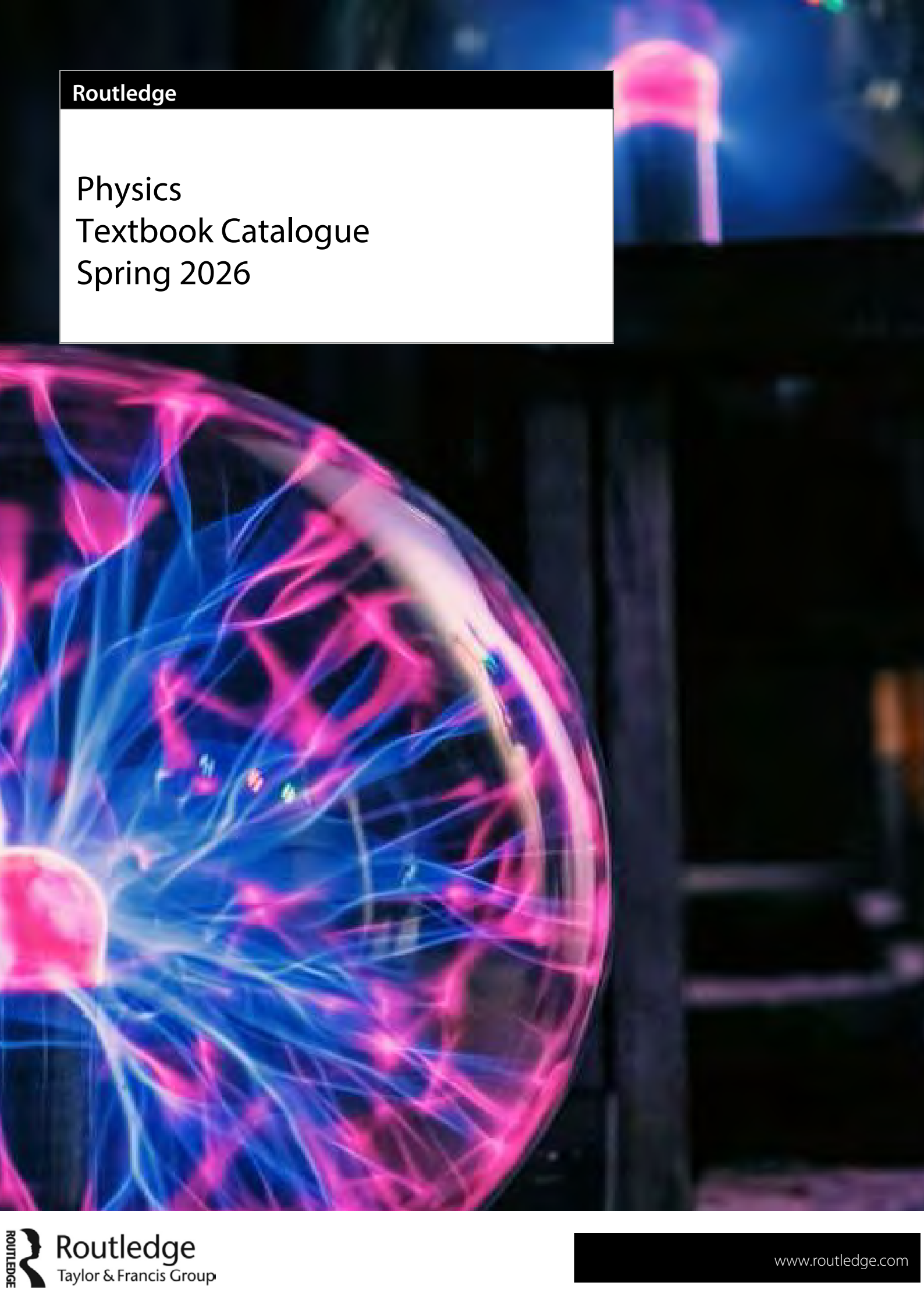




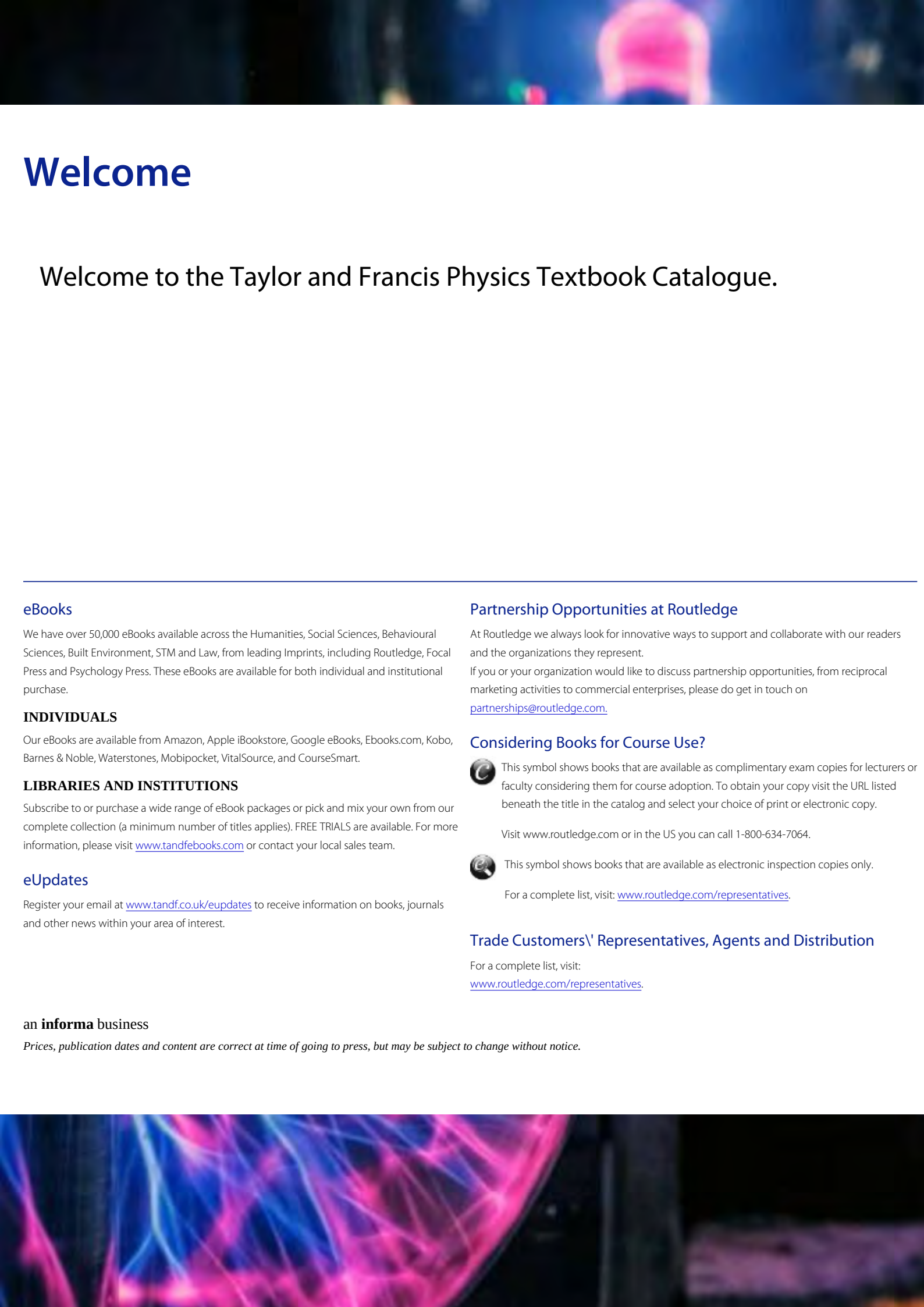
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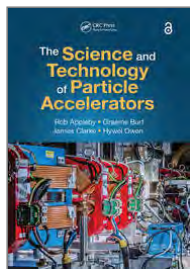
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Rob Appleby , Graeme Burt , James Clarke , Hywel Owen

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CRC Press

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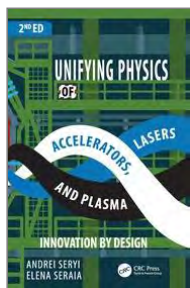
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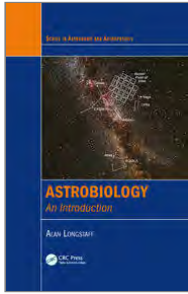
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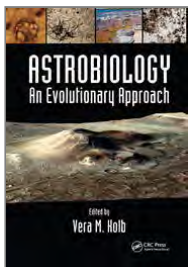
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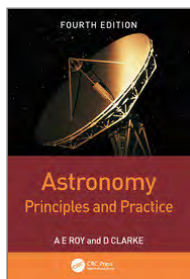
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University of Glasgow, Scotland

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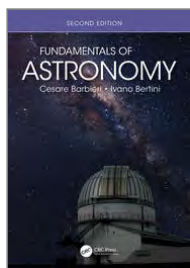
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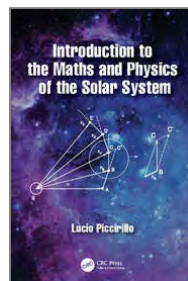
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Lucio Piccirillo University of Manchester, UK

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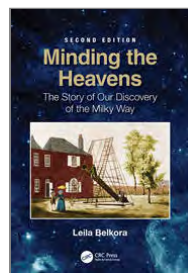
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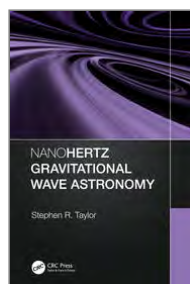
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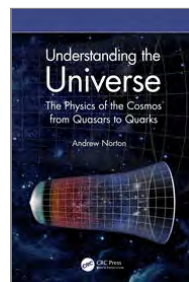
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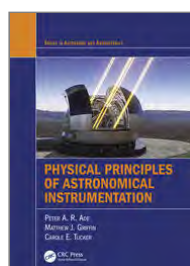
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Peter A. R. Ade, Matthew J. Griffin, Carole E. Tucker

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Series: *Series in Astronomy and Astrophysics*

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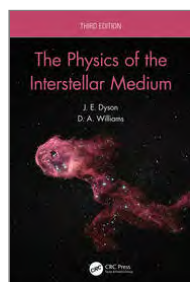
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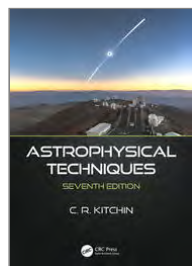
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C.R. Kitchin

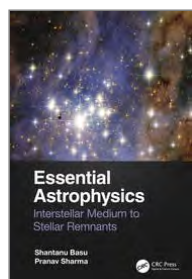
Long used in undergraduate and introductory graduate courses, *Astrophysical Techniques*, Seventh Edition provides an accessible yet comprehensive account of the innovative instruments, detectors, and techniques employed in astronomy and astrophysics. Emphasizing the underlying unity of all astronomical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

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Interstellar Medium to Stellar Remnants



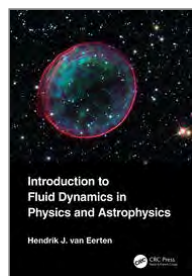
Shantanu Basu , Pranav Sharma

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.

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Hendrik Jan van Eerten

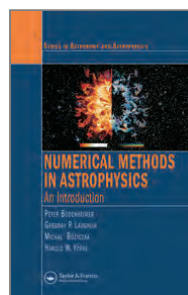
This textbook provides an accessible and self-contained introduction to the physics behind fluid dynamics; exploring the laws of nature describing three out of four fundamental states of matter (liquids, gases, and plasmas). Based on years of teaching of fluid dynamics theory and computation at advanced 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.

