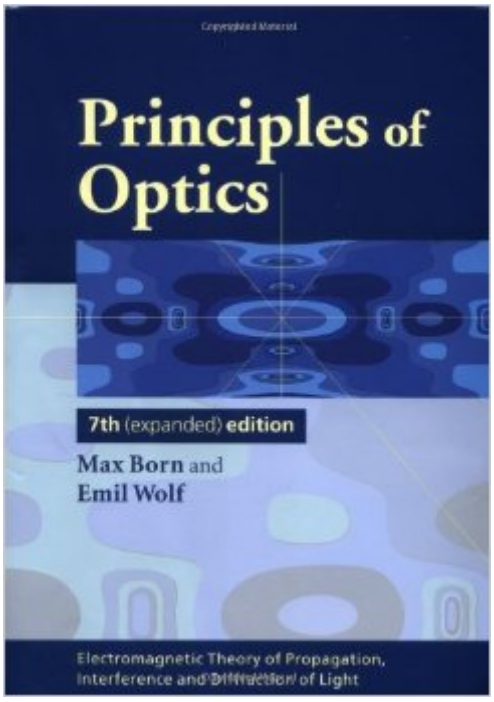
Principles Of Optics: Electromagnetic Theory Of Propagation, Interference And Diffraction Of Light



Synopsis

Principles of Optics is one of the classic science books of the twentieth century, and probably the most influential book in optics published in the past forty years. This edition has been thoroughly revised and updated, with new material covering the CAT scan, interference with broad-band light and the so-called Rayleigh-Sommerfeld diffraction theory. This edition also details scattering from inhomogeneous media and presents an account of the principles of diffraction tomography to which Emil Wolf has made a basic contribution. Several new appendices are also included. This new edition will be invaluable to advanced undergraduates, graduate students and researchers working in most areas of optics.

Book Information

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Customer Reviews

Already for many years, this is a classic on optics. Almost any subject you can think of is covered in this book, in a fundamental way. That is its strength and its weakness: experienced scientists will find everything they need, but for students it is not a good book because it is far too detailed: they will get lost in all the mathematical details before they grasp the essence of the subject.This problem also exists - to a lesser extent - for professionals who try to use the book to fill in a gap in their knowledge: they too will find themselves asking why they have to read so many (well thought-through) pages before the authors finally make their point.My advice: use other books to study from, and use this book when you are already experienced and need a high-quality reference work.A note for scienctists: please mention section numbers when referring to this book in your own publications.

This book is a classic with all problems associated. Half of the reference quoted have been written before the WWII. Very useful if you like to quote original papers. This book cover most topics of the classical optics but hardy cover modern topics.However, it is hard to read and use a weird notation. Certainly not useful for rapid referencing. Like the bible, use it only when you have serious problem to deal with.

This seventh edition of the famous classic standard book on optics is really neat! The notations, symbols became a little more modern than the previous editions. Also the shapes of the characters in the equations looks much more pretty so it helps reading, understanding. As most of you know, this has everything you need to study about, refer to classical wave optics. The only weak point of this book is the material covering geometrical optics. It’s too abstract, mathematical and lacks modern treatment of optical designs, aberrations. But, regarding the wave optics, it’s hard to find any flaws, downsides. Even though I am working on micro-photonic elements, I often need to refer to this book for some wave optics principles, knowledges. But this book alone does not cover the whole optics including optical design, photonics. If you want to have the best minimum combination of books covering the basics of the entire optics. I would recommend "Fundamentals of Photonics(Saleh)", "Modern Optical Engineering(Smith)" and this book.

It is just a rare book on physical optics based on Maxwell equations. Rarely a book states the assumptions,the validity of the equations, the principles and how the equations arrived. Certainly, it is a great book for postgraduates and researchers in physical optics not so for undergraduate students who don’t want to go through all the mathematics.

It should be on the shelf of every serious optical engineer or scientist. I find myself referring to it at least monthly. What more needs to be said?

It is of course the reference for optics, and is very completeand rigorous. I didn’t learn optics from it, I only use itas a reference and I suppose that is its function.It feels a bit oldfashioned (for example, I haven’t foundspeckel applications in the chapter on coherence) but Isuppose that that is due to the fact that it is a classic.My other, personal, objection is that I hate Gaussianunits, I prefer by far SI units. Even Jackson finallyconceded to switch to SI units, but Wolf clings on thisGaussian system.

In reading Max's Born's My Life and My Views I learned that he reworked his lectures on optics into his original 1933 textbook while recovering from a nervous breakdown brought on by heavy demands of his groundbreaking research on quantum mechanics at Gottingen. This volume is the latest version of his inspired tome. Originally, I picked up Born and Wolf in order to understand the origin of the third order spherical aberration coefficient--a derivation that I found completely satisfying. Many important issues are addressed by Born, including Kirchoff's integral and diffraction theory, including Fresnel and Fraunhoffer diffraction. Both thin and thick lenses are also treated.At Gottingen Born benefited from what he characterized as excellent lectures on optics by Woldemar Voigt, as well as Voigt's advanced course on optical experiments. Born later returned to Gottingen as Voigt's assistant. It should also be noted that Born had concentrated on astronomy at different points in his studies and career, which may have also contributed to these lectures. It is worth noting that his treatment of lens aberrations (pp.207-211) was taken from that of Karl Schwarzshild (of the Schwartzschild Radius for black holes) who was Born's astronomy professor at Gottingen--a method which Born describes as "similar to that used in calculations in celestial mechanics." Born was also a guest at Albert Michelson's laboratory at University of Chicago in 1922, where he performed spectroscoptic experiments using Michelson's state-of-the-art diffraction gratings. Perhaps that visit contributed to the section in this book on stellar inferometers.

This is a great book that I have used often. This is a graduate text. You should have had an undergraduate course in optics first. A typical undergraduate text that I recommend is Optics by Eugene Hecht who also wrote the Schaum's Outline for Optics. This being a graduate text you should have taken math for each of the four years of your undergraduate studies. My graduate work is in Microelectronics & Photonics and I use the book now as reference book. This book covers the theory very well; I have not found any other book that even comes close.

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