

Volume 18, Number 1

February 2012

Microscopy AND Microanalysis

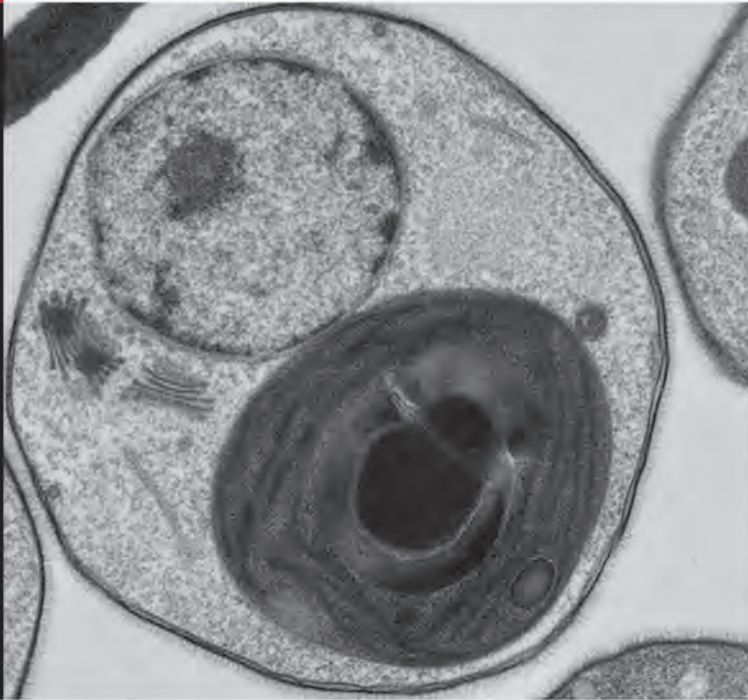


CAMBRIDGE
UNIVERSITY PRESS

ISSN 1431-9276

Living up to Life

Leica
MICROSYSTEMS



A perfect 10⁻⁹



... is only possible with
perfect EM
sample preparation.

No matter what type of imaging instrument you use; TEM, SEM, LM, Confocal or AFM, the ultimate quality of the image comes from high-quality sample preparation. Leica Microsystems has a full range of innovative instrumentation to deliver perfect preparation for all sample materials.

- Sectioning
- Processing
- Staining
- Planing
- Target Polishing
- Ion Milling
- Contrasting
- High Pressure Freezing
- Cryoprocessing and Transfer
- Coating and Drying

A **perfect 10⁹**! See the difference Leica Microsystems quality can make for you. Visit www.leica-microsystems.com/yourimage

© 2011 Leica Microsystems, Inc. BNA#676

Microscopy AND Microanalysis

An International Journal for the Biological and Physical Sciences

THE OFFICIAL JOURNAL OF

MICROSCOPY SOCIETY OF AMERICA
MICROANALYSIS SOCIETY
MICROSCOPICAL SOCIETY OF CANADA /
SOCIÉTÉ DE MICROSCOPIE DU CANADA
MEXICAN MICROSCOPY SOCIETY
BRAZILIAN SOCIETY FOR MICROSCOPY AND MICROANALYSIS
VENEZUELAN SOCIETY OF ELECTRON MICROSCOPY
EUROPEAN MICROBEAM ANALYSIS SOCIETY
AUSTRALIAN MICROSCOPY AND MICROANALYSIS SOCIETY
PORTUGUESE SOCIETY FOR MICROSCOPY

PUBLISHED IN AFFILIATION WITH

ROYAL MICROSCOPICAL SOCIETY
GERMAN SOCIETY FOR ELECTRON MICROSCOPY
BELGIAN SOCIETY FOR MICROSCOPY
MICROSCOPY SOCIETY OF SOUTHERN AFRICA

Editor in Chief

Editor, Biological Applications

Robert L. Price
Cell and Developmental Biology and
Anatomy
University of South Carolina
Columbia, SC 29209
e-mail: Bob.Price@uscmed.sc.edu

Editor, Materials Applications

David J. Smith
Department of Physics
School of Materials
Arizona State University
Tempe, Arizona 85287-1504
e-mail: david.smith@asu.edu

Editor, Scanning Probe Microscopies

Phillip Russell
Physics and Astronomy
Appalachian State University
Boone, North Carolina 28608
e-mail: russllp@appstate.edu

