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Collana	Lecture Notes in Physics, , 0075-8450 ; ; 457
Disciplina	530.1/2
Soggetti	Statistical physics Dynamical systems Thermodynamics Quantum computers Spintronics Quantum physics Probabilities Complex Systems Quantum Information Technology, Spintronics Quantum Physics Probability Theory and Stochastic Processes Statistical Physics and Dynamical Systems
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Nota di contenuto	Stochastic processes from deterministic dynamics -- The interplay of classical and quantum stochastics: Diffusion, measurement and filtering -- Event enhanced and piecewise deterministic quantum theory or the right jump at the right place -- Wave mechanics: The interplay between stochastics and quanta -- Lévy processes and relativistic quantum dynamics -- Quantum coherence and decoherence in a classically chaotic experimentally accessible quantum optical system -- Anomalous diffusion, spontaneous localizations and the

correspondence principle -- Quantum open systems as random classical dynamical systems -- Large-Scale Structure of the Universe and Asymptotics of Burgers' Turbulence with Heavy-tailed Dependent Data Yiming Hue and -- Convergence of iterative methods in perturbation theory -- Eigenfunction expansions for time dependent hamiltonians -- Strange attractors in higher-dimensional phase space -- Mathematical classification of complete chaos -- Anomalous diffusion and Lévy statistics in intermittent chaotic systems -- Classical and quantum chaotic scattering -- From fractals to stochastic differential equations -- Dissipative structures and weak turbulence -- Entropy and quantum characteristic exponents. steps towards a quantum pesin theory -- Rigorous numerics of chaotic dynamical systems -- The effect of symmetry breaking on random walks and brownian motion -- Quantum dynamical entropy -- Strange attractors in nonlinear oscillators -- Wave packet propagation, nonlinear dynamics, and constructing Chaotic Eigenstates -- Chaotic dynamics of weakly nonlinear systems -- Computer simulation of Lévy  $\alpha$ -stable variables and processes -- From quantum physics to probability theory and back -- Stochastic approach to many bosons physics -- Ionization of Rydberg atoms in a low frequency field: Modelling by maps of transition to chaotic behavior -- Periodic perturbations of chaotic dynamics -- p-adic stochastics with applications to the Einstein-Podolsky-Rosen Paradox -- Quantum chaos: double resonance model and its physical applications -- Asymptotic behavior of generalized Levy walks -- Stochastic Moore loop space -- Relativistic chaos in time-driven linear and nonlinear oscillators -- Applications of quantum characteristic exponents -- Asymptotic properties of the Fokker-Planck equation -- Spacetime distortion as a reason for quantum stochasticity -- Divergences of the semiclassical S-matrix beyond hyperbolic systems -- Disturbance propagation in coupled map lattices -- Lévy-Stable and extreme value distributions in modelling of dynamical phenomena in complex physical systems -- Wigner or non-wigner: That is the question -- Random matrices of circular symplectic ensemble.

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### Sommario/riassunto

The study of chaotic behaviour of dynamical systems has triggered new efforts to reconcile deterministic and stochastic processes as well as classical and quantum physics. New efforts are made to understand complex and unpredictable behaviour. The papers collected in this volume give a broad overview of these activities. Readers will get a glimpse of the growing importance of Lévy processes for physics. They will find new views on fundamental concepts of quantum physics and will see many applications of chaotic and essentially random phenomena to a number of physical problems.

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