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corrections; 4.6.2 Self-Consistent Theory of Localization; 4.6.2.1 Metallic phase; 4.6.2.2 Anderson insulator; 4.6.2.3 Frequency dispersion of the generalized diffusion coefficient; 4.7 ""Triangular"" vertex; 4.8 The role of electron-electron interaction; 5 Superconductivity; 5.1 Cooper instability; 5.2 Gorkov equations; 5.3 Superconductivity in disordered metals; 5.4 Ginzburg-Landau expansion; 5.5 Superconductors in electromagnetic field; 6 Electronic Instabilities and Phase Transitions; 6.1 Phonon spectrum instability 6.2 Peierls dielectric6.3 Peierls dielectric with impurities; 6.4 Ginzburg-Landau expansion for Peierls transition; 6.5 Charge and spin density waves in multi-dimensional systems. Excitonic insulator; 6.6 Pseudogap; 6.6.1 Fluctuations of Peierls short-range order; 6.6.2 Electron in a random field of fluctuations; 6.6.3 Electromagnetic response; 6.7 Tomonaga-Luttinger model and non Fermi-liquid behavior; Appendix A Fermi Surface as Topological Object; Appendix B Electron in a Random Field and Feynman Path Integrals; Bibliography

Sommario/riassunto

The introduction of quantum field theory methods has led to a kind of "revolution" in condensed matter theory. This resulted in the increased importance of Feynman diagrams or diagram technique. It has now become imperative for professionals in condensed matter theory to have a thorough knowledge of this method.There are many good books that cover the general aspects of diagrammatic methods. At the same time, there has been a rising need for books that describe calculations and methodical "know how" of specific problems for beginners in graduate and postgraduate courses. This unique collection