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An Introduction



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Series: *Series in Astronomy and Astrophysics*

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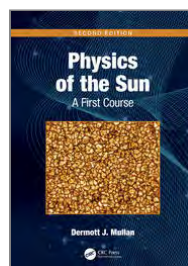
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A First Course



Dermott J. Mullan University of Delaware, Newark, USA

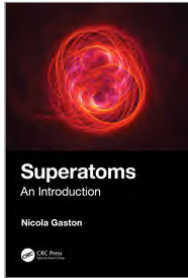
With an emphasis on numerical modelling, *Physics of the Sun: A First Course* presents a quantitative examination of the physical structure of the Sun and the conditions of its extended atmosphere. It gives step-by-step instructions for calculating the numerical values of various physical quantities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

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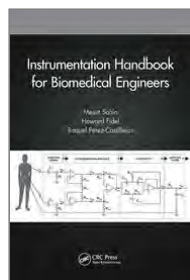
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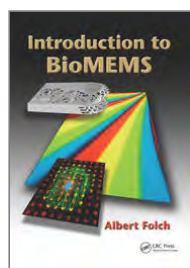
Mesut Sahin New Jersey Institute of Technology, Newark, New Jersey, USA, **Howard Fidel**, **Raquel Perez-Castillejos**

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.

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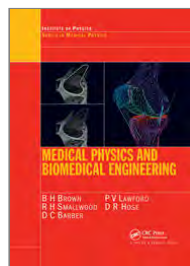
Albert Folch

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
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Pb: 978-0-367-86496-5 : **£58.99**
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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

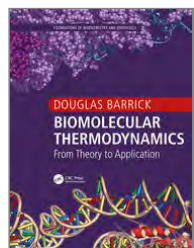
Appropriate for senior undergraduates and graduates, this text presents the underlying physics, electronics, anatomy, and physiology as well as addresses practical applications. The structured approach of the text builds and broadens the material of opening chapters in the later chapters. The book covers 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.

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Douglas Barrick Johns Hopkins University, Baltimore, Maryland, USA

Series: Foundations of Biochemistry and Biophysics

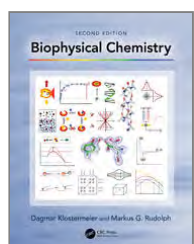
This book introduces the concepts and practical tools necessary to understand the behavior of biological macromolecules at a quantitative level. It begins by describing biochemical phenomena using principles of classical and statistical thermodynamics. Unlike other books, this text goes beyond theory 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 : **£125**
Hb: 978-1-138-06884-1 : **£190**
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.

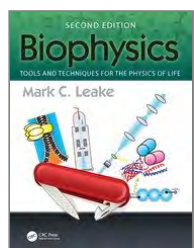
CRC Press
April 2025 : 944pp
Hb: 978-1-032-06083-5 : **£86.99**
eBook: 978-1-003-20398-8

* For full contents and more information, visit: www.routledge.com/9781032060835

2ND EDITION

Biophysics

Tools and Techniques for the Physics of Life



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

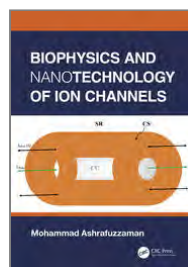
Biophysics: Tools and Techniques for the Physics of Life covers the experimental, theoretical and computational tools and techniques of biophysics. It addresses the purpose, science, and application of all physical science instrumentation, theoretical analysis and biophysical computational methods used 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 : **£60.99**
Hb: 978-1-032-37321-8 : **£165**
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



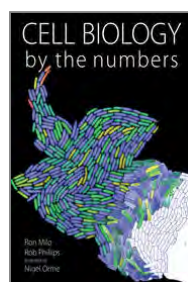
This book provides a comprehensive review of the biophysics and nanotechnology of ion channels. It details the biological and physiological entities of ion channels in cells and addresses various physical perspectives of ion channel structures and functions.

CRC Press
September 2023 : 318pp
Pb: 978-1-032-07374-3 : **£49.99**
Hb: 978-0-367-44545-4 : **£120**
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



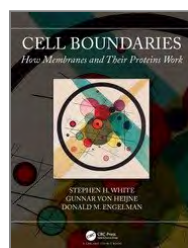
A full color book written as a pocket guide and handy reference for advanced students and practitioners in molecular and cell biology, chemistry, and biophysics. It is based on the BioNumbers website, a peer-reviewed open-source database of numbers, created and curated by author Ron Milo. Well-illustrated 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 : **£48.99**
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

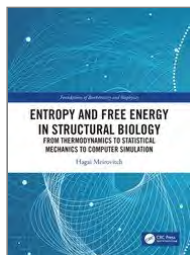
The central themes of Cell Boundaries concern the structural and organizational principles underlying cell membranes, and how these principles enable function. By building a biological and biophysical foundation for understanding the organization of lipids in bilayers and the folding, assembly, stability, 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 : **£59.99**
Hb: 978-0-815-34216-8 : **£94.99**
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 : **£50.99**

Hb: 978-0-367-40692-9 : **£125**

eBook: 978-0-367-85478-2

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

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

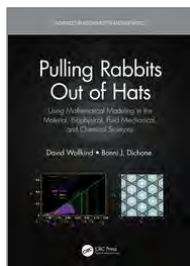
Pb: 978-0-815-34450-6 : **£99.99**

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 Wolkind, **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 : **£48.99**

Hb: 978-1-032-04787-4 : **£195**

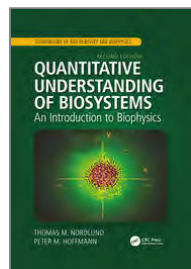
eBook: 978-1-003-19560-3

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2ND EDITION

Quantitative Understanding of Biosystems

An Introduction to Biophysics, Second Edition



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Series: Foundations of Biochemistry and Biophysics

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 : **£50.99**

Hb: 978-1-138-63341-4 : **£155**

eBook: 978-1-315-20760-5

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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

October 2025 : 1064pp

Pb: 978-1-032-42430-9 : **£158.97**

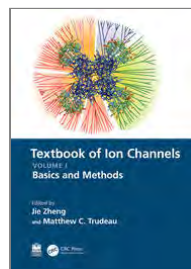
Hb: 978-1-032-42428-6 : **£315**

eBook: 978-1-003-46194-4

* For full contents and more information, visit: www.routledge.com/9781032424309

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

September 2025 : 330pp

Pb: 978-0-367-56049-2 : **£52.99**

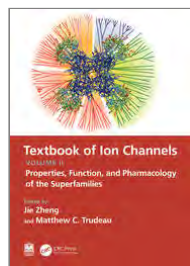
Hb: 978-0-367-53815-6 : **£105**

eBook: 978-1-003-09621-4

* For full contents and more information, visit: www.routledge.com/9780367560492

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

September 2025 : 488pp

Pb: 978-0-367-56081-2 : **£52.99**

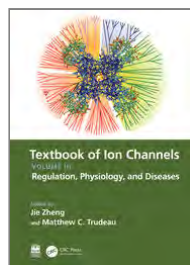
Hb: 978-0-367-53816-3 : **£105**

eBook: 978-1-003-09627-6

* For full contents and more information, visit: www.routledge.com/9780367560812

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

October 2025 : 246pp

Pb: 978-1-032-40804-0 : **£52.99**

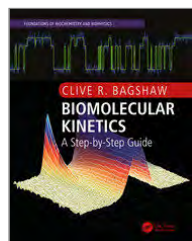
Hb: 978-0-367-53819-4 : **£105**

eBook: 978-1-003-31031-0

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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

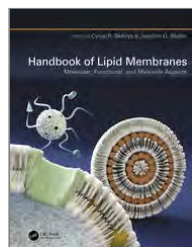
Biomolecular kinetics concerns the measurement and analysis of reaction phenomena as a function of time. This book explains the methods used for measuring how much a reaction gets speeded up, as well as the framework for solving problems such as ligand binding and macromolecular folding. It is a thoroughly 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 : **£155**
Hb: 978-1-138-06658-8 : **£200**
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.

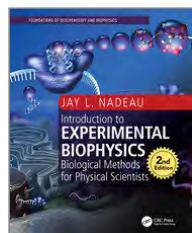
CRC Press
October 2024 : 376pp
Pb: 978-1-032-01441-8 : **£48.99**
Hb: 978-1-466-55572-3 : **£170**
eBook: 978-0-429-19407-8

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2ND EDITION

Introduction to Experimental Biophysics

Biological Methods for Physical Scientists



Jay L. Nadeau Portland State University, OR, USA

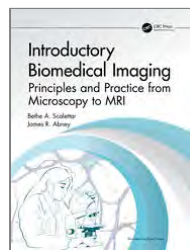
This book provides a starting point for any student or researcher in the physical sciences to gain firm grounding in the techniques employed in molecular biophysics and quantitative biology. As with the first edition, the author will take a practical approach, sharing expert tips and insider's knowledge 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 : **£99.99**
Hb: 978-1-138-08815-3 : **£200**
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 Lewis & Clark College, **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 : **£48.99**
Hb: 978-1-032-32819-5 : **£125**
eBook: 978-1-315-22313-1

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2ND EDITION

Physical Biology of the Cell



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

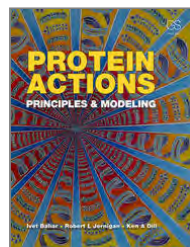
Physical Biology of the Cell is a textbook for a first course in physical biology or biophysics for undergraduate or graduate students. It maps the huge and complex landscape of cell and molecular biology from the distinct perspective of physical biology. As a key organizing principle, the proximity 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 : **£99.99**
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 : **£120**
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 : £52.99

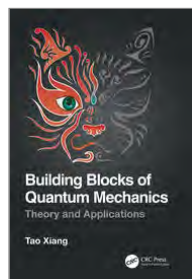
Hb: 978-1-138-59898-0 : £125

eBook: 978-0-429-46989-3

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Building Blocks of Quantum Mechanics

Theory and Applications



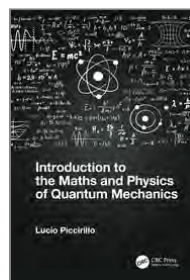
Tao Xiang

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 : **£65.99**
Hb: 978-1-032-00610-9 : **£170**
eBook: 978-1-003-17488-2

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Introduction to the Maths and Physics of Quantum Mechanics



Lucio Piccirillo University of Manchester, UK

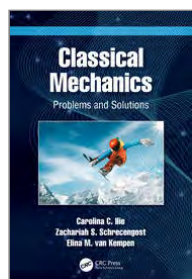
This book will appeal to first- and second-year university students in physics, mathematics, engineering and other sciences studying quantum mechanics who will find material and clarifications not easily found in other textbooks. It will also appeal to self-taught readers with a genuine interest in modern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

CRC Press
August 2025 : 246pp
Pb: 978-0-367-69901-7 : **£52.99**
Hb: 978-0-367-70302-8 : **£86.99**
eBook: 978-1-003-14556-1

* For full contents and more information, visit: www.routledge.com/9780367699017

Classical Mechanics

Problems and Solutions



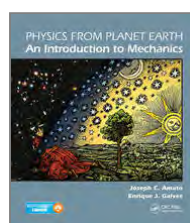
Carolina C. Ilie, Zachariah S. Schrecengost, Elina M. van Kempen

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 : **£48.99**
Hb: 978-0-367-76844-7 : **£83.99**
eBook: 978-1-003-36570-9

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

Physics from Planet Earth - An Introduction to Mechanics



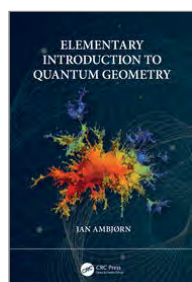
Joseph C. Amato Colgate University, Hamilton, New York, USA, **Enrique J. Galvez** Colgate University, Hamilton, New York, USA

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 : **£94.99**
eBook: 978-0-429-19447-4

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

Elementary Introduction to Quantum Geometry



Jan Ambjorn

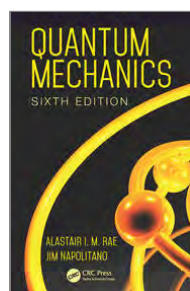
This graduate textbook provides an introduction to quantum gravity, when spacetime is two-dimensional. The quantization of gravity is the main missing piece of theoretical physics, but in two dimensions it can be done explicitly with elementary mathematical tools, but it still has most of the conceptional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

CRC Press
March 2025 : 290pp
Pb: 978-1-032-34100-2 : **£48.99**
Hb: 978-1-032-33555-1 : **£83.99**
eBook: 978-1-003-32056-2

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

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.

