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Solid State Physics-Neil W. Ashcroft 2011

Solid State Physics-Neil Ashcroft 2020-10

The Oxford Solid State Basics-Steven H. Simon 2013-06-20 This is a first undergraduate textbook in Solid State Physics or Condensed Matter Physics. While most textbooks on the subject are extremely dry, this book is written to be much more exciting, inspiring, and entertaining.

Solid State Theory-Walter A. Harrison 2012-04-30 DIVThorough, modern study of solid state physics; solid types and symmetry, electron states, electronic properties

and cooperative phenomena. /div

Introduction to Solid State Physics-Charles Kittel 1962

Solid State Physics-J. S. Blakemore 1985-12-12 Updated to reflect recent work in the field, this book emphasizes crystalline solids, going from the crystal lattice to the ideas of reciprocal space and Brillouin zones, and develops these ideas for lattice vibrations, for the theory of metals, and for semiconductors. The theme of lattice periodicity and its varied consequences runs through eighty percent of the book. Other sections deal with major aspects of solid state physics controlled by other phenomena: superconductivity, dielectric and magnetic properties, and magnetic resonance.

Boojums All the Way Through-N. David Mermin 1990-03-15 Boojums All the Way Through is a collection of essays that deals in a variety of ways with the problem of communicating modern physics to both physicists and non-physicists. The author is Professor David Mermin, a well-known theoretical physicist, who recently won the first Julius Edgar Lileinfeld prize of the American Physical Society 'for his remarkable clarity and wit as a lecturer to nonspecialists on difficult subjects'. David Mermin's wry humour is clearly apparent in most of these articles, but even those that are more serious are characterized by a liveliness and commitment to finding startlingly simple ways of presenting ideas that are traditionally regarded as complex. This book will appeal to physicists at all levels, to mathematicians, scientists and engineers, and indeed to anyone who enjoys reading non-technical accounts of new ways of looking at modern science.

Introduction to the Physics of Electrons in Solids-Brian K. Tanner 1995-03-30 Unlike other solid state physics texts, this work does not begin with complex crystallography, but

instead progresses from the simplest possible model of a free electron in a box.

It's About Time-N. David Mermin 2009-07-06 In It's About Time, N. David Mermin asserts that relativity ought to be an important part of everyone's education--after all, it is largely about time, a subject with which all are familiar. The book reveals that some of our most intuitive notions about time are shockingly wrong, and that the real nature of time discovered by Einstein can be rigorously explained without advanced mathematics. This readable exposition of the nature of time as addressed in Einstein's theory of relativity is accessible to anyone who remembers a little high school algebra and elementary plane geometry. The book evolved as Mermin taught the subject to diverse groups of undergraduates at Cornell University, none of them science majors, over three and a half decades. Mermin's approach is imaginative, yet accurate and complete. Clear, lively, and informal, the book will appeal to intellectually curious readers of all kinds, including even professional physicists, who will be intrigued by its highly original approach.

Condensed Matter Physics-Michael P. Marder 2010-11-17 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.

Advanced Solid State Physics-Philip Phillips 2019-03-08 Solid state physics continues to be the most rapidly growing subdiscipline in physics. As a result, entering graduate students wishing to pursue research in this field face the daunting task of not only mastering the old topics but also gaining competence in the problems of current interest, such as the fractional quantum Hall effect, strongly correlated electron systems, and quantum phase transitions. This book is written to serve the needs of such students. I have attempted in this book to present some of the standard topics in a way that makes it possible to move smoothly to current material. Hence, all the interesting topics are not presented at the end of the book. For example, immediately after the first 50 pages, Anderson's analysis of local magnetic moments is presented as an application of Hartree-Fock theory; this affords a discussion of the relationship with the Kondo model and how scaling ideas can be used to uncloak low-energy physics. As the key

problems of current interest in solid state involve some aspects of electron-electron interactions or disorder or both, I have focused on the archetypal problems in which such physics is central. However, only those problems in which there is a consensus view are discussed extensively. In addition, I have placed the emphasis on physics rather than on techniques. Consequently, I focus on a clear presentation of the phenomenology along with a pedagogical derivation of the relevant equations. A key goal of the detailed derivations is to make it possible for the students who have read this book to immediately comprehend research papers on related topics. A key omission in this book is magnetism beyond the Stoner criterion and local magnetic moments. This omission has arisen primarily because the topic is adequately treated in the book by Assa Auerbach.

