

1. Record Nr.	UNINA9910458560003321
Autore	Winston Roland
Titolo	Nonimaging optics [[electronic resource] /] / Roland Winston, Juan C. Minano and Pablo Benitez ; with contributions by Narkis Shatz and John C. Bortz
Pubbl/distr/stampa	Burlington, MA, : Elsevier Academic Press, c2005
ISBN	1-281-00840-0 9786611008406 0-08-047973-1
Edizione	[1st edition]
Descrizione fisica	1 online resource (511 p.)
Altri autori (Persone)	WelfordW. T MinanoJuan C BenitezPablo
Disciplina	621.36/9
Soggetti	Solar collectors Optics Reflectors, Lighting Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"This books is a successor to High collection nonimaging optics published by Academic Press in 1989, and Optics of nonimaging concentrators, published 10 years earlier, by W.T. Welford and R. Winston."--Pref.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front Cover; NONIMAGING OPTICS; Copyright Page; CONTENTS; Preface; Chapter 1. Nonimaging Optical Systems and Their Uses; 1.1 Nonimaging Collectors; 1.2 Definition of the Concentration Ratio; The Theoretical Maximum; 1.3 Uses of Concentrators; 1.4 Uses of Illuminators; References; Chapter 2. Some Basic Ideas in Geometrical Optics; 2.1 The Concepts of Geometrical Optics; 2.2 Formulation of the Ray-Tracing Procedure; 2.3 Elementary Properties of Image-Forming Optical Systems; 2.4 Aberrations in Image-Forming Optical Systems 2.5 The Effect of Aberrations In an Image-Forming System on the Concentration Ratio2.6 The Optical Path Length and Fermat's Principle; 2.7 The Generalized etendue or Lagrange Invariant and the Phase Space Concept; 2.8 The Skew Invariant; 2.9 Different Versions of the

Concentration Ratio; Reference; Chapter 3. Some Designs of Image-Forming Concentrators; 3.1 Introduction; 3.2 Some General Properties of Ideal Image-Forming Concentrators; 3.3 Can an Ideal Image-Forming Concentrator Be Designed?; 3.4 Media with Continuously Varying Refractive Indices; 3.5 Another System of Spherical Symmetry 3.6 Image-Forming Mirror Systems3.7 Conclusions on Classical Image-Forming Concentrators; References; Chapter 4. Nonimaging Optical Systems; 4.1 Limits to Concentration; 4.2 Imaging Devices and Their Limitations; 4.3 Nonimaging Concentrators; 4.4 The Edge-Ray Principle or "String" Method; 4.5 Light Cones; 4.6 The Compound Parabolic Concentrator; 4.7 Properties of the Compound Parabolic Concentrator; 4.8 Cones and Paraboloids As Concentrators; References; Chapter 5. Developments and Modifications of the Compound Parabolic Concentrator; 5.1 Introduction
5.2 The Dielectric-Filled CPC with Total Internal Reflection5.3 The CPC with Exit Angle Less Than $\pi/2$; 5.4 The Concentrator for A Source at A Finite Distance; 5.5 The Two-Stage CPC; 5.6 The CPC Designed for Skew Rays; 5.7 The Truncated CPC; 5.8 The Lens-Mirror CPC; 5.9 2D Collection in General; 5.10 Extension of the Edge-Ray Principle; 5.11 Some Examples; 5.12 The Differential Equation for the Concentrator Profile; 5.13 Mechanical Construction for 2D Concentrator Profiles; 5.14 A General Design Method for A 2D Concentrator with Lateral Reflectors 5.15 Application of the Method: Tailored Designs5.16 A Constructive Design Principle for Optimal Concentrators; References; Chapter 6. The Flow-line Method for Designing Nonimaging Optical Systems; 6.1 The Concept of the Flow Line; 6.2 Lines of Flow from Lambertian Radiators: 2D Examples; 6.3 3D Example; 6.4 A Simplified Method for Calculating Lines of Flow; 6.5 Properties of the Lines of Flow; 6.6 Application to Concentrator Design; 6.7 The Hyperboloid of Revolution As A Concentrator; 6.8 Elaborations of the Hyperboloid: the Truncated Hyperboloid; 6.9 The Hyperboloid Combined with A Lens
6.10 The Hyperboloid Combined With Two Lenses

Sommario/riassunto

From its inception nearly 30 years ago, the optical subdiscipline now referred to as nonimaging optics, has experienced dramatic growth. The term nonimaging optics is concerned with applications where imaging formation is not important but where effective and efficient collection , concentration, transport and distribution of light energy is - i.e. solar energy conversion, signal detection, illumination optics, measurement and testing. This book will incorporate the substantial developments of the past decade in this field.* Includes all substantial developments of the past decade in
