



# Quantum Fields on a Lattice (Cambridge Monographs on Mathematical Physics)

By Istvan Montvay, Gernot Münster

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Quantum field theory describes basic physical phenomena over an extremely wide range of length or energy scales. Quantum fields exist in space and time, which can be approximated by a set of lattice points. This book presents a comprehensive and coherent account of the theory of quantum fields on a lattice, an essential technique for the study of the strong and electroweak nuclear interactions. After introductory chapters on scalar fields, gauge fields and fermion fields, the book studies quarks and gluons in QCD and fermions and bosons in the electroweak theory. The last chapter is devoted to numerical simulations algorithms that have been used in recent large-scale numerical simulations. The book will be valuable for graduate students and researchers in theoretical physics, elementary particle physics, and field theory, as well as non-perturbative approximations and numerical simulations of quantum field phenomena.

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#### Review

"...a real advancement for the study of quantum field theory on a lattice... a rather comprehensive treatment of its many recent applications without the presentation of detailed numerical results...this book will be generally useful to those readers who seek an accurate knowledge of lattice techniques applied to quantum field theory for some years to come. The cited literature with the exact titles could be very helpful to the advance graduate student in the further understanding of this type of work in high energy physics." David E. Miller, Mathematical Reviews, 98j

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