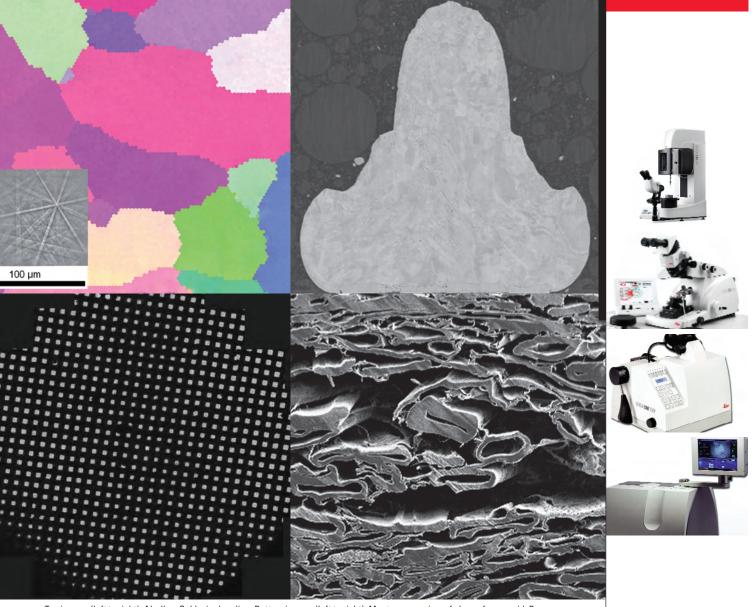
Microscopy and Microanalysis







Top images (left to right): Al-alloy; Gold wire bonding. Bottom images (left to right): Montage overview of plunge frozen grid; Paper.

Your Image Starts Here!

Innovative Sample Preparation for a Wide Range of Applications

Leica Microsystems offers the most comprehensive product portfolio for precise preparation of high-quality biological and industrial materials samples for TEM, SEM, LM, Confocal, and AFM. Our instruments meet the highest expectations for precision and ergonomy in the field of nanotechnology.

Sample Preparation for Every Need

Sectioning, processing, staining, planing, target polishing, ion milling, contrasting, high pressure freezing, cryo processing and transfer, coating and drying are all expertly addressed by one or more of our innovative instruments.

www.leica-microsystems.com

2010 Leica Microsystems, Inc. BNA#616

Living up to Life



Microscopyand Microanalysis

An International Journal for the Biological and Physical Sciences

THE OFFICIAL JOURNAL OF		4	
	MICROBEAM ANALYSIS SOCIETY MICROSCOPICAL SOCIETY OF CAN		
	SOCIÉTÉ DE MICROSCOPIE DU CA		
	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 MICROS	SCOPY	
PUBLISHED IN AFFILIATION WITH	ROYAL MICROSCOPICAL SOCIETY		
	GERMAN SOCIETY FOR ELECTRON		
	BELGIAN SOCIETY FOR MICROSCOF		
	MICROSCOPY SOCIETY OF SOUTHERN AFRICA		
Editor in Chief	Editor, Light and Scanning Probe	Special Issues and Reviews	
Editor, Biological Applications	Microscopies	Jay Jerome	
Robert L. Price	Brian Herman	Vanderbilt University Medical	
Department of Cell and Developmental	Cellular and Structural Biology	Nashville, TN 37232	

Biology and Anatomy School of Medicine University of South Carolina 6439 Garner's Ferry Road, Bldg. 1 B-60 Columbia, SC 29209 Phone: (803) 733-3392 Fax: (803) 733-3212 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 Phone: (480) 965-4540 Fax: (480) 965-9004 e-mail: david.smith@asu.edu

Editor, Materials Applications

Elizabeth Dickey Materials Science and Engineering Pennsylvania State University 223 MRL Building University Park, PA 16802-7003 Phone: (814) 865-9067 Fax: (814) 863-8561 e-mail: ecd10@psu.edu

University of Texas at San Antonio 7703 Floyd Curl Drive

San Antonio, Texas 78284-7762 Phone: (210) 567-3800 Fax: (210) 567-3803 e-mail: hermanb@uthscsa.edu

Editor, Biological Applications

Heide Schatten Veterinary Pathobiology University of Missouri-Columbia 1600 E. Rollins Street Columbia, Missouri 65211-5030 Phone: (573) 882-2396 Fax: (573) 884-5414 e-mail: schattenh@missouri.edu

