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Nota di contenuto	Motivation and Outline -- Continuous Observation of Quantum Systems -- Quantum Critical Phenomena -- Out-of-Equilibrium Quantum Dynamics -- Quantum Spin in an Environment -- Quantum Particle in a Magnetic Environment -- Conclusions and Outlook.
Sommario/riassunto	This book studies the fundamental aspects of many-body physics in quantum systems open to an external world. Recent remarkable developments in the observation and manipulation of quantum matter at the single-quantum level point to a new research area of open many-body systems, where interactions with an external observer and the environment play a major role. The first part of the book elucidates the influence of measurement backaction from an external observer, revealing new types of quantum critical phenomena and out-of-

equilibrium dynamics beyond the conventional paradigm of closed systems. In turn, the second part develops a powerful theoretical approach to study the in- and out-of-equilibrium physics of an open quantum system strongly correlated with an external environment, where the entanglement between the system and the environment plays an essential role. The results obtained here offer essential theoretical results for understanding the many-body physics of quantum systems open to an external world, and can be applied to experimental systems in atomic, molecular and optical physics, quantum information science and condensed matter physics.