Solid State Physics-László Mihály 2009-02-24 The ideal companion in condensed matter physics - now in new and revised edition. Solving homework problems is the single most effective way for students to familiarize themselves with the language and details of solid state physics. Testing problem-solving ability is the best means at the professor's disposal for measuring student progress at critical points in the learning process. This book enables any instructor to supplement end-of-chapter textbook assignments with a large number of challenging and engaging practice problems and discover a host of new ideas for creating exam questions. Designed to be used in tandem with any of the excellent textbooks on this subject, Solid State Physics: Problems and Solutions provides a self-study approach through which advanced undergraduate and first-year graduate students can develop and test their skills while acclimating themselves to the demands of the discipline. Each problem has been chosen for its ability to illustrate key concepts, properties, and systems, knowledge of which is crucial in developing a complete

understanding of the subject, including: * Crystals, diffraction, and reciprocal lattices. * Phonon dispersion and electronic band structure. * Density of states. * Transport, magnetic, and optical properties. * Interacting electron systems. * Magnetism. * Nanoscale Physics.

Principles of the Theory of Solids-J. M. Ziman 1979-11-29 Professor Ziman's classic textbook on the theory of solids was first pulished in 1964. This paperback edition is a reprint of the second edition, which was substantially revised and enlarged in 1972. The value and popularity of this textbook is well attested by reviewers' opinions and by the existence of several foreign language editions, including German, Italian, Spanish, Japanese, Polish and Russian. The book gives a clear exposition of the elements of the physics of perfect crystalline solids. In discussing the principles, the author aims to give students an appreciation of the conditions which are necessary for the appearance of the various phenomena. A self-contained mathematical account is given of the simplest model that will demonstrate each principle. A grounding in quantum mechanics and knowledge of elementary facts about solids is assumed. This is therefore a textbook for advanced undergraduates and is also appropriate for graduate courses.

Principles of Condensed Matter Physics-P. M. Chaikin 2000-09-28 Now in paperback, this book provides an overview of the physics of condensed matter systems. Assuming a familiarity with the basics of quantum mechanics and statistical mechanics, the book establishes a general framework for describing condensed phases of matter, based on symmetries and conservation laws. It explores the role of spatial dimensionality and microscopic interactions in determining the nature of phase transitions, as well as discussing the structure and properties of materials with

different symmetries. Particular attention is given to critical phenomena and renormalization group methods. The properties of liquids, liquid crystals, quasicrystals, crystalline solids, magnetically ordered systems and amorphous solids are investigated in terms of their symmetry, generalised rigidity, hydrodynamics and topological defect structure. In addition to serving as a course text, this book is an essential reference for students and researchers in physics, applied physics, chemistry, materials science and engineering, who are interested in modern condensed matter physics.

INTRODUCTION TO SOLID STATE PHYSICS, 7TH ED-Kittel 2007 Market_Desc: · Physicists· Engineers· Senior and Graduate Level Students of Solid State Physics· Professors of Solid State Physics Special Features: · Kittel is a world authority in solid state physics· Known to the physics community as the definitive work on solid state physics About The Book: This is an updated edition of the definitive text in Solid State Physics. Solid State Physics is concerned with the properties that result from the distribution of electrons in metals, semiconductors, and insulators. The book also demonstrates how the changes and imperfections of real solids can be understood with simple models.