Editor, Microanalysis

John Mansfield Electron Microbeam Analysis Lab North Campus, 417 SRB University of Michigan 2455 Hayward Ann Arbor, MI 48109-2143 Phone: (734) 936-3352 Fax: (734) 763-2282 e-mail: jfmjfm@umich.edu

s Editor Center 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. Edelmann 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



© MICROSCOPY SOCIETY OF AMERICA 2010

Editorial Board

Ralph Albrecht	University of Wisconsin, Madison, Wisconsin
Barry Carter	University of Connecticut, Storrs, Connecticut
Wah Chiu	Baylor College of Medicine, Houston, Texas
Niels de Jonge	Vanderbilt University School of Medicine
Alwyn Eades	Lehigh University, Bethlehem, Pennsylvania
Mark Ellisman	University of California at San Diego, San Diego, California
Pratibha Gai	University of York, United Kingdom
Marija Gajdardziska-Josifovska	University of Wisconsin-Milwaukee, Milwaukee, Wisconsin
Dale Johnson	University of South Florida, Tampa, Florida
Paul Kotula	Sandia National Labs, Albuquerque, New Mexico
William Landis	Northeastern Ohio Universities College of Medicine, Rootstown, Ohio
Eric Lifshin	SUNY at Albany, Albany, New York
Charles Lyman	Lehigh University, Bethlehem, Pennsylvania
Dale Newbury	National Institute of Standards and Technology, Gaithersburg, Maryland
Jean-Paul Revel	California Institute of Technology, Pasadena, California
Conly Rieder	Wadsworth Center, Albany, New York
Phillip Russell	Appalachian State University, Boone, North Carolina
John Silcox	Cornell University, Ithaca, New York
Nestor Zaluzec	Argonne National Laboratory, Argonne, Illinois

Editorial Board Representatives from Affiliated Societies

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

Founding Editor

Jean-Paul Revel

California Institute of Technology, Pasadena, California

Previous Editors-in-Chief

Dale Johnson	University of South Florida, Tampa, Florida
Charles Lyman	Lehigh University, Bethlehem, Pennsylvania

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.

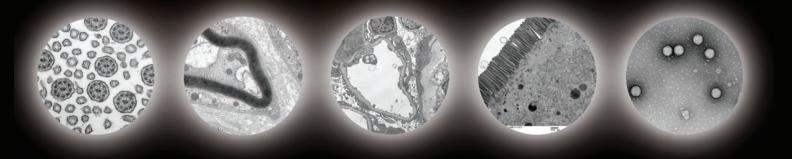
Instructions for authors submitting manuscripts may be found at journals.cambridge.org/MAM. Select "Further Information" then select "Instructions for Contributors." An abbreviated version of these instructions will be published in the first issue (February) of each volume.



High Definition Digital TEM Cameras with 1 to 16 Megapixels

- AMT SOLUTIONS
- Life Science Cameras
- Material Science Cameras
- Easy To Use Software
- Reliability and Services
- TEM Integration
- Extensive Support





3 Electronics Avenue, Danvers, MA 01923 • Phone: 978.774.5550 • www.amtimaging.com

Microscopy AND Microanalysis

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 double 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 \pounds 577.00 + VAT elsewhere. Institutions online only: US \$790.00 in the USA, Canada, and Mexico; UK \pounds 478.00 + VAT elsewhere. Institutions print only: US \$863.00 in the USA, Canada, and Mexico; UK \pounds 520.00 + VAT elsewhere. Individuals print and online: US \$359.00 in the USA, Canada, and Mexico; UK \pounds 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) 733-3392; 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.

© 2010 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.



Cooling Stages

Recirculating Heaters and Chillers

Film Thickness Monitors

Sputter Coaters

SEM/TEM Carbon Coaters

Glow Discharge Systems

RF Plasma Etchers/ Plasma Reactors

Critical Point Dryers

Freeze Dryers

Cryo-SEM Preparation

Evaporation Supplies



EMS is committed to providing the highest guality products along with competitive pricing, prompt delivery and outstanding customer service.

not just products...

