

Saturday, July 31

All times listed are Eastern Time

8:30 am – 5:00 pm

Pre-Meeting Congress

X60 - Pre-Meeting Congress for Early Career Professionals in Microscopy & Microanalysis

Sunday, August 1

8:30 am – 5:00 pm

Pre-Meeting Congress

X62 - Recent Developments in Advanced Imaging and Spectroscopy

8:30 am – 5:00 pm

Sunday Short Courses

X12 - Guidelines for Performing 4D-STEM Characterization from the Atomic to >Micrometer Scales: Experimental Considerations, Data Analysis and Simulation

X15 - Data Analysis in Materials Science

5:15 pm - 6:15 pm

Lens on Diversity

Monday, August 2

10:00 am – 11:30 am

M&M 2021 Biological Science Plenary Session

Opening Welcome

The 2021 Executive Program Committee is pleased to present a plenary session with lectures from Kizzmekia Corbett, PhD, and Jason McLellan, PhD.

COVID-19 Vaccine Developers

Kizzmekia S. Corbett, PhD

Coronavirus Vaccines & Immunopathogenesis Team,
Vaccine Research Center, National Institute of Allergy and Infectious Diseases,
National Institutes of Health

Jason McLellan, PhD

Department of Molecular Biosciences, Department of Chemistry,
College of Natural Sciences, University of Texas at Austin

11:30 am – 11:45 am

Break

11:30 am – 12:30 pm

Exhibit Hall Hour

11:45 am – 12:30 pm

Lens On Diversity

12:00 pm – 12:30 pm

Exhibitor Spotlight Sessions

12:30 pm – 1:30 pm

Platform Sessions

A01.1 - Diffraction Imaging Across Disciplines

A02.1 - Advances in Focused Ion Beam Instrumentation, Applications and Techniques in and Materials and Life Sciences

A03.1 - Microscopy and Microanalysis for Real World Problem Solving

A04.1 - New Frontiers in In-Situ Electron Microscopy in Liquids and Gases (*L&G EM FIG Sponsored*)

A06.1 - Full System and Workflow Automation for Enabling Big Data and Machine Learning in Electron Microscopy

A12.1 - Microscopy and Microanalysis of Biomineralized and Biomimetic Materials and Structures

B01.1 - 3D Structures: From Macromolecular Assemblies to Whole Cells (*3DEM FIG*)

M&M
2021

Week At-A-Glance

Monday, August 2 (Cont'd.)

12:30 pm – 1:30 pm	<p>Platform Sessions (Cont'd.)</p> <p>B05.1 - Imaging, Microscopy, and Micro/Nano-Analysis of Pharmaceutical, Biopharmaceutical, and Medical Health Products — Research, Development, Analysis, Regulation, and Commercialization (<i>FIG associated</i>)</p> <p>B06.1 - Multi-Modal Multi-Dimensional Microscopy</p> <p>P01.1 - Advanced Imaging and Spectroscopy for Nanoscale Materials Characterization</p> <p>P04.1 - Emerging Low-Dimensional Nanomaterials and Their Heterostructures</p> <p>P07.1 - Quantum Materials Probed by High Spatial and Energy Resolution in Scanning/Transmission Electron Microscopy</p> <p>P09.1 - Nanoscale X-ray and Electron Microscopy Techniques and Applications in Material Science</p> <p>P10.1 - Investigating Phase Transitions in Functional Materials and Devices by In Situ/Operando TEM</p> <p>P13.1 - Advanced Application of Atom Probe Tomography: Specimen Preparation, Instrumentation, and Data Analysis</p>
1:30 pm – 2:00 pm	Platform Session Networking
2:00 pm – 2:30 pm	Exhibitor Spotlight Sessions
2:30 pm – 3:30 pm	<p>Platform Sessions</p> <p>A01.2 - Diffraction Imaging Across Disciplines</p> <p>A02.2 - Advances in Focused Ion Beam Instrumentation, Applications and Techniques in and Materials and Life Sciences</p> <p>A03.2 - Microscopy and Microanalysis for Real World Problem Solving</p> <p>A04.2 - New Frontiers in In-Situ Electron Microscopy in Liquids and Gases (<i>L&G EM FIG Sponsored</i>)</p> <p>A06.2 - Full System and Workflow Automation for Enabling Big Data and Machine Learning in Electron Microscopy</p> <p>A12.2 - Microscopy and Microanalysis of Biomineralized and Biomimetic Materials and Structures</p> <p>B01.2 - 3D Structures: From Macromolecular Assemblies to Whole Cells (<i>3DEM FIG</i>)</p> <p>B05.2 - Imaging, Microscopy, and Micro/Nano-Analysis of Pharmaceutical, Biopharmaceutical, and Medical Health Products — Research, Development, Analysis, Regulation, and Commercialization (<i>FIG associated</i>)</p> <p>B06.2 - Multi-Modal Multi-Dimensional Microscopy</p> <p>P01.2 - Advanced Imaging and Spectroscopy for Nanoscale Materials Characterization</p> <p>P04.2 - Emerging Low-Dimensional Nanomaterials and Their Heterostructures</p> <p>P07.2 - Quantum Materials Probed by High Spatial and Energy Resolution in Scanning/Transmission Electron Microscopy</p> <p>P09.2 - Nanoscale x-ray and Electron Microscopy Techniques and Applications in Material Science</p> <p>P10.2 - Investigating Phase Transitions in Functional Materials and Devices by In Situ/Operando TEM</p> <p>P12.1 - Microscopy & Spectroscopy of Energy Conversion and Storage Materials</p> <p>P13.2 - Advanced Application of Atom Probe Tomography: Specimen Preparation, Instrumentation, and Data Analysis</p>
3:30 pm – 4:00 pm	Platform Session Networking
4:00 pm – 4:15 pm	Break
4:15 pm – 5:45 pm	Monday Poster Presentations & Networking
5:45 pm – 6:45 pm	Vendor Tutorials
6:00 pm – 7:00 pm	Student Mixer

