CALL FOR PAPERS
Abstract Submission Deadline: February 15, 2011
Up-to-date information www.microscopy.org/MandM/2011/

MICROSCOPY & MICROANALYSIS 2011
August 7-11 ★ Nashville Tennessee
November 2010

Fellow Microscopists/Microanalysts, Colleagues, Students, and Friends,

We would like to extend an invitation to you to join us at Microscopy & Microanalysis 2011 in Nashville, Tennessee from August 6-11. The M&M conference is the premier meeting, spanning the physical, life and analytical sciences, which brings together delegates from around the globe who report on the latest work and advances in microscopy and microanalysis. Our Program Committee has once again put together a compelling suite of over 30 symposia reflecting the current state-of-the-art, as well as the innovative and emerging fields of research. Whether your interest is in nanotechnology or traditional metallurgy, biology or clinical diagnosis, or the growing field of multifunctional hard/soft materials, you will find a fascinating venue. In addition to our thematic symposia, we also feature a range of educational opportunities ranging from “Back to the Basics” tutorials, to in-depth, multi-day intensive workshops, as well as the chance to network with your peers.

Our meeting will begin with a plenary session featuring Prof. Stefan Hell, who will be discussing super-resolution microscopy. We will also honor the winners of our major societal awards for distinguished scientists, professional technical achievement as well as student and post-graduate scholars.

Complementing the symposia is one of the largest exhibitions of microscopy/micro-analysis instrumentation and resources in the world, which includes access to our very popular evening vendor tutorials. In addition, the traditional Sunday Short Courses will be joined this year by a Pre-Meeting Specialist Workshop on Opportunities, Artifacts and Interpretation of Aberration-Corrected Electron Microscopy Data.

We encourage all of you, whether newcomers or veterans of M&M, to submit a paper on your latest research for presentation in Nashville. We are looking forward to greeting you at our opening Sunday Reception in the Music City for what we are sure will be an exciting and educational conference for all.

Sincerely,

Nestor J. Zaluzec, President
John Henry Scott, President
Frauke Hogue, President

Microscopy Society of America
Microbeam Analysis Society
International Metallographic Society

NOT A MEMBER? JOIN TODAY AND SAVE ON M&M 2011 REGISTRATION FEES!

Registration Opens February 1, 2011

Visit www.microscopy.org to join the Microscopy Society online, or call 1-800-538-3672 for more information about the benefits of MSA Membership.

Visit www.microbeamanalysis.org to join the Microbeam Analysis Society and find out information about MAS membership benefits.

Go to www.internationalmetallographicsociety.org for membership information on the International Metallographic Society.
Biological Sciences Symposia

B01 Super-resolution Microscopy – Principles and Practice
Jim Galbraith
Particular areas of focus will include:
• Hardware and software approaches to super-resolution
• Live cell superresolution imaging
• Multiple dimensions in super-resolution: 3D space, multicolor
• Super-resolution image analysis
• Probes for super-resolution imaging

B02 Near Field and Single Molecule in Life Sciences
Erik Sánchez and Jordon Gerton
This symposium will cover:
• The latest near-field work in the life sciences
• New developments in near-field techniques
• New plasmonic developments for near-field imaging
• Latest probe design
• Nanoparticle near-field spectroscopy and imaging

B03 TIRF Microscopy: Imaging Cell Biology and Molecular Dynamics at the Interface
Edward Stuenkel, Christian Merrifield, and David Perrais
This symposium will cover:
• -TIRF imaging of single molecule dynamics, in vitro and in situ
• Monitoring molecular actions at the membrane that drive cell shape and motility
• Quantifying dynamics of subcellular organelles adjacent to the cell membrane by TIRF
• Combining TIRF with FRET to define intermolecular dynamics with cell function
• Using TIRF to characterize mobility and clustering of integral membrane proteins

B04 Cilopathies In Different Organs and Organisms
Surya Nauli and Caroline A. Miller
This symposium will address:
• Research findings in ciliopathies
• The use of various imaging platforms to study cilia morphology and function from light to electron microscopy
• Basic and clinical research technical applications

Physical Sciences Symposia

P01 A.V. Crewe Memorial Symposium: From Images of Single Atoms to Single Atom Spectroscopy and Beyond
Mike Isaacson and Ondrej Krivanek
This symposium will cover:
• Development of the Field Emission STEM/SEM
• Atom Imaging
• Nanometer scale electron energy loss spectroscopy
• Aberration correction in the electron microscope

P02 Structural and Physical Properties of Thin Films, Interfaces, and Grain Boundaries
Klaus van Benthem and Naoya Shibata
This symposium will cover:
• Characterization of thin films, multi-layers and intergranular films
• Wetting/dewetting transitions of thin films
• Evolution of interface structures under external stress (temperature, electrical & mechanical stress, etc.)
P03 Microanalysis of Cement and Concrete Materials: State of the Art, Methodologies and Standardization
Luisa Amelia Dempere and Jeff Davis

