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Titolo	Introduction to infrared system design / / William L. Wolfe
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Collana	Tutorial texts in optical engineering ; ; v. TT 24
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Soggetti	Infrared equipment - Design and construction
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 126-129) and index.
Nota di contenuto	1. Introduction -- 2. Applications overview -- 3. Review of geometric optics -- Rays, beams, and pencils -- The laws of reflection and refraction -- Gaussian optics -- Paraxial optics -- Stops and pupils -- Optical speed -- Aberrations -- Combinations of aberrations -- 4. Review of radiometry -- Angle and solid angle -- Spectral terms -- Radiometric terms -- Radiometric transfer -- 5. Detector parameters -- Detector descriptions -- Detector noises -- Detector types -- Detector arrays -- 6. The infrared system -- Description of the infrared system -- Sensitivity equations -- The emitted and reflected scene -- 7. Atmospheric transmission and Radiation -- Overview -- High-resolution spectra -- Computational methods -- Procedures -- MODTRAN. 8. Evaluation of the infrared scene -- Evaluation of the scene SNR -- The nature of the infrared scene -- 9. Bandwidth and scan strategies -- Information bandwidth -- Time delay and integration -- Optimizing scan patterns -- The bow-tie effect -- The Palmer scan -- Effective noise bandwidth -- 10. Optical materials -- Types of materials -- Selection criteria -- Reflection and transmission -- Absorption -- Refractive materials -- Mirrors -- Glass vs. metals and composites -- 11. Some optical systems -- Single-mirror systems -- Two-mirror systems -- Three-mirror systems -- Schmidt systems -- Bouwers-Maksutov systems -- Reflecting relays -- 12. Scanning systems -- The plane parallel plate -- Refracting polygon scanners -- Risley prism scanners -- Rotating flats and axe-blade reflecting scanners -- The

reflecting polygon scanner (carousel) -- The Kennedy split-aperture scanner -- Image-space scanners -- Narcissus -- 13. Real-time imager descriptions -- Contrast and modulation -- Spatial frequency -- Modulation transfer functions -- Minimum resolvable temperature difference -- Limitations and other figures of merit -- MTFs for diffraction-limited systems -- 14. Design examples -- The design process -- A night-driving imager -- ICBM interceptors -- A Peacekeeper detector -- Summary.

Sommario/riassunto

This Tutorial Text focuses on the optics and detector aspects of infrared system design. It introduces the terminology, processes, and instrument design techniques available to engineers today. Design examples are based on real problems investigated by the author during his 30 years of experience as an industrialist, teacher, and consultant.
