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Soggetti	Probabilities Statistical physics Dynamics Field theory (Physics) Applied mathematics Engineering mathematics Fluid mechanics Probability Theory and Stochastic Processes Complex Systems Classical and Continuum Physics Applications of Mathematics Engineering Fluid Dynamics Statistical Physics and Dynamical Systems
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Preliminary -- Probability -- Brownian Motion -- Stationary Stochastic Processes -- Statistical Mechanics -- Index -- Time-Dependent Statistical Mechanics.
Sommario/riassunto	"Stochastic Tools in Mathematics and Science" covers basic stochastic tools used in physics, chemistry, engineering and the life sciences. The topics covered include conditional expectations, stochastic processes, Brownian motion and its relation to partial differential equations, Langevin equations, the Liouville and Fokker-Planck equations, as well as Markov chain Monte Carlo algorithms, renormalization, basic statistical mechanics, and generalized Langevin equations and the

Mori-Zwanzig formalism. The applications include sampling algorithms, data assimilation, prediction from partial data, spectral analysis, and turbulence. The book is based on lecture notes from a class that has attracted graduate and advanced undergraduate students from mathematics and from many other science departments at the University of California, Berkeley. Each chapter is followed by exercises. The book will be useful for scientists and engineers working in a wide range of fields and applications. For this new edition the material has been thoroughly reorganized and updated, and new sections on scaling, sampling, filtering and data assimilation, based on recent research, have been added. There are additional figures and exercises. Review of earlier edition: "This is an excellent concise textbook which can be used for self-study by graduate and advanced undergraduate students and as a recommended textbook for an introductory course on probabilistic tools in science." Mathematical Reviews, 2006 .