Tuesday, August 3

10:00 am – 10:45 am	M&M 2021 Physical Science Plenary Session Opening Welcome The 2020 Kavli Prize in Nanoscience was awarded to Maximilian Haider, Ondrej Krivanek, Harald Rose, and Knut Urban for sub-ångström resolution and chemical analysis using electron beams. 2020 Kavli Awardee Ondrej Krivanek, PhD President, Nion Co. Affiliate Professor at Arizona State University
10:45 am – 11:45 am	Technologists' Forum, Tutorials, and Outreach X30 - Technologists' Forum Roundtable: Histology Helpline X41 - Physical Sciences Tutorial: Entrepreneurship in the Microscopy Community
10:45 am – 11:45 am	Platform Sessions A01.3 - Diffraction Imaging Across Disciplines A02.3 - Advances in Focused Ion Beam Instrumentation, Applications and Techniques in and Materials and Life Sciences A03.3 - Microscopy and Microanalysis for Real World Problem Solving A04.3 - New Frontiers in In-Situ Electron Microscopy in Liquids and Gases (<i>L&G EM FIG Sponsored</i>) A06.3 - Full System and Workflow Automation for Enabling Big Data and Machine Learning in Electron Microscopy B01.3 - 3D Structures: From Macromolecular Assemblies to Whole Cells (<i>3DEM FIG</i>) B10.1 - Cryo-EM at Local, Regional, and National Cryo-EM Centers B11.1 - Frontiers in Fluorescence Lifetime and Super-resolution Imaging of Biological Structures and Dynamics P01.3 - Advanced Imaging and Spectroscopy for Nanoscale Materials Characterization P04.3 - Emerging Low-Dimensional Nanomaterials and Their Heterostructures P06.1 - Defects in Materials: How We See and Understand Them P07.3 - Quantum Materials Probed by High Spatial and Energy Resolution in Scanning/Transmission Electron Microscopy P09.3 - Nanoscale x-ray and Electron Microscopy Techniques and Applications in Material Science P10.3 - Investigating Phase Transitions in Functional Materials and Devices by In Situ/Operando TEM P12.2 - Microscopy & Spectroscopy of Energy Conversion and Storage Materials P13.3 - Advanced Application of Atom Probe Tomography: Specimen preparation, Instrumentation, and Data analysis
11:45 am – 12:15 pm	Platform Session Networking
11:45 am – 12:45 pm	MAS Meal with a Mentor
12:15 pm – 12:30 pm	Break
12:15 pm – 1:15 pm	Technologists' Forum, Tutorials, and Outreach X31 - Technologists' Forum Workshop Technique Tips: Special Stains and Serial Sectioning X42 - Physical Sciences Tutorial: Monochromated Aberration Corrected STEM: Why?

