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KEY=FIELDS - TREVINO JAZMINE

THE QUANTUM THEORY OF FIELDS: VOLUME 2, MODERN APPLICATIONS

Cambridge University Press In this second volume of The Quantum Theory of Fields, available for the first time in paperback, Nobel Laureate Steven Weinberg continues his masterly exposition of quantum theory. Volume 2 provides an up-to-date and self-contained account of the methods of quantum field theory, and how they have led to an understanding of the weak, strong, and electromagnetic interactions of the elementary particles. The presentation of modern mathematical methods is throughout interwoven with accounts of the problems of elementary particle physics and condensed matter physics to which they have been applied. Exercises are included at the end of each chapter.

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THE QUANTUM THEORY OF FIELDS

MODERN APPLICATIONS. VOLUME 2

The Quantum Theory of Fields, first published in 1996, is a self-contained, comprehensive introduction to quantum field theory from Nobel Laureate Steven Weinberg. Volume II gives an account of the methods of quantum field theory, and how they have led to an understanding of the weak, strong, and electromagnetic interactions of the elementary particles. The presentation of modern mathematical methods is throughout interwoven with accounts of the problems of elementary particle physics and condensed matter physics to which they have been applied. Many topics are included that are not usually found in books on quantum field theory. The book is peppered with examples and insights from the author's experience as a leader of elementary particle physics. Exercises are included at the end of each chapter.

THE QUANTUM THEORY OF FIELDS

Cambridge University Press Comprehensive introduction to quantum field theory by Nobel Laureate Steven Weinberg, now available in paperback.

THE QUANTUM THEORY OF FIELDS: VOLUME 1, FOUNDATIONS

Cambridge University Press Available for the first time in paperback, The Quantum Theory of Fields is a self-contained, comprehensive, and up-to-date introduction to quantum field theory from Nobel Laureate Steven Weinberg. Volume I introduces the foundations of quantum field theory. The development is fresh and logical throughout, with each step carefully motivated by what has gone before. After a brief historical outline, the book begins with the principles of relativity and quantum mechanics, and the properties of particles that follow. Quantum field theory emerges from this as a natural consequence. The classic calculations of quantum electrodynamics are presented in a thoroughly modern way, showing the use of path integrals and dimensional regularization. It contains much original material, and is peppered with examples and insights drawn from the author's experience as a leader of elementary particle research. Exercises are included at the end of each chapter.

THE QUANTUM THEORY OF FIELDS: VOLUME 1, FOUNDATIONS

Cambridge University Press In The Quantum Theory of Fields, Nobel Laureate Steven Weinberg combines his exceptional physical insight with his gift for clear exposition to provide a self-contained, comprehensive, and up-to-date introduction to quantum field theory. This is a two-volume work. Volume I introduces the foundations of quantum field theory. The development is fresh and logical throughout, with each step carefully motivated by what has gone before, and emphasizing the reasons why such a theory should describe nature. After a brief historical outline, the book begins anew with the principles about which we are most certain, relativity and quantum mechanics, and the properties of particles that follow from these principles. Quantum field theory emerges from this as a natural consequence. The author presents the classic calculations of quantum electrodynamics in a thoroughly modern way, showing the use of path integrals and dimensional regularization. His account of renormalization theory reflects the changes in our view of quantum field theory since the advent of effective field theories. The book's scope extends beyond quantum electrodynamics to elementary particle physics, and nuclear physics. It contains much original material, and is peppered with examples and insights drawn from the author's experience as a leader of elementary particle research. Problems are included at the end of each chapter. This work will be an invaluable reference for all physicists and mathematicians who use quantum field theory, and it is also appropriate as a textbook for graduate students in this area.

THE GLOBAL APPROACH TO QUANTUM FIELD THEORY

Oxford University Press, USA This new volume takes a complete look at how classical field theory, quantum mechanics and quantum field theory are interrelated. It takes a global approach and discusses the importance of quantization by relating it to different theories such as tree amplitude and conservation laws. There are special chapters devoted to Euclideanization and renormalization, space and time inversion and the closed-time-path formalism.

