Bogoliubov De Gennes Method And Its Applications

If you ally infatuation such a referred **Bogoliubov De Gennes Method And Its Applications** ebook that will have the funds for you worth, get the totally best seller from us currently from several preferred authors. If you desire to humorous books, lots of novels, tale, jokes, and more fictions collections are then launched, from best seller to one of the most current released.

You may not be perplexed to enjoy all ebook collections Bogoliubov De Gennes Method And Its Applications that we will definitely offer. It is not around the costs. Its approximately what you compulsion currently. This Bogoliubov De Gennes Method And Its Applications, as one of the most functional sellers here will agreed be in the course of the best options to review.

Bogoliubov De Gennes Method And Its Applications ***2021-08-06***

KEIRA ELSA

Superfluidity and Superconductivity Springer
A distinguished physicist and leading researcher describes the theory and selected applications of one of the most important mathematical tools used in the theoretical investigation of collective excitations in statistical physics.
A Chebyshev-Bogoliubov-de Gennes Approach to Quasiparticle Interference in the Nematic Phase of FeSe Springer
During August 24-27, 1993, approximately 60 scientists from the Americas, Europe and Japan, gathered in the city of Guanajuato, in the state of Guanajuato, Mexico, at the II Latin American Workshop on Magnetism, Magnetic Materials and their Applications. The group of scientists converging into the beautiful city of Guanajuato had come from Argentina, Chile, Brazil, Venezuela, Cuba, several places in Mexico, U. S. A. , Japan, Spain, France, Italy, Germany, Austria, Switzerland, and Denmark. The event attested to the success of the previous Workshop on Magnetism, Magnetic Materials and their Applications, held in Havana, Cuba, in 1991, as well as to the interest, level of activity and quality of the work being carried out in Latin America in the area of magnetism and magnetic materials. Equally important to everyone present was the fact that we had come to honor a friend, Professor L. M. Falicov, on his sixtieth birthday. The choice of a Latin American Workshop on magnetism as a Festschrift for Leo Falicov was, in our opinion, quite appropriate not only because of Leo's strong ties to Latin America, but also because of his superb contributions to science, and in particular, to magnetism. Professor Falicov was born in Buenos Aires, Argentina, where he spent a good part of his formative years.
Superfluids and Superconductors Springer Nature
This book demonstrates how the new phenomena in the nanometer scale serve as the basis for the invention and development of novel nanoelectronic devices and how they are used for engineering nanostructures and metamaterials with unusual properties. It discusses topics such as superconducting spin-valve effect and thermal spin transport, which are important for developing spintronics; fabrication of nanostructures from antagonistic materials like ferromagnets and superconductors, which lead to a novel non-conventional FFLO-superconducting state; calculations of functional nanostructures with an exotic triplet superconductivity, which are the basis for novel nanoelectronic devices, such as superconducting spin valve, thin-film superconducting quantum interference devices (SQUIDs) and memory-elements (MRAM). Starting with theoretical chapters about triplet superconductivity, the book then introduces new ideas and approaches in the fundamentals of superconducting electronics. It presents various quantum devices based on the new theoretical approaches, demonstrating the enormous potential of the electronics of 21st century - spintronics. The book is useful for a broad audience, including researchers, engineers, PhD graduates, students and others wanting to gain insights into the frontiers of nanoscience.
Issues in Nuclear, High Energy, Plasma, Particle, and Condensed Matter Physics: 2011 Edition CRC Press
This up-to-date reference is the most comprehensive summary of the field of nanoscience and its applications. It begins with fundamental properties at the nanoscale and then goes well beyond into the practical aspects of the design, synthesis, and use of nanomaterials in various industries. It emphasizes the vast strides made in the field over the past decade – the chapters focus on new, promising directions as well as emerging theoretical and experimental methods. The contents incorporate experimental data and graphs where appropriate, as well as supporting tables and figures with a tutorial approach.