Tuesday, August 3 (cont'd.)

12:30 pm – 1:30 pm

Platform Sessions

A01.4 - Diffraction Imaging Across Disciplines

A02.4 - Advances in Focused Ion Beam Instrumentation, Applications and Techniques in and Materials and Life Sciences

A03.4 - Microscopy and Microanalysis for Real World Problem Solving

A04.4 - New Frontiers in In-Situ Electron Microscopy in Liquids and Gases (*L&G EM FIG Sponsored*)

A05.1 - Full System and Workflow Automation for Enabling Big Data and Machine Learning in Electron Microscopy

A07.1 - Vendor Symposium

A08.1 - Data Management, Version Control, and Multiformat Analysis in Electron Microscopy

A10.1 - Unresolved Challenges in Quantitative X-ray Microanalysis

B01.4 - 3D Structures: From Macromolecular Assemblies to Whole Cells (*3DEM FIG*)

B04.1 - Michael Rossmann Memorial Symposium

B07.1 - Challenges and Advances in Electron Microscopy Research and Diagnosis of Diseases in Humans, Plants and Animals (*FIG associated*)

B09.1 - To Fix or Not To Fix? A Question for Biological Samples

B10.2 - Cryo-EM at Local, Regional, and National Cryo-EM Centers

B11.2 - Frontiers in Fluorescence Lifetime and Super-resolution Imaging of Biological Structures and Dynamics

P01.4 - Advanced Imaging and Spectroscopy for Nanoscale Materials Characterization

P06.2 - Defects in Materials: How We See and Understand Them

P07.4 - Quantum Materials Probed by High Spatial and Energy Resolution in Scanning/Transmission Electron Microscopy

P09.4 - Nanoscale x-ray and Electron Microscopy Techniques and Applications in Material Science

P10.4 - Investigating Phase Transitions in Functional Materials and Devices by In Situ/Operando TEM

P12.3 - Microscopy & Spectroscopy of Energy Conversion and Storage Materials

P13.4 - Advanced Application of Atom Probe Tomography: Specimen preparation, Instrumentation, and Data analysis

1:30 pm – 2:00 pm

Platform Session Networking

2:00 pm – 3:00 pm

Exhibit Hall Hour

2:30 pm – 3:00 pm

Exhibitor Spotlight Sessions

3:00 pm – 4:00 pm

Technologists' Forum, Tutorials, and Outreach

X32 - Technologists' Forum Workshop Technique Tips: Special Stains and Serial Sectioning

X43 - Physical Sciences Tutorial: X-Ray Imaging & Computed Tomography

X90 - Outreach: Microscopy in the Classroom

3:00 pm – 4:00 pm

Platform Sessions

A01.5 - Diffraction Imaging Across Disciplines

A03.5 - Microscopy and Microanalysis for Real World Problem Solving

A04.5 - New Frontiers in In-Situ Electron Microscopy in Liquids and Gases (*L&G EM FIG Sponsored*)

A05.2 - Advances in Analytical STEM-in-SEM

A07.2 - Vendor Symposium

Tuesday, August 3 (cont'd.)

3:00 pm – 4:00 pm	Platform Sessions (Cont'd.) A08.2 - Data Management, Version Control, and Multiformat Analysis in Electron Microscopy A10.2 - Unresolved Challenges in Quantitative X-ray Microanalysis B04.2 - Michael Rossmann Memorial Symposium B07.2 - Challenges and Advances in Electron Microscopy Research and Diagnosis of Diseases in Humans, Plants and Animals (<i>FIG associated</i>) B09.2 - To Fix or Not To Fix? A Question for Biological Samples B10.3 - Cryo-EM at Local, Regional, and National Cryo-EM Centers B11.3 - Frontiers in Fluorescence Lifetime and Super-resolution Imaging of Biological Structures and Dynamics P01.5 - Advanced Imaging and Spectroscopy for Nanoscale Materials Characterization P06.3 - Defects in Materials: How We See and Understand Them P07.5 - Quantum Materials Probed by High Spatial and Energy Resolution in Scanning/Transmission Electron Microscopy P10.5 - Investigating Phase Transitions in Functional Materials and Devices by In Situ/Operando TEM P12.4 - Microscopy & Spectroscopy of Energy Conversion and Storage Materials P13.5 - Advanced Application of Atom Probe Tomography: Specimen preparation, Instrumentation, and Data analysis
4:00 pm – 4:30 pm	Platform Session Networking
4:30 pm – 4:45 pm	Break
4:45 pm – 5:15 pm	Exhibitor Spotlight Sessions
5:15 pm – 6:45 pm	Tuesday Poster Presentations & Networking
6:45 pm – 7:45 pm	Vendor Tutorials
7:00 pm – 8:30 pm	MSA Student Council Meeting

