Statistical Field Theory Volume 2 Strong Coupling Monte Carlo Methods Conformal Field Theory And Random Systems Cambridge Monographs On Mathematical Physics

Statistical Field Theory: Volume 1, From Brownian Motion to Renormalization and Lattice Gauge TheoryMethods of Quantum Field Theory in Statistical PhysicsLectures on Elementary Particles and Quantum Field TheoryThe Classical Theory of FieldsQuantum Field Theory and Quantum Statistics, Essays in Honour of the Sixtieth Birthday of E S FradkinField Theories of Condensed Matter PhysicsPath Integrals in PhysicsInteractions between Electromagnetic Fields and MatterStatistical Field TheoriesA Survey of Hidden-Variables TheoriesQuantum GeometryGauge Field TheoriesThe Nebular VariablesQuantum Field Theory and Condensed MatterPlasma AstrophysicsIntroduction to Gauge Field Theory Revised EditionAlgebraic Methods in Statistical Mechanics and Quantum Field TheoryRandom FieldsProblems in Quantum MechanicsStatistical Approach to Quantum Field TheoryStatistical Field Theory: Volume 2, Strong Coupling, Monte Carlo Methods, Conformal Field Theory and Random SystemsStatistical Field TheoryStatistical Field TheoryStatistical Field Theory for Neural NetworksIdeas and Methods in Quantum and Statistical Physics: Volume 2Introduction to Feynman

DiagramsOpticsStatistical Physics of FieldsCollected Papers Vol.1: Quantum Field Theory and Statistical MechanicsQuantum Field Theory and Statistical MechanicsGaseous Electronics and Gas LasersProblems of Linear Electron (Polaron) Transport Theory in SemiconductorsStatistical Field Theory: Volume 2, Strong Coupling, Monte Carlo Methods, Conformal Field Theory and Random SystemsString Theory: Volume 2, Superstring Theory and BeyondThermal Field TheoryStatistical Field TheoryFunctional Methods in Quantum Field Theory and Statistical PhysicsHandbook of Item Response TheoryStatistical Field Theory: Volume 1, From Brownian Motion to Renormalization and Lattice Gauge TheoryStatistical Field Theory: Volume 2, Strong Coupling, Monte Carlo Methods, Conformal Field Theory and Random Systems

Statistical Field Theory: Volume 1, From Brownian Motion to Renormalization and Lattice Gauge Theory

The conclusive volume of the Brandeis University Summer Institute lecture series of 1970 on theories of interacting elementary particles consisting of five sets of lectures. The five sets of lectures are as follows: Rudolph Haag (II. Institut fur Theoretische Physik der Universitat Hamburg) on "Observables and Fields": introduction; axiomatic quantum field theory in various formulations; structure of superselection rules; charge quantum numbers; statistics; parastatistics. Maurice

Jacob (CERN, European Organization for Nuclear Research) on "Regge Models and Duality": introduction; duality in a semi-local way; duality and unitary symmetry; dual models for meson-meson scattering; dual models for production process; from dual models to a dual theory. Henry Primakoff (University of Pennsylvania) on "Weak Interactions": introduction; lepton conversation and the implications of a possible lepton non-conversation; first-order and second-order weak collision processes; "abnormalities in the weak currents and how to discover them; conclusion. Michael C. Reed (Princeton University) on "The GNS Construction--A Pedagogical Example": infinite tensor products of Hilbert spaces; the canonical anti-commutation relations; the example; the example--via the GNS construction. Bruno Zumino (CERN, European Organization for Nuclear Research) on "Effective Lagrangians and Broken Symmetries": Introduction; effective action and phenomenological fields; Ward identities and the effective action; Goldstone's theorem; non-linear realizations; massive Yang-Mills fields as phenomenological fields; broken scale invariance; the fifteen parameter conformal group and the Weyl transformations; conversion identities and trace identities; invariant actions; SU(3)xSU(3) and conformal invariance; strong gravitation; concluding remarks.

