

M&M 2014

MICROSCOPY & MICROANALYSIS

AUGUST 3 – 7 • HARTFORD, CT

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Future Meeting Dates



July 24–28, 2016 **Columbus, OH**



July 23–27, 2017 **St. Louis, MO**



August 5–9, 2018 **Baltimore, MD**



August 4–8, 2019 **Portland, OR**

Welcome from the Society Presidents

DEAR FELLOW MICROSCOPISTS, MICROANALYSTS, STUDENTS AND FRIENDS, we are pleased to have you attend Microscopy & Microanalysis 2014, August 3–7 at the Connecticut Convention Center in historic Hartford, Connecticut. M&M, serving as the annual meeting of the Microscopy Society of America, the Microanalysis Society, and the International Metallographic Society, continues to be the premier meeting for scientists, technologists, and students who use microscopy or microanalysis in their research, with over 1,100 papers to be presented in 2014. Our joining societies are the Microscopical Society of Canada/ Société de Microscopie du Canada and the International Union of Microbeam Analysis Societies (IUMAS), which is holding its sixth meeting (IUMAS-6) in conjunction with M&M 2014.

The Program Committee for 2014 has assembled an exceptional, diverse scientific program featuring researchers from around the world presenting the latest advances in the biological and physical sciences, techniques and instrumentation. In synchrony with this remarkable program is one of the world's largest exhibitions of state-of-the-art microscopy and microanalysis instrumentation. In addition, there are several educational opportunities during M&M 2014, in particular the excellent Short Courses, a Pre-Meeting Congress on Quantitative Aberration-Corrected Electron Microscopy, both held on Sunday, as well as a number of tutorials, educational outreach events, and the always-popular evening vendor tutorials during the week.

If you are new to M&M or a longtime participant, we feel that M&M 2014 is the perfect place to network with others in your field, to learn the newest techniques, to see the latest exhibits, and to check out future job opportunities.

Sunday night's Opening Reception at the Connecticut Science Center provides an enjoyable start to the meeting. You can renew old friendships and make new acquaintances while enjoying a selection of locally sourced dishes and your favorite beverages. Museum exhibits will be open for you to visit.

The Monday morning plenary session will be highlighted by talks from two extraordinary researchers: Prof. Colin Humphreys who will discuss "How Cutting-edge Atomic Resolution Microscopy Can Help to Solve Some of the World's Energy Problems" and Prof. Brian J. Ford who will present "Living Images from the Birth of Microscopy". In addition, participating Societies will recognize major Meeting award winners as well as student, post-doc and technologist winners. During the week, there will be daily student poster awards acknowledging the talents of the best young researchers in instrumentation & techniques, and biological and physical applications of microscopy & microanalysis.

Hartford is an inviting location with hotels, shops, numerous restaurants and historical sites for your enjoyment. The strong science connection in Hartford influenced its most well-known resident, Mark Twain to write *A Connecticut Yankee in King Arthur's Court* about a time traveler. We hope the science presented at Microscopy & Microanalysis 2014 will inspire you to great things!

Have a wonderful week and we look forward to seeing you next year in Portland, Oregon!

Jeanette Killius
President, MSA



Kristin Bunker
President, MAS



Richard Blackwell
President, IMS

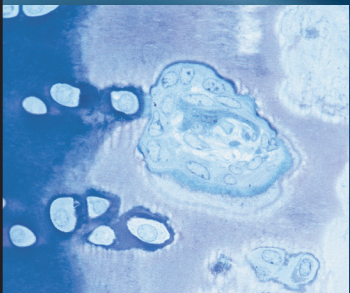


Anja Geitmann
President, MSC/SMC



Se-Ahn Song
President, IUMAS

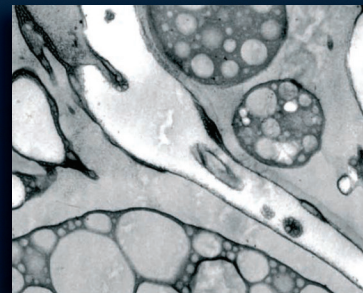
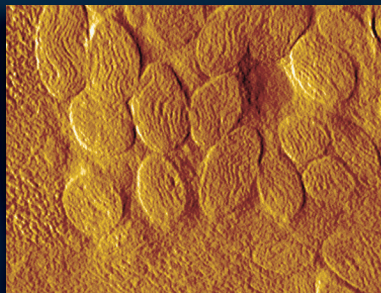




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doi:10.1017/S1431927614001366

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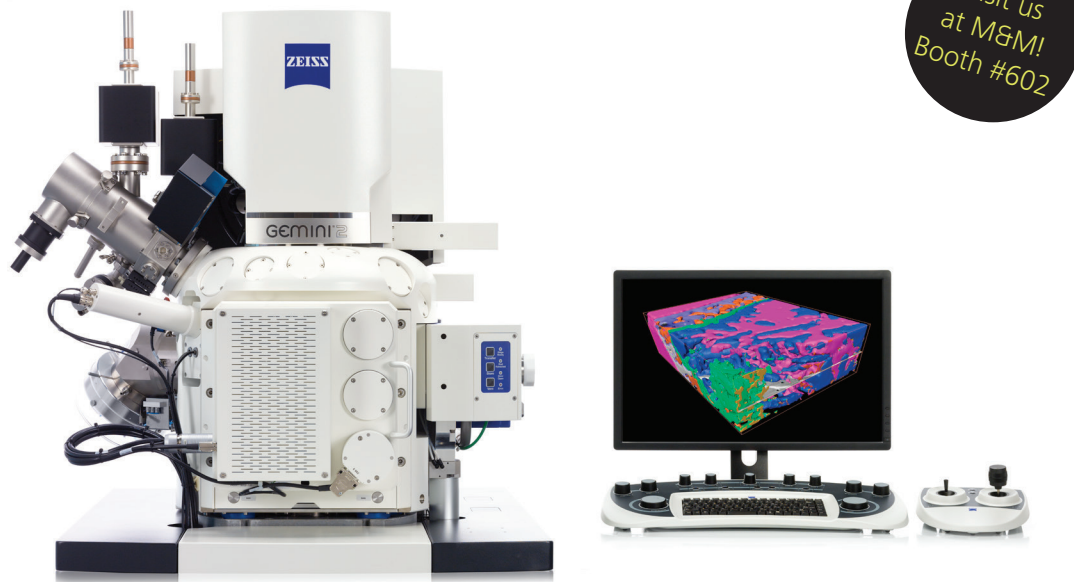
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Onsite Registration Desk

The Registration Desk at M&M 2014 is on the 2nd Level outside the Exhibit Hall in the Connecticut Convention Center (See *Floor Plan/Map on page 10*). Pick up your badge and materials at the Registration desk according to the schedule below. The Sunday Social starts at 6:30 pm at the Connecticut Science Center, next door to the Marriott Hotel.

ATTENDEE REGISTRATION HOURS

Friday, August 1	7 am – 5 pm
Saturday, August 2	7 am – 6 pm
Sunday, August 3	7 am – 8 pm
Monday, August 4	7 am – 6 pm
Tuesday, August 5	7:30 am – 5 pm
Wednesday, August 6	7:30 am – 5 pm
Thursday, August 7	7:30 am – 3 pm

SPEAKER/AWARDEE REIMBURSEMENT HOURS:

Sunday, August 3	7 am – 6 pm
Monday, August 4	8 am – 6 pm
Tuesday, August 5	8 am – 5 pm
Wednesday, August 6	8 am – 5 pm
Thursday, August 7	8 am – 4 pm

COMMERCIAL EXHIBITION HOURS:

Monday, August 4	12 pm – 5:30 pm
Tuesday, August 5	10 am – 5:30 pm
Wednesday, August 6	10 am – 5:30 pm
Thursday, August 7	10 am – 2 pm

EXCLUSIVE EXHIBITOR-ONLY REGISTRATION HOURS

Thursday, July 31	8 am – 5 pm
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EXHIBITOR MOVE-IN:

Thursday, July 31	8 am – 4 pm
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Targeted Island Booths Only

