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Nota di contenuto	Optical elements for atoms: A beamsplitter and a mirror -- Atom interferometry -- Optical ramsey interferometry with magnesium atoms -- Momentum transfer by adiabatic passage in a light field -- Atomic waveguides and cavities from hollow optical fibers -- Towards higher densities of cold atoms: intense slow atom beams and dark light traps -- Two and three-dimensional optical crystals -- Multidimensional laser cooling: Quantum approaches -- Software atom of optical physics -- Quantum optics with cold atoms -- Correlations of the resonance

fluorescence from a single trapped ion -- Non-classical states of motion in an ion trap -- Limits in preparation of coherent population trapping states -- Adiabatic atomic cooling in cavity QED -- Quantum electrodynamics in an optical cavity -- Fock state superpositions in cavity QED with dark atoms -- Mesoscopic quantum coherences in cavity QED -- Using the positive P-representation -- Generating number-phase squeezed states -- Suppression of photon fluctuations in the light flow under non-linear amplification in a resonant medium layer -- Quantum statistics of four-wave mixing of nonclassical light with pump depletion -- Quantum non-demolition measurements in optics and quantum optical repeaters -- Perfect correlations of three-particle entangled states -- Irreversibility in quantum dynamical processes -- On lasing without inversion within the sodium D1 line.

Sommario/riassunto

Advanced experimental techniques make quantum optics one of the most active fields in probing the fundamental laws of quantum theory. The contributions collected in this volume, by both theoreticians and experimentalists, give an overview of the most recent developments in fundamental quantum optics. Of particular interest is the physics of cooled and trapped particles. Other topics include atomic interferometry, quantum electrodynamics in a cavity, quantum measurement and much more. The level of presentation makes this book intelligible not only to the expert but also to a wide readership from engineering and physics.