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Soggetti	Atoms Physics Statistical physics Dynamics Thermodynamics Fluids Atomic, Molecular, Optical and Plasma Physics Complex Systems Mathematical Methods in Physics Numerical and Computational Physics, Simulation Fluid- and Aerodynamics
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Nota di contenuto	Probability in physics -- From stratonovich calculus to noise-induced phase transitions -- Generalized langevin equations: A useful tool for the perplexed modeller of nonequilibrium fluctuations? -- Colored noise in dynamical systems: Some exact solutions -- On the operator method of variable contraction for stochastic processes -- Recurrence time statistics in low-dimensional dynamical systems -- The boltzmann equation for the gas of partly inelastic balls with regard to random interaction forces -- Ratchets driven by colored gaussian noise -- A motor protein model and how it relates to stochastic resonance, feynman’s ratchet, and maxwell’s demon -- A diffusion-limited reaction -- Stochastic localization in soft anharmonic oscillators -- Quantum transition state theory for multidimensional dissipative

systems -- Surmounting fluctuating barriers: Basic concepts and results -- Some problems of cluster dynamics of biological macromolecules -- Stochastic synchronization -- Stochastic analysis of limit cycle behavior -- Symbolic dynamics approach to stochastic processes -- Stochastic resonance (for beginners) -- Dynamics of globally coupled noisy oscillators -- Cluster statistics and traffic on a lattice -- Phase synchronization in noisy and chaotic oscillators -- A glauber-dynamics approach to coupled stochastic resonators -- Stochastic aspects of the force network in a regular granular piling -- Burgers' turbulence and dynamical scaling -- Quantum mechanics simulated by diffusion and branching processes -- Markov chain models for spatially-distributed reacting systems -- Macromechanical modeling of the surface flow of granular systems -- Novel pattern formation in granular matter -- Self-motion in physico-chemical systems far from thermal equilibrium -- Synthetic random flows: Generation and applications -- Active brownian particles: Artificial agents in physics -- Planetary rings — nonequilibrium systems in space.

Sommario/riassunto

Stochastic Dynamics, born almost 100 years ago with the early explanations of Brownian motion by physicists, is nowadays a quickly expanding field of research within nonequilibrium statistical physics. The present volume provides a survey on the influence of fluctuations in nonlinear dynamics. It addresses specialists, although the intention of this book is to provide teachers and students with a reliable resource for seminar work. In particular, the reader will find many examples illustrating the theory as well as a host of recent findings.