Methods of Quantum Field Theory in Statistical Physics

Providing a systematic introduction to the techniques which are fundamental to quantum field theory, this book pays special attention to the use of these

techniques in a wide variety of areas, including ordinary quantum mechanics, quantum mechanics in the second-quantized formulation, relativistic quantum field theory, Euclidean field theory, quant

Lectures on Elementary Particles and Quantum Field Theory

Notes after each chapter

The Classical Theory of Fields

Quantum Field Theory and Quantum Statistics, Essays in Honour of the Sixtieth Birthday of E S Fradkin

Volume 1: From Brownian Motion to Renormalization and Lattice Gauge Theory. Volume 2: Strong Coupling, Monte Carlo Methods, Conformal Field Theory, and Random Systems. This two-volume work provides a comprehensive and timely survey of the application of the methods of quantum field theory to statistical physics, a very active and fruitful area of modern research. The first volume provides a pedagogical introduction to the subject, discussing Brownian motion, its anticommutative counterpart in the guise of Onsager's solution to the two-

dimensional Ising model, the mean field or Landau approximation, scaling ideas exemplified by the Kosterlitz-Thouless theory for the XY transition, the continuous renormalization group applied to the standard phi-to the fourth theory (the simplest typical case) and lattice gauge theory as a pathway to the understanding of quark confinement in quantum chromodynamics. The second volume covers more diverse topics, including strong coupling expansions and their analysis, Monte Carlo simulations, two-dimensional conformal field theory, and simple disordered systems. The book concludes with a chapter on random geometry and the Polyakov model of random surfaces which illustrates the relations between string theory and statistical physics. The two volumes that make up this work will be useful to theoretical physicists and applied mathematicians who are interested in the exciting developments which have resulted from the synthesis of field theory and statistical physics.

Field Theories of Condensed Matter Physics

Notes after each chapter.

Path Integrals in Physics

Interactions between Electromagnetic Fields and Matter deals with the principles

and methods that can amplify electromagnetic fields from very low levels of signals. This book discusses how electromagnetic fields can be produced, amplified, modulated, or rectified from very low levels to enable these for application in communication systems. This text also describes the properties of matter and some phenomenological considerations to the reactions of matter when an action of external fields results in a polarization of the particle system and changes the bonding forces existing in the matter. This book considers the above phenomena in detail by explaining matter as a conglomeration of charged mass points in the electromagnetic field. Quantum mechanics and Maxwell's theory can then account for the precise description of the interactions between the electromagnetic fields and matter. This book then describes special processes such as 1) the static and quasistatic interactions and 2) dynamic processes, particularly the resonance process. This text also defines a general form for electric and magnetic reactions using the generalized field equation. This book also cites the anharmonic oscillator and the single spin as different examples of electric and magnetic dipole interactions. This text is suitable for electrical engineers, radio technicians, physicists whose work is in quantum mechanics, and engineers interested in electro-magnetism theory.

Interactions between Electromagnetic Fields and Matter

Specifically written to introduce researchers and advanced students to the modern

developments in statistical mechanics and field theory, this book's leitmotiv is functional integration and its application to different areas of physics. The book acts as both an introduction to and a lucid overview of the major problems in statistical field theory.

Statistical Field Theories

Introduction to Gauge Field Theory provides comprehensive coverage of modern relativistic quantum field theory, emphasizing the details of actual calculations rather than the phenomenology of the applications. Forming a foundation in the subject, the book assumes knowledge of relativistic quantum mechanics, but not of quantum field theory. The book is ideal for graduate students, advanced undergraduates, and researchers in the field of particle physics.

