CONTENTS

C	ONTRIBUTORS	ix
V	OLUMES IN SERIES	хi
PΕ	REFACE	xv
1.	Surface Characterization: Composition Structure and Topography by S. Speller, W. Heiland, and M. Schleberger	
	1. Introduction	1
	2. Ion Scattering Methods	3
	3. Diffraction Methods	27
	4. Electron Spectroscopy	38
	PART I. Quantitative Analysis of Electron Spectra	40
	PART II. Nanostructures of Semiconductor Systems	55
	5. Scanning Probe Microscopy	66
	PART III. Scanning Tunneling Microscopy	66
	PART IV. Atomic Force Microscopy	89
	6. Comparative Considerations	99
	References	101
2.	Application of Photoelectron Spectroscopy in Inorganic and Organic Material Systems by Sudipta Seal and Tery L. Barr	
	1. Introduction	111
	2. Fundamentals and a Brief History of ESCA	112
	3. A Basic ESCA System	113
	4. Information Available from ESCA	114
	5. Binding Energy and Chemical Shift	114

vi	CONTENTS	
	6. Quantification	127 3.
	7. Application of ESCA in Oxides	130 4.
	8. Application of ESCA in Composite Systems	141
	9. Key Silicate Analyses Using ESCA	157 5.
	10. ESCA in Selected Organic Systems	167 6.
	11. Conclusion	183
	References	183
3.	Secondary Electron Fine Structure—a Method of Local Atomic Structure Characterization	5. Hig
	by Yu. V. Ruts, D. E. Guy, D. V. Surnin, and V. I. Grebennikov	
	1. Introduction	191 1.
	2. The Method of Obtaining the SEFS Experimental Data	203 2.
	3. Theoretical Description of the SEFS Process	206 3.
	4. Estimation of Amplitudes and Intensities of First- and Second-Order Processes	222
	5. Description of the Characteristic Features of the SEFS Spectra of the Secondary Electrons	4.
	6. Analysis of the Surface Local Atomic Structure by the SEFS Method	INDEX
	7. Conclusion	263
	Acknowledgments	265
	References	265
4.	Photonic and Electronic Spectroscopies for the Characterization of Organic Surfaces and Organic Molecules Adsorbed on Surfaces by Ana Maria Botelho do Rego and Luis Filipe Vieira Ferreira	
	1. Introduction	269
	Diffuse Reflectance Techniques for Surface Photochemistry Studies	270

		CONTENTS vii
	127	3. Electronic Spectroscopies
ems		4. Examples of Systems Studied by Electronic and Photonic Spectroscopies
		5. Combined Studies Involving Photonic and Electronic Spectroscopies
	167	6. Conclusions
• • • • • • • • • • • • • • • • • • • •	183	Acknowledgments
• • • • • • • • • • • • • • • • • • • •	183	References
ethod of Local Atomic	M.	5. High-Pressure Surface Science by Vladislav Domnich and Yury Gogotsi
· · · · · · · · · · · · · · · · · · ·		1. Introduction
erimental Data	203	Phase Transformations in Materials Under Static Contact Loading
of First- and	206	3. Phase Transformations in Materials Under Dynamic Contact Loading
s of the SEFS Spectra of	222	4. Conclusions
s of the SEr3 Spectra of	236	References
ructure by the	248	INDEX