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Introduction to the Physics of Waves-Tim Freegarde 2012-11-08 Balancing concise mathematical analysis with real-world examples and practical applications, to provide a clear and approachable introduction to wave phenomena.
Introduction to the Physics of Rocks-Yves Guéquen 1994 Finding viable solutions to many of the problems threatening our environment hinges on understanding the rocks below the earth's surface. For those evaluating the relative hazards of radioactive waste sites, investigating energy resources such as oil, gas, and hydrothermal energy, studying the behavior of natural hazards like earthquakes and volcanoes, or charting the flow of groundwater through the earth, this book will be indispensable. Until now, there has been no book that treats the subject of the nature and behavior of rocks in a comprehensive yet accessible manner. Yves Gu□quen and Victor Palciauskas first discuss the physical properties of rocks, proceeding by chapter through mechanical, fluid flow, acoustical, electrical, dielectric, thermal, and magnetic properties. Then they provide the theoretical framework for achieving reliable data and making reasonable inferences about the aggregate system within the earth. Introduction to the Physics of Rocks covers the important and most current theoretical approaches to the physics of inhomogeneous media, including theoretical bounds on properties, various effective medium theories, percolation, and fractals. This book will be of use to students and researchers in civil, petroleum, and environmental engineering and to geologists, geophysicists, hydrologists, and other earth scientists interested in the physics of the earth. Its clear presentation, with problems at the end of each chapter and selective references, will make it ideal for advanced undergraduate-or graduate-level courses.
Introduction to Physics-John D. Cutnell 2015-09-22 Cutnell and Johnson has been the Number one text in the algebra-based physics market for over 20 years. Over 250,000 students have used the book as the equipment they need to build their problem-solving confidence, push their limits, and be successful. The tenth edition continues to offer material to help the development of conceptual understanding, and show the relevance of physics to readers lives and future careers. Helps the reader to first identify the physics concepts, then associate the appropriate mathematical equations, and finally to work out an algebraic solution
Introduction to the Physics of Gyrotrons-Gregory S. Nusinovich 2020-03-03 As unique sources of coherent high-power, microwave, and millimeter-wave radiation, gyrotrons are an essential part of the hunt for controlled fusion. Presently, gyrotrons are actively used for electron cyclotron resonance plasma heating and current drive in various controlled fusion reactors. These sources have been under development in many countries for more than forty years. In spite of their widespread use, however, there is as yet no single book to introduce non-specialists to this vital field. Now Gregory S. Nusinovich, an early pioneer of the gyrotron and widely regarded today as the world's leading authority on the subject, explains the fundamental physical principles upon which gyrotrons and related devices operate. Nusinovich first sets forth some "rules of thumb" that allow readers to understand gyrotron operation in simple terms. He then explores the fundamentals of the general theory of gyrotrons and offers an overview of the various types of gyro-devices, including gyromonotrons, gyroklystrons, gyro-traveling-wave tubes, and gyrotwystrons. He explains not only the theory, linear and nonlinear, but also the practical challenges that users of such devices face. This book will be of interest to undergraduate and graduate students as well as to those who develop gyrotrons or who use them in various applications. It should also appeal to plasma physicists interested in charged-particle dynamics, as well as to applied physicists needing to know more about micro- and millimeter-wave technologies.