The symposium will cover:
- Optical, X-ray, and synchrotron based analysis of cement and concrete
- Development of new quantitative techniques for cement/concrete analysis
- Development of new methods and instrumentation
- Concrete durability, chemistry and materials science

P04 Imaging and Spectroscopy of Carbon-based Nano-materials and Devices
Moon Kim and Ray Carpenter

This symposium will cover:
- Advanced characterization of carbon-based materials and devices, including carbon nanotubes and graphenes
- In-situ study of growth and properties of carbon-based nanostructures
- Low-voltage microscopy for carbon-based materials

P05 Imaging and Spectroscopy of Energy-related Nanomaterials
Frederic Cosandey and Jason Graetz

This symposium will cover:
- Structural and chemical analysis of nanomaterials for energy storage and conversion
- EELS chemical mapping of Li and identification of Li compounds
- Prospect of imaging Li with Cs-tunable TEM and STEM
- Interfacial phenomena in electrochemical systems
- In-situ techniques for electrochemical processes
- Heterogeneous catalysts and fuel cells
- Nanomaterials for hydrogen storage and carbon capture
- Thermoelectric and photovoltaic nanomaterials

P06 Failure Analysis: Applications of Electron and Optical Microscopy
Michael He, Gabe Lucas, and Dave Norfleet

This symposium will cover:
- Electron- and optical-based microscopy techniques utilized in failure analysis
- Metallography, fractography, spectroscopy, non-destructive evaluation (NDE)
- All length scales ranging from nano to macro
- Failures and forensic analyses from any field, including transportation, energy, microelectronics and defense.

P07 Microscopy and Microanalysis Applications in Cultural Heritage Research
John F. Mansfield, Ed Vicenzi, Cathy Selvius DeRoo

Topics will include:
- Applications of microscopy and microanalysis to cultural heritage research including optical microscopy, scanning electron microscopy (both high vacuum, variable pressure and environmental), transmission electron microscopy, scanning probe microscopy, X-ray energy dispersive spectrometry, energy loss spectroscopy, X-ray photoelectron spectroscopy, Auger electron spectroscopy and secondary ion mass spectrometry.
- Application areas may include:
  - Analysis of paintings and pigments.
  - Analysis of historic glasses, qualitative and quantitative.
  - Analysis of ceramics.
  - Examination of wear, tool-marks and other indications of usage.
  - Characterization of weathering and degradation of architectural materials, stone, brick, mortar.
  - Inspection of aging of manuscripts, textiles and photographic materials.

P08 Microscopy and Microanalysis Methods Applied to Joining Technologies
Paul Vianco and David Hillman

This symposium will cover:
- Joining technologies of soldering, brazing, diffusion bonding, welding, and new innovations.
- Materials, processes, and long-term reliability applications.
- Topical areas of commercial and military systems as well as energy generation and conversion.
- Research and development activities as well as case studies and failure analyses.
- All types of destructive and non-destructive analytical tools, including metallography, electron microscopy, as well as x-ray and electron elemental analysis techniques.

Instrumentation and Techniques Symposia

A01 EBSD Data Collection and Analysis on Challenging Materials and Applications
David Field, Steven Claves, and Scott Sitzman

This symposium will cover:
- EBSD data collection for materials which are difficult to index correctly. This includes: crystal structures with low symmetry, those possessing only minor differences in the lattice parameters, or distinguishing multiple phases that exhibit similar patterns.
- Sample preparation for materials that are challenging to prepare properly for quality EBSD data acquisition.
- Examination of small grain size materials or particles that are near the limits of the technique’s spatial or depth resolution.
- Analysis of structures for which a knowledge of small angular deviations is required, such as cross-correlation strain measurements.

A02 Opportunities and Advances for In-situ Experiments in Electron-Optical Instruments
Nestor Zaluzec, Blythe Clark, and Thomas Hansen

This symposium will cover:
- In-situ electron microscopy studies
- Instrument development/modification
- Using aberration corrected instrumentation in real world environments
- Innovative/creative studies in hard/soft materials and interfaces
- Monitoring nanoscale processes, such as catalysis, growth, phase transformations, deformation, and microstructural evolution

A03 Microanalysis at 60 Years: A Symposium Dedicated to Raimond Castaing
Paul Carpenter, Raynald Gauvin, Ed Vicenzi, and John Fournelle

This symposium will cover:
- Celebration of the inspiring and remarkable legacy of Raimond Castaing, inventor of the electron-probe microanalyzer
- Advances in EPMA, instrumentation, X-ray spectrometry, quantitative analysis, SIMS, techniques and applications
- Trends and future developments in microanalysis and microscopy