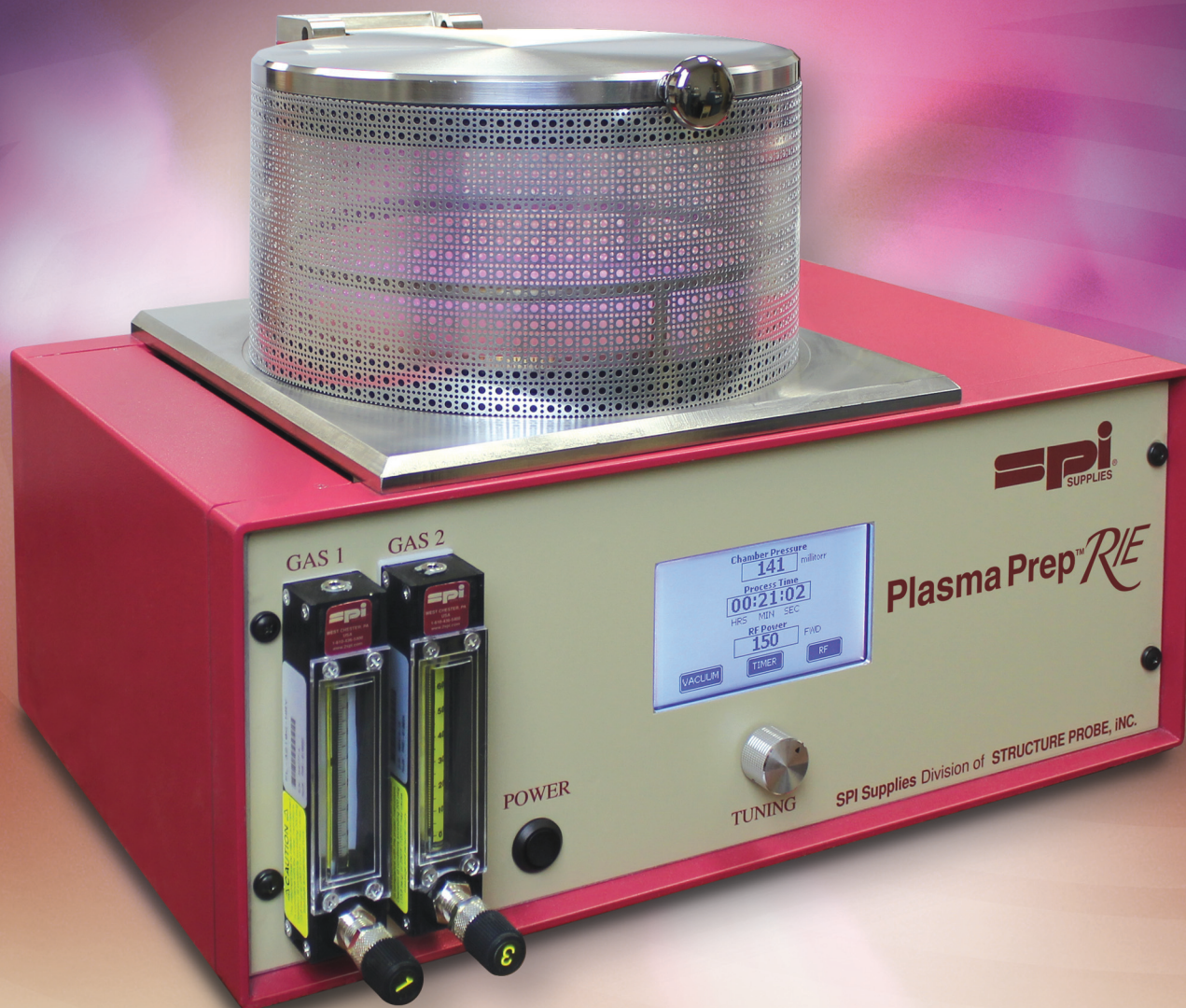
Friday, August 1	8 am – 4:30 pm
Saturday, August 2	8 am – 4:30 pm
Sunday, August 3	8 am – 4:30 pm

EXHIBITOR MOVE-OUT:

Thursday, August 7	2 pm – 7 pm
Friday, August 8	8 am – 5 pm



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Essential Meeting Information

ACCESSIBILITY

If you require special accommodation in order to participate fully in the meeting, please ask to speak with the meeting manager, or email MeetingManager@microscopy.org. Requests made after July 1 or onsite at the meeting will be accommodated as much as possible.

AWARDS

Major Society Awards for MSA, MAS and IUMAS, along with M&M Student Awards, will be presented at the Plenary Session on Monday morning. IMS Awards are presented at the IMS Awards Banquet on Wednesday evening (ticket purchase required). For detailed listings of all awards, criteria, and award winners, please visit <http://microscopy.org/MandM/2014/awards>.

CANCELLATION AND REFUND POLICY

Refund requests received prior to July 12, 2014 will be honored. No refunds will be issued for cancellations (for any reason) received after July 12, 2014 and no refunds will be issued on-site in Hartford, Connecticut. E-mail: MMRegistration@microscopy.org or fax (703) 964-1246 less a \$65 administrative fee.

FOOD FOR PURCHASE

Inexpensive, portable breakfast and snack items are available for purchase in the convention center (7:30 am – 10:30 am). Lunch concessions are available for purchase inside the exhibit hall during lunch hours (11:00 am – 2:00 pm).

HARTFORD & REGIONAL VISITOR INFORMATION

Stop by the Hartford City booth, to pick up local information, including maps, dining guides and tour info. Located on Level 1 of the Connecticut Convention Center, it's staffed during the meeting and stocked with visitor information on Hartford and surrounding areas.

INTERNET & E-MAIL

Free wireless internet is available inside the exhibit hall for M&M attendees in the Connecticut Convention Center. Check your email and surf the web at the Internet Café inside the M&M exhibit hall during exhibit hours (located next to the MSA MegaBooth). For more information on the MegaBooth, go to page 23.

JOB & RESUME POSTINGS/PLACEMENT

OFFICE (see MSA MegaBooth info on Page 23) Post your company's or department's job listing, peruse posted resumes for that perfect job candidate, or post your own resume. Take advantage of thousands of microscopists and microscopy companies all gathered in one place! Go to the MSA MegaBooth (Exhibit Hall) for details.

M&M 2015-PORTLAND LOCAL HOST COMMITTEE

The Portland Local Host committee is looking forward to welcoming M&M back next year! Stop by their booth to find out all the exciting and fun activities they are planning.

M&M 2015-MEETING & CITY INFORMATION

Get the inside scoop on all the great plans for next year's M&M Meeting in Portland, Oregon. The 2015 booth is staffed with a Travel Portland representative, and located in the main registration area on the exhibit hall level.

MSA MEGABOOTH [BOOTH # 1228]

See complete details on Page 23. Check out all that MSA has to offer its members and M&M attendees: Free Internet Café, book display from scientific publishers, updated information on the Certification Board, and a DVD Library. Register for the popular Vendor Tutorials, sign up for MSA Membership, check out recent editions of *Microscopy Today*, learn about Project MICRO, and join the Technologists' Forum.

PHONE NUMBERS & INFORMATION

- Connecticut Convention Center Main: 860-249-6000
- Connecticut Convention Center Exhibitor Services: 860-728-2640

<http://www.ctconventions.com/exhibitors/order-services/>

- Urgent Care –Concentra Urgent Care East Hartford (2 Miles from Conv Ctr): 860-289-5561

PROCEEDINGS

Conference Proceedings are distributed at Registration. All Full Meeting registrations include a free copy of the proceedings on DVD. Hard-copy proceedings are available for purchase through Cambridge University Press (allow several weeks for delivery). Inquire at the Registration Desk or log onto: <http://www.microscopy.org/MandM/2014/program/index.cfm>.

SOCIETY BOOTHS

MAS, IMS and MSC-SMC each have a membership and information booth located in the main registration foyer on the exhibit hall level. Sign up for membership, get information on Society events at or after the M&M Meeting, and find out all that the societies have to offer.

SMOKING POLICY

M&M 2014 is a smoke-free meeting. If you wish to smoke, you will need to go to designated outdoor areas.

VOLUNTEER ROOM

The volunteer & student bursary office is in Show Office B on the exhibit hall level (Hall B side). Check in here for volunteer assignments and sign-outs.



Service hours and info: www.cttransit.com

The DASH is a FREE Downtown circulator service. Please ask the shuttle driver which stop is best for your desired destination.

The DASH operates weekdays 7:00 a.m. to 7:00 p.m. The circulator route connects the Connecticut Convention Center, XL Center, Front Street District, along with some restaurants, hotels, attractions, meeting venues and parking areas. Hop on and off at any of the stops marked as a "DASH Shuttle Stop".

Extended service hours are 7:00 a.m. to 12:00 a.m. for August 1-7 2014.

All official conference events are being held at the Connecticut Convention Center and Hartford Marriott. The center and Marriott are connected, and located in the Adriatic's Landing district in downtown Hartford, with spectacular views of the Connecticut River.

