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August - September 2018

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ISBN : 978-981-10-7958-0

Liu, F., Lu, S., Sun, Y., Shanghai Aerospace Control Technology Institute, Shanghai, China

Guidance and Control Technology of Spacecraft on Elliptical Orbit

- The first book that covers the key technologies of GNC system design for spacecraft in elliptical orbits
- Systematically introduces relative dynamics to elliptical orbits by using both relative orbit elements and relative position, autonomous navigation, relative navigation, and autonomous rendezvous
- Provides simulation instances for each method, together with insightful explanations

This book introduces readers to the navigation, guidance and control technologies involved in single-spacecraft, double-spacecraft, and multiple-spacecraft tasks in elliptical orbits. It comprehensively covers the key technologies of guidance, navigation and control (GNC) system design for spacecraft in elliptical orbits, including the orbit design, formation configuration design and maintenance, autonomous navigation technology and relative navigation technology, as well as autonomous rendezvous technology. The methods that this book introduces are very close to actual practical engineering applications and presented in an accessible style. ...

Contents

Introduction.- Modeling and Hardware Components of Control System of Orbital Transfer Vehicle.- Orbit Prediction Technology.- Inertial Navigation and Initial Alignment Technology.- INS/GNSS Integrated Navigation Technology.- INS/CNS Integrated Navigation Technology.- Redundant Fault Tolerance and Failure Reconfiguration Technology of Inertial Sensor.- Guidance and Midcourse Correction Technology.- Orbit Control Strategy.

Fields of Interest

Aerospace Technology and Astronautics;

Space Sciences (including Extraterrestrial Physics, Space Exploration and Astronautics); Control, Robotics, Mechatronics

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2019,XII, 237 p. 102 illus., 71 illus. in color.(Navigation: Science and Technology) Hardcover

Medium Type

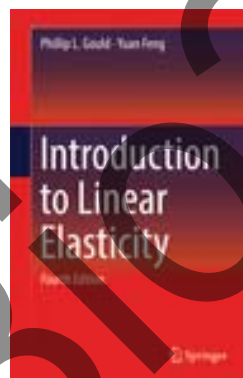
Book

Imprint

Springer

E11999 特別本体19460円

Order Quantity



ISBN : 978-3-319-73884-0

Gould, Phillip L., Feng, Yuan, Washington University, St. Louis, MO, USA

Introduction to Linear Elasticity

- Features a new suite of computational tools and examples in each chapter;
- Maximizes student learning by combining the basics of continuum mechanics and linear elasticity;
- Introduces the powerful computational tool (MATLAB) with applications for solving elasticity problems;

This augmented and updated fourth edition introduces a new complement of computational tools and examples for each chapter and continues to provide a grounding in the tensor-based theory of elasticity for students in mechanical, civil, aeronautical and biomedical engineering and

materials and earth science. Professor Gould's proven approach allows faculty to introduce this subject early on in an educational program, where students are able to understand and apply the basic notions of mechanics to stress analysis and move on to advanced work in continuum mechanics, plasticity, plate and shell theory, composite materials and finite element ...

Contents

Introduction and Mathematical Preliminaries.- Traction, Stress and Equilibrium.- Deformations.- Material Behavior.- Formulations, Uniqueness and Solutions Strategies.- Extension, Bending and Torsion.- Two-Dimensional Elasticity.- Thin Plates and Shells.- Dynamic Effects.- Viscoelasticity.- Energy Principles.- Strength and Failure Criteria.- Something New.

Fields of Interest

Continuum Mechanics and Mechanics of Materials; Classical Mechanics; Structural Mechanics

Content Level

Upper undergraduate

Product category

Graduate/advanced undergraduate textbook

Available

Bibliography

4th ed. 2018,XX, 384 p. 207 illus., 88 illus. in color. Hardcover

Medium Type

Book

Imprint

Springer

E8999 特別本体14600円

Order Quantity



ISBN : 978-3-319-69741-3

Warlimont, Hans, Martienssen, Werner (Eds.),
Freigericht, Germany

Springer Handbook of Materials Data

- Provides the most concise, yet authoritative collection of materials data
- Allows quick retrieval of applicable, reliable, and comprehensive data through tables and graphs
- Second edition carefully updated and extended with materials for novel applications

The second edition of this well-received handbook is the most concise yet comprehensive compilation of materials data. The chapters provide succinct descriptions and summarize essential and reliable data for various types of materials. The information is amply illustrated with 900 tables and 1050 figures selected primarily from well-established data collections, such as Landolt-Börnstein, which is now part of the SpringerMaterials database. The new edition of the Springer Handbook of Materials Data starts by presenting the latest CODATA recommended values of the fundamental physical constants and provides comprehensive tables of the ...

Contents

Part A Fundamentals.- Part B Metals.- Part C Nonmetallic Materials.- Part D Functional Materials.- Part E Special Structures.

Fields of Interest

Materials Science, general; Condensed Matter Physics; Materials Engineering; Physical Chemistry

Content Level

Professional/practitioner

Product category

Handbook

Available

Bibliography

2nd ed. 2018,XX, 1140 p. 1110 illus. in color. (Springer Handbooks) Hardcover

Medium Type

Book

Imprint

Springer

E27999 特別本体45420円

[Order Quantity](#)



ISBN : 978-3-319-91895-2

Goodnick, S.M., Korkin, A., Nemanich, R. (Eds.),
Arizona State University, Tempe, AZ, USA

Semiconductor Nanotechnology

Advances in Information and Energy Processing and Storage

- Provides an authoritative overview of the current status and future trends of nanoelectronics and semiconductors
- Presents broad-ranging tutorials on both theoretical and experimental aspects of key topics in nanotechnology
- Written by recognized international experts in each area

This book presents research dedicated to solving scientific and technological problems in many areas of electronics, photonics and renewable energy. Energy and information are interconnected and are essential elements for the development of human society. Transmission, processing and storage of information requires energy consumption, while the efficient use and access to new energy sources requires new information (ideas and expertise) and the design of novel systems such as photovoltaic devices, fuel cells and batteries. Semiconductor physics creates the knowledge base for the development of information (computers, cell phones, etc.) and ...

Contents

Molecular Nanoelectronics by Molecular Layer Epitaxy.- The Nanoscale Application-Specific Integrated Circuit (ASIC) Development Process.- Fundamentals of Oxide Resistive Random Access Memories (RRAM).- Current Trends in Nanotechnology for Information and Energy Transformation and Storage.- Quantum Confinement Effects in Nanoelectronic Materials.- High-throughput Materials Discovery and Development: Breakthroughs and Challenges in the Mapping of the Materials Genome.- Digital Design and Computer Architecture in the Era of System on Chip (SoC) and Internet of Things (IoT).- Atomic Layer Processing: Basics, Materials, Processes and ...

Fields of Interest

Nanotechnology; Semiconductors; Nanotechnology and Microengineering; Renewable and Green Energy; Nanoscale Science and Technology

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,X, 236 p. 137 illus., 122 illus. in color.(Nanostructure Science and Technology) Hardcover

Medium Type

Book

Imprint

Springer

E12999 特別本体21090円

[Order Quantity](#)



ISBN : 978-3-319-78144-0

Lynch, Stephen, Manchester Metropolitan University, Manchester, UK

Dynamical Systems with Applications using Python

- Designed for a broad audience of students in applied mathematics, physics, and engineering
- Represents dynamical systems with popular Python libraries like sympy, numpy, and matplotlib
- Explores a variety of advanced topics in dynamical systems, like neural networks, fractals, and nonlinear optics, at an undergraduate level

This textbook provides a broad introduction to continuous and discrete dynamical

systems. With its hands-on approach, the text leads the reader from basic theory to recently published research material in nonlinear ordinary differential equations, nonlinear optics, multifractals, neural networks, and binary oscillator computing. Dynamical Systems with Applications Using Python takes advantage of Python's extensive visualization, simulation, and algorithmic tools to study those topics in nonlinear dynamical systems through numerical algorithms and generated diagrams. After a tutorial introduction to Python, the first part of the book deals ...

Contents

Preface.- A Tutorial Introduction to Python.- Differential Equations.- Planar Systems.- Interacting Species.- Limit Cycles.- Hamiltonian Systems, Lyapunov Functions, and Stability.- Bifurcation Theory.- Three-Dimensional Autonomous Systems and Chaos.- Poincaré Maps and Nonautonomous Systems in the Plane.- Local and Global Bifurcations.- The Second Part of Hilbert's Sixteenth Problem.- Delay Differential Equations.- Linear Discrete Dynamical Systems.- Nonlinear Discrete Dynamical Systems.- Complex Iterative Maps.- Electromagnetic Waves and Optical Resonators.- Fractals and Multifractals.- Image Processing with Python.- Chaos Control and ...

Fields of Interest

Dynamical Systems and Ergodic Theory; Complex Systems; Ordinary Differential Equations; Mathematical and Computational Engineering; Applications of Mathematics; Statistical Physics and Dynamical Systems

Content Level

Graduate

Product category

Graduate/advanced undergraduate textbook

Due September 27,2018

In production

Bibliography

1st ed. 2018,VIII, 662 p. 278 illus., 115 illus. in color. Hardcover

Medium Type

Book

Imprint

Birkhäuser

E7999 特別本体12970円

[Order Quantity](#)



ISBN : 978-3-319-95224-6

Torres del Castillo, Gerardo F., Ciudad Universitaria - UAP, Puebla, Mexico

An Introduction to Hamiltonian Mechanics

- Presents a precise definition and examples of the symmetries of a Hamiltonian, including transformations that depend explicitly on the time
- Contains the definition and examples of R-separable solutions of the Hamilton--Jacobi equation
- Illustrates a complete and simplified proof for the Liouville Theorem and examples of its application

This textbook examines the Hamiltonian formulation in classical mechanics with the basic mathematical tools of multivariate calculus. It explores topics like variational symmetries, canonoid transformations, and geometrical optics that are usually omitted from an introductory classical mechanics course. For students with only a basic knowledge of mathematics and physics, this book makes those results accessible through worked-out examples and well-chosen exercises. For readers not familiar with Lagrange equations, the first chapters are devoted to the Lagrangian formalism and its applications. Later sections discuss canonical ...

Contents

Preface.- The Lagrangian Formalism.- Some Applications of the Lagrangian Formalism.- Rigid Bodies.- The Hamiltonian Formalism.- Canonical Transformations.- The Hamilton--Jacobi Formalism.- Solutions.- References.- Index.

Fields of Interest

Dynamical Systems and Ergodic Theory; Classical Mechanics; Mathematical Physics

Content Level

Graduate

Product category

Graduate/advanced undergraduate textbook

Due September 26,2018

In production

Bibliography

1st ed. 2018,X, 366 p. 42 illus., 2 illus. in color. (Birkhäuser Advanced Texts Basler Lehrbücher) Hardcover

Medium Type

Book

Imprint

Birkhäuser

E6499 特別本体10540円

[Order Quantity](#)



ISBN : 978-3-319-92794-7

Bennett Jr., William Ralph, Morrison, Andrew C. H. (Ed.), Yale University, New Haven, CT, USA

The Science of Musical Sound

Volume 1: Stringed Instruments, Pipe Organs, and the Human Voice

- Provides unique historical anecdotes relevant to the science
- Includes illustrations and photographs depicting key concepts in novel ways
- Designed for the students who fear math as well as the mathematically inclined

This textbook is a product of William Bennett's work in developing and teaching a course on the physics of music at Yale University to a diverse audience of musicians and science students in the same class. The book is a culmination of over a decade of teaching the course and weaves together historical descriptions of the physical phenomena with the author's clear interpretations of the most important aspects of the science of music and musical instruments. Many of the historical examples are not found in any other textbook available on the market. As the co-inventor of the Helium-Neon laser, Prof. Bennett's knowledge

of physics was ...

