1. Record Nr. UNINA9910739423703321

Autore	Benatti Fabio
Titolo	Dynamics, Information and Complexity in Quantum Systems / / by Fabio Benatti
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023
ISBN	3-031-34248-8
Edizione	[2nd ed. 2023.]
Descrizione fisica	1 online resource (620 pages)
Collana	Theoretical and Mathematical Physics, , 1864-5887
Disciplina	530.12
Soggetti	Quantum theory Dynamics System theory Quantum computing Statistical physics Quantum Physics Dynamical Systems Complex Systems Quantum Information Statistical Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Classical Dynamics and Ergodic Theory -- Dynamical Entropy and Information -- Algorithmic Complexity -- Machine Learning -- Quantum Mechanics of Finite Degrees of Freedom -- Quantum Information Theory -- Quantum Mechanics of Infinite Degrees of Freedom -- Quantum Dynamical Entropies -- Quantum Algorithmic Complexities -- Quantum Machine Learning.
Sommario/riassunto	This second edition of Dynamics, Information and Complexity in Quantum Systems widens its scope by focussing more on the dynamics of quantum correlations and information in microscopic and mesoscopic systems, and their use for metrological and machine learning purposes. The book is divided into three parts: Part One: Classical Dynamical Systems Addresses classical dynamical systems, classical dynamical entropy, and classical algorithmic complexity.

Includes a survey of the theory of simple perceptrons and their storage capacity. Part Two: Quantum Dynamical Systems Focuses on the dynamics of entanglement under dissipative dynamics and its metrological use in finite level quantum systems. Discusses the quantum fluctuation approach to large-scale mesoscopic systems and their emergent dynamics in quantum systems with infinitely many degrees of freedom. Introduces a model of quantum perceptron whose storage capacity is computed and compared with the classical one. Part Three: Quantum Dynamical Entropies and Complexities Devoted to quantum dynamical entropies and algorithmic complexities. This book is meant for advanced students, young and senior researchers working in the fields of quantum statistical mechanics, quantum information, and quantum dynamical systems. It is self-contained, and the only prerequisites needed are a standard knowledge of statistical mechanics, quantum mechanics, and linear operators on Hilbert spaces.