

Springer Series

Applied Scanning Probe Methods

Series Editors: Bharat Bhushan, Harald Fuchs

Series ISSN: 1434-4904



The series NanoScience and Technology is focused on the fascinating nano-world, mesoscopic physics, analysis with atomic resolution, nano and quantum-effect devices, nanomechanics and atomic-scale processes. All the basic aspects and technology-oriented developments in this emerging discipline are covered by comprehensive and timely books. The series constitutes a survey of the relevant special topics, which are presented by leading experts in the field. These books will appeal to researchers, engineers, and advanced students.

The volumes VIII, IX and X examine the physical and technical foundation for recent progress in applied scanning probe techniques. The first volume came out in January 2004, the second to fourth volumes in early 2006 and the fifth to seventh volumes in late 2006. The field is progressing so fast that there is a need for a set of volumes every 12 to 18 months to capture latest developments. These volumes constitute a timely comprehensive overview of SPM applications. After introducing scanning probe microscopy, including sensor technology and tip characterization, chapters on use in various industrial applications are presented. Industrial applications span topographic and dynamical surface studies of thin-film semiconductors, polymers, paper, ceramics, and magnetic and biological materials. The chapters have been written by leading researchers and application scientists from all over the world and from various industries to provide a broader perspective.

Titles in this series:

Volume 8

Bharat Bhushan, The Ohio State University, Columbus, OH, USA
Harald Fuchs, University of Münster, Germany
Masahiko Tomitori, Advanced Institute of Science & Technology, Ishikawa, Japan (Eds.)

Applied Scanning Probe Methods VIII Scanning Probe Microscopy Techniques

P.G. Gucciardi, G. Bachelier, S.J. Stranick, and M. Allegrini: Background-free apertureless near-field imaging.

Hao-Chih (Bernard) Liu, Gregory A. Dahlen, Jason R. Osborne: Critical Dimension Atomic Force Microscopy for Sub-50 nm Microelectronics Technology Nodes.

E. Cefali, S. Patané, S. Spadaro, R. Gardelli, M. Albani, M. Allegrini: Near Field Probes: from optical fibers to optical nanoantennas.

Sophie Marsaudon, Charlotte Bernard, Dirk Dietzel, Cattien V. Nguyen, Anne-Marie Bonnot, Jean-Pierre Aime, Rodolphe Boisgard: Carbon Nanotubes as SPM Tips: Nanotube Tips Mechanical Properties and Imaging.

H.D. Espinosa and Andrea Ho: Scanning Probes for the Life Sciences.

Hayato Sone and Sumio Hosaka: Self-sensing cantilever sensor for bio-science.

Vinzenz Friedli, Samuel Hoffmann, Johann Michler, and Ivo Utke: AFM Sensors in Scanning Electron and Ion Microscopes: Tools for Nanomechanics, Nanoanalytics, and Nanofabrication.

Peter J. Cumpson, Charles Clifford, Jose Portoles, James Johnstone, and Martin Munz: Cantilever Spring Constant Calibration in Atomic Force Microscopy.

Suzanne P. Jarvis, John E. Sader, Takeshi Fukuma: Frequency Modulation Atomic Force Microscopy in Liquids.

Y. Rosenwaks, O. Tal, S. Saraf, A. Schwarzman, E. Lepkifker, and A. Boag: Kelvin Probe Force Microscopy: Recent Advances and Applications.

Stefan Lanyi: Application of Scanning Capacitance Microscopy to Analysis at the Nanoscale.

Laura Fumagalli, Ignacio Casuso, Giorgio Ferrari and Gabriel Gomila: Probing Electrical transport properties at the nanoscale by current-sensing Atomic Force Microscopy.

2008 Approx. 425 p. Hardcover
NanoScience and Technology

► ca. \$ 169.00

ISBN: 978-3-540-74079-7

Volume 9

Bharat Bhushan, The Ohio State University, Columbus, OH, USA
Harald Fuchs, University of Münster, Germany
Masahiko Tomitori, Advanced Institute of Science & Technology, Ishikawa, Japan (Eds.)

