graduate students with coverage of the very latest developments in the field. Full treatment of the origin of structure, scalar fields, the cosmic microwave background and the early universe are provided. Problems are included, with solutions in a separate solutions manual. More advanced extension material is offered in the Appendix, ensuring the book is fully accessible to students with a wide variety of background experience.

CRC Press
June 2020 : 180pp
Pb: 978-0-367-57438-3 : **£45.99**
Hb: 978-1-498-75531-3 : **£84.99**
eBook: 978-1-315-36801-6

* For full contents and more information, visit: www.routledge.com/9780367574383

Understanding the Universe

The Physics of the Cosmos from Quasars to Quarks



Andrew Norton

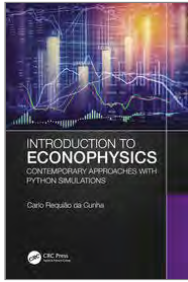
Understanding the Universe: The Physics of the Cosmos from Quasars to Quarks explores how all areas of physics, from the very smallest scales to the very largest, come together to form our current understanding of the Universe. It takes readers on a fascinating journey, from the Big Bang and how the Universe has evolved, to how it appears now, and the possibilities for how it will continue to evolve in the future. It also explores the latest exciting developments in the area and how they impact our understanding of the Universe, such as quantum chromodynamics, black holes, dark energy, and gravitational waves.

CRC Press
May 2023 : 252pp
Pb: 978-0-367-75932-2 : **£46.99**
Hb: 978-0-367-74805-0 : **£120**
eBook: 978-1-003-16466-1

* For full contents and more information, visit: www.routledge.com/9780367759322

Introduction to Econophysics

Contemporary Approaches with Python Simulations



Carlo Requião da Cunha

Econophysics explores the parallels between physics and economics and is an exciting topic that is attracting increasing attention.

CRC Press

January 2024 : 294pp

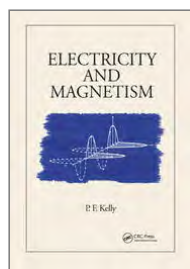
Pb: 978-0-367-65128-2 : **£46.99**

Hb: 978-0-367-64845-9 : **£84.99**

eBook: 978-1-003-12795-6

* For full contents and more information, visit: www.routledge.com/9780367651282

Electricity and Magnetism



P.F. Kelly

This text applies the principles of classical mechanics to reveal the laws governing electric and magnetic phenomena. Exposition of classical electric and magnetic fields is interwoven with analyses of linear electric circuits. Beginning with electric charge, the book culminates in Maxwell's equations, which provide a complete description of classical electromagnetism. With over 450 problems included, it can be used as a primary text, supplement, or exam review.

CRC Press

March 2021 : 418pp

Pb: 978-0-367-78369-3 : **£45.99**

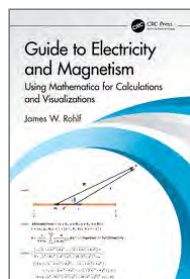
Hb: 978-1-482-20635-7 : **£76.99**

eBook: 978-0-429-17132-1

* For full contents and more information, visit: www.routledge.com/9780367783693

Guide to Electricity and Magnetism

Using Mathematica for Calculations and Visualizations



James W. Rohlff

This is a "how to guide" for a calculus-based introductory course in electricity and magnetism. Students taking the subject at an intermediate or advanced level may also find it to be a useful reference. The calculations are performed in Mathematica, and stress graphical visualization, units, and numerical answers. The techniques show the student how to learn the physics without being hung up on the math.

CRC Press

March 2024 : 232pp

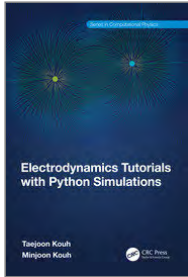
Pb: 978-1-032-64085-3 : **£46.99**

Hb: 978-1-032-64667-1 : **£125**

eBook: 978-1-032-64668-8

* For full contents and more information, visit: www.routledge.com/9781032640853

Electrodynamics Tutorials with Python Simulations



Taejoon Kouh , Minjoon Kouh

Series: Series in Computational Physics

This book provides an accessible introduction to intermediate-level electrodynamics with computational approaches to complement a traditional mathematical treatment of the subject. It covers key topics in electrodynamics, such as electromagnetic fields, forces, potentials, and waves as well as Special Theory of Relativity.

CRC Press

April 2024 : 294pp

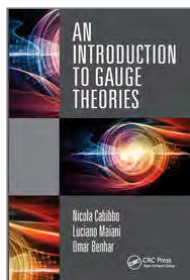
Pb: 978-1-032-50231-1 : **£47.99**

Hb: 978-1-032-49803-4 : **£125**

eBook: 978-1-003-39749-6

* For full contents and more information, visit: www.routledge.com/9781032502311

An Introduction to Gauge Theories



Nicola Cabibbo, Luciano Maiani, Omar Benhar

Written by world-leading experts in particle physics, this new book from Luciano Maiani and Omar Benhar, with contributions from the late Nicola Cabibbo, is based on Feynman's path integrals. Key elements of gauge theories are described — Feynman diagrams, gauge-fixing, Faddeev-Popov ghosts — as well as renormalization in Quantum Electrodynamics. Quarks and QCD interactions are introduced. Renormalization group and high momentum behaviour of the coupling constants is discussed in QED and QCD, with asymptotic freedom derived at one-loop. These concepts are related to the Higgs boson and models of grand unification.

CRC Press

June 2020 : 320pp

Pb: 978-0-367-57340-9 : **£45.99**

Hb: 978-1-498-73451-6 : **£105**

eBook: 978-1-315-36972-3

* For full contents and more information, visit: www.routledge.com/9780367573409

5TH EDITION

Gauge Theories in Particle Physics 40th Anniversary Edition

A Practical Introduction, Two Volume Set



Ian J.R. Aitchison Prof. Em., Univ. of Oxford, **Anthony J.G. Hey** Microsoft Research

The fifth edition of this well-established, highly regarded two-volume set continues to provide a fundamental introduction to advanced particle physics while incorporating substantial new experimental results, especially in the areas of the Higgs and top quark sectors, as well as CP violation and neutrino oscillations. It offers an accessible and practical introduction to the three gauge theories comprising the Standard Model of particle physics: quantum electrodynamics (QED), quantum chromodynamics (QCD), and the Glashow-Salam-Weinberg (GSW) electroweak theory.

CRC Press

August 2024 : 856pp

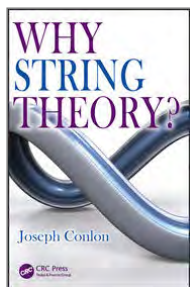
Pb: 978-1-032-72618-2 : **£89.99**

Hb: 978-1-032-49158-5 : **£230**

eBook: 978-1-003-56308-2

* For full contents and more information, visit: www.routledge.com/9781032726182

Why String Theory?



Joseph Conlon Professor of Theoretical Physics, University of Oxford and Fellow of New College

Series: Discovering Physics

This popular science book offers a highly readable and accessible panorama of the who, what, and why of string theory. The author, a theoretical physics professor at the University of Oxford and a leading string theorist, explains what string theory is and where it originated. He describes how string theory fits into physics and why so many physicists and mathematicians find it appealing when working on topics from M-theory to monsters and from cosmology to superconductors.

CRC Press

November 2015 : 260pp

Pb: 978-1-482-24247-8 : **£28.99**

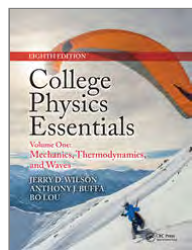
Hb: 978-1-138-42953-6 : **£185**

eBook: 978-1-315-27236-8

* For full contents and more information, visit: www.routledge.com/9781482242478

College Physics Essentials, Eighth Edition

Mechanics, Thermodynamics, Waves (Volume One)



Jerry D. Wilson, Anthony J. Buffa, Bo Lou

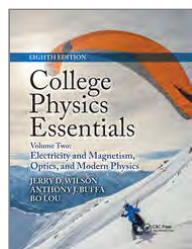
This edition provides a streamlined update of a major textbook for algebra-based physics, reflecting the demand by instructors for more substance. The authors enhance emphasis on worked examples to enhance reader engagement, together with expanded problem sets that build from conceptual understanding to numerical solutions and real-world applications. It is the textbook of choice for those seeking a basic understanding of key physics concepts and how to apply them to real problems. The first volume covers mechanics, solids and fluids, heat, thermodynamics, vibrations and waves, and sound. The second volume covers electricity and magnetism, optics, atomic, nuclear, and quantum physics.

CRC Press
June 2022 : 408pp
Pb: 978-1-032-33728-9 : **£45.99**
Hb: 978-1-138-47632-5 : **£120**
eBook: 978-0-429-32336-2

* For full contents and more information, visit: www.routledge.com/9781032337289

College Physics Essentials, Eighth Edition

Electricity and Magnetism, Optics, Modern Physics (Volume Two)



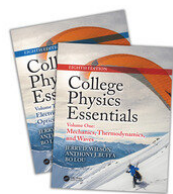
Jerry D. Wilson, Anthony J. Buffa, Bo Lou

This edition provides a streamlined update of a major textbook for algebra-based physics, reflecting the demand by instructors for more substance. The authors enhance emphasis on worked examples to enhance reader engagement, together with expanded problem sets that build from conceptual understanding to numerical solutions and real-world applications. It is the textbook of choice for those seeking a basic understanding of key physics concepts and how to apply them to real problems. The first volume covers mechanics, solids and fluids, heat, thermodynamics, vibrations and waves, and sound. The second volume covers electricity and magnetism, optics, atomic, nuclear, and quantum physics.

CRC Press
June 2022 : 408pp
Pb: 978-1-032-33727-2 : **£45.99**
Hb: 978-1-138-47608-0 : **£120**
eBook: 978-0-429-32337-9

* For full contents and more information, visit: www.routledge.com/9781032337272

College Physics Essentials, Eighth Edition (Two-Volume Set)



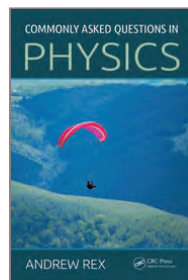
Jerry D. Wilson, Anthony J. Buffa, Bo Lou

This edition provides a streamlined update of a major textbook for algebra-based physics, reflecting the demand by instructors for more substance. The authors enhance emphasis on worked examples to enhance reader engagement, together with expanded problem sets that build from conceptual understanding to numerical solutions and real-world applications. It is the textbook of choice for those seeking a basic understanding of key physics concepts and how to apply them to real problems. The first volume covers mechanics, solids and fluids, heat, thermodynamics, vibrations and waves, and sound. The second volume covers electricity and magnetism, optics, atomic, nuclear, and quantum physics.

CRC Press
July 2022 : 812pp
Pb: 978-1-032-33726-5 : **£86.99**
Hb: 978-0-815-35546-5 : **£230**
eBook: 978-1-351-12992-3

* For full contents and more information, visit: www.routledge.com/9781032337265

Commonly Asked Questions in Physics



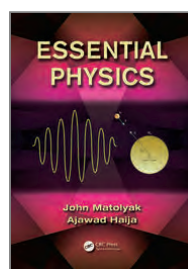
Andrew Rex University of Puget Sound, Tacoma, Washington, USA

Suitable for a wide audience, this book covers a broad scope of subjects, from classical physics that goes back to the age of Newton to new ideas just formulated in the twenty-first century. The book highlights the core areas of physics that predate the twentieth century, including mechanics, electromagnetism, optics, and thermodynamics. It also focuses on modern physics, covering quantum mechanics, atomic and nuclear physics, fundamental particles, and relativity.

CRC Press
February 2014 : 256pp
Pb: 978-1-466-56017-8 : **£28.99**
Hb: 978-1-138-42956-7 : **£180**
eBook: 978-0-429-19405-4

* For full contents and more information, visit: www.routledge.com/9781466560178

Essential Physics



John Matolyak Emeritus Professor, Indiana University of Pennsylvania, USA, **Ajawad I. Haija** Indiana University of Pennsylvania, USA

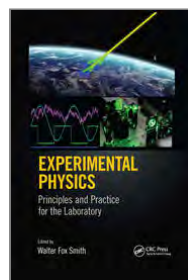
This book is designed for an algebra-based course in physics for non-physics majors and provides a thorough understanding of the fundamentals of essential physics. It omits material often found in much larger texts that cannot be covered in a yearlong course and is not needed for non-physics majors. Instead, this text focuses on providing a solid understanding of fundamental physics and physical principles. Each topic includes worked examples. Math is introduced as necessary, with an emphasis on applications in fields including some biology and chemistry.

CRC Press
December 2013 : 472pp
Hb: 978-1-466-57521-9 : **£110**
eBook: 978-0-429-10150-2

* For full contents and more information, visit: www.routledge.com/9781466575219

Experimental Physics

Principles and Practice for the Laboratory



Edited by **Walter Fox Smith**

This textbook provides the underlying knowledge and skills needed to understand and utilize the most common and important experimental and data analysis techniques in physics. The reader is presented with the tools to design, assemble, and debug experimental apparatus, and to use it to take meaningful data. The contents start with an introduction to key topics such as troubleshooting, statistical methods, and the scientific method, then progressing through a sequence of experiments that encompass each major subfield of physics. Experiments lay out background theory, procedures and equipment, conceptual questions, safety instructions, examples, and troubleshooting exercises.

CRC Press
June 2022 : 452pp
Pb: 978-1-032-33665-7 : **£49.99**
Hb: 978-1-498-77847-3 : **£120**
eBook: 978-0-429-19489-4

* For full contents and more information, visit: www.routledge.com/9781032336657

Fischer-Cripps Student Companion Set (5 Volumes)



Anthony C. Fischer-Cripps Fischer-Cripps Laboratories Pty Ltd, Sydney, Australia

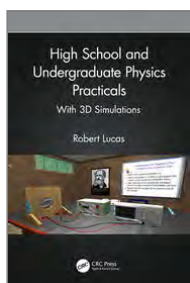
Taking the same signature approach, these books use clear writing and a visual presentation to make the material suitable for students in any country, including those with English as a second language. The author has now extended the coverage of The Physics Companion, The Electronics Companion, The Mathematics Companion, and The Materials Physics Companion and updated them where necessary, building on the outstanding success of the first editions. Along with these volumes, the set contains The Chemistry Companion.

CRC Press
September 2014 : 1632pp
Pb: 978-1-498-70967-5 : **£165**

* For full contents and more information, visit: www.routledge.com/9781498709675

High School and Undergraduate Physics Practicals

With 3D Simulations



Robert Lucas

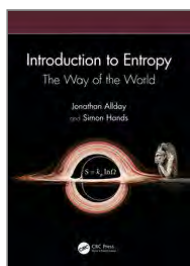
This book describes more than thirty physics practicals at high school and undergraduate levels with background information on each one, a description of the equipment needed, and instructions on how the experiment is performed. Uniquely, for those without access to a real laboratory, the book provides access to highly detailed 3D simulations of all the experiments. Uniquely, for those without access to a real laboratory, the book gives you access to highly detailed 3d simulations of all the experiments.

CRC Press
May 2022 : 246pp
Pb: 978-1-032-19739-5 : **£49.99**
Hb: 978-1-032-20129-0 : **£130**
eBook: 978-1-003-26235-0

* For full contents and more information, visit: www.routledge.com/9781032197395

Introduction to Entropy

The Way of the World



Jonathan Allday The Royal Hospital School, Ipswich, UK,
Simon Hands

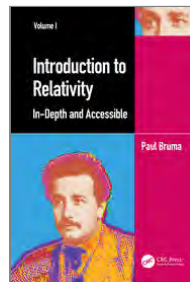
This book will draw these diverse threads together and present entropy as one of the crucial physical concepts. It will cover a range of different applications of entropy, from the classical theory of thermodynamics, the statistical approach, entropy in quantum theory, information theory and finally its manifestation in black hole physics. Each will be presented in a manner suitable for both undergraduates and interested laypersons with no previous knowledge. The book will take an overview of these areas and see to what extent the concept of entropy is being treated in the same way in each, and also how it differs.

CRC Press
October 2024 : 358pp
Pb: 978-0-367-63866-5 : **£44.99**
Hb: 978-0-367-63868-9 : **£130**
eBook: 978-1-003-12105-3

* For full contents and more information, visit: www.routledge.com/9780367638665

Introduction to Relativity Volume I

In-Depth and Accessible



Paul Bruma

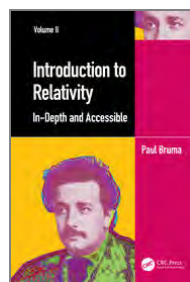
$E=mc^2$ is known as the most famous but least understood equation in physics. This two-volume textbook illuminates this equation and much more through clear and detailed explanations, new demonstrations, a more physical approach, and a deep analysis of the concepts and postulates of Relativity. It fills a gap in the literature by drawing out the physical aspects and consequences of Relativity, which are otherwise often second place to the mathematical aspects. Its concrete focus on physics allows students to gain a full understanding of the underlying concepts and cornerstones of Relativity.

CRC Press
December 2024 : 262pp
Pb: 978-1-032-06243-3 : **£45.99**
Hb: 978-1-032-05674-6 : **£76.99**
eBook: 978-1-003-20133-5

* For full contents and more information, visit: www.routledge.com/9781032062433

Introduction to Relativity Volume II

In-Depth and Accessible



Paul Bruma

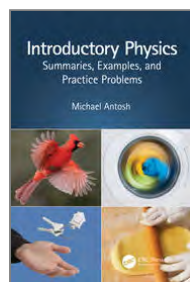
$E=mc^2$ is known as the most famous but least understood equation in physics. This two-volume textbook illuminates this equation and much more through clear and detailed explanations, new demonstrations, a more physical approach, and a deep analysis of the concepts and postulates of Relativity. It fills a gap in the literature by drawing out the physical aspects and consequences of Relativity, which are otherwise often second place to the mathematical aspects. Its concrete focus on physics allows students to gain a full understanding of the underlying concepts and cornerstones of Relativity.

CRC Press
December 2024 : 286pp
Pb: 978-1-032-06244-0 : **£45.99**
Hb: 978-1-032-05676-0 : **£76.99**
eBook: 978-1-003-20135-9

* For full contents and more information, visit: www.routledge.com/9781032062440

Introductory Physics

Summaries, Examples, and Practice Problems



Michael Antosh University of Rhode Island

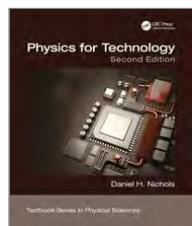
This textbook covers topics related to units, kinematics, forces, energy, momentum, circular and rotational motion, Newton's general equation for gravity, and simple harmonic motion (things that go back and forth). A math review is also included, with a focus on algebra and trigonometry. This book is a very useful study guide for students in introductory physics courses, particularly high school and college students in an algebra-based introductory physics course, and even students in an introductory calculus-level course. It can also be used as a standalone textbook in courses where derivations are not emphasized.

CRC Press
February 2023 : 408pp
Pb: 978-0-367-43423-6 : **£43.99**
Hb: 978-0-367-43685-8 : **£115**
eBook: 978-1-003-00504-9

* For full contents and more information, visit: www.routledge.com/9780367434236

2ND EDITION

Physics for Technology, Second Edition



Daniel H. Nichols

This text provides an introduction to the important physics underpinning current technologies, highlighting key concepts in areas that include linear and rotational motion, energy, work, power, heat, temperature, fluids, waves, and magnetism. This revision reflects the latest technology advances, from smart phones to the Internet of Things, and all kinds of sensors. The author also provides more modern worked examples with useful appendices and laboratories for hands-on practice. There are also two brand new chapters covering sensors as well as electric fields and electromagnetic radiation as applied to current technologies.

CRC Press

March 2021 : 432pp

Pb: 978-0-367-78059-3 : **£45.99**

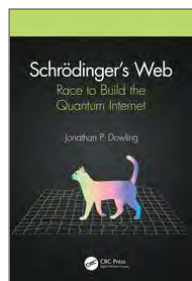
Hb: 978-0-815-38292-8 : **£125**

eBook: 978-1-351-20727-0

* For full contents and more information, visit: www.routledge.com/9780367780593

Schrödinger's Web

Race to Build the Quantum Internet



Jonathan P. Dowling Louisiana State University, Baton Rouge, USA

As the race to build the world's first quantum computer is coming to an end, the race to build the quantum internet is has just started. This book leverages the author's unique insights into both the Chinese and American quantum programs. It begins with the physics and history of the quantum internet and ends with the latest results in quantum computing and quantum networks. Written by a renowned quantum physicist, this book is for everyone who is interested in the rapidly advancing field of Quantum Technology — The Second Quantum Revolution.

CRC Press

August 2020 : 314pp

Pb: 978-0-367-32231-1 : **£35.99**

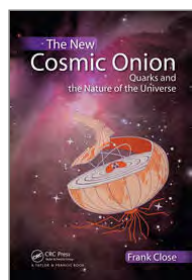
Hb: 978-0-367-33761-2 : **£175**

eBook: 978-0-367-33762-9

* For full contents and more information, visit: www.routledge.com/9780367322311

The New Cosmic Onion

Quarks and the Nature of the Universe



Frank Close University of Oxford, UK

Series: Discovering Physics

Not since Newton's apple has there been a physics phenomenon as deliciously appealing to the masses as Frank Close's Cosmic Onion. Widely embraced by scientists and laypersons alike, the book quickly became an international bestseller, has been translated into seven languages, and propelled the author to become a recognized popular science celebrity around the world. Much has changed since the original publication in 1983, and The New Cosmic Onion was extensively revised and updated to reflect our new view of the universe. Keeping the best contents from the previous work, this new edition includes extensive new material explaining the scientific challenges at the start of this century.

CRC Press

December 2006 : 232pp

Pb: 978-1-584-88798-0 : **£47.99**

Hb: 978-1-138-42970-3 : **£185**

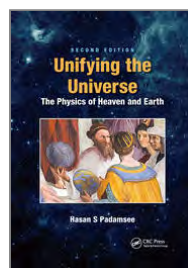
eBook: 978-0-429-13855-3

* For full contents and more information, visit: www.routledge.com/9781584887980

2ND EDITION

Unifying the Universe

The Physics of Heaven and Earth



Hasan S. Padamsee

Unifying the Universe: The Physics of Heaven and Earth provides a solid background in basic physics. With a humanistic perspective, it shows how science is significant for more than its technological consequences. Fully updated throughout, with a new chapter on the 'Quantum World' and supplementary video resources, this new edition includes clear and well-planned links to the arts and philosophies of relevant historical periods to bring science and the humanities together.

CRC Press

September 2021 : 508pp

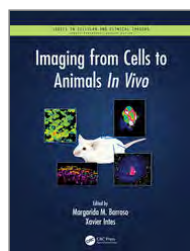
Pb: 978-1-032-17481-5 : **£45.99**

Hb: 978-1-138-38868-0 : **£84.99**

eBook: 978-0-429-42441-0

* For full contents and more information, visit: www.routledge.com/9781032174815

Imaging from Cells to Animals In Vivo



Edited by **Margarida Barroso**, **Xavier Intes**

Series: *Series in Cellular and Clinical Imaging*

This book offers an overview of imaging techniques used to investigate cells and tissue in their native environment. It covers the range of imaging approaches used, as well as the application of those techniques to the study of biological processes in cells and whole tissues within living organisms. Among the areas covered are cell metabolism, receptor-ligand interactions, membrane trafficking, cell signaling, cell migration, cell adhesion, cytoskeleton and other processes using intra-vital microscopy and optical and molecular imaging in living organisms such as mice and zebrafish.