Contents

Dedication.- Foreword.- Preface.-
Acknowledgements.- About the Author.-
Chapter 1: Wave Motion.- Chapter 2: Spectral
Analysis and Fourier Series.- Chapter 3:
Plucked Strings.- Chapter 4: The Struck
String.- Chapter 5: Violins and Bowed Strings.-
Chapter 6: The Voice.- Chapter 7: Pipe
Organs.- Appendix A: The Harmonic
Oscillator.- Appendix B: Vibrating Strings and
Membranes.- Appendix C: Fourier Analysis.-
Appendix D: The Well-Tempered Scale.-
Solutions.- References.- Index.

Fields of Interest

Acoustics; Engineering Acoustics; Music;
Vibration, Dynamical Systems, Control;
Otorhinolaryngology

Content Level

Upper undergraduate

Product category

Undergraduate textbook

In production

Bibliography

1st ed. 2018,XV, 434 p. 268 illus., 84 illus. in
color. Hardcover

Medium Type

Book

Imprint

Springer

E6499 特別本体10540円

Order Quantity



ISBN : 978-3-319-96264-1

Capova, K.A., Persson, E., Milligan, T., Dunér, D. (Eds.)
, Durham University, Durham, UK

Astrobiology and Society in Europe Today

- Presents an overview of the status of astrobiology today
- Places astrobiology in a societal context
- Written by the leading European scientists and scholars in the field

This White Paper describes the state of astrobiology in Europe today and its relation to the European society at large. With contributions from authors in twenty countries and over thirty scientific institutions worldwide, the document illustrates the societal implications of astrobiology and the positive contribution that astrobiology can make to European society. The White paper has two main objectives: 1. It recommends the establishment of a European Astrobiology Institute (EAI) as an answer to a series of challenges relating to astrobiology but also European research, education and the society at large. 2. It also acknowledges the ...

Contents

1. Introduction.- 2. Astrobiology and Society in Europe.- 3. The International Context of Astrobiology.- 4. Society, Worldview and Outreach.- 5. Environment and Sustainability.- 6. Education, Training and Scholarship.- 7. Technological Innovation and Commerce.- 8. Science and Research.- 9. Leading the Future of Astrobiology in Europe.- 10. Appendices.

Fields of Interest

Astrobiology; Societal Aspects of Physics,
Outreach and Education; Science and
Technology Studies; Public Policy

Content Level

Popular/general

Product category

Brief

Available

Bibliography

1st ed. 2018,XVI, 72 p. 14 illus., 13 illus. in
color.(SpringerBriefs in Astronomy) Softcover

Medium Type

Book

Imprint

Springer

E5499 特別本体8920円

Order Quantity



ISBN : 978-3-319-96013-5

Casanueva Diaz, Julia, University of Pisa, Pisa, Italy

Control of the Gravitational Wave Interferometric Detector Advanced Virgo

- Nominated as an outstanding Ph.D thesis by the University of Paris-Sud, Orsay, France
- Gives a comprehensive review of the design and function of state-of-the-art Gravitational Wave Detectors
- Addresses the all-important question of stabilization and control of the instruments, both in simulation and experiment

This book focuses on the development and implementation of the longitudinal, angular and frequency controls of the Advanced Virgo detector, both from the simulation and experimental point of view, which contributed to Virgo reaching a sensitivity that enabled it to join the LIGO-Virgo O2 run in August 2017. This data taking was very successful, with the first direct detection of a binary black hole merger (GW170814) using the full network of three interferometers, and the first detection and localization of a binary neutron star merger (GW170817). The second generation of gravitational wave detector, Advanced Virgo, is capable of detecting ...

Contents

Gravitational Waves.- Ground Based Gravitational Wave Detectors.- Advanced Virgo.- Fabry-Perot Cavities in Advanced Virgo.- Power Recycled Interferometer.- Advanced Virgo Commissioning.- Conclusion.

Fields of Interest

Astronomy, Observations and Techniques;
Measurement Science and Instrumentation;
Classical and Quantum Gravitation, Relativity
Theory; Optics, Lasers, Photonics, Optical
Devices

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XVII, 202 p. 133 illus., 122 illus. in color.(Springer Theses) Hardcover

Medium Type

Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity

ISBN : 978-3-319-90040-7

Parks, George K., University of California, Berkeley, Berkeley, CA, USA

Characterizing Space Plasmas**A Data Driven Approach**

- Maximizes reader insight into real-world observations and data through detailed discussions
- Presents critiques of space plasma models using both theory and cutting-edge observational data
- Provides step-by-step derivations of the equations presented, along with enlightening mathematical and historical asides

This didactic book uses a data-driven approach to connect measurements made by plasma instruments to the real world. This approach makes full use of the instruments' capability and examines the data at the most detailed level an experiment can provide. Students using this approach will learn what instruments can measure, and working with real-world data will pave their way to models consistent with these observations. While conceived as a teaching tool, the book contains a considerable amount of new information. It emphasizes recent results, such as particle measurements made from the Cluster ion experiment, explores the consequences of new ...

Contents

Preface.- 1 Basic Equations and Concepts.- 2 Charged Particle Acceleration.- 3 Escaping Stellar Particles.- 4 Collisionless Shocks.- 5 Boundaries and Current Sheets.- 6 Electric Field and Current.- 7 Topics for Further Studies.- Index.

Fields of Interest

Astrophysics and Astroparticles; Plasma Physics; Solar and Heliospheric Physics ; Theoretical Astrophysics; Fluid- and Aerodynamics

Content Level

Graduate

Product category

Graduate/advanced undergraduate textbook

Available

Bibliography

1st ed. 2018,XX, 332 p. 95 illus., 47 illus. in color.(Astronomy and Astrophysics Library) Hardcover

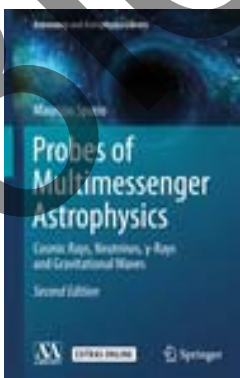
Medium Type

Book

Imprint

Springer

E7999 特別本体12970円

Order Quantity

ISBN : 978-3-319-96853-7

Spurio, Maurizio, University of Bologna, Bologna, Italy

The Probes of Multimessenger Astrophysics**Charged cosmic rays, neutrinos, γ-rays and gravitational waves**

- The new edition includes a comprehensive description of gravitational-wave physics written for a student audience

- Provides a modern introduction to astroparticle physics
- Presents the different probes used to study astrophysical phenomena in the multi-messenger strategy

"I have taught from and enjoyed the first edition of the book. The selection of topics is the best I've seen. Maurizio Spurio gives very clear presentations using a generous amount of observational data." James Matthews (Louisiana State University) This is the second edition of an introduction to "multi-messenger" astrophysics. It covers the many different aspects connecting particle physics with astrophysics and cosmology and introduces high-energy astrophysics using different probes: the electromagnetic radiation, with techniques developed by traditional astronomy; charged cosmic rays, gamma-rays and neutrinos, with methods developed in ...

Contents

Preface.- An Overview of Multimessenger Astrophysics.- Charged Cosmic Rays in our Galaxy.- Direct Cosmic Rays Detection: Protons, Nuclei, Electrons and Antimatter.- Indirect Cosmic Rays Detection: Particle Showers in the Atmosphere.- Diffusion of Cosmic Rays in the Galaxy.- Galactic Acceleration and Acceleration Mechanisms.- The Extragalactic Sources and Ultra High Energy Cosmic Rays.- The Sky Seen in γ-Rays.- The TeV Sky and Multiwavelength Astrophysics.- High-Energy Neutrino Astrophysics.- Atmospheric Muons and Neutrinos.- Low-Energy Neutrino Physics and Astrophysics.- Basics on the Observations of Gravitational Waves.- Microcosm and ...

Fields of Interest

Astrophysics and Astroparticles; Particle Acceleration and Detection, Beam Physics

Content Level

Graduate

Product category

Graduate/advanced undergraduate textbook

Due September 27,2018

In production

Bibliography

2nd ed. 2018,XII, 560 p. 202 illus.(Astronomy and Astrophysics Library) Hardcover

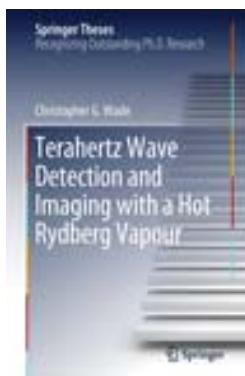
Medium Type

Book

Imprint

Springer

E8999 特別本体14600円

Order Quantity

ISBN : 978-3-319-94907-9

Wade, Christopher G., Durham University, Durham, UK

Terahertz Wave Detection and Imaging with a Hot Rydberg Vapour

- Nominated as an outstanding Ph.D thesis by the Durham University, Durham, UK
- Offers a clear exposition of relevant atomic physics in to facilitate understanding
- Provides descriptions of real-time terahertz wave imaging techniques

This book details groundbreaking experiments for the sensing and imaging of terahertz-frequency electromagnetic radiation (THz) using Rydberg atoms. The major advances described include the development and implementation of a new technique for THz imaging using atomic fluorescence; the demonstration of a THz-driven phase transition in room-temperature atomic vapour; and a novel method for probing the excited-state dynamics of atoms using quantum beats. The work has formed the basis for several articles published in journals including Nature Photonics and the Physical Review, and has sparked industry interest, becoming the subject of ongoing ...

Contents

Introduction.- Atomic Structure and Atom-light Interactions.- Experimental Methods.- Probing an Excited State Transition Using Quantum Beats.- Intrinsic Rydberg Optical Bistability.-Terahertz Electrometry with Rydberg EIT.- Real-time Near-field Terahertz Field Imaging.-Terahertz-driven Phase Transition in a Hot Rydberg Vapour.- Summary and Outlook.

Fields of Interest

Atomic/Molecular Structure and Spectra; Quantum Physics; Spectroscopy and Microscopy

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XIII, 91 p. 41 illus., 30 illus. in color.(Springer Theses) Hardcover

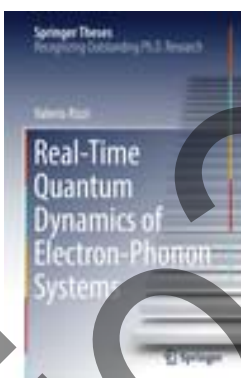
Medium Type

Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity

ISBN : 978-3-319-96279-5

Rizzi, Valerio, Università della Svizzera Italiana, Lugano, Switzerland

Real-Time Quantum Dynamics of Electron-Phonon Systems

- Nominated as an outstanding PhD thesis by the Queen's University Belfast, UK
- Develops a new methodology to tackle the coupled quantum dynamics of electrons and phonons in nanostructures
- Applies the approach to fundamental and practical problems encountered in nanodevices, laser-matter interactions and beyond

This book develops a methodology for the real-time coupled quantum dynamics of electrons and phonons in nanostructures, both isolated structures and those open to an environment. It then applies this technique to both fundamental and practical problems that are relevant, in particular, to nanodevice physics, laser-matter interaction, and radiation damage in living tissue. The interaction between electrons and atomic

vibrations (phonons) is an example of how a process at the heart of quantum dynamics can impact our everyday lives. This is e.g. how electrical current generates heat, making your toaster work. It is also a key process behind ...