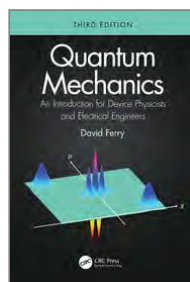
CRC Press
December 2015 : 440pp
Pb: 978-1-482-29918-2 : **£61.99**
Hb: 978-1-138-45833-8 : **£200**
eBook: 978-0-429-15734-9

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

3RD EDITION

Quantum Mechanics

An Introduction for Device Physicists and Electrical Engineers


David K. Ferry Arizona State University, Tempe, USA

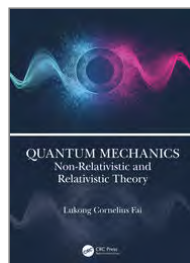
Quantum Mechanics: An Introduction for Device Physicists and Electrical Engineers, Third Edition provides a complete course in quantum mechanics for students of semiconductor device physics and electrical engineering. It provides the necessary background to quantum theory for those starting work on micro- 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 : **£87.99**
Hb: 978-0-367-46915-3 : **£235**
eBook: 978-1-003-03194-9

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Quantum Mechanics

Non-Relativistic and Relativistic Theory


Lukong Cornelius Fai University of Dschang, Cameroon

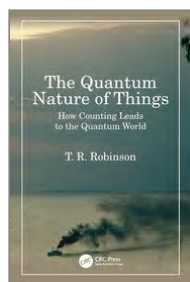
This book provides an accessible treatment of non-relativistic and relativistic quantum mechanics. It is an ideal textbook for undergraduate and graduate physics students, as well as researchers in theoretical physics, quantum mechanics, condensed matter, mathematical physics, quantum chemistry and electronic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

CRC Press
August 2024 : 552pp
Pb: 978-1-032-22559-3 : **£48.99**
Hb: 978-1-032-22146-5 : **£140**
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

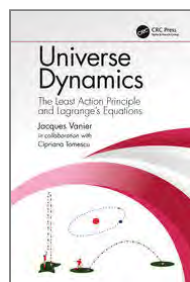
This book offers readers an entirely original and unconventional view of quantum mechanics. It is a view that accepts quantum mechanics as the natural way to think about the way nature works, rather than the view commonly expressed, especially in books on quantum physics, that quantum theory is weird 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 : **£51.99**
Hb: 978-1-032-44623-3 : **£135**
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

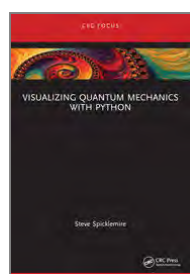

Jacques Vanier Université de Montréal, Québec, Canada,
Cipriana Tomescu Université de Montréal, Québec, Canada

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 : **£65.99**
Hb: 978-1-138-33589-9 : **£235**
eBook: 978-0-429-44347-3

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

Visualizing Quantum Mechanics with Python


Steve Spicklemire

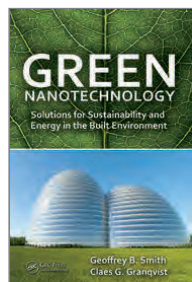
The goal of this book is to reduce the complexity and clarify the abstractions with concrete visual examples driven by simple python programs. It is assumed that the reader is concurrently taking a course in quantum mechanics, or self-studying quantum mechanics, but is looking for supplementary material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

CRC Press
June 2024 : 60pp
Pb: 978-1-032-56924-6 : **£23.99**
Hb: 978-0-367-76879-9 : **£55.99**
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

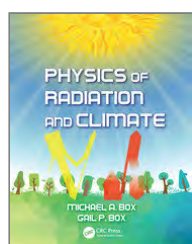
September 2010 : 484pp

Hb: 978-1-420-08532-7 : £190

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 : £105

Hb: 978-1-138-42426-5 : £200

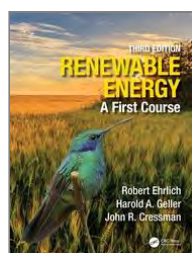
eBook: 978-0-429-19422-1

* 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

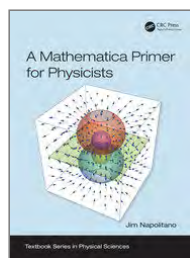
Pb: 978-0-367-76837-9 : £99.99

Hb: 978-1-032-00088-6 : £265

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 : **£67.99**

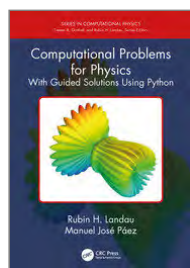
Hb: 978-1-138-48656-0 : **£200**

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 : **£78.99**

Hb: 978-1-138-70591-3 : **£125**

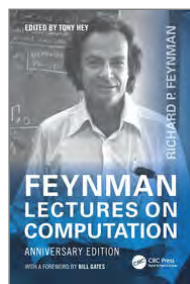
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Edited by **Tony Hey** Microsoft Research Connections, Redmond, Washington, USA

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CRC Press

May 2023 : 426pp

Pb: 978-0-367-85733-2 : **£55.99**

Hb: 978-1-032-41588-8 : **£145**

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. Ganney

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 : **£48.99**

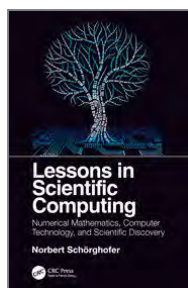
Hb: 978-1-032-32413-5 : **£83.99**

eBook: 978-1-003-31624-4

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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

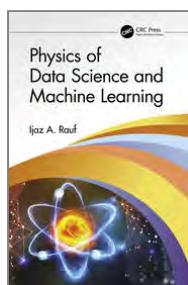
Pb: 978-1-138-07058-5 : **£67.99**

Hb: 978-1-138-07063-9 : **£235**

eBook: 978-1-315-10835-3

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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 : **£65.99**

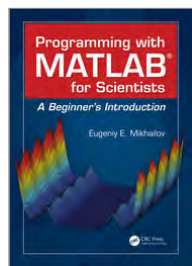
Hb: 978-0-367-76858-4 : **£94.99**

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 : **£71.99**

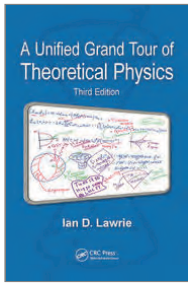
Hb: 978-1-138-57004-7 : **£170**

eBook: 978-1-351-22818-3

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3RD EDITION

A Unified Grand Tour of Theoretical Physics



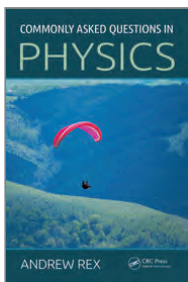
Ian D. Lawrie University of Leeds, UK

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 : £91.99
Hb: 978-1-138-47335-5 : £200
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

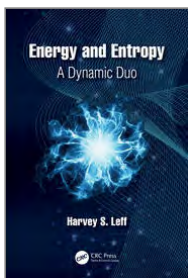
Suitable for a wide audience, this book covers a broad scope of subjects, from classical physics that goes back to the age of Newton to new ideas just formulated in the twenty-first century. The book highlights the core areas of physics that predate the twentieth century, including mechanics, electromagnetism, 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 : £31.99
Hb: 978-1-138-42956-7 : £200
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

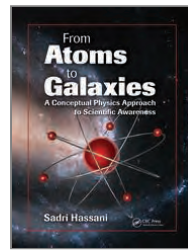
Energy is typically regarded as understandable despite its multiple forms of storage and transfer. Yet entropy is an enigma, in part because of the common view that it represents disorder. That view is flawed and hides entropy's connection with energy. However, macroscopic matter stores internal energy, 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 : £50.99
Hb: 978-0-367-35141-0 : £140
eBook: 978-0-429-33001-8

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From Atoms to Galaxies

A Conceptual Physics Approach to Scientific Awareness



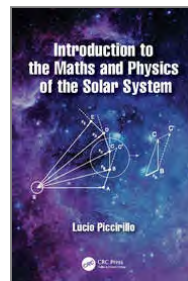
Sadri Hassani

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 : £65.99
Hb: 978-1-439-80849-8 : £190
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

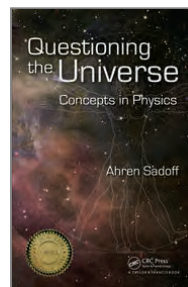
This book provides readers with an understanding of the basic physics and mathematics that governs our solar system. It explores the mechanics of our Sun and planets; their orbits, tides, craters, eclipses and many other fascinating phenomena including asteroids and comets. This book is a valuable resource 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 : £61.99
Hb: 978-0-367-02271-6 : £160
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

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Chapman & Hall
December 2008: 234pp
Pb: 978-1-420-08258-6 : £71.99
Hb: 978-1-138-42968-0 : £200
eBook: 978-0-429-13812-6

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Superstrings and Other Things

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**Carlos I. Calle**

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CRC Press

May 2020 : 474pp

Pb: 978-1-138-36488-2 : **£67.99**Hb: 978-1-138-36492-9 : **£235**

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 : **£87.99**

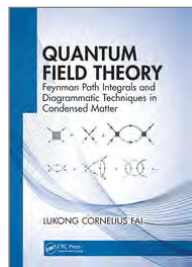
Hb: 978-1-138-74276-5 : **£220**

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 : **£50.99**

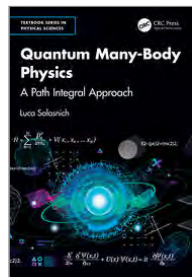
Hb: 978-0-367-18574-9 : **£170**

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Quantum Many-Body Physics

A Path Integral Approach



Luca Salasnich

Series: Textbook Series in Physical Sciences

Quantum Many-Body Physics: A Path Integral Approach offers a fresh perspective on quantum phenomena in condensed matter physics. This comprehensive first edition provides a powerful and versatile framework for understanding complex problems in systems such as ultracold atoms, superfluids, and superconductors. Designed for graduate students in physics and related disciplines, this book serves as an essential resource for those aiming to advance their studies in quantum mechanics. Researchers in condensed matter physics, quantum optics, and quantum information will also find valuable insights to support their work on the next breakthroughs in the field.

CRC Press

November 2025 : 294pp

Hb: 978-1-032-96134-7 : **£97.99**

eBook: 978-1-003-58833-7

* For full contents and more information, visit: www.routledge.com/9781032961347

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Fundamentals of Ceramics



Michel Barsoum

Series: Series in Materials Science and Engineering

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 : **£50.99**

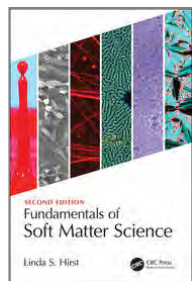
Hb: 978-1-498-70813-5 : **£140**

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 : **£94.99**

Hb: 978-1-138-72478-5 : **£245**

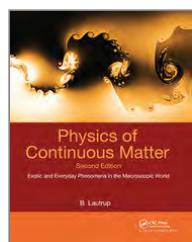
eBook: 978-1-315-19238-3

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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 : **£58.99**

Hb: 978-1-420-07700-1 : **£71.99**

eBook: 978-0-429-10950-8

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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 : **£67.99**

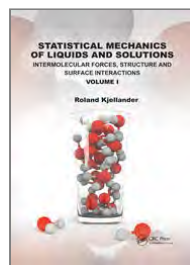
Hb: 978-0-750-31023-9 : **£190**

eBook: 978-0-429-14512-4

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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

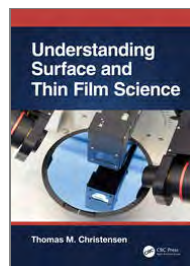
Pb: 978-0-367-47790-5 : **£50.99**

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

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CRC Press

June 2025 : 372pp

Pb: 978-1-032-39215-8 : **£52.99**

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Michael de Podesta National Physics Laboratory,
Middlesex, UK

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CRC Press

April 2002 : 450pp

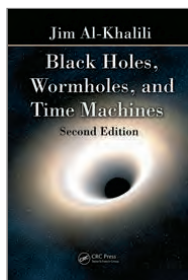
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Jim Al-Khalili University of Surrey, England, UK

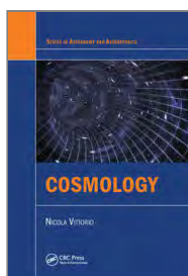
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Cosmology



Nicola Vittorio

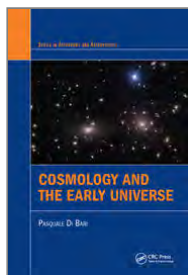
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Cosmology and the Early Universe



Pasquale Di Bari

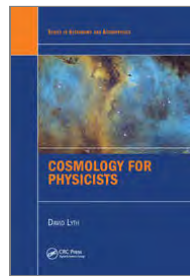
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Cosmology for Physicists



David Lyth

Series: Series in Astronomy and Astrophysics

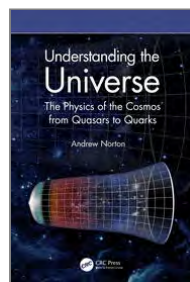
Written by an award-winning cosmologist, this brand new textbook provides advanced undergraduate and graduate students with coverage of the very latest developments in the field. Full treatment of the origin of structure, scalar fields, the cosmic microwave background and the early universe are provided. 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.

