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Guided waves propagation and integrated optics -- Prospects for long-wavelength X-ray microscopy and diffraction -- Kinematical and dynamical diffraction theories -- Dynamical theory of X-ray propagation in distorted crystals -- Polarization phenomena in X-ray diffraction -- Perfect crystal neutron optics -- Coherent approach to neutron beam polarization -- X-ray and neutron interferometry -- X-ray topography : Principles -- Examples of X-ray topographic results -- Neutron topography -- Crystal diffraction optics for x-rays and neutrons -- Electron imaging techniques -- Speckle and intensity interferometry. Applications to astronomy -- Electron holography -- Prospects of X-ray holography -- Imageing by means of channelled particles -- Neutron optics using non-perfect crystals -- Ultrasonic real-time reconstruction imaging -- What can be done with high voltage electron microscopy? -- Transfer functions and electron microscope image formation -- Acoustic microscopy -- Use of coded apertures in gamma-imaging techniques -- Principles and techniques of acoustical imaging -- NMR imaging -- Nuclear scattering radiography -- Computerized tomography scanners -- Recording materials and transducers in optics -- Some applications in hybrid image processing -- X-ray image detectors -- Electron detectors -- Image processing of regular biological objects -- Cathodoluminescence topography -- Image processing in electron microscopy : Non-periodic objects -- Interpretation of X-Ray topography -- “Coherence is beautiful”.