A Survey of Hidden-Variables Theories

Optics, Parts 1 and 2 covers electromagnetic optics and quantum optics. The first part of the book examines the various of the important properties common to all electromagnetic radiation. This part also studies electromagnetic waves; electromagnetic optics of transparent isotropic and anisotropic media; diffraction; and two-wave and multi-wave interference. The polarization states of light, the

velocity of light, and the special theory of relativity are also examined in this part. The second part is devoted to quantum optics, specifically discussing the classical molecular theory of optical phenomena and the quantization of radiant energy and of energy in atoms. This part also looks into topics such as wave mechanics, atomic and molecular spectra, and spectrometry. This book will be beneficial to those interested in studying optics, including students of physics.

Quantum Geometry

A thorough and pedagogical introduction to phase transitions and exactly solved models in statistical physics and quantum field theory.

Gauge Field Theories

A Survey of Hidden-Variables Theories is a three-part book on the hidden-variable theories, referred in this book as ""theories of the first kind"". Part I reviews the motives in developing different types of hidden-variables theories. The quest for determinism led to theories of the first kind; the quest for theories that look like causal theories when applied to spatially separated systems that interacted in the past led to theories of the second kind. Parts II and III further describe the theories of the first kind and second kind, respectively. This book is written to make the

literature on hidden variables comprehensible to those who are confused by the original papers with their controversies, and to average reader of physics papers.

The Nebular Variables

Recent developments in theoretical physics include new instances of the unification of quite different phenomena. The theoretical community is challenged by the growing interactions between high-energy physics, statistical physics, and condensed matter physics. The common language, though, is exact solutions of two-dimensional and conformable field theories. This volume is a faithful representation of this interdisciplinary domain. Conformable and integrable field theories have been active research topics for several decades. The main recent developments concern the boundary effects and applications to disordered systems. The number of applications of the exact methods to condensed-matter problems has been growing over the years. Nowadays it is widely recognized that strongly interacting systems in low dimensions can be successfully described by integrable and conformable theories. This volume is an indispensable aid to those seeking to find their way in this domain.

Quantum Field Theory and Condensed Matter

This book presents a self-contained introduction to techniques from field theory applied to stochastic and collective dynamics in neuronal networks. These powerful analytical techniques, which are well established in other fields of physics, are the basis of current developments and offer solutions to pressing open problems in theoretical neuroscience and also machine learning. They enable a systematic and quantitative understanding of the dynamics in recurrent and stochastic neuronal networks. This book is intended for physicists, mathematicians, and computer scientists and it is designed for self-study by researchers who want to enter the field or as the main text for a one semester course at advanced undergraduate or graduate level. The theoretical concepts presented in this book are systematically developed from the very beginning, which only requires basic knowledge of analysis and linear algebra.

Plasma Astrophysics

Gaseous Electronics and Gas Lasers deals with the fundamental principles and methods of analysis of weakly ionized gas discharges and gas lasers. The emphasis is on processes occurring in gas discharges and the analytical methods used to calculate important process rates. Detailed analyses of a variety of gas discharges are presented using atomic, ionic, and gas lasers as primary illustrations. Comprised of 12 chapters, this book begins with some initial categorization of gas discharge species and an overview of their interactions. The discussion then turns

to an elementary theory of a gas discharge; inelastic collisions; distribution functions and the Boltzmann equation; and transport coefficients. Subsequent chapters focus on the fluid equations; electron-density decay processes; excited species; atomic neutral gas lasers; molecular gas lasers; and ion lasers. The important electron loss processes that determine the behavior of a plasma when the source and loss terms balance are also examined. This monograph will be of value to graduate students, practitioners, and researchers in the fields of physics and engineering, as well as to professionals interested in working with weakly ionized discharges.