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Understanding the Universe

The Physics of the Cosmos from Quasars to Quarks



Andrew Norton

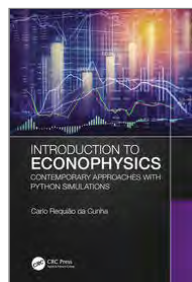
Understanding the Universe: The Physics of the Cosmos from Quasars to Quarks explores how all areas of physics, from the very smallest scales to the very largest, come together to form our current understanding of the Universe. It takes readers on a fascinating journey, from the Big Bang and how the 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.

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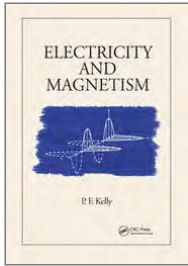
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March 2021 : 418pp

Pb: 978-0-367-78369-3 : **£50.99**

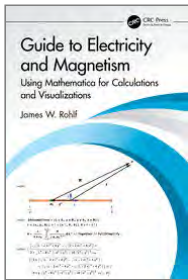
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CRC Press

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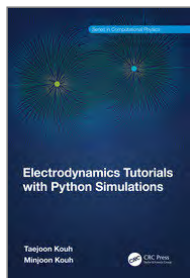
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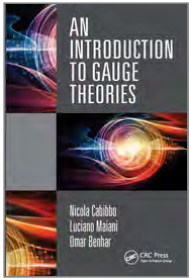
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An Introduction to Gauge Theories



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 : **£50.99**

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CRC Press

August 2024 : 856pp

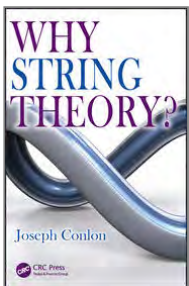
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Joseph Conlon Professor of Theoretical Physics, University of Oxford and Fellow of New College

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CRC Press

November 2015 : 260pp

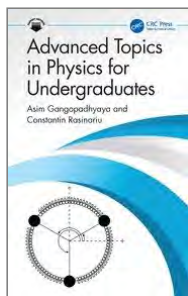
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Advanced Topics in Physics for Undergraduates



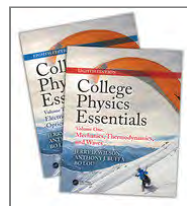
Asim Gangopadhyaya Loyola University Chicago, USA,
Constantin Rasinariu Loyola University Chicago, USA

This book explores classical mechanics, electrodynamics, and quantum mechanics beyond the standard introductory courses. Designed to support departments with limited resources, this book integrates these advanced topics into a single, cohesive volume, offering students a unified perspective on fundamental physical principles. This book serves as an invaluable guide for undergraduate students seeking to deepen their knowledge of physics, preparing them for further academic study or careers in physics and related fields. Its clear explanations and structured approach make it accessible to learners looking to advance their understanding beyond traditional coursework.

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Hb: 978-0-367-77582-7 : **£96.99**
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College Physics Essentials, Eighth Edition (Two-Volume Set)



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

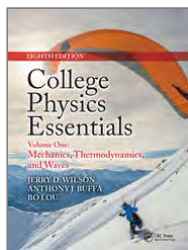
This edition provides a streamlined update of a major textbook for algebra-based physics, reflecting the demand by instructors for more substance. The authors enhance emphasis on worked examples to enhance reader engagement, together with expanded problem sets that build from conceptual understanding 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.

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Mechanics, Thermodynamics, Waves (Volume One)



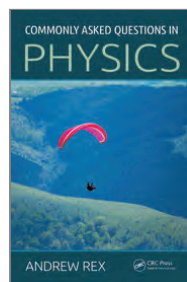
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Commonly Asked Questions in Physics



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

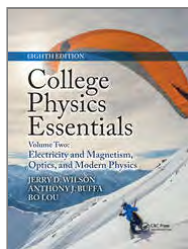
Suitable for a wide audience, this book covers a broad scope of subjects, from classical physics that goes back to the age of Newton to new ideas just formulated in the twenty-first century. The book highlights the core areas of physics that predate the twentieth century, including mechanics, electromagnetism,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

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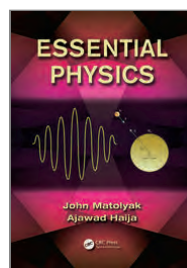
Jerry D. Wilson , Anthony J. Buffa , Bo Lou

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Essential Physics



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

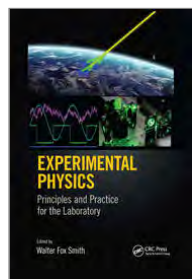
This book is designed for an algebra-based course in physics for non-physics majors and provides a thorough understanding of the fundamentals of essential physics. It omits material often found in much larger texts that cannot be covered in a yearlong course and is not needed for non-physics majors. 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
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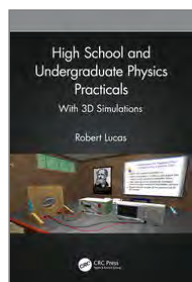
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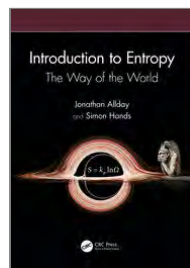
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Jonathan Allday The Royal Hospital School, Ipswich, UK,
Simon Hands

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CRC Press

October 2024 : 358pp

Pb: 978-0-367-63866-5 : **£47.99**

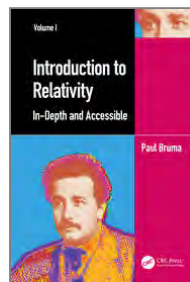
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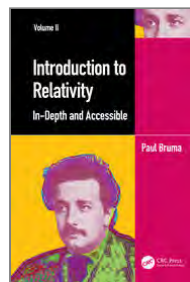
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CRC Press

December 2024 : 286pp

Pb: 978-1-032-06244-0 : **£47.99**

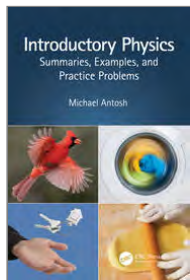
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Summaries, Examples, and Practice Problems



Michael Antosh University of Rhode Island

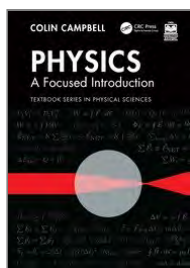
This textbook covers topics related to units, kinematics, forces, energy, momentum, circular and rotational motion, Newton's general equation for gravity, and simple harmonic motion (things that go back and forth). A math review is also included, with a focus on algebra and trigonometry. This book is 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 : **£48.99**
Hb: 978-0-367-43685-8 : **£130**
eBook: 978-1-003-00504-9

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

Physics

A Focused Introduction



Colin Campbell

Series: Textbook Series in Physical Sciences

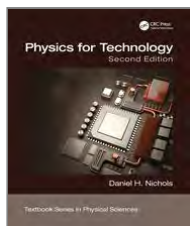
Physics: A Focused Introduction provides a thorough introduction to the principles and practical applications of introductory undergraduate physics. Featuring a streamlined narrative, it encourages active engagement between fundamental concepts and fully worked examples. Major topics such as motion (kinematics, forces, and conservation of momentum and energy), thermodynamics, waves, optics, electricity and magnetism are covered, in addition to the foundations of modern physics. This textbook is suitable for students of science and engineering who require a concise introduction to the field, as well as students of both algebra-based and calculus-based courses.

CRC Press
November 2025 : 732pp
Pb: 978-1-032-94588-0 : **£65.99**
Hb: 978-1-032-94587-3 : **£190**
eBook: 978-1-003-57156-8

* For full contents and more information, visit: www.routledge.com/9781032945880

2ND EDITION

Physics for Technology, Second Edition



Daniel H. Nichols

Series: Textbook Series in Physical Sciences

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 : **£50.99**
Hb: 978-0-815-38292-8 : **£140**
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

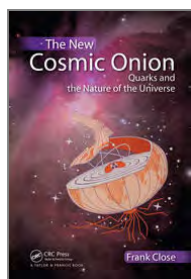
As the race to build the world's first quantum computer is coming to an end, the race to build the quantum internet is has just started. This book leverages the author's unique insights into both the Chinese and American quantum programs. It begins with the physics and history of the quantum internet 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 : **£38.99**
Hb: 978-0-367-33761-2 : **£190**
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.

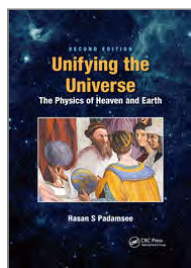
CRC Press
December 2006 : 232pp
Pb: 978-1-584-88798-0 : **£51.99**
Hb: 978-1-138-42970-3 : **£200**
eBook: 978-0-429-13855-3

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

2ND EDITION

Unifying the Universe

The Physics of Heaven and Earth



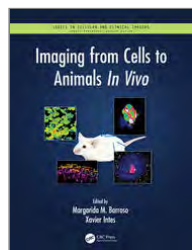
Hasan S. Padamsee

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 : **£50.99**
Hb: 978-1-138-38868-0 : **£94.99**
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 : **£48.99**

Hb: 978-1-138-04109-7 : **£195**

eBook: 978-1-315-17466-2

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

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 example 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

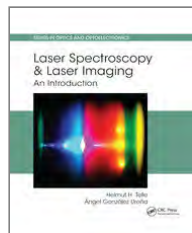
Hb: 978-1-032-26171-3 : **£78.99**

eBook: 978-1-003-29658-4

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

Laser Spectroscopy and Laser Imaging

An Introduction



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

Series: *Series in Optics and Optoelectronics*

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 : **£78.99**

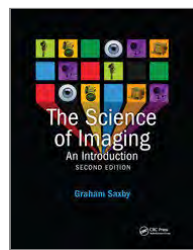
Hb: 978-1-466-58822-6 : **£190**

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

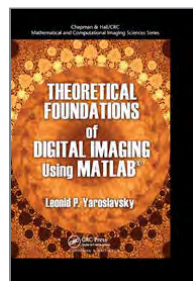
Pb: 978-0-367-86446-0 : **£50.99**

Hb: 978-1-439-81286-0 : **£94.99**

eBook: 978-0-429-13191-2

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

Theoretical Foundations of Digital Imaging Using MATLAB



Leonid P. Yaroslavsky

Series: *Chapman & Hall/CRC Mathematical and Computational Imaging Sciences Series*

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 : **£65.99**

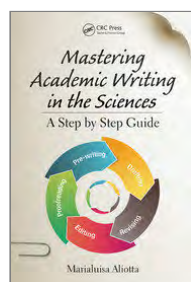
Hb: 978-1-439-86140-0 : **£125**

eBook: 978-0-429-07415-8

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

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

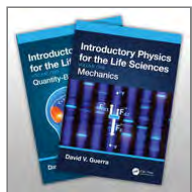
Pb: 978-1-498-70147-1 : **£52.99**

Hb: 978-1-138-74288-8 : **£140**

eBook: 978-1-351-00214-1

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



David V. Guerra

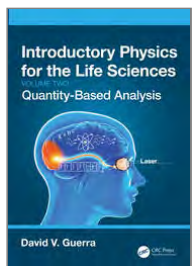
This textbook provides an accessible introduction to physics for undergraduate students in the life sciences, including those majoring in all branches of biology, biochemistry, and psychology and students working on pre-professional programs such as pre-medical, pre-dental, and physical therapy. The 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 : **£121.98**
Hb: 978-1-032-49091-5 : **£300**

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

Introductory Physics for the Life Sciences: (Volume 2)