Ultracold Atoms in Optical Lattices OUP Oxford
This book is part of a two volume set which presents the analysis of nonlinear phenomena as a long-standing challenge for research in basic and applied science as well as engineering. It discusses nonlinear differential and differential equations, bifurcation theory for periodic orbits and global connections. The integrability and reversibility of planar vector fields and theoretical analysis of classic physical models are sketched. This first volume concentrates on the mathematical theory and computational techniques that are essential for the study of nonlinear science, a second volume deals with real-world nonlinear phenomena in condensed matter, biology and optics.
Inhomogeneous Superconductivity World Scientific
This thesis develops novel numerical techniques for simulating quantum transport in the time domain and applies them to pertinent physical systems such as flying qubits in electronic interferometers and superconductor/semiconductor junctions hosting Majorana bound states (the key ingredient for topological quantum computing). In addition to exploring the rich new physics brought about by time dependence, the thesis also develops software that can be used to simulate nanoelectronic systems with arbitrary geometry and time dependence, offering a veritable toolbox for exploring this rapidly growing domain.
Quantum Many-Body Physics of Ultracold Molecules in Optical Lattices Springer Science & Business Media
Most recent publications on spin-related phenomena focus on technological aspects of spin-dependent transport, with emphasis on the specific needs of spintronics. The present publication targets rather fundamental problems related to the physics of spin in solids, such as: (1) manifestation of spin and orbital polarization in spectroscopy, including valence and X-ray photoemission, magneto-optics, low-energy electron scattering on the surface; (2) application of new methods for interpretation and determination of magnetic low-lying excitations in the bulk and on the surface; (3) recent progress in evaluation of different type of magnetic forces including spin-orbit and exchange interaction, with subsequent determination of anisotropy and spin-ordering structure; (4) general problems of spin-dependent transport in semiconductors and metals, such as current-caused torque effect on spins at interfaces and spin injection in quantum dot systems; (5) problems in understanding the spin-dependent trends in unconventional superconductors; (6) many-body problems in solid state physics and recent progress in evaluation of self-energy effects; (7) fabrication of new magnetic materials with pre-programmed properties based on assembly from nano-particles, etc.
Superconductivity in Graphene and Carbon Nanotubes Springer Nature
This book covers the optical and electrical properties of nanoscale materials with an emphasis on how new and unique material properties result from the special nature of their electronic band structure. Beginning with a review of the optical and solid state physics needed for understanding optical and electrical properties, the book then introduces the electronic band structure of solids and discusses the effect of spin orbit coupling on the valence band, which is critical for understanding the optical properties of most nanoscale materials. Excitonic effects and excitons are also presented along with their effect on optical absorption. 2D materials, such as graphene and transition metal dichalcogenides, are host to unique electrical properties resulting from the electronic band structure. This book devotes significant attention to the optical and electrical properties of 2D and topological materials with an emphasis on optical measurements, electrical characterization of carrier transport, and a discussion of the electronic band structures using a tight binding approach. This book succinctly compiles useful fundamental and practical information from one of the fastest growing research topics in materials science and is thus an essential compendium for both students and researchers in this rapidly moving field.
The Electron Liquid Paradigm in Condensed Matter Physics Springer Nature
Issues in Nuclear, High Energy, Plasma, Particle, and Condensed Matter Physics: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Nuclear, High Energy, Plasma, Particle, and Condensed Matter Physics. The editors have built Issues in Nuclear, High Energy, Plasma, Particle, and Condensed Matter Physics: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Nuclear, High Energy, Plasma, Particle, and Condensed Matter Physics in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Nuclear, High Energy, Plasma, Particle, and Condensed Matter Physics: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.
Physics of Spin in Solids: Materials, Methods and Applications Elsevier
The connection between the electric and magnetic fields is fundamental to our understanding of light as electromagnetic waves. The magnetic vector potential lies at the heart of this relation. The idea emerged in the early days of research in electromagnetism but was dismissed for more than half a century until the formulation of quantum electrodynamics. The magnetic vector potential is a pivotal concept with ties to many aspects of physics and mathematics. This book unravels the nature of the magnetic vector potential, highlights its connection to quantum mechanics and superconductivity, and explores the analogy with hydrodynamics.