Electron Microscopy Sciences is pleased to announce that a new brochure for electron microscope specimen preparation equipment is available, including 20 pages of articles reviewing electron microscope preparation techniques. These are:

- Sputter Coating Techniques and Applications
- · Silver as a Removable Coating for Scanning Electron Microscopy
- · Carbon Coating Techniques and Applications
- · Plasma Etching and Ashing Techniques and Applications · A summary of the Critical Point
- Drying Method
- Freeze Drying Principles
- · Cryo-SEM the Advantages

The new brochure as well as the EMS printed catalog and CD-ROM eBook can be ordered on line.

For more information, please visit our website at www.emsdiasum.com





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

https://doi.org/10.1017/S1431927610094262 Published online by Cambridge University Press

FREEDOM TO EXPLORE





An artistic rendering of an EFTEM spectrum image stack from a semiconductor sample. The data was acquired with a GIF Tridiem® energy filter using Gatan's EFTEM spectrum imaging software. The resulting data cube was rendered in GMS® 2.0. The extensive visualization tools and efficient large data set handling of GMS® 2.0 give you the freedom to explore data in new ways.

Microscopy and Microanalysis

An International Journal for the Biological and Physical Sciences

Volume 16, Number 6 December 2010

REVIEW ARTICLE

Contributions of Electron Microscopy to Understand Secretion of Immune Mediators by Human Eosinophils Rossana C.N. Melo, Ann M. Dvorak, and Peter F. Weller	653
SPECIAL SECTION FROM PORTUGAL MEETING Introduction Henrique Almeida	661
TEM Characterization of As-Deposited and Annealed Ni/Al Multilayer Thin Film S. Simões, F. Viana, A.S. Ramos, M.T. Vieira, and M.F. Vieira	662
Early Spreading and Propagation of Human Bone Marrow Stem Cells on Isotropic and Anisotropic Topographies of Silica Thin Films Produced via Microstamping A. Pelaez-Vargas, D. Gallego-Perez, N. Ferrell, M.H. Fernandes, D. Hansford, and F.J. Monteiro	670
Histological and Stereological Characterization of Brown Trout (Salmo trutta f. fario) Trunk Kiclney Albina D. Resende, Alexandre Lobo-da-Cunha, Fernanda Malhão, Filipa Franquinho, Rogério A.F. Monteiro, and Eduardo Rocha	677
Histochemical and Ultrastructural Characterization of the Posterior Esophagus of Bulla striata (Mollusca, Opisthobranchia) Alexandre Lobo-da-Cunha, Elsa Oliveira, Íris Ferreira, Rita Coelho, and Gonçalo Calado	688
Characterization of the Expression of Ang1, Ang2, and Tie2 in the Corpus Cavernosum of the Rat during Aging Ana Lúcia Cordeiro, António Figueiredo, Inês Tomada, Henrique de Almeida, and Delminda Neves	699
FLUORESCENCE AND CONFOCAL MICROSCOPIES Colocalization Analysis in Fluorescence Micrographs: Verification of a More Accurate Calculation of Pearson's Correlation Coefficient Andrew L. Barlow, Alasdair MacLeod, Samuel Noppen, Jeremy Sanderson, and Christopher J. Guérin	710

Christopher J. Guerin	
Measurement of Oxygen Diffusivity and Permeability in Polymers Using Fluorescence Microscopy Sanchari Chowdhury, Venkat R. Bhethanabotla, and Rajan Sen	725
Testate Amoebae Examined by Confocal and Two-Photon Microscopy: Implications for Taxonomy and Ecophysiology Zuzana Burdíková, Martin Čapek, Pavel Ostašov, Jiří Machač, Radek Pelc, Edward A.D. Mitchell, and Lucie Kubínová	735
Streamlined Embedding of Cell Monolayers on Gridded Glass-Bottom Imaging Dishes for Correlative Light and Electron Microscopy	747

Hugo H. Hanson, James E. Reilly, Rebecca Lee, William G. Janssen, and Greg R. Phillips

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



On the Cover: Electron tomography of Eosinophil Sombrero Vesicles (EoSVs). For details see Melo et al., pp. 653–660.

