

1. Record Nr.	UNINA9910808029203321
Autore	Meyer-Ortmanns Hildegard
Titolo	Principles of phase structures in particle physics [[electronic resource] /] / Hildegard Meyer-Ortmanns, Thomas Reisz
Pubbl/distr/stampa	New Jersey ; ; London, : World Scientific Pub., c2007
ISBN	1-281-37901-8 9786611379018 981-277-491-2
Descrizione fisica	1 online resource (702 p.)
Collana	World Scientific lecture notes in physics ; ; vol. 77
Altri autori (Persone)	ReiszThomas
Disciplina	539.725
Soggetti	Particles (Nuclear physics) Collisions (Nuclear physics)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Contents ; Preface ; 1. Introduction ; 2. General Background from Statistical Physics ; 2.1 Generalities ; 2.1.1 Phase transitions in statistical systems ; 2.1.1.1 First- and second-order transitions in the infinite volume limit ; 2.1.1.2 Landau's free energy ; 2.2 Generating functional n-point correlations and effective potentials ; 2.3 The molecular-mean field approximation ; 2.3.1 Self-consistent equation of state for a ferromagnet ; 2.3.1.1 Critical exponents in the molecular-mean field approximation ; 2.3.1.2 Variational estimates for the free energy of a spin system ; 2.3.1.3 Molecular-mean field approximation for an N-component scalar field theory in D dimensions ; 2.3.1.4 Solutions of the mean-field equations ; 2.3.1.5 Critical exponents in the symmetric phase ; 2.3.1.6 Critical exponents in the broken phase ; 2.3.1.7 First-order transitions within the molecular-mean field approximation ; 2.3.1.8 Tricritical behavior ; 2.3.2 Variational estimates for the SU(2) Higgs model ; 2.3.2.1 Solutions of the mean-field equations of the SU(2) Higgs

model

2.3.5 Improved variational estimates for the SU(2) Higgs model

2.3.6 Summary ; 2.4 Renormalization group

; 2.4.1 Generalities ; 2.4.2 Block-spin transformations

; 2.4.3 Iteration of the block-spin transformation

; 2.4.4 Field renormalization

2.4.5 Linearized renormalization-group transformation and universality

---

Sommario/riassunto

The phase structure of particle physics shows up in matter at extremely high densities and/or temperatures as they were reached in the early universe, shortly after the big bang, or in heavy-ion collisions, as they are performed nowadays in laboratory experiments. In contrast to phase transitions of condensed matter physics, the underlying fundamental theories are better known than their macroscopic manifestations in phase transitions. These theories are quantum chromodynamics for the strong interaction part and the electroweak part of the Standard Model for the electroweak interaction. It is

---