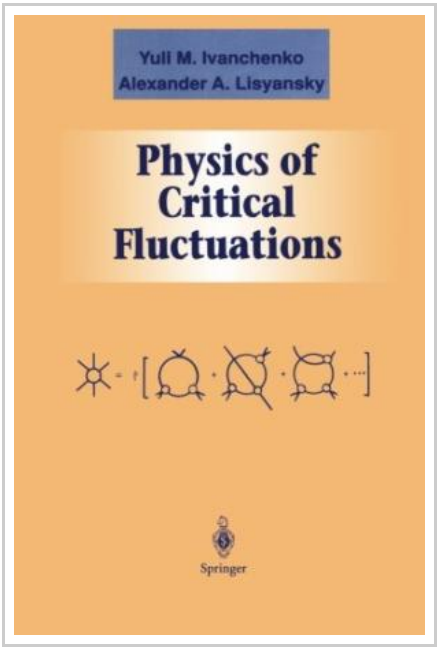

Physics of Critical Fluctuations

By Ivanchenko, Yuli M. / Lisyansky, Alexander A.

Book Condition: New. Publisher/Verlag: Springer, Berlin | Building on Wilson's renormalization group, the authors have developed a unified approach that not only reproduces known results but also yields new results. A systematic exposition of the contemporary theory of phase transitions, the book includes detailed discussions of phenomena in Heisenberg magnets, granular super-conducting alloys, anisotropic systems of dipoles, and liquid-vapor transitions. Suitable for advanced undergraduates as well as graduate students in physics, the text assumes some knowledge of statistical mechanics, but is otherwise self-contained. | '1. Classical Approach.- 1.1 Introduction.- 1.2 Landau Theory.- 1.2.1 The Scalar Order Parameter.- 1.2.2 The Vector Order Parameter.- 1.3 Broken Symmetry and Condensation.- 1.3.1 Bose-Einstein Condensation.- 1.4 Ergodicity.- 1.4.1 Susceptibility.- 1.4.2 The Ergodic Hypothesis.- 1.5 Gaussian Approximation.- 1.5.1 Goldstone Branch of Excitations.- 1.5.2 Correlation Functions.- 1.5.3 Microscopic Scales in Phase Transitions.- 1.6 The Ginzburg Criterion.- 1.6.1 Critical Dimensions.- 1.7 The Scaling Hypothesis.- 1.7.1 Scaling Laws.- 2 The Ginzburg-Landau Functional.- 2.1 Introduction.- 2.2 Classical Systems.- 2.2.1 The Ising Model.- 2.2.2 The Heisenberg Model.- 2.2.3 Interacting Particles.- 2.3 Quantum Systems.- 2.3.1 The Heisenberg Hamiltonian.- 2.3.2 Bose Gas.- 2.3.3 Bose-Einstein Condensation.- 2.3.4 Fermi Gas.- 3 Wilson's Renormalization Scheme.- 3.1 Introduction.- 3.2 Kadanoff's Invariance.- 3.3 Wilson's Theory.- 3.3.1 Derivation of...

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