A04 Focused Ion Beam Symposium
Lucille Giannuzzi and Noel Smith

This symposium will cover:
- Applications and science of FIB to physical and life sciences
- Theoretical and experimental research on ion-solid interactions
- Advances in 2D and 3D FIB-based specimen preparation and analyses
- Nano and micro fabrication and prototyping using FIB techniques
- Advances in FIB e.g., light ions, high-current sources, mass-filtered sources, low-energy milling
A05 Advancing Data Collection and Analysis for Atom Probe Tomography
Brian P. Gorman and Karen T. Henry
This symposium will cover:
• Advances in data analysis and quantification of small volume variations in elemental chemistry
• New hardware and software methods for improving the spatial resolution of atom probe reconstructions
• Hardware and technique advancements for analysis of organic and insulating materials

A06 Advances in EELS and EFTEM
Gianluigi Botton and Peter A. van Aken
This symposium will cover:
• High-resolution EELS chemical analysis
• Low-Loss Spectroscopy for optical properties determination
• Theory for interpretation of spatially-resolved chemical analysis
• New instrumentation and methods

A07 Microanalysis Standards
Heather Lowers, Eric Steel, and Paul Carpenter
This symposium will cover:
• Obtaining, development of and existing microanalysis standards
• New community needs for standards such as LA-ICPMS & atom probe
• Improving interlaboratory calibration with standards

A08 Remote & Collaborative Instrument Operation for Research, Teaching and Maintenance
John F. Mansfield and Gary M. Brown
This symposium will cover:
• Development of advanced systems for remote operation.
• Remote operation for teaching and learning.
• Collaboratories, remote and collaborative operation for research.
• Remote monitoring and operation for instrumental service, trouble shooting and maintenance.

A09 Optimizing Imaging for Microanalysis: Realizing the Benefits of the New Detector Options
Brendan Griffin, David Joy, and Dale Newbury
This symposium will cover:
• Developments in conventional and in-lens secondary electron detectors
• Comparisons between conventional and angular-selective backscattered electron detectors
• Imaging with x-rays using Silicon Drift Detectors
• X-ray image resolution with field emission sources
• Energy-filtered SE imaging applications for microanalysis

A10 Advances in 3D Electron Microscopy
Niels de Jonge, Christian Kuebel, and Alioscka Sousa
This symposium will cover:
• New technological developments in 3D electron microscopy (EM)
• Applications in both biology and materials science
• Advances in tilt-series tomography, and single-particle reconstruction
• 3D EM using novel approaches such as phase plates, STEM tomography, focal-series STEM, and 3D FIB-SEM
• Advances in data processing, analysis, and structure prediction

A11 Effects of Metallurgical and Other Preparation Techniques on Microstructural Characterization
George Vander Voort, Sidnei Paciornick, and James Martinez
This symposium will cover:
• All sample preparation techniques including automated and manual metallography, ion-beam polishing techniques, chemical and electrolytic etching
• The effects of sample preparation on microstructural characterization
• Microscopy methods including light optical, SEM, EBSD, quantitative image analysis, etc., and the effects of sample preparation on those techniques
• Specimen preparation and characterization of metals and alloys, ceramics, composites and other material with emphasis on new materials or new techniques
• Effects of sample processing on microhardness and nano-indentation hardness

A12 Advances in Electron Crystallography for Materials Research
Sergei Rouvimov, Wolfgang Neumann, Chongmin Wang, and Peter Moeck
This symposium will cover:
• Advances in electron crystallography for organic and inorganic crystals
• Instrumentation for automated acquisition and handling of 3-dimensional electron diffraction data; automated crystal orientation and phase mapping in TEM
• Steps towards quantitative electron diffraction and 3D diffraction tomography in real and reciprocal space
• Structural refinement based on HRTEM images
• Nano crystallographic fingerprinting and crystallographic data processing.

A13 Microscopy, Microanalysis, and Image Analysis in the Pharmaceutical Sciences and Diagnostic Microscopy Organizers
Andrew Vogt, Cindy Smith, Phoebe Stewart, and Karen Weidenheim
This symposium will cover:
• Specialized technologies, themes for microscopists in diagnostic human, animal, & plant pathobiology
• Specialized technologies, themes for microscopists in pharmaceutical research & development
• Applications include biological and materials science
• Forum provided for sharing thoughts and strategies on issues in diagnostic & pharmaceutical labs
• Contributed papers for platform or poster presentations on related topics are welcome

A14 Current Equipment Funding Opportunities and Strategies for Success
Owen Mills, Christopher Gilpin
This symposium will cover:
• Major research instrumentation funding opportunities
• Grant application guidelines: follow the rules!
• Strategies for success: increasing funding prospects
• Do’s and don’ts in proposal preparation
• Lessons from successful and unsuccessful proposals

A15 Vendor Symposium: Tools for Science
Thomas Nuhfer and Stephen Mick
This symposium is designed for manufacturers and instrument vendors to showcase their new and improved products. Topics include:
• New developments and technologies
• Improvements for existing instrumentation
• Breakthroughs and new instruments

