
Atomic Nuclear Physics 2nd Edition

Nuclear Physics between the First and Second World Wars
Theoretical Nuclear and Subnuclear Physics
An Exploration Through Problems and Solutions
Introduction to Atomic and Nuclear Physics
Radioactivity
Exploring the Heart of Matter
Introduction and History, From the Quantum to Quarks
The Elegant Universe
Nuclear Materials Science
Atoms and Photons and Quanta, Oh My!
Nuclear Science Abstracts
Introduction to Nuclear Science
Atomic Physics
Experimental Techniques in High-Energy Nuclear and Particle Physics
Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory
The Atomic Nucleus
Nuclear Physics
Nuclear and Particle Physics
X-rays in Atomic and Nuclear Physics
Second Edition
A Student's Guide to Atomic Physics
5th edition
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Atomic and Nuclear Physics
Introductory Nuclear Physics
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Problems in Undergraduate Physics
Elementary Atomic Structure
Atomic And Nuclear Physics
Experimental Techniques in Nuclear and Particle Physics
Atomic Spectra and Radiative Transitions
The Age of Innocence
Problems and Solutions on Atomic, Nuclear and Particle Physics

HUNTER JOHNNY

Nuclear Physics between the First and Second World Wars

Oxford University Press, USA

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 8. Interaction with static external fields 9. Hyperfine structure and isotope shift 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 Appendix E. Units Index

Theoretical Nuclear and Subnuclear Physics Morgan & Claypool Publishers

A concise overview of the fundamental concepts and applications of atomic physics for students including examples, problems, and diagrams of key concepts.

[An Exploration Through Problems and Solutions](#) Springer Science & Business Media

Comprises a comprehensive reference source that unifies the entire fields of atomic molecular and optical (AMO) physics, assembling the principal ideas, techniques and results of the field. 92 chapters written by about 120 authors present the principal ideas, techniques and results of the field, together with a guide to the primary research literature (carefully edited to ensure a uniform coverage and style, with extensive cross-references). Along with a summary of key ideas, techniques, and results, many chapters offer diagrams of apparatus, graphs, and tables of data. From atomic spectroscopy to applications in comets, one finds contributions from over 100 authors, all leaders in their respective disciplines. Substantially updated and expanded since the original 1996 edition, it now contains several entirely new chapters covering current areas of great research interest that barely existed in 1996, such as Bose-Einstein condensation, quantum information, and cosmological variations of the fundamental

constants. A fully-searchable CD-ROM version of the contents accompanies the handbook.

Introduction to Atomic and Nuclear Physics Elsevier

Introduces the superstring theory that attempts to unite general relativity and quantum mechanics

Radioactivity Introductory Nuclear Physics

Written as a collection of problems, hints and solutions, this book should provide help in learning about both fundamental and applied aspects of this vast field of knowledge, where rapid and exciting developments are taking place.

World Scientific Publishing Company

' The original edition of *Introduction to Nuclear and Particle Physics* was used with great success for single-semester courses on nuclear and particle physics offered by American and Canadian universities at the undergraduate level. It was also translated into German, and used overseas. Being less formal but well-written, this book is a good vehicle for learning the more intuitive rather than formal aspects of the subject. It is therefore of value to scientists with a minimal background in quantum mechanics, but is sufficiently substantive to have been recommended for graduate students interested in the fields covered in the text. In the second edition, the material begins with an exceptionally clear development of Rutherford scattering and, in the four following chapters, discusses sundry phenomenological issues concerning nuclear properties and structure, and general applications of radioactivity and of the nuclear force. This is followed by two chapters dealing with interactions of particles in matter, and how these characteristics are used to detect and identify such particles. A chapter on accelerators rounds out the experimental aspects of the field. The final seven chapters deal with elementary-particle phenomena, both before and after the realization of the Standard Model. This is interspersed with discussion of symmetries in classical physics and in the quantum domain, bringing into full focus the issues concerning CP violation, isotopic spin, and other symmetries. The final three chapters are devoted to the Standard Model and to possibly new physics beyond it, emphasizing unification of forces, supersymmetry, and other exciting areas of current research. The book contains several appendices on related subjects, such as special relativity,