Contents

Physical Motivation.- Effective Temperature Methods.- Atomistic Methods.- The ECEID Method.- ECEID Validation.- Thermalization with ECEID.- Inelastic Electron Injection in Water.- A New Development: ECEID xp.

Fields of Interest

Atoms and Molecules in Strong Fields, Laser Matter Interaction; Strongly Correlated Systems, Superconductivity; Quantum Physics; Nanoscale Science and Technology

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XVIII, 175 p. 70 illus., 28 illus. in color.(Springer Theses) Hardcover

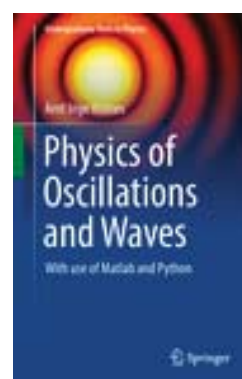
Medium Type

Book

Imprint

Springer

E12999 特別本体21090円

Order Quantity

ISBN : 978-3-319-72313-6

Vistnes, Arnt Inge, University of Oslo, Oslo, Norway

Physics of Oscillations and Waves

With use of Matlab and Python

- Uses both mathematics and numerical methods to give physics students insights not offered by traditional physics teaching
- Rectifies misconceptions on many matters, even including how musical instruments work
- Discusses the interesting interplay between time and frequency more deeply than most textbooks

In this textbook a combination of standard mathematics and modern numerical methods is used to describe a wide range of natural wave phenomena, such as sound, light and water waves, particularly in specific popular contexts, e.g. colors or the acoustics of musical instruments. It introduces the reader to the basic physical principles that allow the description of the oscillatory motion of matter and classical fields, as well as resulting concepts including interference, diffraction, and coherence. Numerical methods offer new scientific insights and make it possible to handle interesting cases that can't readily be addressed using analytical ...

Contents

Chapter 1: Introduction.- Chapter 2: Free and damped oscillations.- Chapter 3: Forced oscillations and resonance.- Chapter 4: Numerical methods.- Chapter 5: Fourier analysis.- Chapter 6: Waves.- Chapter 7: Sound.- Chapter 8: Dispersion and surface waves on water.- Chapter 9: Electromagnetic waves.- Chapter 10: Reflection, transmission and polarization.- Chapter 11: Measurements of light, dispersion of light, colours.- Chapter 12: Geometric optics.- Chapter 13: Interference, diffraction.- Chapter 14: Wavelet transformation.- Chapter 15: Coherence, dipole radiation and lasers.- Chapter 16: Skin depth and wave guides.

Fields of Interest

Classical Mechanics; Mathematical Methods in Physics; Numerical and Computational Physics, Simulation; Atmospheric Sciences; Fluid- and Aerodynamics

Content Level

Upper undergraduate

Product category

Undergraduate textbook

Available

Bibliography

1st ed. 2018, XVIII, 576 p. 273 illus., 257 illus. in color. (Undergraduate Texts in Physics) Softcover

Medium Type

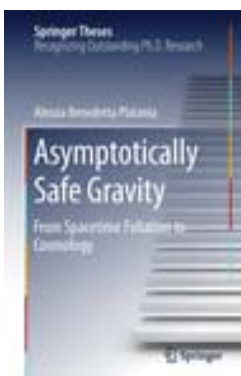
Book

Imprint

Springer

E5999 特別本体9730円

Order Quantity



ISBN : 978-3-319-98793-4

Platania, Alessia Benedetta, Universität Heidelberg, Heidelberg, Germany

Asymptotically Safe Gravity

From Spacetime Foliation to Cosmology

- Nominated as an outstanding Ph.D thesis by the Università degli studi di Catania, Italy and Radboud University Nijmegen, Netherlands
- Reports significant progress towards realizing Weinberg's idea of Asymptotic Safety
- Makes groundbreaking steps towards bridging the gap between quantum gravity in Euclidean and Lorentzian spacetimes

This book seeks to construct a consistent fundamental quantum theory of gravity, which is often considered one of the most challenging open problems in present-day physics. It approaches this challenge using modern functional renormalization group techniques, and attempts to realize the idea of "Asymptotic Safety" originally proposed by S. Weinberg. Quite remarkably, the book makes significant progress regarding both the fundamental aspects of the program and its phenomenological consequences. The conceptual developments pioneer the construction of a well-behaved functional renormalization group equation adapted to spacetimes with a ...

Contents

Part I: Asymptotically Safe Quantum Gravity.- The Wilsonian Idea of Renormalization.- Functional Renormalization and Asymptotically Safe Gravity.- Part II: Asymptotically Safe Gravity on Foliated Spacetimes.- Quantum Gravity on Foliated Spacetimes.- Part III: Astrophysical and Cosmological Implications of Asymptotic Safety.- Inflationary Cosmology from

Quantum Gravity-matter Systems.- Quantum Black Holes and Spacetime Singularities.- Conclusions.

Fields of Interest

Classical and Quantum Gravitation, Relativity Theory; Cosmology; Manifolds and Cell Complexes (incl. Diff.Topology)

Content Level

Research

Product category

Monograph

Due September 22, 2018

In production

Bibliography

1st ed. 2018, XV, 142 p. 87 illus., 13 illus. in color. (Springer Theses) Hardcover

Medium Type

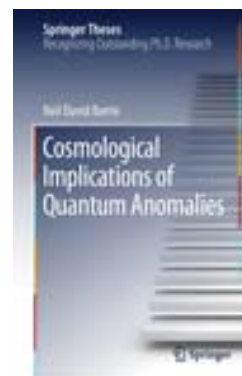
Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity



ISBN : 978-3-319-94714-3

Barrie, Neil David, The University of Tokyo Kashiwa Campus, Kashiwa, Japan

Cosmological Implications of Quantum Anomalies

- Nominated as an outstanding Ph.D thesis by the University of Sydney, New South Wales, Australia
- Demonstrates relevance of quantum anomalies for important aspects of modern cosmology
- Links particle physics to cosmology as a key to solving open problems

The successes of the standard models of particle physics and cosmology are many, but have proven incapable of explaining all the phenomena that we observe. This book investigates the potentially important role of quantum physics, particularly quantum anomalies, in various aspects of modern cosmology, such as inflation, the dynamical generation of the visible and dark matter in the universe, and gravitational waves. By doing so, the authors demonstrate that exploring the links between cosmology and particle physics is key to helping solve the mysteries of our Universe.

Contents

Introduction.- Scale Invariant Inflation.- An Asymmetric Universe from Inflation.- Baryogenesis During Reheating via the Ratchet Mechanism.- Gravitational Waves and the Cosmic Neutrino Background.- Concluding Remarks and Outlook.

Fields of Interest

Cosmology; Particle and Nuclear Physics; Quantum Physics

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XIII, 140 p. 14 illus., 11 illus. in color.(Springer Theses) Hardcover

Medium Type

Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity



ISBN : 978-3-319-96760-8

Bose, Sownak, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA

Beyond Λ CDM

Exploring Alternatives to the Standard Cosmological Paradigm

- Nominated as an outstanding PhD thesis by the University of Durham, England
- Employs state-of-the-art, high-resolution cosmological simulations
- Confronts the predictions of theoretical models with observations using a sophisticated semi-analytic model of galaxy formation

This book employs computer simulations of 'artificial' Universes to investigate the properties of two popular alternatives to the standard candidates for dark matter (DM) and dark energy (DE). It confronts the predictions of theoretical models with observations using a sophisticated semi-analytic model of galaxy formation. Understanding the nature of dark matter (DM) and dark energy (DE) are two of the most central problems in modern cosmology. While their important role in the evolution of the Universe has been well established—namely, that DM serves as the building blocks of galaxies, and that DE accelerates the expansion of the ...

Contents

Introduction.- Statistical Properties of Warm Dark Matter Haloes.- Substructure and Galaxy Formation in Warm Dark Matter Simulations.- Reionisation in Sterile Neutrino Cosmologies.- Testing the Quasi-Static Approximation in F (R) Gravity Simulations.- Speeding up N-Body Simulations of Modified Gravity: Chameleon Screening Models.- Conclusions and Future Work.

Fields of Interest

Cosmology; Theoretical Astrophysics; Numerical and Computational Physics, Simulation; Classical and Quantum Gravitation, Relativity Theory

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XXXIV, 181 p. 49 illus., 31 illus. in color.(Springer Theses) Hardcover

Medium Type

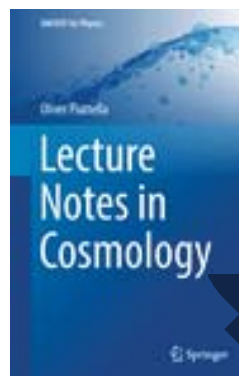
Book

Imprint

Springer

E11999 特別本体19460円

Order Quantity



ISBN : 978-3-319-95569-8

Piattella, Oliver, Federal University of Espírito Santo, Vitória, Brazil

Lecture Notes in Cosmology

- Provides an in-depth introduction to cosmology for beginners including open problems and very recent topics
- Functional appendices contain the necessary physics background as a reminder to students making the book self-contained
- Exercises in the text complete the derivations of the results, whose ideas and logical steps are carefully outlined

Cosmology has become a very active research field in the last decades thanks to the impressive improvement of our observational techniques which have led to landmark discoveries such as the accelerated expansion of the universe, and have put physicists in front of new mysteries to unveil, such as the quest after the nature of dark matter and dark energy. These notes offer an approach to cosmology, covering fundamental topics in the field: the expansion of the universe, the thermal history, the evolution of small cosmological perturbations and the anisotropies in the cosmic microwave background radiation. Some extra topics are presented in ...

Contents

Preface.- Notation.- Cosmology.- The expanding universe and its content.- Cosmological observations.- Redshift.- Open problems in cosmology.- The universe in expansion.- Newtonian cosmology.- Relativistic cosmology.- Friedmann equations.- Solutions of the Friedmann equations.- Distances in cosmology.- Thermal history.- Thermal equilibrium and Boltzmann equation.- Short summary of thermal history.- The distribution function.- The entropy density.- Photons.- Neutrinos.- Boltzmann equation.- Boltzmann equation with a collisional term.- Big-Bang Nucleosynthesis.- Recombination and decoupling.-

Cosmological perturbations.- From the perturbations ...

Fields of Interest

Cosmology; Classical and Quantum Gravitation, Relativity Theory

Content Level

Graduate

Product category

Graduate/advanced undergraduate textbook

Available

Bibliography

1st ed. 2018,XVIII, 418 p. 53 illus., 23 illus. in color.(UNITEXT for Physics) Hardcover

Medium Type

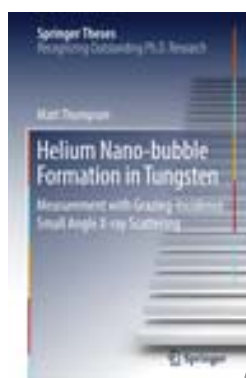
Book

Imprint

Springer

E7999 特別本体12970円

Order Quantity



ISBN : 978-3-319-96010-4

Thompson, Matt, Australian National University, Canberra, ACT, Australia

Helium Nano-bubble Formation in Tungsten

Measurement with Grazing-Incidence Small Angle X-ray Scattering

- Nominated as an outstanding Ph.D thesis by the Australian National University, Canberra, Australia
- Includes an easy-to-follow discussion of the equations governing grazing-incidence small-angle X-ray scattering (GISAXS), chi-squared fitting, and parameter error estimation
- Helps students embarking on masters or PhD programmes understand the basics of

small-angle scattering pattern fitting (Chap. 2)

This PhD thesis characterises the damage that occurs in tungsten when it is exposed to a fusion-like environment. The book presents pioneering work on the use of grazing-incidence small-angle X-ray scattering (GISAXS) to measure nano-bubble formation in tungsten exposed to helium plasma. The phenomenon of nanoscale bubble formation within metals during helium plasma exposure can lead to undesirable changes in the material properties, such as complex nanoscale surface modification or a reduction in thermal conductivity. As a result of this work, it is now possible to quantify how nanobubble behaviour changes within different materials, and ...