THE QUANTUM THEORY OF FIELDS

Available for the first time in paperback, The Quantum Theory of Fields is a self-contained, comprehensive, and up-to-date introduction to quantum field theory from Nobel Laureate Steven Weinberg. The first volume introduces the foundations of quantum field theory, the second volume examines modern applications, and finally, the third volume presents supersymmetry, an area of theoretical physics likely to be at the center of progress in the physics of elementary particles and gravitation. The development is fresh and logical throughout, with each step carefully motivated by what has preceded. The presentation of modern mathematical methods is interwoven with accounts of applications in both elementary particle and condensed matter physics. The three volumes contain much original material, and are enhanced with examples and insights drawn from the author's experience as a leader of elementary particle research. Hb ISBN (1995) Vol.1 0-521-55001-7 Hb ISBN (1996) Vol.2 0-521-55002-5 Hb ISBN (1996) Vols. 1 & 2 Set 0-521-58555-4 Hb ISBN (2000) Vol.3 0-521-66000-9 HB ISBN (2000) Vols. 1-3 Set 0-521-78082-9

QUANTUM FIELD THEORY II

INTRODUCTIONS TO QUANTUM GRAVITY, SUPERSYMMETRY AND STRING THEORY

Springer This book takes a pedagogical approach to explaining quantum gravity, supersymmetry and string theory in a coherent way. It is aimed at graduate students and researchers in quantum field theory and high-energy physics. The first part of the book introduces quantum gravity, without requiring previous knowledge of general relativity (GR). The necessary geometrical aspects are derived afresh leading to explicit general Lagrangians for gravity, including that of general relativity. The quantum aspect of gravitation, as described by the graviton, is introduced and perturbative quantum GR is discussed. The Schwinger-DeWitt formalism is developed to compute the one-loop contribution to the theory and renormalizability aspects of the perturbative theory are also discussed. This follows by introducing only the very basics of a non-perturbative, background-independent, formulation of quantum gravity, referred to as "loop quantum gravity", which gives rise to a quantization of space. In the second part the author introduces supersymmetry and its consequences. The generation of superfields is represented in detail. Supersymmetric generalizations of Maxwell's Theory as well as of Yang-Mills field theory, and of the standard model are worked out. Spontaneous symmetry breaking, improvement of the divergence problem in supersymmetric field theory, and its role in the hierarchy problem are covered. The unification of the fundamental constants in a supersymmetric version of the standard model are then studied. Geometrical aspects necessary to study supergravity are developed culminating in the derivation of its full action. The third part introduces string theory and the analysis of the spectra of the mass (squared) operator associated with the oscillating strings. The properties of the underlying fields, associated with massless particles, encountered in string theory are studied in some detail. Elements of compactification, duality and D-branes are given, as well of the generation of vertices and interactions of strings. In the final sections, the author shows how to recover GR and the Yang-Mills field Theory from string theory.

THE CLASSICAL THEORY OF FIELDS

Elsevier 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

QUANTUM FIELD THEORY AND THE STANDARD MODEL

Cambridge University Press A modern introduction to quantum field theory for graduates, providing intuitive, physical explanations supported by real-world applications and homework problems.

MODERN COURSE IN QUANTUM FIELD THEORY

FUNDAMENTALS

Programme: IOP Expanding Physi A Modern Course in Quantum Field Theory provides a self-contained pedagogical and constructive presentation of quantum field theory. Written for advanced students, the work provides complete material for a two or three semester course and includes numerous problem exercises, some with detailed solutions.

A MODERN INTRODUCTION TO QUANTUM FIELD THEORY

Oxford University Press The importance and the beauty of modern quantum field theory resides in the power and variety of its methods and ideas, which find application in domains as different as particle physics, cosmology, condensed matter, statistical mechanics and critical phenomena. This book introduces the reader to the modern developments in a manner which assumes no previous knowledge of quantum field theory. Along with standard topics like Feynman diagrams, the book discusses effective lagrangians, renormalization group equations, the path integral formulation, spontaneous symmetry breaking and non-abelian gauge theories. The inclusion of more advanced topics will also make this a most useful book for graduate students and researchers.

