



# Atom-Photon Interactions: Basic Processes and Applications

By Claude Cohen-Tannoudji, Jacques Dupont-Roc, Gilbert Grynberg

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Atom-Photon Interactions: Basic Processes and Applications allows the reader to master various aspects of the physics of the interaction between light and matter. It is devoted to the study of the interactions between photons and atoms in atomic and molecular physics, quantum optics, and laser physics. The elementary processes in which photons are emitted, absorbed, scattered, or exchanged between atoms are treated in detail and described using diagrammatic representation. The book presents different theoretical approaches, including:

- \* Perturbative methods
- \* The resolvent method
- \* Use of the master equation
- \* The Langevin equation
- \* The optical Bloch equations
- \* The dressed-atom approach

Each method is presented in a self-contained manner so that it may be studied independently. Many applications of these approaches to simple and important physical phenomena are given to illustrate the potential and limitations of each method.

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## **Editorial Review**

### **Language Notes**

Text: English (translation)

Original Language: French

### **From the Publisher**

This analysis of the physical phenomena resulting from the interactions between atoms and photons brings together and discusses different theoretical approaches which have up to now been dispersed in more specialized works. Each of these approaches is presented in a self-contained way and can be studied independently. Covers perturbative methods, resolvent method, master equations Langevin equation, optical Bloch equations and dressed atom method.

### **From the Back Cover**

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