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Collana	Lecture Notes in Physics, , 0075-8450 ; ; 446
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Soggetti	Quantum physics Quantum computers Spintronics Thermodynamics Statistical physics Dynamical systems Differential geometry Algebraic geometry Quantum Physics Quantum Information Technology, Spintronics Complex Systems Differential Geometry Algebraic Geometry
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Nota di contenuto	Some questions for constructive field theorists -- Trees, forests and jungles: A botanical garden for cluster expansions -- Weak perturbations of the massless Gaussian measure -- On renormalization group flows and polymer algebras -- Renormalizing partial differential equations -- Supersymmetric quantum field theory -- Equivalence of the Euclidean and Wightman field theories -- Construction of the gross-neveu model in dimension 3 -- Mass generation in a one-dimensional fermi model -- Mass generation in the large N Gross-

Neveu model -- U(1) gauge theory on a torus -- A low temperature expansion and “spin wave picture” for classical N-vector models -- Renormalization group approach to zero temperature bose condensation -- Random and interacting surfaces -- Fermi liquids in two-space dimensions -- The self-avoiding walk in four dimensions -- Charge correlations for the two-dimensional Coulomb gas -- Weakly self-avoiding polymers in four dimensions.

Sommario/riassunto

Addressing graduate students and researchers in physics and mathematics, this book fills a gap in the literature. It is an introduction into modern constructive physics, field theory and statistical mechanics and a survey on the most recent research in this field. It presents the main technical tools such as cluster expansion and their implementation in the rigorous renormalization group, and studies physical models in some detail. The reader will find a study of the ultraviolet limit of the Gross-Neveu model, of continuous symmetry breaking and of self-avoiding random walks in statistical mechanics, as well as applications to solid-state physics. Mathematicians will find constructive methods useful for studies in partial differential equations.