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Nota di contenuto	Preface -- Physics of Dense Gases, Nonideal Plasmas, and High-Energy Density Matter -- Strong Correlations and Equation of State of Dense Gases -- Coulomb Systems - Screening and Ionization Problems -- Coulombic Correlations and EOS of Nondegenerate, Nonideal Plasmas -- Plasma Bound States in Grand Canonical and Mixed Representations -- Equations of State for Strongly Coupled Partially Ionized Plasmas -- Kinetic Equations and Fluctuations in Nonideal Gases and Plasmas -- Hopping Kinetics, Quantum Dynamics and Transport -- Theoretical Approaches to Quantum Monte Carlo Methods -- Simulations of Gas-, Liquid- and Crystal-like States of Coulomb Systems -- Applications to Matter with High Energy Density -- Transport Properties of Quark-

Gluon Plasma -- Index.

Sommario/riassunto

The aim of this book is the pedagogical exploration of the basic principles of quantum-statistical thermodynamics as applied to various states of matter – ranging from rare gases to astrophysical matter with high-energy density. The reader will learn in this work that thermodynamics and quantum statistics are still the concepts on which even the most advanced research is operating - despite of a flood of modern concepts, classical entities like temperature, pressure, energy and entropy are shown to remain fundamental. The physics of gases, plasmas and high-energy density matter is still a growing field and even though solids and liquids dominate our daily life, more than 99 percent of the visible Universe is in the state of gases and plasmas and the overwhelming part of matter exists at extreme conditions connected with very large energy densities, such as in the interior of stars. This text, combining material from lectures and advanced seminars given by the authors over many decades, is a must-have introduction and reference for both newcomers and seasoned researchers alike.