Editor, Atom Probe

Thomas Kelly
Cameca Instruments, Inc.
A Business Unit of AMETEK, Inc.
Madison, WI 53711-4951
e-mail: Thomas.Kelly@ametek.com

Editor, Light and Fluorescence Microscopies

Brian Herman
Cellular and Structural Biology
University of Texas at San Antonio
San Antonio, Texas 78284-7762
e-mail: hermanb@uthscsa.edu

Editor, Biological Applications

Heide Schatten
Veterinary Pathobiology
University of Missouri-Columbia
Columbia, Missouri 65211-5030
e-mail: schattenh@missouri.edu

Editor, Microanalysis

John Mansfield
Electron Microbeam Analysis Lab
North Campus, 417 SRB
University of Michigan
Ann Arbor, MI 48109-2143
e-mail: jfmjfm@umich.edu

Editor, Correlative and Emerging Microscopy Applications

Vinayak P. Dravid
Materials Science and Engineering
Northwestern University
Evanston, Illinois 60208-3105
e-mail: v-dravid@northwestern.edu

Special Issues and Reviews Editor

Jay Jerome
Vanderbilt University Medical Center
Nashville, TN 37232
e-mail: jay.jerome@vanderbilt.edu

Book Review Editor

Cynthia S. Goldsmith
Centers for Disease Control
Atlanta, GA 30333
e-mail: csg1@cdc.gov

Calendar Editor

Nan Yao
Princeton University
Princeton, NJ 08540
e-mail: nyao@Princeton.edu

Expo Editor

Richard E. Edelmans
Miami University
Oxford, OH 45056
e-mail: edelmare@muohio.edu

Proceedings Editor

John Shields
University of Georgia
Athens, GA 30602
e-mail: jpshield@uga.edu

Editorial Board

| | |
|--------------------------------|---|
| Ralph Albrecht | <i>University of Wisconsin, Madison, Wisconsin</i> |
| Barry Carter | <i>University of Connecticut, Storrs, Connecticut</i> |
| Wah Chiu | <i>Baylor College of Medicine, Houston, Texas</i> |
| Niels de Jonge | <i>INM Institute for New Materials, Saarbrücken, Germany</i> |
| Alberto Diaspro | <i>University of Genoa, Italy</i> |
| Elizabeth Dickey | <i>Pennsylvania State University, University Park, Pennsylvania</i> |
| Alwyn Eades | <i>Lehigh University, Bethlehem, Pennsylvania</i> |
| Mark Ellisman | <i>University of California at San Diego, San Diego, California</i> |
| Pratibha Gai | <i>University of York, United Kingdom</i> |
| Marija Gajdardziska-Josifovska | <i>University of Wisconsin-Milwaukee, Milwaukee, Wisconsin</i> |
| Dale Johnson | <i>University of South Florida, Tampa, Florida</i> |
| Paul Kotula | <i>Sandia National Labs, Albuquerque, New Mexico</i> |
| William Landis | <i>Northeastern Ohio Universities College of Medicine, Rootstown, Ohio</i> |
| Eric Lifshin | <i>SUNY at Albany, Albany, New York</i> |
| Charles Lyman | <i>Lehigh University, Bethlehem, Pennsylvania</i> |
| Dale Newbury | <i>National Institute of Standards and Technology, Gaithersburg, Maryland</i> |
| Jean-Paul Revel | <i>California Institute of Technology, Pasadena, California</i> |
| Conly Rieder | <i>Wadsworth Center, Albany, New York</i> |
| John Silcox | <i>Cornell University, Ithaca, New York</i> |
| Nestor Zaluzec | <i>Argonne National Laboratory, Argonne, Illinois</i> |

Editorial Board Representatives from Affiliated Societies

| | |
|---------------------|--|
| Ian Anderson | <i>NIST, Gaithersburg, Maryland (MAS)</i> |
| Gautam Kumar Dey | <i>Bhabha Atomic Research Centre (EMSI)</i> |
| Gema Gonzalez | <i>Venezuelan Institute for Scientific Investigation (Venezuela)</i> |
| Michael Robertson | <i>Acadia University, Wolfville, Nova Scotia (Canada)</i> |
| Brendan Griffin | <i>University of Western Australia (AMMS)</i> |
| Guillermo Solorzano | <i>Pontificia Universidade Catolica, Rio de Janeiro (Brazil)</i> |
| Clive Walker | <i>Institute for Transuranium Elements, Karlsruhe (EMAS)</i> |
| Miguel Yacaman | <i>Mexico Institute for Nuclear Research (Mexico)</i> |
| Henrique Almeida | <i>Universidade do Porto (Portugal)</i> |

