From Ashcroft And Mermin Solid State Physics

Demonstrates how anyone in math, science, and engineering canmaster DFT calculations Density functional theory (DFT) is one of the most frequentlyused computational tools for studying and predicting the propertiesof isolated molecules, bulk solids, and material interfaces,including surfaces. Although the theoretical underpinnings of DFTare quite complicated, this book demonstrates that the basicconcepts underlying the calculations are simple enough to beunderstood by anyone with a background in chemistry, physics,engineering, or mathematics. The authors show how the widespreadavailability of powerful DFT codes makes it possible for studentsand researchers to apply this important computational technique toa broad range of fundamental and applied problems. Density Functional Theory: A Practical Introductionoffers a concise, easy-to-follow introduction to the key conceptsand practical applications of DFT, focusing on plane-wave DFT. Theauthors have many years of experience introducing DFT to studentsfrom a variety of backgrounds. The book therefore offers severalfeatures that have proven to be helpful in enabling students tomaster the subject, including: Problem sets in each chapter that give readers the opportunityto test their knowledge by performing their own calculations Worked examples that demonstrate how DFT calculations are usedto solve real-world problems Further readings listed in each chapter enabling readers toinvestigate specific topics in greater depth This text is written at a level suitable for individuals from avariety of scientific, mathematical, and engineering backgrounds.No previous experience working with DFT calculations is needed.

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 Gl ö bl)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.

In addition to the topics discussed in the First Edition, this Second Edition contains introductory treatments of superconducting materials and of ferromagnetism. I think the book is now more balanced because it is divided perhaps 60% - 40% between devices (of all kinds) and materials (of all kinds). For the physicist interested in solid state applications, I suggest that this ratio is reasonable. I

have also rewritten a number of sections in the interest of (hopefully) increased clarity. The aims remain those stated in the Preface to the First Edition; the book is a survey of the physics of a number of solid state devices and ma terials. Since my object is a discussion of the basic ideas in a number of fields, I have not tried to present the "state of the art," especially in semi conductor devices. Applied solid state physics is too vast and rapidly changing to cover completely, and there are many references available to recent developments. For these reasons, I have not treated a number of interesting areas. Among the lacunae are superiattices, heterostructures, compound semiconductor devices, ballistic transistors, integrated optics, and light wave communications. (Suggested references to those subjects are given in an appendix.) I have tried to cover some of the recent revolutionary developments in superconducting materials.

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.

Advanced Condensed Matter Physics

Boojums All the Way Through

Density Functional Theory

From Bulk to Nano

Comets, Popular Culture, and the Birth of Modern Cosmology

These lecture notes constitute a course on a number of central concepts of solid state physics ? classification of solids, band theory, the developments in one-electron band theory in the presence of perturbation, effective Hamiltonian theory, elementary excitations and the various types of collective elementary excitation (excitons, spin waves and phonons), the Fermi liquid, ferromagnetic spin waves, antiferromagnetic spin waves and the theory of broken symmetry.The book can be used in conjunction with a survey course in solid state physics, or as the basis of a first graduate-level course. It can be read by anyone who has had basic grounding in quantum mechanics.

DIVThorough, modern study of solid state physics; solid types and symmetry, electron

states, electronic properties and cooperative phenomena. /div

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.

This book provides an introduction to the field of solid state physics for undergraduate students in physics, chemistry, engineering, and materials science.

Physics of Condensed Matter

Revised Edition

Principles of the Theory of Solids

Introduction to the Theory

A Practical Introduction

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.

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.

In a lively investigation into the boundaries between popular culture and early-modern science, Sara Schechner presents a case study that challenges the view that rationalism was at odds with popular belief in the development of scientific theories. Schechner Genuth delineates the evolution of people's understanding of comets, showing that until the seventeenth century, all members of society dreaded comets as heaven-sent portents of plague, flood, civil disorder, and other calamities. Although these beliefs became spurned as "vulgar superstitions" by the elite before the end of the century, she shows that they were nonetheless absorbed into the science of Newton and Halley, contributing to their theories in subtle yet profound ways. Schechner weaves together many strands of thought: views of comets as signs and causes of social and physical changes; vigilance toward monsters and prodigies as indicators of God's will; Christian eschatology; scientific interpretations of Scripture; astrological prognostication and political propaganda; and celestial mechanics and astrophysics. This exploration of the interplay between high and low beliefs about nature leads to the conclusion that popular and long-held views of comets as divine signs were not overturned by astronomical discoveries. Indeed, they became part of the foundation on which modern cosmology was built.

A self-contained guide to the Physics GRE, reviewing all of the topics covered alongside three practice exams with fully worked solutions.

Conquering the Physics GRE

Understanding Einstein's Relativity

Elementary Solid State Physics

Concepts in Solids

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.

