

# Contents

1 A Scan Through the History of STEM <i>Stephen J. Pennycook</i>	1
2 The Principles of STEM Imaging <i>Peter D. Nellist</i>	91
3 The Electron Ronchigram <i>Andrew R. Lupini</i>	117
4 Spatially Resolved EELS: The Spectrum-Imaging Technique and Its Applications <i>Mathieu Kociak, Odile Stéphan, Michael G. Walls, Marcel Tencé and Christian Colliex</i>	163
5 Energy Loss Near-Edge Structures <i>Guillaume Radtke and Gianluigi A. Botton</i>	207
6 Simulation and Interpretation of Images <i>Leslie J. Allen, Scott D. Findlay and Mark P. Oxley</i>	247
7 X-Ray Energy-Dispersive Spectrometry in Scanning Transmission Electron Microscopes <i>Masashi Watanabe</i>	291
8 STEM Tomography <i>Paul A. Midgley and Matthew Weyland</i>	353
9 Scanning Electron Nanodiffraction and Diffraction Imaging <i>Jian-Min Zuo and Jing Tao</i>	393
10 Applications of Aberration-Corrected Scanning Transmission Electron Microscopy and Electron Energy Loss Spectroscopy to Complex Oxide Materials <i>Maria Varela, Jaume Gazquez, Timothy J. Pennycook, Cesar Magen, Mark P. Oxley and Stephen J. Pennycook</i>	429

11 Application to Ceramic Interfaces <i>Yuichi Ikuhara and Naoya Shibata</i>	467
12 Application to Semiconductors <i>James M. LeBeau, Dmitri O. Klenov and Susanne Stemmer</i>	523
13 Nanocharacterization of Heterogeneous Catalysts by Ex Situ and In Situ STEM <i>Peter A. Crozier</i>	537
14 Structure of Quasicrystals <i>Eiji Abe</i>	583
15 Atomic-Resolution STEM at Low Primary Energies <i>Ondrej L. Krivanek, Matthew F. Chisholm, Niklas Dellby and Matthew F. Murfitt</i>	615
16 Low-Loss EELS in the STEM <i>Nigel D. Browning, Ilke Arslan, Rolf Erni and Bryan W. Reed</i>	659
17 Variable Temperature Electron Energy-Loss Spectroscopy <i>Robert F. Klie, Weronika Walkosz, Guang Yang and Yuan Zhao</i>	689
18 Fluctuation Microscopy in the STEM <i>Paul M. Voyles, Stephanie Bogle and John R. Abelson</i>	725
Index	757