Founding Editor

| | |
|-----------------|---|
| Jean-Paul Revel | <i>California Institute of Technology, Pasadena, California</i> |
|-----------------|---|

Previous Editors-in-Chief

| | |
|---------------|--|
| Dale Johnson | <i>University of South Florida, Tampa, Florida</i> |
| Charles Lyman | <i>Lehigh University, Bethlehem, Pennsylvania</i> |

This journal is part of the **Cambridge Journals Online** service. Access to online tables of contents and article abstracts is available to all researchers at no cost. Access to full-text articles online is provided to those with online subscription. Online subscriptions must be activated. Once your subscription is activated, free access to past, present, and forthcoming articles is available at:

***Microscopy and Microanalysis* website: journals.cambridge.org/MAM.**

Instructions for authors submitting manuscripts may be found at journals.cambridge.org/MAM. Select "Further Information" then select "Instructions for Contributors." An abbreviated version of these instructions will be published in the first issue (February) of each volume.



Cooling Stages

Recirculating Heaters and Chillers

Sputter Coaters

SEM/TEM Carbon Coaters

Vacuum Evaporators

Glow Discharge Systems

RF Plasma Etchers/
Plasma Reactors

Critical Point Dryers

Freeze Dryers

Cryo-SEM Preparation
Systems

Vacuum Pumps & Accessories

Evaporation Supplies

and more...

well equipped...

Electron Microscopy Sciences is pleased to announce our new full line catalog, your comprehensive source for high-end Vacuum Equipment. EMS is committed to providing the highest quality products along with competitive pricing, prompt delivery and outstanding customer service.

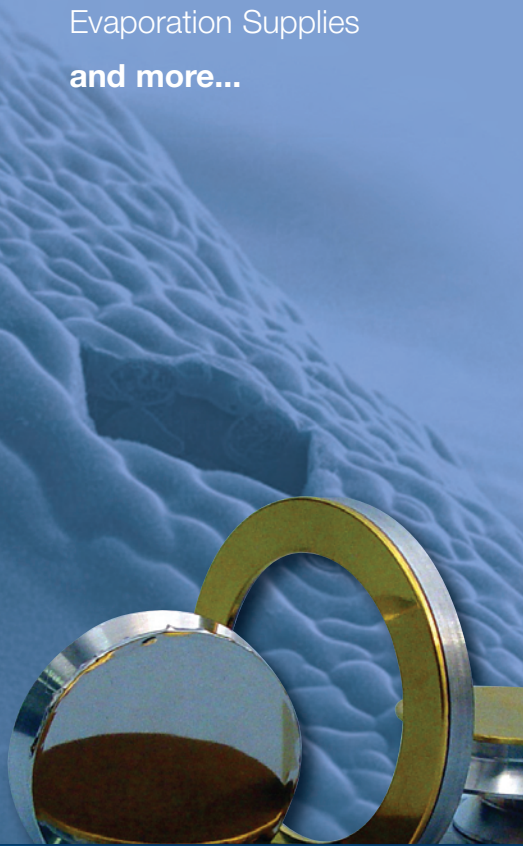


and more...

Not just Vacuum Equipment, EMS also offers:

Laboratory Microwave Ovens • Automated Tissue Processors • Oscillating Tissue Slicers • Vibrating Microtomes • Rapid Immersion Freezers • Tissue Choppers • Desiccators and Desiccants • Centrifuges, Tubes, and Racks • Stirrers, Stirring Hotplates, and Digital Hotplates • Stirring Bars, Stirring Rods, and Hand Mixers • Vortex Mixers, Microplate Mixers, and Magnetic Stirrers • Tissue Rotators, Mixer Vortexes, and Rotator/Rockers • Dri Baths • Oven/Incubators • Cooling Chambers • Ultraviolet Lamps • Lab Jacks

For catalog requests, please visit our website at www.emsdiasum.com



**Electron
Microscopy
Sciences**

Electron Microscopy Sciences
P.O. Box 550 • 1560 Industry Rd. • Hatfield, Pa 19440
Tel: (215) 412-8400 • Fax: (215) 412-8450
email: sgkcock@aol.com • www.emsdiasum.com

Microscopy and Microanalysis publishes original research papers dealing with a broad range of topics in microscopy and microanalysis. These include articles describing new techniques or instrumentation and their applications, as well as papers in which established methods of microscopy or microanalysis are applied to important problems in the fields of biology or materials science. Microscopy and microanalysis are defined here in a broad sense, and include all current and developing approaches to the imaging and analysis of microstructure. The criteria for acceptance of manuscripts are the originality and significance of the research, the quality of the microscopy or microanalysis involved, and the interest for our readership.

