1. Record Nr. UNINA9910955437603321

Autore	Zinn-Justin Jean
Titolo	Phase transitions and renormalization group / / Jean Zinn-Justin
Pubbl/distr/stampa	Oxford, : Oxford University Press, 2007
ISBN	0191527742 9780191527746
Edizione	[1st ed.]
Descrizione fisica	xii, 452 p
Collana	Oxford graduate texts
Disciplina	530.414
Soggetti	Phase transformations (Statistical physics) Renormalization (Physics)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro -- Contents -- 1 Quantum field theory and the renormalization group -- 1.1 Quantum electrodynamics: A quantum field theory -- 1.2 Quantum electrodynamics: The problem of infinities -- 1.3 Renormalization -- 1.4 Quantum field theory and the renormalization group -- 1.5 A triumph of QFT: The Standard Model -- 1.6 Critical phenomena: Other infinities -- 1.7 Kadanoff and Wilson's renormalization group -- 1.8 Effective quantum field theories -- 2 Gaussian expectation values. Steepest descent method -- 2.1 Generating functions -- 2.2 Gaussian expectation values. Wick's theorem -- 2.3 Perturbed Gaussian measure. Connected contributions -- 2.4 Feynman diagrams. Connected contributions -- 2.5 Expectation values. Generating function. Cumulants -- 2.6 Steepest descent method -- 2.7 Steepest descent method: Several variables, generating functions -- Exercises -- 3 Universality and the continuum limit -- 3.1 Central limit theorem of probabilities -- 3.2 Universality and fixed points of transformations -- 3.3 Random walk and Brownian motion -- 3.4 Random walk: Additional remarks -- 3.5 Brownian motion and path integrals -- Exercises -- 4 Classical statistical physics: One dimension -- 4.1 Nearest-neighbour interactions. Transfer matrix -- 4.2 Correlation functions -- 4.3 Thermodynamic limit -- 4.4 Connected functions and cluster properties -- 4.5 Statistical models: Simple examples -- 4.6 The Gaussian model -- 4.7 Gaussian model: The

Sommario/riassunto

The renormalization group is one of most important theoretical concepts that has emerged in physics during the twentieth century. It explains important properties of fundamental interactions at the microscopic scale, as well as universal properties of continuous macroscopic phase transitions.