Solid State Physics-Neil W. Ashcroft 2016-06-30 This 35 chapter, revised edition of Ashcroft and Mermin's Solid State Physics (1976) maintains its predecessor's style whilst covering novel developments in the field of solid state physics. Regarding electronic structure, density functional theory's inclusion completes the description of the many-body electronic theory of crystals. The theory of harmonic crystal and superconductivity are similarly augmented. New chapters on semiconductor devices, piezoelectricity, applied magnetism, spintronics, and the Quantum Hall effect have been added. Various kinds of characterization methods of solids, including diffraction

methods, are introduced in the beginning and the end chapters of the book. This book inherits the merit of the first edition, and endeavors to serve better all readers who are interested in solid state physics and related fundamentals in the physical science of high technology.

Solid State Physics-Mircea S. Rogalski 2000-05-30 Solid State Physics opens with the adiabatic approximation to the many-body problem of a system of ions and valence electrons. After chapters on lattice symmetry, structure and dynamics, it then proceeds with four chapters devoted to the single-electron theory of the solid state. Semiconductors and dielectrics are covered in depth and chapters on m

The Physics of Solids-John B. Ketterson 2016-05-19 This comprehensive text covers the basic physics of the solid state starting at an elementary level suitable for undergraduates but then advancing, in stages, to a graduate and advanced graduate level. In addition to treating the fundamental elastic, electrical, thermal, magnetic, structural, electronic, transport, optical, mechanical and compositional properties, we also discuss topics like superfluidity and superconductivity along with special topics such as strongly correlated systems, high-temperature superconductors, the quantum Hall effects, and graphene. Particular emphasis is given to so-called first principles calculations utilizing modern density functional theory which for many systems now allow accurate calculations of the electronic, magnetic, and thermal properties.

Elements of Advanced Quantum Theory-J. M. Ziman 1969 This textbook gives a connected mathematical derivation of the important mathematical results, concentrating on the central ideas without including elaborate detail or unnecessary rigour, and explaining in the simplest terms the symbols and concepts which confront the researcher in solid state,

nuclear or high-energy physics.

Elementary Solid State Physics-M. Ali Omar 1975

Solid-State Physics for Electronics-Andre Moliton 2013-03-01 Describing the fundamental physical properties of materials used in electronics, the thorough coverage of this book will facilitate an understanding of the technological processes used in the fabrication of electronic and photonic devices. The book opens with an introduction to the basic applied physics of simple electronic states and energy levels. Silicon and copper, the building blocks for many electronic devices, are used as examples. Next, more advanced theories are developed to better account for the electronic and optical behavior of ordered materials, such as diamond, and disordered materials, such as amorphous silicon. Finally, the principal quasi-particles (phonons, polarons, excitons, plasmons, and polaritons) that are fundamental to explaining phenomena such as component aging (phonons) and optical performance in terms of yield (excitons) or communication speed (polarons) are discussed.

Solid State Physics-Frederick Seitz 1975-01-01

Solid-State Physics-James Patterson 2010-12-08 While the standard solid state topics are covered, the basic ones often have more detailed derivations than is customary (with an empasis on crystalline solids). Several recent topics are introduced, as are some subjects normally included only in condensed matter physics. Lattice vibrations, electrons, interactions, and spin effects (mostly in magnetism) are discussed the most comprehensively. Many problems are included whose level is from "fill in the steps" to long and challenging, and the text is equipped with references and several comments about experiments with figures and tables.

Band Theory and Electronic Properties of Solids-John Singleton 2001-08-30 This book provides an introduction to band theory and the electronic properties of materials at a level suitable for final-year undergraduates or first-year graduate students. It sets out to provide the vocabulary and quantum-mechanical training necessary to understand the electronic, optical and structural properties of the materials met in science and technology and describes some of the experimental techniques which are used to study band structure today. In order to leave space for recent developments, the Drude model and the introduction of quantum statistics are treated synoptically. However, Bloch's theorem and two tractable limits, a very weak periodic potential and the tight-binding model, are developed rigorously and in three dimensions. Having introduced the ideas of bands, effective masses and holes, semiconductor and metals are treated in some detail, along with the newer ideas of artificial structures such as super-lattices and quantum wells, layered organic substances and oxides. Some recent `hot topics' in research are covered, e.g. the fractional Quantum Hall Effect and nano-devices, which can be understood using the techniques developed in the book. In illustrating examples of e.g. the de Haas-van Alphen effect, the book focuses on recent experimental data, showing that the field is a vibrant and exciting one. References to many recent review articles are provided, so that the student can conduct research into a chosen topic at a deeper level. Several appendices treating topics such as phonons and crystal structure make the book self-contained introduction to the fundamentals of band theory and electronic properties in condensed matter physic today.

