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Disciplina	536.7
Soggetti	Thermodynamics Statistical physics Dynamics Phase transformations (Statistical physics) Biophysics Complex Systems Phase Transitions and Multiphase Systems Biological and Medical Physics, Biophysics Statistical Physics and Dynamical Systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Introduction -- Small-scale thermodynamics -- Irreversibility and dissipation -- Dissipation and kullback-leibler divergence -- Estimating the kullback-leibler divergence -- A case study: the flashing ratchet -- Application to biology: the ear hair bundle -- Experimental tests and applications of stochastic Thermodynamics -- Energetics of symmetry breaking -- Effective heating with random forces -- Conclusions -- Conclusions and outlook.
Sommario/riassunto	After an insightful introductory part on recent developments in the thermodynamics of small systems, the author presents his contribution to a long-standing problem, namely the connection between irreversibility and dissipation. He develops a method based on recent results on fluctuation theorems that is able to estimate dissipation using only information acquired in a single, sufficiently long, trajectory

of a stationary nonequilibrium process. This part ends with a remarkable application of the method to the analysis of biological data, in this case, the fluctuations of a hair bundle. The third part studies the energetics of systems that undergo symmetry breaking transitions. These theoretical ideas lead to, among other things, an experimental realization of a Szilard engine using manipulated colloids. This work has the potential for important applications ranging from the analysis of biological media to the design of novel artificial nano-machines.