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Autore	Onofrio Roberto
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Sommario/riassunto	This book is based on lecture notes originally developed for introductory graduate courses offered by the authors at Dartmouth College and the University of Padova. The first two chapters analyze quantum degenerate gases and various cooling and trapping techniques for atoms. The remaining three chapters discuss ultracold atoms as weakly interacting, strongly interacting, and non-interacting coherent systems. The third chapter presents multiple pieces of evidence for quantum degeneracy in Bose and Fermi gases, followed by peculiar features such as superfluidity and the formation of topological defects. The fourth chapter addresses strongly correlated systems, discussing the BCS-BEC crossover in fermionic gases and quantum phase transitions, including their dependence on effective

dimensionality. The fifth chapter offers a more specific discussion of quantum coherence in ultracold atoms and their potential as a platform for quantum metrology and quantum emulation. Four appendices provide more quantitative details of theoretical tools used in the last two chapters. Each chapter concludes with problems and a list of more specialized material. The main goal is to introduce interested students to ultracold atom physics research topics and expose scientists working in other areas of frontier physics to this novel and exciting research direction. This book is also intended to complement existing textbooks in standard courses on condensed matter physics, demonstrating how some general elements of the latter can be understood by continuously increasing the interactions between ultracold and quantum degenerate atoms under controlled external conditions.