the nature of symmetry groups, etc. There are also many examples and problems in the text that are of value in gauging the reader's understanding of the material. Contents: Rutherford Scattering Nuclear Phenomenology Nuclear Models Nuclear Radiation Applications of Nuclear Physics Energy Deposition in Media Particle Detection Accelerators Properties and Interactions of Elementary Particles Symmetries Discrete Transformations Neutral Kaons, Oscillations, and CP Violation Formulation of the Standard Model Standard Model and Confrontation with Data Beyond the Standard Model Readership: Advanced undergraduates and researchers in nuclear and particle physics. Keywords: Rutherford Scattering; Nuclear Properties; Nuclear Structure; Elementary Particles; Sub-Structure of Particles; Particle Detectors; Interactions in Matter; The Standard Model; Symmetries of Nature; Theories of Nuclear and Particle

Structure; Radioactivity; Supersymmetry Reviews: "The book by Das and Ferbel is particularly suited as a basis for a one-semester course on both subjects since it contains a very concise introduction to those topics and I like very much the outline and contents of this book." Kay Konigsmann Universität Freiburg, Germany "The book provides an introduction to the subject very well suited for the introductory course for physics majors. Presentation is very clear and nicely balances the issues of nuclear and particle physics, exposes both theoretical ideas and modern experimental methods. Presentation is also very economic and one can cover most of the book in a one-semester course. In the second edition, the authors updated the contents to reflect the very recent developments in the theory and experiment. They managed to do it without substantial increase of the size of the book. I used the first edition several times to teach the course 'Introduction to Subatomic Physics' and I am looking forward to use this new edition to teach the course next year." Professor Mark Strikman Pennsylvania State University, USA "This book can be recommended to those who find elementary particle physics of absorbing interest." Contemporary Physics '

[Exploring the Heart of Matter](#) Springer Science & Business Media

The principal goals of the study were to articulate the scientific rationale and objectives of the field and then to take a long-term

strategic view of U.S. nuclear science in the global context for setting future directions for the field. *Nuclear Physics: Exploring the Heart of Matter* provides a long-term assessment of an outlook for nuclear physics. The first phase of the report articulates the scientific rationale and objectives of the field, while the second phase provides a global context for the field and its long-term priorities and proposes a framework for progress through 2020 and beyond. In the second phase of the study, also developing a framework for progress through 2020 and beyond, the committee carefully considered the balance between universities and government facilities in terms of research and workforce development and the role of international collaborations in leveraging future investments. Nuclear physics today is a diverse field, encompassing research that spans dimensions from a tiny fraction of the volume of the individual particles (neutrons and protons) in the atomic nucleus to the enormous scales of astrophysical objects in the cosmos. *Nuclear Physics: Exploring the Heart of Matter* explains the research objectives, which include the desire not only to better understand the nature of matter interacting at the nuclear level, but also to describe the state of the universe that existed at the big bang. This report explains how the universe can now be studied in the most advanced colliding-beam accelerators, where strong forces are the dominant interactions, as well as the nature of neutrinos. *Introduction and History, From the Quantum to Quarks* World Scientific

After the death of Dr. Littlefield it was decided that I should undertake the revision of the whole of *Atomic and Nuclear Physics*: an Introduction for the third edition, and it was soon apparent that major changes were necessary. I am confident that these changes would have had Dr. Littlefield's approval. The prime consideration for the present edition has been to modernize at a minimum cost. As much as possible of the second edition has therefore been retained, but where changes have been made they have been fairly drastic. Thus the chapters on fine structure, wave mechanics, the vector model of the atom, Pauli's principle and the Zeeman effect have been completely restructured. The chapters on nuclear models, cosmic rays, fusion systems and fundamental particles have been brought up to date while a new chapter on charm and the latest ideas on quarks has been included. It is hoped that the presentation of the last named will give readers a

feeling that physics research can be full of adventure and surprises.