Four types of communications are published in the Journal. **Regular Articles** are of substantial length and describe the findings of an original research project that satisfies the aims and scope of the Journal, described above. **Review Articles** summarize the current status of an important area within the aims and scope of the Journal. **Letters to the Editor** usually contain comments on recent articles that have appeared in the Journal. **Book Reviews** are also published, but these are solicited only through the Book Review Editor.

Instructions for Contributors

Instructions for authors contributing manuscripts may be found at <http://mc.manuscriptcentral.com/mam> under "Resources: Instructions and Forms." Authors may also visit http://www.journals.cambridge.org/jid_MAM, select "Further Information," and then select "Instructions for Contributors." An abbreviated version of these instructions will be published in the first issue (February) of each volume.

Copyright Information

Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that it is not under consideration for publication elsewhere; that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out; that, if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the Microscopy Society of America; that the manuscript will not be published elsewhere in any language without the consent of the copyright holders; and that written permission of the copyright holder is obtained by the authors for material used from other copyrighted sources.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, video disks, etc., without first obtaining written permission from the publisher.

The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names lack protection by the relevant laws and regulation.

Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Cambridge University Press, provided that the appropriate fee is paid directly to Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA (Tel: (508) 750-8400), stating the ISSN (1431-9276), the volume, and the first and last page numbers of each article copied. The copyright owner's consent does not include copying for general distribution, promotion, new works, or resale. In these cases, specific written permission must first be obtained from the publisher.

Disclaimer

The Microscopy Society of America, the other societies stated, and Cambridge University Press cannot be held responsible for errors or for any consequences arising from the use of the information contained in this journal. The appearance of scientific reports and/or workshops, or any other material in *Microscopy and Microanalysis* does not constitute an endorsement or approval by The Microscopy Society of America of the findings, data, conclusions, recommendations, procedures, results, or any other aspect of the content of such articles. The appearance of advertising in *Microscopy and Microanalysis* does not constitute an endorsement or approval by The Microscopy Society of America of the quality or value of the products advertised or any of

the claims, data, conclusions, recommendations, procedures, results, or any other information included in the advertisements.

While the advice and information in this journal is believed to be true and accurate at the date of its going to press, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may be made.

Subscription Information

Microscopy and Microanalysis is published bimonthly in February, April, June, August, October, and December by Cambridge University Press. Two supplements (*Expo* and *Proceedings*) are published in June and August.

Society Rates: Members of the Microscopy Society of America should contact the MSA Business Office for all subscription inquiries: Microscopy Society of America, Hachero Hill, Inc., 11260 Roger Bacon Drive, Suite 402, Reston, VA 20190, Tel.: (703) 964-1240, Ext. 14, E-mail: nicoleguy@mindspring.com, URL: www.msa.microscopy.org. Members of other affiliated societies should contact their respective society business offices for all subscription inquiries.

Subscription Rates: Institutions print and electronic: US \$957.00 in the USA, Canada, and Mexico; UK £577.00 + VAT elsewhere. Institutions online only: US \$790.00 in the USA, Canada, and Mexico; UK £478.00 + VAT elsewhere. Institutions print only: US \$863.00 in the USA, Canada, and Mexico; UK £520.00 + VAT elsewhere. Individuals print and online: US \$359.00 in the USA, Canada, and Mexico; UK £218.00 + VAT elsewhere. Prices include postage and insurance.

USA, Canada, and Mexico: Subscribers in the USA, Canada, and Mexico should send their orders, with payment in US dollars or the equivalent value in Canadian dollars, to: Cambridge University Press, Customer Services Department (Journals), 100 Brook Hill Drive, West Nyack, NY 10994-2133, USA. Tel: (845) 353-7500. Fax: (845) 353-4141. Orders may be phoned direct (toll free): (800) 872-7423. E-mail: journals_subscriptions@cup.org.

