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Nota di contenuto	Aberration-Corrected Analytical Transmission Electron Microscopy; Contents; List of Contributors; Preface; 1 General Introduction to Transmission Electron Microscopy (TEM); 1.1 What TEM Offers; 1.2 Electron Scattering; 1.2.1 Elastic Scattering; 1.2.2 Inelastic Scattering; 1.3 Signals which could be Collected; 1.4 Image Computing; 1.4.1 Image Processing; 1.4.2 Image Simulation; 1.5 Requirements of a Specimen; 1.6 STEM Versus CTEM; 1.7 Two Dimensional and Three Dimensional Information; 2 Introduction to Electron Optics; 2.1 Revision of Microscopy with Visible Light and Electrons 2.2 Fresnel and Fraunhofer Diffraction2.3 Image Resolution; 2.4 Electron Lenses; 2.4.1 Electron Trajectories; 2.4.2 Aberrations; 2.5 Electron Sources; 2.6 Probe Forming Optics and Apertures; 2.7 SEM, TEM and STEM; 3 Development of STEM; 3.1 Introduction: Structural

and Analytical Information in Electron Microscopy; 3.2 The Crewe Revolution: How STEM Solves the Information Problem; 3.3 Electron Optical Simplicity of STEM; 3.4 The Signal Freedom of STEM; 3.4.1 Bright-Field Detector (Phase Contrast, Diffraction Contrast); 3.4.2 ADF, HAADF; 3.4.3 Nanodiffraction; 3.4.4 EELS; 3.4.5 EDX
3.4.6 Other Techniques3.5 Beam Damage and Beam Writing; 3.6 Correction of Spherical Aberration; 3.7 What does the Future Hold?; 4 Lens Aberrations: Diagnosis and Correction; 4.1 Introduction; 4.2 Geometric Lens Aberrations and Their Classification; 4.3 Spherical Aberration-Correctors; 4.3.1 Quadrupole-Octupole Corrector; 4.3.2 Hexapole Corrector; 4.3.3 Parasitic Aberrations; 4.4 Getting Around Chromatic Aberrations; 4.5 Diagnosing Lens Aberrations; 4.5.1 Image-based Methods; 4.5.2 Ronchigram-based Methods; 4.5.3 Precision Needed; 4.6 Fifth Order Aberration-Correction; 4.7 Conclusions
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6.2 The Relationships Between Probe Size, Probe Current and Probe Angle6.2.1 The Geometric Model Revisited; 6.2.2 The Minimum Probe Size, the Optimum Angle and the Probe Current; 6.2.3 The Probe Current; 6.2.4 A Simple Approximation to Wave Optical Probe Size; 6.2.5 The Effect of Chromatic Aberration; 6.2.6 Choosing aopt in Practice; 6.2.7 The Effect of Making a Small Error in the Choice of aopt; 6.2.8 The Effect of a On the Diffraction Pattern; 6.2.9 Probe Spreading and Depth of Field; 6.3 The Condenser System; 6.4 The Scanning System; 6.4.1 Principles of the Scanning System
6.4.2 Implementation of the Scanning System

Sommario/riassunto

"The book is concerned with the theory, background, and practical use of transmission electron microscopes with lens correctors that can correct the effects of spherical aberration. The book also covers a comparison with aberration correction in the TEM and applications of analytical aberration corrected STEM in materials science and biology. This book is essential for microscopists involved in nanoscale and materials microanalysis especially those using scanning transmission electron microscopy, and related analytical techniques such as electron diffraction x-ray spectrometry (EDXS) and electron energy loss spectroscopy (EELS)"--
"The book will be concerned with the theory, background and practical use of transmission electron microscopes with lens correctors which can correct for the effects of spherical aberration"--