A16, A17, A18 Self-Assembled Sessions
Self-assembled sessions, organized among colleagues within a particular area of interest not addressed in the current slate of symposia, will be accepted depending on scientific interest as reflected by the quality and quantity of the contributed papers, and space and time availability during the meeting. Proposals for or questions regarding Self-Assembled Sessions should be directed to:

Program Chair, David Giovannucci at
MM2011ProgramChair@microscopy.org
no later than February 15, 2011

Click on www.microscopy.org for program details ★ Call for Papers
TOPIC LIST FOR CONTRIBUTED PAPERS

Organizers: Executive Program Committee

Potential contributed session topics in the three categories (Biological Sciences, Physical Sciences, and Instrumentation & Techniques) are listed below. Papers submitted to a topic that corresponds to an organized symposium will automatically be moved to that session. If a sufficient number of submissions on a topic are received, the Executive Program Group will organize a contributed session on that topic; if not, the papers will be redirected to the closest regular symposium.

Biological Sciences
C01 - Biological Sciences - General
C02 - Biological Sciences - Specimen Preparation
C03 - Biomaterials
C04 - Biomedical Applications
C05 - Botany
C06 - Cell Biology
C07 - Cytochemistry (Histochemistry, Immunocytochemistry, In-Situ Hybridization)
C08 - Cytoskeleton
C09 - Developmental / Reproductive Biology
C10 - Entomology
C11 - Histology
C12 - Live Cell/In-vivo Imaging
C13 - Macromolecules
C14 - Microbiology
C15 - Molecular Biology
C16 - Pathology
C17 - Structural Biology
C18 - Ultrastructure (Cells, Tissues, & Organ Systems)

Physical Sciences
C19 - Physical Sciences - General
C20 - Physical Sciences - Specimen Preparation
C21 - Catalysts
C22 - Ceramics
C23 - Films & Coatings
C24 - Geology / Mineralogy
C25 - Magnetic & Superconducting Materials
C26 - Metals, Alloys, Composites
C27 - Nanostructured Materials
C28 - Pharmaceuticals
C29 - Polymers
C30 - Semiconductors

Instrumentation & Techniques
C31 - Advances in Instrumentation and Technique- General
C32 - Electron Optics and Aberration Correction
C33 - Transmission/Scanning Transmission Electron Microscopy
C34 - Electron Diffraction (Transmission)
C35 - Electron Holography
C36 - Electron Tomography
C37 - Electron Spectroscopy/Imaging in the TEM/STEM
C38 - X-ray Spectroscopy/Imaging in the TEM/STEM
C39 - Scanning Electron Microscopy
C40 - Variable Pressure / Environmental SEM
C41 - Electron Backscatter Diffraction (EBSD)
C42 - X-ray Spectrometry / Quantitative X-ray Microanalysis (Bulk)
C43 - Cathodoluminescence
C44 - Spectral Imaging
C45 - In-situ / Environmental Experiments
C46 - Focused Ion Beam
C47 - Atom Probe Field Ion Microscopy
C48 - Scanning Ion Microscopy
C49 - X-ray Microscopy (TXM/STXM)
C50 - Scanning Probe Microscopy
C51 - Optical (Light) Microscopy
C52 - Confocal Microscopy
C53 - Multi Photon Excitation Microscopy
C54 - Optical Fluorescence Microscopy
C55 - Infrared and Raman Microscopy and Microanalysis
C56 - Correlative Microscopy
C57 - Digital Image Acquisition, Processing, and Analysis
C58 - Education in Microscopy and Microanalysis
C59 - Metallography and Metallographic Specimen Preparation
C60 - Failure Analysis
C61 - Forensic Science
C62 - Industrial "Real World" Microscopy
C63 - Core/User Facility Management
C64 - Corporate Session

PRE-MEETING WORKSHOP

Organizers: Philip Batson, David Muller, Lawrence Allard, Paul Voyles, Miofang Chi, and Mike O'Keefe

This workshop will be held Sunday, August 7 from 8:30 AM – 5:00 PM. Additional registration fees apply; please see M&M 2011 website for details. A certificate of participation will be issued to each participant.

Z-09 Opportunities, Artifacts and Interpretation of Aberration-Corrected Electron Microscopy Data

- Technological Advances (Corrector Designs, Phase Plates, CC correction, Low voltage)
- New Developments or Artifacts in Image Data (CTEM, STEM, SEM, Holography, Lorentz, Fluctuation Microscopy, Secondary Electrons)
- Innovations or Issues in Spectroscopy (EELS, XEDS, Spectral Imaging)
- Image Simulation and Interpretation: Aberration measurement using arbitrary sample areas, including single crystals, Stobbs Factor, methods for improved image simulation.
- Applications of ACEM to hard/soft materials and, especially, in-situ experiments

David Giovannucci, Advanced Microscopy & Imaging Center, University of Toledo College of Medicine. Organ slice of mouse salivary gland labeled for nuclei (blue), cytoskeleton (green), and nerve fibers (red); confocal image.
SUNDAY SHORT COURSES

Organizer: Mike Marko

- These full-day courses run from 8:30 AM to 5:00 PM on Sunday, August 7th.
- Additional registration fees apply; see M&M 2011 website for details.
- A certificate of participation will be issued to each participant.
- Morning and afternoon coffee breaks are included in your registration fee. Lunch is on your own from on-site concessions.