Outside North America: Subscribers elsewhere should send their orders, with payment in sterling, to: Customer Services Department (Journals), Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge, CB2 8RU, UK. Tel: +44 (0)1223 326070. Fax: +44 (0)1223 325150. E-mail: journals@cambridge.org

Change of address: Allow six weeks for all changes to become effective. All communications should include both old and new addresses (with postal codes) and should be accompanied by a mailing label from a recent issue. Society members should contact their respective society business offices to inform them of address changes.

Microform editions are available from: University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106, USA.

Editorial Office

Robert L. Price, Editor in Chief, Department of Cell and Developmental Biology and Anatomy, School of Medicine, University of South Carolina, 6439 Garner's Ferry Road, Bldg. 1 B-60, Columbia, SC 29209, USA; Tel: (803) 216-3824; Fax: (803) 733-3212; E-mail: Bob.Price@uscmed.sc.edu.

Office of Publication

Cambridge University Press, 32 Avenue of the Americas, New York, NY 10013-2473, USA; Tel: (212) 337-5000; Fax: (212) 337-5959.

Advertising Sales & Production

M.J. Mrvica Associates, Inc., 2 West Taunton Avenue, Berlin, NJ 08009, USA; Tel: (856) 768-9360; Fax: (856) 753-0064.

© 2012 by Microscopy Society of America. Printed in the United States on acid-free paper. Periodicals postage paid at New York, NY, and additional mailing offices. Return postage guaranteed. Postmaster: Send address changes in the U.S.A. and Canada to *Microscopy and Microanalysis*, Subscription Department, Cambridge University Press, 100 Brook Hill Drive, West Nyack, NY 10994-2133.

Preparation Equipment and Microscopy Supplies

The single source for All your microscopy supplies and specimen preparation equipment.



- Vacuum Coating Systems
- Calibration Standards
- PELCO® easiGlow™ Glow Discharge Unit
- SEM Sample Holders and Mounts
- Silicon Nitride TEM Membranes
- PELCO BioWave Pro® Tissue Processor
- TEM Support Films



- AFM Supplies
- Quality Laboratory Tweezers
- Vacuum Pick-up Systems
- Digital Stereo Microscopes
- Conductive Adhesives
- FIB Supplies



Complete line of compact Cressington EM Sample Coaters.