Applied Scanning Probe Methods IX Characterization

Luca Gavioli and Cinzia Cepek: Ultra-thin fullerene-based films via STM and STS.
Alexander Gigler and Othmar Marti: Quantitative measurement of materials properties with the (Digital) Pulsed Force Mode.
Bruno Pignataro: Advances in SPMs for Solid Supported Monolayers Investigation and Modification.
Félix Rico, Ewa P. Wojcikiewicz, and V. Moy: Atomic force microscopy studies of the mechanical properties of living cells.
Claire Verbelen, Guillaume Andre, Xavier Haulot, Yann Gilbert, David Alsteenes, Etienne Dague, and Y. F. Dufrene: Exploring microbial surfaces using AFM imaging and force spectroscopy.
C. Riethmüller and H. Oberleithner: Cellular Physiology of Epithel and Endothel.
Hyonchol Kim, Hironori Uehara, Rehana Afrin, Hiroshi Sekiguchi, Hideo Arakawa, Toshiya Osada, and Atsushi Ikai: Application of the Atomic Force Microscopy to the Study of Expressed Molecules in or on a Single Living Cell.
Annalisa Relini, Claudio Canale, Ornella Cavalleri, Tiziana Svaldo Lanero, Ranieri Rolandi, and Alessandra Gliozzi: What can atomic force microscopy say about amyloid aggregates?.
Zoya Leonenko, Matthias Amrein, David T. Cramb, and Eric Finot: Atomic force microscopy: interaction forces in phospholipid monolayers, bilayers and cell membranes.
Enamul Hoque, James DeRose, B. Bhushan, and H. J. Mathieu: Self-Assembled Monolayers (SAM) on Aluminum and Copper Oxide Surfaces: Surface and Interface Characteristics, Nanotribological Properties, and Chemical Stability.
Nikhil S. Tambe and Bharat Bhushan: High Sliding Velocity Nanotribological Investigations of Materials for Nanotechnology Applications.
Sung-Kyoung Kim and Haiwon Lee: Measurement of Mechanical Properties of One-Dimensional Polymer Nanostructures by AFM.- Sriram Sundararajan and K. S. Kanaga Karupiah: Evaluating Interfacial Properties of Polymeric Materials for Total Joint Replacements Using Scanning Probe Microscopy.
Toshiharu Saiki: Near-field optical spectroscopy of single quantum constituents

2008 Approx. 380 p. Hardcover
NanoScience and Technology
► **ca. \$ 169.00**

ISBN: 978-3-540-74082-7

Volume 10

Bharat Bhushan, The Ohio State University, Columbus, OH, USA
Harald Fuchs, University of Münster, Germany
Masahiko Tomitori, Advanced Institute of Science & Technology, Ishikawa, Japan (Eds.)

Applied Scanning Probe Methods X Biomimetics and Industrial Applications

Bharat Bhushan and Robert A. Sayer: Gecko Feet: Natural Attachment Systems for Smart Adhesion-Mechanism, Modeling and Development of Bio-Inspired Materials.
Filippo Giannazzo, Patrick Fiorenza, Vito Raineri: Carrier transport in advanced semiconductor materials.
Yasuo Cho: Visualization of fixed charges stored in condensed matter and its application to memory technology.
Toshi Kasai Hareh Siriwardane and Bharat Bhushan: Applications of SPM in Chemical Mechanical Planarization (CMP).
Ken-ichi Shinohara: Scanning probe microscope application for single molecules in a p-conjugated polymers toward the molecular devices based on polymer chemistry.
Joachim Loos and Alexander Alexeev: Scanning Probe Microscopy on Polymer Solar Cells.
Hiroyuki Sugimura: Scanning probe anodization for nanopatterning.
Mario D'Acunto, Franco Maria Montevicchi, Paolo Giusti and Gianluca Ciardelli: Tissue Engineering: Nanoscale Contacts in Cell Adhesion to Substrates.
Tatsuo Ushiki and Kazushige Kawabata: Scanning probe microscopy in biological research.-
Jiping Ye: Novel nanoindentation techniques and their applications.
Yasushi Kadota: Application to nano-dispersion macromolecule material evaluation in an electrophotographic printer.
Tianming Bao, David Fong, and Sean Hand: Automated AFM as Industrial Process Metrology for Nanoelectronic Manufacturing

2008 Approx. 380 p. Hardcover
NanoScience and Technology
► **ca. \$ 169.00**

ISBN: 978-3-540-74084-1

Volume 1

Bharat Bhushan, Ohio State University, Columbus, OH, USA;
Harald Fuchs, University of Münster, Germany;
Sumio Hosaka, Gunma University, Kiryu, Japan (Eds.)

Applied Scanning Probe Methods I

2004 XX, 476 p. 344 illus., 6 in color. Hardcover
NanoScience and Technology
▶ \$ 195.00

ISBN: 978-3-540-00527-8

Volume 2

Bharat Bhushan, Ohio State University, Columbus, OH, USA;
Harald Fuchs, University of Münster, Germany (Eds.)