Contents

Introduction.- Developing a GISAXS Model to Enable Study of Nano-bubble Formation.- Validation of GISAXS Model with TEM Data.- Effect of He Fluence on Nano-bubble Growth.- Effect of Sample Temperature and Transient Heat Loading on Nano-bubble Growth.- Investigating Synergistic Effects on W Performance with Magnum-PSI.- Conclusion.

Fields of Interest

Crystallography and Scattering Methods; Nuclear Fusion; Plasma Physics; Energy Materials; Nanoscale Science and Technology

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XVII, 112 p. 40 illus., 6 illus. in color.(Springer Theses) Hardcover

Medium Type

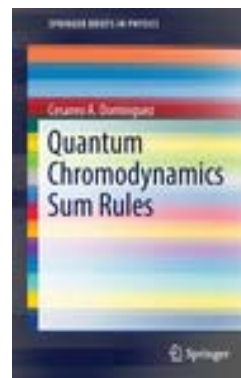
Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity



ISBN : 978-3-319-97721-8

Dominguez, Cesario A., University of Cape Town, Cape Town, South Africa

Quantum Chromodynamics Sum Rules

This concise book provides the necessary background to allow interested readers to launch original research projects on the subject matter. Currently, this material is not available from one single source, and is either spread out over numerous journal publications, or covered in long and technical monographs. At the core of this book lies the sum rule approach to obtain analytic results in Quantum Chromodynamics (QCD), the current theory of strong interactions among quarks and gluons. This method fully complements Lattice QCD, the corresponding computational approach based on discretizing QCD on a space-time lattice. Applications include ...

Contents

1 Introduction.- 2 Operator Product Expansion in QCD.- 3 Renormalization Group Equation.- 4 Integration in the Complex s -Plane.- 5 Determination of the QCD Strong Coupling.- 6 Hadronic Spectral Functions.

Fields of Interest

Elementary Particles, Quantum Field Theory; Nuclear Physics, Heavy Ions, Hadrons

Content Level

Graduate

Product category

Brief

Available

Bibliography

1st ed. 2018,XII, 113 p. 26 illus., 8 illus. in color. (SpringerBriefs in Physics) Softcover

Medium Type

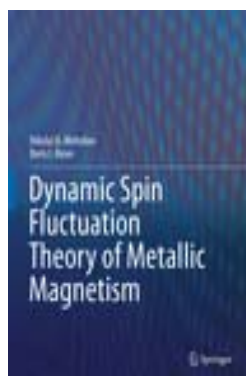
Book

Imprint

Springer

E5499 特別本体8920円

Order Quantity



ISBN : 978-3-319-92972-9

Melnikov, Nikolai B., Reser, Boris I., Moscow State University, Moscow, Russia

Dynamic Spin-Fluctuation Theory of Metallic Magnetism

- Provides a clear and self-contained treatment of the many-electron problem of metallic magnetism
- Introduces theoretical frameworks along with the necessary mathematical background
- Emphasizes practical problems, illustrated by concrete metals and alloys

This book presents a theoretical framework for magnetism in ferromagnetic metals and alloys at finite temperatures. The objective of the book is twofold. First, it gives a detailed presentation of the dynamic spin-fluctuation theory that takes into account both local and long-wave spin fluctuations with any frequency. The authors provide a detailed explanation of the fundamental role of quantum spin fluctuations in the mechanism of metallic magnetism and illustrate the theory with concrete examples. The second objective of the book is to give an accurate and self-contained presentation of many-body techniques such as the functional integral ...

Contents

Introduction.- Basics of Metallic Magnetism.- Many-Electron Problem.- Mean-Field Theory.- Random-Phase Approximation.- Green Functions at Finite Temperatures.- Spin-Fluctuation Theory in the Ising Model.- Functional Integral Method.- Gaussian Approximation.- Single-Site Gaussian Approximation.- High-Temperature Theory.- Low-Temperature Theory.- Temperature Dependence of Magnetic Characteristics.- Neutron Scattering in Metals.- Short-Range Order Above TC.- Conclusion.- Appendices.- Index.

Fields of Interest

Magnetism, Magnetic Materials; Metallic Materials; Electrochemistry; Quantum Information Technology, Spintronics; Solid State Physics

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018, XVIII, 287 p. 59 illus., 18 illus. in color. Hardcover

Medium Type

Book

Imprint

Springer

E13999 特別本体22710円

Order Quantity



ISBN : 978-3-319-98251-9

Zhang, Shilei, University of Oxford, Oxford, UK

Chiral and Topological Nature of Magnetic Skyrmions

- Nominated as an outstanding Ph.D thesis by the University of Oxford, Oxford, UK
- Introduces a novel light-matter interaction principle that is sensitive to complex magnetic structures
- Presents a unique way to measure the chiral and topological properties of a magnetic skyrmion

This book focuses on the characterisation of the chiral and topological nature of magnetic skyrmions in noncentrosymmetric helimagnets. In these materials, the skyrmion lattice phase appears as a long-range-ordered, close-packed grid of nearly

millimetre-level correlation length, while the size of a single skyrmion is 3–100 nm. This is a very challenging range of length scales (spanning 5 orders of magnitude from tens of nm to mm) for magnetic characterisation techniques, and, to date, extensive information on this fascinating, magnetically ordered state has remained elusive. In response, this work develops novel resonant elastic x-ray ...

Contents

The Story so Far.- Measurement of the Magnetic Long-range Order.- Measurement of the Skyrmion Lattice Domains.- Measurement of the Topological Winding Number.- Measurement of the Skyrmion Helicity Angle.- Dichroism Extinction Rule.

Fields of Interest

Magnetism, Magnetic Materials; Spectroscopy and Microscopy

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018, XXI, 117 p. 46 illus. in color. (Springer Theses) Hardcover

Medium Type

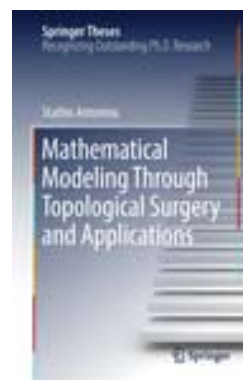
Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity



ISBN : 978-3-319-97066-0

Antoniou, Stathis, National Technical University of Athens, Athens, Greece

Mathematical Modeling Through Topological Surgery and Applications

- Nominated as an outstanding Ph.D thesis by the National Technical University of Athens, Greece
- Details how topological surgery is exhibited in nature
- Provides a topological perspective on the formation of black holes

Topological surgery is a mathematical technique used for creating new manifolds out of known ones. In this book the authors observe that it also occurs in natural phenomena of all scales: 1-dimensional surgery happens during DNA recombination and when cosmic magnetic lines reconnect; 2-dimensional surgery happens during tornado formation and cell mitosis; and they conjecture that 3-dimensional surgery happens during the formation of black holes from cosmic strings, offering an explanation for the existence of a black hole's singularity. Inspired by such phenomena, the authors present a new topological model that extends the formal definition ...

Contents

Introduction.- Useful Mathematical Notions.- The Formal Definition of Surgery.- Continuity.- Dynamics.- Solid Surgery.- A Dynamical System Modeling Solid 2-Dimensional 0-Surgery.- The Ambient Space S^3 .- Embedded Surgery.- 3-Dimensional Surgery.- Conclusions.

Fields of Interest

Mathematical Methods in Physics; Topology; Cosmology; Statistical Physics and Dynamical Systems; Dynamical Systems and Ergodic Theory

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XVII, 85 p. 37 illus., 27 illus. in color.(Springer Theses) Hardcover

Medium Type

Book

Imprint

Springer

E10999 特別本体17840円

[Order Quantity](#)



ISBN : 978-3-319-91808-2

Lechner, Kurt, University of Padua, Padua, Italy

Classical Electrodynamics

A Modern Perspective

- Offers a well-balanced mixture of mathematically rigorous exposition and concrete applications
- Provides exhaustive explanations for effortless reading
- Highlights what distinguishes electrodynamics from the other fundamental interactions

This book addresses the theoretical foundations and the main physical consequences of electromagnetic interaction, generally considered to be one of the four fundamental interactions in nature, in a mathematically rigorous yet straightforward way. The major focus is on the unifying features shared by classical electrodynamics and all other fundamental relativistic classical field theories. The book presents a balanced blend of derivations of phenomenological predictions from first principles on the one hand, and concrete applications on the other. Further, it highlights the internal inconsistencies of classical electrodynamics, and addresses ...

Contents

Part I: THEORETICAL FOUNDATIONS.- 1 Foundations of special relativity.- 2 Fundamental equations of electrodynamics.- 3 Variational methods in field theory.- 4 The variational principle in electrodynamics.- Part II: APPLICATIONS.- 5 Electromagnetic waves.- 6 Generation of electromagnetic fields.- 7 Lienard-Wiechert fields.- 8 Radiation.- 9 Gravitational radiation.- 10 Radiation in the ultrarelativistic limit.- 11 Spectral analysis.- 12 Synchrotron radiation.- 13 The Cerenkov effect.- Part III: SELECTED TOPICS.- 14 Radiation reaction.- 15 A distribution-valued energy-momentum tensor.- 16 Charged particles traveling at the speed of light.- 17 ...

Fields of Interest

Mathematical Methods in Physics; Classical Electrodynamics; Elementary Particles, Quantum Field Theory

Content Level

Graduate

Product category

Graduate/advanced undergraduate textbook

Due September 24,2018

In production

Bibliography

1st ed. 2018,XIX, 688 p.(UNITEXT for Physics) Hardcover

Medium Type

Book

Imprint

Springer

E8499 特別本体13780円

[Order Quantity](#)



ISBN : 978-3-319-96022-7

Lionni, Luca, Kyoto University, Kyoto, Japan

Colored Discrete Spaces

Higher Dimensional Combinatorial Maps and Quantum Gravity

- Nominated as an outstanding Ph.D. thesis by the University of Paris-Sud, Orsay, France
- Clearly explained and including many pedagogical figures and new results
- Marks significant progress towards developing matrix models for tensor models and discrete quantum gravity

This book provides a number of combinatorial tools that allow a systematic study of very general discrete spaces involved in the context of discrete quantum gravity. In any dimension D , we can discretize Euclidean gravity in the absence of matter over random discrete spaces obtained by gluing families of polytopes together in all possible ways. These spaces are then classified according to their

curvature. In $D=2$, it results in a theory of random discrete spheres, which converge in the continuum limit towards the Brownian sphere, a random fractal space interpreted as a quantum random space-time. In this limit, the continuous Liouville theory ...

Contents

Colored Simplices and Edge-Colored Graphs.- Bijective Methods.- Properties of Stacked Maps.- Summary and Outlook.

