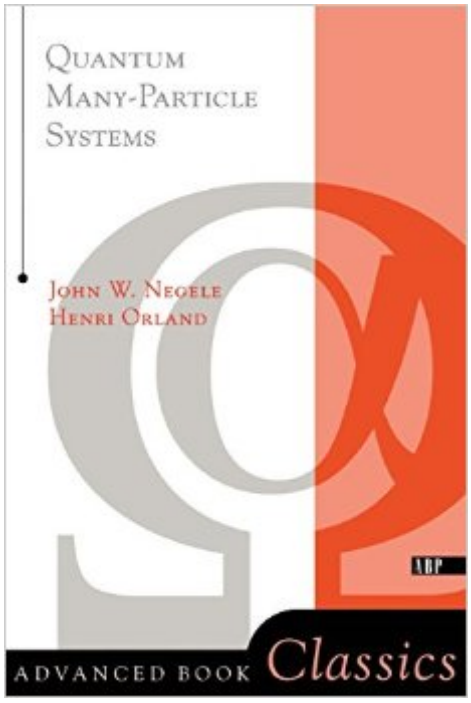
Quantum Many-particle Systems (Advanced Books Classics)



Synopsis

This book explains the fundamental concepts and theoretical techniques used to understand the properties of quantum systems having large numbers of degrees of freedom. A number of complimentary approaches are developed, including perturbation theory; nonperturbative approximations based on functional integrals; general arguments based on order parameters, symmetry, and Fermi liquid theory; and stochastic methods.

Book Information

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Customer Reviews

A great physics book for field theory applied to condensedmatter and sometimes nuclear physics problems. The authorsare EXTREMELY careful mathematically and really don’t skipany steps or shove stuff under the rug; in fact, the firstchapter is just all math about how to do integrals and pathintegrals and field integrals and deal with Grassman numbers.A bit unusual for a physics book, but that’s their style.The rest of the book deals with the usual and other material:zero-temperature Green’s functions and perturbation theory(for energy, Green’s function, etc.) The treatment is detailedand relatively exhaustive. Then there is the same for finite-temperature. The earlier sections on linear response areconcise and one of the best treatments of the subject I haveseen leading directly to the fluctuation dissipation expression(after this book I realized this vaunted "fluctuation-dissipation" that no one can explain is justa straightforward thing about commutators and pert. theory).The book also has other good stuff: a chapter on mean field theory,

Landau-Ginzburg theory, order parameters, and a nicediscussion about spontaneous symmetry breaking that helpsclarify a bunch of stuff. Then there is a whole chapter onfurther aspects of one-particle Green's functions (Dysonequation, solving for poles, quasiparticles, satellites, etc.)that is pretty good and gets the physical point across. Thereis also a chapter on statistical (monte carlo, numerical, etc.)methods for doing quantum many body problems. While some ofthe methods are not the most up to date or modern, the basicsare all there (Monte Carlo, Hubbard-Strataonvich (spelling?

International Series in Computer Science)