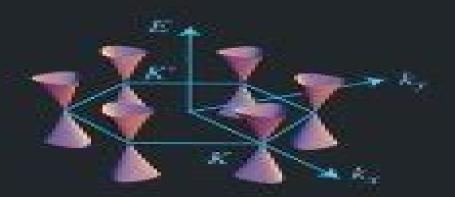


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# Quantum Hall Effects

Field Theoretical Approach and Related Topics



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Hentschel, Friedel Weinert, 2009-07-25 With contributions by leading quantum physicists philosophers and historians this

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comprehensive A to Z of quantum physics provides a lucid understanding of key concepts of quantum theory and experiment It covers technical and interpretational aspects alike and includes both traditional and new concepts making it an indispensable resource for concise up to date information about the many facets of quantum physics **Spectroscopy of Confined Fractional Quantum Hall Systems** Stephan Baer, Klaus Ensslin, 2015-08-18 This book provides an overview of recent developments in experiments probing the fractional quantum Hall FQH states of the second Landau level especially the nu 5 2 state It summarizes the state of the art understanding of these FQH states It furthermore describes how the properties of the FQH states can be probed experimentally by investigating tunneling and confinement properties The progress towards the realization of an experiment allowing to probe the potentially non Abelian statistics of the quasiparticle excitations at nu 5 2 is discussed The book is intended as a reference for graduate students PostDocs and researchers starting in the field The experimental part of this book gives practical advice for solving the experimental challenges which researchers studying highly fragile FQH states are faced with Solid State Physics John J. Quinn, Kyung-Soo Yi, 2018-02-23 This book provides the basis for a two semester graduate course on solid state physics The first half presents all the knowledge necessary for a one semester survey of solid state physics but in greater depth than most introductory solid state physics courses The second half includes most of the important research over the past half century covering both the fundamental principles and most recent advances. This new edition includes the latest developments in the treatment of strongly interacting two dimensional electrons and discusses the generalization from small to larger systems The book provides explanations in a class tested tutorial style and each chapter includes problems reviewing key concepts and calculations The updated exercises and solutions enable students to become familiar with contemporary research activities such as the electronic properties of massless fermions in graphene and topological insulators Recent Developments in Theoretical Physics Subir Ghosh, Guruprasad Kar, 2010 1 Is the end of theoretical physics really in sight A Khare 2 Holography CFT and black hole entropy P Majumdar 3 Hawking radiation effective actions and anomalies R Banerjee 4 Probing dark matter in primordial black holes A S Majumdar 5 Physics in the Once Given universe C S Unnikrishnan 6 Doubly special relativity G Amelino Camelia 7 Nuances of neutrinos A Raychaudhuri 8 Dynamics of proton spin A N Mitra 9 Whither nuclear physics A Abbas 10 Generalized Swanson model and its pseudo supersymmetric partners A Sinha and P Roy 11 The relevance of berry phase in quantum physics P Bandyopadhyay 12 Quantum Hamiltonian diagonalization P Gosselin A B rard and H Mohrbach 13 The Hall conductivity of spinning anyons B Basu 14 Quantum annealing and computation A Das and B K Chakrabarti 15 Liouville gravity from Einstein gravity D Grumiller and R Jackiw 16 Exact static solutions of a generalized discret symbol A Khare 17 A model for flow reversal in two dimensional convection K Kumar und weitere 18 Euclidean networks and dimensionality P Sen 19 Equal superposition transformations and quantum random walks P Parashar 20 Cloning entanglement locally S K Choudhary and R Rahaman The Multifaceted Skyrmion