Introduction to Gauge Field Theory Revised Edition

The Nebular Variables focuses on the nebular variables and their characteristics. Discussions are organized by type of nebular variable, namely, RW Aurigae stars, T Orionis stars, T Tauri stars, and peculiar nebular objects. Topics range from light variations of the stars to their spectroscopic and physical characteristics, spatial distribution, interaction with nebulosity, and evolutionary features. This volume is divided into four sections and consists of 25 chapters, the first of which provides general information on nebular variables, including their stellar associations and their classification into three distinct groups: RW Aurigae, T Orionis and T Tauri variables. These three groups of nebular variables are examined in more detail in the chapters that follow in terms of their light variations, spatial distribution,

interaction with nebulosity, and spectroscopic, physical, and evolutionary characteristics. Visual and photoelectric light curves, mass loss determined spectroscopically, luminosities, and stellar radii are considered. The book also explores the possibility that some of the nebulae associated with certain nebular variables have evolved from a protoplanetary disc of material consisting of both gas and solid matter. Peculiar nebular variables such as the long period variable R Aquarii, Herbig-Haro objects, symbiotic variables, and infrared stars are analyzed as well. This book is written primarily for students and teachers of astronomy.

Algebraic Methods in Statistical Mechanics and Quantum Field Theory

Volume 1: From Brownian Motion to Renormalization and Lattice Gauge Theory. Volume 2: Strong Coupling, Monte Carlo Methods, Conformal Field Theory, and Random Systems. This two-volume work provides a comprehensive and timely survey of the application of the methods of quantum field theory to statistical physics, a very active and fruitful area of modern research. The first volume provides a pedagogical introduction to the subject, discussing Brownian motion, its anticommutative counterpart in the guise of Onsager's solution to the two-dimensional Ising model, the mean field or Landau approximation, scaling ideas exemplified by the Kosterlitz-Thouless theory for the XY transition, the continuous

renormalization group applied to the standard phi-to the fourth theory (the simplest typical case) and lattice gauge theory as a pathway to the understanding of quark confinement in quantum chromodynamics. The second volume covers more diverse topics, including strong coupling expansions and their analysis, Monte Carlo simulations, two-dimensional conformal field theory, and simple disordered systems. The book concludes with a chapter on random geometry and the Polyakov model of random surfaces which illustrates the relations between string theory and statistical physics. The two volumes that make up this work will be useful to theoretical physicists and applied mathematicians who are interested in the exciting developments which have resulted from the synthesis of field theory and statistical physics.

Random Fields

Plasma Astrophysics is a translation from the Russian language; the topics discussed are based on lectures given by V.N. Tsytovich at several universities. The book describes the physics of the various phenomena and their mathematical formulation connected with plasma astrophysics. This book also explains the theory of the interaction of fast particles plasma, their radiation activities, as well as the plasma behavior when exposed to a very strong magnetic field. The text describes the nature of collective plasma processes and of plasma turbulence. One author explains the method of elementary excitation which he has developed. The

book also discusses the sporadic radio-emission of the sun, galactic nuclei, radio-galaxies, quasars, and pulsars. The book explains that problems involving terrestrial plasma can be split into parts; in astrophysics, the approach is different. For example, particle acceleration is determined by turbulence spectra that in turn depends on the energy distribution of the accelerated particles. The authors also give theoretical results based on many calculations analysis of observational data: Tsytovich contributes new theoretical calculations. This book can prove helpful for nuclear scientists and researchers working with plasma physics or astro-physics.

Problems in Quantum Mechanics

Describes random geometry and applications to strings, quantum gravity, topological field theory and membrane physics.

Statistical Approach to Quantum Field Theory

String Theory, first published in 1998, comprises two volumes which provide a comprehensive and pedagogic account of the subject. Volume 2 begins with an introduction to supersymmetric string theories and presents the important advances of recent years. The first three chapters introduce the type I, type II, and heterototic superstring theories and their interactions. The next two chapters

present important recent discoveries about strongly coupled strings, beginning with a detailed treatment of D-branes and their dynamics, and covering string duality, M-theory, and black hole entropy. The final chapters are concerned with four-dimensional string theories, showing how some of the simplest string models connect with previous ideas for unifying the Standard Model. They collect many important results on world-sheet and spacetime symmetries. An appendix summarizes the necessary background on fermions and supersymmetry. An essential text and reference for graduate students and researchers interested in superstring theory.

