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 Understanding light-atom interactions
 Relativity, Gravitation and Cosmology
 A Basic Introduction
 Entropy, Order Parameters and Complexity
 The Amazing Story of Quantum Mechanics
 Statistical Mechanics
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 An Atomic View of Materials
 Atomic Physics: Precise Measurements and Ultracold Matter
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ERICK JOVANI

Particle Astrophysics, Second Edition OUP
 Oxford

This book provides a hands-on experience with atomic structure calculations. Material covered includes angular momentum methods, the central field Schrödinger and Dirac equations, Hartree-Fock and Dirac-Hartree-Fock equations, multiplet structure, hyperfine structure, the isotope shift, dipole and multipole transitions, basic many-body perturbation theory, configuration interaction, and correlation corrections to matrix elements. The book also contains numerical methods for solving the Schrödinger and Dirac eigenvalue problems and the (Dirac)-Hartree-Fock equations.

Understanding light-atom interactions John
 Wiley & Sons

This book is primarily intended to accompany an advanced undergraduate course in atomic physics. However, the elementary atomic physics covered in the early chapters should be accessible to undergraduates when they are first introduced to the subject. The book describes some of the latest advances and the applications to Bose-Einstein condensation of atoms, matter-wave interferometry and quantum computing with trapped ions. To complement the usual quantum mechanical treatment of atomic structure the book strongly emphasizes the experimental basis of the subject, especially in the later chapters.

Relativity, Gravitation and Cosmology
 Princeton University Press

Atomic Physics provides a concise treatment of atomic physics and a basis to

prepare for work in other disciplines that are underpinned by atomic physics such as chemistry, biology and several aspects of engineering science. The focus is mainly on atomic structure since this is what is primarily responsible for the physical properties of atoms. After a brief introduction to some basic concepts, the perturbation theory approach follows the hierarchy of interactions starting with the largest. The other interactions of spin, and angular momentum of the outermost electrons with each other, the nucleus and external magnetic fields are treated in order of descending strength. A spectroscopic perspective is generally taken by relating the observations of atomic radiation emitted or absorbed to the internal energy levels involved. X-ray spectra are then discussed in relation to the energy levels of the innermost electrons. Finally, a brief description is

given of some modern, laser based, spectroscopic methods for the high resolution study of the nest details of atomic structure.

A Basic Introduction OUP Oxford

This book provides an introduction to Einstein's general theory of relativity. A "physics-first" approach is adopted so that interesting applications come before the more difficult task of solving the Einstein equation. The book includes extensive coverage of cosmology, and is designed to allow readers to study the subject alone.

Entropy, Order Parameters and Complexity Oxford University Press

Written primarily for advanced undergraduate and masters level students in physics, this text includes a broad range of topics in applied quantum optics such as laser cooling, Bose-Einstein condensation and quantum information processing.

The Amazing Story of Quantum Mechanics Oxford University Press

This book describes how the arrangement and movement of atoms in a solid are related to the forces between atoms, and how they affect the behaviour and properties of materials. The book is intended for final year undergraduate students and graduate students in physics and materials science.

Statistical Mechanics Oxford University Press

Preface to first edition Preface to second edition
1. Introduction
2. The hydrogen atom- gross structure
3. Radiative transitions
4. The hydrogen atom- fine structure
5. Two-electron system
6. The central-field approximation
7. Angular problems in many-electron atoms
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Appendix A. Some theorems of quantum mechanics
Appendix B. Results of time-independent perturbation theory
Appendix C. Notes on angular momentum
Appendix D. Ground states of the elements
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Spectrophysics Springer Science & Business Media

Underpinning all the other branches of science, physics affects the way we live our lives, and ultimately how life itself functions. Recent scientific advances have led to dramatic reassessment of our understanding of the world around us, and made a significant impact on our lifestyle. In this book, leading international experts, including Nobel prize winners, explore the frontiers of modern physics, from the particles inside an atom to the stars that make up a galaxy, from nano-engineering and brain research to high-speed data networks. Revealing how physics plays a

vital role in what we see around us, this book will fascinate scientists of all disciplines, and anyone wanting to know more about the world of physics today.