Gerald Edward Brown, Manngue Rho, 2010 1 Skyrmions and nuclei R A Battye N S Manton and P M Sutcliffe 2 Electromagnetic form factors of the nucleon in chiral soliton models G Holzwarth 3 Exotic baryon resonances in the Skyrme model D Diakonov and V Petrov 4 Heavy guark skyrmions N N Scoccola 5 Skyrmion approach to finite density and temperature B Y Park and V Vento 6 Half skyrmion hadronic matter at high density H K Lee and M Rho 7 Supergualitons baryons in dense QCD D K Hong 8 Rotational symmetry breaking in baby skyrme models M Karliner and I Hen 9 Spin and isospin exotic order in quantum hall ferromagnets S M Girvin 10 Noncommutative skyrmions in quantum hall systems Z F Ezawa and G Tsitsishvili 11 Skyrmions and merons in bilayer quantum hall system K Moon 12 Spin and pseudospin textures in quantum hall systems H A Fertig and L Brey 13 Half skyrmion theory for high temperature superconductivity T Morinari 14 Deconfined quantum critical points T Senthil und weitere 15 Skyrmion and string theory S Sugimoto 16 Holographic baryons P Yi 17 The Cheshire cat principle from holography H B Nielsen and I Zahed 18 Baryon physics in a five dimensional model of hadrons A Pomarol and A Wulzer *Numerical Methods in Electromagnetics* W.H.A. SCHILDERS,E.J.W. TER MATEN, 2005-04-04 This special volume provides a broad overview and insight in the way numerical methods are being used to solve the wide variety of problems in the electronics industry Furthermore its aim is to give researchers from other fields of application the opportunity to benefit from the results wich have been obtained in the electronics industry Complete survey of numerical methods used in the electronic industry Each chapter is selfcontained Presents state of the art applications and methods Internationally recognised authors The Quantum Hall Effect Benoît Douçot, Vincent Pasquier. Vincent Rivasseau, 2006-01-20 The Poincar Seminar is held twice a year at the Institut Henri Poincar in Paris The goal of this seminar is to provide up to date information about general topics of great interest in physics Both the theoretical and experimental results are covered with some historical background Particular care is devoted to the pedagogical nature of the presentation This volume is devoted to the quantum Hall effect After a historical and general presentation by Nobel prize winner Klaus von Klitzing discoverer of this effect the volume proceeds with reviews on the mathematics and physics of both the integer and fractional case It includes up to date presentations of the tunneling and metrology experiments related to the quantum Hall effect It will serve the community of physicists and mathematicians at professional or graduate student level

Harmonic Oscillators and Two-By-Two Matrices in Symmetry Problems in Physics Young Suh Kim,2018-07-09 This book is a printed edition of the Special Issue Harmonic Oscillators In Modern Physics that was published in Symmetry

Fractional Quantum Hall Effects: New Developments Bertrand I Halperin, Jainendra K Jain, 2020-06-09 The fractional quantum Hall effect has been one of the most active areas of research in quantum condensed matter physics for nearly four decades serving as a paradigm for unexpected and exotic emergent behavior arising from interactions This book featuring a collection of articles written by experts and a Foreword by Klaus von Klitzing the discoverer of quantum Hall effect and winner of 1985 Nobel Prize in physics aims to provide a coherent account of the exciting new developments and the current