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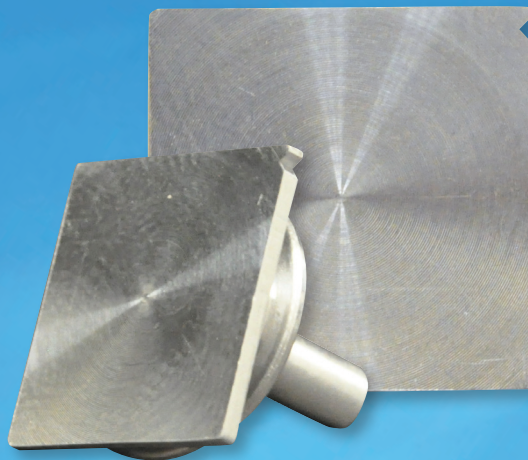
EM Coating Systems



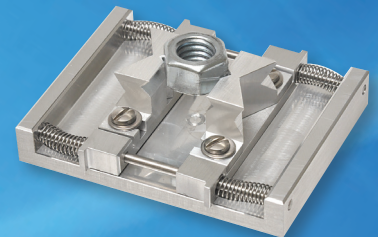
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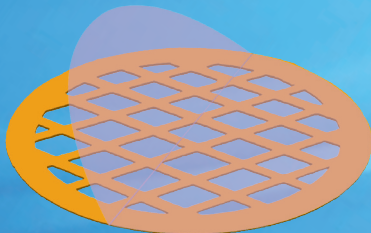
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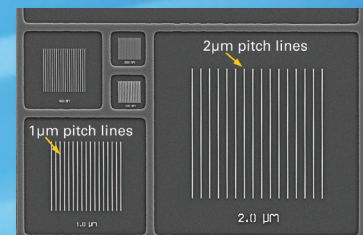
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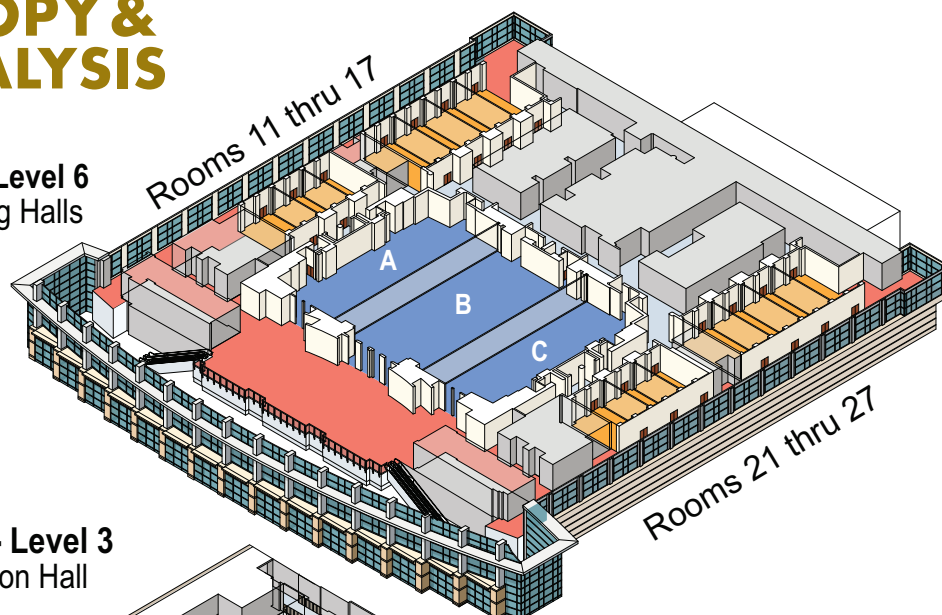
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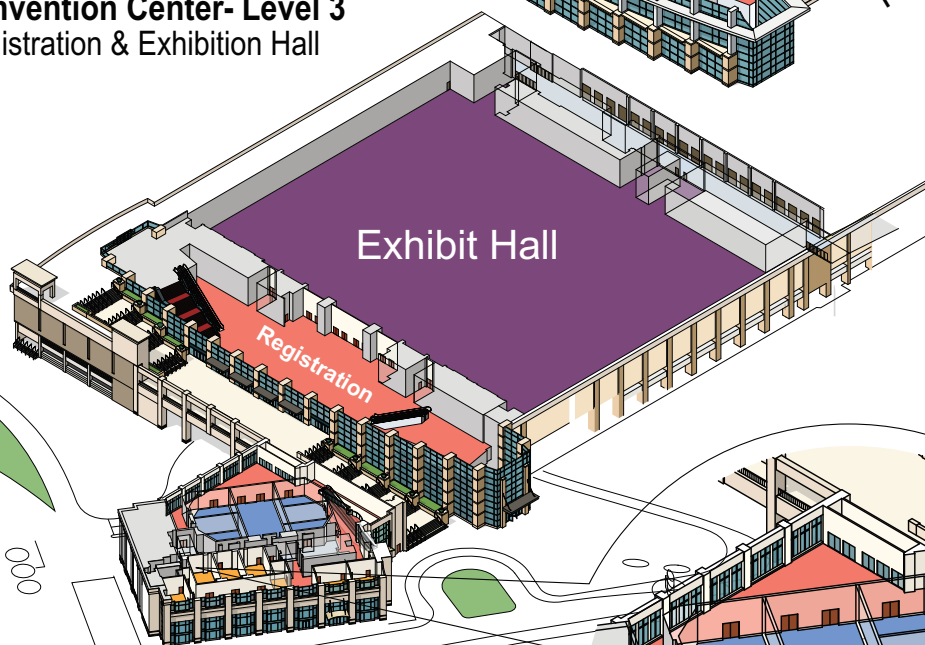
Hartford, Connecticut Convention Center

Convention Center- Level 6 Ballrooms and Meeting Halls

- Ballrooms A, B, C
- Meeting Rooms

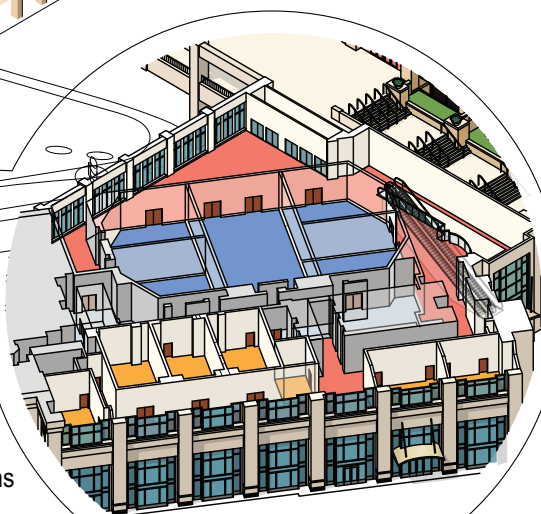


Convention Center- Level 3 Registration & Exhibition Hall



Marriott Hotel

- Ballrooms A, B, C, D, E
- Meeting/Conference Rooms





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M&M 2014 Meetings & Events Schedule

As of June 15. Please check the onsite program or your committee chair to confirm!

Event	Start Time	Room & Venue**
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FRIDAY, AUGUST 1, 2014

MSA Publications Committee	8 am	HM – Capital 2
MAS Council	9 am	HM – Capital 1
MSA Council	10 am	HM – Capital 2

SATURDAY, AUGUST 2, 2014

IMS Board of Directors	8:30 am	HM – Capital 1
IMS Poster Judging	9 am	HM – Ballroom A
MSA Council	9 am	HM – Capital 2
IUMAS-6 Luncheon & Vendor Presentations	12 pm	CCC – Ballroom C
IUMAS-6 Reception	5:30 pm	CCC – Ballroom C

SUNDAY, AUGUST 3, 2014

IUMAS-6 Luncheon & Vendor Presentations	12:30 pm	CCC – Ballroom C
MSC-SMC Council – Meeting & Lunch	1 pm	HM – Conf. Rm 4
Microscopy Today Editors	1 pm	HM – Conf. Rm 7
MaM Editors	3 pm	HM – Conf. Rm 7
Sunday Evening Social Event	6:30 pm	Connecticut Science Center

MONDAY, AUGUST 4, 2014

Technologists' Forum Board	7:15 am	HM – Conf. Rm 7
MaM Editorial Board	7:15 am	HM – Capital 3
FOM FIG "Lunch with a Facility Manager"	12:15 pm	HM – Capital 3
MAS Meal with a Mentor	12:15 pm	HM – Capital 1-2
MSA International Committee Meeting	12:15 pm	HM – Conf. Rm 5
MSA Fellowship & Awards Committee Meeting	12:15 pm	HM – Conf. Rm 4
Diagnostic FIG Meeting	12:15 pm	HM – Conf. Rm 7
IMS General Members' Meeting	2:30 pm	HM – Ballroom A
Technologists' Forum Business Meeting	3:30 pm	HM – Conf. Rm 7
MSC Member Social	5:30 pm	(See MSC Booth for Details.)
Student Mixer	5:30 pm	HM – Capital 1-2
Vendor Tutorials (<i>Sign Up at MSA MegaBooth</i>)	5:45 – 6:45 pm	CCC – Exhibit Hall
IMS Icebreaker	Visit IMS Booth for Details	

**CCC = Connecticut Convention Center HM = Hartford Marriott

M&M 2014 Meetings & Events Schedule

As of June 15. Please check the onsite program or your committee chair to confirm!