Biological Sciences

X-10 Cryo-preparation for Biological EM
Kent McDonald
- Observation and use of some of the newest equipment and techniques for low temperature sample preparation
- The best strategies for cryo-immobilization and cryo-substitution
- A live demonstration of high pressure freezing, plunge freezing, and cryosectioning
- Low-cost alternatives for some biological specimen preparation methods

X-11 Immunolabeling Technology for Light and Electron Microscopy
Caroline Miller
- Specimen preparation considerations for optimizing morphological preservation and labeling efficiency for either light microscopy, electron microscopy, or both
- Consideration of the location of the antibody target within the cell or on its surface
- Matching the localization technique to the antigen of interest
- Correlative techniques bridging light and electron microscopy

X-12 Live Cell Imaging Using Fluorescence Methods
Simon Watkins and Claudette St. Croix
- Optimization of the microscope system for live cell imaging
- How to get maximum data without killing or damaging cells
- Fluorophores and imaging methods as related to live cell imaging

X-13 Basic Confocal Light Microscopy
Jay Jerome and Bob Price
- Introduction and overview: types of confocal microscopes and their uses.
- Specimen preparation for biological confocal microscopy: fixation, processing, labeling, etc.
- Fluorescence in confocal microscopy: basic theory, dye characteristics
- Basic microscopy as related to confocal applications: basics of digital images, resolution in 2D and 3D.
- Confocal use in practice: component parts of the confocal microscope, proper set up of operating parameters.
- Getting the most from your images: matching parameters to maximize image information, image formats and their use.

X-14 Electron Microscopy of Macromolecular Assemblies
Teresa Ruiz, Michael Radermacher, and Stefan Birmanns
- Sample preparation: deep stain, vitreous ice
- Imaging conditions, low-dose imaging, tilt pair data collection
- Particle picking, alignment techniques and multivariate statistical analysis
- 3D reconstruction
- X-ray structure docking: rigid body and flexible fitting
- Applications in both biological and materials science

Multi-Disciplinary

X-15 Advanced Topics in the Theory and Use of Focused Ion Beam Tools
Joe Michael and Lucille Giannuzzi
- Low energy polishing techniques for advanced specimen preparation (TEM, atom probe, EBSD)
- Cryo and biological applications
- 3D FIB/SEM (microstructure, EDS, EBSD)
- Sample preparation for TEM
- Sample preparation for SEM
- Sample preparation for atom probe

X-16 Electron Tomography in Life and Material Sciences
Ilke Arslan and Andy Hoenger
- Basic principles of data collection and reconstruction
- Matching the imaging mode to the application
- Analyzing and visualizing the results

X-17 Imaging and Analysis with Variable Pressure or Environmental SEM
Brendan J. Griffin and Matthew Phillips
- Imaging with SE, BSE, CL, and EDX detectors
- Monitoring and optimizing instrument performance
- Use of charge-related contrast mechanisms
- Use of hot, cool, and cold stages
- Imaging uncoated specimens with ultra low kV and other beams (He, Ga)

X-18 An Introduction to Atomic Force and Scanned Probe Microscopies
Lou Germinario
- How does the AFM work?
- What types of forces are measured?
- How is nano-thermal analysis performed?
- How are vibrational spectroscopy and chemical information generated?
- What data can they produce?
- What can be done with the data?

X-19 Scientific Digital Imaging: Ethics and Execution
John Mackenzie
- Ethics of imaging
- Scientific image enhancement
- Handbook for Scientific Digital Imaging: starting point for standardization
- Scientific workflow including printing, archiving, and publication

Physical Sciences

X-20 Microscopy and Nanomechanical Characterization
Julia Nowak
- Fundamentals of nanomechanical testing
- In-situ characterization techniques
- Nanomechanical testing in the TEM and SEM
X-21 Advanced Electron Crystallography and Automated Crystal Mapping for Materials Applications  
Sergei Rouvimov, Peter Moeck, Wolfgang Neumann and Stavros Nicolopoulos  
- Introduction to electron crystallography  
- Instrumentation for automated electron diffraction data acquisition  
- Nano crystallographic fingerprinting  
- Crystallographic image processing  
- Applications of automated crystal orientation and phase mapping in materials research  

X-22 How to Organize and Run a Failure Investigation  
Daniel Dennis  
- How to get Organized Before You Start  
- Systematic Approach to Failure Analysis  
- Nine Step Process  
- Real Life Examples  

IN-WEEK INTENSIVE WORKSHOPS  
Organizer: Mike Marko  
- These in-depth courses will be held Monday-Thursday from 1:00 PM to 5:00 PM.  
- A certificate of participation will be issued to each participant.  
- Additional registration fees apply; see M&M 2011 website for details. (Course fee includes full registration to M&M 2011)  
- Afternoon coffee breaks included each day.  

