

1. Record Nr.	UNINA9910337869303321
Autore	Basdevant Jean-Louis
Titolo	The Quantum Mechanics Solver : How to Apply Quantum Theory to Modern Physics // by Jean-Louis Basdevant, Jean Dalibard
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
ISBN	3-030-13724-4
Edizione	[3rd ed. 2019.]
Descrizione fisica	1 online resource (XIII, 352 p.)
Disciplina	530.12
Soggetti	Quantum physics Elementary particles (Physics) Quantum field theory Lasers Photonics Quantum optics Condensed matter Quantum Physics Elementary Particles, Quantum Field Theory Optics, Lasers, Photonics, Optical Devices Quantum Optics Condensed Matter Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Part I Elementary Particles, Nuclei and Atoms -- 1 Matter-wave Interferences with Molecules -- 2 Neutron Interferometry -- 3 Analysis of a Stern–Gerlach Experiment -- 4 Spectroscopic Measurements on a Neutron Beam -- 5 Measuring the Electron Magnetic Moment Anomaly -- 6 Atomic Clocks -- 7 The Spectrum of Positronium -- 8 Neutrino Transformations in the Sun -- 9 The Hydrogen Atom in Crossed Fields -- 10 Energy Loss of Ions in Matter -- Part II Quantum Entanglement and Measurement -- 11 The EPR Problem and Bell's Inequality -- 12 Quantum Correlations in a Multi-Particle System -- 13 A Non-Destructive Bomb Detector -- 14 Direct Observation of Field

Quantization -- 15 Schrödinger's Cat -- 16 Quantum Cryptography -- 17 Ideal Quantum Measurement -- 18 The Quantum Eraser -- 19 A Quantum Thermometer -- 20 Laser Cooling and Trapping -- Part III Complex Systems -- 21 Exact Results for the Three-Body Problem -- 22 Properties of a Bose–Einstein Condensate -- 23 Quantized Vortices -- 24 Motion in a Periodic Potential and Bloch Oscillations -- 25 Magnetic Excitons -- 26 A Quantum Box -- 27 Colored Molecular Ions -- 28 Hyperfine Structure in Electron Spin Resonance -- 29 Probing Matter with Positive Muons -- 30 Quantum Reflection of Atoms from a Surface -- Part IV Appendix -- 31 Memento of Quantum Mechanics.

---

Sommario/riassunto

This textbook presents problems with detailed solutions showing how to apply quantum theory to modern physics. The text is divided in three parts, the first dealing with elementary particles, nuclei and atoms, the second presents quantum entanglement and measurement. Finally complex systems are examined in depth. The aim of the text is to guide the student towards applying quantum mechanics to research problems. Advanced undergraduates and graduate students will find a rich and challenging source for improving their skills. This new edition has been extended with sections on neutrino oscillations, quantized vortices in Bose-Einstein condensates, quantum correlations in multi-particle systems, Bloch oscillations in periodic lattices and non-destructive quantum measurements.

---