

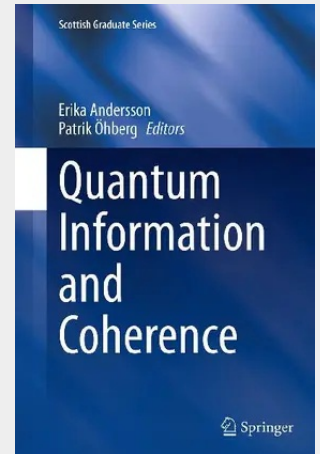
Quantum Information and Coherence

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.

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