CRC Press

May 2023 : 370pp

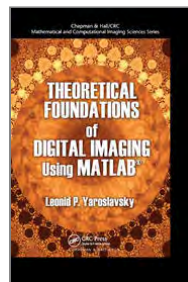
Pb: 978-0-367-56638-8 : **£45.99**

Hb: 978-1-138-04109-7 : **£185**

eBook: 978-1-315-17466-2

* For full contents and more information, visit: www.routledge.com/9780367566388

Theoretical Foundations of Digital Imaging Using MATLAB



Leonid P. Yaroslavsky

Helping readers master digital imaging, this text presents a unified theoretical basis for understanding and designing methods of imaging and image processing. Designed for newcomers to imaging science and engineering, the book covers the subject in its entirety, from image formation to image perfecting. The author avoids using heavy mathematics and derives all formulas in full detail. To facilitate a deeper understanding of the major results, the book includes a number of exercises supported by MATLAB® programs, with the code available at www.crcpress.com.

CRC Press

September 2020 : 516pp

Pb: 978-0-367-86626-6 : **£58.99**

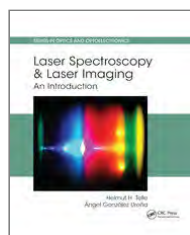
Hb: 978-1-439-86140-0 : **£110**

eBook: 978-0-429-07415-8

* For full contents and more information, visit: www.routledge.com/9780367866266

Laser Spectroscopy and Laser Imaging

An Introduction



Helmut H. Telle, **Ángel González Ureña**

Developments in and applications of laser spectroscopy and laser imaging are growing rapidly, specifically now that spectral analytical methodologies are merging with laser imaging techniques. It is the intention of this book to provide researchers, both in industry and academia, with a concise collection of laser analysis and imaging techniques. Written by two leaders in the field, it will introduce the reader to individual techniques in a tutorial-fashion and provide key examples and including details of the latest techniques.

CRC Press

December 2019 : 750pp

Pb: 978-0-367-86821-5 : **£71.99**

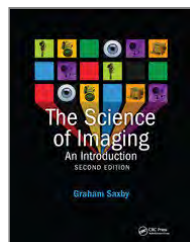
Hb: 978-1-466-58822-6 : **£175**

eBook: 978-1-315-15698-9

* For full contents and more information, visit: www.routledge.com/9780367868215

2ND EDITION

The Science of Imaging



Graham Saxby

Updated and expanded to keep pace with the digital revolution, the new edition of this critically acclaimed work provides a comprehensive exploration of imaging science. Extensively illustrated, the second edition covers the fundamental laws of physics as well as the cutting-edge techniques defining the field. This accessible introduction takes readers on a grand tour of imaging. Starting with the fundamentals of light and basic cameras, the author journeys through television and holography to advanced scientific and medical imaging. He highlights essential formulas, while keeping the complex mathematics to a minimum.

CRC Press

September 2020 : 352pp

Pb: 978-0-367-86446-0 : **£45.99**

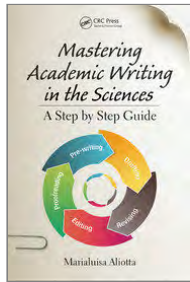
Hb: 978-1-439-81286-0 : **£84.99**

eBook: 978-0-429-13191-2

* For full contents and more information, visit: www.routledge.com/9780367864460

Mastering Academic Writing in the Sciences

A Step-by-Step Guide



Marialuisa Aliotta

This book provides a comprehensive and coherent step-by-step guide to writing in scientific academic disciplines. It is an invaluable resource for those working on a PhD thesis, research paper, dissertation, or report. Writing these documents can be a long and arduous experience for students and their supervisors, and even for experienced researchers. However, this book can hold the key to success. Mapping the steps involved in the writing process - from acquiring and organizing sources of information, to revising early drafts, to proofreading the final product - it provides clear guidance on what to write and how best to write it.

CRC Press

April 2018 : 200pp

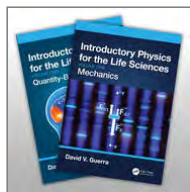
Pb: 978-1-498-70147-1 : **£47.99**

Hb: 978-1-138-74288-8 : **£120**

eBook: 978-1-351-00214-1

* For full contents and more information, visit: www.routledge.com/9781498701471

Introductory Physics for the Life Sciences - Two-Vol. Set



David V. Guerra

This textbook provides an accessible introduction to physics for undergraduate students in the life sciences, including those majoring in all branches of biology, biochemistry, and psychology and students working on pre-professional programs such as pre-medical, pre-dental, and physical therapy. The text is geared for the algebra-based physics course, often named College Physics in the United States. The order of topics studied are such that most of the problems in the text can be solved with the methods of Statics or Dynamics. That is, they require a free body diagram, the application of Newton's Laws, and any necessary kinematics.

CRC Press

June 2023 : 932pp

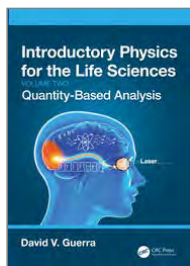
Pb: 978-1-032-49093-9 : **£91.99**

Hb: 978-1-032-49091-5 : **£240**

* For full contents and more information, visit: www.routledge.com/9781032490939

Introductory Physics for the Life Sciences: (Volume 2)

Quantity-Based Analysis



David V. Guerra

This textbook provides an accessible introduction to physics for undergraduate students in the life sciences, including those majoring in all branches of biology, biochemistry, and psychology and students working on pre-professional programs such as pre-medical, pre-dental, and physical therapy. The text is geared for the algebra-based physics course, often named College Physics in the United States. The order of topics studied in this volume require students to first understand a concept, such as the conservation of energy, momentum, voltage, or current, the change in a quantity such as entropy, or the rules of ray and wave optics.

CRC Press

June 2023 : 288pp

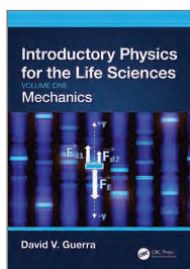
Pb: 978-1-032-31108-1 : **£57.99**

Hb: 978-1-032-30041-2 : **£145**

eBook: 978-1-003-30807-2

* For full contents and more information, visit: www.routledge.com/9781032311081

Introductory Physics for the Life Sciences: Mechanics (Volume One)



David V. Guerra

This textbook provides an accessible introduction to physics for undergraduate students in the life sciences, including those majoring in all branches of biology, biochemistry, and psychology and students working on pre-professional programs such as pre-medical, pre-dental, and physical therapy. The text is geared for the algebra-based physics course, often named College Physics in the United States. The order of topics studied are such that most of the problems in the text can be solved with the methods of Statics or Dynamics. That is, they require a free body diagram, the application of Newton's Laws, and any necessary kinematics.

CRC Press

May 2023 : 258pp

Pb: 978-1-032-31106-7 : **£57.99**

Hb: 978-1-032-30040-5 : **£135**

eBook: 978-1-003-30806-5

* For full contents and more information, visit: www.routledge.com/9781032311067

2ND EDITION

Fundamentals of Fibre Reinforced Composite Materials



A.R. Bunsell Centre des Matériaux, Pierre-Marie Fourt, France, **S. Joannès** Mines ParisTech, France, **A. Thionnet** MINES, ParisTech, France

Series: Series in Materials Science and Engineering

This second edition of Fundamentals of Fibre Reinforced Composite Materials has been fully updated throughout, providing an authoritative and modern introduction to the topic with a brief history of composite development, a review of composite applications, manufacture and markets, types of fibres and matrices used, and their properties with a detailed introduction into the computer simulation of composite behaviour.

CRC Press

September 2022 : 360pp

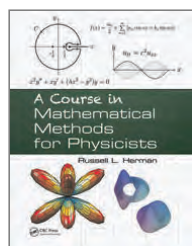
Pb: 978-0-367-74433-5 : **£45.99**

Hb: 978-0-367-02373-7 : **£120**

eBook: 978-0-429-39990-9

* For full contents and more information, visit: www.routledge.com/9780367744335

A Course in Mathematical Methods for Physicists



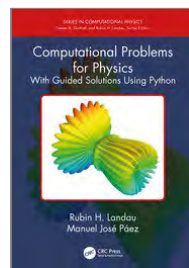
Russell L. Herman University of North Carolina, Wilmington, USA

Based on the author's junior-level undergraduate course, this classroom-tested textbook is designed for an introductory one-semester course in mathematical physics. Focusing on the physics of oscillations and waves, it helps students understand the mathematical techniques needed for their future studies in physics. The book introduces the methods while studying one underlying theme from physics. It takes a bottom-up approach that emphasizes physical applications of the mathematics.

CRC Press
December 2013 : 776pp
Pb: 978-1-466-58467-9 : **£71.99**
Hb: 978-1-138-44208-5 : **£185**
eBook: 978-0-429-08891-9
* For full contents and more information, visit: www.routledge.com/9781466584679

Computational Problems for Physics

With Guided Solutions Using Python



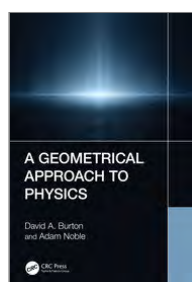
Rubin H. Landau Distinguished Professor Emeritus, Oregon State University, USA, **Manuel José Páez**

Series: Series in Computational Physics

Our future scientists and professionals must be conversant in computational techniques. In order to facilitate integration of computer methods into existing physics courses, this textbook offers a large number of worked examples and problems with fully guided solutions in Python as well as other languages (Mathematica, Java, C, Fortran, and Maple) on the Web. It's also intended as a self-study guide for learning how to use computer methods in physics. The authors include an introductory chapter on numerical tools and indication of computational as well as a separate chapter with problems for beginning students.

CRC Press
June 2018 : 430pp
Pb: 978-1-138-70541-8 : **£71.99**
Hb: 978-1-138-70591-3 : **£110**
eBook: 978-1-315-20209-9
* For full contents and more information, visit: www.routledge.com/9781138705418

A Geometrical Approach to Physics

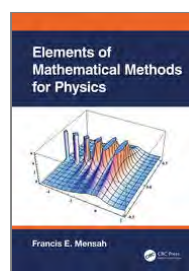


David A. Burton, **Adam Noble**

The purpose of the book is to act as a 'gateway' to more advanced books on the applications of differential geometry in physics. It will also help the reader to better appreciate modern physics research that makes use of differential geometry, and the common features that permeate the discipline as a whole.

CRC Press
March 2024 : 202pp
Pb: 978-1-032-12928-0 : **£48.99**
Hb: 978-1-032-13380-5 : **£130**
eBook: 978-1-003-22894-3
* For full contents and more information, visit: www.routledge.com/9781032129280

Elements of Mathematical Methods for Physics

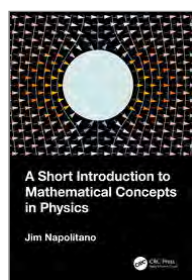


Francis E. Mensah

"Elements of Mathematical Methods for Physics" provides students with an approachable and innovative introduction to key concepts of Mathematical Physics, accompanied by clear and concise explanations, relevant real-world examples, and problems that help them to master the fundamentals of Mathematical Physics. The topics are presented at a basic level, for students lacking a prior mathematical background.

CRC Press
August 2024 : 398pp
Hb: 978-1-032-76222-7 : **£81.99**
eBook: 978-1-003-47881-2
* For full contents and more information, visit: www.routledge.com/9781032762227

A Short Introduction to Mathematical Concepts in Physics



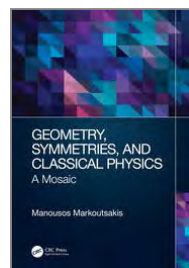
Jim Napolitano Temple University, Pennsylvania, USA

Mathematics is the language of physics and yet, mathematics is an enormous subject. This textbook provides an accessible and concise introduction to mathematical physics for undergraduate students taking a one semester course. It assumes the reader has studied a year of introductory physics and three semesters of basic calculus, including some vector calculus, but no formal training in differential equations or matrix algebra. It equips readers with the skills and foundational knowledge they need for courses that follow in classical mechanics, electromagnetism, quantum mechanics, and thermal physics.

CRC Press
January 2024 : 242pp
Pb: 978-1-032-40430-1 : **£53.99**
Hb: 978-1-032-40977-1 : **£145**
eBook: 978-1-003-35565-6
* For full contents and more information, visit: www.routledge.com/9781032404301

Geometry, Symmetries, and Classical Physics

A Mosaic



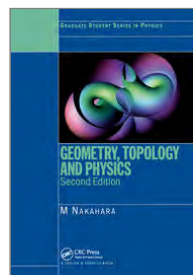
Manousos Markoutsakis

This book provides advanced undergraduate physics and mathematics students with an accessible yet detailed understanding of the fundamentals of differential geometry and symmetries in classical physics.

CRC Press
January 2024 : 482pp
Pb: 978-0-367-54141-5 : **£45.99**
Hb: 978-0-367-53523-0 : **£135**
eBook: 978-1-003-08774-8
* For full contents and more information, visit: www.routledge.com/9780367541415

2ND EDITION

Geometry, Topology and Physics



Mikio Nakahara Kinki University, Osaka, Japan

This book provides an introduction to the ideas and techniques of differential geometry and topology. It starts with a brief survey of quantum field theory, gauge theory, general relativity, vector spaces, and topology. Using many illustrations, exercises, and problems, the author demonstrates more elaborate concepts of topology and geometry, including fiber bundles, characteristic classes, and index theorems. New to this second edition is the proof of the index theorem in terms of supersymmetric quantum mechanics. The final two chapters examine anomalies in gauge field theories and the analysis of Polakov's bosonic string theory from the geometrical point of view.

CRC Press

June 2003 : 596pp

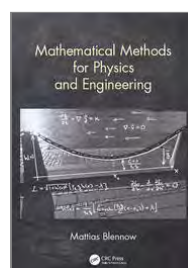
Pb: 978-0-750-30606-5 : £84.99

Hb: 978-1-138-41336-8 : £185

eBook: 978-1-315-27582-6

* For full contents and more information, visit: www.routledge.com/9780750306065

Mathematical Methods for Physics and Engineering



Mattias Blennow KTH Royal Institute of Technology, Stockholm, Sweden

Suitable for advanced undergraduate and graduate students, this new textbook contains an introduction to the mathematical concepts used in physics and engineering. The entire book is unique in that it draws upon applications from physics, rather than mathematical examples, to ensure students are fully equipped with the tools they need. This approach prepares the reader for advanced topics, such as quantum mechanics and general relativity, while offering examples, problems, and insights into classical physics. The book is also distinctive in the coverage it devotes to modelling, and to oft-neglected topics such as Green's functions.

CRC Press

December 2017 : 760pp

Pb: 978-1-138-05688-6 : £105

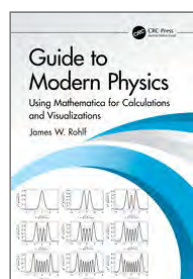
Hb: 978-1-138-05690-9 : £250

eBook: 978-1-315-16509-7

* For full contents and more information, visit: www.routledge.com/9781138056886

Guide to Modern Physics

Using Mathematica for Calculations and Visualizations



James W. Rohl

This is a "how to guide" for making beginning calculations in modern physics. The academic level is second year college physical science and engineering students. The calculations are performed in Mathematica, and stress graphical visualization, units, and numerical answers.

CRC Press

November 2023 : 218pp

Pb: 978-1-032-49686-3 : £46.99

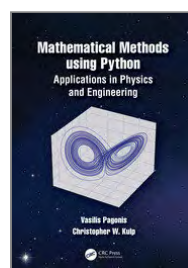
Hb: 978-1-032-49801-0 : £125

eBook: 978-1-003-39551-5

* For full contents and more information, visit: www.routledge.com/9781032496863

Mathematical Methods using Python

Applications in Physics and Engineering



Vasilis Pagonis McDaniel College, Westminster, MD, USA
Christopher Wayne Kulp Lycoming College, Williamsport, PA, USA

This advanced undergraduate textbook presents a new approach to teaching mathematical methods for scientists and engineers. It provides a practical, pedagogical introduction to utilizing Python in Mathematical and Computational Methods courses. Both analytical and computational examples are integrated from its start.

CRC Press

May 2024 : 504pp

Hb: 978-1-032-27836-0 : £81.99

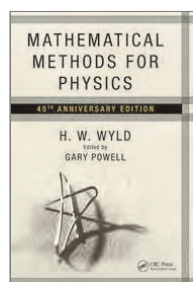
eBook: 978-1-003-29432-0

* For full contents and more information, visit: www.routledge.com/9781032278360

2ND EDITION

Mathematical Methods for Physics

45th anniversary edition



H.W. Wyld, Gary Powell

From classical mechanics and classical electrodynamics to modern quantum mechanics many physical phenomena are formulated in terms of similar partial differential equations while boundary conditions determine the specifics of the problem. Mathematical Methods for Physics demonstrates how many physics problems resolve into similar inhomogeneous partial differential equations and the mathematical techniques for solving them.

CRC Press

May 2022 : 476pp

Pb: 978-0-367-47973-2 : £49.99

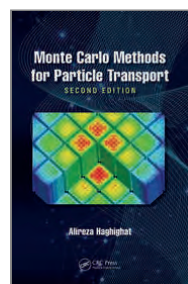
Hb: 978-0-367-47708-0 : £120

eBook: 978-1-003-03746-0

* For full contents and more information, visit: www.routledge.com/9780367479732

2ND EDITION

Monte Carlo Methods for Particle Transport



Alireza Haghighat

Fully updated with the latest developments in the eigenvalue Monte Carlo calculations and automatic variance reduction techniques and containing an entirely new chapter on fission matrix and alternative hybrid techniques. This second edition explores the uses of the Monte Carlo method for real-world applications, explaining its concepts and limitations.

CRC Press

April 2022 : 310pp

Pb: 978-0-367-53809-5 : £49.99

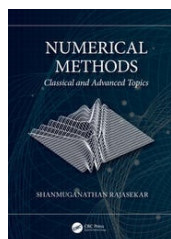
Hb: 978-0-367-18805-4 : £120

eBook: 978-0-429-19839-7

* For full contents and more information, visit: www.routledge.com/9780367538095

Numerical Methods

Classical and Advanced Topics



Shanmuganathan Rajasekar

This book presents a pedagogical treatment of a range of numerical methods to suit the needs of undergraduate and postgraduate students, and teachers and researchers in physics, mathematics, and engineering. For each method, the derivation of the formula/algorithm, error analysis, case studies, applications in science and engineering and the special features are covered. A detailed presentation of solving time-dependent Schrödinger equation and nonlinear wave equations, along with the Monte Carlo techniques will aid in students' understanding of several physical phenomena including tunnelling, elastic collision of nonlinear waves, and diffusion of neutrons through simulation study.

CRC Press

May 2024 : 550pp

Pb: 978-1-032-64991-7 : **£47.99**

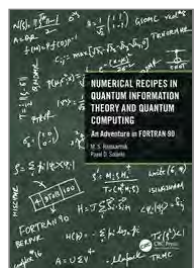
Hb: 978-1-032-63894-2 : **£110**

eBook: 978-1-032-64993-1

* For full contents and more information, visit: www.routledge.com/9781032649917

Numerical Recipes in Quantum Information Theory and Quantum Computing

An Adventure in FORTRAN 90



M.S. Ramkarthik Visvesvaraya National Institute of Technology, India, **Payal D. Solanki** Visvesvaraya National Institute of Technology

This first of a kind textbook provides computational tools in Fortran 90 that are fundamental to quantum information, quantum computing, linear algebra and one dimensional spin half condensed matter systems. Over 160 subroutines are included, and the numerical recipes are aided by detailed flowcharts. Suitable for beginner and advanced readers alike, students and researchers will find this textbook to be a helpful guide and a compendium.

CRC Press

October 2024 : 424pp

Pb: 978-0-367-75931-5 : **£45.99**

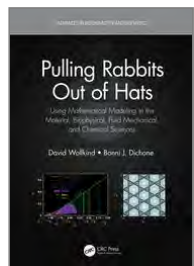
Hb: 978-0-367-75928-5 : **£96.99**

eBook: 978-1-003-16467-8

* For full contents and more information, visit: www.routledge.com/9780367759315

Pulling Rabbits Out of Hats

Using Mathematical Modeling in the Material, Biophysical, Fluid Mechanical, and Chemical Sciences



David Wollkind , Bonni J. Dichone Gonzaga University

Series: Advances in Biochemistry and Biophysics

Pulling Rabbits Out of Hats: Using Mathematical Modeling in the Material, Biophysical, Fluid Mechanical, and Chemical Sciences focuses on those assumptions made during applied mathematical modeling in which the phenomenological data and the model predictions are self-consistent. This comprehensive reference demonstrates how to employ a variety of mathematical techniques to quantify a number of problems from the material, biophysical, fluid mechanical, and chemical sciences. In doing so, methodology of modelling, analysis, and result generation are all covered.

CRC Press

October 2024 : 554pp

Pb: 978-1-032-05007-2 : **£45.99**

Hb: 978-1-032-04787-4 : **£185**

eBook: 978-1-003-19560-3

* For full contents and more information, visit: www.routledge.com/9781032050072

2ND EDITION

Applied Mechanics of Solids



Allan F. Bower Brown University, Providence, Rhode Island, USA

The second edition of Applied Mechanics of Solids provides a concise description of all the concepts needed to predict how solid materials deform and fail under stress. With its companion volume of solved example problems, it is an invaluable class textbook or reference for personal study or review. With the aid of computer simulations, design engineers can predict failure in structural, mechanical, and bio-mechanical components with a few keystrokes. But simulations are built on sophisticated mathematics, physics, and numerical methods, and always involve some judicious approximations. This book contains all the theory needed to make the best use of their simulations.

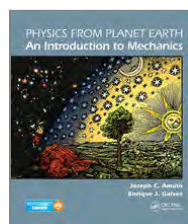
CRC Press

July 2025 : 600pp

Hb: 978-1-041-01995-4 : £91.99

* For full contents and more information, visit: www.routledge.com/9781041019954

Physics from Planet Earth - An Introduction to Mechanics



Joseph C. Amato Colgate University, Hamilton, New York, USA, **Enrique J. Galvez** Colgate University, Hamilton, New York, USA

This classroom-tested text provides a one-semester, calculus-based introduction to classical mechanics for first-year undergraduate students. The authors introduce the three conservation laws as fundamental laws of nature from which secondary concepts are derived and organize topics around the conservation laws. They also illustrate many topics through real, contemporary applications in astronomy, planetary science, and space travel. The book includes short exercises throughout the text as well as novel problems at the end of each chapter.

CRC Press

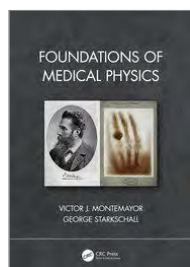
June 2015 : 612pp

Hb: 978-1-439-86783-9 : £86.99

eBook: 978-0-429-19447-4

* For full contents and more information, visit: www.routledge.com/9781439867839

Foundations of Medical Physics



Victor J. Montemayor, **George Starkschall** University of Texas M.D. Anderson Cancer Center, Houston, USA

Foundations of Medical Physics has an overview of the history of cancer and cancer treatment along with a brief introduction to the fundamental principles of Radiobiology constitute Part I of this book, which serves as the motivation for the principles of Radiation Therapy, or cancer treatment with radiation. Part II contains the fundamental ideas from Modern Physics that form the foundation for an understanding of the approaches to treatment used in Radiation Therapy. Finally, Part III shows the applications of Parts I and II to Medical Imaging and Radiation Therapy.

