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Autore	Landi Degl'Innocenti Egidio
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Soggetti	Astrophysics Atomic structure Molecular structure Particle acceleration Elementary particles (Physics) Quantum field theory Space sciences Astrophysics and Astroparticles Atomic/Molecular Structure and Spectra Particle Acceleration and Detection, Beam Physics Elementary Particles, Quantum Field Theory Space Sciences (including Extraterrestrial Physics, Space Exploration and Astronautics)
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	General laws of the electromagnetic field -- Spectrum and polarisation -- Radiation from moving charges -- Quantisation of the electromagnetic field -- Relativistic wave equations -- Atoms with a single valence electron -- Atoms with multiple valence electrons -- Term energies -- More details on the spectra -- Laws of thermodynamic equilibrium -- Interaction between matter and radiation -- Selection rules and line strengths -- Non-equilibrium plasmas -- Radiative transfer -- Second order processes.
Sommario/riassunto	This book describes the basic physical principles of atomic spectroscopy and the absorption and emission of radiation in

astrophysical and laboratory plasmas. It summarizes the basics of electromagnetism and thermodynamics and then describes in detail the theory of atomic spectra for complex atoms, with emphasis on astrophysical applications. Both equilibrium and non-equilibrium phenomena in plasmas are considered. The interaction between radiation and matter is described, together with various types of radiation (e.g., cyclotron, synchrotron, bremsstrahlung, Compton). The basic theory of polarization is explained, as is the theory of radiative transfer for astrophysical applications. Atomic Spectroscopy and Radiative Processes bridges the gap between basic books on atomic spectroscopy and the very specialized publications for the advanced researcher: it will provide under- and postgraduates with a clear in-depth description of theoretical aspects, supported by practical examples of applications.