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Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (290 p.)
Collana	Scottish Graduate Series, , 2199-4617
Disciplina	003.54 004.1
Soggetti	Quantum computers Spintronics Quantum theory Phase transformations (Statistical physics) Condensed matter Quantum optics Quantum Information Technology, Spintronics Quantum Physics Quantum Gases and Condensates Quantum Optics Quantum Computing
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Quantum Retrodiction -- Probing and Controlling Quantum Matter Using Ultracold Quantum Gases in Optical Lattices -- Towards Macroscopic Superpositions via Single-Photon Optomechanics -- An Introduction to Quantum Algorithms: A Physicist's Perspective -- Quantum Key Distribution -- Quantum Control Based On Measurement -- Orbital Angular Momentum: Testbed for Quantum Mechanics -- An Introduction to Entanglement Theory -- An Introduction to Trapped Ions, Scalability and Quantum Metrology -- Open Quantum Systems and Decoherence.

This book offers an introduction to ten key topics in quantum information science and quantum coherent phenomena, aimed at graduate-student level. The chapters cover some of the most recent developments in this dynamic research field where theoretical and experimental physics, combined with computer science, provide a fascinating arena for groundbreaking new concepts in information processing. The book addresses both the theoretical and experimental aspects of the subject, and clearly demonstrates how progress in experimental techniques has stimulated a great deal of theoretical effort and vice versa. Experiments are shifting from simply preparing and measuring quantum states to controlling and manipulating them, and the book outlines how the first real applications, notably quantum key distribution for secure communication, are starting to emerge. The chapters cover quantum retrodiction, ultracold quantum gases in optical lattices, optomechanics, quantum algorithms, quantum key distribution, quantum control based on measurement, orbital angular momentum of light, entanglement theory, trapped ions and quantum metrology, and open quantum systems subject to decoherence. The contributing authors have been chosen not just on the basis of their scientific expertise, but also because of their ability to offer pedagogical and well-written contributions which will be of interest to students and established researchers.
