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Nota di contenuto	1 Physical Background -- 2 Dynamics -- 3 Observables -- 4 Quantization -- 5 Uncertainty Principle and Stability of Atoms and Molecules -- 6 Spectrum and Dynamics -- 7 Special Cases -- 8 Bound States and Variational Principle -- 9 Scattering States -- Existence of Atoms and Molecules -- 11 Perturbation Theory: Feshbach-Schur Method -- 12 Born-Oppenheimer Approximation and Adiabatic Dynamics -- 13 General Theory of Many-particle Systems -- 14 Self-consistent Approximations -- 15 The Feynman Path Integral -- 16 Semi-classical Analysis -- 17 Resonances -- 18 Quantum Statistics -- 19 Open Quantum Systems -- 20 The Second Quantization -- 21 Quantum Electro-Magnetic Field – Photons -- 22 Standard Model of Non-relativistic Matter and Radiation -- 23 Theory of Radiation -- 24 Renormalization Group -- 25 Mathematical Supplement: Spectral Analysis -- 26 Mathematical Supplement: The Calculus of Variations -- 27 Comments on Literature, and Further Reading -- References -- Index.
Sommario/riassunto	The book gives a streamlined introduction to quantum mechanics while describing the basic mathematical structures underpinning this discipline. Starting with an overview of key physical experiments illustrating the origin of the physical foundations, the book proceeds

with a description of the basic notions of quantum mechanics and their mathematical content. It then makes its way to topics of current interest, specifically those in which mathematics plays an important role. The more advanced topics presented include: many-body systems, modern perturbation theory, path integrals, the theory of resonances, adiabatic theory, geometrical phases, Aharonov-Bohm effect, density functional theory, open systems, the theory of radiation (non-relativistic quantum electrodynamics), and the renormalization group. With different selections of chapters, the book can serve as a text for an introductory, intermediate, or advanced course in quantum mechanics. Some of the sections could be used for introductions to geometrical methods in Quantum Mechanics, to quantum information theory and to quantum electrodynamics and quantum field theory.