Fields of Interest

Mathematical Methods in Physics; Classical and Quantum Gravitation, Relativity Theory; Geometry

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018, XVIII, 218 p. 107 illus., 98 illus. in color. (Springer Theses) Hardcover

Medium Type

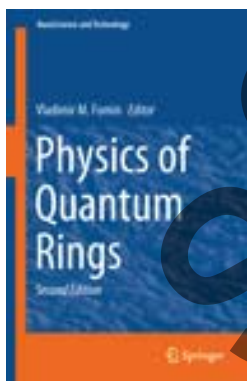
Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity



ISBN : 978-3-319-95158-4

Fomin, Vladimir M. (Ed.), Leibniz Institute for Solid State and Materials Research (IFW) Dresden, Dresden, Germany

Physics of Quantum Rings

• Provides an elemental basis for low-cost high-performance devices, which are promising for electronics, optoelectronics, spintronics, and quantum information

processing applications

- Expanded and updated new edition, with several new chapters
- Presents the application of most advanced nanoengineering and nanocharacterization techniques

This book, now in its second edition, introduces readers to quantum rings as a special class of modern high-tech material structures at the nanoscale. It deals, in particular, with their formation by means of molecular beam epitaxy and droplet epitaxy of semiconductors, and their topology-driven electronic, optical and magnetic properties. A highly complex theoretical model is developed to adequately represent the specific features of quantum rings. The results presented here are intended to facilitate the development of low-cost high-performance electronic, spintronic, optoelectronic and information processing devices based on quantum ...

Contents

Quantum Ring: A Unique Playground for the Quantum-mechanical Paradigm.- Optical Berry Phase in Micro/nano-rings.- From Dot to Ring: Tunable Exciton Topology on Type II InAs/GaSb Quantum Nanostructures.- Self-organized Quantum Rings: Physical Characterization and Theoretical Modeling.- Scanning-probe Electronic Imaging of Lithographically Patterned Quantum Rings.- Functionalization of Droplet Etching for Quantum Rings.- Fabrication of Ordered Quantum Rings by Molecular Beam Epitaxy.- Self-assembled Semiconductor Quantum Rings Complexes by Droplet Epitaxy: Growth and Physical Properties.- Optical Aharonov-Bohm Oscillations of an Exciton and ...

Fields of Interest

Nanoscale Science and Technology; Quantum Information Technology, Spintronics; Optical and Electronic Materials; Magnetism, Magnetic Materials; Spectroscopy and Microscopy; Nanotechnology and Microengineering

Content Level

Research

Product category

Monograph

Due September 11,2018

In production

Bibliography

2nd ed. 2018, XXVI, 586 p. 276 illus., 160 illus. in color. (NanoScience and Technology) Hardcover

Medium Type

Book

Imprint

Springer

E14999 特別本体24330円

Order Quantity



ISBN : 978-981-13-1354-7

Liu, Cheng-Hua, National Taiwan University, Taipei, Taiwan

Electrical and Optoelectronic Properties of the Nanodevices Composed of Two-Dimensional Materials

Graphene and Molybdenum (IV) Disulfide

- Nominated as an outstanding thesis by National Taiwan University
- Presents the observation of a plateau-plateau transition point corresponding to zeroth Landau level
- Demonstrates a unique and efficient means of controlling the PPC (persistent photoconductivity) effect in monolayer MoS2

This thesis focuses on the transport and magneto-transport properties of graphene p-n-p junctions, such as the pronounced quantum Hall effect, a well-defined plateau-plateau transition point, and scaling behavior. In addition, it demonstrates persistent photoconductivity (PPC) in the monolayer MoS2 devices, an effect that can be attributed to random localized potential fluctuations in the devices. Further, it studies scaling behavior at zeroth Landau level and high performance of fractional values of quantum Hall plateaus in these graphene p-n-p devices. Moreover, it demonstrates a unique and efficient means of controlling the PPC effect in ...

Contents

Introduction.- Theoretical background.- Experimental methods.- Distinctive magnetotransport of graphene p-n-p junctions via resist-free fabrication and

controlled diffusion of metallic contact.- Observation of quantum Hall plateau-plateau transition and scaling behavior of the zeroth Landau level in graphene p-n-p junction.- Extrinsic Origin of Persistent Photoconductivity in Monolayer MoS2 Field Effect.- Conclusion.

Fields of Interest

Nanoscale Science and Technology; Nanotechnology and Microengineering; Semiconductors; Surfaces and Interfaces, Thin Films

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XIII, 74 p. 49 illus., 42 illus. in color.(Springer Theses) Hardcover

Medium Type

Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity



ISBN : 978-3-319-97519-1

Beresford, Lydia Audrey, University of Oxford, Oxford, UK

Searches for Dijet Resonances

Using $\sqrt{s} = 13$ TeV Proton-Proton Collision Data Recorded by the ATLAS Detector at the Large Hadron Collider

- Nominated as an outstanding PhD thesis by the University of Oxford, Oxford, UK
- Provides a clear and concise review of all stages of analysis, making it an ideal

introduction to searches for new physics at the Large Hadron Collider

- Presents illustrated explanations of the search and limit-setting procedure, helping to elucidate these complex topics

This book addresses one of the most intriguing mysteries of our universe: the nature of dark matter. The results presented here mark a significant and substantial contribution to the search for new physics, in particular for new particles that couple to dark matter. The first analysis presented is a search for heavy new particles that decay into pairs of hadronic jets (dijets). This pioneering analysis explores unprecedented dijet invariant masses, reaching nearly 7 TeV, and sets constraints on several important new physics models. The two subsequent analyses focus on the difficult low dijet mass region, down to 200 GeV, and employ a novel ...

Contents

Theoretical Background.- The ATLAS Experiment.- Physics Object Reconstruction in ATLAS.- Dijet Invariant Mass Spectra.- Searching for Resonances.- Limit Setting.- Conclusion and Outlook.

Fields of Interest

Nuclear Physics, Heavy Ions, Hadrons; Elementary Particles, Quantum Field Theory; Cosmology

Content Level

Research

Product category

Monograph

Due September 23,2018

In production

Bibliography

1st ed. 2018,XIII, 167 p. 101 illus., 50 illus. in color.(Springer Theses) Hardcover

Medium Type

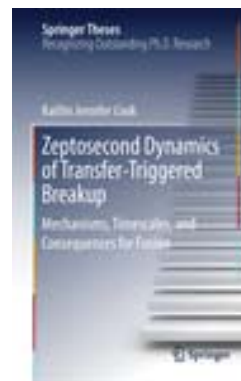
Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity



ISBN : 978-3-319-96016-6

Cook, Kaitlin Jennifer, Australian National University, Canberra, ACT, Australia

Zeptosecond Dynamics of Transfer-Triggered Breakup

Mechanisms, Timescales, and Consequences for Fusion

- Nominated as an outstanding Ph.D thesis by the Australian National University, Canberra, Australia
- Presents a comprehensive study of transfer-triggered breakup that gives unprecedented insights into the mechanisms of breakup
- Offers a uniquely detailed introduction to the effect of including lifetimes of resonant states in models of breakup

Combining incisive experiments with the latest theoretical advances, this book presents an extensive study of transfer-triggered breakup, the dominant process by which breakup occurs in reactions involving light, weakly bound nuclei. It demonstrates not only that lifetimes of resonant states shorter than a zeptosecond are crucially important for these reactions to suppress complete fusion, but also that such short lifetimes are experimentally accessible. By making quantitative predictions of the effect of breakup from short-lived resonant states on incomplete fusion at above-barrier energies, the book suggests that the extent to which ...

Contents

Introduction.- Background Concepts.- Experimental Methods.- Identifying Breakup Modes.- Examining Breakup Mechanisms.- Extraction of Below-barrier Breakup Probabilities.- Mapping Below-barrier Breakup Probabilities to Above-barrier Complete Fusion Suppression.- Towards Measurements of $7\text{Be}(d,p)8\text{Be}$.- Conclusions and Outlook.

Fields of Interest

Nuclear Physics, Heavy Ions, Hadrons; Nuclear Fusion

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XXIII, 269 p. 137 illus., 72 illus. in color.(Springer Theses) Hardcover

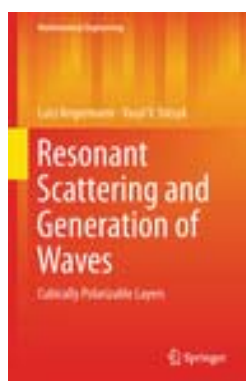
Medium Type

Book

Imprint

Springer

E12999 特別本体21090円

Order Quantity

ISBN : 978-3-319-96300-6

Angermann, Lutz, Yatsyk, Vasyl V., Technische Universität Clausthal, Clausthal-Zellerfeld, Germany

Resonant Scattering and Generation of Waves**Cubically Polarizable Layers**

- Develops a theory that opens the way for practitioners to design or to optimize optical, optoelectronic or electromagnetic devices which make use of nonlinear material properties
- Shows how artificial materials such as virtual gratings could be developed
- Presents the first detailed mathematical and computational analysis of the effect of third-harmonic generation

This monograph deals with theoretical aspects and numerical simulations of the interaction of electromagnetic fields with nonlinear materials. It focuses in particular on media with nonlinear polarization properties. It addresses the direct problem of nonlinear Electrodynamics, that is to understand the nonlinear behavior in the induced polarization and to analyze or even to control its impact on the propagation of electromagnetic fields in the matter. The

book gives a comprehensive presentation of the results obtained by the authors during the last decade and put those findings in a broader, unified context and extends them in several ...

Contents

The mathematical model.- Maxwell's equations and wave propagation in media with nonlinear polarizability.- The reduced frequency-domain model.- The condition of phase synchronism.- Packets of plane waves.- Energy conservation laws.- Existence and uniqueness of a weak solution.- Weak formulation.- Existence and uniqueness of a weak solution.- The equivalent system of nonlinear integral equations.- The operator equation.- A sufficient condition for the existence of a continuous solution.- A sufficient condition for the existence of a unique continuous solution.- Relation to the system of nonlinear Sturm-Liouville boundary value problems.- ...

Fields of Interest

Numerical and Computational Physics, Simulation; Computational Science and Engineering; Optical and Electronic Materials; Solid State Physics; Engineering Mathematics; Mathematics of Computing

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2019,XX, 208 p. 72 illus., 68 illus. in color.(Mathematical Engineering) Hardcover

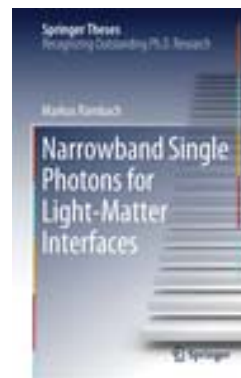
Medium Type

Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity

ISBN : 978-3-319-97153-7

Rambach, Markus, The University of Queensland, Brisbane, QLD, Australia

Narrowband Single Photons for Light-Matter Interfaces

- Nominated as an outstanding Ph.D thesis by the University of Queensland, Australia
- Offers a comprehensive guide for anyone planning to build and characterise his/her own narrowband single photon source
- Strikes a remarkable balance between theoretical foundations, technical material, and experimental results

This book provides a step-by-step guide on how to construct a narrowband single photon source for the integration with atom-based memory systems. It combines the necessary theoretical background with crucial experimental methods and characterisations to form a complete handbook for readers at all academic levels. The future implementation of large quantum networks will require the hybridisation of photonic qubits for communication with quantum memories in the context of information storage. Such an interface requires carefully tailored single photons to ensure compatibility with the chosen memory. The source itself is remarkable for a number ...

Contents

Introduction.- Theoretical and Experimental Foundations.- Design of a Narrowband Single Photon Source.- Single Photon Characterization.- Conclusions.