Statistical Field Theory: Volume 2, Strong Coupling, Monte Carlo Methods, Conformal Field Theory and Random Systems

A collection of essays by many of the closest co-workers of Raphael Høegh-Krohn.

Statistical Field Theory

This volume contains a selection of expository articles on quantum field theory and statistical mechanics by James Glimm and Arthur Jaffe. They include a solution of the original interacting quantum field equations and a description of the physics which these equations contain. Quantum fields were proposed in the late 1920s as

the natural framework which combines quantum theory with relativ ity. They have survived ever since. The mathematical description for quantum theory starts with a Hilbert space H of state vectors. Quantum fields are linear operators on this space, which satisfy nonlinear wave equations of fundamental physics, including coupled Dirac, Max well and Yang-Mills equations. The field operators are restricted to satisfy a "locality" requirement that they commute (or anti-commute in the case of fer mions) at space-like separated points. This condition is compatible with finite propagation speed, and hence with special relativity. Asymptotically, these fields converge for large time to linear fields describing free particles. Using these ideas a scattering theory had been developed, based on the existence of local quantum fields.

Statistical Field Theory

While many scientists are familiar with fractals, fewer are familiar with scale-invariance and universality which underlie the ubiquity of their shapes. These properties may emerge from the collective behaviour of simple fundamental constituents, and are studied using statistical field theories. Initial chapters connect the particulate perspective developed in the companion volume, to the coarse grained statistical fields studied here. Based on lectures taught by Professor Kardar at MIT, this textbook demonstrates how such theories are formulated and studied. Perturbation theory, exact solutions, renormalization groups, and other

tools are employed to demonstrate the emergence of scale invariance and universality, and the non-equilibrium dynamics of interfaces and directed paths in random media are discussed. Ideal for advanced graduate courses in statistical physics, it contains an integrated set of problems, with solutions to selected problems at the end of the book and a complete set available to lecturers at www.cambridge.org/9780521873413.

Statistical Field Theory for Neural Networks

The path integral approach has proved extremely useful for the understanding of the most complex problems in quantum field theory, cosmology, and condensed matter physics. Path Integrals in Physics: Volume II, Quantum Field Theory, Statistical Physics and other Modern Applications covers the fundamentals of path integrals, both the Wiener and Feynman types, and their many applications in physics. The book deals with systems that have an infinite number of degrees of freedom. It discusses the general physical background and concepts of the path integral approach used, followed by a detailed presentation of the most typical and important applications as well as problems with either their solutions or hints how to solve them. Each chapter is self-contained and can be considered as an independent textbook. It provides a comprehensive, detailed, and systematic account of the subject suitable for both students and experienced researchers.

Ideas and Methods in Quantum and Statistical Physics: Volume 2

Presenting the physics of the most challenging problems in condensed matter using the conceptual framework of quantum field theory, this book is of great interest to physicists in condensed matter and high energy and string theorists, as well as mathematicians. Revised and updated, this second edition features new chapters on the renormalization group, the Luttinger liquid, gauge theory, topological fluids, topological insulators and quantum entanglement. The book begins with the basic concepts and tools, developing them gradually to bring readers to the issues currently faced at the frontiers of research, such as topological phases of matter, quantum and classical critical phenomena, quantum Hall effects and superconductors. Other topics covered include one-dimensional strongly correlated systems, quantum ordered and disordered phases, topological structures in condensed matter and in field theory and fractional statistics.

Introduction to Feynman Diagrams

Optics

This systematic algebraic approach offers a careful formulation of the problems' physical motivations as well as self-contained descriptions of the mathematical methods for arriving at solutions. 1972 edition.

