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Titolo	Ray Optics, Fermat's Principle, and Applications to General Relativity [[electronic resource] /] / by Volker Perlick
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	From Maxwell's equations to ray optics -- to Part I -- Light propagation in linear dielectric and permeable media -- Light propagation in other kinds of media -- A mathematical framework for ray optics -- to Part II -- Ray-optical structures on arbitrary manifolds -- Ray-optical structures on Lorentzian manifolds -- Variational principles for rays -- Applications.
Sommario/riassunto	This book is about the mathematical theory of light propagation in

media on general-relativistic spacetimes. The first part discusses the transition from Maxwell's equations to ray optics. The second part establishes a general mathematical framework for treating ray optics as a theory in its own right, making extensive use of the Hamiltonian formalism. This part also includes a detailed discussion of variational principles (i.e., various versions of Fermat's principle) for light rays in general-relativistic media. Some applications, e.g. to gravitational lensing, are worked out. The reader is assumed to have some basic knowledge of general relativity and some familiarity with differential geometry. Some of the results are published here for the first time, e.g. a general-relativistic version of Fermat's principle for light rays in a medium that has to satisfy some regularity condition only.

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