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Chapter 1 Geometrical Optics 1.1 General Comments A light wave is an electromagnetic wave, and the wavelength that optics studies ranges from the ultraviolet (0.2 mm) to the middle infrared (10 mm). The spatial scales involved in most optical applications are much larger than the light wavelength.

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1 CHAPTER 1 GEOMETRICAL OPTICS In this chapter we will introduce most of the basic concepts of geometrical optics, although it is likely that most readers will be familiar with these concepts from a study of more elementary texts. Although all of the basic principles of geometrical optics can be derived from

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Chapter 1 lays out its foundations. It starts with the sign convention of Cartesian geometry, states the Fermat's principle, and derives the three laws of geometrical optics from it. These laws are used to obtain the equations for exact ray tracing, and those for paraxial ray tracing are obtained from them as an approximation.

Fundamentals of Geometrical Optics | (2014) - SPIE

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Geometrical Optics - SPIE

1.1 Introduction. Geometrical optics is the study of image formation. The function of lens and mirror systems is to collect radiation from the object and produce a geometrically similar distribution of flux, an image, across the image plane. We consider first the electromagnetic spectrum, then proceed to the principles of image formation.

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1.1 Introduction. Geometrical Optics / 1 1.1 Coordinate system and notation / 1 1.2 The rectilinear propagation of light / 2 1.3 Snell's law / 2 1.4 Fermat's principle / 4 1.5 Rays and wavefronts-the theorem of Malus / 5 1.6 Stops and pupils / 6 1.6.1 Marginal and chief rays / 7 1.6.2 Entrance and exit pupils / 7 1.6.3 Field stops / 8 1.7 Surfaces / 8

Fundamental Optical Design | (2001) | Kidger ... - spie.org

GEOMETRICAL OPTICS. Geometrical optics is the treatment of the passage of light through lenses, prisms, etc. by representing the light as rays. A light ray from a source goes in a straight line through the air, but when it encounters a lens, prism, or mirror it bends or changes direction. Lens Prism Mirror.

GEOMETRICAL OPTICS

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This second volume of the series Lectures in Optics develops a thorough presentation of geometrical optics effects. The book begins by discussing refraction and reflection off single surfaces, both flat and spherical. Presented next are the essential building elements, optical power and beam vergence, which are paramount in imaging because the incident vergence is added to the element's ...

Geometrical Optics: Lectures in Optics, Volume 2

1.1 INTRODUCTION In geometrical optics, light is assumed to consist of rays that propagate according to three laws: rectilinear propagation, refraction, and reflection. We begin this chapter with a statement of Fermat's principle and the derivation of these laws from it. We consider the refraction of two neighboring rays and show that their optical path lengths between planes that are perpendicular to one or both of them are equal to each other.

Gaussian Optics - SPIE

Geometrical and Trigonometric Optics - by Eustace L. Dereniak September 2008. Skip to main content Accessibility help We use cookies to distinguish you from other users and to provide you with a better experience on our websites. Close this message to accept cookies or find out how to manage your cookie settings.

Light propagation (Chapter 1) - Geometrical and ...

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3.1 Geometrical Optics ECE 460 -Optical Imaging If the objects encountered by light are large compared to wavelength, the equations of propagation can be greatly simplified ($\lambda \ll$) i.e. the wave-phenomena (diffraction, interference, etc) are neglected

Chapter 3 -Geometrical Optics

Chapter 1: Gaussian optics --Introduction --Foundations of geometrical optics --Fermat's principle --Laws of geometrical optics --Optical path lengths of neighboring rays --Malus-Dupin theorem --Hamilton's point characteristic function and direction of a ray --Gaussian imaging --Introduction --Sign convention --Spherical refracting surface --Gaussian imaging equation --Focal lengths and refracting power --Magnifications and Lagrange invariant --Graphical imaging --Newtonian imaging equation ...

Optical imaging and aberrations. Part 1, Ray geometrical ...

1 If then $s' < s$ and the image forms below the object point. 21 Apparent depth is larger than the reality (seeing objects from a pool) . If then $s' > s$ and the image forms above the object point. 2/20/2009 Geometrical Optics 15 If $s' > s$ then the image forms above the object point. Apparent depth is smaller than the reality (looking into ...)

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