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Autore	Kolokoltsov V. N (Vasilii Nikitich)
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	pt. 1. Introduction to stochastic analysis -- pt. 2. Markov processes and beyond.
Sommario/riassunto	Markov processes represent a universal model for a large variety of real life random evolutions. The wide flow of new ideas, tools, methods and applications constantly pours into the ever-growing stream of research on Markov processes that rapidly spreads over new fields of natural and social sciences, creating new streamlined logical paths to its turbulent boundary. Even if a given process is not Markov, it can be often inserted into a larger Markov one (Markovianization procedure) by including the key historic parameters into the state space. This monograph gives a concise, but systematic and self-contained, exposition of the essentials of Markov processes, together with recent achievements, working from the "physical picture" - a formal pre-generator, and stressing the interplay between probabilistic (stochastic differential equations) and analytic (semigroups) tools. The book will be useful to students and researchers. Part I can be used for a one-semester course on Brownian motion, Lévy and Markov processes, or on probabilistic methods for PDE. Part II mainly contains the author's research on Markov processes. From the contents: Tools from

Probability and Analysis Brownian motion Markov processes and martingales SDE, DE and martingale problems Processes in Euclidean spaces Processes in domains with a boundary Heat kernels for stable-like processes Continuous-time random walks and fractional dynamics Complex chains and Feynman integral