Fields of Interest

Optics, Lasers, Photonics, Optical Devices; Quantum Information Technology, Spintronics; Quantum Physics

Content Level

Research

Product category

Monograph

Due September 10,2018

In production

Bibliography

1st ed. 2018,XIV, 144 p. 57 illus., 43 illus. in color.(Springer Theses) Hardcover

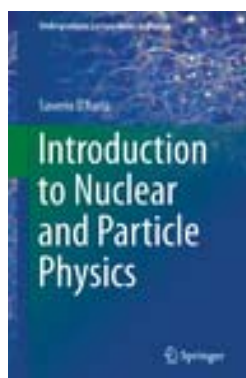
Medium Type

Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity

ISBN : 978-3-319-93854-7

D'Auria, Saverio, University of Glasgow School of Physics and Astronomy, Glasgow, UK

Introduction to Nuclear and Particle Physics

- Presents step-by-step formulae derivation
- Includes fully developed real-world case studies
- Provides end-of-chapter problems and worked solutions

This textbook fills the gap between the very basic and the highly advanced volumes that are widely available on the subject. It offers a concise but comprehensive overview of a number of topics, like general relativity, fission and fusion, which are otherwise only available with much more detail in other textbooks. Providing a general introduction to the underlying concepts (relativity, fission and fusion, fundamental forces), it allows readers to develop an idea of what these two research fields really involve. The book uses real-world examples to make the subject more attractive and encourage the use of mathematical formulae. Besides short ...

Contents

Introduction to radiation.- Introduction to special relativity.- Radioactive decays.- Passage of radiation through the matter.- Introduction to Particle Physics.- Introduction to Nuclear Physics.- Six Problems.-

Bibliography.

Fields of Interest

Particle and Nuclear Physics; Classical and Quantum Gravitation, Relativity Theory; Nuclear Chemistry

Content Level

Lower undergraduate

Product category

Undergraduate textbook

Due September 20,2018

In production

Bibliography

1st ed. 2018,X, 145 p. 120 illus., 84 illus. in color.(Undergraduate Lecture Notes in Physics) Softcover

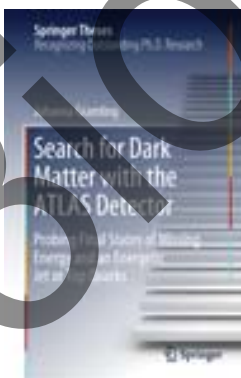
Medium Type

Book

Imprint

Springer

E3999 特別本体6480円

Order Quantity

ISBN : 978-3-319-95015-0

Gramling, Johanna, University of California, Irvine, CA, USA

Search for Dark Matter with the ATLAS Detector**Probing Final States of Missing Energy and an Energetic Jet or Top Quarks**

- Nominated as an outstanding Ph.D thesis by the University of Geneva, Geneve, Switzerland
- Presents a concise introduction to Dark Matter in connection with collider physics
- Provides a detailed discussion of Dark Matter Effective Field Theory, its validity and

Dark Matter Simplified Models

This book discusses searches for Dark Matter at the CERN's LHC, the world's most powerful accelerator. It introduces the relevant theoretical framework and includes an in-depth discussion of the Effective Field Theory approach to Dark Matter production and its validity, as well as an overview of the formalism of Simplified Dark Matter models. Despite overwhelming astrophysical evidence for Dark Matter and numerous experimental efforts to detect it, the nature of Dark Matter still remains a mystery and has become one of the hottest research topics in fundamental physics. Two searches for Dark Matter are presented, performed on data collected ...

Contents

The Standard Model.- Dark Matter.- Supersymmetry.- The ATLAS Detector at the LHC.- Validity of Effective Field Theory Dark Matter Models at the LHC.- Search for Dark Matter in Monojet-like Events.- Constraints on Simplified Dark Matter Models from Mono-X Searches.- Search for New Physics in Events with Missing Energy and Top Quarks.- Conclusions.

Fields of Interest

Particle and Nuclear Physics; Cosmology

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XVIII, 282 p. 148 illus., 41 illus. in color.(Springer Theses) Hardcover

Medium Type

Book

Imprint

Springer

E11999 特別本体19460円

Order Quantity



ISBN : 978-94-024-1559-9

Bolton, Scott (Ed.), Southwest Research Institute, San Antonio, TX, USA

The Juno Mission

- Collects in a single volume extensive descriptions of the science payload aboard the Juno spacecraft, representing the state of the art in scientific instrumentation, spaceflight engineering, and science instrument design, implementation, and calibration
- Written by the foremost experts on Juno's mission to Jupiter, including various Juno instrument team members and Scott Bolton, the Principal Investigator of the Juno project
- Serves as a valuable resource for anybody in the field of space science and engineering

The Juno mission to Jupiter is one of the most ambitious, daring and challenging solar system exploration missions ever conceived. Next to the Sun, Jupiter is the largest object in our solar system. As such, it is both a record and driver of the formation and evolution of the planets -- no other object in our solar system can tell us more about the origin of planetary systems. Understanding the details of giant planet formation, structure, composition and powerful magnetospheric environment required a new perspective close up and over the poles of Jupiter -- an orbit never before attempted. Juno was specifically designed for this challenge, ...

Contents

Editorial: Topical Collection of the Juno Mission Science Objectives, Instruments, and Implementation.- The Juno Mission.- Magnetospheric Science Objectives of the Juno Mission.-The Juno Gravity Science Instrument.- MWR: Microwave Radiometer for the Juno Mission to Jupiter.- The Juno Magnetic Field Investigation.-JIRAM, the Jovian Infrared Auroral Mapper.- The Ultraviolet Spectrograph on NASA's Juno Mission.- Junocam: Juno's Outreach Camera.- The Juno Radiation Monitoring (RM) Investigation.- The Juno Waves Investigation.- The Jupiter Energetic Particle Detector Instrument (JEDI) Investigation for the Juno Mission.- The Jovian Auroral ...

Fields of Interest

Planetary Sciences; Solar and Heliospheric Physics ; Planetology

Content Level

Research

Product category

Monograph

In production

Bibliography

1st ed. 2018,VII, 644 p. 442 illus., 365 illus. in color. Hardcover

Medium Type

Book

Imprint

Springer

E14999 特別本体24330円

Order Quantity



ISBN : 978-94-024-1537-7

Matsuoka, Ayako, Russell, Christopher T. (Eds.), Japan Aerospace Exploration Agency, Kanagawa, Japan

Hayabusa2

Revealing the Evolution of C-Type Asteroid Ryugu

- Serves as an encyclopedia of Hayabusa2's newly developed instruments
- Forms an indispensable reference to solar system evolution as determined through the study of asteroids
- Covers the comprehensive survey techniques used to analyze asteroidal material

In December 2014, Hayabusa2 started its journey to 162173 Ryugu, a C-type asteroid likely to be primordial, thereby making this a voyage in both space and time. Hayabusa2 will begin its observations upon arrival at

Ryugu in 2018. It will survey the asteroid's surface features, touch down on the asteroid, form an artificial crater by shooting an impactor, and collect sample materials both on and under the surface. In 2020, Hayabusa2 will return to Earth and release a re-entry capsule carrying material from Ryugu. This book contains papers describing the scientific objectives and instrumentation on Hayabusa2 and its landing package, MASCOT.

Contents

Editorial to Topical Volume on: Hayabusa2: Revealing the Evolution of C-Type Asteroid Ryugu.- Hayabusa2 Mission Overview.- Preflight Calibration Test Results for Optical Navigation Camera Telescope (ONC-T) Onboard the Hayabusa2 Spacecraft.- Development of the Laser Altimeter (LIDAR) for Hayabusa2.- Albedo Observation by Hayabusa2 LIDAR: Instrument Performance and Error Evaluation.- Dust Detection Mode of the Hayabusa2 LIDAR.- Hayabusa2 Sampler: Collection of Asteroidal Surface Material.- Hayabusa2 Sample Catcher and Container: Metal-Seal System for Vacuum Encapsulation of Returned Samples with Volatiles and Organic Compounds Recovered from ...

Fields of Interest

Planetary Sciences; Space Sciences (including Extraterrestrial Physics, Space Exploration and Astronautics); Geophysics/Geodesy

Content Level

Research

Product category

Monograph

In production

Bibliography

1st ed. 2018,VII, 449 p. 337 illus., 239 illus. in color. Hardcover

Medium Type

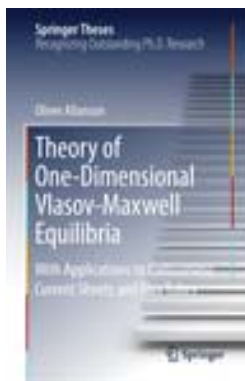
Book

Imprint

Springer

E12999 特別本体21090円

Order Quantity



ISBN : 978-3-319-97540-5

Allanson, Oliver, University of Reading, Reading, UK

Theory of One-Dimensional Vlasov-Maxwell Equilibria

With Applications to Collisionless Current Sheets and Flux Tubes

- Nominated as an outstanding Ph.D thesis by the University of St Andrews, St Andrews, UK
- Presents a pedagogical approach to the subject matter that is as self-contained as possible
- Covers specialist topics presented within the context of both historical and modern-day plasma physics research

This book describes and contextualises collisionless plasma theory, and in particular collisionless plasma equilibria. The Vlasov–Maxwell theory of collisionless plasmas is an increasingly important tool for modern plasma physics research: our ability to sustain plasma in a steady-state, and to mitigate instabilities, determines the success of thermonuclear fusion power plants on Earth; and our understanding of plasma aids in the prediction and mitigation of Space Weather effects on terrestrial environments and satellites. Further afield, magnetic reconnection is a ubiquitous energy release mechanism throughout the Universe, and modern ...

Contents

Introduction.- The Use of Hermite Polynomials for the Inverse Problem in One-Dimensional Vlasov-Maxwell Equilibria.- One-Dimensional Nonlinear Force-Free Current Sheets.- One-Dimensional Asymmetric Current Sheets.- Discussion.

Fields of Interest

Plasma Physics; Magnetism, Magnetic Materials; Space Sciences (including Extraterrestrial Physics, Space Exploration and Astronautics)

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XX, 195 p. 39 illus., 22 illus. in color.(Springer Theses) Hardcover

Medium Type

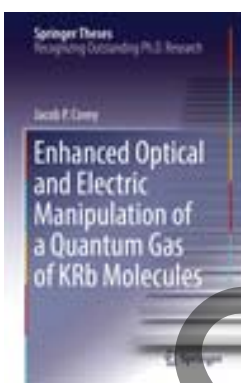
Book

Imprint

Springer

E11999 特別本体19460円

Order Quantity



ISBN : 978-3-319-98106-2

Covey, Jacob P., California Institute of Technology, Pasadena, CA, USA

Enhanced Optical and Electric Manipulation of a Quantum Gas of KRb Molecules

- Nominated as an outstanding PhD thesis by JILA and the University of Colorado, Boulder.
- Opens up new horizons in the experimental use of ultracold polar molecules
- Describes groundbreaking observations of many-body spin dynamics and quantum magnetism with ultracold molecules

This thesis describes significant advances in experimental capabilities using ultracold polar molecules. While ultracold polar molecules are an idyllic platform for quantum chemistry and quantum many-body physics, molecular samples prior to this work failed to be quantum degenerate, were plagued by chemical reactions, and lacked any evidence of many-body physics. These limitations were overcome by loading molecules into an optical lattice to control and eliminate collisions and hence chemical reactions. This led to observations of many-body spin dynamics using rotational states as a pseudo-spin, and the realization of quantum magnetism with ...

