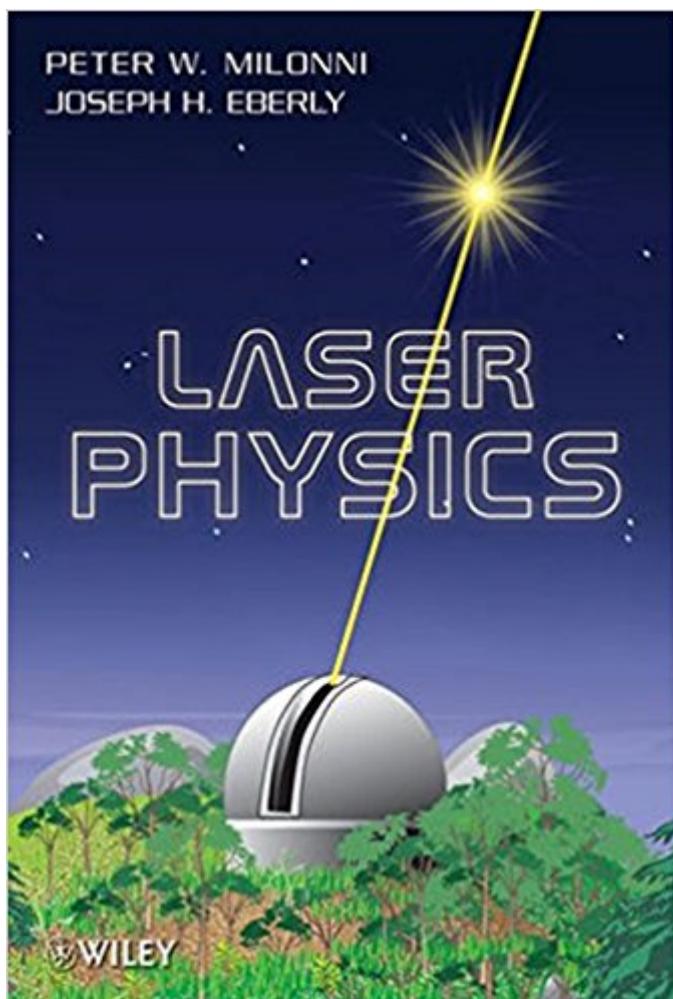


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# Laser Physics



## Synopsis

Although the basic principles of lasers have remained unchanged in the past 20 years, there has been a shift in the kinds of lasers generating interest. Providing a comprehensive introduction to the operating principles and applications of lasers, this second edition of the classic book on the subject reveals the latest developments and applications of lasers. Placing more emphasis on applications of lasers and on optical physics, the book's self-contained discussions will appeal to physicists, chemists, optical scientists, engineers, and advanced undergraduate students.

## Book Information

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## Customer Reviews

This text/reference explains the operating principles and applications of lasers, including central background material not often provided at this level. Exposition incorporates many intuitive explanations and practical examples. Introduces basic principles, including the necessary classical and quantum physics, and provides concise discussions of specific lasers, laser resonators, and numerous applications, including nonlinear optics. Discussions are self-contained and in a style that should appeal to physicists, chemists, and engineers. --This text refers to an out of print or unavailable edition of this title.

A comprehensive introduction to the operating principles and application of lasers Although the basic principles of lasers remain unchanged, the ever-increasing role of optical physics and engineering in basic science and in technology has caused a significant shift in the types of laser systems of greatest interest. *Laser Physics* "which is an updated, reconfigured, and expanded

dition of the previously published *Lasers* "reflects the importance of lasers and their applications in a remarkably wide range of fields. Discussions and features include: Absorption, emission, and dispersion of light Laser principles applied to specific lasers Photon counting and optical coherence Dispersion, chirping, and modes in optical fibers Optical pumping, spin-polarized atoms, and atomic clocks Fiber amplifiers and lasers Laser cooling and trapping Laser propagation in resonant media and in turbulent atmospheres Elements of nonlinear optics Generation of ultrashort pulses and frequency combs and applications Lasers in lidar, adaptive optics, and medicine Semiconductor lasers and optical communications Complete with end-of-chapter problems for students, *Laser Physics* is an excellent textbook for advanced undergraduate and graduate courses in electrical engineering, physics, and optics. It also serves as a valuable reference for professionals working in industry and government laboratories.

Very readable, good companion to *Quantum Optics* by Rodney Loudon.

The hardest part about writing any scientific textbook is balancing readability with volume of content. Generally, authors fall into two categories: those including far too much material and those presuming too much prior knowledge on the part of the reader. Milonni and Eberly have found the perfect compromise in *LASERS*. While an excellent advanced undergrad or intermediate grad. text, it isn't as exhaustive as Siegman's *LASERS*. On the other hand, it contains peripheral material about non-linear optics which many texts on lasers should include, but don't. *LASERS* is perfect for proceeding further with more in depth studies of advanced topics in lasers (as treated in Siegman). There are only 2 faults I can find with the book: one is technical, the other editorial. In the technical area, its discussion of Q-switching is a bit trite and shallow. A topic as important as this should receive a little more attention. It would be nice to see an updated volume reflecting recent advances in technology. The authors did such a nice job the first time around, it shouldn't take a lot of effort to include perhaps one more chapter on current trends in lasers.

Peter Milonni and Joe Eberly are among the best if not the best professional physics writers in contemporary English; for the former it slightly redeems comparative lack of originality of his own research. Their *Laser Physics* is the only book one needs to get complete understanding of the field. When I was preparing (without attentive cliff-noting) for my subject exams in 1979, only incomprehensible Maitland and Dunn's *Laser Physics* was available for my study. (I do not want to blacken the image of M&D but their 1969 book was written too early in

processÃ¢ÂÂlasers were invented in 1960Ã¢ÂÂto accurately summarize the field). My professor, untimely deceased V. S. Letokhov (1939-2009), gave me a good grade probably being amused by the nonsense I told him in my examination answers. Milonni and Eberly's masterpiece appeared a decade after my atrocious examinations, too late for its beautiful clarity to be used for anything except my self-education. I have only two minor criticisms: coverage of the field of diode (and quantum-well) lasers is too sparse, while these are the mainstay of all modern applications and experimental techniques, but the book is already 800+ pages, and that the Chapter 16 is redundant in the second edition. In 2010, Fortran is a dead language. I give this book four starsÃ¢ÂÂas I already said in other reviewsÃ¢ÂÂonly because if I give it five, where should we place La Divina Comedia and Hamlet?

I first wrote the one and only review for this book a decade ago and a decade after the book's publication. Well the authors have FINALLY updated the book: *Laser Physics*. Apparently M & E were content to reside in the "J.D. Jackson" school of textbook writing. I haven't looked into the new edition, but my gut says it's WAY too late and probably just another face now in a very crowded CROWD. At least they hit a home run the first time out.

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