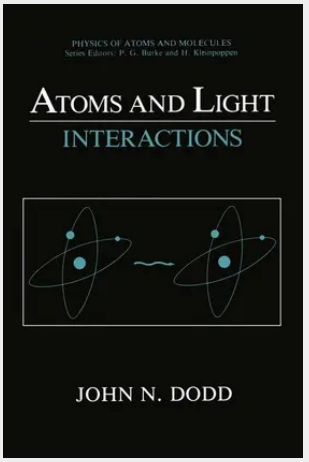
Dodd

Atoms and Light: Interactions



This book discusses the interaction of light with atoms, concentrating on the semiclassical descriptions of the processes. It begins by discussing the classical theory of electromagnetic radiation and its interaction with a classical charged dipole oscillator. Then, in a pivotal chapter, the interaction with a free charge is described (the Compton effect); it is shown that, in order to give agreement with observation, certain quantum rules must be introduced. The book then proceeds to discuss the interaction from this point of view-light always being described classically, atoms described quantum-mechanically, with quantum rules for the interaction. Subsequent chapters deal with stimulated emission and absorption, spontaneous emission and decay, the general problem of light stimulating and being scattered from the two-state atom, the photoelectric effect, and photoelectric counting statistics. Finally the author gives a personal view on the nature of light and his own way of looking at certain paradoxes. The writing of this book was originally conceived as a collaboration between the present author and a colleague of former years, Alan V. Durrant. Indeed, some preliminary exchange of ideas took place in the mid-1970s. But the problems of joint-authorship from antipodean positions proved too difficult and the project was abandoned. I would like to record my indebted ness to him for the stimulation of this early association. I also acknowledge the encouragement of my colleagues at the Univer sity of Otago. Special reference must be made to D. M.

This book discusses the interaction of light with atoms, concentrating on the semiclassical descriptions of the processes. It begins by discussing the classical theory of electromagnetic radiation and its interaction with a classical charged dipole oscillator. Then, in a pivotal chapter, the interaction with a free charge is described (the Compton effect); it is shown that, in order to give agreement with observation, certain quantum rules must be introduced. The book then proceeds to discuss the interaction from this point of view-light always being described classically, atoms described quantum-mechanically, with quantum rules for the interaction. Subsequent chapters deal with stimulated emission and absorption, spontaneous emission and decay, the general problem of light stimulating and being scattered from the two-state atom, the photoelectric effect, and photoelectric counting statistics. Finally the author gives a personal view on the nature of light and his own way of looking at certain paradoxes. The writing of this book was originally conceived as a collaboration between the present author and a colleague of former years, Alan V. Durrant. Indeed, some preliminary exchange of ideas took place in the mid-1970s. But the problems of joint-authorship from antipodean positions proved too difficult and the project was abandoned. I would like to record my indebted ness to him for the stimulation of this early association. I also acknowledge the encouragement of my colleagues at the Univer sity of Otago. Special reference must be made to D. M.

106,99 €
99,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9780306437410
Medium: Buch
ISBN: 978-0-306-43741-0
Verlag: Springer
Erscheinungstermin: 30.04.1991
Sprache(n): Englisch
Auflage: Erscheinungsjahr 1991
Serie: Perspectives on Individual Differences
Produktform: Gebunden
Gewicht: 1120 g
Seiten: 219
Format (B x H): 160 x 241 mm

Kundenservice Verlag Dr. Otto Schmidt KG
Neumannstraße 10, 40235 Düsseldorf | kundenservice@otto-schmidt.de | 0221-93738-997 (Inland)