Publisher Description

Written in the perspective of an experimental chemist, this book puts together some fundamentals from chemistry, solid state physics and quantum chemistry, to help with understanding and predicting the electronic and optical properties of organic semiconductors, both polymers and small molecules. The text is intended to assist graduate students and researchers in the field of organic electronics to use theory to design more efficient materials for organic electronic devices such as organic solar cells, light emitting diodes and field effect transistors. After addressing some basic topics in solid state physics, a comprehensive introduction to molecular orbitals and band theory leads to a description of computational methods based on Hartree-Fock and density functional theory (DFT), for predicting geometry conformations, frontier levels and energy band structures. Topological defects and transport and optical properties are then addressed, and one of the most commonly used transparent conducting polymers, PEDOT:PSS, is described in some detail as a case study.

This revised and updated Fourth Edition of the text builds on the strength of previous edition and gives a systematic and clear exposition of the fundamental principles of solid state physics. The text covers the topics, such as crystal structures and chemical bonds, semiconductors, dielectrics, magnetic materials, superconductors, and nanomaterials. What distinguishes this text is the clarity and precision with which the author discusses the principles of physics, their relations as well as their applications. With the introduction of new sections and additional information, the fourth edition should prove highly useful for the students. This book is designed for the courses in solid state physics for B.Sc. (Hons.) and M.Sc. students of physics. Besides, the book would also be useful to the students of chemistry, material science, electrical/electronic and allied engineering disciplines. New to the Fourth Edition • Solved examples have been introduced to explain the fundamental principles of physics. • Matrix representation for symmetry operations has been introduced in Chapter 1 to enable the use of Group Theory for treating crystallography. • A section entitled ‘Other Contributions to Heat Capacity’, has been introduced in Chapter 5. • A statement on ‘Kondo effect (minimum)’ has been added in Chapter 14. • A section on ‘Graphenes’ has been introduced in Chapter 16. • The section on ‘Carbon Nanotubes’, in Chapter 16 has been revised. • A “Lesson on Group Theory”, has been added as Appendix.

It's About Time

A Quantum Approach to Condensed Matter Physics

Electronic Structure of Organic Semiconductors

Solid State Properties

Principles and Applications

Comprehensive and accessible coverage from the basics to advanced topics in modern quantum condensed matter physics.

Modern experimental developments in condensed matter and ultracold atom physics present formidable challenges to theorists. This book provides a pedagogical introduction to quantum field theory in many-particle physics, emphasizing the applicability of the formalism to concrete problems. This second edition contains two new chapters developing path integral approaches to classical and quantum nonequilibrium phenomena. Other chapters cover a range of topics, from the introduction of many-body techniques and functional integration, to renormalization group methods, the theory of response functions, and topology. Conceptual aspects and formal methodology are emphasized, but the discussion focuses on practical experimental applications drawn largely from condensed matter physics and neighboring fields. Extended and challenging problems with fully worked solutions provide a bridge between formal manipulations and research-oriented thinking. Aimed at elevating graduate students to a level where they can engage in independent research, this book complements graduate level courses on many-particle theory.
Optical Properties of Solids covers the important concepts of intrinsic optical properties and photoelectric emission. The book starts by providing an introduction to the fundamental optical spectra of solids. The text then discusses Maxwell's equations and the dielectric function; absorption and dispersion; and the theory of free-electron metals. The quantum mechanical theory of direct and indirect transitions between bands; the applications of dispersion relations; and the derivation of an expression for the dielectric function in the self-consistent field approximation are also encompassed. The book further tackles current-current correlations; the fluctuation-dissipation theorem; and the effect of surface plasmons on optical properties and photoemission. People involved in the study of the optical properties of solids will find the book invaluable.
In this upper-level text, Professor Tanner introduces the reader to the behavior of electrons in solids, starting with the simplest possible model. 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 and introduces higher levels of complexity only when the simple model is inadequate. 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. The author also includes an examination of the consequences of collective behavior in the phenomena of magnetism and superconductivity. Examples and problems are included for practice.
Communicating Science in a Prosaic Age
Topics in the Applications of Semiconductors, Superconductors, Ferromagnetism, and the Nonlinear Optical Properties of Solids
Condensed Matter Physics
Solid-State Physics
The Solid State

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

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.

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.

Physics of Condensed Matter is designed for a two-semester graduate course on condensed matter physics for students in physics and materials science. While the book offers fundamental ideas and topic areas of condensed matter physics, it also includes many recent topics of interest on which graduate

students may choose to do further research. The text can also be used as a one-semester course for advanced undergraduate majors in physics, materials science, solid state chemistry, and electrical engineering, because it offers a breadth of topics applicable to these majors. The book begins with a clear, coherent picture of simple models of solids and properties and progresses to more advanced properties and topics later in the book. It offers a comprehensive account of the modern topics in condensed matter physics by including introductory accounts of the areas of research in which intense research is underway. The book assumes a working knowledge of quantum mechanics, statistical mechanics, electricity and magnetism and Green's function formalism (for the second-semester curriculum). Covers many advanced topics and recent developments in condensed matter physics which are not included in other texts and are hot areas: Spintronics, Heavy fermions, Metallic nanoclusters, Zno, Graphene and graphene-based electronic, Quantum hall effect, High temperature superdonductivity, Nanotechnology Offers a diverse number of Experimental techniques clearly simplified Features end of chapter problems

Polymers and Small Molecules

Solid State Physics: Essential Concepts

Computer Vision - ECCV '94

Physics at Surfaces

Solid State Theory

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.