CRC Press

June 2024 : 630pp

Pb: 978-0-429-19476-4 : £63.99

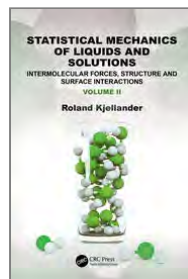
Hb: 978-1-498-74618-2 : £155

eBook: 978-1-003-47745-7

* For full contents and more information, visit: www.routledge.com/9780429194764

Statistical Mechanics of Liquids and Solutions

Intermolecular Forces, Structure and Surface Interactions



Roland Kjellander University of Gothenburg, Sweden

The statistical mechanical theory of liquids and solutions is a fundamental area of physical sciences with important implications in other fields of science and industrial applications. Statistical Mechanics of Liquids and Solutions: Intermolecular Forces, Structure and Surface Interactions is the second in a series of two on this subject. While the first volume introduced equilibrium statistical mechanics in general and statistical mechanics of liquids and solutions at an introductory level, the present volume presents an advanced treatment of the subject and penetrates much deeper into liquid state theory.

CRC Press

December 2024 : 524pp

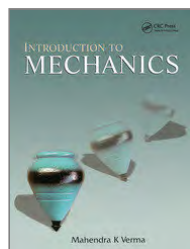
Pb: 978-1-032-26162-1 : £45.99

Hb: 978-1-032-25728-0 : £105

eBook: 978-1-003-28688-2

* For full contents and more information, visit: www.routledge.com/9781032261621

Introduction to Mechanics



Mahendra K. Verma

A modern introduction to Newtonian dynamics and the basics of special relativity, this book discusses standard topics such as Newton's laws of motion, energy, linear and angular momentum, rigid body dynamics, and oscillations, then goes on to introduce modern topics such as symmetries, phase space, nonlinear dynamics and chaos. The author presents Newton's equation of motion as a differential equation, bringing out key issues such as phase space and determinism in mechanical systems and helps introduce modern research topics such as chaos theory in a natural way. He highlights key assumptions of Newtonian mechanics and incorporates numerical solutions of many mechanical systems using MATLAB®.

CRC Press

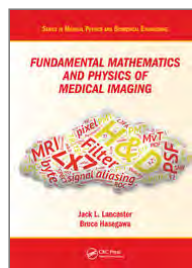
January 2019 : 356pp

Pb: 978-1-138-11677-1 : £19.99

Hb: 978-1-439-80127-7 : £54.99

* For full contents and more information, visit: www.routledge.com/9781138116771

Fundamental Mathematics and Physics of Medical Imaging



Jack Lancaster, Bruce Hasegawa

Authored by a leading educator, this book is ideal for graduate medical imaging courses. Rather than focus on imaging modalities, the book delves into the mechanisms of image formation and image quality common to all imaging systems: contrast mechanisms, noise, and spatial and temporal resolution. This is an extensively revised new edition of The Physics of Medical X-Ray Imaging by Bruce Hasegawa (Medical Physics Publishing, 1991). A wide range of modalities are covered including X-ray CT, MRI and SPECT.

CRC Press

June 2020 : 346pp

Pb: 978-0-367-57452-9 : **£45.99**

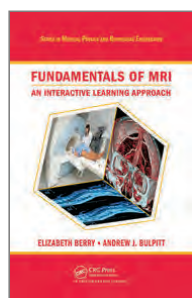
Hb: 978-1-498-75161-2 : **£86.99**

eBook: 978-1-315-36821-4

* For full contents and more information, visit: www.routledge.com/9780367574529

Fundamentals of MRI

An Interactive Learning Approach



Elizabeth Berry Elizabeth Berry Ltd, Leeds, UK, **Andrew J. Bulpitt** University of Leeds, School of Computing, Leeds, UK

Series: Series in Medical Physics and Biomedical Engineering

This interactive workbook provides a practical, self-contained introduction to the principles of MRI. Shaped by the authoritative experience of the authors, the book presents the fundamentals of MRI, while an accompanying CD offers animations and exercises that will help students develop a deeper understanding of the physical principles of MRI in practice. The text includes a number of exercises and worked examples with detailed solutions. It provides advanced students studying medical physics, radiologists, radiographers, and clinicians with a pragmatic approach to MRI that builds a solid foundation for further practice and study.

CRC Press

December 2008 : 316pp

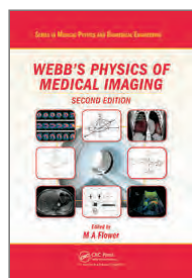
Hb: 978-1-584-88901-4 : **£84.99**

eBook: 978-0-429-14342-7

* For full contents and more information, visit: www.routledge.com/9781584889014

2ND EDITION

Webb's Physics of Medical Imaging



Edited by **M Flower**

Series: Series in Medical Physics and Biomedical Engineering

Since the publication of the best-selling first edition, the technology and clinical applications of medical imaging have changed significantly. Gathering these developments into one volume, this comprehensive second edition presents the basic physics, modern technology, and up-to-date examples of clinical application across all the modalities of medical imaging for undergraduate and graduate students studying medicine and medical physics. It now covers state-of-the-art detector technology and computer processing used in medical imaging. Along with many new examples and figures, this edition includes new chapters on medical image processing and multimodality imaging.

CRC Press

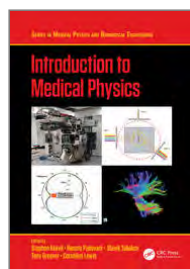
June 2012 : 864pp

Hb: 978-0-750-30573-0 : **£86.99**

eBook: 978-0-429-09957-1

* For full contents and more information, visit: www.routledge.com/9780750305730

Introduction to Medical Physics



Edited by **Stephen Keevil** Guy's and St Thomas' NHS Foundation Trust, London, UK, **Renato Padovani**, **Slavik Tabakov** King's College Hospital, London, UK, **Tony Greener** Guy's and St. Thomas' NHS Foundation Trust, London, UK, **Cornelius Lewis** King's College Hospital, London, UK

Series: *Series in Medical Physics and Biomedical Engineering*

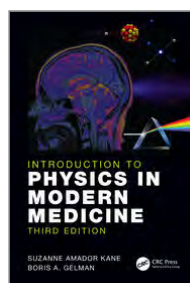
This textbook provides an accessible introduction to the basic principles of medical physics, the applications of medical physics equipment, and the role of a medical physicist in healthcare.

CRC Press
May 2024 : 500pp
Pb: 978-1-138-74283-3 : **£45.99**
Hb: 978-1-498-74479-9 : **£84.99**
eBook: 978-0-429-15575-8

* For full contents and more information, visit: www.routledge.com/9781138742833

3RD EDITION

Introduction to Physics in Modern Medicine



Suzanne Amador Kane Haverford College, Pennsylvania, USA, **Boris A. Gelman**

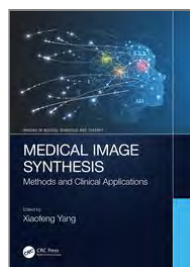
Covering a wide range of applications, this third edition builds on the bestselling second edition, providing medical personnel and students with an exploration of the physics-related applications found in state-of-the-art medical centers. Requiring no previous knowledge of physics, biology, or chemistry and keeping maths to a minimum, the application-dedicated chapters adhere to simple and self-contained qualitative explanations that make use of examples and illustrations. With an enhanced emphasis on digital imaging and computers in medicine, the text gives readers a fundamental understanding of the practical application of each concept and the basic science behind it.

CRC Press
March 2020 : 450pp
Pb: 978-1-138-03603-1 : **£58.99**
Hb: 978-1-138-74263-5 : **£175**
eBook: 978-1-315-23208-9

* For full contents and more information, visit: www.routledge.com/9781138036031

Medical Image Synthesis

Methods and Clinical Applications



Edited by **Xiaofeng Yang**

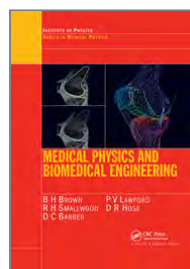
Series: *Imaging in Medical Diagnosis and Therapy*

Image synthesis across and within medical imaging modalities is an active area of research with broad applications in radiology and radiation oncology. This book covers the principles and methods of medical image synthesis, along with state-of-the-art research. The benefits of medical image synthesis have sparked growing interest in a number of advanced clinical applications, such as magnetic resonance imaging (MRI)-only radiation therapy treatment planning and positron emission tomography (PET)/MRI scanning. This book will be a comprehensive and exciting resource for undergraduates, graduates, researchers, and practitioners.

CRC Press
February 2024 : 318pp
Pb: 978-1-032-15284-4 : **£81.99**
Hb: 978-1-032-13388-1 : **£210**
eBook: 978-1-003-24345-8

* For full contents and more information, visit: www.routledge.com/9781032152844

Medical Physics and Biomedical Engineering



B.H Brown, **R.H Smallwood** University of Sheffield, England, UK, **D.C. Barber** Royal Hallamshire Hospital, Sheffield, UK, **P.V Lawford**, **D.R Hose** University of Sheffield, Sheffield, UK

Series: *Series in Medical Physics and Biomedical Engineering*

Appropriate for senior undergraduates and graduates, this text presents the underlying physics, electronics, anatomy, and physiology as well as addresses practical applications. The structured approach of the text builds and broadens the material of opening chapters in the later chapters. The book covers biomechanics, image formation techniques, biomedical devices, physiological signals and responses, and respiratory and cardiovascular function and measurement. It includes chapter problems with short questions to test understanding of the main principles and longer questions to test more in-depth knowledge, along with detailed bibliographies that provide references to introductory texts and research materials.

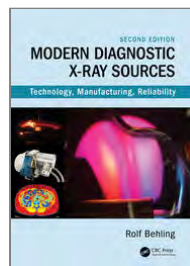
CRC Press
January 1998 : 762pp
Pb: 978-0-750-30368-2 : **£96.99**
eBook: 978-1-315-27560-4

* For full contents and more information, visit: www.routledge.com/9780750303682

2ND EDITION

Modern Diagnostic X-Ray Sources

Technology, Manufacturing, Reliability



Rolf Behling Philips Medical Systems DMC GmbH, Hamburg, Germany

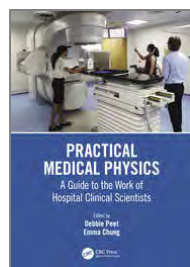
Now fully updated the second edition of Modern Diagnostic X-ray Sources: Technology, Manufacturing, Reliability gives an up-to-date summary of X-ray source design for applications in modern diagnostic medical imaging. It lays a sound groundwork for education and advanced training in the physics of X-ray production, X-ray interactions with matter, imaging modalities, and assesses their prospects. The book begins with a historical overview of X-ray tube and generator development, including key achievements leading up to the current technological and economic state of the field.

CRC Press
May 2023 : 412pp
Pb: 978-0-367-55845-1 : **£66.99**
Hb: 978-0-367-54692-2 : **£155**
eBook: 978-1-003-09540-8

* For full contents and more information, visit: www.routledge.com/9780367558451

Practical Medical Physics

A Guide to the Work of Hospital Clinical Scientists



Edited by **Debbie Peet** University Hospital of Leicester NHS Trust, **Emma Chung**

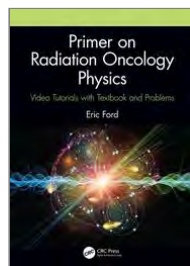
This is the first all-encompassing textbook designed to support trainee clinical scientists in medical physics as they start work in a hospital setting whilst undertaking an academic master's course.

CRC Press
August 2021 : 262pp
Pb: 978-1-138-30753-7 : **£49.99**
Hb: 978-1-138-30982-1 : **£135**
eBook: 978-1-315-14242-5

* For full contents and more information, visit: www.routledge.com/9781138307537

Primer on Radiation Oncology Physics

Video Tutorials with Textbook and Problems



Eric Ford Department of Radiation Oncology, University of Washington, Seattle, WA, USA

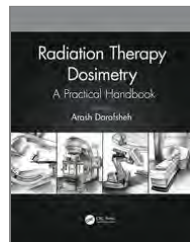
Gain mastery over the fundamentals of radiation oncology physics! This package gives you over 60 tutorial videos (each 15- 20 minutes in length) with a companion text, providing the most complete and effective introduction available. Dr. Ford has tested this approach in formal instruction for years with outstanding results. The text includes extensive problem sets for each chapter with detailed solutions provided for instructors. The videos include embedded quizzes and 'whiteboard' screen technology to facilitate comprehension. Together, this provides a valuable learning tool both for training purposes and as a refresher for those in practice.

CRC Press
May 2020 : 374pp
Pb: 978-1-138-59170-7 : **£84.99**
Hb: 978-1-138-59438-8 : **£215**
eBook: 978-0-429-48888-7

* For full contents and more information, visit: www.routledge.com/9781138591707

Radiation Therapy Dosimetry

A Practical Handbook



Edited by **Arash Darafsheh** Washington University School of Medicine, Department of Radiation Oncology

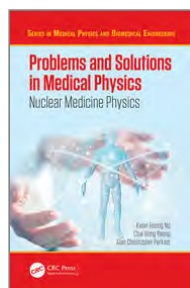
This comprehensive book covers the everyday use and underlying principles of radiation dosimeters used in radiation oncology clinics. It provides an up-to-date reference spanning the full range of current modalities with emphasis on practical know-how. The main audience is medical physicists, radiation oncology physics residents, and medical physics graduate students. The reader gains the necessary tools for determining which detector is best for a given application. Dosimetry of cutting edge techniques from radiosurgery to MRI-guided systems to small fields and proton therapy are all addressed.

CRC Press
May 2023 : 504pp
Pb: 978-0-367-68677-2 : **£81.99**
Hb: 978-1-138-54397-3 : **£215**
eBook: 978-1-351-00538-8

* For full contents and more information, visit: www.routledge.com/9780367686772

Problems and Solutions in Medical Physics

Nuclear Medicine Physics



Kwan Hoong Ng University of Malaya, Kuala Lumpur, Malaysia, **Chai Hong Yeong**, **Alan Perkins** University of Nottingham, UK

Series: Series in Medical Physics and Biomedical Engineering

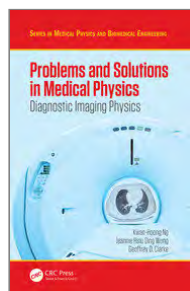
The second in a three-volume set exploring Problems and Solutions in Medical Physics, this volume explores common questions and their solutions in Nuclear Medicine. This invaluable study guide should be used in conjunction with other key textbooks in the field to provide additional learning opportunities. Topics include radioactivity and nuclear transformation, radionuclide production and radiopharmaceuticals, instrumentation for gamma imaging, SPECT and PET/CT, radionuclide therapy, internal radiation dosimetry, and quality control and radiation protection in nuclear medicine. Each chapter provides examples, notes, and references for further reading to enhance understanding.

CRC Press
March 2019 : 163pp
Pb: 978-1-482-24000-9 : **£58.99**
Hb: 978-0-367-14797-6 : **£135**
eBook: 978-1-482-24001-6

* For full contents and more information, visit: www.routledge.com/9781482240009

Problems and Solutions in Medical Physics

Diagnostic Imaging Physics



Kwan Hoong Ng University of Malaya, Kuala Lumpur, Malaysia, **Jeannie Hsiu Ding Wong** University of Malaya, Kuala Lumpur, Malaysia, **Geoffrey Clarke**

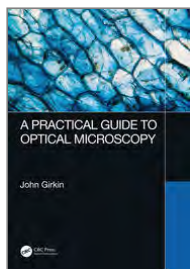
Series: Series in Medical Physics and Biomedical Engineering

The first in a three-volume set exploring Problems and Solutions in Medical Physics, this volume explores common questions and their solutions in Diagnostic Imaging. This invaluable study guide should be used in conjunction with other key textbooks in the field to provide additional learning opportunities. It contains key imaging modalities, exploring X-ray, mammography, and fluoroscopy, in addition to computed tomography, magnetic resonance imaging, and ultrasonography. Each chapter provides examples, notes, and references for further reading to enhance understanding.

CRC Press
May 2018 : 156pp
Pb: 978-1-482-23995-9 : **£53.99**
Hb: 978-1-138-54258-7 : **£145**
eBook: 978-1-351-00678-1

* For full contents and more information, visit: www.routledge.com/9781482239959

A Practical Guide to Optical Microscopy



John Girkin Durham University, UK

This book is aimed at providing users with a practical guide to help them select, and then use, the most suitable method for their application. It explores the principles behind the different forms of optical microscopy, without the use of complex maths, to provide an understanding to help the user utilise a specific method and then interpret the results. This book is an invaluable tool for use within research groups and laboratories in the life and physical sciences, acting as a first source for practical information to guide less experienced users (or those new to a particular methodology) on the range of techniques available.

CRC Press

July 2019 : 278pp

Pb: 978-1-138-06470-6 : **£79.99**

Hb: 978-1-138-06506-2 : **£195**

eBook: 978-1-315-11535-1

* For full contents and more information, visit: www.routledge.com/9781138064706

21st Century Nanoscience

A Handbook (Ten-Volume Set)



Edited by **Klaus D. Sattler** University of Hawaii, Honolulu, USA

Series: *21st Century Nanoscience*

This up-to-date reference is the most comprehensive summary of the field of nanoscience and its applications. It begins with fundamental properties at the nanoscale and then goes well beyond into the practical aspects of the design, synthesis, and use of nanomaterials in various industries. It emphasizes the vast strides made in the field over the past decade – the chapters focus on new, promising directions as well as emerging theoretical and experimental methods. The contents incorporate experimental data and graphs where appropriate, as well as supporting tables and figures with a tutorial approach.

CRC Press

December 2020 : 4142pp

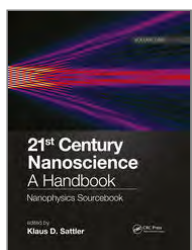
Hb: 978-0-815-36578-5 : £1600

eBook: 978-1-351-26056-5

* For full contents and more information, visit: www.routledge.com/9780815365785

21st Century Nanoscience – A Handbook

Nanophysics Sourcebook (Volume One)



Edited by **Klaus D. Sattler**

This up-to-date reference is the most comprehensive summary of the field of nanoscience and its applications. It begins with fundamental properties at the nanoscale and then goes well beyond into the practical aspects of the design, synthesis, and use of nanomaterials in various industries. It emphasizes the vast strides made in the field over the past decade – the chapters focus on new, promising directions as well as emerging theoretical and experimental methods.

CRC Press

June 2022 : 372pp

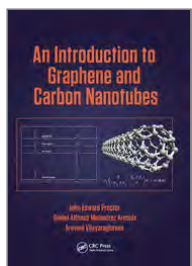
Pb: 978-1-032-33731-9 : £45.99

Hb: 978-0-815-38443-4 : £120

eBook: 978-0-367-33300-3

* For full contents and more information, visit: www.routledge.com/9781032337319

An Introduction to Graphene and Carbon Nanotubes



John E. Proctor , Daniel Melendrez Armada , Aravind Vijayaraghavan

Carbon nanotubes and graphene have been the subject of intense scientific research since their relatively recent discoveries. This book introduces the reader to the science behind these rapidly developing fields, and covers both the fundamentals and latest advances. Suitable for undergraduate students with a working knowledge of basic quantum mechanics, and for postgraduate researchers commencing their studies into the field, this book will equip the reader to critically evaluate the physical properties and potential for applications of graphene and carbon nanotubes.

CRC Press

June 2020 : 302pp

Pb: 978-0-367-57390-4 : £45.99

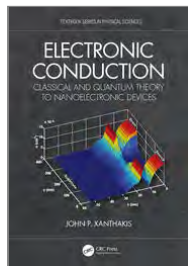
Hb: 978-1-498-75179-7 : £84.99

eBook: 978-1-315-36819-1

* For full contents and more information, visit: www.routledge.com/9780367573904

Electronic Conduction

Classical and Quantum Theory to Nanoelectronic Devices



John P. Xanthakis National Technical University of Athens, Greece

Series: *Textbook Series in Physical Sciences*

This book provides a concise, complete introduction to the fundamental principles of electronic conduction in microelectronic and nanoelectronic devices, with an emphasis on integrating the quantum aspects of conduction. The chapter coverage begins by presenting the classical theory of conduction, including introductory chapters on quantum mechanics and the solid state, then moving to a complete presentation of essential theory for understanding modern electronic devices. The author's unique approach is applicable to microscale and nanoscale device simulation, is particularly timely given the explosion in the nanoelectronics field.

CRC Press

May 2023 : 310pp

Pb: 978-0-367-63919-8 : £45.99

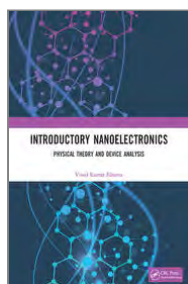
Hb: 978-1-138-58386-3 : £120

eBook: 978-0-429-50644-4

* For full contents and more information, visit: www.routledge.com/9780367639198

Introductory Nanoelectronics

Physical Theory and Device Analysis



Vinod Kumar Khanna CSIR-Central Electronics Engineering Research Institute, India

This introductory text develops the reader's fundamental understanding of core principles and experimental aspects underlying the operation of nanoelectronic devices. The author makes a thorough and systematic presentation of electron transport in quantum-confined systems such as quantum dots, quantum wires and quantum wells together with Landauer-Büttiker formalism and non-equilibrium Green's function approach. The writing throughout is straightforward and accessible, with clearly drawn illustrations and extensive self-study exercises for each chapter.

CRC Press

April 2022 : 446pp

Pb: 978-0-367-50403-8 : £39.99

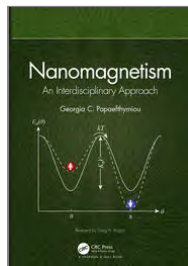
Hb: 978-0-815-38426-7 : £120

eBook: 978-1-351-20467-5

* For full contents and more information, visit: www.routledge.com/9780367504038

Nanomagnetism

An Interdisciplinary Approach



Georgia C. Papaefthymiou Villanova University, Pennsylvania, USA

This book provides a core foundation for understanding magnetic quantum-size effects at the nanoscale and their many applications across the disciplines. This textbook will be a valuable guide for students in new interdisciplinary courses in nanomagnetism and magnetic nanomaterials, an area that has experienced immense growth in the last two decades due to advancements in sample preparation, nano patterning techniques and magnetic measurement instrumentation.

Chapman & Hall

October 2024 : 436pp

Pb: 978-1-032-14090-2 : £45.99

Hb: 978-1-439-81846-6 : £91.99

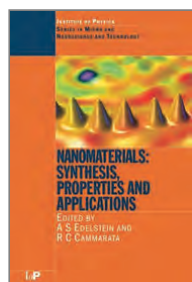
eBook: 978-1-315-15701-6

* For full contents and more information, visit: www.routledge.com/9781032140902

2ND EDITION

Nanomaterials

Synthesis, Properties and Applications, Second Edition



Edited by **A.S. Edelstein** Naval Research Laboratory, Washington, DC, USA, **R.C. Cammarata** Johns Hopkins University Johns Hopkins University Johns Hopkins University, Baltimore, Maryland, USA Johns Hopkins University, Baltimore, Maryland, USA

Nanomaterials: Synthesis, Properties and Applications provides a comprehensive introduction to nanomaterials, from how to make them to example properties, processing techniques, and applications. Contributions by leading international researchers and teachers in academic, government, and industrial institutions in nanomaterials provide an accessible guide for newcomers to the field. The coverage ranges from isolated clusters and small particles to nanostructured materials, multilayers, and nanoelectronics. The book contains a wealth of references for further reading. Individual chapters deal with relevant aspects of the underlying physics, materials science, and physical chemistry.

CRC Press

January 1998 : 618pp

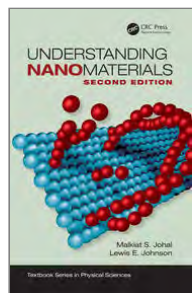
Hb: 978-0-750-30578-5 : £175

eBook: 978-0-429-18126-9

* For full contents and more information, visit: www.routledge.com/9780750305785

2ND EDITION

Understanding Nanomaterials



Malkiat S. Johal Pomona College, CA, USA, **Lewis E. Johnson** University of Washington, WA, USA

Series: Textbook Series in Physical Sciences

The authors provide the perfect training tool for the workforce in nanotech development by presenting the fundamental principles that govern the fabrication, characterization, and application of nanomaterials. This edition represents a complete overhaul, giving a much more complete, self-contained introduction. As before, the text avoids excessive mathematical detail and is written in an easy to follow, appealing style suitable for anyone, regardless of background in physics, chemistry, engineering, or biology. The organization has been revised to include fundamental physical chemistry and physics pertaining to relevant electrical, mechanical, and optical material properties.

