



## Quantum Physics of Light and Matter

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By Salasnich, Luca

Condition: New. Publisher/Verlag: Springer, Berlin | A Modern Introduction to Photons, Atoms and Many-Body Systems | This book offers a concise introduction to the quantum field theory of light and non relativistic matter. It gives a detailed discussion of many-body techniques for electrons and ultra cold atoms as well as includes solved problems at the end of each chapter. | The book gives an introduction to the field quantization (second quantization) of light and matter with applications to atomic physics. The first chapter briefly reviews the origins of special relativity and quantum mechanics and the basic notions of quantum information theory and quantum statistical mechanics. The second chapter is devoted to the second quantization of the electromagnetic field, while the third chapter shows the consequences of the light field quantization in the description of electromagnetic transitions. In the fourth chapter it is analyzed the spin of the electron, and in particular its derivation from the Dirac equation, while the fifth chapter investigates the effects of external electric and magnetic fields on the atomic spectra (Stark and Zeeman effects). The sixth chapter describes the properties of systems composed by many interacting identical particles by introducing the Hartree-Fock variational method, the density...



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