X-23 Introduction to SEM Imaging And X-Ray Compositional Analysis  
David Joy and Brad Thiel  
- Instrument features  
- Operation basics  
- Spectral optimization  
- Sample preparation  

X-24 Nanomaterial Microscopy & Microanalysis: Tools and Preparation  
Phillip Russell and Donovan Leonard  
- Choosing the proper preparation technique  
- Minimizing the introduction of artifacts  
- Ensuring that representative samples are identified for subsequent analysis  
- Tools to be discussed:  
  - SEM, ESEM, and EBSD; FESEM: X-ray Microanalysis  
  - AFM: Imaging and Nanofabrication  
  - TEM and HRTEM; STEM/EELS: Nanoanalysis  
  - FIB: Sample Prep and Nanofabrication  

X-25 Theory and Techniques of Aberration-Corrected Microscopy  
Harald Rose, Mike O’Keefe, Andy Lupini, and Edgar Voekl  
- Theory of aberration correction and design of correctors  
- Atomic-resolution TEM: image formation and focal-series reconstruction  
- Atomic-resolution STEM: theory and practice  
- Holographic reconstruction methods and applications  

Frank Macaluso  
This session will cover:  
- Correlative Microscopy combines fluorescence microscopy with the high resolving power of electron microscopy  
- Correlative techniques enable the interrogation of live cells followed by ultrastructural examination of these same cells by electron microscopy.  
- Super-resolution fluorescence techniques including PALM and STORM are bridging the gap between LM and EM.  
- This symposium will explore the application of fluorescence imaging technologies and electron microscopy to reveal relationships between structure and function of complex biological events.  

X-27 Technologists’ Forum Roundtable: Fundamentals of Image Analysis  
Frank Macaluso  
- The format for this symposium is a short presentation from the experts followed by open discussion among the attendees.  
- Quantitative image analysis is now routine in laboratories utilizing microscopy.  
- Explore the application of popular programs for image analysis.  
- Hear from a panel of experts and share your experience in this roundtable discussion.
OTHER EDUCATIONAL OPPORTUNITIES

X-90 Microscopy in the Classroom: How to Use it and How to Teach It
Donovan N. Leonard and Sherry Cady
Local educators, school administrators, and registered conference attendees invited to participate. This symposium will cover:
• Curricula and pedagogy for introducing micro and nano-scale concepts to students at all levels
• Practical utilization of optical, electron and atomic force microscopes in the classroom
• Microscopy as a teaching tool for college students with no previous science learning experience.

X-91 It’s a Family Affair: CSI Nashville
Elaine Humphrey and Jarret Frafjord
This exciting session is designed to pique the scientific interest of children of all ages – no previous microscopy experience needed!
• It is for the delegates’ families and friends.
• Hands-on activities and demonstrations will prove that science is fun!
• Solve the mystery using clues left at the scene of the crime.
• Participants will have the opportunity to join in a guided tour of the exhibit floor and view samples left at the scene-of-the-crime on electron microscopes to solve the mystery.

PAPER SUBMISSION REQUIREMENTS & INFO

All papers must be submitted in electronic format only at the online submission portal located through:

www.microscopy.org/MandM/2011/

Please complete all the steps to ensure a valid submission.

PLEASE READ ALL INSTRUCTIONS CAREFULLY!

1. Register as a User at the Paper Submission Website (reached through the meeting home page above). Be sure to read all instructions about format and treatment of artwork and special characters.
2. Prepare your paper according to the Instructions for Authors in the next section. Your source file must be either Microsoft Word 2000 or later, or Adobe Acrobat PDF format, saved with NO document security, with all fonts and images embedded electronically.
3. Carefully review instructions for inserting graphics into your paper, for your particular software.
4. Complete an Author Data Form (online) for EACH PAPER at the time that the electronic file of your paper is submitted.
5. Ensure that all addresses are complete and that all co-authors are listed. Special A-V requests MUST be completed on this form.
6. Upload your paper when requested after completing the Author Data Form electronically.
7. Review and approve the final PDF version generated from the source file of your uploaded paper. [PLEASE NOTE: This requires that you revisit the paper submission website after you have uploaded your paper. You must verify that the PDF file is a faithful representation of your original.] Be sure to pay special attention to artwork and special characters.
8. Print the Author Data Acknowledgment Email with the electronically-assigned Paper Number and keep it for your records.
9. IF YOU NEED AN INVITATION LETTER FOR A VISA APPLICATION, BE SURE TO CHECK THE APPROPRIATE BOX.