CRC Press

April 2018 : 528pp

Pb: 978-1-482-25322-1 : £84.99

Hb: 978-0-815-35438-3 : £155

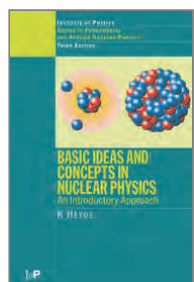
eBook: 978-1-315-15693-4

* For full contents and more information, visit: www.routledge.com/9781482253221

3RD EDITION

Basic Ideas and Concepts in Nuclear Physics

An Introductory Approach, Third Edition

**K. Heyde**

The third edition of a classic book, this text sets out in a clear and consistent manner the various elements of nuclear physics. Divided into four main parts: the constituents and characteristics of the nucleus; nuclear interactions, including the strong, weak and electromagnetic forces; an introduction to nuclear structure; and recent developments in nuclear structure research, the book delivers a balanced account of both theoretical and experimental nuclear physics. In addition to the numerous revisions and updates to the previous edition to capture the developments in the subject over the last five years, the book contains a new chapter on the structure and stability of very light nuclei.

CRC Press

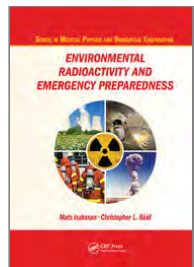
July 2004 : 668pp

Pb: 978-0-750-30980-6 : **£86.99**Hb: 978-1-138-40638-4 : **£180**

eBook: 978-0-367-80657-6

* For full contents and more information, visit: www.routledge.com/9780750309806

Environmental Radioactivity and Emergency Preparedness

**Mats Isaksson , Christopher L. Raaf**

The book explores how to deal with the threats posed by different radiological sources, including those that are lost or hidden, and the issues posed by the use of such sources. It presents measurement methods and approaches to model and quantify the extent of threat, and also presents strategies for emergency preparedness, such as strategies for first-responders and radiological triage in case an accident should happen.

CRC Press

June 2020 : 656pp

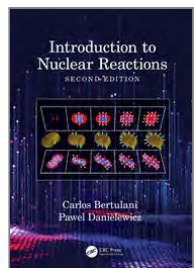
Pb: 978-0-367-57402-4 : **£45.99**Hb: 978-1-482-24464-9 : **£105**

eBook: 978-1-315-37287-7

* For full contents and more information, visit: www.routledge.com/9780367574024

2ND EDITION

Introduction to Nuclear Reactions

**Carlos Bertulani , Pawel Danielewicz**

Until the publication of the first edition of Introduction to Nuclear Reactions in 2004, an introductory reference on nuclear reactions had been unavailable. Now, fully updated throughout, this second edition continues to provide an authoritative overview of nuclear reactions. It discusses the main formalisms, ranging from basic laws to the final formulae used in academic research to calculate measurable quantities.

CRC Press

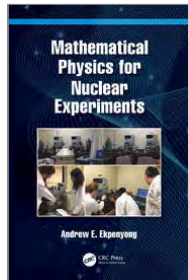
September 2022 : 420pp

Pb: 978-0-367-34993-6 : **£45.99**Hb: 978-0-367-35362-9 : **£135**

eBook: 978-0-429-33106-0

* For full contents and more information, visit: www.routledge.com/9780367349936

Mathematical Physics for Nuclear Experiments

**Andrew E. Ekpenyong**

Mathematical Physics for Nuclear Experiments presents an accessible introduction to the mathematical derivations of key equations used in describing and analysing results of typical nuclear physics experiments. Instead of merely showing results and citing texts, crucial equations in nuclear physics such as the Bohr's classical formula, Bethe's quantum mechanical formula for energy loss, Poisson, Gaussian and Maxwellian distributions for radioactive decay, and the Fermi function for beta spectrum analysis, among many more, are presented with the mathematical bases of their derivation and with their physical utility.

CRC Press

January 2022 : 278pp

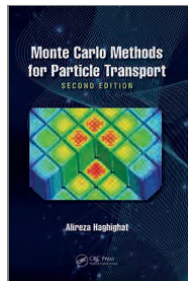
Pb: 978-1-032-10499-7 : **£58.99**Hb: 978-0-367-76852-2 : **£150**

eBook: 978-1-003-21562-2

* For full contents and more information, visit: www.routledge.com/9781032104997

2ND EDITION

Monte Carlo Methods for Particle Transport

**Alireza Haghighat**

Fully updated with the latest developments in the eigenvalue Monte Carlo calculations and automatic variance reduction techniques and containing an entirely new chapter on fission matrix and alternative hybrid techniques. This second edition explores the uses of the Monte Carlo method for real-world applications, explaining its concepts and limitations.

CRC Press

April 2022 : 310pp

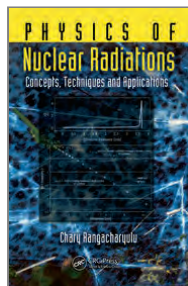
Pb: 978-0-367-53809-5 : **£49.99**Hb: 978-0-367-18805-4 : **£120**

eBook: 978-0-429-19839-7

* For full contents and more information, visit: www.routledge.com/9780367538095

Physics of Nuclear Radiations

Concepts, Techniques and Applications

**Chary Rangacharyulu** University of Saskatchewan, Saskatoon, Canada and Nelson Mandela African Institute of Science and Technology (NM-AIST), Arusha, Tanzania

This text makes the physics of nuclear radiations accessible to students with a basic background in physics and mathematics. Rather than convince students one way or the other about the hazards of nuclear radiations, the text empowers them with tools to calculate and assess nuclear radiations and their impact. It discusses the meaning behind mathematical formulae as well as the areas in which the equations can be applied. Coverage includes archeology, health, and medical physics applications.

CRC Press

December 2013 : 383pp

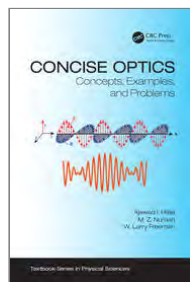
Hb: 978-1-439-85777-9 : **£110**

eBook: 978-0-429-06868-3

* For full contents and more information, visit: www.routledge.com/9781439857779

Concise Optics

Concepts, Examples, and Problems



Ajawad I. Haija Indiana University of Pennsylvania, USA,
M. Z. Numan Indiana University of Pennsylvania, USA, **W. Larry Freeman** Indiana University of Pennsylvania, Professor Emeritus, USA

Series: Textbook Series in Physical Sciences

This introductory text is a reader friendly treatment of geometrical and physical optics emphasizing problems and solved examples with detailed analysis and helpful commentary. The authors are seasoned educators with decades of experience teaching optics. Their approach is to gradually present mathematics explaining the physical concepts. It covers ray tracing to the wave nature of light, and introduces Maxwell's equations in an organic fashion. The text then moves on to explain how to analyze simple optical systems such as spectacles for improving vision, microscopes, and telescopes, while also being exposed to contemporary research topics.

CRC Press

March 2018 : 486pp

Pb: 978-1-138-10702-1 : **£91.99**

Hb: 978-1-138-10712-0 : **£240**

eBook: 978-1-315-10124-8

* For full contents and more information, visit: www.routledge.com/9781138107021

5TH EDITION

Principles of Adaptive Optics



Robert K. Tyson University of North Carolina at Charlotte, USA, **Benjamin West Frazier**

Principles of Adaptive Optics describes the foundations, principles, and applications of adaptive optics (AO) and its enabling technologies. This leading textbook addresses the fundamentals of AO at the core of astronomy, high-energy lasers, biomedical imaging, and optical communications.

CRC Press

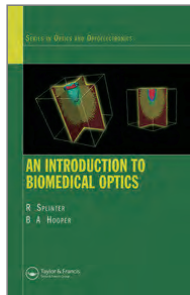
February 2022 : 356pp

Hb: 978-0-367-67603-2 : **£96.99**

eBook: 978-1-003-14019-1

* For full contents and more information, visit: www.routledge.com/9780367676032

An Introduction to Biomedical Optics



Robert Splinter University of North Carolina at Charlotte, USA, **Brett A. Hooper** Areté Associates, Arlington, Virginia, USA

Series: Series in Optics and Optoelectronics

This is the first comprehensive, introductory book describing both diagnostic and therapeutic optical methods in medicine. The first section covers the history of optics theory and the basic science behind light-tissue interactions. It also introduces the relevant approaches and approximations used to describe light propagation in turbid biological media. In the second section, the authors look more closely at light-tissue interactions and their applications in different medical areas, such as wound healing and tissue welding. The final section examines the various diagnostic methods that are employed using optical techniques. Throughout, the text employs numerical examples of clinical and research requirements.

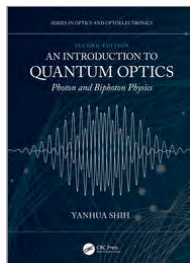
CRC Press
December 2006 : 624pp
Hb: 978-0-750-30938-7 : **£105**
eBook: 978-0-429-14814-9

* For full contents and more information, visit: www.routledge.com/9780750309387

2ND EDITION

An Introduction to Quantum Optics

Photon and Biphoton Physics



Yanhua Shih University of Maryland

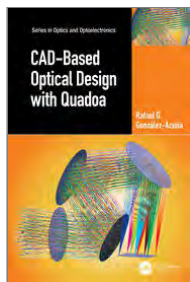
Series: Series in Optics and Optoelectronics

This text offers a complete revision for its introduction to the quantum theory of light, including notable developments as well as improvements in presentation of basic theory and concepts, with continued emphasis on experimental aspects. The author provides a thorough overview on basic methods of classical and quantum mechanical measurements in quantum optics, enabling readers to analyze, summarize, and resolve quantum optical problems. The broad coverage of concepts and tools and its practical, experimental emphasis set it apart from other available resources. New discussions of timely topics such as the concept of the photon and distinguishability bring the entire contents up to date.

CRC Press
May 2023 : 448pp
Pb: 978-0-367-67359-8 : **£46.99**
Hb: 978-1-138-60125-3 : **£120**
eBook: 978-1-003-13060-4

* For full contents and more information, visit: www.routledge.com/9780367673598

CAD-Based Optical Design with Quadoo



Rafael G. González-Acuña

Series: Series in Optics and Optoelectronics

In CAD-based optical design with Quadoo, we explore how optical design entails evaluating application requirements and creating optical systems specifically engineered to meet the exact needs of optical instruments. This extensive system may include optics, light sources, sensors, electronic boards, display devices, and other components. Primarily, optical design focuses on determining the shapes, positions, and materials of lenses and mirrors to ensure the optical system adheres to indicated criteria and specifications. To meet specific requirements, lens designers must use optical design software as an aid for their challenging task.

CRC Press
March 2025 : 334pp
Hb: 978-1-032-82809-1 : **£105**

* For full contents and more information, visit: www.routledge.com/9781032828091

Detection of Optical Signals



Antoni Rogalski, Zbigniew Bielecki

Series: Series in Optics and Optoelectronics

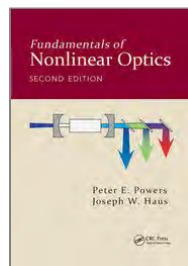
Detection of Optical Signals provides a comprehensive overview of important technologies for photon detection, from the X-ray through ultraviolet, visible, infrared to far-infrared spectral regions. It uniquely combines perspectives from many disciplines, particularly within physics and electronics, which are necessary to have a complete understanding of optical receivers. This will be an invaluable resource for graduate students in physics and engineering, as well as a helpful refresher for those already working with aerospace sensors and systems, remote sensing, thermal imaging, military imaging, optical telecommunications, infrared spectroscopy, and light detection.

CRC Press
October 2024 : 594pp
Pb: 978-1-032-06922-7 : **£45.99**
Hb: 978-1-032-05948-8 : **£135**
eBook: 978-1-003-26309-8

* For full contents and more information, visit: www.routledge.com/9781032069227

2ND EDITION

Fundamentals of Nonlinear Optics



Peter E. Powers, Joseph W. Haus

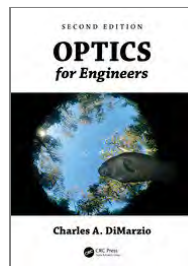
This fully revised edition of the groundbreaking text by the late Peter Powers offers enhanced coverage while remaining the most 'essentials only,' practical introductory treatment available. It includes a brand new chapter on quantum nonlinear optics, other added sections and improvements, as well as many new problems and examples. This up-to-date treatment reflects the latest device applications and importance of nonlinear optics in development of materials, optical switching and processing, and nonlinear guided wave optics.

CRC Press
December 2019 : 500pp
Pb: 978-0-367-87411-7 : **£53.99**
Hb: 978-1-498-73683-1 : **£110**
eBook: 978-1-315-11643-3

* For full contents and more information, visit: www.routledge.com/9780367874117

2ND EDITION

Optics for Engineers



Charles A. DiMarzio Northeastern University, USA

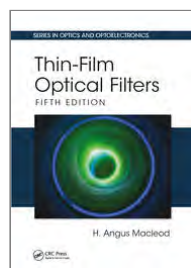
This textbook provides an accessible introduction to the fundamentals of geometric and physical optics as they relate to practical problems encountered by engineers and researchers in designing and analyzing optical systems. In this updated edition, the author focuses on topics that are critical to understanding how the basic principles of optics affect design decisions. In addition to information on breadboarding experiments and prototypes, the new edition also expands its coverage of holography and discusses important state-of-the-art issues in modern optics.

CRC Press
March 2024 : 750pp
Pb: 978-1-482-26323-7 : **£76.99**
Hb: 978-1-032-65040-1 : **£220**
eBook: 978-1-315-15704-7

* For full contents and more information, visit: www.routledge.com/9781482263237

5TH EDITION

Thin-Film Optical Filters



H. Angus Macleod

This book is quite simply the Bible for the field of optical thin films. It gives the most complete introduction to thin film optical coatings addressed to manufacturers and users alike. This fifth edition continues in this role, offering a complete update on current design, manufacture, performance, and applications. Among new topics are absorbers and coherent perfect absorbers, photonic crystals, and metamaterials for optical coating. In addition, the author has added substantial new information on scattering, composite materials, wire grid polarizers, laser damage, and a complete update of applications.

CRC Press

March 2021 : 696pp

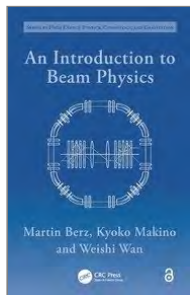
Pb: 978-0-367-78160-6 : **£45.99**

Hb: 978-1-138-19824-1 : **£165**

eBook: 978-1-315-27049-4

* For full contents and more information, visit: www.routledge.com/9780367781606

An Introduction to Beam Physics



Martin Berz Michigan State University, East Lansing, USA,
Kyoko Makino Michigan State University, East Lansing, USA,
Weishi Wan

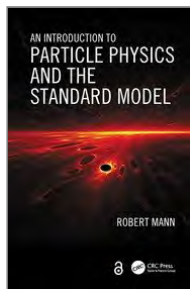
Series: Series in Particle Physics, Cosmology and Gravitation

Accessible to beginning graduate and upper-division undergraduate students in physics, mathematics, and engineering, this book is based on lectures given at Michigan State University, the online VUBeam program, the U.S. Particle Accelerator School, the CERN Academic Training Programme, and other venues. It begins with essential techniques of production, acceleration, and storage of beams, whenever possible from the historical perspective. It covers transfer maps of single- and multi-pass systems and their properties as well as some advanced topics, including aberration integrals and analysis of resonances.

CRC Press
 October 2016 : 314pp
 Pb: 978-1-138-19890-6 : **£49.99**
 Hb: 978-0-750-30263-0 : **£145**
 eBook: 978-0-429-14813-2

* For full contents and more information, visit: www.routledge.com/9781138198906

An Introduction to Particle Physics and the Standard Model



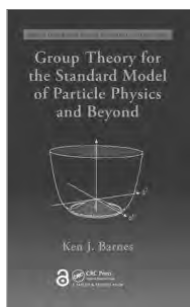
Robert Mann University of Waterloo, Ontario, Canada

Emphasizing the connections between particle physics and the rest of the physics field, this book provides an organizational framework for understanding modern particle physics. The author presents a standard model of strong, weak, and electromagnetic interactions. Undergraduate students will develop a working knowledge of some of the calculation methods and mathematical tools used in particle physics. Reviewing key experimental and theoretical achievements in the field, the text covers such topics as conservation laws, quantum electrodynamics, and wave equations. The final chapter offers a perspective on the future of particle physics.

CRC Press
 November 2009 : 614pp
 Hb: 978-1-420-08298-2 : **£86.99**
 eBook: 978-0-429-14122-5

* For full contents and more information, visit: www.routledge.com/9781420082982

Group Theory for the Standard Model of Particle Physics and Beyond



Ken J. Barnes University of Southampton, UK

Series: Series in Particle Physics, Cosmology and Gravitation

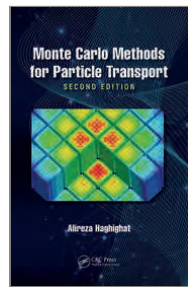
Based on the author's well-established courses, this text explores the use of symmetries through descriptions of the techniques of Lie groups and Lie algebras. It develops the models, theoretical framework, and mathematical tools to understand these symmetries. The author presents the modern framework of special relativity and describes Lie group techniques for the standard model and beyond. He also provides a stepping-stone to Einstein's work on general relativity and goes beyond the standard model to explore supertransformations, superspace methods, and more. The text includes many worked examples and problems, along with a solutions manual for qualifying instructors.

CRC Press
 March 2010 : 256pp
 Hb: 978-1-420-07874-9 : **£84.99**
 eBook: 978-0-429-18455-0

* For full contents and more information, visit: www.routledge.com/9781420078749

2ND EDITION

Monte Carlo Methods for Particle Transport



Alireza Haghighat

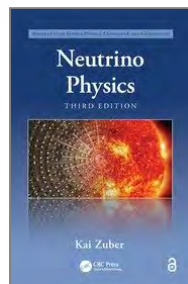
Fully updated with the latest developments in the eigenvalue Monte Carlo calculations and automatic variance reduction techniques and containing an entirely new chapter on fission matrix and alternative hybrid techniques. This second edition explores the uses of the Monte Carlo method for real-world applications, explaining its concepts and limitations.

CRC Press
 April 2022 : 310pp
 Pb: 978-0-367-53809-5 : **£49.99**
 Hb: 978-0-367-18805-4 : **£120**
 eBook: 978-0-429-19839-7

* For full contents and more information, visit: www.routledge.com/9780367538095

3RD EDITION

Neutrino Physics



Kai Zuber Dresden University, Germany

Series: Series in Particle Physics, Cosmology and Gravitation

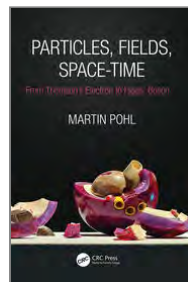
This book provides a comprehensive self-contained examination of neutrinos, covering their research history and theory, as well as their application to particle physics, astrophysics, nuclear physics, and the broad reach of cosmology. Revised as needed to be equal to the research of today, Neutrino Physics, Third Edition delves into neutrino cross sections, mass measurements, double beta decay, solar neutrinos, neutrinos from supernovae, and high energy neutrinos, as well as new experimental results in the context of theoretical models.

CRC Press
 December 2021 : 465pp
 Pb: 978-1-032-24220-0 : **£39.99**
 Hb: 978-1-138-71889-0 : **£110**
 eBook: 978-1-315-19561-2

* For full contents and more information, visit: www.routledge.com/9781032242200

Particles, Fields, Space-Time

From Thomson's Electron to Higgs' Boson



Martin Pohl CERN, Geneva

Series: Discovering Physics

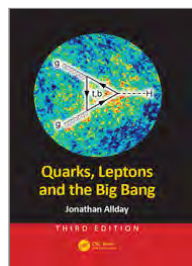
This book explores the concepts, ideas, and experimental results that brought us from the discovery of the first elementary particle in the end of the 19th century to the completion of the Standard Model of particle physics in the early 21st century.

CRC Press
 September 2020 : 312pp
 Pb: 978-0-367-34723-9 : **£43.99**
 Hb: 978-0-367-35381-0 : **£175**
 eBook: 978-0-429-33110-7

* For full contents and more information, visit: www.routledge.com/9780367347239

3RD EDITION

Quarks, Leptons and the Big Bang



Jonathan Allday

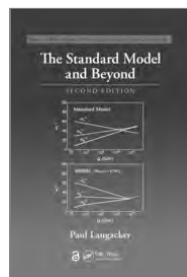
Quarks, Leptons and The Big Bang, Third Edition, is a clear, readable and self-contained introduction to particle physics and related areas of cosmology. It bridges the gap between non-technical popular accounts and textbooks for advanced students. The book concentrates on presenting the subject from the modern perspective of quarks, leptons and the forces between them. This book will appeal to students, teachers and general science readers interested in fundamental ideas of modern physics. This edition brings the book completely up to date by including advances in particle physics and cosmology, such as the discovery of the Higgs boson, the LIGO gravitational wave discovery and the WMAP and PLANCK results.

CRC Press
November 2016 : 393pp
Pb: 978-1-498-77311-9 : **£45.99**
Hb: 978-1-138-42717-4 : **£185**
eBook: 978-1-315-38136-7

* For full contents and more information, visit: www.routledge.com/9781498773119

2ND EDITION

The Standard Model and Beyond



Paul Langacker

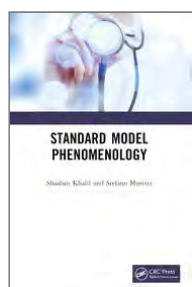
Series: *Series in Particle Physics, Cosmology and Gravitation*

This new edition of The Standard Model and Beyond presents an advanced introduction to the physics and formalism of the standard model and other non-abelian gauge theories. It provides a solid background for understanding supersymmetry, string theory, extra dimensions, dynamical symmetry breaking, and cosmology. In addition to updating all of the experimental and phenomenological results from the first edition, it contains a new chapter on collider physics; expanded discussions of Higgs, neutrino, and dark matter physics; and many new problems.

CRC Press
June 2020 : 650pp
Pb: 978-0-367-57344-7 : **£45.99**
Hb: 978-1-498-76321-9 : **£86.99**
eBook: 978-1-315-17062-6

* For full contents and more information, visit: www.routledge.com/9780367573447

Standard Model Phenomenology



Shaaban Khalil, Stefano Moretti University of Southampton, Highfield Campus, United Kingdom

This new book is fully up to date with all the latest developments on both theoretical and experimental investigations of the Standard Model (SM) of particle physics with a particular emphasis on its historical development on both sides.

CRC Press
August 2024 : 246pp
Pb: 978-1-032-20168-9 : **£45.99**
Hb: 978-1-138-33643-8 : **£175**
eBook: 978-0-429-44301-5

* For full contents and more information, visit: www.routledge.com/9781032201689

The Science and Technology of Particle Accelerators



Rob Appleby, Graeme Burt, James Clarke, Hywel Owen

This book provides integrated coverage of accelerator science and technology, this book presents the fundamental concepts alongside detailed engineering discussions and extensive practical guidance, including many numerical examples. For each topic, the authors provide a description of the physical principles, a guide to the practical application of those principles, and a discussion of how to design the components that allow the application to be realised.