Introduction to the Physics of Electron Emission-Kevin L. Jensen 2017-11-29 A practical, in-depth description of the physics behind electron emission physics and its usage in science and technology Electron emission is both a fundamental phenomenon and an enabling component that lies at the very heart of modern science and technology. Written by a recognized authority in the field, with expertise in both electron emission physics and electron beam physics, An Introduction to Electron Emission provides an in-depth look at the physics behind thermal, field, photo, and secondary electron emission mechanisms, how that physics affects the beams that result through space charge and emittance growth, and explores the physics behind their utilization in an array of applications. The book addresses mathematical and numerical methods underlying electron emission, describing where the equations originated, how they are related, and how they may be correctly used to model actual sources for devices using electron beams. Writing for the beam physics and solid state communities, the author explores applications of electron emission methodology to solid state, statistical, and quantum mechanical ideas and concepts related to simulations of electron beams to condensed matter, solid state and fabrication communities. Provides an extensive description of the physics behind four electron emission mechanisms—field, photo, and secondary, and how that physics relates to factors such as space charge and emittance that affect electron beams. Introduces readers to mathematical and numerical methods, their origins, and how they may be correctly used to model actual sources for devices using electron beams Demonstrates applications of electron methodology as well as quantum mechanical concepts related to simulations of electron beams to solid state design and manufacture Designed to function as both a graduate-level text and a reference for research professionals Introduction to the Physics of Electron Emission is a valuable learning tool for postgraduates studying quantum mechanics, statistical mechanics, solid state physics, electron transport, and beam physics. It is also an indispensable resource for academic researchers and professionals who use electron sources, model electron emission, develop cathode technologies, or utilize electron beams.
An Introduction to the Physics of Sports-Vassilos McInnes Spathopoulos 2013-05-08 This book (see, www.physicsandsport.com), written by a university lecturer, presents the physical mechanisms governing a series of popular sports. The author's goal is twofold: on the one hand to give a new perspective on sport, enabling fans, even those with limited scientific knowledge, to gain a better idea of exactly how athletic performances are achieved. On the other hand, the presentation of the basic concepts of physics through sport is an attractive and popular way for the general public to assimilate these concepts. In all the chapters, simulations, specially created for the purpose of the book, complement the theoretical concepts. The simulations are based on mathematical models of sports, one of the key research interests of the author. A course based on the book can be found here: http: //siminars.com/142824414380524388018098/summary/signup.s
Introduction to the Physics of Electrons in Solids-Henri Alloul 2010-12-09 This textbook sets out to enable readers to understand fundamental aspects underlying quantum macroscopic phenomena in solids, primarily through the modern experimental techniques and results. The classic independent-electrons approach for describing the electronic structure in terms of energy bands helps explain the occurrence of metals, insulators and semiconductors. It is underlined that superconductivity and magnetism can only be understood by taking into account the interactions between electrons. The text recounts the experimental observations that have revealed the main properties of the superconductors and were essential to track its physical origin. While fundamental concepts are underlined, those which are required to describe the high technology applications, present or future, are emphasized as well. Problem sets involve experimental approaches and tools which support a practical understanding of the materials and their behaviour.
Introduction to the Physics of Matter-Nicola Manini 2015-01-14 This book offers an up-to-date, compact presentation of basic topics in the physics of matter, from atoms to molecules to solids, including elements of statistical mechanics. The adiabatic separation of the motion of electrons and nuclei in matter and its spectroscopic implications are outlined for molecules and recalled regularly in the study of the dynamics of gases and solids. Numerous experiments are described and more than 160 figures give a clear visual impression of the main concepts. Sufficient detail of mathematical derivations is provided to enable students to follow easily. The focus is on present-day understanding and especially on phenomena fitting various independent-particle models. The historical development of this understanding, and phenomena such as magnetism and superconductivity, where interparticle interactions and nonadiabatic effects play a crucial role, are mostly omitted. A final outlook section stimulates the curiosity of the reader to pursue the study of such advanced topics in graduate courses.
Introduction to Light-Gary Waldman 2002-01-01 Designed for a nonmathematical undergraduate optics course addressed to art majors, this four-part treatment discusses the nature and manipulation of light, vision, and color. Questions at the end of each chapter help test comprehension of material, which is almost completely presented in a nonmathematical manner. 170 black-and-white illustrations. 1983 edition.
An Introduction to the Physics of Particle Accelerators-Mario Conte 2008-04-28 This book provides a concise and coherent introduction to the physics of particle accelerators, with attention being paid to the design of an accelerator for use as an experimental tool. In the second edition, new chapters on spin dynamics of polarized beams as well as instrumentation and measurements are included, with a discussion of frequency spectra and Schottky signals. The additional material also covers quadratic Lie groups and integration highlighting new techniques using Cayley transforms, detailed estimation of collider luminosities, and new problems.