Event	Start Time	Room & Venue**
TUESDAY, AUGUST 5, 2014		
MSA Local Affiliated Societies' Breakfast	7:15 am	HM – Capital 1
Microscopy Today Editorial Board Meeting	7:15 am	HM – Capital 3
MSA-CUP Book Series Advisory Board Meeting	7:15 am	HM – Conf. Rm 7
M&M 2015 - Program Planning Meeting	10 am	HM – Ballroom A
FOM FIG Business Meeting & Lunch	12:15 pm	HM – Capital 1
MSA Distinguished Scientist Awardee Lectures	12:15 pm	HM – Ballroom A
Cryo-Preparation FIG Meeting	12:15 pm	HM – Conf. Rm 7
Environmental TEM FIG Meeting	12:15 pm	HM – Capital 2
Electron Crystallography FIG	12:15 pm	HM – Conf. Rm 4
FIG Business Meeting	3:30 pm	HM – Conf. Rm 7
MSA Education Committee Meeting	3:30 pm	HM – Capital 3
IUMAS Council Meeting	5:15 pm	HM – Capital 2
Symposium Organizers – Appreciation Event	5:30 pm	HM – Capital 1
Vendor Tutorials (Sign up at MSA MegaBooth)	5:45 pm	CCC – Exhibit Hall
Presidents' Reception (Invitation Only)	6:30 pm	Offsite

WEDNESDAY, AUGUST 6, 2014

MSA Certification Board	7:15 am	HM – Conf. Rm 4
MSA Membership Committee Meeting	7:15 am	HM – Conf. Rm 5
M&M 2015 Program Guide Meeting	8:30 am	HM – Conf. Rm 7
MAS - ANSI Meeting	12:15 pm	HM – Conf. Rm 5
MSA Members' Meeting	12:15 pm	HM – Ballroom B
MAS Affiliated Regional Societies	12:15 pm	HM – Capital 1
Atom Probe FIG Meeting	12:15 pm	HM – Conf. Rm 7
SMC – MSC Business Meeting	3 pm	HM – Capital 3
MAS Business Meeting	5:15 pm	HM – Capital 1-2
Post-Doc Reception & Mixer	5:30 pm	CCC – Room 13
Vendor Tutorials (Sign up at MSA Megabooth)	5:45 pm	CCC – Exhibit Hall
IMS Awards Banquet	6:30 pm - See IMS Booth for Details	
MAS/IUMAS-6 Social	7 pm - See MAS Booth for Details	

THURSDAY, AUGUST 7, 2014

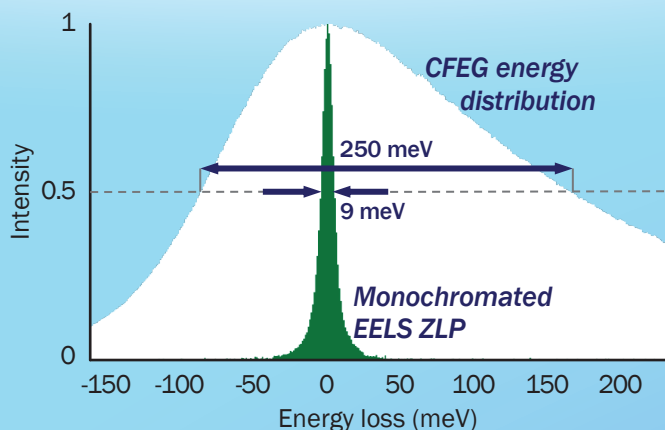
M&M Sustaining Members Meeting	8:30 am	CCC – Room 27
MSA Standards Committee Meeting	12 pm	HM – Conf. Rm 4
IUMAS-6 Closing Ceremonies	12:00 – 1:00 pm	HM – Capital 1-2
M&M 2014 Wrap-Up & Debrief	5:30 pm	CCC – Room 13

**CCC = Connecticut Convention Center HM = Hartford Marriott



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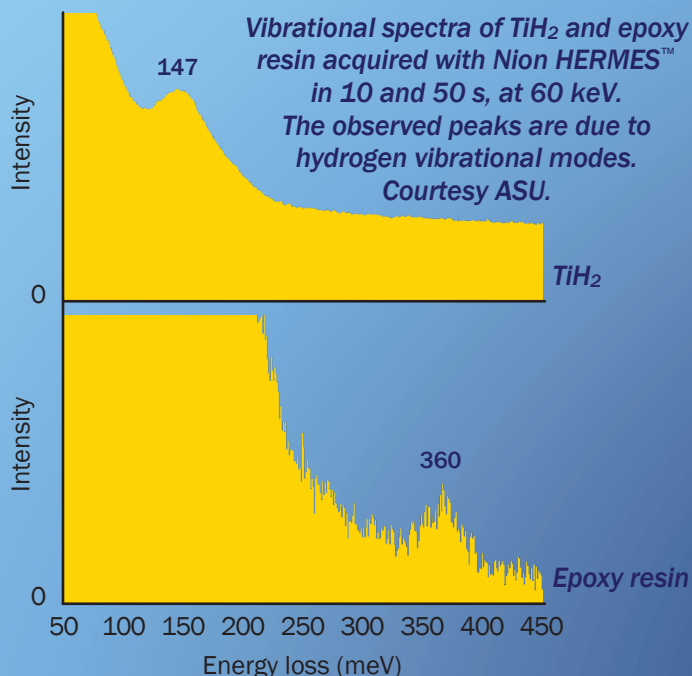
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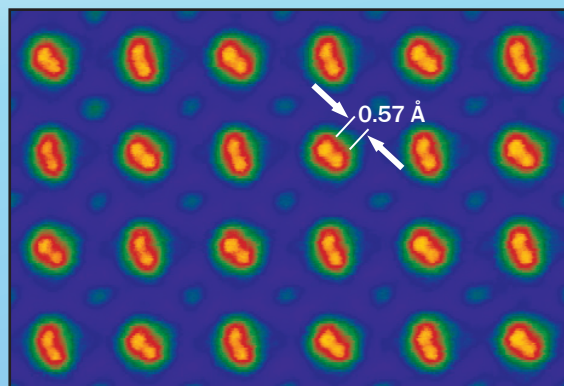
Zero loss peak (ZLP) acquired with Nion HERMES™, 10 ms, 60 keV primary voltage, compared to the unmonochromated ZLP. Courtesy Rutgers U.

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Week at a Glance

Friday, August 1

8 AM	MSA Publications Committee	HM – Capital 2
9 AM	MAS Council	HM – Capital 1
10 AM	MSA Council	HM – Capital 2

Saturday, August 2

8:30 AM	IMS Board of Directors	HM – Capital 1
9 AM	IMS Poster Judging	HM – Ballroom A
9 AM	MSA Council	HM – Capital 2
9 AM – 12 PM	IUMAS-6 Saturday Morning Workshops (see page 7 for details)	CCC – Rooms 11-16
12 PM – 1:30 PM	IUMAS-6 Luncheon <i>ticket required</i>	CCC – Ballroom 3
1:30 PM – 4:30 PM	IUMAS-6 Saturday Afternoon Workshops (see page 7 for details)	CCC – Rooms 11-16
5:30 PM – 7 PM	IUMAS-6 Opening Reception	CCC – Ballroom 3

Sunday, August 3

8:30 AM – 5 PM	IUMAS-6 Plenary Sessions (see page 7 for details)	CCC – Room 15, 16, 17
12 PM – 1:30 PM	IUMAS-6 Luncheon <i>ticket required</i>	CCC – Ballroom 3
8:30 AM – 5 PM	Pre-Meeting Congress (sponsored by ACEM FIG) Opportunities, Artifacts and Interpretation of Quantitative Aberration-Corrected Electron Microscopy	CCC – Room 11-12
8:30 AM – 5 PM	Sunday Short Courses	Locations:
	X10 - Cryo-Preparation for Biological EM	CCC – Room 21
	X11 - Immunolabeling Technology for Light and Electron Microscopy	CCC – Room 22
	X12 - 3D Electron Microscopy of Macromolecular Assemblies	CCC – Room 23
	X13 - Electron Tomography in Life and Materials Sciences	CCC – Room 24
	X14 - Imaging and Analysis with Variable Pressure or Environmental SEM	CCC – Room 25
	X15 - Advanced Focused Ion Beam Methods	CCC – Room 26
	X16 - Practical Considerations for Quantitative Image Analysis	CCC – Room 27
	X17 - Metallography for Failure Analysis	CCC – Room 13
	X18 - Advanced Electron Crystallography and Automated Crystal Mapping for Materials Applications	CCC – Room 14
1 PM	MSC-SMC Council – Meeting & Lunch	HM – Capital 1
1 PM	Microscopy Today Editors	HM – Capital 3
3 PM	MaM Editors	HM – Capital 3
6:30 PM	Sunday Evening Social Event	Connecticut Science Center

