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Soggetti	Statistical physics Dynamics Chemistry, Physical and theoretical Biophysics Biomathematics Biometry Systems biology Complex Systems Theoretical and Computational Chemistry Biological and Medical Physics, Biophysics Mathematical and Computational Biology Biostatistics Systems Biology
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Probability -- Distributions, Moments and Statistics -- Stochastic Processes -- Applications in Chemistry -- Applications in Biology -- Perspectives -- References -- Glossary -- Notation.
Sommario/riassunto	This book has developed over the past fifteen years from a modern course on stochastic chemical kinetics for graduate students in physics, chemistry and biology. The first part presents a systematic collection of the mathematical background material needed to understand probability, statistics, and stochastic processes as a prerequisite for the increasingly challenging practical applications in chemistry and the life

sciences examined in the second part. Recent advances in the development of new techniques and in the resolution of conventional experiments at nano-scales have been tremendous: today molecular spectroscopy can provide insights into processes down to scales at which current theories at the interface of physics, chemistry and the life sciences cannot be successful without a firm grasp of randomness and its sources. Routinely measured data is now sufficiently accurate to allow the direct recording of fluctuations. As a result, the sampling of data and the modeling of relevant processes are doomed to produce artifacts in interpretation unless the observer has a solid background in the mathematics of limited reproducibility. The material covered is presented in a modular approach, allowing more advanced sections to be skipped if the reader is primarily interested in applications. At the same time, most derivations of analytical solutions for the selected examples are provided in full length to guide more advanced readers in their attempts to derive solutions on their own. The book employs uniform notation throughout, and a glossary has been added to define the most important notions discussed.