Introduction to the Physics of Diluted Magnetic Semiconductors-Jan A. Gaj 2011-01-12 As materials whose semiconducting properties are influenced by magnetic ions, DMSs are central to the emerging field of spintronics. This volume focuses both on basic physical mechanisms (e.g. carrier-ion and ion-ion interactions), and resulting phenomena.
Introduction to the Physics of Information-James L. Pinfold 2019-01-15 The "Information Paradigm" provides a new unifying fundamental approach to the physical and computation sciences that can be extended to include the biological sciences. The "Information Theory" approach is now at the theoretical cutting edge of these fields. This book provides numerous "everyday" examples of the use of physics of information for advanced undergraduate students, graduate students, postdocs and academics in the field. Areas discussed in the book include the black hole information paradox that is a central issue in cosmology; the effort to produce a useful quantum computer; and the investigation of the role of information and quantum information in the biological sciences.
An Introduction to the Physics of Mass, Length and Time-Norman Feather 1968
Introduction to the Physics of Matter-Nicola Manini
An Introduction to the Physics of Diagnostic Radiology-Edward E. Christensen 1978
Introduction to the Physics and Psychophysics of Music-Juan G. Roederer 2012-12-06
Introduction to the Physics of Electrons in Solids-Brian K. Tanner 1995-03-30 This book aims to introduce the reader to the behaviour of electrons in solids, starting with the simplest possible model, and introducing higher-level models only when the simple model is inadequate. Unlike other solid state physics texts, this book does not begin with complex crystallography, but instead builds up from the simplest possible model of a free electron in a box. The approach is to introduce the subject through its historical development, and to show how quantum mechanics is necessary for an understanding of the properties of electrons in solids. It does not treat the dynamics of the crystal lattice, but proceeds to examine the consequences of collective behaviour in the phenomena of magnetism and superconductivity. Throughout the mathematics is straightforward and uses standard notation. This text is suitable for a second or third year undergraduate course in physics, and would also be suitable for an introductory solid state course in materials science or materials chemistry.
Introduction to Physics in Modern Medicine-Suzanne Amador Kane 2002-11-28 The medical applications of physics are not typically covered in introductory physics courses. Introduction to Physics in Modern Medicine fills that gap by explaining the physical principles behind technologies such as surgical lasers or computed tomography (CT or CAT) scanners. Each chapter includes a short explanation of the scientific background, making this book highly accessible to those without an advanced knowledge of physics. It is intended for medicine and health studies students who need an elementary background in physics, but it also serves well as a non-mathematical introduction to applied physics for undergraduate students in physics, engineering, and other disciplines.
Introduction to the Physics of Cohesive Sediment Dynamics in the Marine Environment-Johan C. Winterwerp 2004-08-20 This book is an introduction to the physical processes of cohesive sediment in the marine environment. It focuses on highly dynamic systems, such as estuaries and coastal seas. Processes on the continental shelf are also discussed and attention is given to the effects of chemistry, biology and gas. The process descriptions are based on hydrodynamic and soil mechanic principles, which integrate at the soil-water interface. This approach is substantiated through a classification scheme of sediment occurrences in which distinction is made between cohesive and granular material. Emphasis is also placed on the important interactions between turbulent flow and cohesive sediment suspensions, and on the impact of flow-induced forces on the stability of the seabed. An overview of literature on cohesive sediment dynamics is presented and a number of new developments are highlighted, in particular in relation to floc formation, settling and sedimentation, consolidation, bed failure and liquefaction and erosion of the bed. Moreover, it presents a summary on methods and techniques to measure the various sediment properties necessary to quantify the various parameters in the physical-mathematical model descriptions. A number of examples and case studies have been included.
