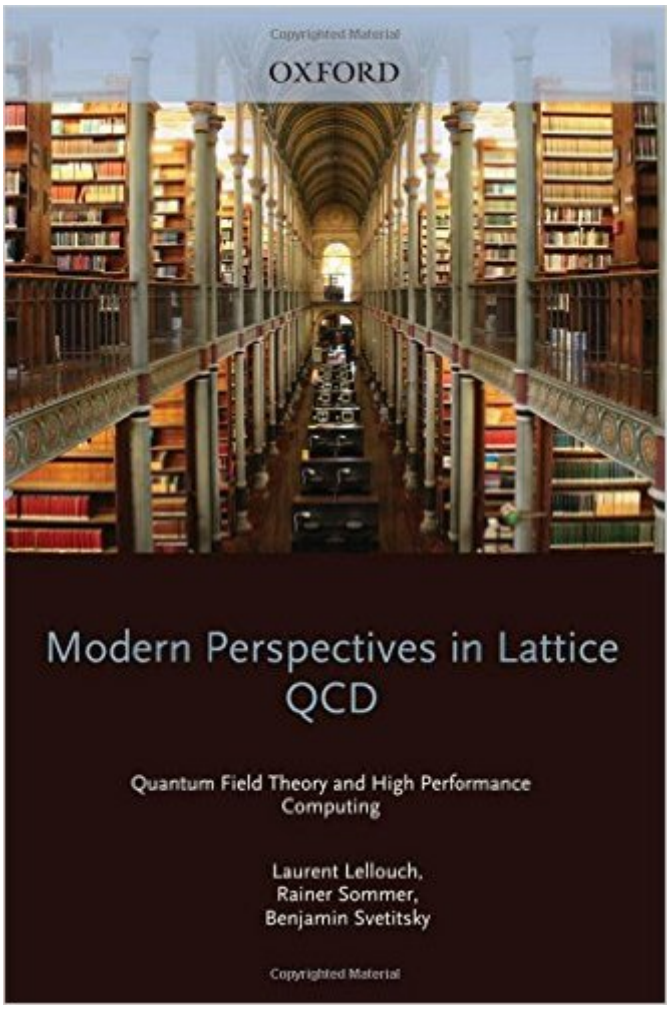
Modern Perspectives In Lattice QCD: Quantum Field Theory And High Performance Computing: Lecture Notes Of The Les Houches Summer School: Volume 93, August 2009



Synopsis

The book is based on the lectures delivered at the XCIII Session of the Ecole de Physique des Houches, held in August, 2009. The aim of the event was to familiarize the new generation of PhD students and postdoctoral fellows with the principles and methods of modern lattice field theory, which aims to resolve fundamental, non-perturbative questions about QCD without uncontrolled approximations. The emphasis of the book is on the theoretical developments that have shaped the field in the last two decades and that have turned lattice gauge theory into a robust approach to the determination of low energy hadronic quantities and of fundamental parameters of the Standard Model. By way of introduction, the lectures begin by covering lattice theory basics, lattice renormalization and improvement, and the many faces of chirality. A later course introduces QCD at finite temperature and density. A broad view of lattice computation from the basics to recent developments was offered in a corresponding course. Extrapolations to physical quark masses and a framework for the parameterization of the low-energy physics by means of effective coupling constants is covered in a lecture on chiral perturbation theory. Heavy-quark effective theories, an essential tool for performing the relevant lattice calculations, is covered from its basics to recent advances. A number of shorter courses round out the book and broaden its purview. These included recent applications to the nucleon--nucleon interation and a course on physics beyond the Standard Model.

Book Information

Series: Lecture Notes of the Les Houches Summer School
Hardcover: 724 pages
Publisher: Oxford University Press; 1 edition (October 1, 2011)
Language: English
ISBN-10: 0199691606
ISBN-13: 978-0199691609
Product Dimensions: 9.7 x 1.7 x 6.8 inches
Shipping Weight: 3.8 pounds (View shipping rates and policies)
Average Customer Review: Be the first to review this item
Best Sellers Rank: #1,890,382 in Books (See Top 100 in Books) #372 inÂ Books > Science & Math > Physics > Waves & Wave Mechanics #1378 inÂ Books > Science & Math > Physics > Mathematical Physics #1618 inÂ Books > Science & Math > Physics > Quantum Theory

Modern Perspectives in Lattice QCD: Quantum Field Theory and High Performance Computing: Lecture Notes of the Les Houches Summer School: Volume 93, August 2009 Quantum Chromodynamics on the Lattice: An Introductory Presentation (Lecture Notes in Physics) Electrodynamics: The Field-Free Approach: Electrostatics, Magnetism, Induction, Relativity and Field Theory (Undergraduate Lecture Notes in Physics) Quantum Thermodynamics: Emergence of Thermodynamic Behavior Within Composite Quantum Systems (Lecture Notes in Physics) Motivic Homotopy Theory: Lectures at a Summer School in Nordfjordeid, Norway, August 2002 (Universitext) Geometrie et theorie des groupes: Les groupes hyperboliques de Gromov (Lecture Notes in Mathematics) (French Edition) Quantum Mechanics and Quantum Field Theory: A Mathematical Primer Quantum Nanoelectronics: An introduction to electronic nanotechnology and quantum computing Molecular Quantum Similarity in QSAR and Drug Design (Lecture Notes in Chemistry) Information Processing in Medical Imaging: Proceedings of the 8th conference, Brussels, 29 August - 2 September 1983 (Proceedings of the Eighth Conference, Brussels, 29 August-2) Lattice Theory: First Concepts and Distributive Lattices (Dover Books on Mathematics) LECTURES ON QED AND QCD: PRACTICAL CALCULATION AND RENORMALIZATION OF ONE- AND MULTI-LOOP FEYNMAN DIAGRAMS Aha Guide to the Health Care Field 2009 Edition: United States Hospitals, Health Care Systems, Networks, Alliances, Health Organizations, Agencies, ... Association Guide to the Health Care Field) Generalized Convexity and Optimization: Theory and Applications (Lecture Notes in Economics and Mathematical Systems) Freddie's Super Summer - DownSyndrome (Moonbeam book award winner 2009) - Special Stories Series 2 (Volume 1) Landau Theory Of Phase Transitions, The: Application To Structural, Incommensurate, Magnetic And Liquid Crystal Systems (World Scientific Lecture Notes in Physics) Cloud Computing for Complete Beginners: Building and Scaling High-Performance Web Servers on the Cloud Essays on Item Response Theory (Lecture Notes in Statistics) Asymptotic Theory of Finite Dimensional Normed Spaces: Isoperimetric Inequalities in Riemannian Manifolds (Lecture Notes in Mathematics) High-Performance Compilers for Parallel Computing