**Applied Scanning Probe Methods II
Scanning Probe Microscopy Techniques**

2006 XLIV, 420 p. 270 illus., 7 in color. Hardcover
NanoScience and Technology
▶ \$ 169.00

ISBN: 978-3-540-26242-8

Volume 3

Bharat Bhushan, Ohio State University, Columbus, OH, USA;
Harald Fuchs, University of Münster, Germany (Eds.)

**Applied Scanning Probe Methods III
Characterization**

2006 XLIV, 378 p. 270 illus., 2 in color. Hardcover
NanoScience and Technology
▶ \$ 169.00

ISBN: 978-3-540-26909-0

Volume 4

Bharat Bhushan, Ohio State University, Columbus, OH, USA;
Harald Fuchs, University of Münster, Germany (Eds.)

**Applied Scanning Probe Methods IV
Industrial Applications**

2006 XLIV, 284 p. 177 illus., 1 in color. Hardcover
NanoScience and Technology
▶ \$ 139.00

ISBN: 978-3-540-26912-0

Volume 5

Bharat Bhushan, The Ohio State University, Columbus, OH, USA;
Harald Fuchs, University of Münster, Germany;
Satoshi Kawata, Osaka City University, Osaka, Japan (Eds.)

**Applied Scanning Probe Methods V
Scanning Probe Microscopy Techniques**

2007 XLVI, 344 p. 199 illus., 5 in color. Hardcover
NanoScience and Technology
▶ \$ 159.00

ISBN: 978-3-540-37315-5

Volume 6

Bharat Bhushan, The Ohio State University, Columbus, OH, USA;
Satoshi Kawata, Osaka City University, Osaka, Japan (Eds.)

Applied Scanning Probe Methods VI Characterization

2007 XLVI, 338 p. 195 illus. Hardcover
NanoScience and Technology
▶ \$ 169.00

ISBN: 978-3-540-37318-6

Volume 7

Bharat Bhushan, The Ohio State University, Columbus, OH, USA;
Harald Fuchs, University of Münster, Germany (Eds.)

Applied Scanning Probe Methods VII Biomimetics and Industrial Applications

2007 XLVI, 380 p. 232 illus., 9 in color. Hardcover
NanoScience and Technology
▶ \$ 169.00

ISBN: 978-3-540-37320-9

Order Now!

For convenient ordering

▶ **Call toll-free** 1-800-SPRINGER
8:30 am – 5:30 pm ET
▶ **Fax your order to** (201) 348-4505

▶ **Email** orders-ny@springer.com
▶ **Web** springer.com

▶ **Visit** your local scientific/technical bookstore
▶ **Use** this convenient form

Yes, please send me

___ Copies _____	ISBN _____	\$ _____
___ Copies _____	ISBN _____	\$ _____
___ Copies _____	ISBN _____	\$ _____
___ Copies _____	ISBN _____	\$ _____
___ Copies _____	ISBN _____	\$ _____

Methods of Payment

Check/Money Order enclosed AmEx MasterCard VISA

Card No.

Exp. Date

Please send orders to: Springer Order Department PO Box 2485 Secaucus, NJ 07096-2485	Subtotal:	Name
	Sales Tax:	Address
	Shipping:	Street Address
	TOTAL:	(Sorry, we cannot deliver to P.O. boxes)
		City / State / ZIP-Code
		Country
		Telephone / Email
		Date ✕
		Signature ✕

CA, CO, MA, MO, NJ, and NY residents, please add sales tax. Canadian residents, please add 7% GST. Please add \$5.00 for shipping one book and \$1.00 for each additional book. Outside the US and Canada add \$10.00 for first book, \$5.00 for each additional book. All orders are processed upon receipt. If an order cannot be fulfilled within 90 days, payment will be refunded upon request. Prices are payable in US currency or its equivalent. Remember, your 30-day return privilege is always guaranteed. Pre-publication pricing: Unless otherwise stated, pre-pub prices are valid through the end of the third month following publication, and therefore are subject to change.

Outside the Americas: ▶ **Write:** Springer Distribution Center GmbH, Haberstrasse 7, 69126 Heidelberg, Germany ▶ **Call:** + 49 (0) 6221-345-4301 ▶ **Fax:** +49 (0) 6221-345-4229 ▶ **Web:** springer.com
▶ **Email:** SDC-bookorder@springer.com