Sands, Powders, and Grains-Jacques Duran 2012-12-06 This introductory text develops the fundamental physics of the behavior of granular materials. It covers the basic properties of flow, friction, and fluidization of uniform granular materials; discusses mixing and segregation of heterogeneous materials (the famous "brazil-nut problem"); and concludes with an introduction to numerical models. The presentation begins with simple experiments and uses their results to build concepts and theorems about materials whose behavior is often quite counter-intuitive; presenting in a unified way the background needed to understand current work in the field. Developed for students at the University of Paris, the text will be suitable for advanced undergraduates and beginning graduates; while also being of interest to researchers and engineers just entering the field.
Introduction to the Physics of Nanoelectronics-Seng Ghee Tan 2012-03-28 This book provides an introduction to the physics of nanoelectronics, with a focus on the theoretical aspects of nanoscale devices. The book begins with an overview of the mathematics and quantum mechanics pertaining to nanoscale electronics, to facilitate the understanding of subsequent chapters. It goes on to encompass quantum electronics, spintronics, Hall effects, carbon and graphene electronics, and topological physics in nanoscale devices. Theoretical methodology is developed using quantum mechanical and non-equilibrium Green's function (NEGF) techniques to calculate electronic currents and elucidate their transport properties at the atomic scale. The spin Hall effect is explained and its application to the emerging field of spintronics – where an electron's spin as well as its charge is utilised – is discussed. Topological dynamics and gauge potential are introduced with the relevant mathematics, and their application in nanoelectronic systems is explained. Graphene, one of the most promising carbon-based nanostructures for nanoelectronics, is also explored. Begins with an overview of the mathematics and quantum mechanics pertaining to nanoscale electronics Encompasses quantum electronics, spintronics, Hall effects, carbon and graphene electronics, and topological physics in nanoscale devices Comprehensively introduces topological dynamics and gauge potential with the relevant mathematics, and extensively discusses their application in nanoelectronic systems
Introduction to the Physics of Landslides-Fabio Vittorio de Blasio 2011-05-13 Landslides represent one of the most destructive natural catastrophes. They can reach extremely long distances and velocities, and are capable of wiping out human communities and settlements. Yet landslides have a creative facet as they contribute to the modification of the landscape. They are the consequence of the gravity pull jointly with the tectonic disturbance of our living planet. Landslides are most often studied within a geotechnical and geomorphological perspective. Engineering calculations are traditionally applied to the stability of terrains. In this book, landslides are viewed as a physical phenomenon. A physical understanding of landslides is a basis for modeling and mitigation and for understanding their flow behavior and dynamics. We still know relatively little about many aspects of landslide physics. It is only recently that the field of landslide dynamics is approaching a more mature stage. This is testified by the release of modelling tools for the simulation of landslides and debris flows. In this book the emphasis is placed on the problems at the frontier of landslide research. Each chapter is self-consistent, with questions and arguments introduced from the beginning.
Introduction to Space Physics-Margaret G. Kivelson 1995-04-28 This text provides a comprehensive introduction to space physics.
Introduction to the Physics and Chemistry of Materials-Robert J. Naumann 2008-12-22 Discusses the Structure and Properties of Materials and How These Materials Are Used in Diverse Applications Building on undergraduate students' backgrounds in mathematics, science, and engineering, Introduction to the Physics and Chemistry of Materials provides the foundation needed for more advanced work in materials science. Ideal for a two-semester course, the text focuses on chemical bonding, crystal structure, mechanical properties, phase transformations, and materials processing for the first semester. The material for the second semester covers thermal, electronic, photonic, optical, and magnetic properties of materials. Requiring no prior experience in modern physics and quantum mechanics, the book introduces quantum concepts and wave mechanics through a simple derivation of the Schrödinger equation, the electron-in-a-box problem, and the wave functions of the hydrogen atom. The author also presents a historical perspective on the development of the materials science field. He discusses the Bose–Einstein, Maxwell–Boltzmann, Planck, and Fermi–Dirac distribution functions, before moving on to the various properties and applications of materials. With detailed derivations of important equations, this applications-oriented text examines the structure and properties of materials, such as heavy metal glasses and superconductors. It also explores recent developments in organics electronics, polymer light-emitting diodes, superconductivity, and more.
