

SOLID-STATE PHYSICS

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D. Manske
Theory of
Unconventional
Superconductors

This book presents a theory for unconventional superconductivity driven by spin excitations. Using the Hubbard Hamiltonian and a self-consistent treatment of the spin excitations, the interplay between magnetism and superconductivity in various unconventional superconductors is discussed. In particular, the monograph applies this theory for Cooper-pairing due to the exchange of spin fluctuations to the case of singlet pairing in hole- and electron-doped high- T_c superconductors, and to triplet pairing in Sr_2RuO_4 . Within the framework of a generalized Eliashberg-like treatment, calculations of both many normal and superconducting properties as well as elementary excitations are performed. The results are related to the phase diagrams of the materials which reflect the interaction between magnetism and superconductivity.

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