Models And Methods For Quantum Condensation And Fluids IOS Press
The present volume contains the texts of the invited talks delivered at the Sev enth International Conference on Recent Progress in Many-Body Theories held at the University of Minnesota during the period August 26-31, 1991. The proceedings of the Fourth Conference (Oulu, Finland, 1987) and Fifth Conference (Arad, Israel, 1989) have been published by Plenum as the first two volumes of this series. Papers from the First Conference (Trieste, 1978) comprise Nuclear Physics volume A328, Nos. 1, 2. The Second Conference (Oaxtepec, Mexico, 1989) was published by Springer-Verlag as volume 142 of "Lecture Notes in Physics," entitled "Recent Progress in Many Body Theories." Volume 198 of the same series contains the papers from the Third Conference (Altenberg, Germany, 1983). These volumes are intended to cover a broad spectrum of current research topics in physics that benefit from the application of many-body theories for their elucidation. At the same time there is a focus on the development and refinement of many-body methods. One of the major aims of the conference series has been to foster the ex change of ideas among physicists working in such diverse areas as nucleon-nucleon in teractions, nuclear physics, astronomy, atomic and molecular physics, quantum chem istry, quantum fluids, and condensed matter physics. The present volume contains contributions from all of these areas.
One-Dimensional Superconductivity in Nanowires Springer
The book introduces scientists and graduate students to superconductivity, and highlights the differences arising from the different dimensionality of the sample under study. It focuses on transport in one-dimensional superconductors, describing relevant theories with particular emphasis on experimental results. It closely relates these results to the emergence of various novel fabrication techniques. The book closes by discussing future perspectives, and the connection and relevance to other physical systems, including superfluidity, Bose-Einstein condensates, and possibly cosmic strings.
Optical and Electrical Properties of Nanoscale Materials Cambridge University Press
This book highlights the methods to engineer dissipative and magnetic nonlinear waves propagating in nonlinear systems. In the first part of the book, the authors present methodologically mathematical models of nonlinear waves propagating in one- and two-dimensional nonlinear transmission networks without/with dissipative elements. Based on these models, the authors investigate the generation and the transmission of nonlinear modulated waves, in general, and solitary waves, in particular, in networks under consideration. In the second part of the book, the authors develop basic theoretical results for the dynamics matter-wave and magnetic-wave solitons of nonlinear systems and of Bose–Einstein condensates trapped in external potentials, combined with the time-modulated nonlinearity. The models treated here are based on one-, two-, and three-component non-autonomous Gross–Pitaevskii equations. Based on the Heisenberg model of spin–spin interactions, the authors also investigate the dynamics of magnetization in ferromagnet with or without spin-transfer torque. This research book is suitable for physicists, mathematicians, engineers, and graduate students in physics, mathematics, and network and information engineering.
Functional Nanostructures and Metamaterials for Superconducting Spintronics Springer Science & Business Media
Models of Itinerant Ordering in Crystals is devoted to the mathematical description of interesting phenomena which occur in solids, such as ferromagnetism, antiferromagnetism and superconductivity. Superconductivity and its interaction with ferro and antiferromagnetism is of special importance since over the last 15 years the temperature of superconductivity existence has been raised from 15-20 K to 100 K, which will allow in the near future numerous practical applications of this phenomenon. Although the book is written in a rather rigorous mathematical language it is made easy to read by detailed derivation for those having only an undergraduate background in physics. Key Features: New field of research Common formalism for superconductivity and magnetism Easy and simple models Easy reading which includes all derivations Good for graduate students and young researchers A new field of research Common formalism for superconductivity and magnetism Easy reading and simple models, which includes all derivations

Physical Properties of Nanosystems Springer
Ultracold atomic gases is a rapidly developing area of physics that attracts many young researchers around the world. Written by world renowned experts in the field, this book gives a comprehensive overview of exciting developments in Bose-Einstein condensation and superfluidity from a theoretical perspective. The authors also make sense of key experiments from the past twenty years with a special focus on the physics of ultracold atomic gases. These systems are characterized by a rich variety of features which make them similar to other important systems of condensed matter physics (like superconductors and superfluids). At the same time they exhibit very peculiar properties which are the result of their gaseous nature, the possibility of trapping in a variety of low dimensional and periodical configurations, and of manipulating the two-body interaction. The book presents a systematic theoretical description based on the most successful many-body approaches applied both to bosons and fermions, at equilibrium and out of equilibrium, at zero as well as at finite temperature. Both theorists and experimentalists will benefit from the book, which is mainly addressed to beginners in the field (master students, PhD students, young postdocs), but also to more experienced researchers who can find in the book novel inspirations and motivations as well as new insightful connections. Building on the authors' first book, Bose-Einstein Condensation (Oxford University Press, 2003), this text offers a more systematic description of Fermi gases, quantum mixtures, low dimensional systems and dipolar gases. It also gives further emphasis on the peculiar phenomenon of superfluidity and its key role in many observable properties of these ultracold quantum gases.