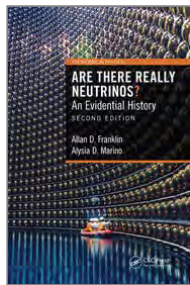
CRC Press
August 2022 : 318pp
Pb: 978-1-032-39984-3 : **£45.99**
Hb: 978-1-138-49987-4 : **£120**
eBook: 978-1-351-00796-2

* For full contents and more information, visit: www.routledge.com/9781032399843

2ND EDITION

Are There Really Neutrinos?

An Evidential History



Allan D. Franklin Department of Physics, University of Colorado Boulder, **Alysia D. Marino** Department of Physics, University of Colorado Boulder

Series: Frontiers in Physics

This intriguing and accessible book examines the experiments on neutrino oscillations. It argues that this history gives us good reason to believe in the existence of neutrinos, a particle that interacts so weakly with matter that its interaction length is measured in light years of lead. Yet, the scientific process has provided evidence of the elusive neutrino. Written in a style accessible to any reader with a college education in physics, *Are There Really Neutrinos?* is of interest to students and researchers alike. This second edition contains a new epilogue highlighting the new developments in neutrino physics over the past 20 years.

CRC Press

September 2021 : 416pp

Pb: 978-0-367-19005-7 : **£43.99**

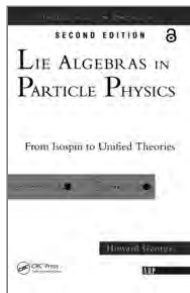
Hb: 978-0-367-19002-6 : **£185**

eBook: 978-0-429-19978-3

* For full contents and more information, visit: www.routledge.com/9780367190057

Lie Algebras In Particle Physics

from Isospin To Unified Theories



Howard Georgi

Series: Frontiers in Physics

Howard Georgi is the co-inventor (with Sheldon Glashow) of the SU(5) theory. This extensively revised and updated edition of his classic text makes the theory of Lie groups accessible to graduate students, while offering a perspective on the way in which knowledge of such groups can provide an insight into the development of unified theories of strong, weak, and electromagnetic interactions.

CRC Press

October 1999 : 340pp

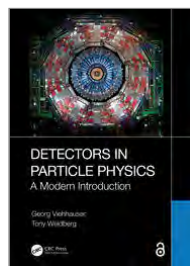
Pb: 978-0-738-20233-4 : **£76.99**

Hb: 978-0-367-09172-9 : **£135**

* For full contents and more information, visit: www.routledge.com/9780738202334

Detectors in Particle Physics

A Modern Introduction



Georg Viehhauser , Tony Weidberg

This textbook provides an accessible yet comprehensive introduction to detectors in particle physics. It emphasises the core physics principles, enabling a deeper understanding of the subject for further and more advanced studies. In addition to the discussion of the underlying detector physics, another aspiration of this book is to introduce the reader to practically important aspects of particle detectors, like electronics, alignment, calibration and simulation of particle detectors. Case studies of the various applications of detectors in particle physics are provided.

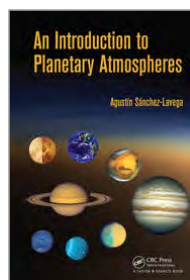
CRC Press

March 2024 : 348pp

Hb: 978-1-032-24658-1 : **£81.99**

* For full contents and more information, visit: www.routledge.com/9781032246581

An Introduction to Planetary Atmospheres



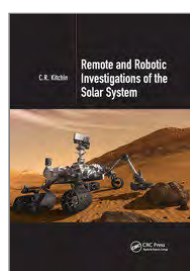
Agustin Sanchez-Lavega

Providing a much-needed resource for this cross-disciplinary field, this text presents current knowledge on atmospheres and the fundamental mechanisms operating on them. It offers a unified scheme of the chemical and physical processes occurring in atmospheres and extends the theoretical foundations of an atmospheric topic to all planets and satellites with an atmosphere. The text provides an up-to-date comparative vision of the phenomena in atmospheres that encompasses the latest planetary space mission discoveries. It also reviews the observational methods and current facilities used to explore planetary atmospheres on Earth and in space.

CRC Press
October 2024 : 630pp
Pb: 978-1-032-91808-2 : **£45.99**
Hb: 978-1-420-06732-3 : **£71.99**
eBook: 978-0-429-18458-1

* For full contents and more information, visit: www.routledge.com/9781032918082

Remote and Robotic Investigations of the Solar System



C.R. Kitchin

Remote and Robotic Investigations of the Solar System covers all aspects of solar system observations: the instruments, their theory, and their practical use both on Earth and in space. It explores the state-of-the-art telescopes, cameras, spacecraft and instruments used to analyse the interiors, surfaces, atmospheres and radiation belts of solar system objects, in addition to radio waves, gamma rays, cosmic rays and neutrinos. This book would be ideal for university students undertaking physical science subjects and professionals working in the field, in addition to amateur astronomers and anyone interested in learning more about our local astronomical neighbors.

CRC Press
December 2019 : 376pp
Pb: 978-0-367-87166-6 : **£45.99**
Hb: 978-1-498-70493-9 : **£135**
eBook: 978-1-351-25547-9

* For full contents and more information, visit: www.routledge.com/9780367871666

Solar System

Between Fire and Ice



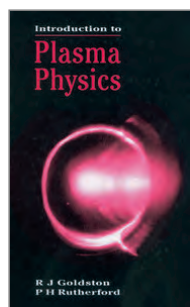
Thomas Hockey , Jennifer Lynn Bartlett , Daniel C. Boice

Combining the latest astronomical results with a historical perspective, Solar System: Between Fire and Ice takes you on a fabulous tour of our intriguing Solar System.

CRC Press
August 2021 : 352pp
Pb: 978-0-367-76869-0 : **£36.99**
Hb: 978-1-032-05437-7 : **£96.99**
eBook: 978-1-003-19755-3

* For full contents and more information, visit: www.routledge.com/9780367768690

Introduction to Plasma Physics



R.J. Goldston Princeton Plasma Physics Laboratory, Princeton University, U, **P.H. Rutherford**

Focusing on the fundamentals of modern plasma physics, this text is ideal for an introductory lecture course on plasma physics. Sections on single-particle motion, plasmas as fluids, and collisional processes in plasmas lay the groundwork for a thorough understanding of the subject. The authors place the material in its historical context for a rich understanding of the ideas presented. They also emphasize the importance of medical imaging in radiotherapy, providing a logical link to more advanced works in the area. The text includes problems, tables, illustrations, a thorough index, and a complete list of references.

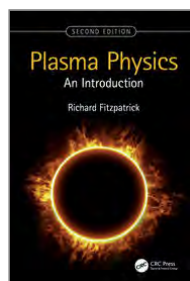
CRC Press
November 1995 : 510pp
Pb: 978-0-750-30183-1 : **£86.99**
Hb: 978-1-138-45831-4 : **£180**
eBook: 978-0-367-80695-8

* For full contents and more information, visit: www.routledge.com/9780750301831

2ND EDITION

Plasma Physics

An Introduction



Richard Fitzpatrick The University of Texas, Austin, USA

Plasma Physics: An Introduction is based on a series of university course lectures by a leading name in the field, and thoroughly covers the physics of the fourth state of matter. This textbook provides a concise and cohesive introduction to plasma physics theory and offers a solid foundation for students of physics wishing to take higher level courses in plasma physics. This second edition has been fully updated to include new content on collisions and magnetic reconnection.

CRC Press
December 2022 : 306pp
Pb: 978-1-032-20251-8 : **£49.99**
Hb: 978-1-032-21407-8 : **£125**
eBook: 978-1-003-26825-3

* For full contents and more information, visit: www.routledge.com/9781032202518

Plasma Physics via Computer Simulation



C.K. Birdsall University of California, Berkeley, USA, **A.B. Langdon** Lawrence Livermore National Laboratory, California, USA

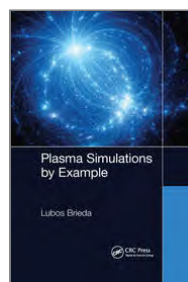
Series: *Series in Plasma Physics*

Divided into three main parts, Plasma Physics via Computer Simulation guides the reader to an understanding of the basic concepts in this fascinating field of research. Part 1 introduces you to the fundamental concepts of simulation. It examines one-dimensional electrostatic codes and electromagnetic codes, and describes the numerical methods and analysis. Part 2 explores the mathematics and physics behind the algorithms used in Part 1. In Part 3, it addresses some of the more complicated simulations in two and three dimensions. Using software available from the author's website, readers are encouraged to perform practical work.

CRC Press
October 2004 : 504pp
Pb: 978-0-750-31025-3 : **£105**
eBook: 978-1-315-27504-8

* For full contents and more information, visit: www.routledge.com/9780750310253

Plasma Simulations by Example



Lubos Brieda

The study of plasmas is crucial in improving our understanding of the universe, and they are being increasingly utilised in key technologies such as spacecraft thrusters, plasma medicine, and fusion energy. Providing the reader with an easy to follow set of examples that clearly illustrate how simulation codes are written, this new book guides readers how to develop C++ computer codes for simulating plasmas primarily with the kinetic Particle in Cell (PIC) method. This text would be invaluable to advanced undergraduates and graduate students looking to learn how to put the theory to the test.

CRC Press
September 2021 : 368pp
Pb: 978-1-032-17614-7 : **£45.99**
Hb: 978-1-138-34232-3 : **£175**
eBook: 978-0-429-43978-0

* For full contents and more information, visit: www.routledge.com/9781032176147

Problems and Solutions in Medical Physics - Three Volume Set



Kwan-Hoong Ng University of Malaya, Kuala Lumpur, Malaysia, **Robin Hill**, **Alan Perkins** University of Nottingham, UK, **Jeannie Hsiu Ding Wong** University of Malaya, Kuala Lumpur, Malaysia, **Geoffrey Clarke**, **Chai Hong Yeong**, **Ngie Min Ung** University of Malaya, Kuala Lumpur, Malaysia

Series: *Series in Medical Physics and Biomedical Engineering*

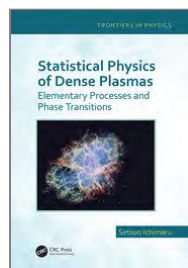
While graduate programs in medical physics are increasing across the globe, there is no graduate-level book currently dedicated to solving problems in medical physics. Filling this need, this three-volume set covers diagnostic imaging physics, nuclear medicine physics, and radiotherapy physics. It is suitable for graduate courses in medical physics, radiological sciences, and biomedical engineering. The set helps students understand how to apply theoretical concepts in real-world medical physics situations.

CRC Press
November 2022 : 600pp
Pb: 978-1-032-33576-6 : **£130**
Hb: 978-1-482-23985-0 : **£325**

* For full contents and more information, visit: www.routledge.com/9781032335766

Statistical Physics of Dense Plasmas

Elementary Processes and Phase Transitions



Setsuo Ichimaru Tokyo University Department of Physics

Series: *Frontiers in Physics*

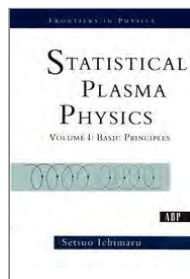
This timely book gives a complete overview on the statistical mechanics and electrodynamics elucidating the physical processes in dense plasma systems. The author emphasizes laboratory-based experiments on metallic hydrogen, and gives detailed account of the plasma phenomena in various astrophysical settings. The coverage encompasses the intersection with condensed matter physics, atomic physics, nuclear physics, and astrophysics, including such key topics as phase transitions, transport, optical and nuclear processes. This essential resource discusses important topics such as metallic hydrogen, stellar and planetary magnetisms, pycnonuclear reactions, and gravitational waves.

Chapman & Hall
December 2018 : 204pp
Pb: 978-1-138-36466-0 : **£71.99**
Hb: 978-1-138-36468-4 : **£175**
eBook: 978-0-429-43121-0

* For full contents and more information, visit: www.routledge.com/9781138364660

Statistical Plasma Physics, Volume I

Basic Principles



Setsuo Ichimaru

Series: Frontiers in Physics

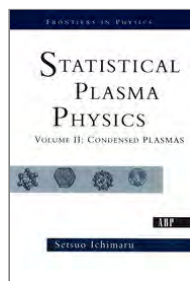
Plasma physics is an integral part of statistical physics, complete with its own basic theories. Designed as a two-volume set, Statistical Plasma Physics is intended for advanced undergraduate and beginning graduate courses on plasma and statistical physics, and as such, its presentation is self-contained and should be read without difficulty by those with backgrounds in classical mechanics, electricity and magnetism, quantum mechanics, and statistics. Major topics include: plasma phenomena in nature, kinetic equations, plasmas and dielectric media, electromagnetic properties of Vlasov plasmas in thermodynamic equilibria, transient processes, and instabilities.

CRC Press
February 2004 : 406pp
Pb: 978-0-813-34178-1 : **£68.99**
Hb: 978-0-367-09201-6 : **£135**
eBook: 978-0-429-49715-5

* For full contents and more information, visit: www.routledge.com/9780813341781

Statistical Plasma Physics, Volume II

Condensed Plasmas



Setsuo Ichimaru

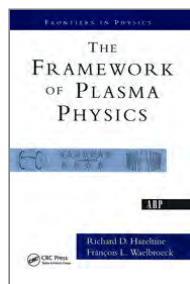
Series: Frontiers in Physics

The aim of this book is to elucidate a number of basic topics in physics of dense plasmas that interface with condensed matter physics, atomic physics, nuclear physics, and astrophysics. The different plasmas examined here include astrophysical dense plasmas - like those found in the interiors, surfaces, and outer envelopes of such astronomical objects as neutron stars, white dwarfs, the Sun, brown dwarfs, and giant planets. Condensed plasmas in laboratory settings cover metals and alloys (solid, amorphous, liquid, and compressed), semiconductors (electrons, holes, and their droplets), and various realizations of dense plasmas (shock-compressed, diamond-anvil cell, metal vaporization, pinch discharges, and more.)

CRC Press
February 2004 : 304pp
Pb: 978-0-813-34179-8 : **£68.99**
Hb: 978-0-367-09202-3 : **£135**
eBook: 978-0-429-49714-8

* For full contents and more information, visit: www.routledge.com/9780813341798

The Framework Of Plasma Physics



Richard D. Hazeltine , Francois L. Waelbroeck

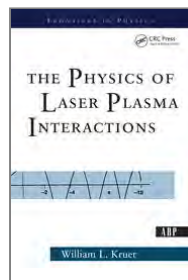
Series: Frontiers in Physics

Plasma physics is a necessary part of our understanding of stellar and galactic structure. It determines the magnetospheric environment of the earth and other planets; it forms the research frontier in such areas as nuclear fusion, advanced accelerators, and high power lasers; and its applications to various industrial processes (such as computer chip manufacture) are rapidly increasing. It is thus a subject with a long list of scientific and technological applications. This book provides the scientific background for understanding such applications, but it emphasizes something else: the intrinsic scientific interest of the plasma state.

CRC Press
January 2004 : 344pp
Pb: 978-0-813-34213-9 : **£68.99**
Hb: 978-0-367-31417-0 : **£135**
eBook: 978-0-429-50280-4

* For full contents and more information, visit: www.routledge.com/9780813342139

The Physics Of Laser Plasma Interactions



William Kruer

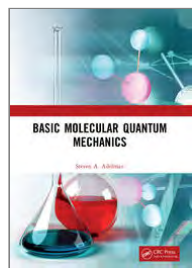
Series: Frontiers in Physics

This book focuses on the physics of laser plasma interactions and presents a complementary and very useful numerical model of plasmas. It describes the linear theory of light wave propagation in plasmas, including linear mode conversion into plasma waves and collisional damping.

CRC Press
January 2003 : 196pp
Pb: 978-0-813-34083-8 : **£58.99**
Hb: 978-0-367-31418-7 : **£135**
eBook: 978-1-003-00324-3

* For full contents and more information, visit: www.routledge.com/9780813340838

Basic Molecular Quantum Mechanics



Steven A. Adelman Purdue University, Department of Chemistry, West Lafayette, Indiana, USA

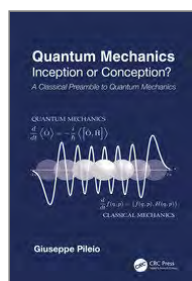
This book introduces quantum mechanics by covering the fundamentals of quantum mechanics and some of its most important chemical applications: vibrational and rotational spectroscopy and electronic structure of atoms and molecules. Thoughtfully organized, the author builds up quantum mechanics systematically with each chapter preparing the student for the more advanced chapters and complex applications.

CRC Press
August 2021 : 464pp
Pb: 978-1-498-73399-1 : **£76.99**
Hb: 978-1-032-01065-6 : **£185**
eBook: 978-0-429-15574-1

* For full contents and more information, visit: www.routledge.com/9781498733991

Quantum Mechanics

Inception or Conception? A Classical Preamble to Quantum Mechanics



Giuseppe Pileio

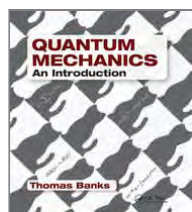
Embarking on a journey into the realm of quantum mechanics can be a daunting task for anyone. Its puzzling mathematics and bewildering predictions often leave individuals feeling confused and disheartened. But what if there was a different approach—one aimed to cultivate an understanding of quantum mechanics from its very foundations? This is the ambition of this book.

CRC Press
February 2024 : 108pp
Hb: 978-1-032-58430-0 : **£145**
eBook: 978-1-003-45978-1

* For full contents and more information, visit: www.routledge.com/9781032584300

Quantum Mechanics

An Introduction



Thomas Banks

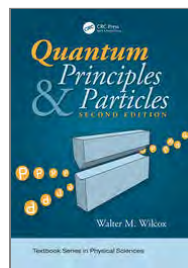
This new introductory textbook gives a complete, modern perspective on quantum mechanics as the basis of so much of physical sciences and today's electronic technologies. It clarifies for the first time many common misconceptions regarding wave/particle duality and the correct interpretation of measurements. The author, a recognized authority in the field and dedicated educator, presents information at an elementary level, avoiding the detailed, complex derivations in favor of simple, clear explanations.

CRC Press
March 2021 : 568pp
Pb: 978-0-367-78062-3 : **£45.99**
Hb: 978-1-482-25506-5 : **£110**
eBook: 978-0-429-43842-4

* For full contents and more information, visit: www.routledge.com/9780367780623

2ND EDITION

Quantum Principles and Particles, Second Edition



Walter Wilcox Baylor University, Waco, Texas, USA

Series: Textbook Series in Physical Sciences

This textbook offers a unique introduction to quantum mechanics progressing gradually from elementary quantum mechanics to aspects of particle physics. It presents the microscopic world by analysis of the simplest possible quantum mechanical system (spin 1/2). A special feature is the author's use of visual aids known as process diagrams, which show how amplitudes for quantum mechanical processes are computed. The second edition includes a new chapter on time-dependent processes, in addition to many new problems and improved illustrations.

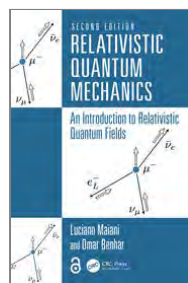
CRC Press
August 2019 : 600pp
Pb: 978-1-138-09037-8 : **£105**
Hb: 978-1-138-09041-5 : **£155**
eBook: 978-1-138-09043-9

* For full contents and more information, visit: www.routledge.com/9781138090378

2ND EDITION

Relativistic Quantum Mechanics

An Introduction to Relativistic Quantum Fields



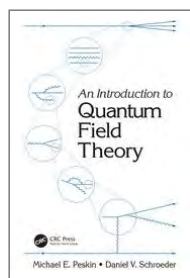
Luciano Maiani University of Rome, La Sapienza, and INFN Sezione di Roma, Rome, Italy, **Omar Benhar** Istituto Nazionale di Fisica Nucleare, Roma, Italy

Written by two of the most prominent leaders in particle physics, Relativistic Quantum Mechanics: An Introduction to Relativistic Quantum Fields provides a classroom-tested introduction to the formal and conceptual foundations of quantum field theory. Designed for advanced undergraduate- and graduate-level physics students, the text only requires previous courses in classical mechanics, relativity, and quantum mechanics.

CRC Press
October 2024 : 384pp
Hb: 978-1-032-56594-1 : **£76.99**

* For full contents and more information, visit: www.routledge.com/9781032565941

An Introduction To Quantum Field Theory



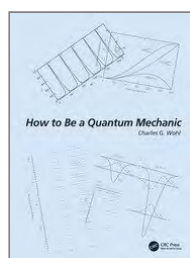
Michael E. Peskin, Daniel V. Schroeder

This is a textbook intended for the graduate physics course covering relativistic quantum mechanics, quantum electrodynamics, and Feynman diagrams. The authors make these subjects accessible through carefully worked examples illustrating the technical aspects of the subject, and intuitive explanations of what is going on behind the mathematics. After presenting the basics of quantum electrodynamics, the authors discuss the theory of renormalization and its relation to statistical mechanics, and introduce the renormalization group. This discussion sets the stage for a discussion of the physical principles that underlie the fundamental interactions of elementary particle physics and their d

CRC Press
September 2019 : 868pp
Pb: 978-0-367-32056-0 : **£64.99**
Hb: 978-0-201-50397-5 : **£120**
eBook: 978-0-429-50355-9

* For full contents and more information, visit: www.routledge.com/9780367320560

How to Be a Quantum Mechanic



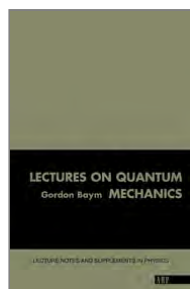
Charles G. Wohl University of California, Berkeley

These lecture notes comprise an advanced undergraduate course in quantum mechanics as taught by Charles Wohl for over 30 years at the University of California, Berkeley. Each chapter covers a major subject in quantum mechanics, beginning with an accessible introduction and unfolding in subsections to signpost the reader's progression through the topic. And, because examples are the best way to get into a subject, every chapter ends with a series of problems—over 175 total in the book—to provide hands-on practice in calculating. Targeted to upper-division physics students and lecturers, this textbook and its worked examples will teach students how to think like a quantum mechanic.

CRC Press
October 2022 : 396pp
Pb: 978-1-032-25602-3 : **£43.99**
Hb: 978-1-032-25603-0 : **£115**
eBook: 978-1-003-28418-5

* For full contents and more information, visit: www.routledge.com/9781032256023

Lectures On Quantum Mechanics



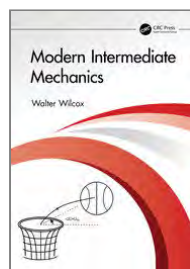
Gordon Baym

These lecture notes comprise a three-semester graduate course in quantum mechanics at the University of Illinois. There are a number of texts which present the basic topics very well; but since a fair quantity of the material discussed in my course was not available to the students in elementary quantum mechanics books, I was asked to prepare written notes. In retrospect these lecture notes seemed sufficiently interesting to warrant their publication in this format. The notes, presented here in slightly revised form, constitute a self-contained course in quantum mechanics from first principles to elementary and relativistic one-particle mechanics. Prerequisite to reading these notes is some familiarity with elementary quantum mechanics, at least at the undergraduate level. Preferably the reader should already have met the uncertainty principle and the concept of a wave function. Prerequisites also include sufficient acquaintance with complex variables to be able to do simple contour i

CRC Press
January 1974 : 606pp
Pb: 978-0-805-30667-5 : **£76.99**
Hb: 978-0-367-09187-3 : **£135**
eBook: 978-0-429-49926-5

* For full contents and more information, visit: www.routledge.com/9780805306675

Modern Intermediate Mechanics



Walter Wilcox Baylor University, Waco, Texas, USA

Modern Intermediate Mechanics (MIM) covers all the basic concepts of classical mechanics. It can serve as a foundational text for a one-semester course or a complete two-semester sequence for intermediate-level undergraduate students in physics or engineering. It includes a comprehensive coverage of the ideas at a basic level (Part I) and at an advanced level (Part II).