An Introduction to the Physics of Nuclei and Particles-R. A. Dunlap 2004 Timely and engaging, AN INTRODUCTION TO THE PHYSICS OF NUCLEI AND PARTICLES focuses on one of the most exciting areas of physics. Author Richard Dunlap has taught this course for the last ten years—during the last two of which he used this text successfully in his own classroom. The author designed this text to provide flexibility and freedom for instructors teaching a one-semester course by including a wealth of problems as well as approximately 20% more material than is necessary for the average 14-week course. In order to ensure that the book is up-to-date and interesting for the students, the author has included recent research results whenever possible and has presented data from ongoing experiments. This is particularly relevant for fields in which there is considerable current research activity, such as neutrino masses and oscillations, quark masses and controlled fusion.
The Solid State-H. M. Rosenberg 1995
Introduction to the physics of many-body systems D. Ter Haar-D. Ter Haar 1958
Introduction to the Physics of Highly Charged Ions-Heinrich F. Beyer 2002-12-06 Emphasizing a physical understanding with many illustrations, Introduction to the Physics of Highly Charged Ions covers the major areas of x-ray radiation and elementary atomic processes occurring with highly charged ions in hot laboratory and astrophysical plasmas. Topics include light and ion sources, spectroscopy, atomic structure, magnetic and QED effects, and a thorough look at atomic collisions, from elementary processes in plasmas to ion-surface interaction and hollow atoms. Avoiding unnecessary mathematical details, this book is accessible to a broad range of readers, including graduate students and researchers.
Introduction to the Physics of the Earth's Interior-Jean-Paul Poirier 2000-03-02 Introduction to the Physics of the Earth's Interior describes the structure, composition and temperature of the deep Earth in one comprehensive volume. This new edition of a successful textbook has been enlarged and fully updated, taking into account the considerable experimental and theoretical progress recently made in understanding the inner structure of the Earth. Like the first edition, this will be a useful textbook for graduate and advanced undergraduate students in geophysics and mineralogy. It will also be of great value to researchers in earth sciences, physics and materials sciences.
An Introduction to the Physics of High Energy Accelerators-D. A. Edwards 2008-11-20 The first half deals with the motion of a single particle under the influence of electronic and magnetic fields. The basic language of linear and circular accelerators is developed. The principle of phase stability is introduced along with phase oscillations in linear accelerators and synchrotrons. Presents a treatment of betatron oscillations followed by an excursion into nonlinear dynamics and its application to accelerators. The second half discusses intensity dependent effects, particularly space charge and coherent instabilities. Includes tables of parameters for a selection of accelerators which are used in the numerous problems provided at the end of each chapter.
The Physics of Particle Accelerators-Klaus Wille (prof.) 2000 The complex technology of particle accelerators is based upon a series of often rather simple physical concepts. This comprehensive introduction to the subject focuses on providing a deep physical understanding of these key ideas. The book surveys the many aspects of accelerator physics andnot only explains how accelerators work, but also why the underlying physics leads to a particular choice of design or technique, and points out the limitations of the technology. The clear and thorough mathematical treatment always emphasizes the physical principles described by the equations, andincludes a range of calculations which develop a genuine feeling for the quantities and concepts involved.
Christensen's Physics of Diagnostic Radiology-Thomas S. Curry 1990 The Fourth Edition of this text provides a clear understanding of the physics principles essential to getting maximum diagnostic value from the full range of current and emerging imaging technologies. Updated material added in areas such as x-ray generators (solid-state devices), xerography (liquid toner), CT scanners (fast-imaging technology) and ultrasound (color Doppler).
Noise and Fluctuations-D. K. C. MacDonald 2013-01-23 An understanding of fluctuations and their role is both useful and fundamental to the study of physics. This concise study of random processes offers graduate students and research physicists a survey that encompasses both the relationship of Brownian Movement with statistical mechanics and the problem of irreversible processes. It outlines the basics of the physics involved, without the strictures of mathematical rigor. The three-part treatment starts with a general survey of Brownian Movement, including electrical Brownian Movement and "shot-noise," Part two explores correlation, frequency spectrum, and distribution function, with particular focus on application to Brownian Movement. The final section examines noise in electric currents, including noise in vacuum tubes and a random rectangular current. Frequent footnotes amplify the text, along with an extensive selection of Appendixes.