Quantity-Based Analysis



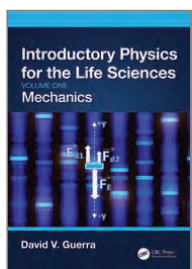
David V. Guerra

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 : **£60.99**
Hb: 978-1-032-30041-2 : **£155**
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 : **£60.99**
Hb: 978-1-032-30040-5 : **£145**
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

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

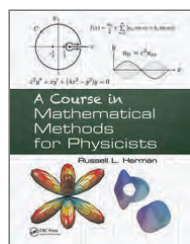
Pb: 978-0-367-74433-5 : **£50.99**

Hb: 978-0-367-02373-7 : **£140**

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

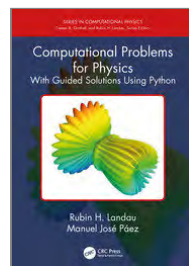
Based on the author's junior-level undergraduate course, this classroom-tested textbook is designed for an introductory one-semester course in mathematical physics. Focusing on the physics of oscillations and waves, it helps students understand the mathematical techniques needed for their future studies 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 : **£78.99**
Hb: 978-1-138-44208-5 : **£200**
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**

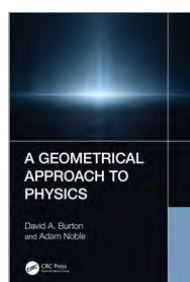
Series: Series in Computational Physics

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 : **£78.99**
Hb: 978-1-138-70591-3 : **£125**
eBook: 978-1-315-20209-9

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

A Geometrical Approach to Physics



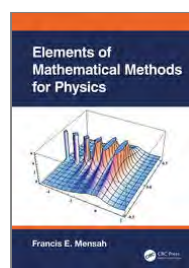
David A. Burton, **Adam Noble**

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 : **£51.99**
Hb: 978-1-032-13380-5 : **£140**
eBook: 978-1-003-22894-3

* For full contents and more information, visit: www.routledge.com/9781032129280

Elements of Mathematical Methods for Physics



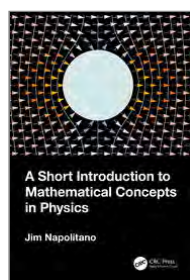
Francis E. Mensah

"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 : **£86.99**
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

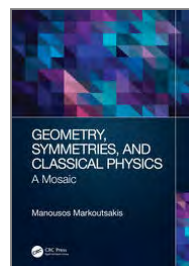
Mathematics is the language of physics and yet, mathematics is an enormous subject. This textbook provides an accessible and concise introduction to mathematical physics for undergraduate students taking a one semester course. It assumes the reader has studied a year of introductory physics and three 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 : **£56.99**
Hb: 978-1-032-40977-1 : **£155**
eBook: 978-1-003-35565-6

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Geometry, Symmetries, and Classical Physics

A Mosaic



Manousos Markoutsakis

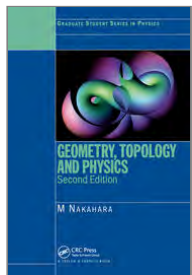
This book provides advanced undergraduate physics and mathematics students with an accessible yet detailed understanding of the fundamentals of differential geometry and symmetries in classical physics.

CRC Press
January 2024 : 482pp
Pb: 978-0-367-54141-5 : **£49.99**
Hb: 978-0-367-53523-0 : **£155**
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

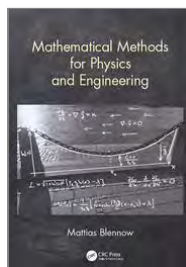
Pb: 978-0-750-30606-5 : **£94.99**

Hb: 978-1-138-41336-8 : **£200**

eBook: 978-1-315-27582-6

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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 : **£120**

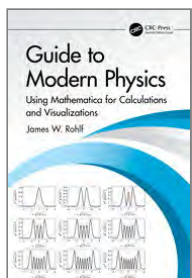
Hb: 978-1-138-05690-9 : **£275**

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. Rohlf

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 : **£49.99**

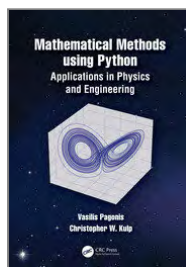
Hb: 978-1-032-49801-0 : **£135**

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 W. 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 : **£86.99**

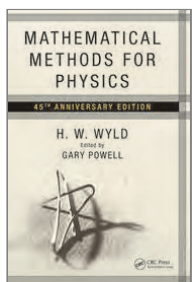
eBook: 978-1-003-29432-0

* 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 : **£54.99**

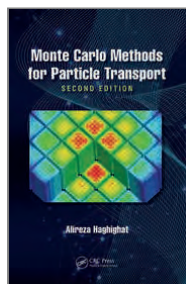
Hb: 978-0-367-47708-0 : **£140**

eBook: 978-1-003-03746-0

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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 : **£54.99**

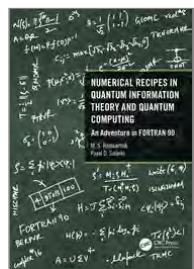
Hb: 978-0-367-18805-4 : **£140**

eBook: 978-0-429-19839-7

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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 : £48.99

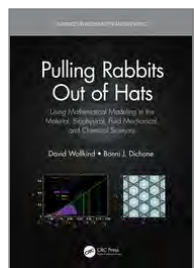
Hb: 978-0-367-75928-5 : £105

eBook: 978-1-003-16467-8

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Pulling Rabbits Out of Hats

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David Wollkind, **Bonni J. Dichone** Gonzaga University

Series: Advances in Biochemistry and Biophysics

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CRC Press

October 2024 : 554pp

Pb: 978-1-032-05007-2 : £48.99

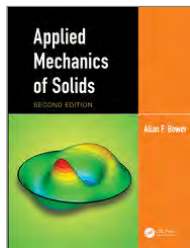
Hb: 978-1-032-04787-4 : £195

eBook: 978-1-003-19560-3

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CRC Press

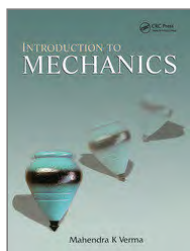
November 2025 : 774pp

Hb: 978-1-041-01995-4 : **£96.99**

eBook: 978-1-003-61728-0

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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

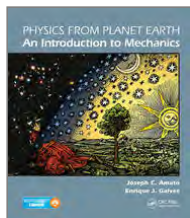
January 2019 : 356pp

Pb: 978-1-138-11677-1 : **£23.99**

Hb: 978-1-439-80127-7 : **£59.99**

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

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

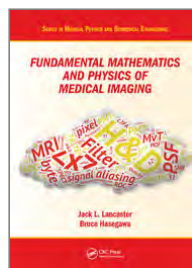
June 2015 : 612pp

Hb: 978-1-439-86783-9 : **£94.99**

eBook: 978-0-429-19447-4

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

Fundamental Mathematics and Physics of Medical Imaging



Jack Lancaster, Bruce Hasegawa

Series: Series in Medical Physics and Biomedical Engineering

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 : **£50.99**

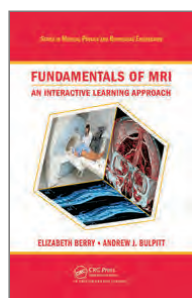
Hb: 978-1-498-75161-2 : **£94.99**

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

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CRC Press

December 2008 : 316pp

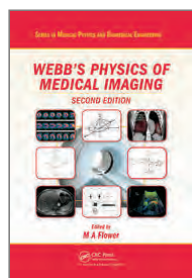
Hb: 978-1-584-88901-4 : **£94.99**

eBook: 978-0-429-14342-7

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Edited by M Flower

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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

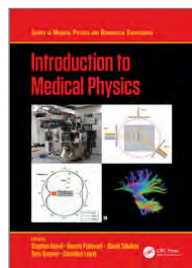
June 2012 : 864pp

Hb: 978-0-750-30573-0 : **£94.99**

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** Guys and St. Thomas' NHS Foundation Trust, London, UK, **Cornelius Lewis** King's College Hospital, London, UK

Series: *Series in Medical Physics and Biomedical Engineering*

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CRC Press

May 2024 : 500pp

Pb: 978-1-138-74283-3 : **£48.99**

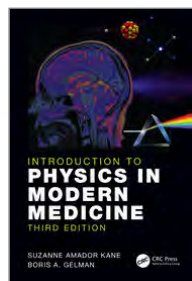
Hb: 978-1-498-74479-9 : **£94.99**

eBook: 978-0-429-15575-8

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

3RD EDITION

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

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CRC Press

March 2020 : 450pp

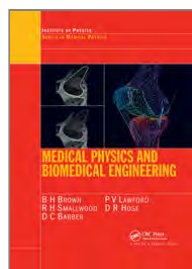
Pb: 978-1-138-03603-1 : **£65.99**

Hb: 978-1-138-74263-5 : **£190**

eBook: 978-1-315-23208-9

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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*

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CRC Press

January 1998 : 762pp

Pb: 978-0-750-30368-2 : **£105**

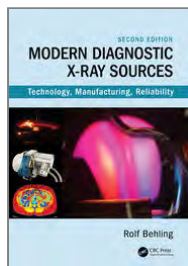
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Modern Diagnostic X-Ray Sources

Technology, Manufacturing, Reliability



Rolf Behling Philips Medical Systems DMC GmbH, Hamburg, Germany

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CRC Press

May 2023 : 412pp

Pb: 978-0-367-55845-1 : **£70.99**

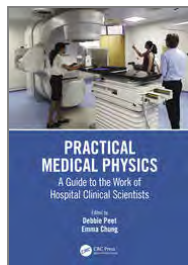
Hb: 978-0-367-54692-2 : **£170**

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**

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CRC Press

August 2021 : 262pp

Pb: 978-1-138-30753-7 : **£54.99**

Hb: 978-1-138-30982-1 : **£155**

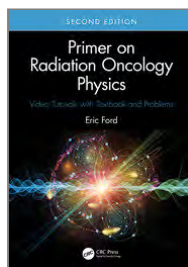
eBook: 978-1-315-14242-5

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Primer on Radiation Oncology Physics

Video Tutorials with Textbook and Problems



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

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CRC Press

May 2025 : 480pp

Pb: 978-1-032-38291-3 : **£86.99**

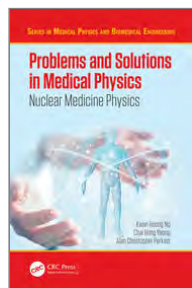
Hb: 978-1-032-38538-9 : **£220**

eBook: 978-1-003-34553-4

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Problems and Solutions in Medical Physics

Nuclear Medicine Physics



Kwan Hoong Ng University of Malaya, Kuala Lumpur, Malaysia, **Chai Hong Yeong**, **Alan Christopher 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 : **£65.99**

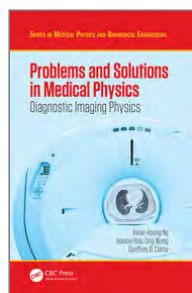
Hb: 978-0-367-14797-6 : **£155**

eBook: 978-1-482-24001-6

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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 : **£58.99**

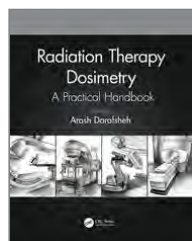
Hb: 978-1-138-54258-7 : **£160**

eBook: 978-1-351-00678-1

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Radiation Therapy Dosimetry

A Practical Handbook



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CRC Press

May 2023 : 504pp

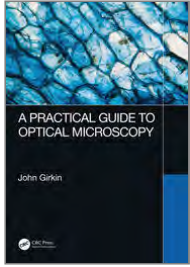
Pb: 978-0-367-68677-2 : **£86.99**

Hb: 978-1-138-54397-3 : **£230**

eBook: 978-1-351-00538-8

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John Girkin Durham University, UK

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CRC Press

July 2019 : 278pp

Pb: 978-1-138-06470-6 : **£87.99**

Hb: 978-1-138-06506-2 : **£220**

eBook: 978-1-315-11535-1

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CRC Press

December 2020 : 4142pp

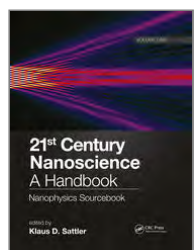
Hb: 978-0-815-36578-5 : £1850

eBook: 978-1-351-26056-5

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CRC Press

June 2022 : 372pp

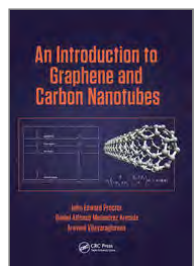
Pb: 978-1-032-33731-9 : £50.99

Hb: 978-0-815-38443-4 : £140

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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 : £50.99