Solid State PhysicsCengage Learning

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.

When Hans Bethe, at the age of 97, asked his long-term collaborator, Gerry Brown, to explain his scientific work to the world, the latter knew that this was a steep task. As the late John Bahcall famously remarked: OC If you know his (Bethe''s) work, you might be inclined to think he is really several people, all of whom are engaged in a conspiracy to sign their work with the same nameOCO. Almost eight decades of original research, hundreds of scientific papers, numerous books, countless reports spanning the key areas of 20th century physics are the impressive record of Hans Bethe''s academic work. In answering Bethe''s request, the editors enlisted the help of experts in the different research fields, collaborators and friends of this OC last giantOCO of 20th century physics. Hans Bethe and His Physics is the result. It contains discussions of Hans Bethe''s work in solid state physics, nuclear physics and astrophysics; it explains his contributions as a science advisor and his stance on energy and nuclear weapons; and it demonstrates his impact as a teacher and mentor to generations of young scientists. While the book''s primary aim is to explain the science behind the man, the different articles also allow the reader to take a glimpse at the man behind the science. Sample Chapter(s). Three Weeks with Hans Bethe (525 KB). Contents: Hans Bethe and His Physics (G E Brown); My Life in Astrophysics (H A Bethe); Three Weeks with Hans Bethe (C Adami); Hans Bethe at The New Yorker (J Bernstein); My Sixty Years with Hans Bethe (E E Salpeter); Hans Bethe (K Gottfried); OC The Happy ThirtiesOCO (S S Schweber); Steller Energy Generation and Solar Neutrinos (J N Bahcall & E E Salpeter); Hans Bethe and Quantum Electrodynamics (F Dyson); Hans Bethe and the Theory of Nuclear Matter (J W Negele); Hans Bethe and Astrophysical Theory (G E Brown); Bethe''s Hypothesis (C N Yang & M-L Ge); Hans Bethe''s Contributions to Solid-State Physics (N D Mermin & N W Ashcroft); Hans Bethe and the Nuclear Many-Body Problem (J Holt & G E Brown); And Don''t Forget the Black Holes (with Commentary) (H A Bethe et al.); Shaping Public Policy (S Drell); Hans Bethe and the Global Energy Problems (B Ioffe); In Memoriam: Hans Bethe (R L Garwin & F von Hippel); Obituary: Hans A Bethe (K Gottfried); List of Publications of Hans A Bethe. Readership: Students, physicists and historians of science."

Third European Conference on Computer Vision, Stockholm, Sweden, May 2 - 6, 1994. Proceedings

Advanced Chemistry

Advanced Solid State Physics

Polarized Electrons In Surface Physics

The Oxford Solid State Basics

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

Primer, including problems and solutions, for graduate level courses on theoretical quantum condensed matter physics.

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.

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

Lectures on the Theory of Solids

Solid-State Physics for Electronics

ELEMENTS OF SOLID STATE PHYSICS

An Introduction to the Physics of Solid...

Carefully researched by the authors to bring the subject of chemistry up-to-date, this text provides complete coverage of the new A- and AS level core specifications. The inclusion of objectives and questions make it suitable for self study.

An advanced textbook covering important modern developments in depth rather than attempting an encyclopaedic approach.

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 tha 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 elemen 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, th book will appeal to intellectually curious readers of all kinds, including even professional physicists, who will be intrigued by its highly origina approach.

Physics at Surfaces is a unique graduate-level introduction to the physics and chemical physics of solid surfaces, and atoms and molecules interact with solid surfaces. A subject of keen scientific inquiry since the last century, surface physics emerged as an independent discipline only in the late 1960s as a result of the development of ultra-high vacuum technology and high speed digital computers. With these tools, reliable experimental measurements and theoretical calculations could at last be compared. Progress in the last decade has been truly strik This volume provides a synthesis of the entire field of surface physics from the perspective of a modern condensed matter physicist with a healthy interest in chemical physics. The exposition intertwines experiment and theory whenever possible, although there is little detailed discussion of technique. This much-needed text will be invaluable to graduate students and researchers in condensed matter physics, phys chemistry and materials science working in, or taking graduate courses in, surface science.

Modern Condensed Matter Physics

Condensed Matter Field Theory

Introduction to Applied Solid State Physics

Solid State Physics

Optical Properties of Solids

Computer vision - ECCV'94. -- v. 1

Introduction to the Physics of Electrons in Solids

Hans Bethe and His Physics