Contents

Chapter1. Introduction.- Chapter2. Experimental Background and Overview.- Chapter 3. Quantum-State Controlled Chemical Reactions and Dipolar Collisions.- Chapter 4. Suppression of Chemical Reactions in a 3D Lattice.- Chapter 5. Quantum Magnetism with Polar Molecules in a 3D Optical Lattice.- Chapter 6. A Low Entropy Quantum Gas of Polar Molecules in a 3D Optical Lattice.- Chapter 7. The New Apparatus – Enhanced Optical and Electric Manipulation of Ultracold Polar Molecules.- Chapter 8. Designing, Building and Testing the New Apparatus.- Chapter 9. Experimental Procedure – Making Molecules in the New Apparatus.- Chapter 10. New Physics with ...

Fields of Interest

Quantum Gases and Condensates; Atoms and Molecules in Strong Fields, Laser Matter Interaction; Low Temperature Physics

Content Level

Research

Product category

Monograph

Due September 28,2018

In production

Bibliography

1st ed. 2018,X, 290 p. 148 illus., 142 illus. in color.(Springer Theses) Hardcover

Medium Type

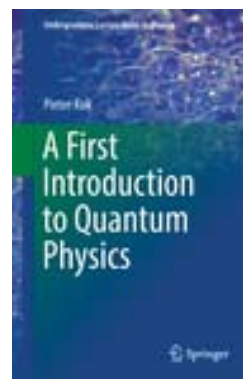
Book

Imprint

Springer

E11999 特別本体19460円

Order Quantity



ISBN : 978-3-319-92206-5

Kok, Pieter, University of Sheffield, Sheffield, UK

A First Introduction to Quantum Physics

- Explores key concepts in quantum theory using the simplest physical systems
- Advances quantum theory with only simple mathematics that is developed as it is needed
- Illustrates each key concept with modern examples such as gravitational wave detection, atomic clocks, magnetic resonance imaging, and the scanning tunneling microscope

In this undergraduate textbook, the author develops the quantum theory from first principles based on very simple experiments: a photon travelling through beam splitters to detectors, an electron moving through a Stern-Gerlach machine, and an atom emitting radiation. From the physical description of these experiments follows a natural mathematical description in terms of matrices and complex numbers. The first part of the book examines how experimental facts force us to let go of some deeply held preconceptions and develops this idea into a mathematical description of states, probabilities, observables, and time evolution using physical ...

Contents

Chapter 1: Three simple experiments.- The purpose of physical theories.- A laser and a detector.- A laser and a beam splitter.- A Mach-Zehnder interferometer.- The breakdown of classical concepts.- Chapter 2: Photons and Interference.- Photon paths and superpositions.- The beam splitter as a matrix.- The phase in an interferometer.- How to calculate probabilities.- Gravitational wave detection.- Chapter 3: Electrons with Spin.- The Stern-Gerlach experiment.- The spin observable.- The Bloch sphere.- The uncertainty principle.- Magnetic resonance imaging.- Chapter 4: Atoms and Energy.- The energy spectrum of atoms.- Changes over time.- The ...

Fields of Interest

Quantum Physics; Mathematical Methods in Physics; Quantum Field Theories, String Theory; Mathematical Applications in the Physical Sciences

Content Level

Lower undergraduate

Product category

Undergraduate textbook

Available

Bibliography

1st ed. 2018, IX, 243 p. 63 illus., 2 illus. in color. (Undergraduate Lecture Notes in Physics) Softcover

Medium Type

Book

Imprint

Springer

E4499 特別本体7290円

Order Quantity



ISBN : 978-3-319-96007-4

Linnemann, Daniel, Universität Heidelberg, Heidelberg, Germany

Quantum Enhanced Sensing Based on Time Reversal of Entangling Interactions

- Nominated as an outstanding Ph.D thesis by the University of Heidelberg, Heidelberg, Germany
- Makes an important contribution to applied quantum technologies
- Backs key results with intuitive arguments and instructive examples from classical mechanics and quantum optics

Quantum mechanics entails effects like superpositions and entanglement, which have no classical counterparts. From a technological standpoint these counterintuitive quantum aspects can be viewed as an unexploited resource that can be harnessed to support various tasks, e.g. in the domains of computation, communication, and metrology. In many applications, however, the potential of nonclassical states cannot practically be exploited due to detection inefficiencies. The authors address this limitation by experimentally realizing a novel detection scheme in which entangling interactions are time reversed. In this way, nonclassical many-particle ...

Contents

Introduction.- Part I: Theoretical Basics.- Quantum Mechanical Spin.- Hamiltonian of a Spin-1 Bose-Einstein Condensate.- Part II: Concepts of Time Reversal Interferometry.- Spin Exchange as an Amplifier.- Interferometry Concept Within the SU(1,1)

Framework.- Part III: Experimental Platform.- Experimental System and Manipulation Techniques.- Part IV: Experimental Results.- State and Process Characterization.- Quantum-Enhanced Sensing Based on Time Reversal.- Interferometry Beyond Exact Time Reversal.- Nonlinear Time Reversal as a Diagnostic Tool.- Outlook.

Fields of Interest

Quantum Physics; Quantum Information Technology, Spintronics; Quantum Gases and Condensates

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018, XVIII, 165 p. 64 illus., 63 illus. in color. (Springer Theses) Hardcover

Medium Type

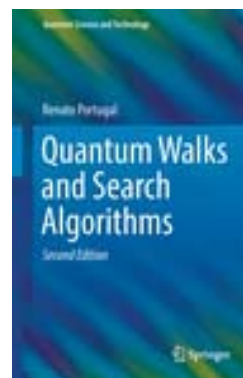
Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity



ISBN : 978-3-319-97812-3

Portugal, Renato, National Laboratory of Scientific Computing (LNCC), Petrópolis, Brazil

Quantum Walks and Search Algorithms

- Offers an expanded introduction to the field of quantum walks
- Covers key topics in quantum computation including Grover's algorithm
- Includes a new chapter on the Element Distinctness Algorithm

The revised edition of this book offers an extended overview of quantum walks and explains their role in building quantum algorithms, in particular search algorithms. Updated throughout, the book focuses on core topics including Grover's algorithm and the most important quantum walk models, such as the coined, continuous-time, and Szegedy's quantum walk models. There is a new chapter describing the staggered quantum walk model. The chapter on spatial search algorithms has been rewritten to offer a more comprehensive approach and a new chapter describing the element distinctness algorithm has been added. There is a new appendix on graph ...

Contents

1 Introduction.- 2 The Postulates of Quantum Mechanics.- 3 Introduction to Quantum Walks.- 4 Grover's Algorithm and Its Generalization.- 5 Coined Walks on Infinite Lattices.- 6 Coined Walks with Cyclic Boundary Conditions.- 7 Coined Quantum Walks on Graphs.- 8 Staggered Model.- 9 Spatial Search Algorithms.- 10 Element Distinctness.- 11 Szegedy's Quantum Walk.- A Linear Algebra for Quantum Computation.- B Graph Theory for Quantum Walk.- C Classical Hitting Time.

Fields of Interest

Quantum Physics; Quantum Computing; Theory of Computation; Quantum Information Technology, Spintronics

Content Level

Research

Product category

Monograph

Available

Bibliography

2nd ed. 2018,XIV, 308 p. 56 illus., 15 illus. in color.(Quantum Science and Technology) Hardcover

Medium Type

Book

Imprint

Springer

E12999 特別本体21090円

Order Quantity



ISBN : 978-3-319-93150-0

Walschaers, Mattia, Sorbonne University, CNRS, École Normale Supérieure, and Collège de France, Paris, France

Statistical Benchmarks for Quantum Transport in Complex Systems

From Characterisation to Design

- Nominated as an outstanding Ph.D thesis by the Albert Ludwig University, Freiburg, Germany
- Provides an introduction to the algebraic formalism for many-particle systems, applied to modern problems such as boson sampling
- Introduces a statistical approach to understand dynamical features of complex quantum systems

This book introduces a variety of statistical tools for characterising and designing the dynamical features of complex quantum systems. These tools are applied in the contexts of energy transfer in photosynthesis, and boson sampling. In dynamical quantum systems, complexity typically manifests itself via the interference of a rapidly growing number of paths that connect the initial and final states. The book presents the language of graphs and networks, providing a useful framework to discuss such scenarios and explore the rich phenomenology of transport phenomena. As the complexity increases, deterministic approaches rapidly become ...

Contents

Part I: General Introduction.- Perspective.- Essential Quantum Theory.- Complex Quantum Systems and Random Matrix Theory.- Part II: Single-particle Quantum Transport.- Efficient Transport in Closed Systems.- Scattering Approach to Efficient Transport.- Part III: Many-particle Quantum Transport.- Describing Many-particle Quantum Systems.- Many-Particle Interference.- Currents of Indistinguishable Particles.- Part IV: General Conclusions and Prospects.- Conclusions.

Fields of Interest

Quantum Physics; Statistical Physics and Dynamical Systems; Complex Systems

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XX, 450 p. 80 illus., 17 illus. in color.(Springer Theses) Hardcover

Medium Type

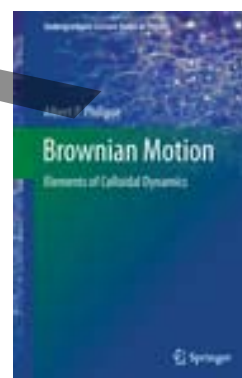
Book

Imprint

Springer

E12999 特別本体21090円

Order Quantity



ISBN : 978-3-319-98052-2

Philipse, Albert P., Utrecht Univ Debye Inst for Nanomaterial Sci, Utrecht, The Netherlands

Brownian Motion

Elements of Colloid Dynamics

- A compact primer for the study of Brownian motion of colloidal particles
- Illustrates the basic physical and chemical principles and the dynamics of colloidal solutions in a clear and didactic way
- Enriched with exercises of variable level of difficulty and addressing different settings

This textbook is an introduction to the Brownian motion of colloids and nanoparticles, and the diffusion of molecules. One very appealing aspect of Brownian motion, as this book illustrates, is that the subject connects a broad variety of topics, including thermal physics, hydrodynamics, reaction kinetics, fluctuation phenomena, statistical thermodynamics, osmosis and colloid science. The book is based on a set of lecture notes that the authors used for an undergraduate course at the University of

Utrecht, Netherland. It aims to provide more than a simplified qualitative description of the subject, without getting bogged down in difficult ...

Contents

Preface.- A first round of Brownian motion.- The feverish Sphinx.- Kinetic theory.- A tale of ten time scales.- Continuity, constitution and Fick's laws.- Brownian displacements.- Fluid flow.- Flow past spheres and simple geometries.- Encounters of the Brownian kind.- Random walks in external fields.- Brownian motion and Van 't Hoff's law.- Appendices: A. Moments, fluctuations and Gaussian integrals.- B. Summary vector calculus.- C. Answers to selected problems.- Index.- Greek/Roman symbols.

