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Nota di contenuto	pt. I. Theoretical background -- 1. Hadronic atoms - an overview -- 2. Extended quantum mechanical framework -- 3. Coulomb wave functions -- 4. Coulomb propagator and scattering operators -- 5. Two-potential scattering formalism -- 6. Bound states and low-energy scattering. 6.1. Effective range approximation. 6.2. Nuclear and quasi-nuclear bound states -- 7. Atomic spectrum. 7.1. Real nuclear potentials -- 7.2. Complex nuclear potential -- 7.3. Small Shift Approximation (SSA) -- 8. Gamow states and completeness problem -- 8.1. Normalization of Gamow states -- 8.2. Completeness problem -- 9. X-Ray transition rate -- 10. Computational methods -- 10.1. The matching method. 10.2. variational methods. 10.3. Fredholm integral equation method. 10.4. Momentum space methods -- 11. Examples. 11.1. Rank-one separable potential. 11.2. Delta-shell potential. 11.3. Square-well potential. 11.4. Cut-off Coulomb potential. 11.5. Bound states in extended-charge Coulomb potential -- 12. Chiral theory primer. 12.1. Quantum mechanics: zero-range potential. 12.2. Effective field theory approach. 12.3. Chiral perturbation theory -- pt. II. Comparison with experiment -- 13. Two-meson atomic bound states. 13.1. Pionium. 13.2. K[symbol] atom. 13.3. Kaonium -- 14. Hadronic hydrogen. 14.1. Pionic hydrogen. 14.2. Kaonic hydrogen. 14.3. Antiprotonic hydrogen -- 15. Hadronic deuterium. 15.1. Pionic

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Sommario/riassunto

Hadronic atoms provide a unique laboratory for studying hadronic interactions essentially at threshold. This text is the first book-form exposition of hadronic atom theory with emphasis on recent developments, both theoretical and experimental. Since the underlying Hamiltonian is a non-self-adjoined operator, the theory goes beyond traditional quantum mechanics and this book covers topics that are often glossed over in standard texts on nuclear physics. The material contained here is intended for the advanced student and researcher in nuclear, atomic or elementary-particle physics. A good knowledge of quantum mechanics and familiarity with nuclear physics are presupposed.