The Elegant Universe World Scientific Publishing Company
The Nobel Prize-winning physicist offers a fascinating popular introduction to nuclear physics from early atomic theory to its transformative applications. Theoretical physicist Werner Heisenberg is famous for developing the uncertainty principle, which bears his name, and for his pioneering work in quantum mechanics. A central figure in the development of the atomic bomb and a close colleague of Albert Einstein, Heisenberg wrote *Nuclear Physics* "for readers who, while interested in natural sciences, have no previous training in theoretical physics." Compiled from a series of his lectures on the subject, Heisenberg begins with a short history of atomic physics before delving into the nature of nuclear forces and reactions, the tools of nuclear physics, and its world-changing technical and practical applications. *Nuclear Physics* is an ideal book for general readers interested in learning about some of the most significant scientific breakthroughs of the twentieth century.

Nuclear Materials Science John Wiley & Sons

I have been teaching courses on experimental techniques in nuclear and particle physics to master students in physics and in engineering for many years. This book grew out of the lecture notes I made for these students. The physics and engineering students have rather different expectations of what such a course should be like. I hope that I have nevertheless managed to write a book that can satisfy the needs of these different target audiences. The lectures themselves, of course, need to be adapted to the needs of each group of students. An engineering student will not question a statement like "the velocity of the electrons in atoms is $\approx 1\%$ of the velocity of light", a physics student will. Regarding units, I have written factors h and c explicitly in all equations throughout the book. For physics students it would be preferable to use the convention that is common in physics and omit these constants in the equations, but that would probably be confusing for the engineering students. Physics students tend to be more interested in theoretical physics courses. However, physics is an experimental science and physics students should understand how experiments work, and be able to make experiments work.

Atoms and Photons and Quanta, Oh My! Springer

This is the second book in the "Ask the Physicist" series. The first book, *From Newton to Einstein: Ask the physicist about mechanics and relativity*, provides an excellent foundation for this book that covers topics in 'modern' physics. The main emphasis of this volume is providing an accessible introduction to quantum physics, atomic physics, and nuclear physics to anyone with at least high-school physics knowledge.

Nuclear Science Abstracts CRC Press

Experimental Techniques in High-Energy Nuclear and Particle Physics is a compilation of outstanding technical papers and reviews of the ingenious methods developed for experimentation in modern nuclear and particle physics. This book, a second edition, provides a balanced view of the major tools and technical concepts currently in use, and elucidates the basic principles that underly the detection devices. Several of the articles in this volume have never been published, or have appeared in relatively inaccessible journals. Although the emphasis is on charged-particle tracking and calorimetry, general reviews of ionization detectors and Monte Carlo techniques are also included. This book serves as a compact source of reference for graduate students and experimenters in the fields of nuclear and particle physics, seeking information on some of the major ideas and techniques developed for modern experiments in these fields. Contents: Particle Detectors (K Kleinknecht) Principles of Operation of Multiwire Proportional and Drift Chambers (F Sauli) High-Resolution Electronic Particle Detectors (G Charpak & F Sauli) Calorimetry in High-Energy Physics (C Fabjan) Fluctuations in Calorimetry Measurements (U Amaldi) The Physics of Charged Particle Identification dE/dx , Cerenkov and Transition Radiation (W W M Allison and P R S Wright) A Two-Dimensional, Single-Photoelectron Drift Detector for Cherenkov Ring Imaging (E Barrelet et al.) Development of Proportional Counters Using Photosensitive Gases and Liquids (D F Anderson) Liquid-Argon Ionization Chambers as Total Absorption Detectors (W J Willis & V Radeka) Fundamental Properties of Liquid Argon, Krypton and Xenon as Radiation Detector Media (T Doke) Signal, Noise and Resolution in Position-Sensitive Detectors (V Radeka) Monte Carlo Theory and Practice (F James) High Resolution Hadron Calorimetry (R Wigmans) Readership: Nuclear and particle physicists. keywords: "... this book is well suited for active experimenters in the field who will appreciate very much the exhaustive reference

... the book may well serve as a basis for graduate students courses, particularly in view of the reasonable price of the volume." J. Phys. G: Nucl. Part. Phys.