Fields of Interest

Soft and Granular Matter, Complex Fluids and Microfluidics; Physical Chemistry; Thermodynamics; Fluid- and Aerodynamics

Content Level

Upper undergraduate

Product category

Undergraduate textbook

Due September 28,2018

In production

Bibliography

1st ed. 2018,XVII, 176 p. 50 illus., 15 illus. in color.(Undergraduate Lecture Notes in Physics) Hardcover

Medium Type

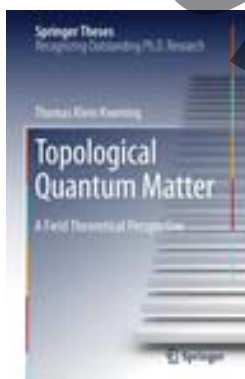
Book

Imprint

Springer

E5999 特別本体9730円

Order Quantity



ISBN : 978-3-319-96763-9

Klein Kvonning, Thomas, Royal Institute of Technology, Stockholm, Sweden

Topological Quantum Matter

A Field Theoretical Perspective

- Nominated as an outstanding Ph.D. thesis by the Stockholm University, Sweden
- Focusses on topological superconductors and topological insulators
- Presents formulations of topological order in modern mathematical language

This book offers a theoretical description of topological matter in terms of effective field theories, and in particular topological field theories, focusing on two main topics: topological superconductors and topological insulators. Even though there is vast literature on these subjects, the book fills an important gap by providing a concise introduction to both topological order and symmetry-protected phases using a modern mathematical language, and developing the theoretical concepts by highlighting the physics and the physical properties of the systems. Further, it discusses in detail the topological interactions for topologically ...

Contents

Introduction.- Anyons and Topological Order.- Response Theory and SPT Phases.- Geometric Response and TO of SC's.- The Abelian Hierarchy of Fractional Quantum Hall Liquids.

Fields of Interest

Solid State Physics; Strongly Correlated Systems, Superconductivity; Mathematical Methods in Physics

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,X, 81 p. 24 illus., 6 illus. in color. (Springer Theses) Hardcover

Medium Type

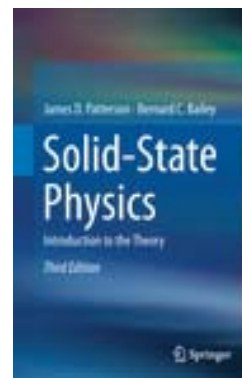
Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity



ISBN : 978-3-319-75321-8

Patterson, James D., Bailey, Bernard C., Florida Institute of Technology, Rapid City, SD, USA

Solid-State Physics

Introduction to the Theory

- Written by two experienced researchers with years of teaching experience
- Features a wealth of problems and solutions
- Includes 90 biographical snapshots of prominent researchers in solid state physics

This book teaches solid state physics in a comprehensive way, covering all areas. It begins with three broad topics: how and why atoms bind together to form solids, lattice vibrations and phonons, and electrons in solids. It then applies this knowledge to interactions, especially those between electrons and phonons, metals, the Fermi surface and alloys, semiconductors, magnetism, superconductivity, dielectrics and ferroelectrics, optical properties, defects, layered materials, quantum Hall effect, mesoscopics, nanophysics and soft condensed matter. Further important topics of the book are the evolution of BEC to BCS phenomena, conducting ...

Contents

Crystal Binding and Structure.- Lattice Vibrations and Thermal Properties.- Electrons in Periodic Potentials.- The Interaction of Electrons and Lattice Vibrations.- Metals, Alloys, and the Fermi Surface.- Semiconductors.- Magnetism, Magnons, and Magnetic Resonance.- Superconductivity.- Dielectrics and Ferroelectrics.- Optical Properties of Solids.- Defects in Solids.- Current Topics in Solid Condensed-Matter Physics.

Fields of Interest

Solid State Physics; Optical and Electronic Materials; Microwaves, RF and Optical Engineering; Semiconductors; Mathematical Methods in Physics

Content Level

Graduate

Product category

Graduate/advanced undergraduate textbook

Due September 06,2018

In production

Bibliography

3rd ed. 2018,XXIV, 951 p. 256 illus., 4 illus. in color. Hardcover

Medium Type

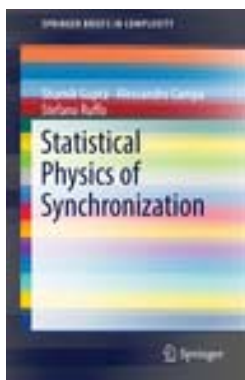
Book

Imprint

Springer

E10999 特別本体17840円

[Order Quantity](#)



ISBN : 978-3-319-96663-2

Gupta, S., Campa, A., Ruffo, S., Ramakrishna Mission Vivekananda University, Howrah, India

Statistical Physics of Synchronization

This book introduces and discusses the analysis of interacting many-body complex systems exhibiting spontaneous synchronization from the perspective of nonequilibrium statistical physics. While such systems have been mostly studied using dynamical system theory, the book underlines the usefulness of the statistical physics approach to obtain insightful results in a number of representative dynamical settings. Although it is intractable to follow the dynamics of a particular initial condition, statistical physics allows to derive exact analytical results in the limit of an infinite number of interacting units. Chapter one discusses dynamical ...

Contents

Synchronizing systems.- Introduction.- The oscillators and their interaction: A qualitative discussion.- Oscillators as limit cycles.-

Interacting limit-cycle oscillators.- Synchronizing systems as statistical mechanical systems.- The features of a statistical physical description.- Some results for noiseless interacting oscillators.- The oscillators with inertia.- Appendix 1: A two-dimensional dynamics with a limit-cycle attractor.- Appendix 2: The Lyapunov exponents.- Appendix 3: The one-body distribution function in an N-body system.- Oscillators with first-order dynamics.- The oscillators with distributed natural frequencies.- The ...

Fields of Interest

Statistical Physics and Dynamical Systems; Complexity; Mathematical Physics

Content Level

Research

Product category

Brief

Available

Bibliography

1st ed. 2018,XVI, 121 p. 32 illus., 27 illus. in color.(SpringerBriefs in Complexity) Softcover

Medium Type

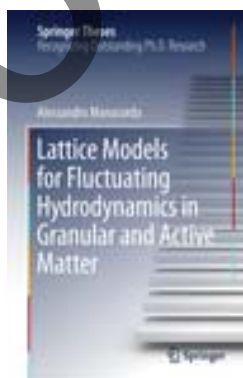
Book

Imprint

Springer

E5499 特別本体8920円

[Order Quantity](#)



ISBN : 978-3-319-95079-2

Manacorda, Alessandro, University of Sapienza, Rome, Italy

Lattice Models for Fluctuating Hydrodynamics in Granular and Active Matter

• Nominated as an outstanding Ph.D thesis by

the Sapienza University of Rome, Italy

- Investigates the complex collective behaviour of non-equilibrium systems of granular and active matter
- Relates microscopic properties of a few particles to the macroscopic collective motion of the whole system

This book investigates the common nature of granular and active systems, which is rooted in their intrinsic out-of-equilibrium behavior, with the aim of finding minimal models able to reproduce and predict the complex collective behavior observed in experiments and simulations. Granular and active matter are among the most studied systems in out-of-equilibrium statistical physics. The book guides readers through the derivation of a fluctuating hydrodynamic description of granular and active matter by means of controlled and transparent mathematical assumptions made on a lattice model. It also shows how a macroscopic description can be ...

Contents

Part I: Granular and Active Matter.- Granular Matter.- Active Matter.- Hydrodynamic Description and Lattice Models.- Part II: Fluctuating Hydrodynamics of Granular and Active Matter: Lattice Models.- Granular Lattice: Fluctuating Hydrodynamics.- Granular Lattice: Beyond Molecular Chaos.- Active Lattice Fluctuating Hydrodynamics.- Conclusions.

Fields of Interest

Statistical Physics and Dynamical Systems; Soft and Granular Matter, Complex Fluids and Microfluidics; Thermodynamics

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XIX, 200 p. 47 illus., 15 illus. in color.(Springer Theses) Hardcover

Medium Type

Book

Imprint

Springer

E10999 特別本体17840円

[Order Quantity](#)



ISBN : 978-3-319-93945-2

Martínez-Guerra, Rafael, Pérez-Pinacho, Claudia Alejandra, CINVESTAV-IPN, Mexico City, Mexico

Advances in Synchronization of Coupled Fractional Order Systems

Fundamentals and Methods

- Provides a self-contained account on recent advances in fractional order dynamical systems
- Contains a lot of introductory and background material, as well as worked examples for newcomers to the field
- Offers a special chapter on secure communications as newly emerging topic for fractional order systems modeling

After a short introduction to the fundamentals, this book provides a detailed account of major advances in applying fractional calculus to dynamical systems. Fractional order dynamical systems currently continue to gain further importance in many areas of science and engineering. As with many other approaches to mathematical modeling, the first issue to be addressed is the need to couple a definition of the fractional differentiation or integration operator with the types of dynamical systems that are analyzed. As such, for the fundamentals the focus is on basic aspects of fractional calculus, in particular stability analysis, which is ...

Contents

Preface.- Introduction.- Basic Concepts and Preliminaries.- Synchronization of Chaotic Systems by means of a nonlinear observer: An application to Secure Communications.- Synchronization for Chaotic system through an Observer using the Immersion and Invariance (I&I) Approach.- Synchronization of Nonlinear Fractional Order Systems by Means of Pira Reduced Order Observer.- Estimators for a class of commensurate fractional order systems with Caputo derivative.- Generalized Multi-synchronization of Fractional Order Liouvillian Chaotic Systems using Fractional Dynamical Controller.- An Observer for a Class of Incommensurate Fractional Order ...

Fields of Interest

Statistical Physics and Dynamical Systems; Vibration, Dynamical Systems, Control; Applications of Nonlinear Dynamics and Chaos Theory; Complexity

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XIX, 185 p. 66 illus., 59 illus. in color.(Understanding Complex Systems) Hardcover

Medium Type

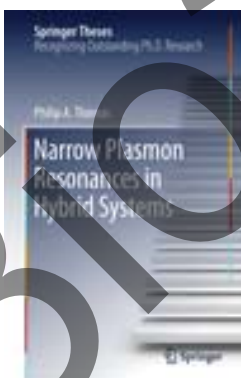
Book

Imprint

Springer

E9999 特別本体16220円

Order Quantity



ISBN : 978-3-319-97525-2

Thomas, Philip A., University of Exeter, Exeter, UK

Narrow Plasmon Resonances in Hybrid Systems

- Nominated as an outstanding Ph.D thesis by the University of Manchester, Manchester, UK
- Details two approaches to achieving extremely narrow plasmon resonances
- Presents system capable of detecting trace quantities of toxin, undetectable by other methods

Advances in understanding the interactions between light and subwavelength materials have enabled the author and his collaborators to tailor unique optical responses at the nanoscale. In particular, metallic nanostructures capable of

supporting surface plasmons can be designed to possess spectrally narrow plasmon resonances, which are of particular interest due to their exceptional sensitivity to their local environment. In turn, combining plasmonic nanostructures with other materials in hybrid systems allows this sensitivity to be exploited in a broad range of applications. In this book the author explores two different approaches to ...

Contents

Plasmonics.- Two-dimensional Materials.- Super-narrow, Extremely High Quality Collective Plasmon Resonances at Telecommunication Wavelengths.- Nanomechanical Electro-optical Modulator Based on Atomic Heterostructures.- Strong Coupling of Diffraction Coupled Plasmons and Optical Waveguide Modes in Gold Stripe-dielectric Nanostructures at Telecom Wavelengths.- Phase-sensitive Detection of HT-2 Mycotoxin Using Graphene-protected Copper Plasmonics.- Conclusions and Future Work.

Fields of Interest

Surface and Interface Science, Thin Films; Optical and Electronic Materials; Nanotechnology; Electronic Circuits and Devices

Content Level

Research

Product category

Monograph

Available

Bibliography

1st ed. 2018,XVII, 114 p. 49 illus., 37 illus. in color.(Springer Theses) Hardcover

Medium Type

Book

Imprint

Springer

E10999 特別本体17840円

Order Quantity

S83103K \$ ↑