ATOMIC FORCE MICROSCOPY BIOLOGICAL APPLICATIONS

Unraveling the Role of the <i>rssC</i> Gene of <i>Serratia marcescens</i> by Atomic Force Microscopy	755
Bor-Ching Sheu, Chih-Chen Lin, Ying-Hsien Fu, Shih-Yuan Lee, Hsin-Chih Lai, Rung-Shin Wu, Chih-Hao Liu, Jui-Chang Tsai, and Shiming Lin	
A Multiscale Approach to Assess the Complex Surface of Polyurethane Catheters and the Effects of a New Plasma Decontamination Treatment on the Surface Properties Omar Mrad, Johanna Saunier, Caroline Aymes-Chodur, Véronique Rosilio, Sylvie Bouttier, Florence Agnely, Pascal Aubert, Jacky Vigneron, Arnaud Etcheberry, and Najet Yagoubi	764
Effect of the Insertion and Polymerization Technique in Composite Resin Restorations: Analysis of Marginal Gap by Atomic Force Microscopy Marcos Aurélio Bomfim da Silva, Guilherme José Pimentel Lopes de Oliveira, Josealdo Tonholo, José Ginaldo da Silva Júnior, Lucineide de Melo Santos, and José Ivo Limeira dos Reis	779
INSTRUMENTATION AND SOFTWARE	
DEVELOPMENTS	
New Electrostatic Phase Plate for Phase-Contrast Transmission Electron Microscopy and Its Application for Wave-Function Reconstruction Katrin Schultheiss, Joachim Zach, Bjoern Gamm, Manuel Dries, Nicole Frindt, Rasmus R. Schröder, and Dagmar Gerthsen	785
Simulating STEM Imaging of Nanoparticles in Micrometers-Thick Substrates H. Demers, N. Poirier-Demers, D. Drouin, and N. de Jonge	795
Gas Cascade Amplification in Ultra-High-Resolution Environmental Scanning Electron Microcopy Milos Toth, Bradley L. Thiel, and W. Ralph Knowles	805
Advantages of Clustering in the Phase Classification of Hyperspectral Materials Images Christopher L. Stork and Michael R. Keenan	810
Development of a New Quantitative X-Ray Microanalysis Method for Electron Microscopy Paula Horny, Eric Lifshin, Helen Campbell, and Raynald Gauvin	821
A Simple Algorithm to Eliminate Ambiguities in EBSD Orientation Map Visualization and Analyses: Application to Fatigue Crack-Tips/Wakes in Aluminum Alloys Vipul K. Gupta and Sean R. Agnew	831
BOOK REVIEW	
Handbook of Biomedical Nonlinear Optical Microscopy by Barry R. Masters and Peter T.C. So Susana A. Sanchez	842
CALENDAR OF EVENTS	843
Indexes	
Author Index	848
Subject/Keyword Index	850



EDS and EBSD for Nanoscience



- Unique ESPRIT TQuant software for quantification at low acceleration voltages (< 5 kV)
- Unmatched resolution at all energies (Mn K $\alpha \le$ 123 eV, F K $\alpha \le$ 54 eV, C K $\alpha \le$ 46 eV)

QUANTAX EDS for S/TEM

- Low weight, LN₂-free, large solid angle XFlash[®] SD Detector
- Optimum performance in conventional and Cs-corrected S/TEM

QUANTAX CrystAlign for EBSD

- High-speed indexing of 800 patterns/s (200 patterns/s simultaneous EBSD/EDS acquisition)
- Colored SEM images for better grain differentiation using forescattered electron detectors
- **NEW** dynamic simulation of diffraction patterns

www.bruker-nano.com

think forward

XFlash[®] 5000 series for SEM



XFlash® 5030T for S/TEM



e⁻*Flash*¹⁰⁰⁰⁺ EBSD Detector



EDS/EBSD

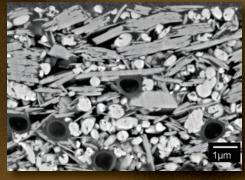
Cross Section Perfection

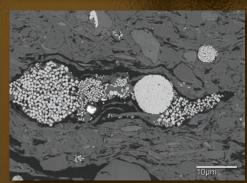
Wire Bond

Paper Coating

Oil Shale

Solar Thin Film





Prepare to be amazed.

Some materials simply defy cross sectioning for the SEM. For those of you who are making do with smearing, distortion, crumbling, and contamination, prepare to be amazed.

Paper, shale, solar thin films, yeast, latex beads, solder bumps and wire bonds are just a few difficult materials that our customers routinely and pristinely cross section with the JEOL ion beam Cross Section Polisher.