QUANTUM MECHANICS FOR NUCLEAR STRUCTURE

A PRIMER

This book, the first of a two-volume set, provides a comprehensive introduction to quantum mechanics for advanced undergraduate and postgraduate students entering the field of nuclear structure studies via two-state systems: both polarized photons and spin-1/2 particles. This leads to the logic behind the physical structure and an axiomatic formulation using linear spaces and operators. The one-dimensional harmonic oscillator is used to illustrate the mechanics of quantized systems, reaching to time dependence and coherent states. Measurement theory is introduced. The transformation theory of space and time leads to wave functions. The role of group theory and rotations then leads to the quantization of angular momentum. Central force problems are handled algebraically. The development is completed with quantization of motion of a charged particle in a magnetic field. Part of IOP Series in Nuclear Spectroscopy and Nuclear Structure.

THE CONCEPTUAL FRAMEWORK OF QUANTUM FIELD THEORY

Oxford University Press The book provides a step by step construction of the framework of relativistic quantum field theory, starting from a minimal set of basic foundational postulates. The emphasis is on a careful and detailed description of the conceptual subtleties of modern field theory, many of which are glossed over in other texts.

QUANTUM ELECTRODYNAMICS

Elsevier Several significant additions have been made to the second edition, including the operator method of calculating the bremsstrahlung cross-section, the calculation of the probabilities of photon-induced pair production and photon decay in a magnetic field, the asymptotic form of the scattering amplitudes at high energies, inelastic scattering of electrons by hadrons, and the transformation of electron-positron pairs into hadrons.

AN INTRODUCTION TO QUANTUM FIELD THEORY

CRC Press An Introduction to Quantum Field Theory is a textbook intended for the graduate physics course covering relativistic quantum mechanics, quantum electrodynamics, and Feynman diagrams. The authors make these subjects accessible through carefully worked examples illustrating the technical aspects of the subject, and intuitive explanations of what is going on behind the mathematics. After presenting the basics of quantum electrodynamics, the authors discuss the theory of renormalization and its relation to statistical mechanics, and introduce the renormalization group. This discussion sets the stage for a discussion of the physical principles that underlie the fundamental interactions of elementary particle physics and their description by gauge field theories.

RELATIVISTIC QUANTUM PHYSICS

FROM ADVANCED QUANTUM MECHANICS TO INTRODUCTORY QUANTUM FIELD THEORY

Cambridge University Press Quantum physics and special relativity theory were two of the greatest breakthroughs in physics during the twentieth century and contributed to paradigm shifts in physics. This book combines these two discoveries to provide a complete description of the fundamentals of relativistic quantum physics, guiding the reader effortlessly from relativistic quantum mechanics to basic quantum field theory. The book gives a thorough and detailed treatment of the subject, beginning with the classification of particles, the Klein-Gordon equation and the Dirac equation. It then moves on to the canonical quantization procedure of the Klein-Gordon, Dirac and electromagnetic fields. Classical Yang-Mills theory, the LSZ formalism, perturbation theory, elementary processes in QED are introduced, and regularization, renormalization and radiative corrections are explored. With exercises scattered through the text and problems at the end of most chapters, the book is ideal for advanced undergraduate and graduate students in theoretical physics.

LECTURES ON QUANTUM MECHANICS

Cambridge University Press "Ideally suited to a one-year graduate course, this textbook is also a useful reference for researchers. Readers are introduced to the subject through a review of the history of quantum mechanics and an account of classic solutions of the Schr.

THE QUANTUM THEORY OF FIELDS

Cambridge University Press In this second volume of The Quantum Theory of Fields, available for the first time in paperback, Nobel Laureate Steven Weinberg continues his masterly exposition of quantum theory. Volume 2 provides an up-to-date and self-contained account of the methods of quantum field theory, and how they have led to an understanding of the weak, strong, and electromagnetic interactions of the elementary particles. The presentation of modern mathematical methods is throughout interwoven with accounts of the problems of elementary particle physics and condensed matter physics to which they have been applied. Exercises are included at the end of each chapter.

