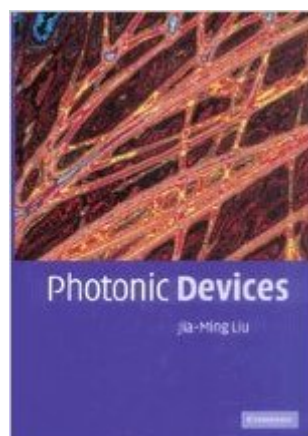


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# Photonic Devices



## Synopsis

Covering every major photonic device, this textbook strikes a careful balance between theoretical and practical concepts. The devices it covers include optical fibers, couplers, electro-optic devices, magneto-optic devices, lasers, and photodetectors. The book is well-suited as a text for senior undergraduate and graduate courses, as well as a device-driven engineering reference for professionals.

## Book Information

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## Customer Reviews

I used this book for a semiconductor material and optical devices course (at the graduate level). I like the book because it has many examples throughout the chapter and several questions at the end of the chapter to test your understanding of the material. The chapters that I have familiarity with are chapter(s) 2, 12, 13, and 14. The book is very rich in text and tries to use plots and graphs only out of absolute necessity. There are also many equations throughout each of the chapters and thus the problem arises that the same variable can be used to describe two or more different physical process. There is an extensive list in the front of the book explaining each variable, but some confusion can arise for the reader if not extremely careful. All in all, I highly recommend the book for physicists and engineers alike who want a detailed description of the major topics in photonics all in one book. However, please note that photovoltaics is not covered in this text (S.O. Kasap's "Optoelectronics and Photonics: Principles and Practices" covers photovoltaic basics very well).

(This review covers Chapters 1-6+9, which covers dielectric waveguides, gratings, couplers, electro-optics, nonlinear optics. Other chapters include magneto-optics, acousto-optics, semiconductor physics, lasers)

**PROS** Good physical explanations of phenomena- For example, goes through derivation of dielectric planar step-index waveguide. General results derived here apply to all dielectric waveguides. Good from device perspective- Covers all basic device principles and the devices themselves, from which larger and more complicated configurations can be made. Gives what seems to be just the right level of math.- When realistically designing photonic devices, Liu knows that one would use a computer for simulation, not crazy mathematical expressions (though this book does have some of those, but not to an overwhelming extent). Thus, he gives the math necessary if one were to write simulations (in the sense of, the simulation would solve the wave equation or the derived expression he gives).- Section on nonlinear optics is EXCELLENT! Whereas other books are highly confusing on how to organize mathematics of nonlinear optics (which is very thick, considering the large number of elements in the tensors and the coupled equations), this one gives you a formula that always works: (1) Determine the frequencies involved. (2) Write the polarization of that frequency. (3) Use symmetries to reduce the number of independent elements (intrinsic, full and Kleinman). (4) Write the coupled equations. (5) Solve. Additionally, he spends a lot of time on phase matching, which is crucial for all processes where phase matching is not "automagically" (Liu himself used this word!) satisfied.

**CONS** Needs his lecture.- He is a professor of Electrical Engineering at UCLA, and his lecture emphasizes the big picture, while clarifying subtle facts. Without that, one might see the trees without seeing the forest.

The book titled "Photonic Devices" by Jia-Ming Liu is good subject matter, an authority. I trust and respect the author. But the book is being used as a con by some sellers professing to have very high star rating. I bought this book as advertised on "Item 1. Photonic Devices 2 Part Set by Jia-Ming Liu". Guess what! the seller sent me only the first part of the two set book...chapters 1-9 only. Not sure if they know English or it was shipping error or it was deliberate, but I felt bad for not being able to receive the full advertised material. I was referred this book by a colleague of mine and I just wanted to refer a few chapters, those unfortunately were in the 2nd part. I travelled a lot when the order was made and received therefore I was unable to verify and get back to within the 30 day period. After that period, there is no return, so here I am, booked with part 1. I can't even sell it back because the whole is a 2 set, not individual. At this point I am just looking for a single part 1 buyer, hopefully to recover the cost I paid for it.

the express is killing me! so slowwwwwwwwwwwwwwwwwwwwwwwwww, quite disappointed. But the books look fine, no damage. Although I have not open them yet....

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