Monday, August 4

7:15 AM	MSA Awards Committee	HM – Conf. Rm
7:15 AM	Technologists' Forum Board	HM – Conf. Rm 7
7:15 AM	MaM Editorial Board	HM – Capital 3
8:30 AM – 12 PM	M&M 2014 Plenary Sessions	CCC – Ballroom AB
	Opening Welcome	
	Plenary Talk #1: <i>"How Cutting-Edge Atomic Resolution Microscopy Can Help to Solve Some of the World's Energy Problems"</i>	
	Nanomaterial Microscopy & Microanalysis: Tools and Preparation	
	MAS Awards Presentation	
	IMS Awards Presentation	
	SMC Awards Presentation	
	Coffee & Donuts Break	
	IUMAS-6 Awards Presentation	
	MSA Awards Presentation	
	M&M Meeting Awards Presentation	
	Plenary Talk #2: <i>"Living Images from the Birth of Microscopy"</i>	
12 PM – 1:30 PM	Lunch Break	CCC – Exhibit Hall
12 PM – 5:30 PM	EXHIBIT HALL OPEN	CCC – Exhibit Hall
12:15 PM	MAS Meal with a Mentor	HM – Capital 1-2
12:15 PM	FOM FIG "Lunch with a Facility Manager"	HM – Capital 3
12:15 PM	MSA International Committee Meeting	HM – Conf. Rm 5
12:15 PM	MSA Fellowship Committee Meeting	HM – Conf. Rm 4
12:15 PM	Diagnostic FIG Meeting	HM – Conf. Rm 7
1:30 PM – 3 PM	P.M. Symposia & Sessions	Locations:
	A01 - Oliver Wells Memorial Symposium on the Scanning Electron Microscope	CCC – Room 24
	A04 - Electron Holography at the Atomic Scale and the Nanoscale	HM – Ballroom B
	A07 - Microscopy and Spectroscopy for Power Generation and Storage	CCC – Room 15
	A16 - Correlative Microscopy and Microanalysis from Macro to Pico	CCC – Room 21
	A17 - Extended Crystal Defects: Quantifications of Strain, Local Atomic Structure and Chemistry	CCC – Room 12
	A18 - Vendor Symposium: New Tools for Life and Materials Sciences	CCC – Room 25
	B02 - Microbes and Microbial Communities	CCC – Room 17
	B06 - Microanalysis of Biological Materials	CCC – Room 23
	B08 - Optical, Confocal and Fluorescence Imaging	CCC – Room 27
	P02 - Advances in <i>In-situ</i> Microscopy	HM – Ballroom C
	P03 - Mineral Analyses from Laboratory to Spacecraft	CCC – Room 11
	P04 - Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges	CCC – Room 16
	P08 - Imaging and Analysis of Cultural Heritage Materials	CCC – Room 26
	X52 - BIO SCIENCE TUTORIAL: Super Resolution: What Technique Should I Use?	CCC – Room 13
	IMS Henry Clifton Sorby Award & Lecture	HM – Ballroom A

Week at a Glance

Monday, August 4 continued

3 PM – 5 PM	Monday Poster Presentations	CCC – Exhibit Hall
	A01 - Oliver Wells Memorial Symposium on the Scanning Electron Microscope	
	A04 - Electron Holography at the Atomic Scale and the Nanoscale	
	A07 - Microscopy and Spectroscopy for Power Generation and Storage	
	A17 - Extended Crystal Defects: Quantifications of Strain, Local Atomic Structure and Chemistry	
	A18 - Vendor Symposium: New Tools for Life and Materials Sciences	
	A19 - Facilities	
	B01 - Dr. Simon T. Gerard Memorial Symposium on Anatomic Pathology	
	B02 - Microbes and Microbial Communities	
	B06 - Microanalysis of Biological Materials	
	L01 - <i>Post-Deadline Poster Session</i>	
	P04 - Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges	
	P08 - Imaging and Analysis of Cultural Heritage Materials	
2:30 PM	IMS General Members' Meeting	HM – Ballroom A
3:30 PM	Technologists' Forum Business Meeting	HM – Conf. Rm 7
5:30 PM	MSC Member Social <i>See MSC Booth for Details</i>	
5:30 PM	Student Mixer	HM – Capital 1-2
5:45 – 6:45 PM	Vendor Tutorials <i>Sign Up at MSA MegaBooth</i>	CCC – Exhibit Hall
	IMS Icebreaker <i>Visit IMS Booth for Details</i>	

Tuesday, August 5

7:15 AM	MSA Local Affiliated Societies' Breakfast	HM – Capital 1-2
7:15 AM	Microscopy Today Editorial Board Meeting	HM – Capital 3
8:30 AM – 10 AM	A.M. Symposia & Sessions	Locations:
	A01 - Oliver Wells Memorial Symposium on the Scanning Electron Microscope	CCC – Room 24
	A02 - Advances in Imaging and Spectroscopy in STEM	CCC – Room 14
	A04 - Electron Holography at the Atomic Scale and the Nanoscale	HM – Ballroom B
	A07 - Microscopy and Spectroscopy for Power Generation and Storage	CCC – Room 15
	A15 - Cs-Correctors: Current State and Ongoing Developments	CCC – Room 22
	A16 - Correlative Microscopy and Microanalysis from Macro to Pico	CCC – Room 21
	A17 - Extended Crystal Defects: Quantifications of Strain, Local Atomic Structure and Chemistry	CCC – Room 12
	A18 - Vendor Symposium: New Tools for Life and Materials Sciences	CCC – Room 25
	B01 - Dr. Simon T. Gerard Memorial Symposium on Anatomic Pathology	CCC – Room 27
	B02 - Microbes and Microbial Communities	CCC – Room 17
	B06 - Microanalysis of Biological Materials	CCC – Room 23
	P02 - Advances in <i>In-situ</i> Microscopy	HM – Ballroom C
	P03 - Mineral Analyses from Laboratory to Spacecraft	CCC – Room 11
	P04 - Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges	CCC – Room 16
	P08 - Imaging and Analysis of Cultural Heritage Materials	CCC – Room 26
	P09 - Surface and Subsurface Microscopy and Microanalysis in Materials and Biological Systems	HM – Ballroom D

Tuesday, August 5 continued

8:30 AM – 10 AM	A.M. Symposia & Sessions continued X40 - PHYSICAL SCIENCES TUTORIAL: STEM_CELL: (S)TEM Software for Supercell Manipulation and Image Analysis X90 - Microscopy Outreach – Microscopy in the Classroom	Locations: CCC – Room 13 HM – Ballroom E
10 AM – 10:30 AM	Coffee Break - EXHIBIT HALL OPEN	CCC – Exhibit Hall
10 AM	M&M 2015 - Program Planning	HM – Ballroom A
10:30 AM – 12 PM	A.M. Symposia & Sessions continued A01 - Oliver Wells Memorial Symposium on the Scanning Electron Microscope A02 - Advances in Imaging and Spectroscopy in STEM A04 - Electron Holography at the Atomic Scale and the Nanoscale A07 - Microscopy and Spectroscopy for Power Generation and Storage A12 - 3D Imaging and Microanalysis: Image Analysis and Applications A15 - Cs-Correctors: Current State and Ongoing Developments A16 - Correlative Microscopy and Microanalysis from Macro to Pico A17 - Extended Crystal Defects: Quantifications of Strain, Local Atomic Structure and Chemistry A18 - Vendor Symposium: New Tools for Life and Materials Sciences B01 - Dr. Simon T. Gerard Memorial Symposium on Anatomic Pathology B06 - Microanalysis of Biological Materials P02 - Advances in <i>In-situ</i> Microscopy P03 - Mineral Analyses from Laboratory to Spacecraft P04 - Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges P08 - Imaging and Analysis of Cultural Heritage Materials P09 - Surface and Subsurface Microscopy and Microanalysis in Materials and Biological Systems X41 - PHYSICAL SCIENCES TUTORIAL: Imaging of Magnetic Structures in Scanning and Conventional TEM X90 - Microscopy Outreach – Microscopy in the Classroom	Locations: CCC – Room 24 CCC – Room 14 HM – Ballroom B CCC – Room 15 CCC – Room 17 CCC – Room 22 CCC – Room 21 CCC – Room 12 CCC – Room 25 CCC – Room 27 CCC – Room 23 HM – Ballroom C CCC – Room 11 CCC – Room 16 CCC – Room 26 HM – Ballroom D CCC – Room 13 HM – Ballroom E
12 PM – 1:30 PM	Lunch Break	
12:15 PM	FOM FIG Business Meeting & Lunch	HM – Capital 1
12:15 PM	MSA Distinguished Scientist Awardee Lectures	HM – Ballroom A
12:15 PM	Cryo-Preparation FIG Meeting	HM – Conf. Rm 7
12:15 PM	Environmental TEM FIG Meeting	HM – Capital 2
12:15 PM	Electron Crystallography FIG	HM – Conf. Rm 4
1:30 PM – 3 PM	P.M. Symposia & Sessions A01 - Oliver Wells Memorial Symposium on the Scanning Electron Microscope A02 - Advances in Imaging and Spectroscopy in STEM A07 - Microscopy and Spectroscopy for Power Generation and Storage A12 - 3D Imaging and Microanalysis: Image Analysis and Applications A15 - Cs-Correctors: Current State and Ongoing Developments A17 - Extended Crystal Defects: Quantifications of Strain, Local Atomic Structure and Chemistry	Locations: CCC – Room 24 CCC – Room 14 CCC – Room 15 CCC – Room 17 CCC – Room 22 CCC – Room 12