Exam Prep for: An Introduction to the Physics of ...-
Christensen's Introduction to the Physics of Diagnostic Radiology-Edward E. Christensen 1984
An Introduction to the Physics of Metals and Alloys-Walter Boas 1947 Based on the author's lectures presented at the University of Melbourne Campion Collection.
An Introduction to Acoustics-Robert H. Randall 2012-11-21 Undergraduate-level text examines waves in air and in three dimensions, interference patterns and diffraction, and acoustic impedance, as illustrated in the behavior of horns. 1951 edition.
Introduction to Environmental Physics-Peter Hughes 2001-05-29 The changing climate and its affect on all of us is becoming increasingly apparent - ozone depletion, hurricanes, floods and extreme weather behaviour. Introduction to Environmental Physics challenges the way we think about how and why environmental change occurs. This authoritative book aims to cover some of the more common and popular topics addressed in "physics of the earth", "physics of the environment" and "environmental physics" courses. It provides an essentially non- mathematical treatment suitable for a first year undergraduate level course. The principle topics covered are the physics of the built environment, the physics of human survival, energy for living, environmental health, revealing the planet, the sun and the atmosphere, the biosphere, the global climate and climate change. With contributions from well-respected experts on the subject, this textbook contains a summary, references and questions at the end of each chapter. This is an ideal textbook for first year undergraduates in a variety of courses, particularly physical geography, physics, environmental and earth science, with worked examples illustrating principles and vignettes from scientists who have made a significant contribution to the field enlightening the student along the way. As the authors say in the preface to this book, "At the outset of the 21st century there are many environmental challenges to be wrestled with, and though the environment is changing, the Physics is not!"
Introduction to the Physics of Free Electron Laser and Comparison with Conventional Laser Sources-G. Dattoli 2012 Introduction to the Physics of Free Electron Laser and Comparison with Conventional Laser Sources.
Introduction To The Physics and Techniques of Remote Sensing-Charles Elachi 2006-05-11 The science and engineering of remote sensing--theory andapplications The Second Edition of this authoritative book offers readers theessential science and engineering foundation needed to understandremote sensing and apply it in real-world situations. Thoroughlyupdated to reflect the tremendous technological leaps made sincethe publication of the first edition, this book covers the gamut ofknowledge and skills needed to work in this dynamic field,including: * Physics involved in wave-matter interaction, the building blocksfor interpreting data * Techniques used to collect data * Remote sensing applications The authors have carefully structured and organized the book tointroduce readers to the basics, and then move on to more advancedapplications. Following an introduction, Chapter 2 sets forth thebasic properties of electromagnetic waves and their interactionswith matter. Chapters 3 through 7 cover the use of remote sensingin solid surface studies, including oceans. Each chapter covers onemajor part of the electromagnetic spectrum (e.g., visible/nearinfrared, thermal infrared, passive microwave, and activemicrowave). Chapters 8 through 12 then cover remote sensing in the study ofatmospheres and ionospheres. Each chapter first presents the basicinteraction mechanism, followed by techniques to acquire, measure,and study the information, or waves, emanating from the mediumunder investigation. In most cases, a specific advanced sensor isused for illustration. The book is generously illustrated with fifty percent new figures.Numerous illustrations are reproduced in a separate section ofcolor plates. Examples of data acquired from spaceborne sensors areincluded throughout. Finally, a set of exercises, along with asolutions manual, is provided. This book is based on an upper-level undergraduate and first-yeargraduate course taught by the authors at the California Instituteof Technology. Because of the multidisciplinary nature of the fieldand its applications, it is appropriate for students in electricalengineering, applied physics, geology, planetary science,astronomy, and aeronautics. It is also recommended for any engineeror scientist interested in working in this exciting field.

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