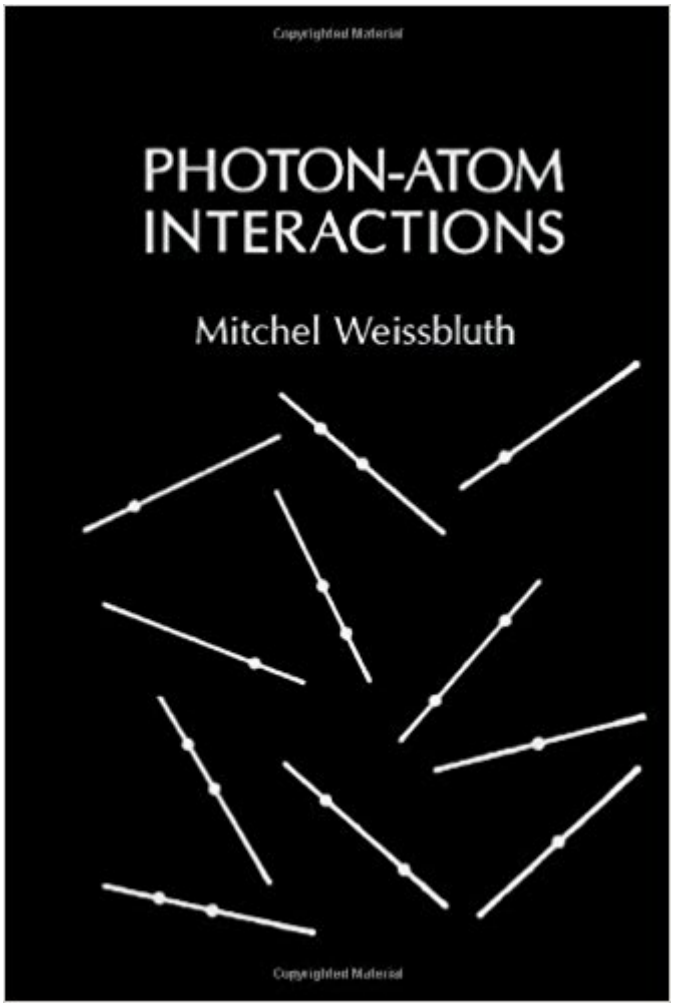
Photon-Atom Interactions



Synopsis

This book provides an introduction to the body of theory shared by several branches of modern optics--nonlinear optics, quantum electronics, laser physics, and quantum optics--with an emphasis on quantum and statistical aspects. It is intended for well prepared undergraduate and graduate students in physics, applied physics, electrical engineering, and chemistry who seek a level of preparation of sufficient maturity to enable them to follow the specialized literature.

Book Information

Hardcover: 407 pages

Publisher: Academic Press; 1 edition (May 12, 1989)

Language: English

ISBN-10: 012743660X

ISBN-13: 978-0127436609

Product Dimensions: 6 x 1.1 x 9 inches

Shipping Weight: 1.7 pounds (View shipping rates and policies)

Average Customer Review: 5.0 out of 5 stars 3 customer reviews

Best Sellers Rank: #870,340 in Books (See Top 100 in Books) #124 inÃ Â Books > Science & Math > Physics > Molecular Physics #492 inÃ Â Books > Science & Math > Physics > Nuclear Physics #784 inÃ Â Books > Science & Math > Physics > Quantum Theory

Customer Reviews

"This is a well-written introduction to photon-atom interactions."--LA PHYSIQUE AU CANADA

This book is a rare gem!It is clear, concise, reasonably complete and mostly a self-contained. It is really a text on quantum dynamics, with topics not found and/or done well in most quantum mechanics texts. The topics (below) will serve as necessary background for more advanced studies in, e.g., quantum optics/electronics, laser physics, and nonlinear optics (Sargent, Scully, Lamb, Meystre, Mandel and Wolf, Cohen-Tannoudji, Dupont-Roc and Grynberg, Haken, Boyd, Yariv, Marcuse), advanced quantum mechanics and quantum field theory (Schwabl, Sakurai, Peskin and Schroeder, Mandel and Shaw, Feynman, Greiner, Srednicki), quantum chemistry, and advanced quantum statistical mechanics and solid-state/semiconductor theory (McQuarrie, Huang, Schwabl, Le Bellac, Van Vliet, Jones and March, Kira and Koch, Fetter and Walecka). Note, as is common in quantum optics, chemistry, semiconductor/solid-state physics, Weissbluth describes nonrelativistic field quantization (second quantization) very well he also describes basic Feynman diagrams pretty

well, but his terse presentation is probably the weakest aspect of this text.I especially enjoyed its treatment of the physics of magnetic two-level systems and quantum spin-field interactions. Although found in MRI, nuclear physics and medicine, as well as spectroscopy in chemistry and solid-state physics, Weissbluth presents the best coverage I know of in a non-specialized text. Most quantum-optics/computing texts base their models on this theory, but never do actual quantum magnetism well.CONTENTS:!. Stochastic Processes - brief introduction, not really used but does serve to lay a statistical foundation for the sequel.II. Density Matrices and Perturbation Theory - excellent introduction to density matrices (used extensively throughout the text); however, one should have another advanced undergraduate quantum mechanics text for perturbation theory, e.g., Shankar, Cohen-Tannoudji, or even Griffiths would suffice.III. Magnetic Two-Level Systems ÃƒÂ¢Ã â ¬Ã â œ this serves as the basic model for most of the following field-matter interactions.IV. Absorption, Emission, and Scattering in Weak Fields ÃƒÂ¢Ã â ¬Ã â œ great coverage of semi-classical and second quantization for these interactions ÃƒÂ¢Ã â ¬Ã â œ as well as quantum coherence.V. Reservoir Theory and Damping ÃƒÂ¢Ã â ¬Ã â œ great introduction to quantum-statistical optics/physics.VI. Nonlinear and Multiphoton Processes ÃƒÂ¢Ã â ¬Ã â œ this overview is likewise very well done.ÃƒÂ¢Ã â ¬Ã Å“Photon-Atom InteractionsÃƒÂ¢Ã â ¬Ã Â• does have a few minor typos, but mostly in referencing content, not in the theory/equations themselves. Even though it is almost 2 decades old, WeissbluthÃƒÂ¢Ã â ¬Ã â„¢s notation is very contemporary for the fields (he even uses SI units). Any theoretical, experimental and/or applied physicist/chemist and/or research electrical engineer would do well to have ÃƒÂ¢Ã â ¬Ã Å“Photon-Atom InteractionsÃƒÂ¢Ã â ¬Ã Â• on their shelves. It also serves as a well-written, quick-read review for those in or entering said areas.

Excellent probability and statistics review in chapter 1...the optimum scope for this book.Great experience with seller.

nice ,affordable case,I'll buy again does the job I haven't gotten any complaints Like as product presentation, both beautiful and simple, and this is what I want and need. I will order again. I will be buying more in the future. Delivery date in time as expected...

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