 **TED PELLA, INC.**
Microscopy Products for Science and Industry

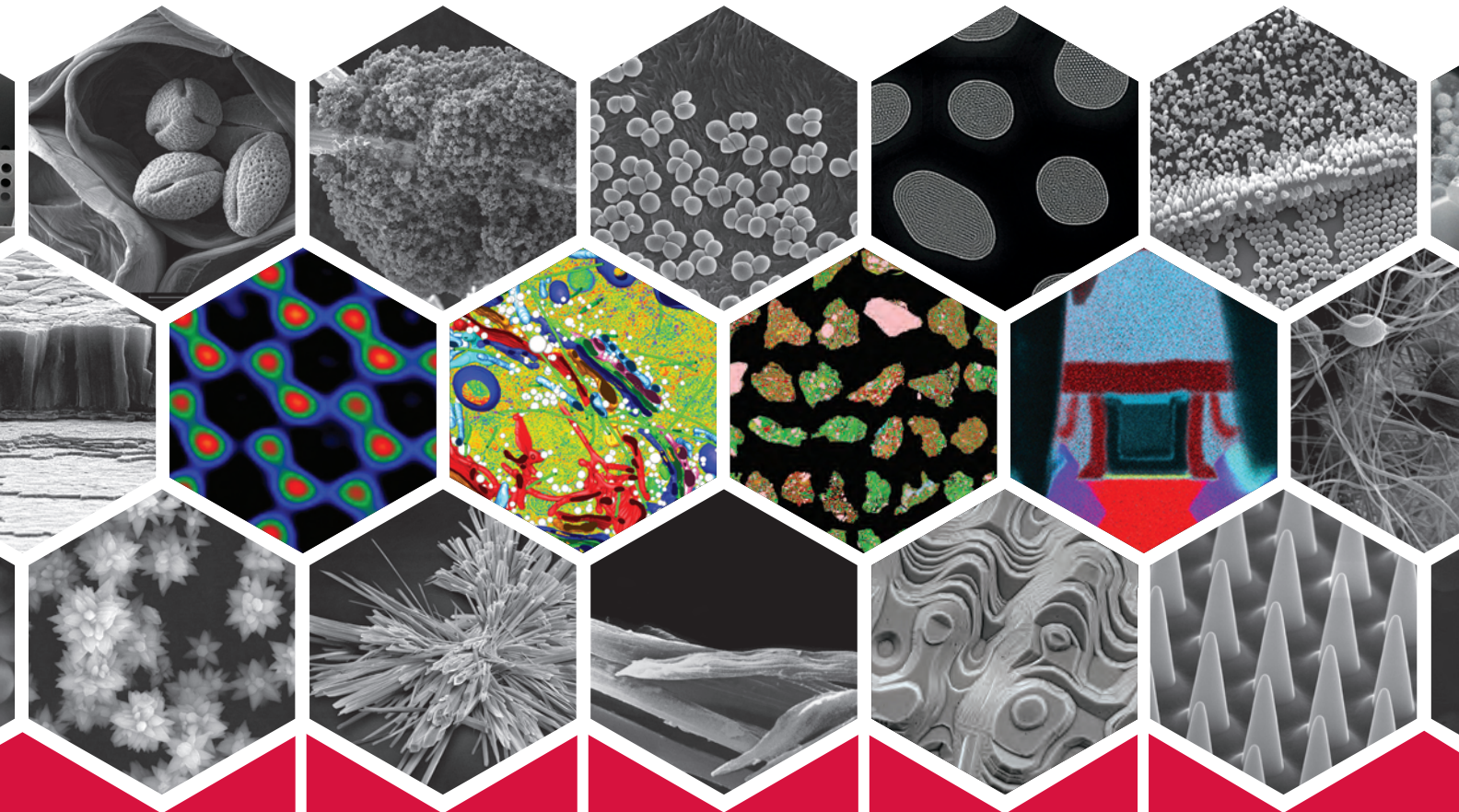
sales@tedpella.com

800-237-3526

www.tedpella.com



Explore new materials.
Discover advancements.
Resolve to solution.



Research

Life Sciences

Natural
Resources

Electronics

FEI is dedicated to providing you with the most innovative instrument solutions for materials research, life sciences, natural resources, and electronics. Explore the broadest portfolio of imaging and analytical instruments and application software, designed, produced and supported to enable discovery and resolution of your most significant challenges.

Atomic resolution phase image of graphene *Sample courtesy of N. Alem and A. Zettl, University of California, Berkeley. Image slice from a high-resolution (~5nm) tomogram of the Golgi region in a pancreatic islet cell* *Sample courtesy of N. Alem and A. Zettl, University of California, Berkeley* • **600 x 600 pixel maps, fully quantified, of a 45 nm PMOS transistor structure** *Courtesy of D. Klenov, FEI NanoPort, The Netherlands* • **Drill cuttings from a CO2 injection well** *Courtesy CO2CRC, Australia*



FEI™ Explore. Discover. Resolve.

Microscopy AND Microanalysis

An International Journal for the Biological and Physical Sciences

Volume 18, Number 1
February 2012

SPECIAL SECTION: KEYSTONE MEETING ON EXTRACELLULAR MATRIX

Introduction: Extracellular Matrix and Cardiovascular Remodeling—Using
Microscopy to Delineate Mechanisms 1
Merry L. Lindsey and Thomas K. Borg

Review Articles

The Glomerular Basement Membrane as a Model System to Study the
Bioactivity of Heparan Sulfate Glycosaminoglycans 3
Kevin J. McCarthy and Deborah J. Wassenhove-McCarthy

Diabetes-Induced Alterations in the Extracellular Matrix and Their Impact
on Myocardial Function 22
Brittany Law, Vennece Fowlkes, Jack G. Goldsmith, Wayne Carver, and Edie C. Goldsmith

Myofibroblasts in the Infarct Area: Concepts and Challenges 35
Evangelos P. Daskalopoulos, Ben J.A. Janssen, and W. Matthijs Blankestijn

Structural Remodeling and Mechanical Function in Heart Failure 50
Bridget Louise Leonard, Bruce Henry Smaill, and Ian John LeGrice

Endothelial Cell-Pericyte Interactions Stimulate Basement Membrane Matrix
Assembly: Influence on Vascular Tube Remodeling, Maturation, and Stabilization 68
Amber N. Stratman and George E. Davis