Wednesday, August 4

10:00 am – 11:00 am	M&M Awardee Talks & Ceremony MSA Burton Medal Awardee Reto Fiolka, PhD MAS Kurt F.J. Heinrich Awardee Katherine Burges, PhD MSA Burton Medal Awardee Huolin Xin, PhD
11:00 am – 11:30 am	M&M Awardee Ceremony Social
11:30 am – 12:30 pm	Technologists' Forum, Tutorials, and Outreach
11:30 am – 12:30 pm	Platform Sessions A01.6 - Diffraction Imaging Across Disciplines A03.6 - Microscopy and Microanalysis for Real World Problem Solving A05.3 - Advances in Analytical STEM-in-SEM A07.3 - Vendor Symposium A09.1 - Moon Dust, Minerals and Microscopy

Wednesday, August 4 (cont'd.)

11:30 am – 12:30 pm	Platform Sessions (Cont'd.)
	A10.3 - Unresolved Challenges in Quantitative X-ray Microanalysis
	B04.3 - Michael Rossmann Memorial Symposium
	B07.3 - Challenges and Advances in Electron Microscopy Research and Diagnosis of Diseases in Humans, Plants and Animals (<i>FIG associated</i>)
	B10.4 - Cryo-EM at Local, Regional, and National Cryo-EM Centers
	P01.6 - Advanced Imaging and Spectroscopy for Nanoscale Materials Characterization
	P05.1 - Evaluation of Materials for Nuclear Applications
	P06.4 - Defects in Materials: How We See and Understand Them
	P10.6 - Investigating Phase Transitions in Functional Materials and Devices by In Situ/Operando TEM
	P12.5 - Microscopy & Spectroscopy of Energy Conversion and Storage Materials
12:30 pm – 1:00 pm	Platform Session Networking
1:00 pm – 1:15 pm	Break
1:15 pm – 2:15 pm	Exhibit Hall Hour
1:45 pm – 2:15 pm	Exhibitor Spotlight Sessions
2:15 pm – 3:15 pm	Technologists' Forum, Tutorials, and Outreach
	X45 - Biological Sciences Tutorial: Traversing Spatial Scales with Correlative Microscopy
2:15 pm – 3:15 pm	Platform Sessions
	A01.7 - Diffraction Imaging Across Disciplines
	A03.7 - Microscopy and Microanalysis for Real World Problem Solving
	A05.4 - Advances in Analytical STEM-in-SEM
	A07.4 - Vendor Symposium
	A09.2 - Moon Dust, Minerals and Microscopy
	A10.4 - Unresolved Challenges in Quantitative X-ray Microanalysis
	B02.1 - Cryo-Electron Tomography: Present Capabilities and Future Potential
	B07.4 - Challenges and Advances in Electron Microscopy Research and Diagnosis of Diseases in Humans, Plants and Animals (<i>FIG associated</i>)
	P01.7 - Advanced Imaging and Spectroscopy for Nanoscale Materials Characterization
	P03.1 - Exploring Beam-sample Interactions for Uncovering the Atomic or Dynamic Nature of Matter
	P05.2 - Evaluation of Materials for Nuclear Applications
	P06.5 - Defects in Materials: How We See and Understand Them
	P08.1 - Advanced Characterization of Components Fabricated by Additive Manufacturing
	P10.7 - Investigating Phase Transitions in Functional Materials and Devices by In Situ/Operando TEM
	P12.6 - Microscopy & Spectroscopy of Energy Conversion and Storage Materials
3:15 pm – 3:45 pm	Platform Session Networking
3:45 pm – 4:00 pm	Break
4:00 pm – 4:30 pm	Exhibitor Spotlight Sessions
4:30 pm – 6:00 pm	Wednesday Poster Presentations & Networking
6:00 pm – 7:00 pm	Vendor Tutorials
7:00 pm – 8:30 pm	MAS Members' Social (<i>See MAS Booth for details</i>)