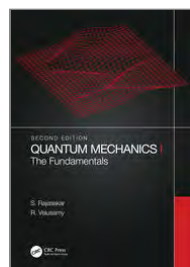
CRC Press
March 2025 : 496pp
Hb: 978-1-032-64996-2 : **£89.99**

* For full contents and more information, visit: www.routledge.com/9781032649962

2ND EDITION

Quantum Mechanics I

The Fundamentals



S. Rajasekar Bharathidasan University, Tiruchirappalli, India
, R. Velusamy ANJA College, Tamilnadu, India

Quantum Mechanics I: The Fundamentals provides a graduate-level account of the behavior of matter and energy at the molecular, atomic, nuclear, and sub-nuclear levels. It covers basic concepts, mathematical formalism, and applications to physically important systems.

CRC Press
January 2025 : 606pp
Pb: 978-0-367-77636-7 : **£45.99**
Hb: 978-0-367-76998-7 : **£86.99**
eBook: 978-1-003-17217-8

* For full contents and more information, visit: www.routledge.com/9780367776367

2ND EDITION

Quantum Mechanics II

Advanced Topics



S. Rajasekar Bharathidasan University, Tiruchirappalli, India
, R. Velusamy ANJA College, Tamilnadu, India

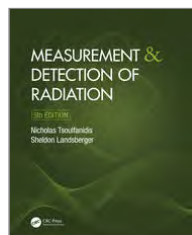
Quantum Mechanics II: Advanced Topics offers a comprehensive exploration of the state-of-the-art in various advanced topics of current research interest. A follow-up to the authors' introductory book Quantum Mechanics I: The Fundamentals, this book expounds basic principles, theoretical treatment, case studies, worked-out examples and applications of advanced topics including quantum technologies.

CRC Press
January 2025 : 432pp
Pb: 978-0-367-77642-8 : **£45.99**
Hb: 978-0-367-77000-6 : **£86.99**
eBook: 978-1-003-17219-2

* For full contents and more information, visit: www.routledge.com/9780367776428

5TH EDITION

Measurement and Detection of Radiation



Nicholas Tsoulfanidis University of Nevada, Reno, USA,
Sheldon Landsberger The University of Texas at Austin,
 USA

Measurement and Detection of Radiation, Fifth Edition provides the most up-to-date and accessible introduction to radiation detector materials, systems, and applications. It also includes more problems and updated references and bibliographies, and step-by-step derivations and numerous examples illustrate key concepts.

CRC Press

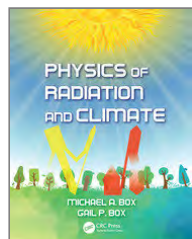
January 2025 : 642pp

Pb: 978-1-032-04282-4 : **£45.99**Hb: 978-0-367-43401-4 : **£110**

eBook: 978-1-003-00984-9

* For full contents and more information, visit: www.routledge.com/9781032042824

Physics of Radiation and Climate



Michael A. Box, **Gail P. Box**

This book offers an introduction to the physics of climate science. It is divided into three main sections, with the first providing an introduction to the atmosphere and ocean—their composition, thermodynamics, vertical structure, and basic flow patterns. The next chapters focus on the central physics of interactions between radiation, gases, and particles, addressing the core phenomena of absorption, emission, scattering, and radiative transfer. The final section integrates those principles and how they are applied in the study of weather and climate change.

CRC Press

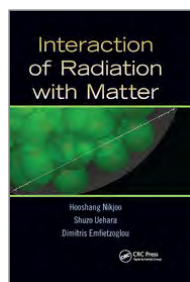
October 2015 : 514pp

Pb: 978-1-466-57205-8 : **£96.99**Hb: 978-1-138-42426-5 : **£180**

eBook: 978-0-429-19422-1

* For full contents and more information, visit: www.routledge.com/9781466572058

Interaction of Radiation with Matter



Hooshang Nikjoo, Shuzo Uehara, Dimitris Emfietzoglou

Clearly progressing from an elementary level to the state of the art, this text focuses on the physics of the interactions of ionizing radiation in living matter and the Monte Carlo simulation of radiation tracks. It explores the classical physics of track description as well as modern aspects based on condensed matter physics. The authors include the relevant atomic physics background, show how to simulate radiation tracks in a computer experiment, and highlight applications in medical/health physics and radiation biology. A solutions manual is available with qualifying course adoption.

CRC Press

September 2020 : 364pp

Pb: 978-0-367-86602-0 : **£47.99**

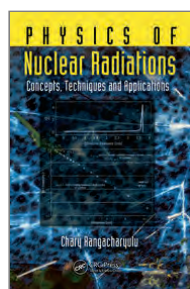
Hb: 978-1-439-85357-3 : **£150**

eBook: 978-0-429-06196-7

* For full contents and more information, visit: www.routledge.com/9780367866020

Physics of Nuclear Radiations

Concepts, Techniques and Applications



Chary Rangacharyulu University of Saskatchewan, Saskatoon, Canada and Nelson Mandela African Institute of Science and Technology (NM-AIST), Arusha, Tanzania

This text makes the physics of nuclear radiations accessible to students with a basic background in physics and mathematics. Rather than convince students one way or the other about the hazards of nuclear radiations, the text empowers them with tools to calculate and assess nuclear radiations and their impact. It discusses the meaning behind mathematical formulae as well as the areas in which the equations can be applied. Coverage includes archeology, health, and medical physics applications.

CRC Press

December 2013 : 383pp

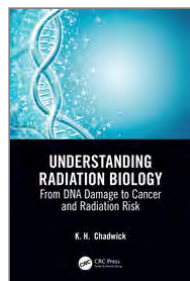
Hb: 978-1-439-85777-9 : **£110**

eBook: 978-0-429-06868-3

* For full contents and more information, visit: www.routledge.com/9781439857779

Understanding Radiation Biology

From DNA Damage to Cancer and Radiation Risk



Kenneth Chadwick

This textbook provides a qualitative and quantitative exploration of the action of radiation on living matter. It takes readers from radiation-induced molecular damage in the nucleus of the cell and links this damage to cellular effects such as cell killing, chromosome aberrations and mutations and on to organ damage, organism killing (lethality) and cancer induction. It also touches upon radiological protection and predicting the dose effect relationship for low dose and dose rate radiation risk. This book will provide the basic foundations of radiation biology for undergraduate and graduate students in medical physics, biomedical engineering, and medicine and radiology

CRC Press

December 2019 : 252pp

Pb: 978-0-367-25376-9 : **£96.99**

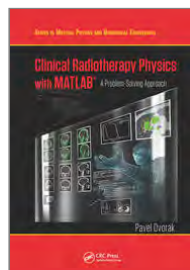
Hb: 978-0-367-25515-2 : **£240**

eBook: 978-0-429-28819-7

* For full contents and more information, visit: www.routledge.com/9780367253769

Clinical Radiotherapy Physics with MATLAB

A Problem-Solving Approach



Pavel Dvorak

The first MATLAB programming book written specifically for clinical radiotherapy medical physicists and medical physics trainees, this much-needed book teaches users how to create their own clinical applications using MATLAB, as a complement to commercial software particularly when the latter does not cover specific local clinical needs. Chapters explore key radiotherapy areas such as handling volumes, 3D dose calculation, comparing dose distributions, reconstructing treatment plans and their summations, and automated tests for machine quality assurance.

CRC Press

June 2020 : 280pp

Pb: 978-0-367-57148-1 : **£45.99**

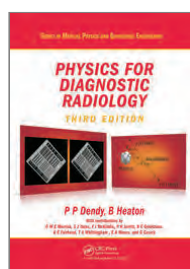
Hb: 978-1-498-75499-6 : **£120**

eBook: 978-0-429-50809-7

* For full contents and more information, visit: www.routledge.com/9780367571481

3RD EDITION

Physics for Diagnostic Radiology



Philip Palin Dendy Addenbrookes NHS Trust, Cambridge, UK, **Brian Heaton** Aberdeen Radiation Protection Services, UK

Series: Series in Medical Physics and Biomedical Engineering

Fully revised and updated, this bestselling text helps readers understand how various imaging techniques work. This edition includes new chapters on PET and PACS as well as new material on digital receptors, radiation doses and risks to patients, and special radiographic techniques, including subtraction techniques and interventional radiology. It also emphasizes the differences between analogue and digital images and covers multi-slice CT and three-dimensional resolution, dual energy applications, and cone beam CT. Exercises, multiple choice questions, extensive references, and further reading aid in understanding.

CRC Press

August 2011 : 716pp

Hb: 978-1-420-08315-6 : **£86.99**

eBook: 978-0-429-18436-9

* For full contents and more information, visit: www.routledge.com/9781420083156

An Overview of General Relativity and Space-Time



Nicola Vittorio Università di Roma Tor Vergata, Roma, Italy

Series: Series in Astronomy and Astrophysics

This textbook equips Masters' students studying Physics and Astronomy with the necessary mathematical tools to understand the basics of General Relativity and its applications. It begins by reviewing classical mechanics with a more geometrically oriented language, continues with Special Relativity and, then onto a discussion on the pseudo-Riemannian space-times.

CRC Press
December 2022 : 270pp
Pb: 978-0-367-68304-7 : **£61.99**
Hb: 978-0-367-69288-9 : **£155**
eBook: 978-1-003-14125-9

* For full contents and more information, visit: www.routledge.com/9780367683047

General Relativity and its Applications

Black Holes, Compact Stars and Gravitational Waves



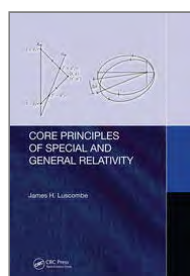
Valeria Ferrari, Leonardo Gualtieri, Paolo Pani

Containing the latest, groundbreaking discoveries in the field, this text outlines the basics of Einstein's theory of gravity with a focus on its most important astrophysical consequences, including stellar structures, black holes, and the physics of gravitational waves. Pedagogical feature boxes including examples, mathematical tools, and practical applications of theory to maximise learning make this text ideal for graduate students.

CRC Press
December 2020 : 494pp
Pb: 978-0-367-62532-0 : **£81.99**
Hb: 978-1-138-58977-3 : **£215**
eBook: 978-0-429-49140-5

* For full contents and more information, visit: www.routledge.com/9780367625320

Core Principles of Special and General Relativity



James Luscombe

This book provides an accessible, yet thorough, introduction to special and general relativity, crafted and class-tested over many years of teaching. Suitable for advanced undergraduate and graduate students, this book provides clear descriptions of how to approach the mathematics and physics involved. It also contains the latest exciting developments in the field, including dark energy, gravitational waves, and frame dragging. The table of contents has been carefully developed in consultation with a large number of instructors teaching courses worldwide, to ensure its wide applicability to modules on relativity and gravitation.

CRC Press
March 2021 : 400pp
Pb: 978-0-367-78067-8 : **£45.99**
Hb: 978-1-138-54294-5 : **£86.99**
eBook: 978-0-429-02383-5

* For full contents and more information, visit: www.routledge.com/9780367780678

Newtonian Dynamics

An Introduction



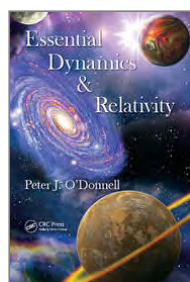
Richard Fitzpatrick The University of Texas, Austin, USA

This textbook provides a comprehensive review of Newtonian dynamics at a level suitable for undergraduate physics students. It demonstrates that Newton's three laws of motion, combined with a few simple force laws, can not only describe the motions of everyday objects observed on the surface of the Earth, but can also account for the motions of celestial objects seen in the sky. The book will start off at a level suitable for undergraduate (freshman) physics students and will very gradually increase, until, towards the end, it will approach (but not quite reach) a level characteristic of a graduate (senior) physics course.

CRC Press
January 2024 : 284pp
Pb: 978-1-032-05666-1 : **£46.99**
Hb: 978-1-032-04662-4 : **£84.99**
eBook: 978-1-003-19864-2

* For full contents and more information, visit: www.routledge.com/9781032056661

Essential Dynamics and Relativity



Peter J. O'Donnell Department of Applied Mathematics and Theoretical Physics, University of Cambridge, and Fellow of St. Edmund's College, Cambridge, UK

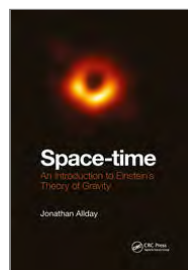
This text provides undergraduate students with an introduction to the core aspects of dynamics and special relativity. It helps students understand the precise nomenclature of dynamics and presents the mathematics of special relativity in a straightforward way. The author reiterates important ideas and terms throughout and covers concepts that are often missing from other textbooks at this level. He also places each topic within the wider constructs of the theory, without jumping from topic to topic to illustrate a point.

CRC Press
November 2014 : 336pp
Pb: 978-1-466-58839-4 : **£61.99**
Hb: 978-1-138-40418-2 : **£180**
eBook: 978-0-429-16799-7

* For full contents and more information, visit: www.routledge.com/9781466588394

Space-time

An Introduction to Einstein's Theory of Gravity



Jonathan Allday

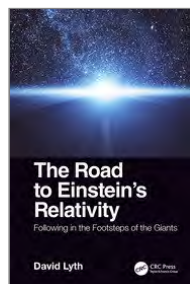
This book, suitable for interested post-16 school pupils or undergraduates looking for a supplement to their course text, develops our modern view of space-time and its implications in the theories of gravity and cosmology. While aspects of this topic are inevitably abstract, the book seeks to ground thinking in observational and experimental evidence where possible. In addition, some of Einstein's philosophical thoughts are explored and contrasted with our modern views. Written in an accessible yet rigorous style, Jonathan Allday, a highly accomplished writer, brings his trademark clarity and engagement to these fascinating subjects, which underpin so much of modern physics.

CRC Press
March 2021 : 370pp
Pb: 978-0-367-77969-6 : **£41.99**
Hb: 978-1-138-05668-8 : **£105**
eBook: 978-1-315-16514-1

* For full contents and more information, visit: www.routledge.com/9780367779696

The Road to Einstein's Relativity

Following in the Footsteps of the Giants



David Lyth Lancaster University, United Kingdom

Series: Discovering Physics

Expertly guided by renowned cosmologist Dr. David Lyth, learn about the pioneering scientists whose work provided the foundation for Einstein's formulation of his theories of relativity, and about Einstein's groundbreaking life and work as well. This highly readable and accessible panorama of the field delicately balances history and science as it takes the reader on an adventure through the centuries. Without complex mathematics or scientific formulae, this book will be of interest to all, even those without a scientific background, who are intrigued to find out more about what paved the way for one of our most famous physicists to push the boundaries of physics to new lengths.

CRC Press

January 2019 : 168pp

Pb: 978-0-367-00253-4 : **£25.99**

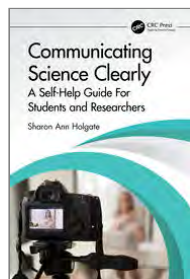
Hb: 978-0-367-02285-3 : **£105**

eBook: 978-0-429-40044-5

* For full contents and more information, visit: www.routledge.com/9780367002534

Communicating Science Clearly

A Self-Help Guide For Students and Researchers



Sharon Ann Holgate

This unique self-help guide equips undergraduates, postgraduate students, and early career researchers within the sciences with transferrable communication skills that they can adapt, and refer back to, as they progress through their careers. It provides practical guidance on how to best communicate science in a range of different settings.

CRC Press

November 2023 : 162pp

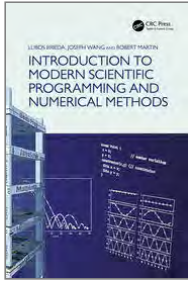
Pb: 978-1-032-06911-1 : **£37.99**

Hb: 978-1-032-07422-1 : **£94.99**

eBook: 978-1-003-20682-8

* For full contents and more information, visit: www.routledge.com/9781032069111

Introduction to Modern Scientific Programming and Numerical Methods



Lubos Brieda , Joseph Wang , Robert Martin

This book introduces the reader not only to the mathematical foundation but also to the programming paradigms encountered in modern hybrid software-hardware scientific computing. After completing the text, the reader will be well-versed in the use of different numerical techniques, programming languages, and hardware architectures, and will be able to select the appropriate software and hardware tool for their analysis.

CRC Press

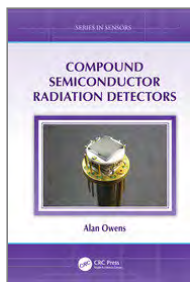
October 2024 : 472pp

Hb: 978-0-367-67191-4 : **£74.99**

eBook: 978-1-003-13223-3

* For full contents and more information, visit: www.routledge.com/9780367671914

Compound Semiconductor Radiation Detectors



Alan Owens European Space Agency, Noordwijk, The Netherlands

Series: Series in Sensors

For many applications, compound semiconductors are now viable competitors to elemental semiconductors because of their wide range of physical properties. This book describes all aspects of radiation detection and measurement using compound semiconductors, including crystal growth, detector fabrication, contacting, and spectroscopic performance (with particular emphasis on the X- and gamma-ray regimes). A concentrated reference for researchers in various disciplines as well as graduate students in specialized courses, the text outlines the potential and limitations of semiconductor detectors.

CRC Press

October 2016 : 567pp

Pb: 978-1-138-19958-3 : **£68.99**

Hb: 978-1-439-87312-0 : **£185**

eBook: 978-0-429-06231-5

* For full contents and more information, visit: www.routledge.com/9781138199583

Modern Semiconductor Physics and Device Applications



Vitalii Dugaev, Vladimir Litvinov Sierra Nevada Corporation, Irvine, California, USA

This textbook provides a theoretical background for contemporary trends in solid state theory and semiconductor device physics. It discusses advanced methods of quantum mechanics and field theory and is therefore primarily intended for graduate students in theoretical and experimental physics who have already studied electrodynamics, statistical physics, and quantum mechanics.

CRC Press

May 2023 : 397pp

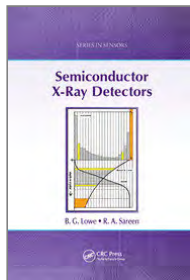
Pb: 978-0-367-25080-5 : **£45.99**

Hb: 978-0-367-25082-9 : **£120**

eBook: 978-0-429-28592-9

* For full contents and more information, visit: www.routledge.com/9780367250805

Semiconductor X-Ray Detectors



B. G. Lowe, R. A. Sareen

Series: Series in Sensors

This book focuses on the history and development of Si(Li) X-Ray Detectors, while providing an up-to-date review of the principles, practical applications, and state of the art of semiconductor x-ray detectors. It describes many of the facets of x-ray detection and measurement using semiconductors, from manufacture to implementation. The initial chapters summarize relevant background physics, materials science, and engineering aspects. Later chapters compare and contrast the manufacture and physical properties of systems and materials currently employed, enabling readers to fully understand the materials and scope for applications.

CRC Press

November 2017 : 624pp

Pb: 978-1-138-03385-6 : **£64.99**

Hb: 978-1-466-55400-9 : **£185**

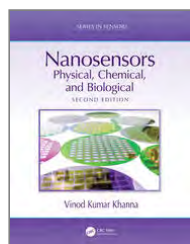
eBook: 978-0-429-08824-7

* For full contents and more information, visit: www.routledge.com/9781138033856

2ND EDITION

Nanosensors

Physical, Chemical, and Biological



Vinod Kumar Khanna CSIR-Central Electronics
Engineering Research Institute, India

Series: Series in Sensors

A growing and exciting field, nanosensors have recently spurred considerable research endeavors across the globe, driving a need for the development of new device concepts and engineering nanostructured materials with controlled properties. *Nanosensors, Second Edition* offers a panoramic view of the field and related nanotechnologies with extraordinary clarity and depth. This is an ideal reference for researchers and industry professionals engaged in the frontier areas of material science and semiconductor fabrication as well as graduate students in physics and engineering pursuing electrical engineering and electronics courses with a focus on nanoscience and nanotechnology.

CRC Press

August 2022 : 578pp

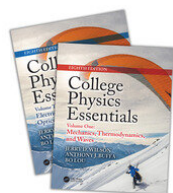
Pb: 978-0-367-51480-8 : **£96.99**

Hb: 978-0-367-45705-1 : **£250**

eBook: 978-1-003-02555-9

* For full contents and more information, visit: www.routledge.com/9780367514808

College Physics Essentials, Eighth Edition (Two-Volume Set)



Jerry D. Wilson, Anthony J. Buffa, Bo Lou

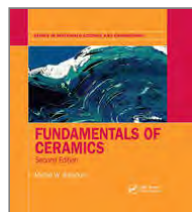
This edition provides a streamlined update of a major textbook for algebra-based physics, reflecting the demand by instructors for more substance. The authors enhance emphasis on worked examples to enhance reader engagement, together with expanded problem sets that build from conceptual understanding to numerical solutions and real-world applications. It is the textbook of choice for those seeking a basic understanding of key physics concepts and how to apply them to real problems. The first volume covers mechanics, solids and fluids, heat, thermodynamics, vibrations and waves, and sound. The second volume covers electricity and magnetism, optics, atomic, nuclear, and quantum physics.

CRC Press
July 2022 : 812pp
Pb: 978-1-032-33726-5 : **£86.99**
Hb: 978-0-815-35546-5 : **£230**
eBook: 978-1-351-12992-3

* For full contents and more information, visit: www.routledge.com/9781032337265

2ND EDITION

Fundamentals of Ceramics



Michel Barsoum

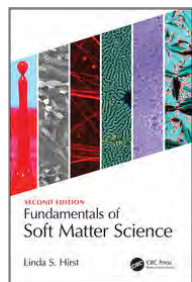
This second edition of Fundamentals of Ceramics adds a section on density functional theory calculations for shedding light on properties. It also adds more on applications, including solid oxide fuel cells as a case study and a major overhaul of the last chapter on optical properties. There's also new and extended discussion of such topics as non-parabolic oxidation, dislocation creep, thermal conductivity, ferroelectric ceramics, ferromagnetic ceramics, scattering mechanisms, surface tension, and processing of ceramics from aqueous environments.

CRC Press
June 2022 : 644pp
Pb: 978-1-032-33730-2 : **£45.99**
Hb: 978-1-498-70813-5 : **£120**
eBook: 978-1-498-70816-6

* For full contents and more information, visit: www.routledge.com/9781032337302

2ND EDITION

Fundamentals of Soft Matter Science



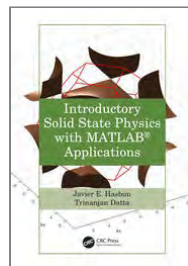
Linda S. Hirst University of California, Merced, USA

This revised edition continues to provide the most approachable introduction to the structure, characteristics, and everyday applications of soft matter. It begins with a substantially revised overview of the underlying physics and chemistry common to soft materials. Subsequent chapters comprehensively address the different classes of soft materials, from liquid crystals to surfactants, polymers, colloids, and biomaterials, with vivid, full-color illustrations throughout.

CRC Press
August 2019 : 304pp
Pb: 978-1-138-72444-0 : **£86.99**
Hb: 978-1-138-72478-5 : **£220**
eBook: 978-1-315-19238-3

* For full contents and more information, visit: www.routledge.com/9781138724440

Introductory Solid State Physics with MATLAB Applications



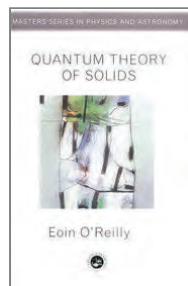
Javier E. Hasbun, Trinanjan Datta

Solid state physics, the study and prediction of the fundamental physical properties of materials, forms the backbone of modern materials science and has many technological applications. The unique feature of this text is the MATLAB®-based computational approach with several numerical techniques and simulation methods included. This is highly effective in addressing the need for visualization and a direct hands-on approach in learning the theoretical concepts of solid state physics. The code is freely available to all textbook users.

