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Soggetti	Atoms Physics Chemistry, Physical and theoretical Quantum computers Spintronics Quantum theory Atomic, Molecular, Optical and Plasma Physics Physical Chemistry Mathematical Methods in Physics Numerical and Computational Physics, Simulation Quantum Information Technology, Spintronics Quantum Physics
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Nota di contenuto	The coupled cluster method -- Atomic and molecular applications of the coupled cluster method -- A thermal cluster-cumulant theory -- Correlated basis function theory for fermion systems -- Inhomogeneous quantum liquids: Statics, dynamics, and thermodynamics -- Some applications of correlated basis function theories in finite and infinite nuclear systems -- Monte carlo methods in quantum many-body theories -- Monte carlo calculations of nuclei -- Diffusion Monte Carlo for excited states: Application to liquid

helium.

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## Sommario/riassunto

Quantum many-body theories have become an essential tool for all physicists. The field is interdisciplinary, predicting the properties of macroscopic matter based on the fundamental interactions between the elementary constituents. This book presents a systematic and pedagogical approach to the coupled cluster method, correlated basis function theory and Monte Carlo methods. These topics are widely recognized and provide the most powerful and widely applicable theories of all available formulations of QMBT. As the future evolution of QMBT depends to a large measure on establishing links between these different methods, the authors discuss hybrid procedures that can build even further upon the huge strengths and great advantages of each theory.

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