Tuesday, August 5 continued

1:30 PM – 3 PM	P.M. Symposia & Sessions continued	Locations:
	B03 - Nuclear Architecture and Chromatin Structure: 40 Years after the Nucleosome	CCC – Room 27
	B05 - Structural Biology and Ultrastructure	CCC – Room 21
	B07 - Light Sheet and Multi-Photon Imaging	CCC – Room 23
	P02 - Advances in <i>In-situ</i> Microscopy	HM – Ballroom C
	P03 - Mineral Analyses from Laboratory to Spacecraft	CCC – Room 11
	P04 - Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges	CCC – Room 16
	P07 - Microscopy and Characterization of Ceramics, Polymers and Composites	HM – Ballroom A
	P08 - Imaging and Analysis of Cultural Heritage Materials	CCC – Room 26
	P09 - Surface and Subsurface Microscopy and Microanalysis in Materials and Biological Systems	HM – Ballroom D
3 PM – 5 PM	X92 - Microscopy Outreach: Project MICRO	HM – Ballroom E
	Tuesday Poster Presentations	CCC - Exhibit Hall
	A02 - Advances in Imaging and Spectroscopy in STEM	
	A12 - 3D Imaging and Microanalysis: Image Analysis and Applications	
	A15 - Cs-Correctors: Current State and Ongoing Developments	
	A16 - Correlative Microscopy and Microanalysis from Macro to Pico	
	A17 - Extended Crystal Defects: Quantifications of Strain, Local Atomic Structure and Chemistry	
	B03 - Nuclear Architecture and Chromatin Structure: 40 Years after the Nucleosome	
	B07 - Light Sheet and Multi-Photon Imaging	
	B08 - Optical Topics	
3:30 PM	P02 - Advances in <i>In-situ</i> Microscopy	
	P03 - Mineral Analyses from Laboratory to Spacecraft	
	P06 - Failure Analysis of Structural Materials: Microscopy, Metallography & Fractography	
	P07 - Microscopy and Characterization of Ceramics, Polymers and Composites	
	X90 - Microscopy Outreach – Microscopy in the Classroom	
	FIG Business Meeting	HM – Conf. Rm 7
	MSA Education Committee Meeting	HM – Capital 3
	IUMAS Council Meeting	HM – Capital 2
	Symposium Organizers – Appreciation Event	HM – Capital 1
	Vendor Tutorials <i>Sign Up at MSA MegaBooth</i>	CCC – Exhibit Hall
6:30 PM	Presidents' Reception <i>Invitation Only</i>	Offsite

Wednesday, August 6

7:15 AM	MSA-CUP Book Series Advisory Board Meeting	HM – Conf. Rm 7
7:15 AM	MSA Certification Board	HM – Conf. Rm 4
7:15 AM	MSA Membership Committee	HM – Conf. Rm 5
8:30 AM	M&M 2015 Conference Publications Meeting	HM – Capital 3
8:30 AM – 10 AM	A.M. Symposia & Sessions	Locations:
	A02 - Advances in Imaging and Spectroscopy in STEM	CCC – Room 14
	A06 - Super Resolution Microscopic Methods	CCC – Room 11
	A07 - Microscopy and Spectroscopy for Power Generation and Storage	CCC – Room 15

Wednesday, August 6 continued

8:30 AM – 10 AM

A.M. Symposia & Sessions continued

Locations:

A09 - Frontiers in Analytical TEM-STEM	CCC – Room 22
A11 - Frontiers of Electron-Probe Microanalysis	CCC – Room 24
A12 - 3D Imaging and Microanalysis: Image Analysis and Applications	CCC – Room 17
A13 - Revealing and Characterizing the Microstructures of Metals and Other Engineered Materials	HM – Ballroom B
A17 - Extended Crystal Defects: Quantifications of Strain, Local Atomic Structure and Chemistry	CCC – Room 12
B05 - Structural Biology and Ultrastructure	CCC – Room 21
B10 - Microscopy, Microanalysis and Image Analysis in the Pharmaceutical Sciences	CCC – Room 23
P02 - Advances in <i>In-situ</i> Microscopy	HM – Ballroom C
P04 - Carbon Nanomaterials and Related Counterparts: Recent Results and Challenges	CCC – Room 16
P05 - Microanalysis of Irradiated Materials: Preparation, Instrumental Development and Analysis	CCC – Room 25
P06 - Failure Analysis of Structural Materials: Microscopy, Metallography & Fractography	CCC – Room 26
P07 - Microscopy and Characterization of Ceramics, Polymers and Composites	HM – Ballroom A
P09 - Surface and Subsurface Microscopy and Microanalysis in Materials and Biological Systems	HM – Ballroom D
X30 - Technologists' Forum Special Topics: Technical Approaches to Wide Field Fluorescence and Laser Scanning Confocal Microscopy	CCC – Room 27
X50 - Biological Sciences Tutorial: Filling the Missing Wedge	CCC – Room 13

10 AM – 10:30 AM

Coffee Break - EXHIBIT HALL OPEN

CCC – Exhibit Hall

10:30 AM – 12 PM

A.M. Symposia & Sessions continued

Locations:

A02 - Advances in Imaging and Spectroscopy in STEM	CCC – Room 14
A06 - Super Resolution Microscopic Methods	CCC – Room 11
A07 - Microscopy and Spectroscopy for Power Generation and Storage	CCC – Room 15
A09 - Frontiers in Analytical TEM-STEM	CCC – Room 22
A10 - X-ray Imaging	CCC – Room 12
A11 - Frontiers of Electron-Probe Microanalysis	CCC – Room 24
A12 - 3D Imaging and Microanalysis: Image Analysis and Applications	CCC – Room 17
B05 - Structural Biology and Ultrastructure	CCC – Room 21
B09 - Utilizing Microscopy for Research and Diagnosis of Diseases in Humans, Plants and Animals	CCC – Room 16
B10 - Microscopy, Microanalysis and Image Analysis in the Pharmaceutical Sciences	CCC – Room 23
P02 - Advances in <i>In-situ</i> Microscopy	HM – Ballroom C
P05 - Microanalysis of Irradiated Materials: Preparation, Instrumental Development and Analysis	CCC – Room 25
P06 - Failure Analysis of Structural Materials: Microscopy, Metallography & Fractography	CCC – Room 26
P07 - Microscopy and Characterization of Ceramics, Polymers and Composites	HM – Ballroom A
P09 - Surface and Subsurface Microscopy and Microanalysis in Materials and Biological Systems	HM – Ballroom D
X30 - Technologists' Forum Special Topics: Technical Approaches to Wide Field Fluorescence and Laser Scanning Confocal Microscopy	CCC – Room 27
X51 - Biological Sciences Tutorial: Getting the Most from your Direct Detection (DD) Camera for Low-Dose TEM	CCC – Room 13