CONCEPTUAL FOUNDATIONS OF QUANTUM FIELD THEORY

Cambridge University Press Multi-author volume on the history and philosophy of physics.

P(0)2 EUCLIDEAN (QUANTUM) FIELD THEORY

Princeton University Press Barry Simon's book both summarizes and introduces the remarkable progress in constructive quantum field theory that can be attributed directly to the exploitation of Euclidean methods. During the past two years deep relations on both the physical level and on the level of the mathematical structure have been either uncovered or made rigorous. Connections between quantum fields and the statistical mechanics of ferromagnets have been established, for example, that now allow one to prove numerous inequalities in quantum field theory. In the first part of the book, the author presents the Euclidean methods on an axiomatic level and on the constructive level where the traditional results of the $P(\emptyset)_2$ theory are translated into the new language. In the second part Professor Simon gives one of the approaches for constructing models of non-trivial, two-dimensional Wightman fields—specifically, the method of correlation inequalities. He discusses other approaches briefly. Drawn primarily from the author's lectures at the Eidgenössische Technische Hochschule, Zurich, in 1973, the volume will appeal to physicists and mathematicians alike; it is especially suitable for those with limited familiarity with the literature of this very active field. Originally published in 1974. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University Press since its founding in 1905.

PHILOSOPHY OF PHYSICS

QUANTUM THEORY

Princeton University Press A sophisticated and original introduction to the philosophy of quantum mechanics from one of the world's leading philosophers of physics In this book, Tim Maudlin, one of the world's leading philosophers of physics, offers a sophisticated, original introduction to the philosophy of quantum mechanics. The briefest, clearest, and most refined account of his influential approach to the subject, the book will be invaluable to all students of philosophy and physics. Quantum mechanics holds a unique place in the history of physics. It has produced the most accurate predictions of any scientific theory, but, more astonishing, there has never been any agreement about what the theory implies

about physical reality. Maudlin argues that the very term "quantum theory" is a misnomer. A proper physical theory should clearly describe what is there and what it does—yet standard textbooks present quantum mechanics as a predictive recipe in search of a physical theory. In contrast, Maudlin explores three proper theories that recover the quantum predictions: the indeterministic wavefunction collapse theory of Ghirardi, Rimini, and Weber; the deterministic particle theory of deBroglie and Bohm; and the conceptually challenging Many Worlds theory of Everett. Each offers a radically different proposal for the nature of physical reality, but Maudlin shows that none of them are what they are generally taken to be.

GENERAL PRINCIPLES OF QUANTUM FIELD THEORY

[Springer Science & Business Media](#) The majority of the "memorable" results of relativistic quantum theory were obtained within the framework of the local quantum field approach. The explanation of the basic principles of the local theory and its mathematical structure has left its mark on all modern activity in this area. Originally, the axiomatic approach arose from attempts to give a mathematical meaning to the quantum field theory of strong interactions (of Yukawa type). The fields in such a theory are realized by operators in Hilbert space with a positive Poincaré-invariant scalar product. This "classical" part of the axiomatic approach attained its modern form as far back as the sixties. * It has retained its importance even to this day, in spite of the fact that nowadays the main prospects for the description of the electro-weak and strong interactions are in connection with the theory of gauge fields. In fact, from the point of view of the quark model, the theory of strong interactions of Wightman type was obtained by restricting attention to just the "physical" local operators (such as hadronic fields consisting of "fundamental" quark fields) acting in a Hilbert space of physical states. In principle, there are enough such "physical" fields for a description of hadronic physics, although this means that one must reject the traditional local Lagrangian formalism. (The connection is restored in the approximation of low-energy "phenomenological" Lagrangians.

LECTURES ON ASTROPHYSICS

[Cambridge University Press](#) An account of classic and contemporary aspects of astrophysics, with an emphasis on analytical calculations and physical understanding.

