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Nota di contenuto	Quantum chaos for kicked spins -- Localization and delocalization in a dissipative quantum map -- Coherences and correlations in chaotic optical signals -- Squeezed state generation by the normal mode splitting of two-level atoms in an optical cavity -- Quantum noise reduction via twin photon beam generation -- Dynamics of three-level atoms: jumping and squeezing -- Interferometric detection of gravitational radiation and nonclassical light -- “Quantum jumps” observed in single-ion fluorescence -- Macroscopic quantum jumps -- Spontaneous emission in confined space -- The micromaser as a problem in “Quantum chaology” -- Rydberg atoms two-photon micromaser -- Preparation of cold atoms for precision measurements -- Atomic motion in a resonant laser standing wave -- Low- temperature physics with laser cooling -- Expectation values, Q- functions and eigenvalues for dispersive optical bistability -- Berry's phase and the parallel transport of polarization -- Raman heterodyne ramsey spectroscopy in local space and velocity space -- Dissipative death of quantum effects in a spin system -- Period doubling in a

quantized version of Henon's map -- Resonance overlap and diffusion of the action variable in the laserexcitation of molecular vibrations -- Winding numbers and collisions between attractors in a laser system -- Squeezed quantum fluctuations and noise limits in amplifiers and attenuators -- Ordered structures of ions stored in a RF-Trap -- Quenching of quantum noise and detection of weak optical signals in the quantum beat laser -- Light pressure induced nonlinear dispersion in a Doppler-broadened medium -- Unstable periodic atomic orbitals -- Virtual cloud effects in spontaneous decay.

Sommario/riassunto

Quantum optics in the most general sense seeks to understand the physical phenomena related to the interaction of radiation and matter. The field has therefore always been characterized by an enormous span of activities from fundamental investigations - e.g., into the nature of radiation fields - to spectroscopic methods for applied research. The 18 invited lectures presented at the seminar on "Fundamentals of Quantum Optics II" in Obergurgl, Austria, in the winter of 1987 cover the following topics: - chaos in quantum systems; - squeezed quantum states; - quantum jumps; - quantum electrodynamics in a cavity; - laser cooling and optical traps; - Rydberg atoms; - cooperative phenomena and other fundamentals. For scientists and graduate students working in quantum optics and related fields this book provides an excellent overview of new developments; it gives a clear demonstration of the surprising and characteristic speed with which this field turns fundamental insights into applications (e.g., squeezed states) and how experimental progress contributes to those fundamental insights (e.g., trapping techniques).