Modélisation et simulation du mouvement naturel humain-Olivier Coppin 1992

Cette étude s'insère dans le cadre du projet FAERIE qui a pour but la réalisation d'une fonction d'ergonomie physiologique dans un système C.F.A.O. Cette fonction vise à simuler le comportement de l'Homme dans son environnement. L'un des principaux aspects du comportement est le mouvement. La présente étude analyse les différents problèmes liés au mouvement et propose une approche originale. L'accent est mis sur la réalisation d'un mouvement et particulièrement sur le délicat problème du naturel. Les différents modèles utilisés sont présentés et les conditions de leur généralisation sont étudiés. L'aboutissement de cette approche est une synthèse du mouvement naturel. La génération de mouvement constitue la base de l'outil d'évaluation ergonomique proposé. Il est alors possible d'évaluer les dépenses musculaires, energétiques,... qui sont nécessaires à l'exécution d'un mouvement. Des notions telles que la fatigue et le confort peuvent être appréhendées. Une attention particulière a été portée sur la facilité d'utilisation de la fonction réalisée. Son emploi ne doit pas requérir de connaissances ergonomiques particulières. L'intégration de cet outil au système C.F.A.O constitue alors un atout majeur pour la prise en compte des contraintes ergonomiques pendant la conception.

Solid State Physics-
Giuseppe Grosso 2013-10-17
Solid State Physics is a textbook for students of physics, material science, chemistry, and engineering. It is the state-of-the-art presentation of the theoretical foundations and application of the quantum structure of matter and materials. This second edition provides timely coverage of the most important scientific breakthroughs of the last decade (especially in low-dimensional systems and quantum transport). It helps build readers' understanding of the newest advances in condensed matter physics with rigorous yet clear mathematics. Examples are an integral part of the text, carefully designed to apply

the fundamental principles illustrated in the text to currently active topics of research. Basic concepts and recent advances in the field are explained in tutorial style and organized in an intuitive manner. The book is a basic reference work for students, researchers, and lecturers in any area of solid-state physics. Features additional material on nanostructures, giving students and lecturers the most significant features of low-dimensional systems, with focus on carbon allotropes Offers detailed explanation of dissipative and nondissipative transport, and explains the essential aspects in a field, which is commonly overlooked in textbooks Additional material in the classical and quantum Hall effect offers further aspects on magnetotransport, with particular emphasis on the current profiles Gives a broad overview of the band structure of solids, as well as presenting the foundations of the electronic band structure. Also features reported with new and revised material, which leads to the latest research

Solid State Physics-Philip Hofmann 2015-05-19 A must-have textbook for any undergraduate studying solid state physics. This successful brief course in solid state physics is now in its second edition. The clear and concise introduction not only describes all the basic phenomena and concepts, but also such advanced issues as magnetism and superconductivity. Each section starts with a gentle introduction, covering basic principles, progressing to a more advanced level in order to present a comprehensive overview of the subject. The book is providing qualitative discussions that help undergraduates understand concepts even if they can?t follow all the mathematical detail. The revised edition has been carefully updated to present an up-to-date account of the essential topics and recent developments in this exciting field of physics. The coverage now includes ground-breaking materials with high relevance for applications in communication and energy, like graphene and topological insulators, as well