QUANTUM FIELD THEORY FOR THE GIFTED AMATEUR

[Oxford University Press](#) Quantum field theory provides the theoretical backbone to most modern physics. This book is designed to bring quantum field theory to a wider audience of physicists. It is packed with worked examples, witty diagrams, and applications intended to introduce a new audience to this revolutionary theory.

STUDENT FRIENDLY QUANTUM FIELD THEORY

BASIC PRINCIPLES AND QUANTUM ELECTRODYNAMICS

By incorporating extensive student input and innovative teaching methodologies, this book aims to make the process of learning quantum field theory easier, and thus more rapid, profound, and efficient, for both students and instructors. Comprehensive explanations are favored over conciseness, every step in derivations is included, and 'big picture' overviews are provided throughout. Typical student responses indicate how well the text achieves its aim. "[This] book ... makes quantum field theory much easier to understand!" "Thanks for ... making quantum field theory clearer!" "Awesome. .. approach and presentation .. just awesome !!! "Best presentation of QFT I have ever seen marvelous!!!. " transforms learning QFT from being a hazardous endeavor to actually being an enjoyable thing to do." "Great job .. extremely clear ... guided me through many ambiguities .. I wasn't able to work out with any other book." .."truly special... extraordinary text. For me, ... a big relief .. finding [this] text." The book focuses on the canonical quantization approach, but also provides an introductory chapter on path integrals. It covers fundamental principles of quantum field theory, then develops quantum electrodynamics in depth. The second edition incorporates suggestions from readers to make certain sections even clearer and easier to understand. See the first few chapters at www.quantumfieldtheory.info.

QUANTUM MECHANICS AND QUANTUM FIELD THEORY

A MATHEMATICAL PRIMER

[Cambridge University Press](#) Explaining the concepts of quantum mechanics and quantum field theory in a precise mathematical language, this textbook is an ideal introduction for graduate students in mathematics, helping to prepare them for further studies in quantum physics. The textbook covers topics that are central to quantum physics: non-relativistic quantum mechanics, quantum statistical mechanics, relativistic quantum mechanics and quantum field theory. There is also background material on analysis, classical mechanics, relativity and probability. Each topic is explored through a statement of basic principles followed by simple examples. Around 100 problems throughout the textbook help readers develop their understanding.

QUANTUM FIELD THEORY IN A NUTSHELL

SECOND EDITION

[Princeton University Press](#) A fully updated edition of the classic text by acclaimed physicist A. Zee Since it was first published, Quantum Field Theory in a Nutshell has quickly established itself as the most accessible and comprehensive introduction to this profound and deeply fascinating area of theoretical physics. Now in this fully revised and expanded edition, A. Zee covers the latest advances while providing a solid conceptual foundation for students to build on, making this the most up-to-date and modern textbook on quantum field theory available. This expanded edition features several additional chapters, as well as an entirely new section describing recent developments in quantum field theory such as gravitational waves, the helicity spinor formalism, on-shell gluon scattering, recursion relations for amplitudes with complex momenta, and the hidden connection between Yang-Mills theory and Einstein gravity. Zee also provides added exercises, explanations, and examples, as well as detailed appendices, solutions to selected exercises, and suggestions for further reading. The most accessible and comprehensive introductory textbook available Features a fully revised, updated, and expanded text Covers the latest exciting advances in the field Includes new exercises Offers a one-of-a-kind resource for students and researchers Leading universities that have adopted this book include: Arizona State University Boston University Brandeis University Brown University California Institute of Technology Carnegie Mellon College of William & Mary Cornell Harvard University Massachusetts Institute of Technology Northwestern University Ohio State University Princeton University Purdue University - Main Campus Rensselaer Polytechnic Institute Rutgers University - New Brunswick Stanford University University of California - Berkeley University of Central Florida University of Chicago University of Michigan University of Montreal University of Notre Dame Vanderbilt University Virginia Tech University

QUANTUM FIELD THEORIES IN TWO DIMENSIONS

COLLECTED WORKS OF ALEXEI ZAMOLODCHIKOV

[World Scientific Publishing Company Incorporated](#) A collection of reprinted works of Alexei Zamolodchikov who was a prominent theoretical physicist of his time. It contains his works on conformal field theories, 2D quantum gravity, and Liouville theory. It also includes Alexei Zamolodchikov's works on non-perturbative methods in 2D quantum field theory, and on integrable models.