Thursday, August 5

10:00 am – 11:00 am

Platform Sessions

- A01.8** - Diffraction Imaging Across Disciplines
- A03.8** - Microscopy and Microanalysis for Real World Problem Solving
- A06.4** - Full System and Workflow Automation for Enabling Big Data and Machine Learning in Electron Microscopy
- A09.3** - Moon Dust, Minerals and Microscopy
- A11.1** - Portable- and Laboratory-based Approaches to Analysis in Cultural Heritage
- B02.2** - Cryo-Electron Tomography: Present Capabilities and Future Potential
- B03.1** - From Images to Insights: Working with Large Multi-modal Data in Cell Biological Imaging
- B08.1** - Cryo-EM in Drug Discovery
- P01.8** - Advanced Imaging and Spectroscopy for Nanoscale Materials Characterization
- P03.2** - Exploring Beam-sample Interactions for Uncovering the Atomic or Dynamic Nature of Matter
- P05.3** - Evaluation of Materials for Nuclear Applications
- P06.6** - Defects in Materials: How We See and Understand Them
- P08.2** - Advanced Characterization of Components Fabricated by Additive Manufacturing
- P10.8** - Investigating Phase Transitions in Functional Materials and Devices by In Situ/Operando TEM
- P11.1** - Fast and Ultrafast Dynamics Using Electron Microscopy
- P12.7** - Microscopy & Spectroscopy of Energy Conversion and Storage Materials

