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Titolo	Stochastic Foundations in Movement Ecology : Anomalous Diffusion, Front Propagation and Random Searches / / by Vicenç Méndez, Daniel Campos, Frederic Bartumeus
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Disciplina	519.62
Soggetti	Sociophysics
	Econophysics
	Ecology
	Biomathematics
	Computational complexity
	System theory
	Data-driven Science, Modeling and Theory Building
	Theoretical Ecology/Statistics
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Elements of Probability Theory -- Introduction to Stochastic Processes -- Microscopic, Mesoscopic and Macroscopic Descriptions of Dispersal-Continuous-Time Random Walks and Anomalous Diffusion -- Reaction-Dispersal Models and Front Propagation -- Stochastic Optimal Foraging Theory -- Cell Motion and Chemotaxis -- Host-Pathogen Interactions -- Biological Invasions -- Random Search in Model Organisms.
Sommario/riassunto	This book presents the fundamental theory for non-standard diffusion problems in movement ecology. Lévy processes and anomalous diffusion have shown to be both powerful and useful tools for

qualitatively and quantitatively describing a wide variety of spatial population ecological phenomena and dynamics, such as invasion fronts and search strategies. Adopting a self-contained, textbook-style approach, the authors provide the elements of statistical physics and stochastic processes on which the modeling of movement ecology is based and systematically introduce the physical characterization of ecological processes at the microscopic, mesoscopic and macroscopic levels. The explicit definition of these levels and their interrelations is particularly suitable to coping with the broad spectrum of space and time scales involved in bio-ecological problems. Including numerous exercises (with solutions), this text is aimed at graduate students and newcomers in this field at the interface of theoretical ecology, mathematical biology and physics.