Introduction to Nuclear Science John Wiley & Sons

Dramatic progress has been made in all branches of physics since the National Research Council's 1986 decadal survey of the field. The Physics in a New Era series explores these advances and looks ahead to future goals. The series includes assessments of the major subfields and reports on several smaller subfields, and preparation has begun on an overview volume on the unity of physics, its relationships to other fields, and its contributions to national needs. Nuclear Physics is the latest volume of the series. The book describes current activity in understanding nuclear structure and symmetries, the behavior of matter at extreme densities, the role of nuclear physics in astrophysics and cosmology, and the instrumentation and facilities used by the field. It makes recommendations on the resources needed for experimental and theoretical advances in the coming decade.

Atomic Physics Vintage

The Book Describes The Basics Of Atomic And Nuclear Physics, Related Phenomena, And The Physics Of Nuclear Reactors And The Instruments And Applications For The Same. The Flow Of The Chapters In The Book Gradually Moves From Atomic Physics, Then To Quantum Physics, And Finally To Nuclear Physics.

Experimental Techniques in High-Energy Nuclear and Particle Physics Student's Guides

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.

Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory National Academies Press

This book is a revised and updated version of the most comprehensive text on nuclear and subnuclear physics, first published in 1995. It maintains the original goal of providing a clear, logical, in-depth, and unifying treatment of modern nuclear theory, ranging from the nonrelativistic many-body problem to the standard model of the strong, electromagnetic, and weak interactions. In addition, new chapters on the theoretical and experimental advances made in nuclear and subnuclear physics in the past decade have been incorporated. Four key topics are emphasized: basic nuclear structure, the relativistic nuclear many-body problem, strong-coupling QCD, and electroweak interactions with nuclei. New chapters have been added on the many-particle shell model, effective field theory, density functional theory, heavy-ion reactions and quark-gluon plasma, neutrinos, and electron scattering. This book is designed to provide graduate students with a basic understanding of modern nuclear and hadronic physics needed to explore the frontiers of the field. Researchers will benefit from the updates on developments and the bibliography.

The Atomic Nucleus Springer Science & Business Media

Discusses the methods of X-ray production.

Nuclear Physics Springer Science & Business Media

A recipient of the PROSE 2017 Honorable Mention in Chemistry & Physics, *Radioactivity: Introduction and History, From the Quantum to Quarks, Second Edition* provides a greatly expanded overview of radioactivity from natural and artificial sources on earth, radiation of cosmic origins, and an introduction to the atom and its nucleus. The book also includes historical accounts of the lives, works, and major achievements of many famous pioneers and Nobel Laureates from 1895 to the present. These leaders in the field have contributed to our knowledge of the science of the atom, its nucleus, nuclear decay, and subatomic particles that are part of our current knowledge of the structure of matter, including the role of quarks, leptons, and the bosons (force carriers). Users will find a completely revised and greatly expanded text that includes all new material that further describes the significant historical events on the topic dating from the 1950s to the present. Provides a detailed account of nuclear radiation – its origin and properties, the atom, its nucleus, and subatomic particles including quarks, leptons, and force carriers (bosons) Includes fascinating biographies of the pioneers in the field, including captivating anecdotes and insights Presents meticulous accounts of experiments and calculations used by pioneers to confirm their findings

Nuclear and Particle Physics Springer Science & Business Media

Introductory Nuclear Physics John Wiley & Sons

X-rays in Atomic and Nuclear Physics CRC Press

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