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Autore	Williams David B
Titolo	Transmission Electron Microscopy [[electronic resource] ] : A Textbook for Materials Science / / by David B. Williams, C. Barry Carter
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Descrizione fisica	1 online resource (XXIX, 729 p. 1722 illus.)
Disciplina	621.36
Soggetti	Spectroscopy Microscopy Surfaces (Physics) Interfaces (Physical sciences) Thin films Solid state physics Materials science Spectroscopy and Microscopy Surface and Interface Science, Thin Films Solid State Physics Characterization and Evaluation of Materials Biological Microscopy
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	1 The Transmission Electron Microscope -- 2 Scattering and Diffraction -- 3 Elastic Scattering -- 4 Inelastic Scattering and Beam Damage -- 5 Electron Sources -- 6 Lenses, Apertures, and Resolution -- 7 How to "See" Electrons -- 8 Pumps and Holders -- 9 The Instrument -- 10 Specimen Preparation -- 11 Diffraction Patterns -- 12 Thinking in Reciprocal Space -- 13 Diffracted Beams -- 14 Bloch Waves -- 15 Dispersion Surfaces -- 16 Diffraction from Crystals -- 17 Diffraction from Small Volumes -- 18 Indexing Diffraction Patterns -- 19 Kikuchi Diffraction -- 20 Obtaining CBED Patterns -- 21 Using Convergent-Beam Techniques -- 22 Imaging in the TEM -- 23 Thickness and

Bending Effects -- 24 Planar Defects -- 25 Strain Fields -- 26 Weak-Beam Dark-Field Microscopy -- 27 Phase-Contrast Images -- 28 High-Resolution TEM -- 29 Image Simulation -- 30 Quantifying and Processing HRTEM Images -- 31 Other Imaging Techniques -- 32 X-ray Spectrometry -- 33 The XEDS-TEM Interface -- 34 Qualitative X-ray Analysis -- 35 Quantitative X-ray Microanalysis -- 36 Spatial Resolution and Minimum Detectability -- 37 Electron Energy-Loss Spectrometers -- 38 The Energy-Loss Spectrum -- 39 Microanalysis with Ionization-Loss Electrons -- 40 Everything Else in the Spectrum -- Acknowledgements for Figures.

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## Sommario/riassunto

Electron microscopy has revolutionized our understanding of the extraordinary intellectual demands required of the materials scientist in order to do the job properly: crystallography, links down to atomistic levels. It now is even possible to determine image contrast, inelastic scattering events, and to tailor the microstructure (and meso structure) of materials spectroscopically. Remember, these used to be fields in themselves to achieve specific sets of properties; the extraordinary abilities. Today, one has to understand the fundamentals of modern transmission electron microscopy-TEM- of all of these areas before one can hope to tackle significant instruments to provide almost all of the structural, phase, and other problems in materials science. TEM is a technique of and crystallographic data allow us to accomplish this feat. characterizing materials down to the atomic limits. It must therefore, it is obvious that any curriculum in modern materials education must include suitable courses in electron microscopy-TEM- teams of experts from different venues. The fundamentals of microscopy. It is also essential that suitable texts be available are, of course, based in physics, so aspiring materials scientists for the preparation of the students and researchers who must eventually would be well advised to have prior exposure to, for carry out electron microscopy properly and quantitatively.

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