Feature Articles

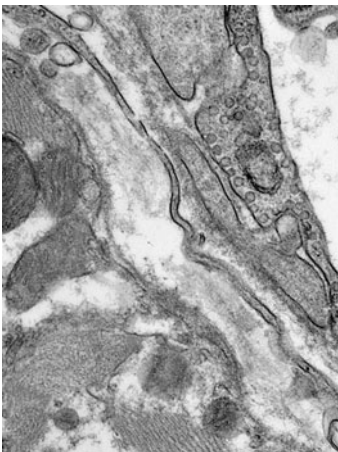
Matrix Metalloproteinase-28 Deletion Amplifies Inflammatory and Extracellular
Matrix Responses to Cardiac Aging 81
*Yonggang Ma, Ying Ann Chiao, Jianhua Zhang, Anne M. Manicone, Yu-Fang Jin,
and Merry L. Lindsay*

Cigarette Smoke Exacerbates Ventricular Remodeling and Dysfunction in the
Volume Overloaded Heart 91
Jessica M. Bradley, Jonathan B. Nguyen, Alyssa C. Fournett, and Jason D. Gardner

Self-Organizing Tissue-Engineered Constructs in Collagen Hydrogels 99
Robert G. Gourdie, Tereance A. Myers, Alex McFadden, Yin-xiong Li, and Jay D. Potts

Desmoplakin is Important for Proper Cardiac Cell-Cell Interactions 107
Stephanie L.K. Bowers, William A. McFadden, Thomas K. Borg, and Troy A. Baudino

The Use of Neural Networks and Texture Analysis for Rapid Objective Selection
of Regions of Interest in Cytoskeletal Images 115
Amanda D. Felder Derkacs, Samuel R. Ward, and Richard L. Lieber



On the Cover: Interactions of cardiac fibroblasts and endothelial cells. For more information see the article by Bowers et al., pages 107–114.

Microscopy and Microanalysis website: <http://www.journals.cambridge.org/MAM>
Indexed in Chemical Abstracts, Current Contents, BIOSIS, and MEDLINE (PubMed)

BIOLOGICAL APPLICATIONS

- Uranium Microdistribution in Renal Cortex of Rats after Chronic Exposure:
A Study by Secondary Ion Mass Spectrometry Microscopy 123
*Christine Tessier, David Suhard, François Rebière, Maâmar Souidi, Isabelle Dublineau,
and Michèle Agarande*
- Dye Surface Coating Enables Visible Light Activation of TiO₂ Nanoparticles
Leading to Degradation of Neighboring Biological Structures 134
*Jay Blatnik, Lanette Luebke, Stephanie Simonet, Megan Nelson, Race Price,
Rachael Leek, Leyong Zeng, Aiguo Wu, and Eric Brown*
- Quantitative Mineralogical Properties (Morphology-Chemistry-Structure) of
Pharmaceutical Grade Kaolinites and Recommendations to Regulatory Agencies 143
Meral Dogan, A. Umran Dogan, Aktham Aburub, Alta Botha, and Dale Eric Wurster

MATERIALS APPLICATIONS

- A Transmission Electron Microscopy Study of the Effect of Interfaces on Bubble
Formation in He-Implanted Cu-Nb Multilayers 152
D. Bhattacharyya, M.J. Demkowicz, Y.-Q. Wang, R.E. Baumer, M. Nastasi, and A. Misra
- Microstructural Evolution in a CeO₂-Gd₂O₃ System 162
Fei Ye, Ding Rong Ou, and Toshiyuki Mori
- Characterization of Nanometer-Scale Porosity in Reservoir Carbonate Rock by
Focused Ion Beam–Scanning Electron Microscopy 171
Bijoyendra Bera, Naga Siva Kumar Gunda, Sushanta K. Mitra, and Douglas Vick

TECHNIQUES DEVELOPMENT

- Phase Contrast Synchrotron Microtomography: Improving Noninvasive
Investigations of Fossil Embryos *In Ovo* 179
*Vincent Fernandez, Eric Buffetaut, Eric Maire, Jérôme Adrien, Varavudh Suteethorn,
and Paul Tafforeau*
- Improving AFM Images with Harmonic Interference by Spectral Analysis 186
Marek Kiwilszo, Artur Zieliński, Janusz Smulko, and Kazimierz Darowicki
- Use of Astronomy Filters in Fluorescence Microscopy 196
Jörg Piper
- Quantitative High-Resolution Transmission Electron Microscopy of Single Atoms 212
*Björn Gamm, Holger Blank, Radian Popescu, Reinhard Schneider, André Beyer,
Armin Gözlhäuser, and Dagmar Gerthsen*
- Optimized Deconvolution for Maximum Axial Resolution in Three-Dimensional
Aberration-Corrected Scanning Transmission Electron Microscopy 218
Ranjan Ramachandra and Niels de Jonge
- Improving Accuracy and Precision of Strain Analysis by Energy-Filtered
Nano-Beam Electron Diffraction 229
*Angelika Hähnel, Manfred Reiche, Oussama Moutanabbir, Horst Blumtritt,
Holm Geisler, Jan Höntschel, and Hans-Jürgen Engelmann*
- Examination of a Polycrystalline Thin-Film Model to Explore the Relation
between Probe Size and Structural Correlation Length in Fluctuation Electron
Microscopy 241
M.M.J. Treacy and J.M. Gibson

