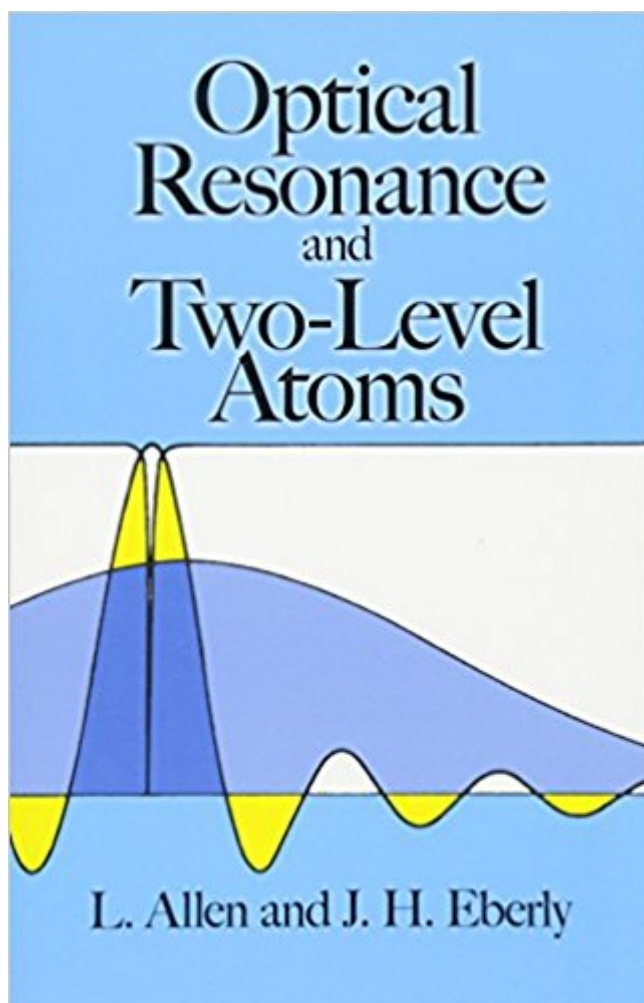


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# Optical Resonance And Two-Level Atoms (Dover Books On Physics)



## Synopsis

"Coherent and lucid—a valuable summary of a subject to which [the authors] have made significant contributions by their own research." • Contemporary Physics Offering an admirably clear account of the basic principles behind all quantum optical resonance phenomena, and hailed as a valuable contribution to the literature of nonlinear optics, this distinguished work provides graduate students and research physicists probing fields such as laser physics, quantum optics, nonlinear optics, quantum electronics, and resonance optics an ideal introduction to the study of the interaction of electromagnetic radiation with matter. The book first examines the applicability of the two-level model for atoms to real atoms, then explores semiclassical radiation theory, and derives the optical Bloch equations. It then examines Rabi inversion, optical nutation, free-induction decay, coherent optical transient effects, light amplification, superradiance, and photon echoes in solids and gases. Before the publication of this book, much of the material discussed was widely scattered in other books and research journals. This comprehensive treatment brings it together in one convenient resource. The style of writing is clear and informal and the emphasis throughout is always on the physics of the processes taking place. There are numerous helpful illustrations, excellent introductions to each chapter, and lists of references for further reading. "The authors have endeavored to create a primer for the field of optical resonance—they have succeeded admirably. Their coverage of the subject is remarkably complete." • IEEE Journal of Quantum Electronics

## Book Information

Series: Dover Books on Physics

Paperback: 256 pages

Publisher: Dover Publications (December 1, 1987)

Language: English

ISBN-10: 0486655334

ISBN-13: 978-0486655338

Product Dimensions: 5.4 x 0.5 x 8.5 inches

Shipping Weight: 8 ounces (View shipping rates and policies)

Average Customer Review: 4.7 out of 5 stars 2 customer reviews

Best Sellers Rank: #170,594 in Books (See Top 100 in Books) #41 in Books > Science & Math > Physics > Optics #650 in Books > Textbooks > Science & Mathematics > Physics

## Customer Reviews

Leslie C. Allen is Professor of Old Testament at Fuller Theological Seminary. Formerly he was Lecturer in Hebrew, Aramaic and Judaism at London Bible College. He holds the M.A. degree from Corpus Christi College, Cambridge, in Classics and Oriental Studies. His Ph.D. is from the University College of London, In Hebrew. Among his publications are The Greek Chronicles Parts 1 and 2 (supplements to Vetus Testamentum) and The Books of Joel, Obadiah, Jonah, and Micah for The New International Commentary on the Old Testament, as well as the section on Psalms 101-150 in the Word Biblical Commentary and Psalms in the Word Biblical Themes series. Peter W. Milonni is a staff member of the Theoretical Division of Los Alamos National Laboratory and Professor of Physics at the University of Arkansas. Previously he held positions with the Perkin-Elmer Corporation and the Air Force Weapons Laboratory. He received his Ph.D. degree from the University of Rochester. Dr. Milonni is the author of numerous research and review papers on quantum optics, atomic radiation theory, and lasers, and is co-author of Chaos in Laser-Matter Interactions. Joseph H. Eberly is Professor of Physics and of Optics at the University of Rochester. Dr. Eberly has contributed to the research literature on quantum optics and laser physics. He has received a number of awards and fellowships from US and foreign organizations, most recently the Marian Smoluchowski Medal. He has acted as consultant to agencies of the US government, to foundations and to private industry, and has held visiting positions in Warsaw, Stanford, Boulder, London, Munich, and elsewhere. Dr. Eberly is co-author of Optical Resonance and Two-Level Atoms, and co-editor of Multiphoton Processes. He received his Ph.D. degree from Stanford University.

A classic

If you're looking for an introduction to optics or atomic physics, this book may be a little terse and advanced. But if you have some exposure to optics and lasers, and a good foundation in electromagnetism and basic quantum mechanics, this is a great book to have. The authors discuss the semiclassical two-level model to a level of detail which is hard to find in other standard texts. And although there is a good amount of detail, the book does not get lost in the mathematics, making it easily accessible to the experimentalist as well as to the theorist. I particularly like the treatment of the Bloch equations and pulse propagation. On the down-side, the book does tend to be terse in some areas, giving minimal discussion of the physics (although at least it does discuss the physics!), and some of the derivations are little difficult to follow. Also, the brevity of the table of contents makes it a little difficult to figure out what the book actually covers. And the notation used

in some parts was somewhat unfamiliar. But overall, if you're looking for a book in atomic and optical physics where you get the most value for your money, this book is to be highly recommended.

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