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Nota di contenuto	Part I: Transport Theory -- 1. Preliminary Concepts -- 2. The Quantum Transport Problem -- 3. Linear Transport within Kubo Formalism -- 4. Density Matrix Methods for Quantum Transport -- 5. Diagrammatic Formulation of Transport in Liouville space -- Part II: Interacting Nanojunctions -- 6. The Single Impurity Anderson Model -- 7. Double Quantum Dots -- 8. Quantum Dot Molecules -- 9. Junctions with Ferromagnetic Electrodes -- 10. Transport in Molecular Junctions -- 11. Junctions with Superconducting Leads -- 12. Solutions.
Sommario/riassunto	This book serves as an introduction to the growing field of quantum many-body transport in interacting nanojunctions. It delves into a theoretical approach based on a general density-matrix formulation for open quantum systems. In the book, relevant transport observables, like the current or its higher order cumulants, are obtained by evaluating quantum statistical averages. This approach requires the

knowledge of the reduced density matrix of the interacting nanosystems. The formulation for addressing transport problems, based on the evolution of the reduced density operator in Liouville space, is highly versatile. It enables the treatment of charge and spin transport across various realistic nanostructures. Topics encompass standard Coulomb blockade, cotunneling phenomena in quantum dots, vibrational and Franck-Condon effects in molecular junctions, as well as many-body interference observed in double quantum dots or carbon nanotubes. Derived from lectures tailored for graduate and advanced students at the University of Regensburg in Germany, this book is enriched with exercises and step-by-step derivations.