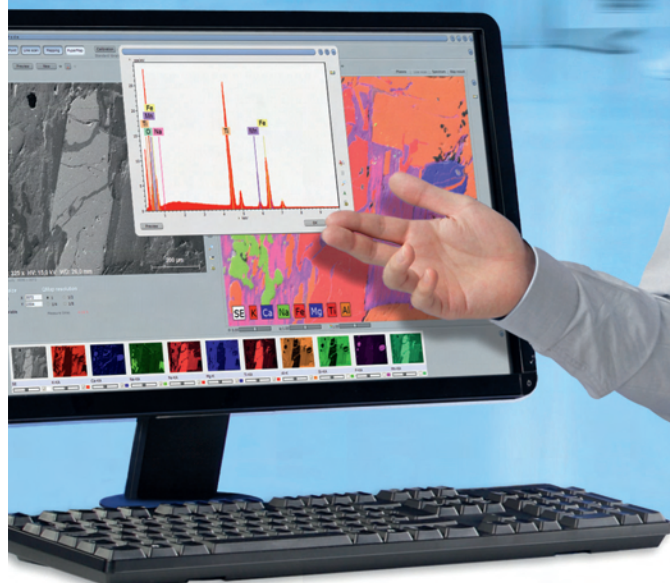
BOOK REVIEW

- Basic Confocal Microscopy*, Edited by Robert. L Price and W. Gray (Jay) Jerome. 254
John Oreopoulos

CALENDAR OF MEETINGS AND COURSES 256



QUANTAX – Ultimate EDS for SEM and TEM

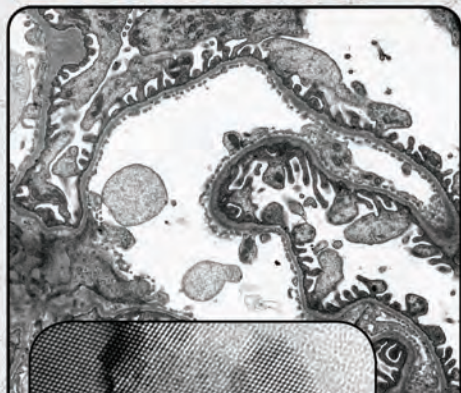


- Data collection at the highest speed and at the best resolution you can get – first class results no matter the circumstance
- Excellent light element performance with $\text{Mn K}\alpha \leq 123 \text{ eV}$ ($\text{F K}\alpha \leq 54 \text{ eV}$, $\text{C K}\alpha \leq 46 \text{ eV}$) even at 100,000 cps
- Best acquisition conditions for sensitive and rough samples through unique multi-detector systems and optimum geometry using VZ-Adapters
- Genuine standardless P/B-ZAF quantification for rough samples and VZ applications, Cliff-Lorimer quantification for TEM

www.bruker.com/microanalysis

SIA

1 TO 50 MEGAPIXELS live and slow scan
MAGNIFICATION FACTOR OF 1 on bottom mounted cameras
DIFFRACTION BEAM STOP on side mounted cameras



Affordable TEM camera systems for research, education, healthcare, and industry since 2001

Scientific Instruments and Applications
2773 Heath Lane • Duluth, GA 30096
(770) 232 7785 • www.sia-cam.com

SAVE THE DATE

M&M 2012

MICROSCOPY & MICROANALYSIS

July 29 – August 2 • Phoenix, AZ

Come To M&M 2012 And Discover What's NEW!

NEW— Ideas • Scientific Program • Schedule •
Convention Center • Hotels • Revitalized Downtown Phoenix!

Participate in Four Full Days of sessions, workshops, symposia, tutorials and networking events at the largest scientific meeting and gathering of microscopy and microanalysis professionals, academics, technicians, students and exhibitors in the world!