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Descrizione fisica	1 online resource (XV, 390 p. 47 illus., 24 illus. in color.)
Collana	UNITEXT for Physics, , 2198-7882
Disciplina	530
Soggetti	Quantum theory Mechanics Thermodynamics Quantum Physics Classical Mechanics
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Nota di contenuto	Physical theories, fundamental constants and the role of Mathematics -- Analytical Mechanics -- Dirac's delta -- Green's functions for Electromagnetism -- Equilibrium Thermodynamics -- Classical Statistical Mechanics -- Relativity -- Particles and waves from classical to Quantum Mechanics -- Schroedinger equation -- Elementary solutions in one dimension -- Postulates and formulations of Quantum Mechanics -- Separation of variables -- Angular momentum--Hydrogen atom -- Discrete models -- Fano resonances and Green's functions -- Spin -- Quantum statistics and many-body phenomena -- Non-equilibrium phenomena and quantum transport -- Berry Phase -- Quantum Statistical Mechanics -- Entanglement, EPR paradox. Teleportation -- Perturbation theory -- Variational method in Quantum Mechanics -- Recursion methods -- Mathematical appendices: Tensors - Hermite and Laguerre Polynomials.
Sommario/riassunto	This book presents the basic elements of theoretical physics in a highly accessible, captivating way for university students in the third year of a degree in physics. It covers analytical mechanics, thermodynamics and statistical physics, special and general relativity and non-relativistic quantum theory, fully developing the necessary mathematical methods

beyond standard calculus. The central theme is scientific curiosity and the main focus is on the experimental meaning of all quantities and equations. Several recent verifications of General Relativity are presented, with emphasis on the physical effects – why they were predicted to exist and what signals they were seen to produce. Similarly, the basic reasons why superconductors have zero resistance and are perfect diamagnets are pinpointed. Quantum Eraser Experiments and Delayed Choice Experiments are described. Many statements of Quantum Theory are a challenge to common sense and some crucial predictions have often been considered hard to believe and have been tested experimentally. The book examines the EPR paradox, Bell states and teleportation. To show the beauty and richness of the subject, various topics from different areas of Physics are covered. These include: discrete quantum models and lattices (periodic and not), Casimir effect, Anyons, Fano Resonances, the Hanbury Brown and Twiss effect, the Aharonov-Bohm effect, the Meitner-Auger effect, Squeezed Light, the Rabi model, neutrino oscillations, aspects of Quantum Transport, Quantum Pumping, and Berry phases, black holes and cosmological problems.