12 PM – 1:30 PM

Lunch Break

12:15 PM

MAS - ANSI Meeting

HM – Conf. Rm 5

Wednesday, August 6 continued

12:15 PM	MSA Members Meeting	HM – Ballroom B
12:15 PM	MAS Affiliated Regional Societies	HM – Capital 1
12:15 PM	Atom Probe FIG Meeting	HM – Conf. Rm 7
1:30 PM – 3 PM	P.M. Symposia & Sessions	Locations:
	A02 - Advances in Imaging and Spectroscopy in STEM	CCC – Room 14
	A03 - TEM Phase Contrast Imaging in Biological and Materials Science	CCC – Room 23
	A05 - 15 Years of Focused Ion Beams at M&M	CCC – Room 17
	A08 - Nano-Characterization of Emerging Photovoltaic Materials and Devices	CCC – Room 15
	A09 - Frontiers in Analytical TEM-STEM	CCC – Room 22
	A10 - X-ray Imaging	CCC – Room 12
	A11 - Frontiers of Electron-Probe Microanalysis	CCC – Room 24
	A12 - 3D Imaging and Microanalysis: Image Analysis and Applications	CCC – Room 17
	A13 - Revealing and Characterizing the Microstructures of Metals and Other Engineered Materials	HM – Ballroom B
	A17 - Extended Crystal Defects: Quantifications of Strain, Local Atomic Structure and Chemistry	CCC – Room 12
	B05 - Structural Biology and Ultrastructure	CCC – Room 21
	B09 - Utilizing Microscopy for Research and Diagnosis of Diseases in Humans, Plants and Animals	CCC – Room 16
	P01 - Analytical Techniques and Their Application for the Study of Deformed Microstructures	CCC – Room 11
	P02 - Advances in <i>In-situ</i> Microscopy	HM – Ballroom C
	P05 - Microanalysis of Irradiated Materials: Preparation, Instrumental Development and Analysis	CCC – Room 25
	P06 - Failure Analysis of Structural Materials: Microscopy, Metallography & Fractography	CCC – Room 26
	P07 - Microscopy and Characterization of Ceramics, Polymers and Composites	HM – Ballroom A
	P09 - Surface and Subsurface Microscopy and Microanalysis in Materials and Biological Systems	HM – Ballroom D
	X31 - Technologists' Forum Roundtable Discussion: Doing Great Science on a Tight Budget	CCC – Room 27
	X91 - Microscopy Outreach – It's A Family Affair!	HM – Ballroom E
3 PM	MSC Business Meeting	HM – Capital 3
3 PM – 5 PM	Wednesday Poster Presentations	CCC – Exhibit Hall
	A02 - Advances in Imaging and Spectroscopy in STEM	
	A06 - Super Resolution Microscopic Methods	
	A07 - Microscopy and Spectroscopy for Power Generation and Storage	
	A09 - Frontiers in Analytical TEM-STEM	
	A11 - Frontiers of Electron-Probe Microanalysis	
	A12 - Atom Probe Tomography In Correlative Investigations	
	A13 - Microscopy and Microanalysis for Real World Problem Solving	
	B05 - Structural Biology and Ultrastructure	
	B09 - Diseases Topical Session	
	B10 - Pharma Topical Session	
	P02 - Advances in <i>In-situ</i> Microscopy	
	P05 - Microanalysis of Irradiated Materials: Preparation, Instrumental Development and Analysis	
	P07 - Microscopy and Characterization of Ceramics, Polymers and Composites	

Thursday, August 6 continued

5:15 PM	MAS Business Meeting	HM – Capital 1-2
5:30 PM	Post-Doc Reception & Mixer	CCC – Room 13
5:45 PM	Vendor Tutorials <i>Sign Up at MSA MegaBooth</i>	CCC – Exhibit Hall
6:30 PM	IMS Awards Banquet <i>See IMS Booth for Details</i>	
7 PM	MAS/IUMAS-6 Social <i>See MAS Booth for Details</i>	

Thursday, August 7

8:30 AM	M&M Sustaining Members Meeting	CCC – Room 27
8:30 AM – 10 AM	A.M. Symposia & Sessions	Locations:
	A02 - Advances in Imaging and Spectroscopy in STEM	CCC – Room 14
	A03 - TEM Phase Contrast Imaging in Biological and Materials Science	CCC – Room 23
	A05 - 15 Years of Focused Ion Beams at M&M	CCC – Room 17
	A08 - Nano-Characterization of Emerging Photovoltaic Materials and Devices	CCC – Room 15
	A09 - Frontiers in Analytical TEM-STEM	CCC – Room 22
	A10 - X-ray Imaging	CCC – Room 12
	A11 - Frontiers of Electron-Probe Microanalysis	CCC – Room 24
	A13 - Revealing and Characterizing the Microstructures of Metals and Other Engineered Materials	HM – Ballroom B
	A14 - Advances in Cathodoluminescence and Soft X-ray Microanalysis	CCC – Room 16
	B04 - Advances in Sample Preparation for Cryo-EM Studies	CCC – Room 25
	P01 - Analytical Techniques and Their Application for the Study of Deformed Microstructures	CCC – Room 11
	P02 - Advances in <i>In-situ</i> Microscopy	HM – Ballroom C
	P07 - Microscopy and Characterization of Ceramics, Polymers and Composites	HM – Ballroom A
	P09 - Surface and Subsurface Microscopy and Microanalysis in Materials and Biological Systems	HM – Ballroom D
10 AM – 12 PM	Coffee Break & Poster Session - EXHIBIT HALL OPEN	CCC – Exhibit Hall
10 AM – 12 PM	Thursday Poster Presentations	CCC – Exhibit Hall
	A02 - Advances in Imaging and Spectroscopy in STEM	
	A03 - TEM Phase Contrast Imaging in Biological and Materials Science	
	A05 - 15 Years of Focused Ion Beams at M&M	
	A08 - Nano-Characterization of Emerging Photovoltaic Materials and Devices	
	A10 - X-ray Imaging	
	A11 - Frontiers of Electron-Probe Microanalysis	
	A13 - Revealing and Characterizing the Microstructures of Metals and Other Engineered Materials	
	A14 - Advances in Cathodoluminescence and Soft X-ray Microanalysis	
	B04 - Advances in Sample Preparation for Cryo-EM Studies	
	P01 - Analytical Techniques and Their Application for the Study of Deformed Microstructures	
	P02 - Advances in <i>In-situ</i> Microscopy	
	P09 - Surface and Subsurface Microscopy and Microanalysis in Materials and Biological Systems	
12 PM – 1:30 PM	Lunch Break	

Week at a Glance

Thursday, August 7 continued

12 PM – 1 PM	MSA Standards Committee	
12 PM – 1 PM	IUMAS-6 Closing Ceremonies	HM – Capital 1-2
1:30 PM – 3 PM	P.M. Symposia & Sessions	Locations:
	A02 - Advances in Imaging and Spectroscopy in STEM	CCC – Room 14
	A03 - TEM Phase Contrast Imaging in Biological and Materials Science	CCC – Room 23
	A05 - 15 Years of Focused Ion Beams at M&M	CCC – Room 17
	A08 - Nano-Characterization of Emerging Photovoltaic Materials and Devices	CCC – Room 15
	A09 - Frontiers in Analytical TEM-STEM	CCC – Room 22
	A10 - X-ray Imaging	CCC – Room 12
	A11 - Frontiers of Electron-Probe Microanalysis	CCC – Room 24
	A13 - Revealing and Characterizing the Microstructures of Metals and Other Engineered Materials	HM – Ballroom B
	A14 - Advances in Cathodoluminescence and Soft X-ray Microanalysis	CCC – Room 16
	B04 - Advances in Sample Preparation for Cryo-EM Studies	CCC – Room 25
	B09 - Utilizing Microscopy for Research and Diagnosis of Diseases in Humans, Plants and Animals	CCC – Room 16
	P01 - Analytical Techniques and Their Application for the Study of Deformed Microstructures	CCC – Room 11
	P02 - Advances in <i>In-situ</i> Microscopy	HM – Ballroom C
3 PM – 3:30 PM	Coffee Break	
3:30 PM – 5 PM	P.M. Symposia & Sessions continued	Locations:
	A02 - Advances in Imaging and Spectroscopy in STEM	CCC – Room 14
	A03 - TEM Phase Contrast Imaging in Biological and Materials Science	CCC – Room 23
	A05 - 15 Years of Focused Ion Beams at M&M	CCC – Room 17
	A08 - Nano-Characterization of Emerging Photovoltaic Materials and Devices	CCC – Room 15
	A11 - Frontiers of Electron-Probe Microanalysis	CCC – Room 24
	A14 - Advances in Cathodoluminescence and Soft X-ray Microanalysis	CCC – Room 16
	B04 - Advances in Sample Preparation for Cryo-EM Studies	CCC – Room 25
	P02 - Advances in <i>In-situ</i> Microscopy	HM – Ballroom C
5:30 PM – 6:30 PM	M&M 2014 – Wrap-Up & Debrief (<i>invitation only</i>)	CCC – Room 13



MSA MegaBooth in the M&M 2014 Exhibit Hall

Open during all
exhibit hall hours

The **MSA MegaBooth** showcases all that MSA membership has to offer. If you are currently a member, stop by to catch up on all the new society developments. Member information available at Regular, Sustaining (corporate) and Student levels.

