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Nota di contenuto

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2.6 Reflection and Refraction at a Plane Boundary2.7 Amplitudes of Reflected and Refracted Waves.; 2.8 The Brewster Angle; 2.9 The Evanescent Wave in Total Reflection; 2.10 Phase Changes in Total Internal Reflection; 2.11 Reflection Matrix; CHAPTER 3 - Coherence and Interference; 3.1 The Principle of Linear Superposition; 3.2 Young's Experiment; 3.3 The Michelson Interferometer; 3.4 Theory of Partial Coherence. Visibility of Fringes; 3.5 Coherence Time and Coherence Length; 3.6 Spectral Resolution of a Finite Wave Train. Coherence and Line Width; 3.7 Spatial Coherence
3.8 Intensity Interferometry3.9 Fourier Transform Spectroscopy; CHAPTER 4 - Multiple-Beam Interference; 4.1 Interference with Multiple Beams; 4.2 The Fabry-Perot Interferometer; 4.3 Resolution of Fabry-Perot Instruments; 4.4 Theory of Multilayer Films; CHAPTER 5 - Diffraction; 5.1 General Description of Diffraction; 5.2 Fundamental Theory; 5.3 Fraunhofer and Fresnel Diffraction; 5.4 Fraunhofer Diffraction Patterns; 5.5 Fresnel Diffraction Patterns; 5.6 Applications of the Fourier Transform to Diffraction; 5.7 Reconstruction of the Wave Front by Diffraction. Holography
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7.2 Kirchhoff's Law. Blackbody Radiation7.3 Modes of Electromagnetic Radiation in a Cavity; 7.4 Classical Theory of Blackbody Radiation. The Rayleigh-Jeans Formula; 7.5 Quantization of Cavity Radiation; 7.6 Photon Statistics. Planck's Formula; 7.7 The Photoelectric Effect and the Detection of Individual Photons; 7.8 Momentum of a Photon. Light Pressure; 7.9 Angular Momentum of a Photon; 7.10 Wavelength of a Material Particle. de Broglie's Hypothesis; 7.11 Heisenberg's Uncertainty Principle; CHAPTER 8 - Optical Spectra; 8.1 General Remarks; 8.2 Elementary Theory of Atomic Spectra
8.3 Quantum Mechanics

Sommario/riassunto

This incisive text provides a basic undergraduate-level course in modern optics for students in physics, technology and engineering. The first half of the book deals with classical physical optics; the second principally with the quantum nature of light. Chapters 1 and 2 treat the propagation of light waves, including the concepts of phase and group velocities, and the vectorial nature of light. Chapter 3 applies the concepts of partial coherence and coherence length to the study of interference, and Chapter 4 takes up multiple-beam interference and includes Fabry-Perot interferometry and mul