QUANTUM FIELDS AND STRINGS

A COURSE FOR MATHEMATICIANS

QUANTUM FIELD THEORY AND STATISTICAL MECHANICS

EXPOSITIONS

[Springer Science & Business Media](#) 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 relativity. 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, Maxwell and Yang-Mills equations. The field operators are restricted to satisfy a "locality" requirement that they commute (or anti-commute in the case of fermions) 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.

QUANTUM FIELD THEORY

[Cambridge University Press](#) Quantum field theory is the basic mathematical framework that is used to describe elementary particles. This textbook provides a complete and essential introduction to the subject. Assuming only an undergraduate knowledge of quantum mechanics and special relativity, this book is ideal for graduate students beginning the study of elementary particles. The step-by-step presentation begins with basic concepts illustrated by simple examples, and proceeds through historically important results to thorough treatments of modern topics such as the renormalization group, spinor-helicity methods for quark and gluon scattering, magnetic monopoles, instantons, supersymmetry, and the unification of forces. The book is written in a modular format, with each chapter as self-contained as possible, and with the necessary prerequisite material clearly identified. It is based on a year-long course given by the author and contains extensive problems, with password protected solutions available to lecturers at www.cambridge.org/9780521864497.

FOUNDATIONS OF MODERN PHYSICS

Cambridge University Press Nobel Laureate Steven Weinberg explains the foundations of modern physics in historical context for undergraduates and beyond.

QUANTUM FIELD THEORY

John Wiley & Sons Following on from the successful first (1984) and revised (1993) editions, this extended and revised text is designed as a short and simple introduction to quantum field theory for final year physics students and for postgraduate students beginning research in theoretical and experimental particle physics. The three main objectives of the book are to: Explain the basic physics and formalism of quantum field theory To make the reader proficient in theory calculations using Feynman diagrams To introduce the reader to gauge theories, which play a central role in elementary particle physics. Thus, the first ten chapters deal with QED in the canonical formalism, and are little changed from the first edition. A brief introduction to gauge theories (Chapter 11) is then followed by two sections, which may be read independently of each other. They cover QCD and related topics (Chapters 12-15) and the unified electroweak theory (Chapters 16 - 19) respectively. Problems are provided at the end of each chapter. New to this edition: Five new chapters, giving an introduction to quantum chromodynamics and the methods used to understand it: in particular, path integrals and the renormalization group. The treatment of electroweak interactions has been revised and updated to take account of more recent experiments.

QUANTUM FIELD THEORY FOR ECONOMICS AND FINANCE

Cambridge University Press This book provides an introduction to how the mathematical tools from quantum field theory can be applied to economics and finance. Providing a range of quantum mathematical techniques for designing financial instruments, it demonstrates how a range of topics have quantum mechanical formulations, from asset pricing to interest rates.

PROBLEM BOOK IN QUANTUM FIELD THEORY

Springer Science & Business Media The Problem Book in Quantum Field Theory contains about 200 problems with solutions or hints that help students to improve their understanding and develop skills necessary for pursuing the subject. It deals with the Klein-Gordon and Dirac equations, classical field theory, canonical quantization of scalar, Dirac and electromagnetic fields, the processes in the lowest order of perturbation theory, renormalization and regularization. The solutions are presented in a systematic and complete manner. The material covered and the level of exposition make the book appropriate for graduate and undergraduate students in physics, as well as for teachers and researchers.

STATISTICAL APPROACH TO QUANTUM FIELD THEORY

AN INTRODUCTION

Springer Nature

FACTORIZATION ALGEBRAS IN QUANTUM FIELD THEORY

Cambridge University Press This first volume develops factorization algebras with a focus upon examples exhibiting their use in field theory, which will be useful for researchers and graduates.