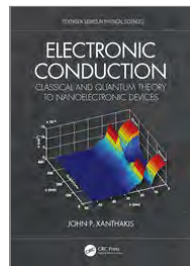
Hb: 978-1-498-75179-7 : £94.99

eBook: 978-1-315-36819-1

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Electronic Conduction

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CRC Press

May 2023 : 310pp

Pb: 978-0-367-63919-8 : £50.99

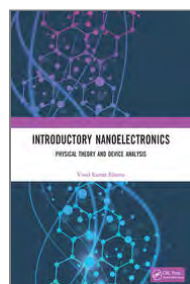
Hb: 978-1-138-58386-3 : £140

eBook: 978-0-429-50644-4

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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 : £44.99

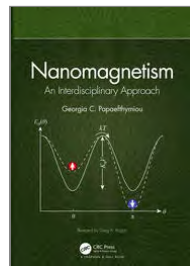
Hb: 978-0-815-38426-7 : £140

eBook: 978-1-351-20467-5

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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 : £47.99

Hb: 978-1-439-81846-6 : £99.99

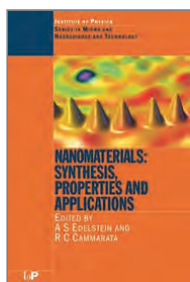
eBook: 978-1-315-15701-6

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2ND EDITION

Nanomaterials

Synthesis, Properties and Applications, Second Edition



Edited by **A.S. Edelstein** Naval Research Laboratory, Washington, DC, USA, **R.C. Cammaratra** 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

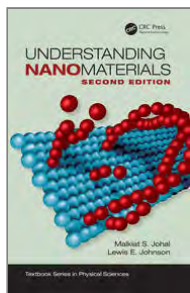
Hb: 978-0-750-30578-5 : £190

eBook: 978-0-429-18126-9

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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 : £94.99

Hb: 978-0-815-35438-3 : £170

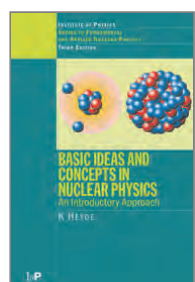
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The third edition of a classic book, this text sets out in a clear and consistent manner the various elements of nuclear physics. Divided into four main parts: the constituents and characteristics of the nucleus; nuclear interactions, including the 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

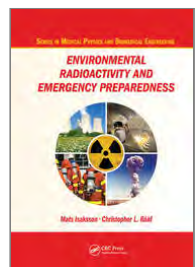
July 2004 : 668pp

Pb: 978-0-750-30980-6 : **£94.99**Hb: 978-1-138-40638-4 : **£200**

eBook: 978-0-367-80657-6

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Environmental Radioactivity and Emergency Preparedness

**Mats Isaksson, Christopher L. Raaf***Series: Series in Medical Physics and Biomedical Engineering*

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

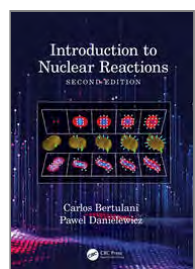
Pb: 978-0-367-57402-4 : **£50.99**Hb: 978-1-482-24464-9 : **£120**

eBook: 978-1-315-37287-7

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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

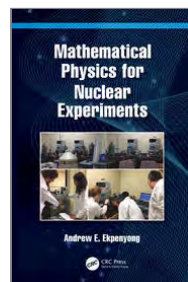
September 2022 : 420pp

Pb: 978-0-367-34993-6 : **£50.99**Hb: 978-0-367-35362-9 : **£155**

eBook: 978-0-429-33106-0

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CRC Press

January 2022 : 278pp

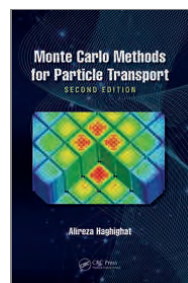
Pb: 978-1-032-10499-7 : **£65.99**Hb: 978-0-367-76852-2 : **£170**

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April 2022 : 310pp

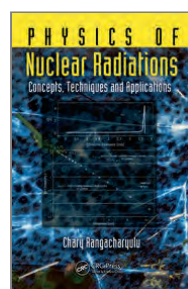
Pb: 978-0-367-53809-5 : **£54.99**Hb: 978-0-367-18805-4 : **£140**

eBook: 978-0-429-19839-7

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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

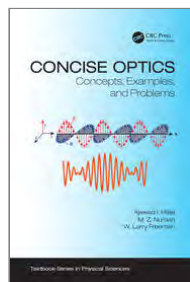
Hb: 978-1-439-85777-9 : **£125**

eBook: 978-0-429-06868-3

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Concise Optics

Concepts, Examples, and Problems



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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

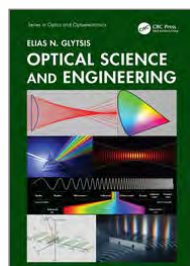
Pb: 978-1-138-10702-1 : **£99.99**

Hb: 978-1-138-10712-0 : **£265**

eBook: 978-1-315-10124-8

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Optical Science and Engineering



Elias Glytsis

Series: Series in Optics and Optoelectronics

Optical Science and Engineering explores the fundamental principles and advanced topics within the field of optical science and engineering. This textbook is an essential resource for undergraduate and graduate students studying optics, as well as engineers and researchers seeking a deeper understanding of optical science and engineering. With its blend of theoretical insights and computational examples, it serves as both a foundational learning tool and a practical reference for those working in academia and industry.

CRC Press

December 2025 : 942pp

Hb: 978-1-032-79062-6 : **£105**

eBook: 978-1-003-49033-3

* For full contents and more information, visit: www.routledge.com/9781032790626

5TH EDITION

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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

September 2025 : 356pp

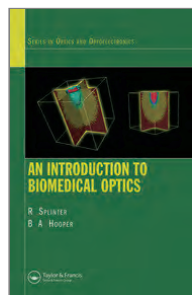
Pb: 978-0-367-69048-9 : **£52.99**

Hb: 978-0-367-67603-2 : **£105**

eBook: 978-1-003-14019-1

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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.

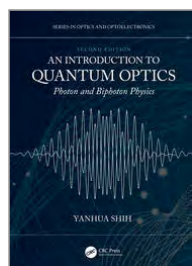
CRC Press
December 2006 : 624pp
Hb: 978-0-750-30938-7 : **£120**
eBook: 978-0-429-14814-9

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2ND EDITION

An Introduction to Quantum Optics

Photon and Biphoton Physics



Yanhua Shih University of Maryland

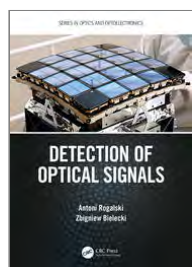
Series: Series in Optics and Optoelectronics

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 : **£49.99**
Hb: 978-1-138-60125-3 : **£140**
eBook: 978-1-003-13060-4

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Detection of Optical Signals



Antoni Rogalski, **Zbigniew Bielecki**

Series: Series in Optics and Optoelectronics

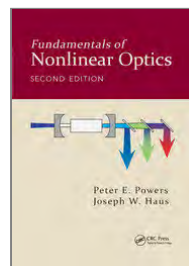
Detection of Optical Signals provides a comprehensive overview of important technologies for photon detection, from the X-ray through ultraviolet, visible, infrared to far-infrared spectral regions. It uniquely combines perspectives from many disciplines, particularly within physics and electronics, 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 : **£48.99**
Hb: 978-1-032-05948-8 : **£155**
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**

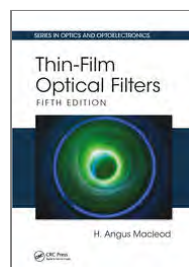
This fully revised edition of the groundbreaking text by the late Peter Powers offers enhanced coverage while remaining the most 'essentials only,' practical introductory treatment available. It includes a brand new chapter on quantum nonlinear optics, other added sections and improvements, as well as 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 : **£58.99**
Hb: 978-1-498-73683-1 : **£125**
eBook: 978-1-315-11643-3

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5TH EDITION

Thin-Film Optical Filters



H. Angus Macleod

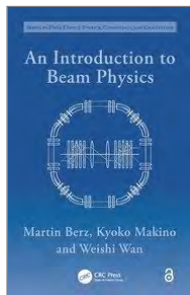
Series: Series in Optics and Optoelectronics

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 : **£50.99**
Hb: 978-1-138-19824-1 : **£185**
eBook: 978-1-315-27049-4

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An Introduction to Beam Physics



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

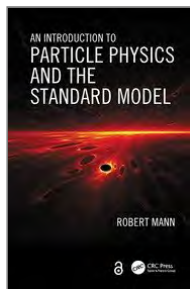
Series: Series in Particle Physics, Cosmology and Gravitation

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 : **£54.99**
 Hb: 978-0-750-30263-0 : **£160**
 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



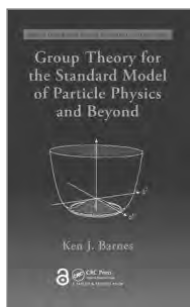
Robert Mann University of Waterloo, Ontario, Canada

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 : **£94.99**
 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

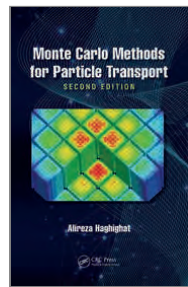
Based on the author's well-established courses, this text explores the use of symmetries through descriptions of the techniques of Lie groups and Lie algebras. It develops the models, theoretical framework, and mathematical tools to understand these symmetries. The author presents the modern framework 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 : **£94.99**
 eBook: 978-0-429-18455-0

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2ND EDITION

Monte Carlo Methods for Particle Transport



Alireza Haghighat

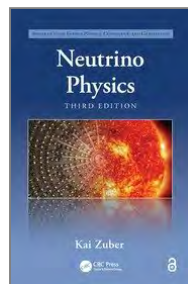
Fully updated with the latest developments in the eigenvalue Monte Carlo calculations and automatic variance reduction techniques and containing an entirely new chapter on fission matrix and alternative hybrid techniques. This second edition explores the uses of the Monte Carlo method for real-world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

CRC Press
 April 2022 : 310pp
 Pb: 978-0-367-53809-5 : **£54.99**
 Hb: 978-0-367-18805-4 : **£140**
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3RD EDITION

Neutrino Physics



Kai Zuber Dresden University, Germany

Series: Series in Particle Physics, Cosmology and Gravitation

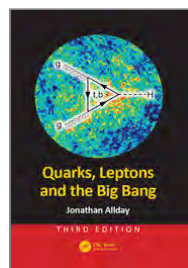
This book provides a comprehensive self-contained examination of neutrinos, covering their research history and theory, as well as their application to particle physics, astrophysics, nuclear physics, and the broad reach of cosmology. Revised as needed to be equal to the research of today, Neutrino Physics, 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 : **£44.99**
 Hb: 978-1-138-71889-0 : **£125**
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3RD EDITION

Quarks, Leptons and the Big Bang



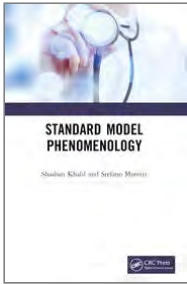
Jonathan Allday

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 : **£50.99**
 Hb: 978-1-138-42717-4 : **£200**
 eBook: 978-1-315-38136-7

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Standard Model Phenomenology



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

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CRC Press

August 2024 : 246pp

Pb: 978-1-032-20168-9 : **£48.99**

Hb: 978-1-138-33643-8 : **£190**

eBook: 978-0-429-44301-5

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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 : **£50.99**

Hb: 978-1-138-49987-4 : **£140**

eBook: 978-1-351-00796-2

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Paul Langacker

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CRC Press

June 2020 : 650pp

Pb: 978-0-367-57344-7 : **£50.99**

Hb: 978-1-498-76321-9 : **£94.99**

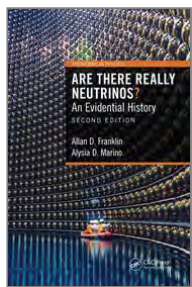
eBook: 978-1-315-17062-6

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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 : **£48.99**

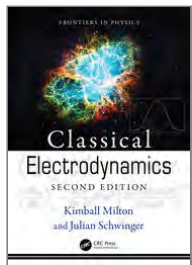
Hb: 978-0-367-19002-6 : **£200**

eBook: 978-0-429-19978-3

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Classical Electrodynamics captures Schwinger's inimitable lecturing style, in which everything flows inexorably from what has gone before. This anniversary edition offers a refreshing update while still maintaining Schwinger's voice. The book provides the student with a thorough grounding in electrodynamics in particular, and in classical field theory in general.