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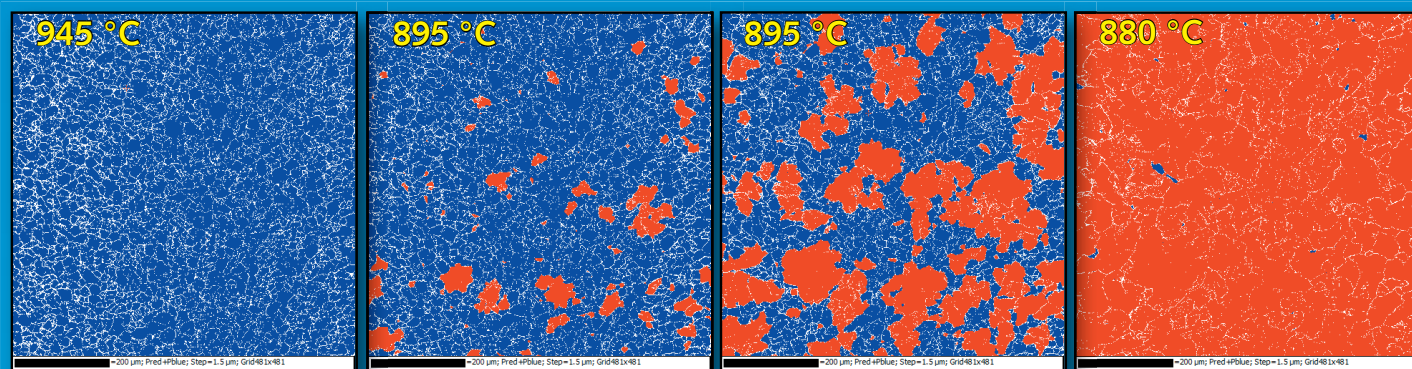
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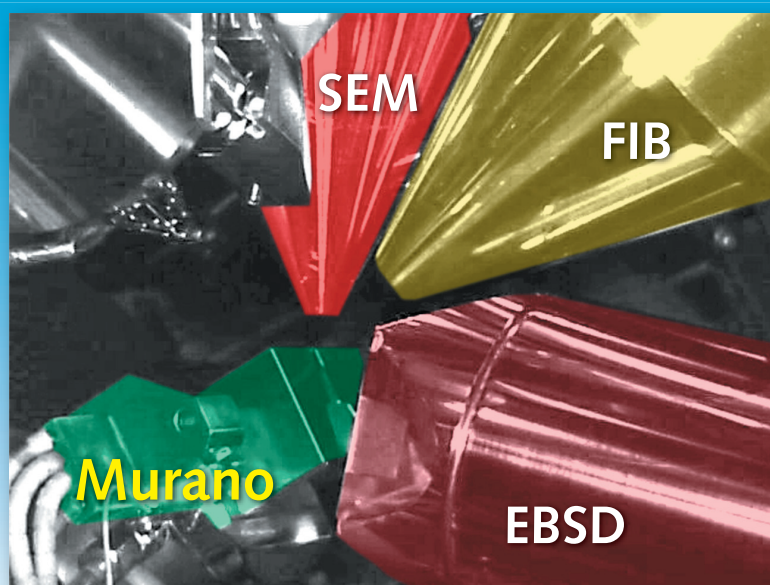
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Top Images: EBSD phase maps showing austenite to ferrite transformation from 945 °C to 880 °C, austenite is blue (dark) and ferrite is red (light). Measurements were taken using a single low carbon steel specimen heated to 945 °C then cooled at 1 °C per minute until the start of phase transformation was observed. Once transformation started, temperature was held to observe development of the phase change in individual grains before cooling resumed. Data courtesy of Dr. Singh Ubhi from Oxford Instruments. Bottom Image: SEM chamber view with EBSD, FIB, SED.



Murano Heating Stage

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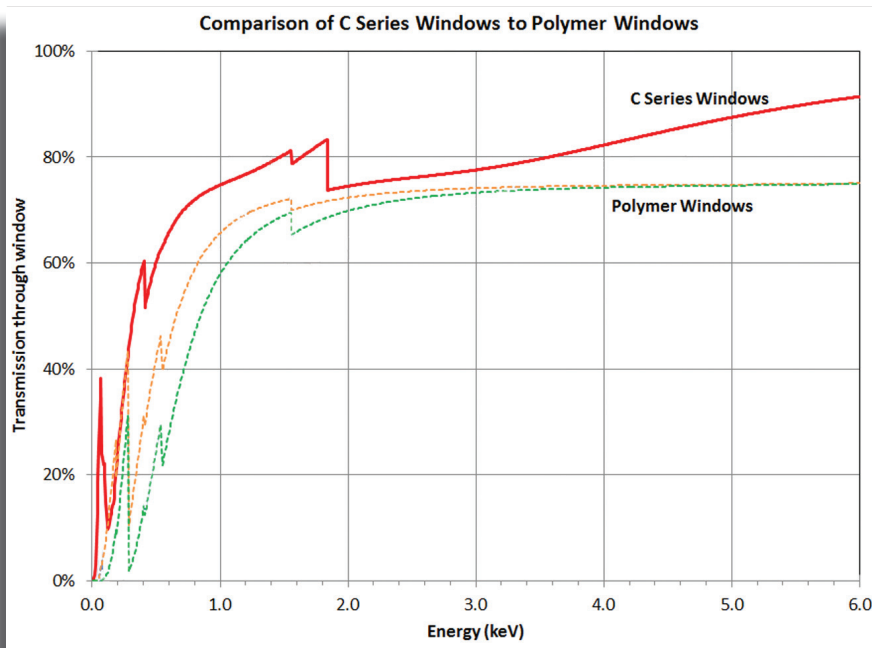
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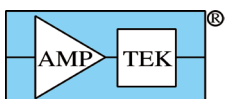


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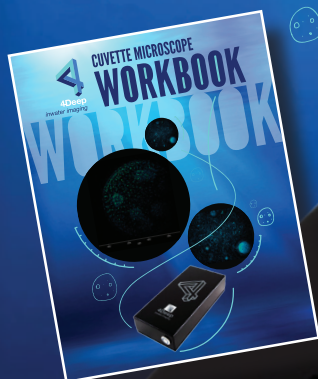


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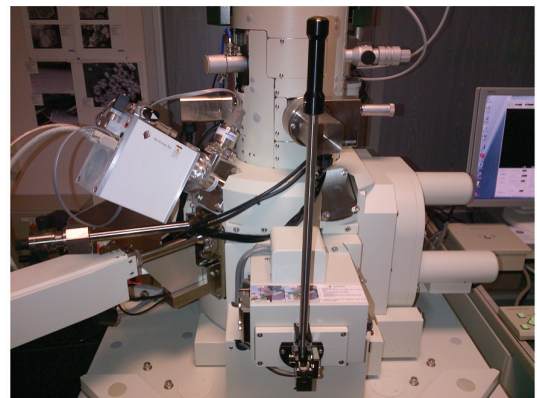
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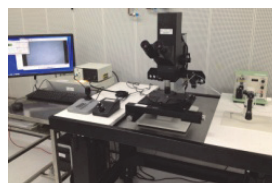
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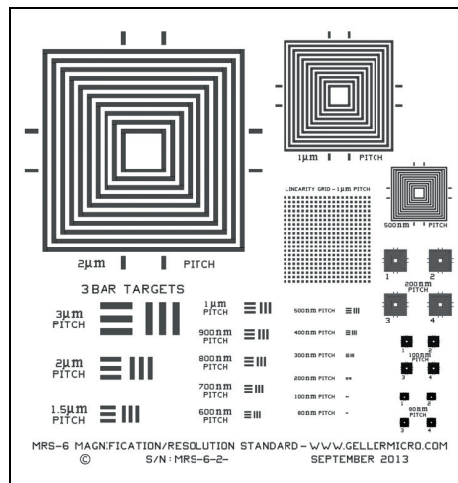
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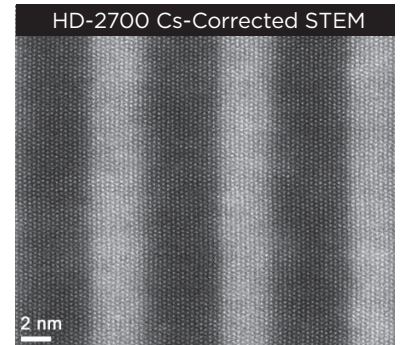
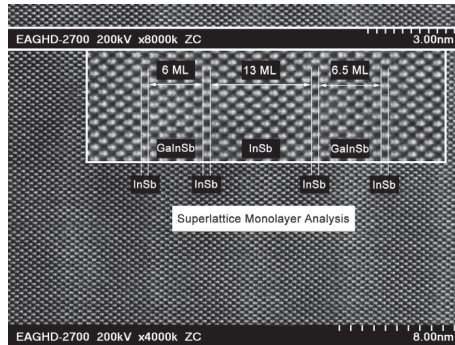
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