Nonlinear Systems, Vol. 1 Springer
The electron liquid paradigm is at the basis of most of our current understanding of the physical properties of electronic systems. Quite remarkably, the latter are nowadays at the intersection of the most exciting areas of science: materials science, quantum chemistry, nano-electronics, biology and quantum computation. Accordingly, its importance can hardly be overestimated. During the past 20 years the field has witnessed momentous developments, which are partly covered in this new volume. Advances in semiconductor technology have allowed the realizations of ultra-pure electron liquids whose density, unlike that of the ones spontaneously occurring in nature, can be tuned by electrical means, allowing a systematic exploration of both strongly and weakly correlated regimes. Most of these system are two- or even one-dimensional and can be coupled together in the form of multi-layers or multi-wires, opening vast observational possibilities. On the theoretical side, quantum Monte Carlo methods have allowed an essentially exact determination of the ground-state energy of the electron liquid, and have provided partial answers to the still open question of the structure of its phase diagram. Starting from the 1980s some truly revolutionary concepts have emerged, which are well represented in this volume.
Statistical Mechanics of Superconductivity John Wiley & Sons
This book covers some of the most recent advances in the field of superfluids and superconductors. More specifically, it presents some of the most advanced theoretical formulations of superfluidity and superconductivity with special regard to their topological properties and vortex dynamics together with a description of the main experiments carried out via experimental techniques at the forefront to study these two such important phenomena in condensed matter physics. Special emphasis is given to ultracold Fermi gases, to clean liquid helium and to vortex membranes and knots for the class of superfluids and to the emerging superconductivity, to intermediate states in type-I superconductors, and to heat treatments to modulate the critical temperature for the class of superconductors.
Topology in Ordered Phases Springer Science & Business Media
This is the first text on the modern theory of superconductivity. It deals with the behaviour of superconductors in external fields varying in time, and with transport phenomena in superconductors. The book starts with the fundamentals of the first-principle, microscopic theory of superconductivity, and guides the reader through the modern theoretical analysis directly to applications of the theory to practical problems. The reader of this book will learn about the methods of quantum field theory applied to nonstationary superconductivity in their most advanced formulation, namely about the so-called semi-classical version of the real-time Green's function technique applied to the celebrated Bardeen, Cooper, and Schrieffer model of superconductivity. A considerable part of the book is devoted to vortex dynamics, dealing with the behaviour of superconductors in the most practical situation when they carry electric currents in the presence of a magnetic field.