as transparent conductors. The text assumes only basic mathematical knowledge on the part of the reader and includes more than 100 discussion questions and some 70 problems, with solutions free to lecturers from the Wiley-VCH website. The author's webpage provides Online Notes on x-ray scattering, elastic constants, the quantum Hall effect, tight binding model, atomic magnetism, and topological insulators. This new edition includes the following updates and new features: * Expanded coverage of mechanical properties of solids, including an improved discussion of the yield stress * Crystal structure, mechanical properties, and band structure of graphene * The coverage of electronic properties of metals is expanded by a section on the quantum hall effect including exercises. New topics include the tight-binding model and an expanded discussion on Bloch waves. * With respect to semiconductors, the discussion of solar cells has been extended and improved. * Revised coverage of magnetism, with additional material on atomic magnetism * More extensive treatment of finite solids and nanostructures, now including topological insulators * Recommendations for further reading have been updated and increased. * New exercises on Hall mobility, light penetrating metals, band structure

Atomic and Electronic Structure of Solids- Efthimios Kaxiras 2003-01-09 Graduate-level textbook for physicists, chemists and materials scientists.

Solid State Properties- Mildred Dresselhaus 2018-01-17 This book fills a gap between many of the basic solid state physics and materials sciencebooks that are currently available. It is written for a mixed audience of electricalengineering and applied physics students who have some knowledge of elementaryundergraduate quantum mechanics and statistical mechanics. This book, based on asuccessful

course taught at MIT, is divided pedagogically into three parts: (I) ElectronicStructure, (II) Transport Properties, and (III) Optical Properties. Each topic is explainedin the context of bulk materials and then extended to low-dimensional materials whereapplicable. Problem sets review the content of each chapter to help students to understandthe material described in each of the chapters more deeply and to prepare them to masterthe next chapters.

Optical Properties of Solids-F. Abelès 1972

Modern Condensed Matter Physics-Steven M. Girvin 2019-02-28 Comprehensive and accessible coverage from the basics to advanced topics in modern quantum condensed matter physics.

The Nature of Solids-Alan Holden 1992-01-01 Unusually clear, accessible introduction to contemporary theories of solid-state physics. Nonmathematical treatment of heat, atomic motion, electrons in solids, many other topics. "Excellent." — Choice. 1965 edition.

Solid State Physics-John J. Quinn 2009-09-18 Intended for a two semester advanced undergraduate or graduate course in Solid State Physics, this treatment offers modern coverage of the theory and related experiments, including the group theoretical approach to band structures, Moessbauer recoil free fraction, semi-classical electron theory, magnetoconductivity, electron self-energy and Landau theory of Fermi liquid, and both quantum and fractional quantum Hall effects. Integrated throughout are developments from the newest semiconductor devices, e.g. space charge layers, quantum wells and superlattices. The first half includes all material usually covered in the introductory course, but in greater depth than most introductory textbooks. The second half includes most of the

important developments in solid-state researches of the past half century, addressing e.g. optical and electronic properties such as collective bulk and surface modes and spectral function of a quasiparticle, which is a basic concept for understanding LEED intensities, X ray fine structure spectroscopy and photoemission. So both the fundamental principles and most recent advances in solid state physics are explained in a class-tested tutorial style, with end-of-chapter exercises for review and reinforcement of key concepts and calculations.

Quantum Theory of Solids-Charles Kittel 1963 The object of this textbook is to present the central principles of the quantum theory of solids to theoretical physicists generally and to those experimental solid state physicists who have had a one year course in quantum mechanics.

A History of the Work Concept-Agamenon R. E. Oliveira 2013-11-19 This book traces the history of the concept of work from its earliest stages and shows that its further formalization leads to equilibrium principle and to the principle of virtual works, and so pointing the way ahead for future research and applications. The idea that something remains constant in a machine operation is very old and has been expressed by many mathematicians and philosophers such as, for instance, Aristotle. Thus, a concept of energy developed. Another important idea in machine operation is Archimedes' lever principle. In modern times the concept of work is analyzed in the context of applied mechanics mainly in Lazare Carnot mechanics and the mechanics of the new generation of polytechnical engineers like Navier, Coriolis and Poncelet. In this context the word "work" is finally adopted. These engineers are also responsible for the incorporation of the concept of work into the discipline of economics when they endeavoured to combine the study of the work of machines and men together.