CRC Press
October 2019 : 570pp
Hb: 978-1-466-51230-6 : **£84.99**
eBook: 978-0-429-08660-1

* For full contents and more information, visit: www.routledge.com/9781466512306

Quantum Theory of Solids



Eoin O'Reilly NMRC, Cork, Ireland

Series: Master's Series in Physics and Astronomy

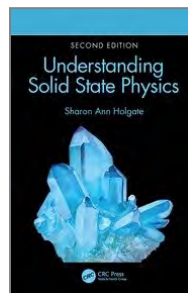
Although the topic is a well established sub-set of solid state physics, Quantum Theory of Solids develops the concepts of quantum theory for the solid state in a single, one-stop reference. Readers with previous courses in quantum mechanics and solid state physics can develop further, learning the three most significant topics in solid state physics: semiconductors, magnetism, and superconductivity. The author explains quantum mechanics techniques, such as the variational method and perturbation theory, not usually found in introductory courses. Covering the necessary physics from a basic to advanced level, the text is suitable for a stand-alone final year course.

CRC Press
September 2002 : 264pp
Pb: 978-0-748-40627-2 : **£61.99**
Hb: 978-0-748-40628-9 : **£115**
eBook: 978-1-315-27319-8

* For full contents and more information, visit: www.routledge.com/9780748406272

2ND EDITION

Understanding Solid State Physics



Sharon Ann Holgate

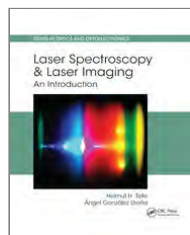
Keeping the mathematics to a minimum yet losing none of the required rigor, Understanding Solid State Physics, Second Edition clearly explains basic physics principles to provide a firm grounding in the subject. This new edition has been fully updated throughout, with recent developments and literature in the field, including graphene and the use of quasicrystalline materials, in addition to featuring new journalistic boxes and the reciprocal lattice.

CRC Press
April 2021 : 392pp
Pb: 978-0-367-24985-4 : **£96.99**
Hb: 978-0-367-25528-2 : **£250**
eBook: 978-0-429-28823-4

* For full contents and more information, visit: www.routledge.com/9780367249854

Laser Spectroscopy and Laser Imaging

An Introduction



Helmut H. Telle , Ángel González Ureña

Developments in and applications of laser spectroscopy and laser imaging are growing rapidly, specifically now that spectral analytical methodologies are merging with laser imaging techniques. It is the intention of this book to provide researchers, both in industry and academia, with a concise collection of laser analysis and imaging techniques. Written by two leaders in the field, it will introduce the reader to individual techniques in a tutorial-fashion and provide key examples and including details of the latest techniques.

CRC Press

December 2019 : 750pp

Pb: 978-0-367-86821-5 : **£71.99**

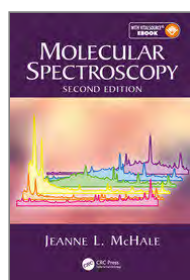
Hb: 978-1-466-58822-6 : **£175**

eBook: 978-1-315-15698-9

* For full contents and more information, visit: www.routledge.com/9780367868215

2ND EDITION

Molecular Spectroscopy



Jeanne L. McHale Washington State University, Pullman, USA

This newly expanded, extensively updated edition provides the most accessible and complete introduction to spectroscopy and dynamics of molecules in condensed phases. It covers practical spectroscopic approaches relevant for rapidly advancing areas such as nanomaterials and interfaces for optoelectronic devices, bioinspired materials for solar energy conversion, and biomedical applications of emissive nanoparticles. New chapters reflect the importance of time-resolved and nonlinear optical spectroscopy. Additional topics include terahertz spectroscopy, single molecule spectroscopy, Fourier-transform techniques, atomic spectroscopy, Stark spectroscopy, and computational approaches.

CRC Press

May 2017 : 475pp

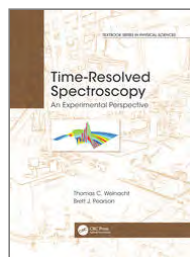
Hb: 978-1-466-58658-1 : **£91.99**

eBook: 978-1-315-11521-4

* For full contents and more information, visit: www.routledge.com/9781466586581

Time-Resolved Spectroscopy

An Experimental Perspective



Thomas Weinacht , Brett J. Pearson

This concise and carefully developed text offers a reader friendly guide to the basics of time-resolved spectroscopy with an emphasis on experimental implementation. The authors carefully explain and relate for the reader how measurements are connected to the core physical principles. They use the time-dependent wave packet as a building block for understanding quantum dynamics, progressively advancing to more complex topics. The topics are discussed in paired sections, one discussing the theory and the next presenting the related experimental methods. A wide range of readers including students and newcomers to the field will gain a clear and practical und

CRC Press

March 2021 : 372pp

Pb: 978-0-367-78040-1 : **£45.99**

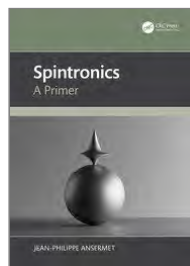
Hb: 978-1-498-71673-4 : **£120**

eBook: 978-0-429-44082-3

* For full contents and more information, visit: www.routledge.com/9780367780401

Spintronics

A Primer



Jean-Philippe Ansermet

A sound understanding of magnetism, transport theory, spin relaxation mechanisms, and magnetization dynamics is necessary to engage in spintronics research. In this primer, special effort has been made to give straightforward explanations for these advanced concepts. This book will be a valuable resource for graduate students in spintronics and related fields. Concepts of magnetism such as exchange interaction, spin-orbit coupling, spin canting, and magnetic anisotropy are introduced.

CRC Press

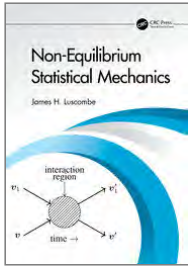
August 2024 : 454pp

Hb: 978-1-032-43233-5 : **£81.99**

eBook: 978-1-003-37001-7

* For full contents and more information, visit: www.routledge.com/9781032432335

Non-Equilibrium Statistical Mechanics



James H. Luscombe

Statistical mechanics provides a framework for relating the properties of macroscopic systems (large collections of atoms, such as in a solid) to the microscopic properties of its parts. However, what happens when macroscopic systems are not in thermal equilibrium, where time is not only a relevant variable, but also essential? That is the province of nonequilibrium statistical mechanics – there are many ways for systems to be out of equilibrium! The subject is governed by fewer general principles than equilibrium statistical mechanics and consists of a number of different approaches for describing nonequilibrium systems.

CRC Press

September 2024 : 256pp

Hb: 978-1-138-54295-2 : **£97.99**

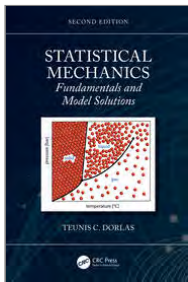
eBook: 978-1-003-51229-5

* For full contents and more information, visit: www.routledge.com/9781138542952

2ND EDITION

Statistical Mechanics

Fundamentals and Model Solutions



Teunis C Dorlas Dublin Institute for Advanced Studies, Ireland

Fully updated throughout and with new chapters on the Mayer expansion for classical gases and on cluster expansion for lattice models, this new edition of Statistical Mechanics: Fundamentals and Model Solutions provides a comprehensive introduction to equilibrium statistical mechanics for advanced undergraduate and graduate students of mathematics and physics.

CRC Press

April 2021 : 348pp

Pb: 978-0-367-47175-0 : **£84.99**

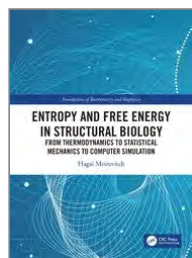
Hb: 978-0-367-47881-0 : **£215**

eBook: 978-1-003-03717-0

* For full contents and more information, visit: www.routledge.com/9780367471750

Entropy and Free Energy in Structural Biology

From Thermodynamics to Statistical Mechanics to Computer Simulation



Hagai Meirovitch

Series: Foundations of Biochemistry and Biophysics

Computer simulation has become the main engine of development in statistical mechanics. In structural biology, computer simulation constitutes the main theoretical tool for structure determination of proteins and for calculation of the free energy of binding, which are important in drug design. Entropy and Free Energy in Structural Biology leads the reader to the simulation technology in a systematic way. Enhanced by a number of solved problems and examples, this volume will be a valuable resource to advanced undergraduate and graduate students in chemistry, chemical engineering, biochemistry biophysics, pharmacology, and computational biology.

CRC Press

April 2022 : 396pp

Pb: 978-0-367-42745-0 : **£45.99**

Hb: 978-0-367-40692-9 : **£110**

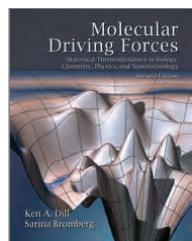
eBook: 978-0-367-85478-2

* For full contents and more information, visit: www.routledge.com/9780367427450

2ND EDITION

Molecular Driving Forces

Statistical Thermodynamics in Biology, Chemistry, Physics, and Nanoscience



Ken Dill University of California, San Francisco, USA,
Sarina Bromberg Pescadero, California, USA

Molecular Driving Forces, Second Edition is an introductory statistical thermodynamics text that describes the principles and forces that drive chemical and biological processes. The second edition includes an additional chapter on thermodynamics and two new chapters: (1) "Microscopic Dynamics" which explores single molecule experiments; and (2) "Bio and Nano Machines" which describes the workings of biological molecules including proteins and DNA. New examples and practical applications are integrated throughout the revised and updated text, exploring topics in biology, environmental and energy science, and nanotechnology. It also includes new end-of-chapter problems, and purely mathematical topics are now in appendices. Written in a clear and reader-friendly style, the book provides an excellent introduction to the subject for novices while remaining a valuable resource for experts.

Garland Science

October 2010 : 784pp

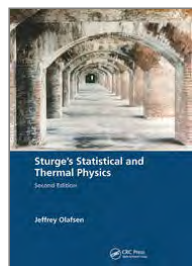
Pb: 978-0-815-34430-8 : **£135**

eBook: 978-0-203-80907-5

* For full contents and more information, visit: www.routledge.com/9780815344308

2ND EDITION

Sturge's Statistical and Thermal Physics, Second Edition



Jeffrey Olafsen

This fully revised and updated edition provides a uniquely accessible introduction to the principles and applications of statistical mechanics and thermodynamics. Based on the highly acclaimed text by famous physicist M.D. Sturge, it continues its emphasis on explaining concepts with simple mathematics and plain English, as well as consistent use of terminology and notation. The new edition includes a chapter on non-equilibrium thermodynamics and many new examples from soft condensed matter physics. Additionally, chapters have been reorganized for better flow.

CRC Press

March 2021 : 422pp

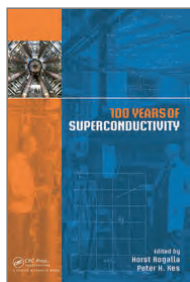
Pb: 978-0-367-77949-8 : **£45.99**

Hb: 978-1-482-25600-0 : **£105**

eBook: 978-1-315-15695-8

* For full contents and more information, visit: www.routledge.com/9780367779498

100 Years of Superconductivity



Edited by **Horst Rogalla** University of Twente, Enschede, The Netherlands and University of Colorado at Boulder, USA, **Peter H. Kes** Leiden University, The Netherlands

Tracing the historical developments in superconductivity, this comprehensive collection includes contributions from many pioneers who are responsible for important steps forward in the field. These leaders discuss interesting stories of the discovery and gradual progress of theory and experimentation. Emphasizing key developments in the early 1950s and 1960s, the book looks at how superconductivity started to permeate society and how most of today's applications are based on the innovations of those years. It also explores the genuine revolution that occurred with the discovery of high temperature superconductors.

CRC Press

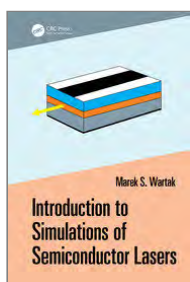
November 2011 : 864pp

Hb: 978-1-439-84946-0 : £175

eBook: 978-0-429-06586-6

* For full contents and more information, visit: www.routledge.com/9781439849460

Introduction to Simulations of Semiconductor Lasers



Marek Wartak

The book begins with explaining the physics and fundamental characteristics behind semiconductor lasers and their applications. It presumes little prior knowledge, such that only a familiarity with the basics of electromagnetism and quantum mechanics is required. The book transitions from textbook explanations, equations, and formulas to ready-to-run numeric codes that enable the visualization of concepts and simulation studies.

CRC Press

March 2024 : 364pp

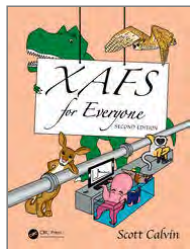
Hb: 978-1-032-20904-3 : £110

eBook: 978-1-003-26584-9

* For full contents and more information, visit: www.routledge.com/9781032209043

2ND EDITION

XAFS for Everyone



Scott Calvin Lehman College, the City University of New York

XAFS for Everyone provides a practical, thorough guide to x-ray absorption fine-structure (XAFS) spectroscopy for both novices and seasoned practitioners from a range of disciplines. This second edition now includes chapters on spatial and temporal resolution, alternative measurement modes including resonant inelastic x-ray scattering (RIXS) and high-energy resolution fluorescence detection (HERFD), and an expanded chapter on experimental design. In addition, this edition adds new sections on wavelet transforms, blind source separation, free electron lasers, and theoretical XANES standards, as well as three new case studies.

CRC Press

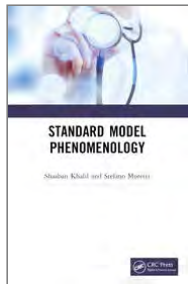
July 2024 : 444pp

Hb: 978-1-032-74548-0 : £89.99

eBook: 978-0-429-32955-5

* For full contents and more information, visit: www.routledge.com/9781032745480

Standard Model Phenomenology



Shaaban Khalil , Stefano Moretti University of Southampton, Highfield Campus, United Kingdom

This new book is fully up to date with all the latest developments on both theoretical and experimental investigations of the Standard Model (SM) of particle physics with a particular emphasis on its historical development on both sides.

CRC Press

August 2024 : 246pp

Pb: 978-1-032-20168-9 : **£45.99**

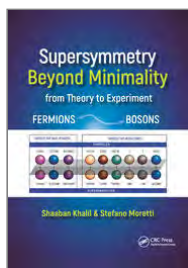
Hb: 978-1-138-33643-8 : **£175**

eBook: 978-0-429-44301-5

* For full contents and more information, visit: www.routledge.com/9781032201689

Supersymmetry Beyond Minimality

From Theory to Experiment



Shaaban Khalil , Stefano Moretti

Series: Series in Particle Physics, Cosmology and Gravitation

Supersymmetry is an elegant and simple theory, but its existence lacks direct proof. Instead of dismissing supersymmetry altogether, *Supersymmetry Beyond Minimality: from Theory to Experiment* suggests that supersymmetry may exist in more complex and subtle manifestation than the minimal model. The book explores in detail non-minimal supersymmetry models, in a bottom-up approach that interconnects experimental phenomena in the fermionic and bosonic sectors. The book considers with equal emphasis the Higgs and Superparticle sectors, and explains both collider and non-collider experiments. Uniquely, the book explores charge/parity and lepton flavour v

CRC Press

December 2019 : 400pp

Pb: 978-0-367-87662-3 : **£45.99**

Hb: 978-1-498-75673-0 : **£150**

eBook: 978-1-315-36790-3

* For full contents and more information, visit: www.routledge.com/9780367876623

5TH EDITION

Gauge Theories in Particle Physics 40th Anniversary Edition

A Practical Introduction, Two Volume Set



Ian J.R. Aitchison Prof. Em., Univ. of Oxford, **Anthony J.G. Hey** Microsoft Research

The fifth edition of this well-established, highly regarded two-volume set continues to provide a fundamental introduction to advanced particle physics while incorporating substantial new experimental results, especially in the areas of the Higgs and top quark sectors, as well as CP violation and neutrino oscillations. It offers an accessible and practical introduction to the three gauge theories comprising the Standard Model of particle physics: quantum electrodynamics (QED), quantum chromodynamics (QCD), and the Glashow-Salam-Weinberg (GSW) electroweak theory.

CRC Press

August 2024 : 856pp

Pb: 978-1-032-72618-2 : **£89.99**

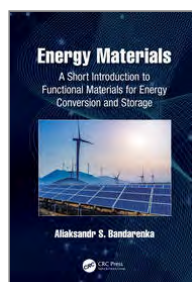
Hb: 978-1-032-49158-5 : **£230**

eBook: 978-1-003-56308-2

* For full contents and more information, visit: www.routledge.com/9781032726182

Energy Materials

A Short Introduction to Functional Materials for Energy Conversion and Storage



Aliaksandr S. Bandarenka

This textbook provides readers with an accessible overview of the functional materials currently employed or investigated for energy provision, conversion, and storage.

CRC Press

May 2023 : 252pp

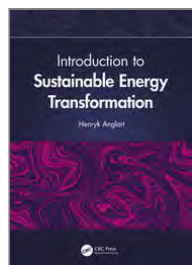
Pb: 978-0-367-45810-2 : **£45.99**

Hb: 978-0-367-45736-5 : **£120**

eBook: 978-1-003-02549-8

* For full contents and more information, visit: www.routledge.com/9780367458102

Introduction to Sustainable Energy Transformation



Henryk Anglart

This textbook provides an accessible introduction to various energy transformation technologies and their influences on the environment. Here the energy transformation is understood as any physical process induced by humans, in which energy is intentionally transformed from one form to another. This book provides an accessible introduction to the subject: covering the theory, principles of design, operation, and efficiency of the systems in addition to discerning concepts such as energy, entropy, exergy, efficiency, and sustainability.

CRC Press

November 2021 : 386pp

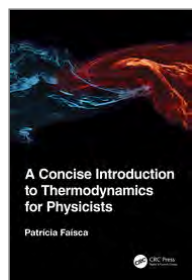
Pb: 978-0-367-47080-7 : **£84.99**

Hb: 978-0-367-47861-2 : **£215**

eBook: 978-1-003-03698-2

* For full contents and more information, visit: www.routledge.com/9780367470807

A Concise Introduction to Thermodynamics for Physicists



Patricia Faisca

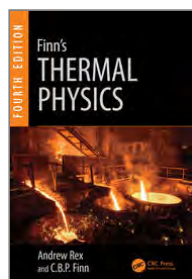
This introductory textbook on thermodynamics is designed for undergraduate students in physics, physics engineering, biophysics and biomedical engineering who are being exposed to the ideas and concepts of thermal physics for the first time. While this is a self-contained text on thermodynamics (i.e. focused on macroscopic physics), emphasis is placed on the microscopic underlying model in order to facilitate the understanding of thermodynamics concepts and properties, and motivate a future course on statistical physics. This book will equip the readers with an understanding of the scope and applicability of this discipline and will be able to apply it to study any physical system.

CRC Press
September 2022 : 236pp
Pb: 978-0-367-54641-0 : **£45.99**
Hb: 978-0-367-55084-4 : **£120**
eBook: 978-1-003-09192-9

* For full contents and more information, visit: www.routledge.com/9780367546410

4TH EDITION

Finn's Thermal Physics



Andrew Rex University of Puget Sound, Tacoma, Washington, USA, **C.B.P. Finn** Sussex University, UK

While maintaining the style of the original work, the book now covers statistical mechanics and incorporates worked examples systematically throughout the text. It also covers more problems, and incorporates some essential updates, such as discussions on superconductivity, magnetism, Bose-Einstein condensation, and climate change.

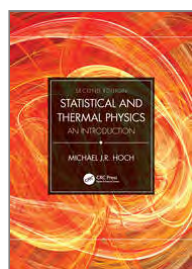
CRC Press
April 2024 : 408pp
Pb: 978-1-032-28982-3 : **£56.99**
Hb: 978-1-032-28903-8 : **£145**
eBook: 978-1-003-29947-9

* For full contents and more information, visit: www.routledge.com/9781032289823

2ND EDITION

Statistical and Thermal Physics

An Introduction



Michael J.R. Hoch

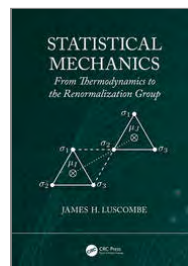
Thermal and statistical physics has established the principles and procedures needed to understand and explain the properties of systems consisting of macroscopically large numbers of particles. By developing microscopic statistical physics and macroscopic classical thermodynamic descriptions in tandem, Statistical and Thermal Physics: An Introduction provides insight into basic concepts and relationships at an advanced undergraduate level.

CRC Press
May 2021 : 348pp
Pb: 978-0-367-46134-8 : **£84.99**
Hb: 978-0-367-46410-3 : **£215**
eBook: 978-1-003-02860-4

* For full contents and more information, visit: www.routledge.com/9780367461348

Statistical Mechanics

From Thermodynamics to the Renormalization Group



James H. Luscombe

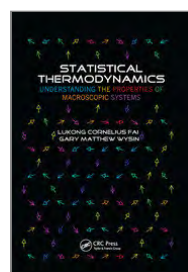
This textbook provides a comprehensive, yet accessible, introduction to statistical mechanics. Crafted and class-tested over many years of teaching, it carefully guides advanced undergraduate and graduate students who are encountering statistical mechanics for the first time through this – sometimes – intimidating subject. The book provides a strong foundation in thermodynamics and the ensemble formalism of statistical mechanics.

CRC Press
December 2020 : 400pp
Pb: 978-1-138-54297-6 : **£66.99**
Hb: 978-0-367-68927-8 : **£175**
eBook: 978-1-003-13966-9

* For full contents and more information, visit: www.routledge.com/9781138542976

Statistical Thermodynamics

Understanding the Properties of Macroscopic Systems



Lukong Cornelius Fai University of Dschang, Cameroon and The Abdus Salam International Centre For Theoretical Physics, Trieste, Italy, **Gary Matthew Wysin** Kansas State University, Manhattan, USA

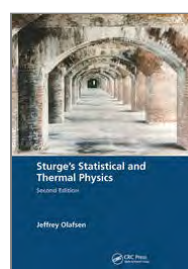
Presenting a look at the evolution of modern statistical thermodynamics, this book provides a detailed overview of the statistical principles used to obtain the physical and thermodynamic properties of macroscopic systems. Going further than many advanced textbooks, it includes Bose-Einstein, Fermi-Dirac statistics, and Lattice dynamics as well as applications in polaron theory, electronic gas in a magnetic field, thermodynamics of dielectrics, and magnetic materials in a magnetic field. The text also examines statistical thermodynamics using functional integration and Feynman path integrals. In addition, it features physical results as well as worked problems and a solutions manual.

CRC Press
September 2019 : 548pp
Pb: 978-0-367-38076-2 : **£58.99**
Hb: 978-1-466-51067-8 : **£175**
eBook: 978-0-429-08674-8

* For full contents and more information, visit: www.routledge.com/9780367380762

2ND EDITION

Sturge's Statistical and Thermal Physics, Second Edition



Jeffrey Olafsen

This fully revised and updated edition provides a uniquely accessible introduction to the principles and applications of statistical mechanics and thermodynamics. Based on the highly acclaimed text by famous physicist M.D. Sturge, it continues its emphasis on explaining concepts with simple mathematics and plain English, as well as consistent use of terminology and notation. The new edition includes a chapter on non-equilibrium thermodynamics and many new examples from soft condensed matter physics. Additionally, chapters have been reorganized for better flow.