status of the field **Controllable Quantum States** Hideaki Takayanagi,2008 This volume is a collection of papers from the fourth meeting of the International Symposium on Mesoscopic Superconductivity and Spintronics held at NTT Atsugi Japan Research in these fields has advanced a great deal since the previous meeting largely because these fields have drawn much attention from the viewpoint of new quantum phenomena and quantum information technology Mesoscopic superconductivity has been developed in new fields such as a ferromagnet superconductor junction the proximity effect in unconventional superconductors macroscopic quantum tunneling in high Tc superconductors quantum modulation of superconducting junctions and superconducting quantum bits The book also covers transport and spins in nano scale semiconductor structures such as quantum dots and wires quantum interference and coherence and order in exotic materials and some papers on quantum algorithm This book adequately provides an overview of recent progress in mesoscopic superconductivity Ultracold Gases and Quantum Information Christian Miniatura, Leong-Chuan Kwek, Martial Ducloy, BenoÎt Grémaud, Berthold-Georg Englert, Leticia Cugliandolo, Artur Ekert, Kok Khoo Phua, 2011-05-05 In recent years there has been much synergy between the exciting areas of quantum information science and ultracold atoms This volume as part of the proceedings for the XCI session of Les Houches School of Physics held for the first time outside Europe in Singapore brings together experts in both fields The theme of the school focused on two principal topics quantum information science and ultracold atomic physics The topics range from Bose Einstein Condensates to Degenerate Fermi Gases to fundamental concepts in Quantum Information Sciences including some special topics on Quantum Hall Effects Quantum Phase Transition Interactions in Quantum Fluids Disorder and Interference Phenomenoma Trapped Ions and Atoms and Quantum Optical Devices The Multifaceted Skyrmion Manngue Rho, Ismail Zahed, 2016-09-29 This book presents in the form of reviews by world's leading physicists in wide ranging fields in theoretical physics the influence and prescience of Skyrme's daring idea of 1960 originally conceived for nuclear physics that fermions can arise from bosons via topological solitons pervasively playing a powerful role in wide ranging areas of physics from nuclear astrophysics to particle physics to string theory and to condensed matter physics The skyrmion description both from gauge theory and from gauge gravity duality offers solutions to some long standing and extremely difficult problems at high baryonic density inaccessible by QCD proper It also offers explanations and makes startling predictions for fascinating new phenomena in condensed matter systems In both cases what is at the core is the topology although the phenomena are drastically different even involving different spacetime dimensions This second edition has been expanded with addition of new reviews and extensively updated to take into account the latest developments in the field Contents Hadrons and Nuclear Matter Skyrmions and Nuclei R A Battye N S Manton and P M Sutcliffe States of Carbon 12 in the Skyrme Model P H C Lau and N S Manton Electromagnetic Form Factors of the Nucleon in Chiral Soliton Models G Holzwarth Exotic Baryon Resonances in the Skyrme Model D Diakonov and V Petrov Heavy Quark Skyrmions N N Scoccola Pentaguark Candidates P c 4380 and P c 4450 within the

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conventional electromagnetic field based tools Once accepting the formulation based on gauge fields the computational code is very transparent due to the mimetic mapping of the electrodynamic variables on the computational grid Although the illustrations and applications originate from microelectronic engineering the method has a much larger range of applicability Therefore this book is of interest to everyone having interest in computational electrodynamics The volume is organized as follows In part 1 a detailed introduction and overview is presented of the Maxwell equations as well as the derivation of the current and charge densities is different materials Semiconductors are responding to electromagnetic fields in a non linear way and the induced complications are discussed in detail In part 2 the transition of the theory of electrodynamics using the gauge potentials to a formulation that can serve as the gateway to computational code is presented In part 3 the feasibility and success of the methods of part 2 are demonstrated by a collection of microelectronic device designs Part 4 focuses on a set of topical themes that brings the reader to the frontier of research in building the simulation tools using the gauge principle in computational electrodynamics Technical topics discussed in the book include Electromagnetic Field EquationsConstitutive RelationsDiscretization and Numerical AnalysisFinite Element and Finite Volume MethodsDesign of Graphene Viera Skakalova, Alan B. Kaiser, 2021-06-23 Graphene Properties Preparation **Integrated Passive Components** Characterization and Devices Second Edition provides a comprehensive look at the methods used to prepare and analyze graphene Since the first edition s publication there have been many advances in the understanding of graphene in particular its key properties and most relevant applications Updates to this new edition include chapters on liquid exfoliation production of graphene and scanning transmission electron microscopy of graphene New sections cover graphene s thermal optical mechanical chemical and biocompatibility with special attention paid to transport properties a main barrier to the realization of commercial applications Reviews the preparation and characterization of graphene covering the latest advances in liquid exfoliation production and the scanning transmission electron microscopy of graphene Includes a new section dedicated to the properties of graphene thermal transport optical mechanical chemical to reflect the latest understanding of this important material Discusses the most relevant applications of graphene such as biomedical sensing energy and electronic applications

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