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Soggetti	Statistical physics Dynamics Ergodic theory Physics Mechanics Applications of Nonlinear Dynamics and Chaos Theory Dynamical Systems and Ergodic Theory Mathematical Methods in Physics Classical Mechanics
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Nota di contenuto	Introduction -- Fundamental terminology -- Complexity -- Classical versus quantum dynamics.- Problems -- References -- Dynamical systems -- Evolution law -- One-dimensional maps -- Problems -- References -- Nonlinear Hamiltonian systems -- Integrable examples -- Hamiltonian formalism -- Important techniques in the Hamiltonian formalism -- Integrable systems -- Non-integrable systems -- Perturbation of low-dimensional systems -- Canonical perturbation theory -- Transition to chaos in Hamiltonian systems -- Criteria for local and global chaos -- Appendix -- Problems -- References -- Aspects of quantum chaos -- Introductory remarks on quantum mechanics -- Semiclassical quantization of integrable systems -- Semiclassical description of non-integrable systems -- Wave functions in phase space -- Anderson and dynamical localization -- Universal level statistics -- Concluding remarks -- Appendix -- Problems --

The field of nonlinear dynamics and chaos has grown very much over the last few decades and is becoming more and more relevant in different disciplines. This book presents a clear and concise introduction to the field of nonlinear dynamics and chaos, suitable for graduate students in mathematics, physics, chemistry, engineering, and in natural sciences in general. It provides a thorough and modern introduction to the concepts of Hamiltonian dynamical systems' theory combining in a comprehensive way classical and quantum mechanical description. It covers a wide range of topics usually not found in similar books. Motivations of the respective subjects and a clear presentation eases the understanding. The book is based on lectures on classical and quantum chaos held by the author at Heidelberg University. It contains exercises and worked examples, which makes it ideal for an introductory course for students as well as for researchers starting to work in the field.