The Silicon Web Oxford University Press on Demand

In each generation, scientists must redefine their fields: abstracting, simplifying and distilling the previous standard topics to make room for new advances and methods. Sethna's book takes this step for statistical mechanics - a field rooted in physics and chemistry whose ideas and methods are now central to information theory, complexity, and modern biology. Aimed at advanced undergraduates and early graduate students in all of these fields, Sethna limits his main presentation to the topics that future mathematicians and biologists, as well as physicists and chemists, will find fascinating and central to their work. The amazing breadth of the field is reflected in the author's large supply of carefully crafted exercises, each an introduction to a whole field of study: everything from chaos through information theory to life at the end of the universe.

An Atomic View of Materials Springer Science & Business Media

Most of us are unaware of how much we depend on quantum mechanics on a day-to-day basis. Using illustrations and examples from science fiction pulp magazines and comic books, *The Amazing Story of Quantum Mechanics* explains the fundamental principles of quantum mechanics that underlie the world we live in. Watch a Video

Atomic Physics: Precise Measurements and Ultracold Matter Oxford University Press

This book describes atomic physics and the latest advances in this field at a level suitable for fourth year undergraduates. The numerous examples of the modern applications of atomic physics include Bose-Einstein condensation of atoms, matter-wave interferometry and quantum computing with trapped ions.

Physics for the Internet Age Oxford University Press

The rapid development of quantum technologies has driven a revolution in related research areas such as quantum computation and communication, and quantum materials. The first prototypes of functional quantum devices are beginning to appear, frequently created using ensembles of atoms, which allow the observation of sensitive, quantum effects, and have important applications in quantum simulation and matter wave interferometry. This modern text offers a self-contained introduction to the

fundamentals of quantum atom optics and atomic many-body matter wave systems. Assuming a familiarity with undergraduate quantum mechanics, this book will be accessible for graduate students and early career researchers moving into this important new field. A detailed description of the underlying theory of quantum atom optics is given, before development of the key, quantum, technological applications, such as atom interferometry, quantum simulation, quantum metrology, and quantum computing.

The Pope of Physics Cambridge University Press

Atomic Physics Oxford University Press

Quantum Information Cambridge University Press

to Atomic and Nuclear Physics Aerial view of the National Accelerator Laboratory, Batavia, Illinois. (Photograph courtesy of NAL.) Introduction to Atomic and Nuclear Physics HENRY SEMAT Professor Emeritus The City College of the City University of New York JOHN R. ALBRIGHT The Florida State University FIFTH EDITION LONDON NEW YORK CHAPMAN AND HALL First edition 1939 Fifth edition, first published in the U.S.A. by Holt, Rinehart and Winston, Inc. Fifth edition first published in Great Britain 1973 by Chapman and Hall Ltd 11 New Fetter Lane, London EC4P 4EE Reprinted as a paperback 1978 Reprinted 1979, 1983, 1985 © 1939, 1946, 1954, 1962 by Henry Semat © 1972 by Holt, Rinehart and Winston, Inc. Fletcher & Son Ltd, Norwich ISBN-13: 978-0-412-15670-0 e-ISBN-13: 978-1-4615-9701-8 DOI: 10.1007/978-1-4615-9701-8 All rights reserved. No part of this book may be reprinted, or reproduced or utilized in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage and retrieval system, without permission in writing from the Publisher.

