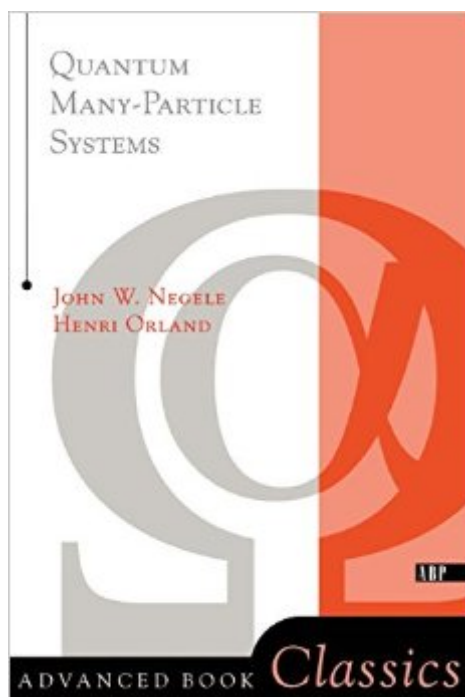


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# Quantum Many-particle Systems (Advanced Books Classics)



## 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

Series: Advanced Books Classics

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Average Customer Review: 4.8 out of 5 stars [See all reviews](#) (5 customer reviews)

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## Customer Reviews

A great physics book for field theory applied to condensed matter and sometimes nuclear physics problems. The authors are EXTREMELY careful mathematically and really don't skip any steps or shove stuff under the rug; in fact, the first chapter is just all math about how to do integrals and path integrals 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 detailed and relatively exhaustive. Then there is the same for finite-temperature. The earlier sections on linear response are concise and one of the best treatments of the subject I have seen leading directly to the fluctuation dissipation expression (after this book I realized this vaunted "fluctuation-dissipation" that no one can explain is just a 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 nice discussion about spontaneous symmetry breaking that helps clarify a bunch of stuff. Then there is a whole chapter on further aspects of one-particle Green's functions (Dyson equation, solving for poles, quasiparticles, satellites, etc.) that is pretty good and gets the physical point across. There is also a chapter on statistical (Monte Carlo, numerical, etc.) methods for doing quantum many body problems. While some of the methods are not the most up to date or modern, the basics are all there (Monte Carlo, Hubbard-Stratonovich (spelling?

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