CRC Press

August 2025 : 570pp

Pb: 978-0-367-52298-8 : **£52.99**

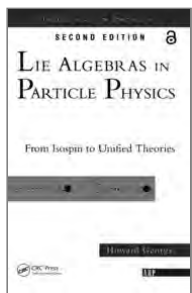
Hb: 978-0-367-50207-2 : **£105**

eBook: 978-1-003-05736-9

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Lie Algebras In Particle Physics

from Isospin To Unified Theories



Howard Georgi

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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 : **£83.99**

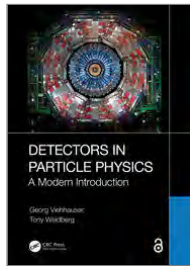
Hb: 978-0-367-09172-9 : **£155**

eBook: 978-0-429-49921-0

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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

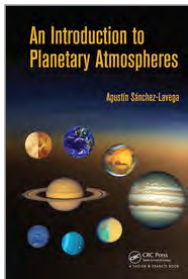
March 2024 : 348pp

Hb: 978-1-032-24658-1 : **£86.99**

eBook: 978-1-003-28767-4

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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

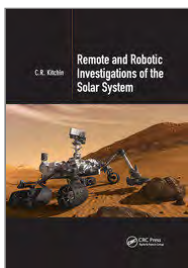
Pb: 978-1-032-91808-2 : **£48.99**

Hb: 978-1-420-06732-3 : **£78.99**

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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 : **£50.99**

Hb: 978-1-498-70493-9 : **£155**

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

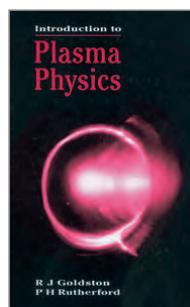
Pb: 978-0-367-76869-0 : **£39.99**

Hb: 978-1-032-05437-7 : **£105**

eBook: 978-1-003-19755-3

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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.

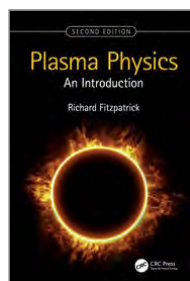
CRC Press
November 1995 : 510pp
Pb: 978-0-750-30183-1 : **£94.99**
Hb: 978-1-138-45831-4 : **£200**
eBook: 978-0-367-80695-8

* 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 : **£54.99**
Hb: 978-1-032-21407-8 : **£140**
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. Bruce Langdon**, **A.B. Langdon** Lawrence Livermore National Laboratory, California, USA

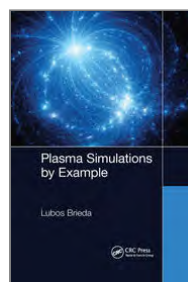
Series: *Series in Plasma Physics*

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 : **£120**
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 : **£50.99**
Hb: 978-1-138-34232-3 : **£190**
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 Christopher 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*

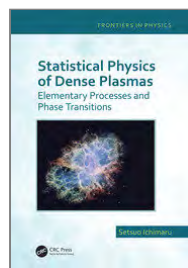
While graduate programs in medical physics are increasing across the globe, there is no graduate-level book currently dedicated to solving problems in medical physics. Filling this need, this three-volume set covers diagnostic imaging physics, nuclear medicine physics, and radiotherapy physics. It is 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 : **£175.97**
Hb: 978-1-482-23985-0 : **£350**

* 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*

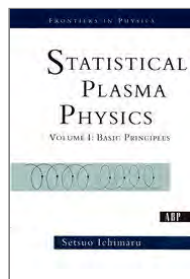
This timely book gives a complete overview on the statistical mechanics and electrodynamics elucidating the physical processes in dense plasma systems. The author emphasizes laboratory-based experiments on metallic hydrogen, and gives detailed account of the plasma phenomena in various astrophysical 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 : **£78.99**
Hb: 978-1-138-36468-4 : **£190**
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

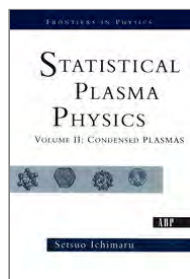
Plasma physics is an integral part of statistical physics, complete with its own basic theories. Designed as a two-volume set, Statistical Plasma Physics is intended for advanced undergraduate and beginning graduate courses on plasma and statistical physics, and as such, its presentation is self-contained 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 : **£75.99**
Hb: 978-0-367-09201-6 : **£155**
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

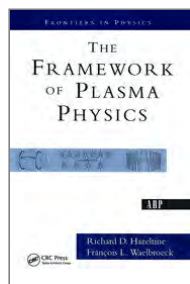
Series: Frontiers in Physics

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 : **£75.99**
Hb: 978-0-367-09202-3 : **£155**
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

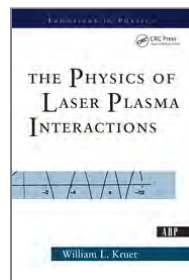
Series: Frontiers in Physics

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 : **£75.99**
Hb: 978-0-367-31417-0 : **£155**
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

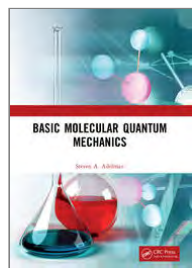
Series: Frontiers in Physics

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 : **£65.99**
Hb: 978-0-367-31418-7 : **£155**
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

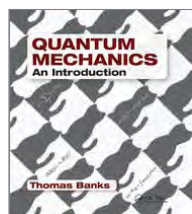
This book introduces quantum mechanics by covering the fundamentals of quantum mechanics and some of its most important chemical applications: vibrational and rotational spectroscopy and electronic structure of atoms and molecules. Thoughtfully organized, the author builds up quantum mechanics systematically 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 : **£83.99**
Hb: 978-1-032-01065-6 : **£200**
eBook: 978-0-429-15574-1

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

Quantum Mechanics

An Introduction



Thomas Banks

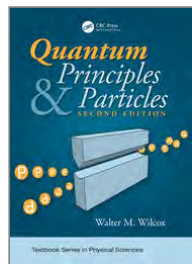
This new introductory textbook gives a complete, modern perspective on quantum mechanics as the basis of so much of physical sciences and today's electronic technologies. It clarifies for the first time many common misconceptions regarding wave/particle duality and the correct interpretation of measurements. 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 : **£50.99**
Hb: 978-1-482-25506-5 : **£125**
eBook: 978-0-429-43842-4

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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.

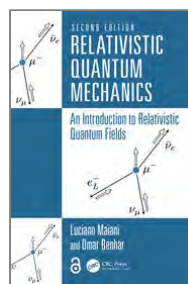
CRC Press
August 2019 : 600pp
Pb: 978-1-138-09037-8 : **£120**
Hb: 978-1-138-09041-5 : **£170**
eBook: 978-1-138-09043-9

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

2ND EDITION

Relativistic Quantum Mechanics

An Introduction to Relativistic Quantum Fields



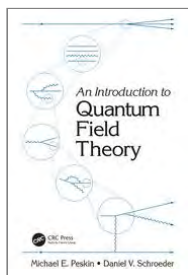
Luciano Maiani University of Rome, La Sapienza, Italy,
Omar Benhar INFN, Roma, Italy

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 : **£80.99**
eBook: 978-1-003-43626-3

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

An Introduction To Quantum Field Theory



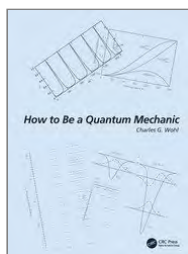
Michael E. Peskin, Daniel V. Schroeder

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 : **£71.99**
Hb: 978-0-201-50397-5 : **£140**
eBook: 978-0-429-50355-9

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

How to Be a Quantum Mechanic



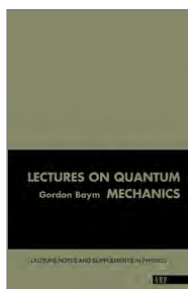
Charles G. Wohl University of California, Berkeley

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 : **£48.99**
Hb: 978-1-032-25603-0 : **£130**
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

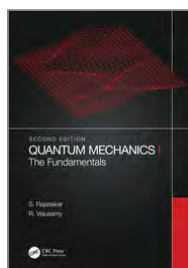
CRC Press
January 1974 : 606pp
Pb: 978-0-805-30667-5 : **£83.99**
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S. Rajasekar Bharathidasan University, Tiruchirapalli, India
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Quantum Mechanics I: The Fundamentals provides a graduate-level account 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
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2ND EDITION

Quantum Mechanics II

Advanced Topics



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

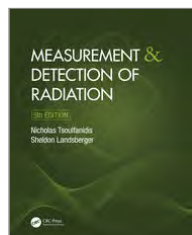
Quantum Mechanics II: Advanced Topics offers a comprehensive exploration of the state-of-the-art in various advanced topics of current research interest. A follow-up to the authors' introductory book Quantum Mechanics I: The Fundamentals, this book expounds basic principles, theoretical treatment, case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

CRC Press
January 2025 : 432pp
Pb: 978-0-367-77642-8 : **£48.99**
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Nicholas Tsoulfanidis University of Nevada, Reno, USA,
Sheldon Landsberger The University of Texas at Austin,
 USA

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CRC Press

January 2025 : 642pp

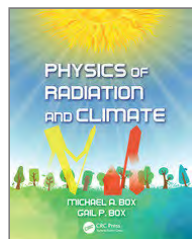
Pb: 978-1-032-04282-4 : £48.99

Hb: 978-0-367-43401-4 : £125

eBook: 978-1-003-00984-9

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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

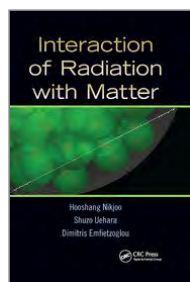
Pb: 978-1-466-57205-8 : £105

Hb: 978-1-138-42426-5 : £200

eBook: 978-0-429-19422-1

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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 : 368pp

Pb: 978-0-367-86602-0 : **£52.99**

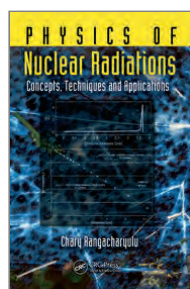
Hb: 978-1-439-85357-3 : **£170**

eBook: 978-0-429-06196-7

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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

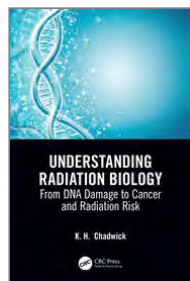
Hb: 978-1-439-85777-9 : **£125**

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 : **£105**

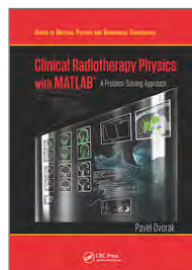
Hb: 978-0-367-25515-2 : **£265**

eBook: 978-0-429-28819-7

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Clinical Radiotherapy Physics with MATLAB

A Problem-Solving Approach



Pavel Dvorak

Series: Series in Medical Physics and Biomedical Engineering

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 : **£50.99**

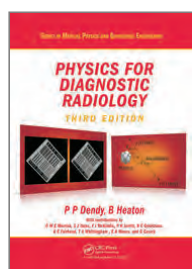
Hb: 978-1-498-75499-6 : **£140**

eBook: 978-0-429-50809-7

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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 : **£94.99**

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 : **£67.99**
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General Relativity and its Applications

Black Holes, Compact Stars and Gravitational Waves



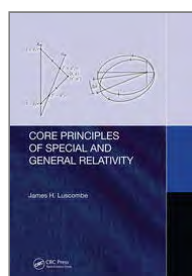
Valeria Ferrari, Leonardo Gualtieri, Paolo Pani

