1. Record Nr. UNINA9910992779303321

Autore	Chorowski Micha
Titolo	Anomalous Stochastics : A Comprehensive Guide to Multifractals, Random Walks, and Real-World Applications / / by Micha Chorowski, Tomasz Gubiec, Ryszard Kutner
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2025
ISBN	9783031803925 3031803922
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (599 pages)
Collana	Understanding Complex Systems, , 1860-0840
Altri autori (Persone)	GubiecTomasz KutnerRyszard
Disciplina	519.23
Soggetti	Stochastic processes System theory Statistical physics Probabilities Statistics Stochastic Processes Complex Systems Statistical Physics Applied Probability Statistics in Business, Management, Economics, Finance, Insurance
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Fundamental Concepts -- Singular Stochastic Processes -- Non-deterministic Fractals -- Signatures and Causes of Multifractality -- Dispersive Transport and Diffusion -- Fractal Wanderings -- Valley Model of Multifractal Continuous-time Random Wandering on Amorphous Substrates -- Statistics of Extremes -- Limit Theorems on the Stock Market -- Comprehensive Partition Function: A Universal Tool in Multifractality.
Sommario/riassunto	This textbook provides a comprehensive exploration of anomalous stochastic processes and extreme events, commonly referred to as "black swans," with a particular focus on (multi-)fractal approaches and

continuous-time random walks. The authors present a systematic examination of the subject, tracing its inception and providing a multi-directional perspective. By drawing on real-world experiences in finance, physics, and technology, the book underscores the practical relevance of anomalous stochastic processes for practitioners dealing with real-world data from complex systems. The content is based on a series of interdisciplinary physics lectures that have been delivered to undergraduate and graduate students at the University of Warsaw for nearly two decades. Updated to reflect recent developments, this book is a valuable resource for graduate students, ambitious undergraduate students, and researchers interested in random processes and the practical implications of anomalous processes. Familiarity with fundamental principles of probability theory, algebra, and basic concepts of differential and integral calculus is assumed, while a foundational understanding of mathematical statistics, stochastic processes, and statistical thermodynamics is recommended. Additionally, each chapter includes practical exercises designed to help readers master the concepts, develop practical skills, and serve as teaching material.