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Nota di contenuto	ch. 1. Independent-particle model. 1.1. Introduction. 1.2. Bosons. 1.3. Fermions. 1.4. Matrix elements of one-body operators. 1.5. Matrix elements of two-body operators. 1.6. Density matrices. 1.7. Ideal Bose gas confined in a harmonic potential. 1.8. The Fermi gas. 1.9. Finite temperature and quasiparticles ch. 2. The Hartree-Fock theory. 2.1. Introduction. 2.2. The Hartree-Fock method for fermions. 2.3. The Hartree-Fock method for bosons. 2.4. The Gross-Pitaevskii equations. 2.5. Hartree-Fock in second quantization language. 2.6. Hartree-Fock at finite temperature. 2.7. Hartree-Fock-Bogoliubov and BCS ch. 3. The Brueckner-Hartree-Fock (BHF) theory. 3.1. Introduction. 3.2. The Lippman-Schwinger equation. 3.3. The Bethe-Goldstone equation. 3.4. The one-dimensional fermion system. 3.5. Numerical results of BHF calculation in different systems. 3.6. The g matrix for the 2D electron gas ch. 4. The density functional theory (DFT). 4.1. Introduction. 4.2. The density functional formalism. 4.3. Examples of application of the density functional theory. 4.4. The Kohn-Sham equations. 4.5. The local density approximation for the exchange-correlation energy. 4.6. The local spin density approximation (LSDA). 4.7. Inclusion of current terms in the DFT (CDFT). 4.8. Ensemble density functional theory. 4.9. DFT for strongly correlated systems: nuclei and helium. 4.10. DFT for mixed systems. 4.11. Symmetries and mean field theories ch. 5.

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Sommario/riassunto	A study of modern many-particle physics. It describes homogenous systems, such as electron gas in different dimensions, the quantum well in an intense magnetic field, liquid helium and nuclear matter, and addresses finite systems, such as metallic clusters, quantum dots, helium drops and nuclei.