CRC Press
March 2021 : 422pp
Pb: 978-0-367-77949-8 : **£45.99**
Hb: 978-1-482-25600-0 : **£105**
eBook: 978-1-315-15695-8

* For full contents and more information, visit: www.routledge.com/9780367779498

Thermal Physics Tutorials with Python Simulations



Minjoon Kouh , Taejoon Kouh

Series: Series in Computational Physics

This book may serve as a thermal physics textbook for a semester-long undergraduate thermal physics course or may be used as a tutorial on scientific computing with focused examples from thermal physics. This book will also appeal to engineering students studying intermediate-level thermodynamics as well as computer science students looking to understand how to apply their computer programming skills to science.

CRC Press

December 2024 : 238pp

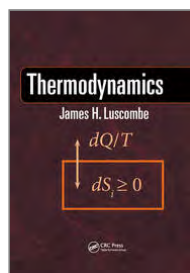
Pb: 978-1-032-26343-4 : **£45.99**

Hb: 978-1-032-25756-3 : **£76.99**

eBook: 978-1-003-28784-1

* For full contents and more information, visit: www.routledge.com/9781032263434

Thermodynamics



James Luscombe

This book provides an accessible yet thorough introduction to thermodynamics, crafted and class-tested over many years of teaching. Suitable for advanced undergraduate and graduate students, this book delivers clear descriptions of how to think about the mathematics and physics involved. The content has been carefully developed in consultation with a large number of instructors teaching courses worldwide, to ensure wide applicability to modules on thermodynamics. Modern applications of thermodynamics (in physics and related areas) are included throughout—something not offered to the same degree by existing texts in the field.

CRC Press

June 2020 : 240pp

Pb: 978-0-367-57199-3 : **£45.99**

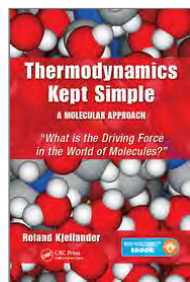
Hb: 978-1-138-54298-3 : **£86.99**

eBook: 978-0-429-50762-5

* For full contents and more information, visit: www.routledge.com/9780367571993

Thermodynamics Kept Simple - A Molecular Approach

What is the Driving Force in the World of Molecules?



Roland Kjellander University of Gothenburg, Sweden

This book offers a unique way of teaching and thinking about basic thermodynamics that helps students overcome common conceptual problems. It delivers a brilliantly conceived introduction to thermodynamics at the molecular level, presenting the core laws with clear explanations. The text covers key concepts such as entropy, energy transfer, heat exchange, work, enthalpy, free energy, irreversible and reversible processes, chemical equilibrium, and phase transitions in the molecular world, employing simple but well-chosen examples to supply insight into the molecular events underlying the thermodynamic macroscopic description.

CRC Press

August 2015 : 252pp

Pb: 978-1-482-24410-6 : **£46.99**

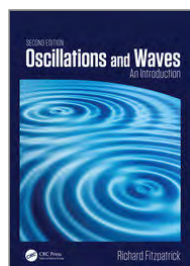
eBook: 978-0-429-19437-5

* For full contents and more information, visit: www.routledge.com/9781482244106

2ND EDITION

Oscillations and Waves

An Introduction, Second Edition



Richard Fitzpatrick The University of Texas, Austin, USA

Emphasizing physics over mathematics, this popular, classroom-tested text helps advanced undergraduates acquire a sound physical understanding of wave phenomena. This second edition of *Oscillations and Waves: An Introduction* contains new widgets, animations in Python, and exercises, as well as updated chapter content throughout; continuing to ease the difficult transition for students between lower-division courses that mostly encompass algebraic equations and upper-division courses that rely on differential equations.

CRC Press

July 2018 : 309pp

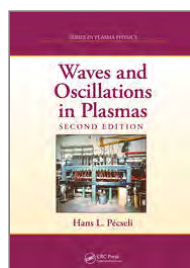
Pb: 978-1-138-47971-5 : **£79.99**Hb: 978-1-138-48035-3 : **£210**

eBook: 978-1-351-06310-4

* For full contents and more information, visit: www.routledge.com/9781138479715

2ND EDITION

Waves and Oscillations in Plasmas



Hans L. Pecseli

Waves and Oscillations in Plasmas addresses central issues in modern plasma sciences, working gradually from an introductory to an advanced level. This second edition has been fully updated, and includes the latest developments in fluid models as well as kinetic plasma models, including a detailed discussion of, for instance, collisionless Landau damping. Offering a clear separation of linear and nonlinear models, the book can be tailored for readers of varying levels of expertise in areas as diverse as the space sciences, laboratory experiments, plasma processing, and more.

CRC Press

December 2021 : 554pp

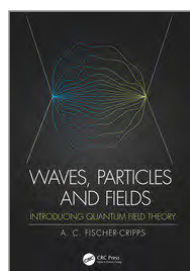
Pb: 978-1-032-23642-1 : **£45.99**Hb: 978-1-138-59129-5 : **£185**

eBook: 978-0-429-48997-6

* For full contents and more information, visit: www.routledge.com/9781032236421

Waves, Particles and Fields

Introducing Quantum Field Theory



Anthony C. Fischer-Cripps Fischer-Cripps Laboratories Pty Ltd, Sydney, Australia

This book presents a background to the concepts of quantum physics; from its inception and the original quantum physics of the Schrodinger Equation through to modern-day theories. It discusses the basics of mechanics, relativity, old and new quantum theory, and Feynman and the concept of a quantum field. It provides the necessary foundation for readers to then progress to more advanced texts on quantum field theory. This book will be of interest to undergraduate students in physics and mathematics and an interested, general audience.

CRC Press

July 2019 : 350pp

Pb: 978-0-367-19876-3 : **£76.99**Hb: 978-0-367-19878-7 : **£195**

eBook: 978-0-429-24384-4

* For full contents and more information, visit: www.routledge.com/9780367198763

1.		C.		F.		Introduction to Fluid Dynamics in Physics and Astrophysics 6
2.		CAD-Based Optical Design with Quadoa 48		Feynman Lectures on Computation 17		Introduction to Fluorescence 10
21st Century Nanoscience 44		Cell Biology by the Numbers 9		Finn's Thermal Physics 77		Introduction to Mechanics 39
21st Century Nanoscience – A Handbook . . . 44		Cell Boundaries 9		Fischer-Cripps Student Companion Set (5 Volumes) 30		Introduction to Medical Physics 41
100 Years of Superconductivity 73		Classical Mechanics 14		Foundations of Medical Physics 39		Introduction to Modern Scientific Programming and Numerical Methods 65
A.		Clinical Radiotherapy Physics with MATLAB . . 61		From Atoms to Galaxies 19		Introduction to Nuclear Reactions 46
A Concise Introduction to Thermodynamics for Physicists 77		College Physics Essentials, Eighth Edition . . . 29		Fundamental Mathematics and Physics of Medical Imaging 40		Introduction to Physics in Modern Medicine . . 41
A Course in Mathematical Methods for Physicists 36		College Physics Essentials, Eighth Edition (Two-Volume Set) 29		Fundamentals of Astronomy 4		Introduction to Plasma Physics 55
A Geometrical Approach to Physics 36		College Physics Essentials, Eighth Edition (Two-Volume Set) 29		Fundamentals of Ceramics 22		Introduction to Python for Science and Engineering 17
A Mathematica Primer for Physicists 17		Commonly Asked Questions in Physics 19		Fundamentals of Ceramics 68		Introduction to Relativity Volume I 30
An Introduction to Beam Physics 50		Commonly Asked Questions in Physics 29		Fundamentals of Fibre Reinforced Composite Materials 35		Introduction to Relativity Volume II 30
An Introduction to Biomedical Optics 48		Communicating Science Clearly 64		Fundamentals of MRI 40		Introduction to Simulations of Semiconductor Lasers 73
An Introduction to Gauge Theories 28		Compound Semiconductor Radiation Detectors . 66		Fundamentals of Nonlinear Optics 48		Introduction to Sustainable Energy Transformation 76
An Introduction to Graphene and Carbon Nanotubes 44		Computational Problems for Physics 36		Fundamentals of Radio Astronomy 4		Introduction to the Maths and Physics of Quantum Mechanics 14
An Introduction to Particle Physics and the Standard Model 50		Computational Problems for Physics 17		Fundamentals of Soft Matter Science 22		Introduction to the Maths and Physics of the Solar System 4
An Introduction to Planetary Atmospheres . . 54		Concise Optics 47		G.		Introduction to the Maths and Physics of the Solar System 19
An Introduction To Quantum Field Theory . . 58		Core Principles of Special and General Relativity . 62		Gauge Theories in Particle Physics 40th Anniversary Edition 28		Introductory Biomedical Imaging 12
An Introduction to Quantum Optics 48		Cosmology 24		Gauge Theories in Particle Physics 40th Anniversary Edition 75		Introductory Nanoelectronics 44
An Overview of General Relativity and Space-Time 62		Cosmology and the Early Universe 24		General Relativity and its Applications 62		Introductory Physics 30
Applied Mechanics of Solids 39		Cosmology for Physicists 24		Geometry, Symmetries, and Classical Physics . 36		Introductory Physics for the Life Sciences - Two-Vol. Set 34
A Practical Guide to Observational Astronomy . . 4		D.		Geometry, Topology and Physics 37		Introductory Physics for the Life Sciences: (Volume 2) 34
A Practical Guide to Optical Microscopy 43		Detection of Optical Signals 48		Green Nanotechnology 16		Introductory Physics for the Life Sciences: Mechanics (Volume One) 34
Are There Really Neutrinos? 52		Detectors in Particle Physics 53		Group Theory for the Standard Model of Particle Physics and Beyond 50		Introductory Solid State Physics with MATLAB Applications 68
A Short Introduction to Mathematical Concepts in Physics 36		E.		Guide to Electricity and Magnetism 26		
Astrobiology 3		Electricity and Magnetism 26		Guide to Modern Physics 37		L.
Astrobiology 3		Electrodynamics Tutorials with Python Simulations 27		H.		Laser Spectroscopy and Laser Imaging 32
Astronomy 4		Electronic Conduction 44		Handbook of Lipid Membranes 12		Laser Spectroscopy and Laser Imaging 69
Astrophysical Techniques 6		Elementary Introduction to Quantum Geometry . 14		Hands-On Accelerator Physics Using MATLAB® . . 2		Lectures On Quantum Mechanics 58
A Unified Grand Tour of Theoretical Physics . . 19		Elements of Mathematical Methods for Physics . 36		High School and Undergraduate Physics Practicals 30		Lessons in Scientific Computing 17
B.		Energy and Entropy 19		How to Be a Quantum Mechanic 58		Lie Algebras In Particle Physics 52
Basic Ideas and Concepts in Nuclear Physics . . 46		Energy Materials 76		I.		M.
Basic Molecular Quantum Mechanics 57		Entropy and Free Energy in Structural Biology . 10		Imaging from Cells to Animals In Vivo 32		Mastering Academic Writing in the Sciences . . 33
Biomolecular Kinetics 12		Entropy and Free Energy in Structural Biology . 72		Instrumentation Handbook for Biomedical Engineers 8		Mathematical Methods for Physics 37
Biomolecular Thermodynamics 9		Environmental Radioactivity and Emergency Preparedness 46		Interaction of Radiation with Matter 60		Mathematical Methods for Physics and Engineering 37
Biophysical Chemistry 9		Essential Astrophysics 6		Introduction to Bioinformatics and Clinical Scientific Computing 17		Mathematical Methods using Python 37
Biophysics 9		Essential Dynamics and Relativity 62		Introduction to BiomEMS 8		Mathematical Physics for Nuclear Experiments . 46
Biophysics and Nanotechnology of Ion Channels . 9		Essential Physics 29		Introduction to Econophysics 25		Measurement and Detection of Radiation . . . 59
Black Holes, Wormholes and Time Machines . . 24		Essentials of Soft Matter Science 21		Introduction to Entropy 30		Medical Image Synthesis 41
Building Blocks of Quantum Mechanics 14		Experimental Physics 29		Introduction to Experimental Biophysics 12		Medical Physics and Biomedical Engineering . . 8

Modern Diagnostic X-Ray Sources	41	Plasma Physics	55	Standard Model Phenomenology	51	Understanding Solid State Physics	68
Modern Intermediate Mechanics	58	Plasma Physics via Computer Simulation	55	Standard Model Phenomenology	74	Understanding Surface and Thin Film Science	22
Modern Semiconductor Physics and Device Applications	66	Plasma Simulations by Example	55	Statistical and Thermal Physics	77	Understanding the Properties of Matter	23
Molecular Driving Forces	72	Practical Medical Physics	41	Statistical Mechanics	71	Understanding the Universe	5
Molecular Spectroscopy	69	Primer on Radiation Oncology Physics	42	Statistical Mechanics	77	Understanding the Universe	24
Monte Carlo Methods for Particle Transport	37	Principles of Adaptive Optics	47	Statistical Mechanics of Liquids and Solutions	39	Unifying Physics of Accelerators, Lasers and Plasma	2
Monte Carlo Methods for Particle Transport	50	Problems and Solutions in Medical Physics	42	Statistical Mechanics of Liquids and Solutions	22	Unifying the Universe	31
Monte Carlo Methods for Particle Transport	46	Problems and Solutions in Medical Physics - Three Volume Set	55	Statistical Plasma Physics, Volume I	56	Universe Dynamics	15
N		Programming with MATLAB for Scientists	18	Statistical Plasma Physics, Volume II	56	V	
Nanohertz Gravitational Wave Astronomy	5	Protein Actions	12	Statistical Thermodynamics	77	Visualizing Quantum Mechanics with Python	15
Nanomagnetism	44	Pulling Rabbits Out of Hats	10	Sturge's Statistical and Thermal Physics, Second Edition	77	W	
Nanomaterials	45	Pulling Rabbits Out of Hats	38	Sturge's Statistical and Thermal Physics, Second Edition	72	Waves, Particles and Fields	79
Nanosensors	67	Q		Superatoms	7	Waves and Oscillations in Plasmas	79
Neutrino Physics	50	Quantitative Bioimaging	13	Superstrings and Other Things	20	Webb's Physics of Medical Imaging	40
Newtonian Dynamics	62	Quantitative Understanding of Biosystems	10	Supersymmetry Beyond Minimality	74	Why String Theory?	28
Non-Equilibrium Statistical Mechanics	71	Quantum Field Theory	21	T		X	
Numerical Methods	44	Quantum Mechanics	15	Textbook of Ion Channels	10	XAFS for Everyone	73
Numerical Methods in Astrophysics	6	Quantum Mechanics	14	Textbook of Ion Channels Volume I	11		
Numerical Recipes in Quantum Information Theory and Quantum Computing	38	Quantum Mechanics	57	Textbook of Ion Channels Volume II	11		
O		Quantum Mechanics	57	Textbook of Ion Channels Volume III	11		
Optics for Engineers	48	Quantum Mechanics I	15	The Framework Of Plasma Physics	56		
Oscillations and Waves	79	Quantum Mechanics II	58	The New Cosmic Onion	31		
P		Quantum Principles and Particles, Second Edition	57	Theoretical Foundations of Digital Imaging Using MATLAB	32		
Particles, Fields, Space-Time	50	Quantum Theory of Solids	68	The Physics Of Laser Plasma Interactions	56		
Physical Biology of the Cell	12	Quarks, Leptons and the Big Bang	51	The Physics of the Interstellar Medium	5		
Physical Biology of the Cell	10	Questioning the Universe	19	The Quantum Nature of Things	15		
Physical Principles of Astronomical Instrumentation	5	R		Thermal Physics Tutorials with Python Simulations	78		
Physics for Diagnostic Radiology	61	Radiation Therapy Dosimetry	42	Thermodynamics	78		
Physics for Technology, Second Edition	31	Relativistic Quantum Mechanics	57	Thermodynamics Kept Simple - A Molecular Approach	78		
Physics from Planet Earth - An Introduction to Mechanics	39	Remote and Robotic Investigations of the Solar System	54	The Road to Einstein's Relativity	63		
Physics from Planet Earth - An Introduction to Mechanics	14	Renewable Energy	16	The Science and Technology of Particle Accelerators	2		
Physics of Continuous Matter	22	S		The Science and Technology of Particle Accelerators	51		
Physics of Data Science and Machine Learning	18	Schrödinger's Web	31	The Science of Imaging	32		
Physics of Nuclear Radiations	46	Semiconductor X-Ray Detectors	66	The Standard Model and Beyond	51		
Physics of Nuclear Radiations	60	Soft Condensed Matter Physics in Molecular and Cell Biology	22	Thin-Film Optical Filters	49		
Physics of Radiation and Climate	16	Solar System	54	Time-Resolved Spectroscopy	69		
Physics of Radiation and Climate	59	Space-time	62	U			
Physics of the Sun	6	Spintronics	70	Understanding Nanomaterials	45		
Physiology, Biophysics, and Biomedical Engineering	8			Understanding Radiation Biology	60		

A

Ade, Griffin, Tucker	5
Adelman	57
Aitchison, Hey	28
Aitchison, Hey	75
Al-Khalili	24
Aliotta	33
Allday	62
Allday	51
Allday, Hands	30
Amato, Galvez	39
Amato, Galvez	14
Ambjorn	14
Anglart	76
Ansermet	70
Antosh	30
Appleby, Burt, Clarke, Owen	2
Appleby, Burt, Clarke, Owen	2
Ashrafuzzaman	9

B

Bagshaw	12
Bahar, Jernigan, Dill	12
Bandarenka	76
Banks	57
Barbieri, Bertini	4
Barnes	50
Barrick	9
Barroso, Intes	32
Barsoum	22
Barsoum	68
Basu, Sharma	6
Baym	58
Behling	41
Belkora	4
Berry, Bulpitt	40
Bertulani, Danielewicz	46
Berz, Makino, Wan	50
Birdsall, Langdon	55
Blennow	37

Bodenheimer, Bodenheimer, Laughlin, Laughlin, Rozyczka, Plewa, Yorke, Rozyczka, Yorke	6
Bower	39
Box, Box	59
Box, Box	16
Brieda	55
Brieda, Wang, Martin	65
Brochard-Wyart, Nassoy, Puech	21
Brown, Smallwood, Barber, Lawford, Hose	8
Brown, Smallwood, Barber, Lawford, Hose	41
Bruma	30
Bruma	30
Bunsell, Joannès, Thionnet	35
Burns	4
Burton, Noble	36

C

Cabibbo, Maiani, Benhar	51
Calle	20
Calvin	73
Chadwick	60
Christensen	22
Close	31
Conlon	28

D

Darafsheh	42
Dendy, Heaton	61
de Podesta	23
Di Bari	24
Dill, Bromberg	72
DiMarzio	48
Dorlas	71
Dowling	31
Dugaev, Litvinov	66
Dvorak	61
Dyson, Williams	5

E

Edelstein, Cammaratra	45
Ehrlich, Geller, Cressman	16
Ekpenyong	46

F

Fai	21
---------------	----

Fai	15
Fai, Wysin	77
Faisca	77
Ferrari, Gualtieri, Pani	62
Ferry	15
Fischer-Cripps	30
Fischer-Cripps	79
Fitzpatrick	79
Fitzpatrick	62
Fitzpatrick	55
Flower	40
Folch	8
Ford	42
Franklin, Marino	52

G

Ganney	17
Gaston	7
Georgi	52
Girkin	43
Goldston, Rutherford	55
González-Acuña	48
Guerra	34
Guerra	34
Guerra	34

H

Haghighat	46
Haghighat	37
Haghighat	50
Hajja, Numan, Freeman	47
Hasbun, Datta	68
Hassani	19
Hazeltine, Waelbroeck	56
Herman	36
Hey	17
Heyde	46
Hirst	22
Hirst	68
Hoch	77
Hockey, Bartlett, Boice	54
Holgate	68

Holgate	64
-------------------	----

I

Ichimaru	56
Ichimaru	56
Ichimaru	55
Ilie, Schrecengost, van Kempen	14
Isaksson, Raaf	46

J

Jameson	10
Johal, Johnson	45

K

Kane, Gelman	41
Keevil, Padovani, Tabakov, Greener, Lewis	41
Kelly	26
Khalil, Moretti	74
Khalil, Moretti	74
Khalil, Moretti	51
Khanna	67
Khanna	44
Kitchin	6
Kitchin	54
Kjellander	39
Kjellander	78
Kjellander	22
Klostermeier, Rudolph	9
Kolb	3
Kouh, Kouh	27
Kouh, Kouh	78
Kruer	56

L

Lancaster, Hasegawa	40
Landau, Páez	36
Landau, Páez	17
Langacker	51
Lautrup	22
Lawrie	19
Leake	9
Leff	19
Longstaff	3
Lowe, Sareen	66

- Lucas 30
Luscombe 62
Luscombe 78
Luscombe 71
Luscombe 77
Lyth 63
Lyth 24
- M**
- Macleod 49
Maiani, Benhar 57
Mann 50
Markoutsakis 36
Marr, Snell, Kurtz 4
Matolyak, Hajja 29
McHale 69
Meirovitch 72
Meirovitch 10
Mensah 36
Mikhailov 18
Milo, Phillips 9
Montemayor, Starkschall 39
Mullan 6
- N**
- Nadeau 12
Nakahara 37
Napolitano 36
Napolitano 17
Ng, Hill, Perkins, Wong, Clarke, Yeong, Ung 55
Ng, Wong, Clarke 42
Ng, Yeong, Perkins 42
Nichols 31
Nikjoo, Uehara, Emfietzoglou 60
Nordlund, Hoffmann 10
Norton 24
Norton 5
- O**
- O'Reilly 68
Ober, Ward, Chao 13
Olafsen 77
- Olafsen 72
Owens 66
O'Donnell 62
- P**
- Padamsee 31
Pagonis, Kulp 37
Papaefthymiou 44
Pecseli 79
Peet, Chung 41
Peskin, Schroeder 58
Phillips, Kondev, Theriot, Garcia 10
Phillips, Kondev, Theriot, Garcia 12
Piccirillo 14
Piccirillo 4
Piccirillo 19
Pileio 57
Pine 17
Pohl 50
Poon, Andelman 22
Powers, Haus 48
Proctor, Melendrez Armada, Vijayaraghavan 44
- R**
- Rae, Napolitano 14
Rajasekar 38
Rajasekar, Velusamy 58
Rajasekar, Velusamy 58
Ramkarthik, Solanki 38
Rangacharyulu 46
Rangacharyulu 60
Rauf 18
Requião da Cunha 25
Rex 29
Rex 19
Rex, Finn 77
Robinson 15
Rogalla, Kes 73
Rogalski, Bielecki 48
Rohlf 26
Rohlf 37
Roy, Clarke 4
- S**
- Sadoff 19
Safinya, Rädler 12
Sahin, Fidel, Perez-Castillejos 8
Sanchez-Lavega 54
Sattler 44
Sattler 44
Saxby 32
Scalettar, Abney 12
Schorghofer 17
Seryi, Seraia 2
Shih 48
Smith 29
Smith, Granqvist 16
Spicklemire 15
Splinter, Hooper 48
- T**
- Taylor 5
Telle, González Ureña 32
Telle, González Ureña 69
Tsoulfanidis, Landsberger 59
Tyson, Frazier 47
- V**
- van Eerten 6
Vanier, Tomescu 15
Verma 39
Viehhauser, Weidberg 53
Vittorio 24
Vittorio 62
- W**
- Wartak 73
Weinacht, Pearson 69
White, von Heijne, Engelman 9
Wilcox 58
Wilcox 57
Wilson, Buffa, Lou 68
Wilson, Buffa, Lou 29
Wilson, Buffa, Lou 29
Wilson, Buffa, Lou 29
Wohl 58
- Wollkind, Dichone 38
Wollkind, Dichone 10
Wood 8
Wyld, Powell 37
- X**
- Xanthakis 44
Xiang 14
- Y**
- Yang 41
Yaroslavsky 32
- Z**
- Zheng, Trudeau 11
Zheng, Trudeau 11
Zheng, Trudeau 11
Zheng, Trudeau 10
Ziemann 2
Zuber 50

