1.	Record Nr.	UNINA9910300545303321
	Autore	Vitali Ettore
	Titolo	Theory and Simulation of Random Phenomena : Mathematical Foundations and Physical Applications / / by Ettore Vitali, Mario Motta, Davide Emilio Galli
	Pubbl/distr/stampa	Cham : , , : Springer International Publishing : , , : Imprint : Springer, , 2018
	ISBN	3-319-90515-5
	Edizione	[1st ed. 2018.]
	Descrizione fisica	1 online resource (XIII, 235 p. 5 illus.)
	Collana	UNITEXT for Physics, , 2198-7890
	Disciplina	519.2
	Soggetti	Mathematical physics Probabilities Statistics Mathematical Methods in Physics Probability Theory Statistical Theory and Methods Mathematical Physics Theoretical, Mathematical and Computational Physics
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di bibliografia	Includes bibliographical references.
	Nota di contenuto	1 Review of Probability Theory -- 2 Applications to Mathematical Statistics -- 3 Conditional Probability and Conditional Expectation -- 4 Markov Chains -- 5 Sampling of Random Variables and Simulation -- 6 Brownian Motion -- 7 Introduction to Stochastic Calculus and Ito Integral -- 8 Introduction to Stochastic Differential Equations and Applications -- Bibliography -- Solutions. .
	Sommario/riassunto	The purpose of this book is twofold: first, it sets out to equip the reader with a sound understanding of the foundations of probability theory and stochastic processes, offering step-by-step guidance from basic probability theory to advanced topics, such as stochastic differential equations, which typically are presented in textbooks that require a very strong mathematical background. Second, while leading the reader on this journey, it aims to impart the knowledge needed in order to develop algorithms that simulate realistic physical systems.

Connections with several fields of pure and applied physics, from quantum mechanics to econophysics, are provided. Furthermore, the inclusion of fully solved exercises will enable the reader to learn quickly and to explore topics not covered in the main text. The book will appeal especially to graduate students wishing to learn how to simulate physical systems and to deepen their knowledge of the mathematical framework, which has very deep connections with modern quantum field theory.