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Sommario/riassunto	Stochastic systems provide powerful abstract models for a variety of important real-life applications: for example, power supply, traffic flow, data transmission. They (and the real systems they model) are often subject to phase transitions, behaving in one way when a parameter is below a certain critical value, then switching behaviour as soon as that critical value is reached. In a real system, we do not necessarily have control over all the parameter values, so it is important to know how to find critical points and to understand system behaviour near these points. This book is a modern presentation of the 'semimartingale' or 'Lyapunov function' method applied to near-critical stochastic systems, exemplified by non-homogeneous random walks. Applications treat near-critical stochastic systems and range across modern probability

theory from stochastic billiards models to interacting particle systems. Spatially non-homogeneous random walks are explored in depth, as they provide prototypical near-critical systems.