Magnetism and Superconductivity World Scientific
In 2001, the Nobel Foundation celebrated the 100th anniversary of the first Nobel Prize, and all previous Nobel laureates were invited to attend the Nobel ceremonies in Stockholm. This gave an excellent opportunity for arranging jubilee symposia with topics that would attract several of the laureates. The chosen subject of “Condensation and Coherence in Condensed Systems” attracted sixteen Nobel laureates and another thirty-five leading scientists. The idea was to bring scientists together from several related subdisciplines: atomic physics, quantum optics, and condensed matter physics, for cross-breeding of ideas, concepts, and experience. Subjects like phase transitions in strongly coupled systems, Bose–Einstein condensation in weakly coupled systems, macroscopic quantum phenomena, coherence in mesoscopic structures, and quantum information were intensively discussed from different points of view. Coherence phenomena in condensed systems were emphasized. A special session was devoted to the emerging field of quantum computing, with experimental and theoretical results reported for different types of qu-bits. The 2001 Nobel Prize awarded to Eric Cornell, Wolfgang Ketterle, and Carl Wieman, “for the achievement of Bose–Einstein condensation in dilute gases of alkali atoms, and for early fundamental studies of the properties of the condensates,” gave an extra flavor to the theme of the Centennial Symposium. Contents:Quantum Coherence Between States with Even and Odd Numbers of Electrons (A F Andreev)Electron Spin in Single Wall Carbon Nanotubes (P E Lindelof et al.)Superfluidity and Coherence in Bose–Einstein Condensates (W Ketterle)Jahn–Teller Bipolarons and Their Condensation (K A Müller)Probing Quantum Mechanics Towards the Everyday World: Where Do We Stand? (A J Leggett)The Question of Phase in a Bose–Einstein Condensate (S Stenholm)Experiments with d-Wave Superconductors (J Mannhart et al.)Noise and Decoherence in Quantum Two-Level Systems (A Shnirman et al.)Coherent Manipulations of Charge-Number States in a Cooper-Pair Box (Y Nakamura et al.)Quiet Readout of Superconducting Flux States (J Clarke et al.)and other papers Readership: Researchers in atomic physics, quantum optics and condensed matter physics. Keywords:Condensation;Coherence;Condensed Matter;Phase Transitions;Quantum Computing
Advances in Atomic, Molecular, and Optical Physics World Scientific
Volume 55 of the Advances in Atomic, Molecular, and Optical Physics Series contains seven contributions, covering a diversity of subject areas in atomic, molecular and optical physics. In their contribution, Stowe, Thorpe, Pe’er, Ye, Stalnaker, Gerginov, and Diddams explore recent developments in direct frequency comb spectroscopy. Precise phase coherence among successive ultrashort pulses of a frequency comb allows one to probe fast dynamics in the time domain and high-resolution structural information in the frequency domain for both atoms and molecules. The authors provide a detailed review of some of the current applications that exploit the unique features of frequency comb spectroscopy and discuss its future directions. Yurvsky, Olshanii and Weiss review theory and experiment of elongated atom traps that confine ultracold gases in a quasi-one-dimensional regime. Under certain conditions, these quasi-one-dimensional gases are well-described by integrable one-dimensional many-body models with exact quantum solutions. Thermodynamic and correlation properties of one such model that has been experimentally realized are reviewed. DePaola, Morgenstein and Andersen discuss magneto-optical trap recoil ion momentum spectroscopy (MOTRIMS), exploring collisions between a projectile and target resulting in charged target fragments. MOTRIMS combines the technology of laser cooling and trapping of target atoms with the momentum analysis of the charged fragments that recoil from the target. The authors review the different MOTRIMS experimental approaches and the spectroscopic and collisional investigations performed so far. Safronova and Johnson give an overview of atomic many-body perturbation theory and discuss why extensions of the theory are needed. They present “all-order results based on a linearized version of coupled cluster expansions and apply the theory to calculations of energies, transition matrix elements and hyperfine constants. Another contribution on atomic theory, authored by Fischer, explores the advantages of expanding the atomic radial wave functions in a B-spline basis. The differential equations are replaced by non-linear systems of equations and the problems of orthogonality requirements can be dealt with using projection operators. Electron-ion collisional processes are analyzed by Mueller, including descriptions of the experimental techniques needed to obtain cross section data and typical values for these cross sections. The present status of the field is discussed in relation to the detailed cross sections and rate coefficients that are needed for understanding laboratory or astrophysical plasmas. Finally, Duan and Monroe review ways to achieve scalable and robust quantum communication, state engineering, and quantum computation. Using radiation and atoms, ions, or atomic ensembles, they show that they can construct scalable quantum networks that are inherently insensitive to noise. Progress in experimental realization of their proposals is outlined. International experts Comprehensive articles New developments