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Autore	Tasaki Hal
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ISBN	3-030-41265-2
Edizione	[1st ed. 2020.]
Descrizione fisica	1 online resource (534 pages)
Collana	Graduate Texts in Physics, , 1868-4513
Disciplina	521.015118
Soggetti	Superconductivity Superconductors Mathematical physics Statistical physics Phase transitions (Statistical physics) Physics Strongly Correlated Systems, Superconductivity Mathematical Physics Statistical Physics and Dynamical Systems Phase Transitions and Multiphase Systems Mathematical Methods in Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- Basics of quantum spin systems.-Long-range order and spontaneous symmetry breaking in the classical and quantum Ising models -- Long-range order and spontaneous symmetry breaking in the antiferromagnetic Heisenberg model -- Long-range order and “spontaneous symmetry breaking” in Bose-Einstein condensates.-Affleck-Kennedy-Lieb-Tasaki model -- Haldane phase.-The origin of ferromagnetism -- Mathematical appendices -- Solutions -- Index.
Sommario/riassunto	This book is a self-contained advanced textbook on the mathematical-physical aspects of quantum many-body systems, which begins with a pedagogical presentation of the necessary background information before moving on to subjects of active research, including topological

phases of matter. The book explores in detail selected topics in quantum spin systems and lattice electron systems, namely, long-range order and spontaneous symmetry breaking in the antiferromagnetic Heisenberg model in two or higher dimensions (Part I), the Haldane phenomenon in antiferromagnetic quantum spin chains and related topics in topological phases of quantum matter (Part II), and the origin of magnetism in various versions of the Hubbard model (Part III). Each of these topics represents certain nontrivial phenomena or features that are invariably encountered in a variety of quantum many-body systems, including quantum field theory, condensed matter systems, cold atoms, and artificial quantum systems designed for future quantum computers. The book's main focus is on universal properties of quantum many-body systems. The book includes roughly 50 problems with detailed solutions. The reader only requires elementary linear algebra and calculus to comprehend the material and work through the problems. Given its scope and format, the book is suitable both for self-study and as a textbook for graduate or advanced undergraduate classes. .