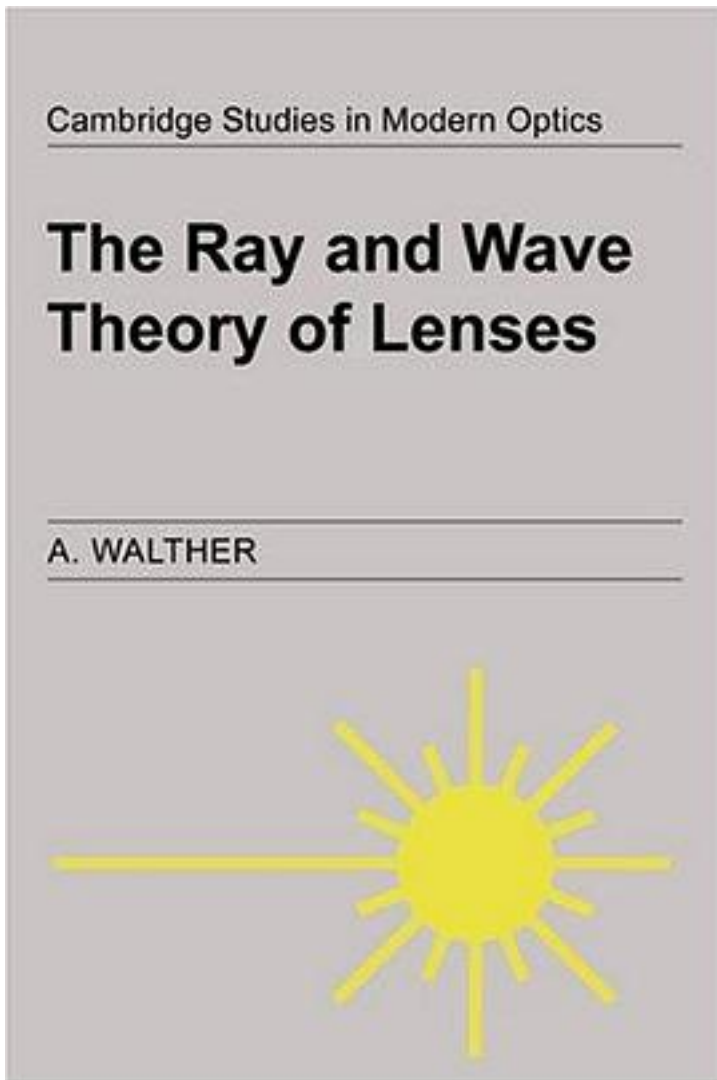


The Ray and Wave Theory of Lenses (Cambridge Studies in Modern Optics)



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出版者:Cambridge University Press

出版时间:02 February, 1995

装帧:Hardcover

isbn:9780521451444

Calculations on lens systems are often marred by the unjustifiable use of the small-angle approximation. This book describes in detail how the ray and wave pictures of lens behaviour can be combined and developed into a theory capable of dealing with the large angles encountered in real optical systems. A distinct advantage of this approach is that Fourier optics appears naturally, in a form valid for arbitrarily large angles. The book begins with extensive reviews of geometrical optics, eikonal functions and the theory of wave propagation. The propagation of waves through lenses is then treated by exploiting the close connection between eikonal function theory and the stationary phase approximation. Aberrations are then discussed, and the book concludes with various applications in lens design and analysis, including chapters on laser beam propagation and diffractive optical elements. Throughout, special emphasis is placed on the intrinsic limitations of lens performance. The many practical insights it contains, as well as the exercises with their solutions, will be of interest to graduate students as well as to anyone working in optical design and engineering.

作者介绍:

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