11:00 am – 11:30 am

Platform Session Networking

11:30 am – 12:30 pm

Exhibit Hall Hour

11:45 am – 12:30 pm

Lens on Diversity

12:00 pm – 12:30 pm

Exhibitor Spotlight Sessions

12:30 pm – 12:45 pm

Break

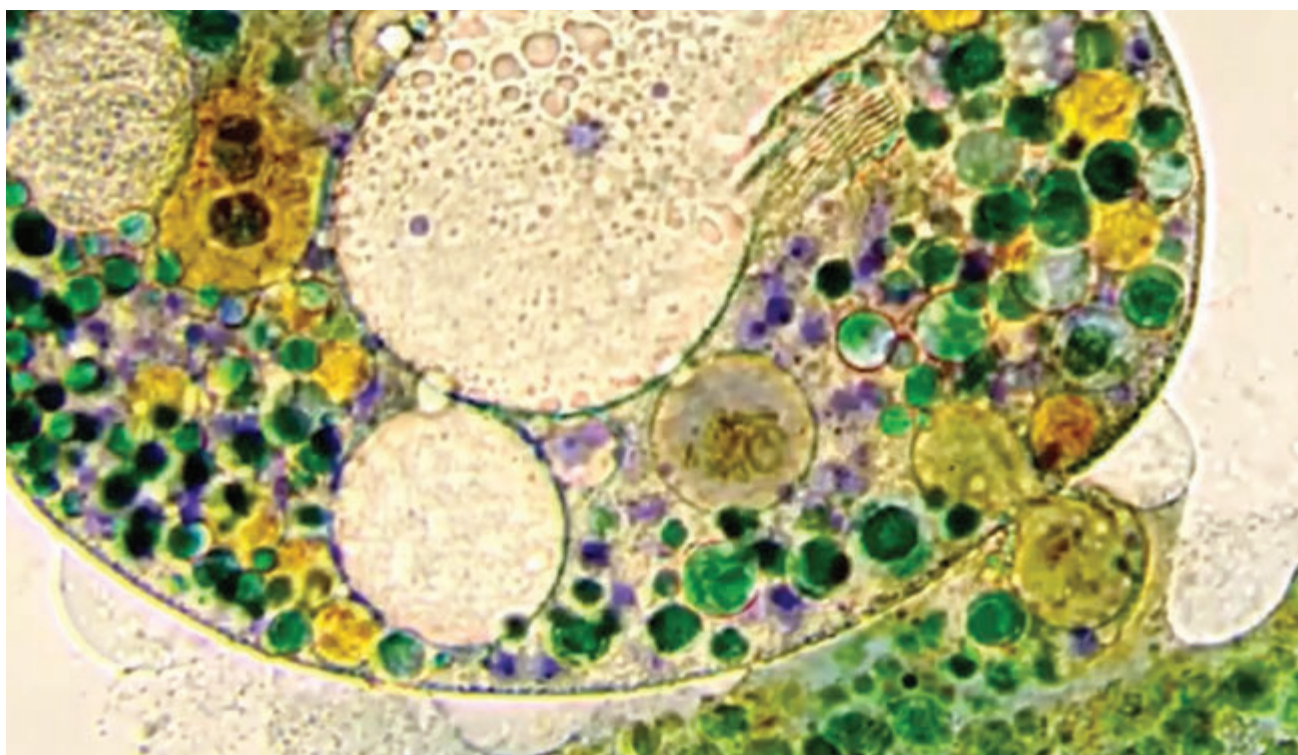
12:45 pm – 1:45 pm

Platform Sessions

- A03.9** - Microscopy and Microanalysis for Real World Problem Solving
- A06.5** - Full System and Workflow Automation for Enabling Big Data and Machine Learning in Electron Microscopy
- A09.4** - Moon Dust, Minerals and Microscopy
- A11.2** - Portable- and Laboratory-based Approaches to Analysis in Cultural Heritage
- B02.3** - Cryo-Electron Tomography: Present Capabilities and Future Potential
- B03.2** - From Images to Insights: Working with Large Multi-modal Data in Cell Biological Imaging
- B08.2** - Cryo-EM in Drug Discovery
- P01.9** - Advanced Imaging and Spectroscopy for Nanoscale Materials Characterization
- P02.1** - Many Detectors Make Lights Work: Advances in Microanalysis of Light Elements in Synthetic and Natural Materials
- P03.3** - Exploring Beam-sample Interactions for Uncovering the Atomic or Dynamic Nature of Matter
- P05.4** - Evaluation of Materials for Nuclear Applications
- P06.7** - Defects in Materials: How We See and Understand Them
- P08.3** - Advanced Characterization of Components Fabricated by Additive Manufacturing
- P11.2** - Fast and Ultrafast Dynamics Using Electron Microscopy
- P12.8** - Microscopy & Spectroscopy of Energy Conversion and Storage Materials

Thursday, August 5 (cont'd.)

1:45 pm – 2:15 pm	Platform Session Networking
2:15 pm – 2:45 pm	Exhibitor Spotlight Sessions
2:45 pm – 3:45 pm	Platform Sessions <ul style="list-style-type: none">A06.6 - Full System and Workflow Automation for Enabling Big Data and Machine Learning in Electron MicroscopyA11.3 - Portable- and Laboratory-based Approaches to Analysis in Cultural HeritageB02.4 - Cryo-Electron Tomography: Present Capabilities and Future PotentialB03.3 - From Images to Insights: Working with Large Multi-modal Data in Cell Biological ImagingP01.7 - Advanced Imaging and Spectroscopy for Nanoscale Materials CharacterizationP02.2 - Many Detectors Make Lights Work: Advances in Microanalysis of Light Elements in Synthetic and Natural MaterialsP03.4 - Exploring Beam-sample Interactions for Uncovering the Atomic or Dynamic Nature of MatterP05.5 - Evaluation of Materials for Nuclear ApplicationsP06.8 - Defects in Materials: How We See and Understand ThemP08.4 - Advanced Characterization of Components Fabricated by Additive ManufacturingP11.3 - Fast and Ultrafast Dynamics Using Electron MicroscopyP12.9 - Microscopy & Spectroscopy of Energy Conversion and Storage Materials
3:45 pm – 4:15 pm	Platform Session Networking
4:15 pm – 5:45 pm	Thursday Poster Presentations & Networking
5:45 pm – 6:30 pm	MSA Members Meeting
6:45 pm – 8:15 pm	MAS Members Meeting



Detail from *Ciliate expels its organelles* by Julia Van Etten, Rutgers University, New Brunswick, NJ