Awards: Please see additional instructions for award application on Pages 10-11.

Receipt of submitted files will be acknowledged promptly by email. All papers will be reviewed by the Program Committee.

(Please go to Paper Submissions on the meeting website for a list of reasons for rejection.)

Submitting and presenting authors will be notified of session, room, day and time assignments on or around April 10, 2011.

Audio-Visual Equipment
All rooms will be equipped with a screen and LCD projector (projector will have multiple connections for laptops). Presenters MUST supply their own computer. Special A-V equipment requests must be indicated on the Author Data Form. All special requests (e.g. 35mm slide projector; overhead projector, VHS player, additional projector) will be accommodated as much as possible but cannot be guaranteed.

Presentation of Paper
Authors are responsible for presenting their paper(s). Presenters who are not able to attend the meeting must: 1) notify the Program Chair and Meeting Manager; and 2) arrange for a colleague or co-author to present the paper. Failure to do so may result in rejection of future submitted papers.

Posters
Papers will be assigned by the Program Committee to either a Platform or Poster presentation, unless “Prefer Poster” is selected on the Author Data Form. Authors will be notified of their assignment on or around April 10, 2011. Poster assignments will specify a presentation day; however, all posters are required to be displayed for the duration of the meeting. Poster presentation times each day are 3:30 – 5:30 PM.

Each poster will be allocated a 92” wide x 46” high display area. Authors must bring their own pins or Velcro hooks for mounting.

PLEASE NOTE: NO A-V equipment shall be provided for ANY poster presentations.
**AWARDS**

Please see below and online ([www.microscopy.org/MandM/2011/awards](www.microscopy.org/MandM/2011/awards)) for details regarding each specific award, criteria and prize(s). In order to be considered for the DSA and PSA, the appropriate box must be checked on the paper submission site. The email address of the person providing the supporting letter must be provided as well. (That person will be contacted via email and asked to submit their support letter via email.) All support letters must be received no later than February 15, 2011. All applicants will be notified of their awards status by March 24, 2011. Unsuccessful applicants are permitted to withdraw their papers by March 31, 2011.

**MSA Presidential Student Awards (PSA)**

**Criteria:**
- Applicants must be bona fide students at a recognized college or university at the time of the meeting (August 2011).
- Awards are based on the quality of the paper submitted for presentation at the meeting.
- Applicant must be the first author of the submitted paper.
- Paper must be submitted for platform presentation.
- Successful applicants must present their papers personally at the meeting in order to receive their award.
- Awardees are expected to attend and participate in the entire meeting.
- Please note: Former winners are ineligible for another award.

**Successful applicants will receive:**
- Complimentary full-meeting registration to M&M 2011 (includes proceedings and social event ticket)
- Invitation to the Presidential Reception
- Up to $1,500 for travel (lowest roundtrip airfare)
- Complimentary student housing accommodations

**Robert P. Apkarian Memorial Scholarship**

- Will provide support for two (2) post-doctoral students to attend M&M 2011.
- One (1) award designated for biological sciences.
- One (1) award designated for materials science, education or instrumentation.

**Criteria (In addition to satisfying all criteria above):**
- Applicant must be a full-time, post-doctoral student (open to both domestic U.S. and international candidates).
- Submission procedures must be followed as indicated above for Presidential Student Awards.
- A supporting letter must be received from a member of MSA, preferably the director or supervisor, attesting to the applicant’s status.
- Applicant must be a current member of MSA (dues paid through 2011).

**Successful applicants will receive:**
- Complimentary full-meeting registration to M&M 2011 (including proceedings & social event ticket)
- Invitation to the Presidents’ Reception
- Award plaque designating the Robert P. Apkarian Memorial Scholarship
- Limited travel and lodging support will be made available

**Eric Samuel Scholarship**

**Sponsored by**

**Criteria:**
- Satisfy all criteria for Presidential Student Awards
- Open to all bona fide students, including post-doctoral students.

**Successful applicants will receive:**
- Complimentary full registration for M&M 2011 (including proceedings & social event ticket)
- Invitation to Presidents’ Reception
- Up to $1,500 for lodging and travel (lowest available roundtrip airfare)
- Complimentary student (or equivalent) lodgings

**Raleigh & Clara Miller Scholarship Award**

**Criteria:**
- Applicant must be the first author of a paper submitted for platform presentation.
- Applicant must have been a student (undergraduate, graduate, post-doctoral) when work to be presented was done.
- Preference is for biological topics, but materials and technical projects will be considered.

