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Nota di contenuto	Nanoscale Characterization of Surfaces and Interfaces; Nanoscale Characterization of Surfaces and Interfaces; List of Symbols and Abbreviations; 1 Introduction; 2 Scanning Tunneling Microscopy (STM); 2.1 Historical Perspective; 2.2 Theory; 2.2.1 Electron Tunneling and STM Imaging; 2.2.2 Scanning Tunneling Spectroscopy (STS); 2.2.3 Inelastic Tunneling Spectroscopy; 2.2.4 Ballistic Electron Emission Microscopy (BEEM); 2.3 Instrumentation; 2.3.1 Microscope Design: STM Heads; 2.3.2 Tips; 2.3.3 Vibration and Shock Isolation; 2.3.4 Electronics; 2.3.5 Microcomputer Control 2.6.2 Surface Diffusion2.6.3 Stepped Surfaces; 2.6.4 Adsorbate-Induced Reconstructions of Metal Surfaces; 2.6.5 Growth of Metallic Adlayers; 2.6.6 Resistivity in Polycrystalline Metals - Scanning Tunneling Potentiometry; 2.7 Insulators; 2.8 Layered Compounds .; 2.9 Charge Density Wave Systems; 2.10 Superconductors; 2.11 Molecular Films, Adsorbates, and Surface Chemistry; 2.11.1 Molecular Imaging; 2.11.2 Adsorption and Surface Chemistry; 2.12 Electrochemistry at

Liquid-Solid Interfaces; 2.1 3 Biological Systems; 2.14 Metrological Applications; 3 Atomic Force Microscopy
3.1 Atomic Force Imaging3.1.1 Graphite; 3.1.2 Insulators; 3.1.3 Metals; 3.1.4 Films; 3.1.5 Polymer Surfaces and Metal Films on Polymer Substrates; 3.1.6 Biological Molecules; 3.1.7 Adsorption Dynamics of Biological Molecules in Real Time; 3.2 Nanoscale Surface Forces; 3.3 Nanotribology; 3.4 Non-Contact Imaging; 3.4.1 Van der Waals Forces; 3.4.2 Electrostatic Forces; 3.4.3 Magnetic Forces; 4 Manipulation of Atoms and Atom Clusters on the Nanoscale; 4.1 Transfer of Atoms and Atom Clusters Between Tip and Sample; 4.2 Tip-Induced Lateral Motion of Atoms on Surfaces
4.3 Nanoscale Modification by Tip-Induced Local Electron-Stimulated Desorption4.4 Nanoscale Chemical Modification; 4.5 High-Temperature Nanofabrication; 4.6 Nanoscale Surface Modification Using the AFM; 4.7 Towards Nanoscale Devices; 5 Spin-offs of STM - Non-Contact Nanoscale Probes; 5.1 Scanning Near-Field Optical Microscope (SNOM); 5.2 Photon Scanning Tunneling Microscope (PSTM); 5.3 Scanning Thermal Profiler (STP); 5.4 Scanning Chemical Potential Microscope (SCPM); 5.5 Optical Absorption Microscope (OAM); 5.6 Scanning Ion Conductance Microscope (SICM); 6 Acknowledgements; 7 References

Sommario/riassunto

Derived from the highly acclaimed series Materials Science and Technology, this book provides in-depth coverage of STM, AFM, and related non-contact nanoscale probes along with detailed applications, such as the manipulation of atoms and clusters on a nanometer scale. The methods are described in terms of the physics and the technology of the methods and many high-quality images demonstrate the power of these techniques in the investigation of surfaces and the processes which occur on them.Topics include:Semiconductor Surfaces and Interfaces * Insulators * Layered Compounds * Charg