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 : **£89.99**
Hb: 978-1-138-58977-3 : **£235**
eBook: 978-0-429-49140-5

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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 is 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 : **£50.99**
Hb: 978-1-138-54294-5 : **£94.99**
eBook: 978-0-429-02383-5

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Newtonian Dynamics

An Introduction



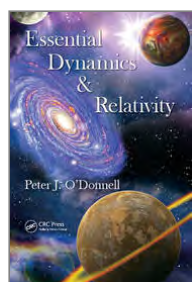
Richard Fitzpatrick The University of Texas, Austin, USA

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 : **£49.99**
Hb: 978-1-032-04662-4 : **£94.99**
eBook: 978-1-003-19864-2

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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

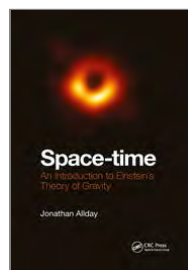
This text provides undergraduate students with an introduction to the core aspects of dynamics and special relativity. It helps students understand the precise nomenclature of dynamics and presents the mathematics of special relativity in a straightforward way. The author reiterates important ideas and 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 : **£67.99**
Hb: 978-1-138-40418-2 : **£200**
eBook: 978-0-429-16799-7

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Space-time

An Introduction to Einstein's Theory of Gravity



Jonathan Allday

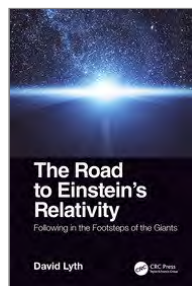
This book, suitable for interested post-16 school pupils or undergraduates looking for a supplement to their course text, develops our modern view of space-time and its implications in the theories of gravity and cosmology. While aspects of this topic are inevitably abstract, the book seeks to ground 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 : **£46.99**
Hb: 978-1-138-05668-8 : **£120**
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Following in the Footsteps of the Giants



David Lyth Lancaster University, United Kingdom

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CRC Press

January 2019 : 168pp

Pb: 978-0-367-00253-4 : **£28.99**

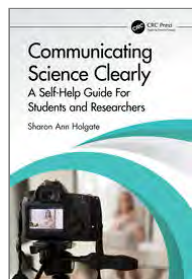
Hb: 978-0-367-02285-3 : **£120**

eBook: 978-0-429-40044-5

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Sharon Ann Holgate

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CRC Press

November 2023 : 162pp

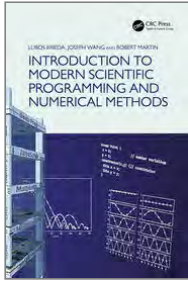
Pb: 978-1-032-06911-1 : **£39.99**

Hb: 978-1-032-07422-1 : **£99.99**

eBook: 978-1-003-20682-8

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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

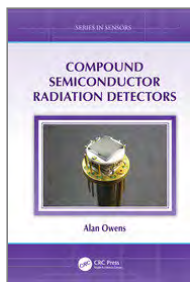
October 2024 : 472pp

Hb: 978-0-367-67191-4 : **£78.99**

eBook: 978-1-003-13223-3

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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 : 580pp

Pb: 978-1-138-19958-3 : **£75.99**

Hb: 978-1-439-87312-0 : **£200**

eBook: 978-0-429-06231-5

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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

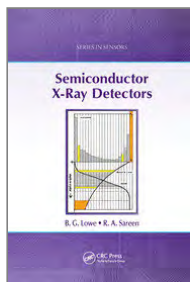
Pb: 978-0-367-25080-5 : **£50.99**

Hb: 978-0-367-25082-9 : **£140**

eBook: 978-0-429-28592-9

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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 : **£71.99**

Hb: 978-1-466-55400-9 : **£200**

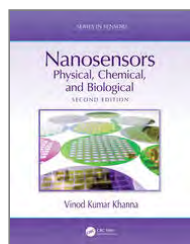
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Physical, Chemical, and Biological



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

Series: Series in Sensors

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CRC Press

August 2022 : 578pp

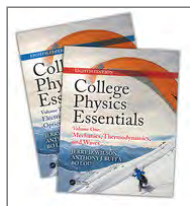
Pb: 978-0-367-51480-8 : **£105**

Hb: 978-0-367-45705-1 : **£275**

eBook: 978-1-003-02555-9

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



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

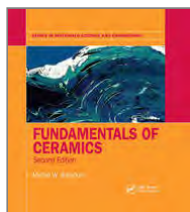
This edition provides a streamlined update of a major textbook for algebra-based physics, reflecting the demand by instructors for more substance. The authors enhance emphasis on worked examples to enhance reader engagement, together with expanded problem sets that build from conceptual understanding 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 : **£101.98**
Hb: 978-0-815-35546-5 : **£280**
eBook: 978-1-351-12992-3

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Fundamentals of Ceramics



Michel Barsoum

Series: Series in Materials Science and Engineering

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 : **£50.99**
Hb: 978-1-498-70813-5 : **£140**
eBook: 978-1-498-70816-6

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

2ND EDITION

Fundamentals of Soft Matter Science



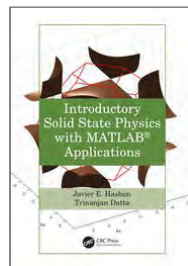
Linda S. Hirst University of California, Merced, USA

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 : **£94.99**
Hb: 978-1-138-72478-5 : **£245**
eBook: 978-1-315-19238-3

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Introductory Solid State Physics with MATLAB Applications



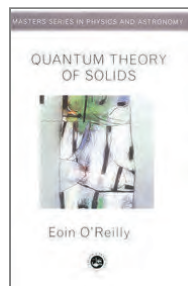
Javier E. Hasbun, Trinanjan Datta

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 : **£94.99**
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

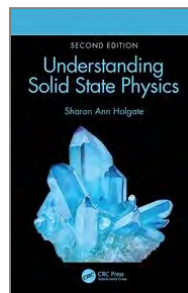
Although the topic is a well established sub-set of solid state physics, Quantum Theory of Solids develops the concepts of quantum theory for the solid state in a single, one-stop reference. Readers with previous courses in quantum mechanics and solid state physics can develop further, learning the three 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 : **£67.99**
Hb: 978-0-748-40628-9 : **£130**
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2ND EDITION

Understanding Solid State Physics



Sharon Ann Holgate

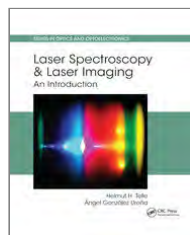
Keeping the mathematics to a minimum yet losing none of the required rigor, Understanding Solid State Physics, Second Edition clearly explains basic physics principles to provide a firm grounding in the subject. This new edition has been fully updated throughout, with recent developments and literature 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 : **£105**
Hb: 978-0-367-25528-2 : **£275**
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Laser Spectroscopy and Laser Imaging

An Introduction



Helmut H. Telle, Ángel González Ureña

Series: Series in Optics and Optoelectronics

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 : **£78.99**

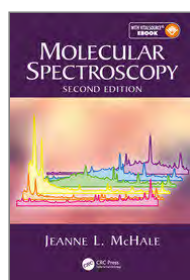
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Jeanne L. McHale Washington State University, Pullman, USA

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CRC Press

May 2017 : 475pp

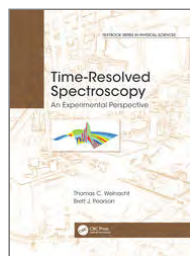
Hb: 978-1-466-58658-1 : **£99.99**

eBook: 978-1-315-11521-4

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An Experimental Perspective



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Series: Textbook Series in Physical Sciences

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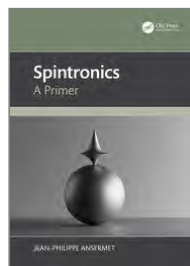
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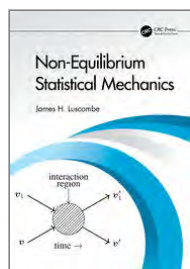
August 2024 : 454pp

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CRC Press

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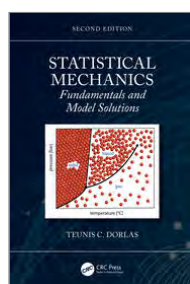
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Teunis C Dorlas Dublin Institute for Advanced Studies, Ireland

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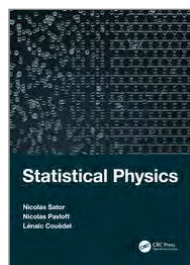
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Nicolas Sator , Nicolas Pavloff , Lenaïc Couedel

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Pb: 978-1-032-22396-4 : **£48.99**

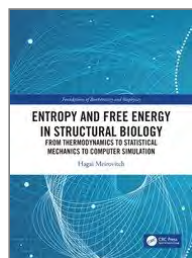
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CRC Press

April 2022 : 396pp

Pb: 978-0-367-42745-0 : **£50.99**

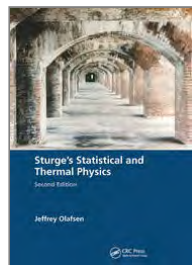
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CRC Press

March 2021 : 422pp

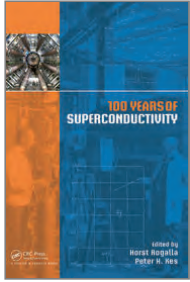
Pb: 978-0-367-77949-8 : **£50.99**

Hb: 978-1-482-25600-0 : **£120**

eBook: 978-1-315-15695-8

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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

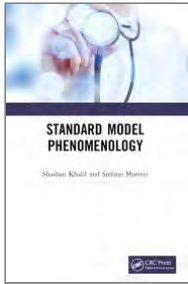
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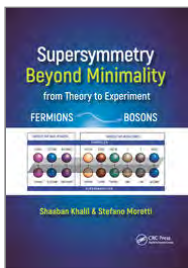
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From Theory to Experiment



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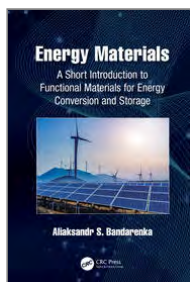
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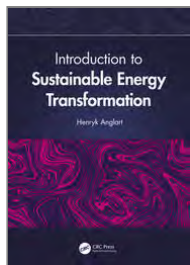
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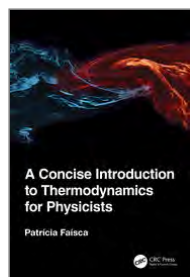
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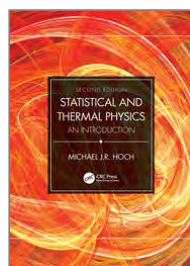
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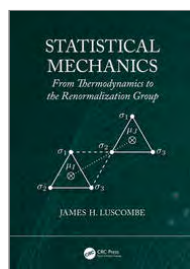
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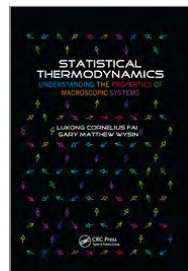
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Statistical Thermodynamics

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

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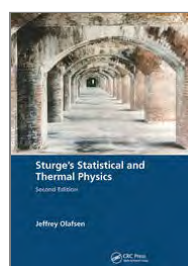
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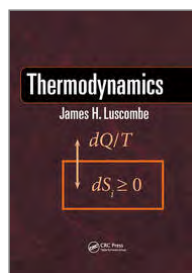
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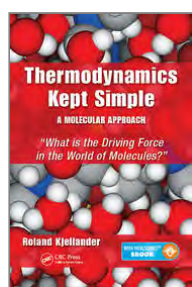
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What is the Driving Force in the World of Molecules?



Roland Kjellander University of Gothenburg, Sweden

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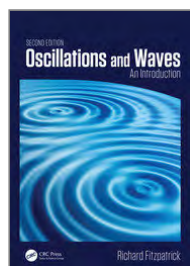
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Richard Fitzpatrick The University of Texas, Austin, USA

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July 2018 : 309pp

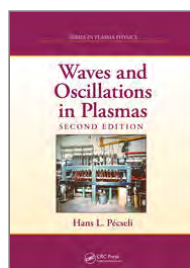
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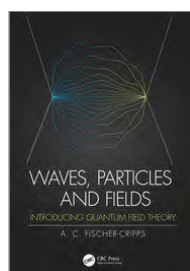
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Introducing Quantum Field Theory



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

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