Quantum Information, Computation and Communication OUP Oxford

This book, part of the seven-volume series Major American Universities PhD Qualifying Questions and Solutions contains detailed solutions to 483 questions/problems on atomic, molecular, nuclear and particle physics, as well as experimental methodology. The problems are of a standard appropriate to advanced undergraduate and graduate syllabi, and blend together two objectives — understanding of physical principles and practical application. The volume is an invaluable supplement to textbooks. *For the Twenty-First Century* Atomic Physics

The book describes classical (non-

quantum) optical phenomena and the instruments and technology based on them. It includes many cutting-edge areas of modern physics and its applications which are not covered in many larger and more expensive books.

Quantum Atom Optics Henry Holt and Company

The importance and the beauty of modern quantum field theory resides in the power and variety of its methods and ideas, which find application in domains as different as particle physics, cosmology, condensed matter, statistical mechanics and critical phenomena. This book introduces the reader to the modern developments in a manner which assumes no previous knowledge of quantum field theory. Along with standard topics like Feynman diagrams, the book discusses effective lagrangians, renormalization group equations, the path integral formulation, spontaneous symmetry breaking and non-abelian gauge theories. The inclusion of more advanced topics will also make this a most useful book for graduate students and researchers.

Multi-species Systems in Optical Lattices Oxford University Press

Now updated—the leading single-volume introduction to solid state and soft condensed matter physics This Second Edition of the unified treatment of condensed matter physics keeps the best of the first, providing a basic foundation in the subject while addressing many recent discoveries. Comprehensive and authoritative, it consolidates the critical advances of the past fifty years, bringing together an exciting collection of new and classic topics, dozens of new figures, and

new experimental data. This updated edition offers a thorough treatment of such basic topics as band theory, transport theory, and semiconductor physics, as well as more modern areas such as quasicrystals, dynamics of phase separation, granular materials, quantum dots, Berry phases, the quantum Hall effect, and Luttinger liquids. In addition to careful study of electron dynamics, electronics, and superconductivity, there is much material drawn from soft matter physics, including liquid crystals, polymers, and fluid dynamics. Provides frequent comparison of theory and experiment, both when they agree and when problems are still unsolved Incorporates many new images from experiments Provides end-of-chapter problems including computational exercises Includes more than fifty data tables and a detailed forty-page index Offers a solutions manual for instructors Featuring 370 figures and more than 1,000 recent and historically significant references, this volume serves as a valuable resource for graduate and undergraduate students in physics, physics professionals, engineers, applied mathematicians, materials scientists, and researchers in other fields who want to learn about the quantum and atomic underpinnings of materials science from a modern point of view.

Bose-Einstein Condensation World Scientific Publishing Company

Enrico Fermi is unquestionably among the greats of the world's physicists, the most famous Italian scientist since Galileo. Called the Pope by his peers, he was regarded as infallible in his instincts and

research. His discoveries changed our world; they led to weapons of mass destruction and conversely to life-saving medical interventions. This unassuming man struggled with issues relevant today, such as the threat of nuclear annihilation and the relationship of science to politics. Fleeing Fascism and anti-Semitism, Fermi became a leading figure in America's most secret project: building the atomic bomb. The last physicist who mastered all branches of the discipline, Fermi was a rare mixture of theorist and experimentalist. His rich legacy encompasses key advances in fields as diverse as cosmic rays, nuclear technology, and early computers. In their revealing book, *The Pope of Physics*, Gino Segré and Bettina Hoerlin bring this scientific visionary to life. An examination of the human dramas that touched Fermi's life as well as a thrilling history of scientific innovation in the twentieth century, this is the comprehensive biography that Fermi deserves.

Atomic Physics Oxford University Press
Intended for advanced undergraduates and beginning graduates with some basic knowledge of optics and quantum mechanics, this text begins with a review of the relevant results of quantum mechanics, before turning to the electromagnetic interactions involved in slowing and trapping atoms and ions, in both magnetic and optical traps. The concluding chapters discuss a broad range of applications, from atomic clocks and studies of collision processes, to diffraction and interference of atomic beams at optical lattices and Bose-Einstein condensation.

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