1.	Record Nr.	UNINA9910144619903321
	Autore	Jiang Da-Quan
	Titolo	Mathematical Theory of Nonequilibrium Steady States : On the Frontier of Probability and Dynamical Systems / / by Da-Quan Jiang, Min Qian, Ming-Ping Qian
	Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 2004
	ISBN	3-540-40957-2
	Edizione	[1st ed. 2004.]
	Descrizione fisica	1 online resource (X, 286 p.)
	Collana	Lecture Notes in Mathematics, , 0075-8434 ; ; 1833
	Disciplina	530
	Soggetti	Probabilities
		Dynamics
		Ergodic theory
		Global analysis (Mathematics)
		Manifolds (Mathematics)
		Statistical physics
		Probability Theory and Stochastic Processes
		Dynamical Systems and Ergodic Theory
		Global Analysis and Analysis on Manifolds
		Complex Systems
		Statistical Physics and Dynamical Systems
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Note generali	Bibliographic Level Mode of Issuance: Monograph
	Nota di bibliografia	Includes bibliographical references (pages [253]-276) and index.
	Nota di contenuto	Preface -- Introduction -- Circulation Distribution, Entropy Production and Irreversibility of Denumerable Markov Chains -- Circulation Distribution, Entropy Production and Irreversibility of Finite Markov Chains with Continuous Parameter -- General Minimal Diffusion Process: its Construction, Invariant Measure, Entropy Production and Irreversibility -- Measure-theoretic Discussion on Entropy Production of Diffusion Processes and Fluctuation-dissipation Theorem -- Entropy Production, Rotation Numbers and Irreversibility of Diffusion Processes on Manifolds -- On a System of Hyperstable Frequency Locking Persistence under White Noise -- Entropy Production and Information Gain in Axiom A Systems -- Lyapunov Exponents of Hyperbolic

	Attractors -- Entropy Production, Information Gain and Lyapunov Exponents of Random Hyperbolic Dynamical Systems -- References -- Index.
Sommario/riassunto	This volume provides a systematic mathematical exposition of the conceptual problems of nonequilibrium statistical physics, such as entropy production, irreversibility, and ordered phenomena. Markov chains, diffusion processes, and hyperbolic dynamical systems are used as mathematical models of physical systems. A measure-theoretic definition of entropy production rate and its formulae in various cases are given. It vanishes if and only if the stationary system is reversible and in equilibrium. Moreover, in the cases of Markov chains and diffusion processes on manifolds, it can be expressed in terms of circulations on directed cycles. Regarding entropy production fluctuations, the Gallavotti-Cohen fluctuation theorem is rigorously proved.