Introduction to Solid State Physics and Crystalline Nanostructures-Giuseppe Iadonisi 2014-06-13 This textbook provides conceptual, procedural, and factual knowledge on solid state and nanostructure physics. It is designed to acquaint readers with key concepts and their connections, to stimulate intuition and curiosity, and to enable the acquisition of competences in general strategies and specific procedures for problem solving and their use in specific applications. To these ends, a multidisciplinary approach is adopted, integrating physics, chemistry, and engineering and reflecting how these disciplines are converging towards common tools and languages in the field. Each chapter discusses essential ideas before the introduction of formalisms and the stepwise addition of complications. Questions on everyday manifestations of the concepts are included, with reasoned linking of ideas from different chapters and sections and further detail in the appendices. The final section of each chapter describes experimental methods and strategies that can be used to probe the phenomena under discussion. Solid state and nanostructure physics is constantly growing as a field of study where the fascinating quantum world emerges and otherwise imaginary things can become real, engineered with increasing creativity and control: from tinier and faster technologies realizing quantum information concepts, to understanding of the fundamental laws of Physics. Elements of Solid State Physics and of Crystalline Nanostructures will offer the reader an enjoyable insight into the complex concepts of solid state physics.

Condensed Matter in a Nutshell-Gerald D. Mahan 2011 An introduction to the area of condensed matter in a nutshell. This textbook covers the standard topics, including crystal structures, energy bands, phonons, optical properties, ferroelectricity,

superconductivity, and magnetism.

The Solid State-H. M. Rosenberg 1995

The Solid State-André Guinier 1989 Updated translation from the French of a work first published in 1987, and intended as a sequel to the principal author's The structure of matter: from the blue sky to liquid crystals (1984). Intended to engage the interest of undergraduates and general readers, the book treats (in five chapters) the thermal, electrical, magnetic and mechanical properties of solids, and (in the final chapter) diffusion. Cleanly written and nicely illustrated descriptive text, with all mathematical material confined to boxes that some readers might want to omit in their entirety. (NW) Annotation copyrighted by Book News, Inc., Portland, OR

Polarized Electrons In Surface Physics-R Feder 1986-01-01 Contents:Theoretical Foundation:Electronic and Magnetic Structure of Solid Surfaces (A J Freeman, C L Fu, S Ohnishi & M Weinert)Ferromagnetism of Transition Metals at Finite Temperatures (H Capellmann)Critical Behaviour at Surfaces of Ferromagnets (K Binder)Principles and Theory of Electron Scattering and Photoemission (R Feder)Experiments and Results:Sources and Detectors for Polarized Electrons (J Kirschner)Elastic Spin-Polarized Low Energy Electron Diffraction from Non-Magnetic Surfaces (F B Dunning & G K Walters)Elastic Spin-Polarized Low-Energy Electron Scattering from Magnetic Surfaces (U Gradmann & S F Alvarad)Inelastic Electron Scattering by Ferromagnets (J Kirschner)Spin Polarized Secondary Electron Emission from Ferromagnets (M Landolt)Spin Polarized Photoemission by Optical Spin Orientation in Semiconductors (F Meier)Adsorbates (U Heinzmann & G

Schonhense)Spin- and Angle-Resolved Photoemission from Ferromagnets (E Kisker)Spin Dependent Inverse Photoemission from Ferromagnets (V Dose & M Glöbl)Photoemission and Bremsstrahlung from Fe and Ni: Theoretical Results and Analysis of Experimental Data (R Clauberg & R Feder)Polarized Electrons in Surface Physics: Outlook (M Campagna) Readership: Graduate students and researchers interested in surface physics.