

Quantum Theory of Many-Particle Systems (Dover Books on Physics)

By Alexander L. Fetter, John Dirk Walecka, Physics



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"Singlemindedly devoted to its job of educating potential many-particle theorists...deserves to become the standard text in the field." — *Physics Today* "The most comprehensive textbook yet published in its field and every postgraduate student or teacher in this field should own or have access to a copy." — *Endeavor*

A self-contained, unified treatment of nonrelativistic many-particle systems, this text offers a solid introduction to procedures in a manner that enables students to adopt techniques for their own use. Its discussions of formalism and applications move easily between general theory and direct use by offering illustrations of principles to specific cases.

Chapters on second quantization and statistical mechanics introduce students to ground-state (zero-temperature) formalism, which is explored by way of Green's functions and field theory (fermions), Fermi systems, linear response and collective modes, and Bose systems. Finite-temperature formalism is examined through field theory at finite temperature, physical systems at finite temperature, and real-time Green's functions and linear response. Additional topics cover canonical transformations and applications to physical systems in terms of nuclear matter, phonons and electrons, superconductivity, and superfluid helium as well as applications to finite systems.

Graduate students will find this text enormously practical in making the transition from taking courses in quantum mechanics to interpreting the vast quantity of literature concerning the many-body problem.

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