Statistical Physics of Fields

Introduction to Feynman Diagrams provides Feynman diagram techniques and methods for calculating quantities measured experimentally. The book discusses topics Feynman diagrams intended for experimental physicists. Topics presented include methods for calculating the matrix elements (by perturbation theory) and the basic rules for constructing Feynman diagrams; techniques for calculating cross sections and polarizations; processes in which both leptons and hadrons take part; and the electromagnetic and weak form factors of nucleons. Experimental physicists and graduate students of physics will find value in the book.

Collected Papers Vol.1: Quantum Field Theory and Statistical Mechanics

Introduction to the relativistic thermal field theory and its applications in particle physics and astrophysics.

Quantum Field Theory and Statistical Mechanics

Drawing on the work of internationally acclaimed experts in the field, Handbook of Item Response Theory, Volume Two: Statistical Tools presents classical and modern statistical tools used in item response theory (IRT). While IRT heavily depends on the use of statistical tools for handling its models and applications, systematic introductions and reviews that emphasize their relevance to IRT are hardly found in the statistical literature. This second volume in a three-volume set fills this void. Volume Two covers common probability distributions, the issue of models with both intentional and nuisance parameters, the use of information criteria, methods for dealing with missing data, and model identification issues. It also addresses recent developments in parameter estimation and model fit and comparison, such as Bayesian approaches, specifically Markov chain Monte Carlo (MCMC) methods.

Gaseous Electronics and Gas Lasers

Notes after each chapter.

Problems of Linear Electron (Polaron) Transport Theory in Semiconductors

These two volumes contain 64 essays on quantum field theory and quantum statistical physics specially commissioned in honour of the sixtieth birthday of Efim Fradkin. Over the years Professor Fradkin has continuously figured among the leaders of this very dynamic science, and the star-studded list of authors of this collection reflects the respect in which he is held. More than 90 theoretical physicists from 16 countries have united their efforts to emphasise his many important contributions and create a portrait of the present-day theory. As wide-ranging as have been Fradkin's studies, this book forms an encyclopaedia of modern high-energy theoretical physics. It contains essays which trace the peculiar, even grotesque, paths followed by theoretical physics over the past forty years and it also contains essays which put forward completely new ideas such as field theory of Galois fields. It contains comprehensive reviews and it also contains illuminating research papers. These are essays expounding general methods of field theory such as quantisation of dynamical systems, the effective action approach, the method of conformal field theory and there are also essays containing current work on quantum gravity, supersymmmetry and superstrings. In addition some essays deal with applications of field theory methods to other areas of physics such as polymer blends and amorphous systems in solid state physics. These volumes will be of great interest to researchers, postgraduate students and all those interested in the modern status of quantum field thoery and statistical physics, as well as the paths of their newest development.

Statistical Field Theory: Volume 2, Strong Coupling, Monte Carlo Methods, Conformal Field Theory and Random Systems

Providing a broad review of many techniques and their application to condensed matter systems, this book begins with a review of thermodynamics and statistical mechanics, before moving onto real and imaginary time path integrals and the link between Euclidean quantum mechanics and statistical mechanics. A detailed study of the Ising, gauge-Ising and XY models is included. The renormalization group is developed and applied to critical phenomena, Fermi liquid theory and the renormalization of field theories. Next, the book explores bosonization and its applications to one-dimensional fermionic systems and the correlation functions of homogeneous and random-bond Ising models. It concludes with Bohm–Pines and Chern–Simons theories applied to the quantum Hall effect. Introducing the reader to a variety of techniques, it opens up vast areas of condensed matter theory for both graduate students and researchers in theoretical, statistical and condensed matter physics.

String Theory: Volume 2, Superstring Theory and Beyond

 x Introduction This volume contains a selection of expository articles on quantum field theory and statistical mechanics by James Glimm and Arthur Jaffe. They include a solution of the original interacting quantum field equations and a description of the physics which these equations contain. Quantum fields were proposed in the late 1920s as the natural framework which combines quantum theory with relativ ity. They have survived ever since.