**Successful applicants will receive:**
- $1,000 to attend the meeting.

**MSA Professional Technical Staff Awards (PTSA)**

(up to 4 awards given)

**Criteria:**
- Awards are designated for professional technical staff.
- Applicants must be regular, current members of MSA (dues fully paid for 2011).
- Awards are based on the quality of the paper submitted and are judged by the MSA Technologists’ Forum.
- Applicant must be the first author of the submitted paper.
- Successful applicants must present their papers personally at the meeting in order to receive their award.
- Awardees are expected to attend and participate in the entire meeting.
- Please note: Former winners are ineligible for another award. This category also includes the Raleigh and Clara Miller Awards.

**Successful applicants will receive:**
- Complimentary full-meeting registration to M&M 2011 (includes proceedings and social event ticket)
- Up to $600 for travel/lodging/meeting expenses
MAS Distinguished Scholar Awards (DSA)
Criteria:
• Applicants must be bona fide students at a recognized college or university at the time of the meeting (August 2011). This must be confirmed by a current member of MAS.
• Awards are based on the quality of the paper submitted for presentation at the meeting.
• Applicant must be the first author of the submitted paper.
• Successful applicants must present their papers personally at the meeting in order to receive their award.

Successful applicants will receive:
• Complimentary full-meeting registration to M&M 2011 (includes proceedings and social event ticket);
• Invitation to the Presidential Reception;
• Monetary contribution towards travel and lodging expenses.

MSA Student Poster Awards
Criteria:
• Presented for best posters in categories of:
  1. Instrumentation & Techniques;
  2. Applications of Microscopy & Microanalysis - Biological;
  3. Applications of Microscopy & Microanalysis - Physical.
• The first author of each awarded paper must be a student (contact information must be provided for someone who can verify student status).
• Awardees’ posters must be displayed at the M&M meeting from Monday through Thursday.

Prizes will be awarded in each category:
First Prize: $400; Second Prize: $200

Diatome Awards
Sponsored by DiATOME

Criteria:
Presented for the posters illustrating the best use of diamond-knife ultramicrotomy in either biological or physical sciences.

First Prize: One week, all-expense-paid trip to Switzerland
Second Prize & Third Prize: Swiss watches

IMS International Metallographic Contest
Criteria:
• The contest embraces 11 classes representing various materials and methods revealing structure such as microphotography, optical and electron microscopy, and unique techniques.
• In general, an exhibit should tell a story about a problem and how it was solved.
• For complete requirements, detailed rules, and submission procedures, visit http://www.internationalmetallographicsociety.org/contest.html or contact the Contest Chair, Alice Kilgo (ackilgo@sandia.gov).

Prizes will be awarded in each category.
First Prize: $200;
Second Prize: $100;
Third Prize: $50;
Best in Show Prize: $3,000

All entries must be received by July 22, 2011 and should be sent to:
James Wittig
Vanderbilt University
5617 Stevenson Center
Nashville, TN 37232

MSA Micrograph Competition
Sponsored by Microscopy Society of America

Held at the M&M Meeting each year, this micrograph competition promotes the innovative blending of art and science. Open to all forms of microscopic imaging, winners of this competition are selected on the basis of artistic merit and general audience appeal. A maximum of three (3) awards will be presented.

Criteria:
• Entries must be scientifically significant
• Entries must contain novel information useful in resolving a scientific issue, and/or
• Present established information in a way that dramatically enhances its comprehension or interpretation.

Rules:
1. Any individual may submit a maximum of two (2) entries (one award per entrant).
2. Entries must have overall dimensions of 11” x 14” (horizontal or vertical), and be affixed to a stiff lightweight support (e.g. ¼” foam board). Micrographs may be mounted so that they have borders.
3. Each entry must have a separate text sheet with the title and a 200-word (max) description of the image, including the technique and its scientific significance. Text is recommended to be printed in 14-pt Times New Roman font on a separate 8 ½” x 11” sheet. Entrant’s name, address and image title shall be posted on the back of the mounted entry(ies).
4. Entries must be brought to the meeting and mounted on the display boards by 12:00 noon on Monday, August 8, 2011. Non-winning entries must be removed Thursday afternoon by 3:00 PM. Micrographs remaining after that time will be discarded. Winning micrographs will be incorporated into the MSA Traveling Poster Exhibit for 2011-2012, and will be returned to the owner during the summer of 2012. Winners will be announced at the meeting. Submitted micrographs remain the property of the entrants subject to the conditions above.

First Prize: $200; Two Second Prizes: $50 each.

Lukasz Boron, Foundry Research Institute, Cracow, Poland. Duplex steel, etched with LBI, mag. 50x, bright field.
MICROSCOPY & MICROANALYSIS 2011
August 7-11 ★ Nashville Tennessee
Registration Opens February 1, 2011!
www.microscopy.org/MandM/2011/register.cfm
Housing Opens February 2, 2011!
Be sure to book your room early!
M&M 2011 has room blocks at several downtown Nashville hotels.

Nashville – Music Calls Us Home

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as of 10/1/2010

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