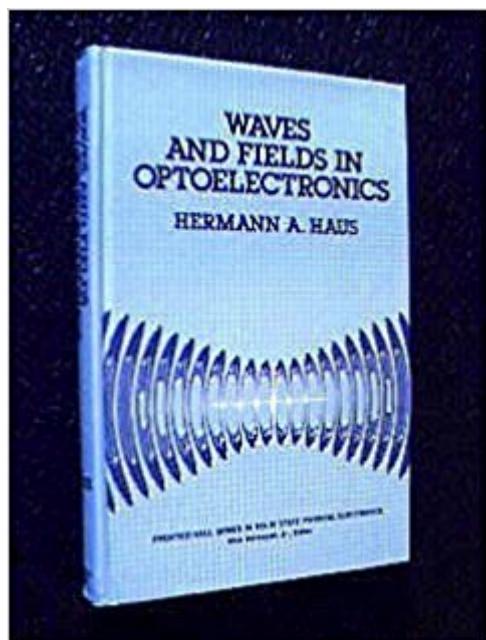


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# Waves And Fields In Optoelectronics (Prentice-Hall Series In Solid State Physical Electronics)



## **Synopsis**

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## **Customer Reviews**

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I know it is a little late but this book is out of print so get one while you can. The title is a little misleading, the contents are far more general than optoelectronics. Every page of this book from Haus, a national treasure, is a gem, and represents a distillation of his work in this area. The style is terse and intuitive so stay with it and burrow in, it's worth it. The style reminds me so much of another national treasure, Robert Adler who ran the Zenith Research Labs in the great years. Sure enough Bob and Haus both R.I.P. were colleagues and wrote some significant papers together. Grab one while you can.

A great book. It can work fine as a stand-alone text, but I've found it more useful as a supplement. Haus approaches material in a somewhat intuitive and sometimes almost hand-wavy fashion. I don't

mean that in a negative way. I find the writing helps me make connections between topics and think about things more clearly. However, if I were reading this as a first text, I can imagine it might cause some discomfort.

I can sympathize somewhat with frustrated reviews of this book. Haus' style is to try to pull the reader up to his level of intuition and understanding. Unfortunately, Haus didn't always seem to have the greatest empathy for those who don't share his experience, let alone his intelligence, and so the book can be frustrating at times. Having said that, the book largely succeeds in the ambitious mission Haus had for it, namely to instill in readers a coherent conceptual framework for thinking about problems in wave mechanics at a level that will allow them to actually contribute to the field. With so many textbooks simply regurgitating the literature and hemming closely to the standard pedagogy, Haus' book is notable for his unique approach to the field. He focuses as much on understanding a problem as in solving it, and to this end he chooses formalisms which may not be the most compact and simple, but which offer greater insight and intuition. This, I think, is his motivation behind stressing the concepts of wave impedance matching and perturbation theory, two very unifying formalisms in optics (and engineering in general). While this requires more effort of the reader, I am certain that it is well worth it and that Haus is not simply trying to make one's life gratuitously difficult. His own success as one of the great theorists in the field should give anyone sufficient faith in taking the effort of following his lead. It's thus a shame that his textbook has fallen out of use (except for graduate students at MIT and Harvard, who don't seem to be much worse for the experience) and it seems to me that it is not for lack of quality, but simply because other books provide paths of lesser resistance.

If you want to be a zen master of optoelectronics then this is the book to read (or at least start with). This book is not for the mathematically challenged or timid, but derivations of the equations cited should take only a few minutes. The presentation is cogent, the book is short (unlike born and wolf), and the derivations are elegant and useful. The reader should already be familiar with Maxwell's equations in vector form, complex form, and tensor form (i.e. using the Einstein notation). Hermann Haus is an optics god, referred to by some as the smartest man alive. Perhaps by reading this you too may get a little food of the gods and find yourself elevated to a higher plane. If you read this book and find that you have difficulty understanding it then you need to read a more elementary book (perhaps Hecht, or maybe Haliday and Resnick has something your speed).

If you think you're going to learn optics with this textbook, you are very very wrong. In fact, this text is on many levels much worse than the Born & Wolf bible. At least Born/Wolf explains their equations and how they got to them. Haus doesn't even do that - he just magically pulls equations out of the air. Oh, he says it is simple algebra, but that simple algebra usually takes an hour or two or work. Not at all very good at explaining physical phenomena and it is quite terse. In fact, terse would be the one word I'd use to describe this text. A much better text to use would be Guenther or Yariv or Saleh & Teich. Guenther covers more of the E&M optics, while the latter two cover the optical resonators, ABCD formalism, coupled systems, etc.

Dr. Haus (RIP) has a great writing style. Every sentence that you read you have to think about what he is saying. Once you understand it, you will jump out of your chair. It is too bad that this book is out of print. I highly recommend that you get it book from a university's library if you can't purchase it.

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