Thermal Field Theory

An expanded and up-dated book examining gauge theories and their symmetries.

Statistical Field Theory

Problems of Linear Electron (Polaron) Transport Theory in Semiconductors summarizes and discusses the development of areas in electron transport theory in semiconductors, with emphasis on the fundamental aspects of the theory and the essential physical nature of the transport processes. The book is organized into three parts. Part I focuses on some general topics in the theory of transport phenomena: the general dynamical theory of linear transport in dissipative

systems (Kubo formulae) and the phenomenological theory. Part II deals with the theory of polaron transport in a crystalline semiconductor. The last part contains a critical account of electron transport in disordered systems, including amorphous substances, with allowance for polaron effects.

Functional Methods in Quantum Field Theory and Statistical Physics

Notes after each chapter.

Handbook of Item Response Theory

Over the past few decades the powerful methods of statistical physics and Euclidean quantum field theory have moved closer together, with common tools based on the use of path integrals. The interpretation of Euclidean field theories as particular systems of statistical physics has opened up new avenues for understanding strongly coupled quantum systems or quantum field theories at zero or finite temperatures. Accordingly, the first chapters of this book contain a self-contained introduction to path integrals in Euclidean quantum mechanics and statistical mechanics. The resulting high-dimensional integrals can be estimated with the help of Monte Carlo simulations based on Markov processes. The most

commonly used algorithms are presented in detail so as to prepare the reader for the use of high-performance computers as an “experimental” tool for this burgeoning field of theoretical physics. Several chapters are then devoted to an introduction to simple lattice field theories and a variety of spin systems with discrete and continuous spins, where the ubiquitous Ising model serves as an ideal guide for introducing the fascinating area of phase transitions. As an alternative to the lattice formulation of quantum field theories, variants of the flexible renormalization group methods are discussed in detail. Since, according to our present-day knowledge, all fundamental interactions in nature are described by gauge theories, the remaining chapters of the book deal with gauge theories without and with matter. This text is based on course-tested notes for graduate students and, as such, its style is essentially pedagogical, requiring only some basics of mathematics, statistical physics, and quantum field theory. Yet it also contains some more sophisticated concepts which may be useful to researchers in the field. Each chapter ends with a number of problems – guiding the reader to a deeper understanding of some of the material presented in the main text – and, in most cases, also features some listings of short, useful computer programs.

Statistical Field Theory: Volume 1, From Brownian Motion to Renormalization and Lattice Gauge Theory

International Series in Natural Philosophy, Volume 30: Problems in Quantum Mechanics focuses on the processes, principles, reactions, and methodologies involved in quantum mechanics. The publication first elaborates on the mathematical formalism of quantum mechanics, simple quantum systems, and mean values and uncertainty relations. Discussions focus on mean values of dynamical variables, uncertainty relations, eigenfunctions and the energy spectrum, motion in a central field, matrix representation of vectors and operators, Hubert spaces, and operators in Hilbert space. The text then takes a look at mean values and uncertainty relations, semi-classical approximation, and pictures and representations. The book takes a look at orbital angular momentum and spin, systems of identical particles, and perturbation theory. Topics include variational method, stationary state perturbation theory, isotopic spin, second quantization, properties of angular momentum operators, and angular momentum and rotations of coordinate axes. The manuscript also ponders on functions used in quantum mechanics, relativistic quantum mechanics, and radiation theory. The publication is a dependable reference for researchers interested in quantum mechanics.

Statistical Field Theory: Volume 2, Strong Coupling, Monte Carlo Methods, Conformal Field Theory and Random Systems

Translated from the 6th Russian edition, this latest edition contains seven new

sections with chapters on General Relativity, Gravitational Waves and Relativistic Cosmology, where Professor Lifshitz's interests lay. The text of the 3rd English edition has been thoroughly revised and additional problems inserted