Send us your most difficult samples and we'll show you how to achieve cross sections without deformation. Need more proof? Visit our extensive gallery of images at www.jeolusa.com/CP2.

Another

solution from

978-535-5900



DIATOME DIAMOND KNIVES

40 YEARS of development, manufacturing, and customer service

What have we achieved in this period?

ultra 45° the first diamond knife with an absolutely score-free, hydrophilic cutting edge.

semi the first diamond knife for alternating sectioning ultrathin/semithin.

Cryo the diamond knife for sectioning at low temperature.

histo the first diamond knife for semithin sections for light microscopy.

ultra 35° the diamond knife for optimized sectioning results in almost all applications.

STATIC LINE II the ionizer for eliminating electrostatic charging in ultramicrotomy.

 $\ensuremath{\text{cryo-P}}$ a cryo knife with a patented platform for section pick up.

cryo immuno the optimized cryo diamond knife for the Tokuyasu technique.

ultra sonic the oscillating diamond knife for room temperature sectioning.

Cryotrim 45 and 25 optimizing trimming with diamond blades.

ultra AFM & cryo AFM the first diamond knives for AFM at room and low temperatures.

cryo 25° for sectioning frozen hydrated specimens.

What services can we offer you?

- Technical assistance in all fields of ultramicrotomy.
- · Free sectioning tests for all types of samples.
- Make use of our many years of experience in perfecting our knives.
- · Custom knives, tools, and boats.
- Special purchase programs.
- · Workshops and training.



P.O. Box 550 1560 Industry Rd. Hatfield, Pa 19440 Tel: (215) 412-8390 Fax: (215) 412-8450 email: sgkcck@aol.com www.emsdiasum.com





For more information, please call or write us today, or visit us online at: www.emsdiasum.com

Put the Knowledge and Experience of an EDS Expert to Work for You

...and Change the Way You do Analysis Forever

B Kα, 5i Kα...5 KV... ZAF > X?

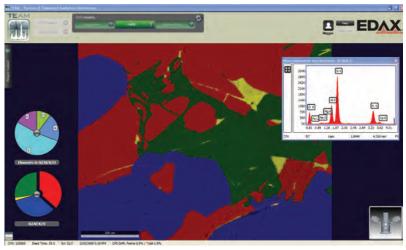
EDAX Introduces the New TEAM Analysis System-

Smart Features at Your Fingertips:

Smart Track – An Environmental Status Panel provides system data, monitors it, and notifies you of operating conditions for your detector, stage, column, and more

Smart Acquisition – Routine tasks can be automated, allowing you to make the most efficient use of your time

Smart Mapping – Map your sample immediately and obtain a complete elemental and phase analysis



TEAM Up with EDAX for SMART EDS Analysis. Visit our website at **www.EDAX.com/TEAMSMART** or call **1-201-529-4880**.



Visit us at MRS Booth 916



Flawless quality proven with one year guarantee.

MICRO STAR DIAMOND KNIVES 800 533 2509 FAX 936 294 9861 WWW.MICROSTARTECH.COM

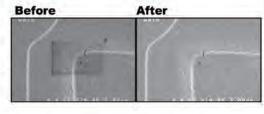
Evactron De-Contaminator

Helps you produce the BEST possible IMAGES



The Evactron De-Contaminator is a compact device which can be installed on any SEM or FIB and easily moved from tool to tool. It is ideal for labs with multiple systems.

Removes carbon contamination from SEM and FIB chambers with oxygen atoms. It has been proven to be safe and effective at providing better images on over 800 systems worldwide.



Only from

Comes with a five year factory warranty included with the purchase price.



XEI Scientific, Inc.

1755 East Bayshore Rd., Suite 17, Redwood City, CA 94063 Contact: PHONE 1.650.369.0133 or 1.800.500.0133 E-MAIL information@evactron.com Website: www.evactron.com

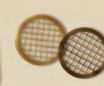


SPI Supplies.

The complete source for all your microscopy needs...

just a click away.





Visit SPI Supplies to view the complete on-line catalog with up-to-the-minute product and pricing information.



2spi.com

B

SPI Supplies Division of STRUCTURE PROBE, Inc.

P.O. Box 656 • West Chester, PA 19381-0656 USA

Phone: 1-610-436-5400 • 1-800-2424-SPI (USA and Canada) • Fax: 1-610-436-5755 • E-mail: sales@2spi.com