

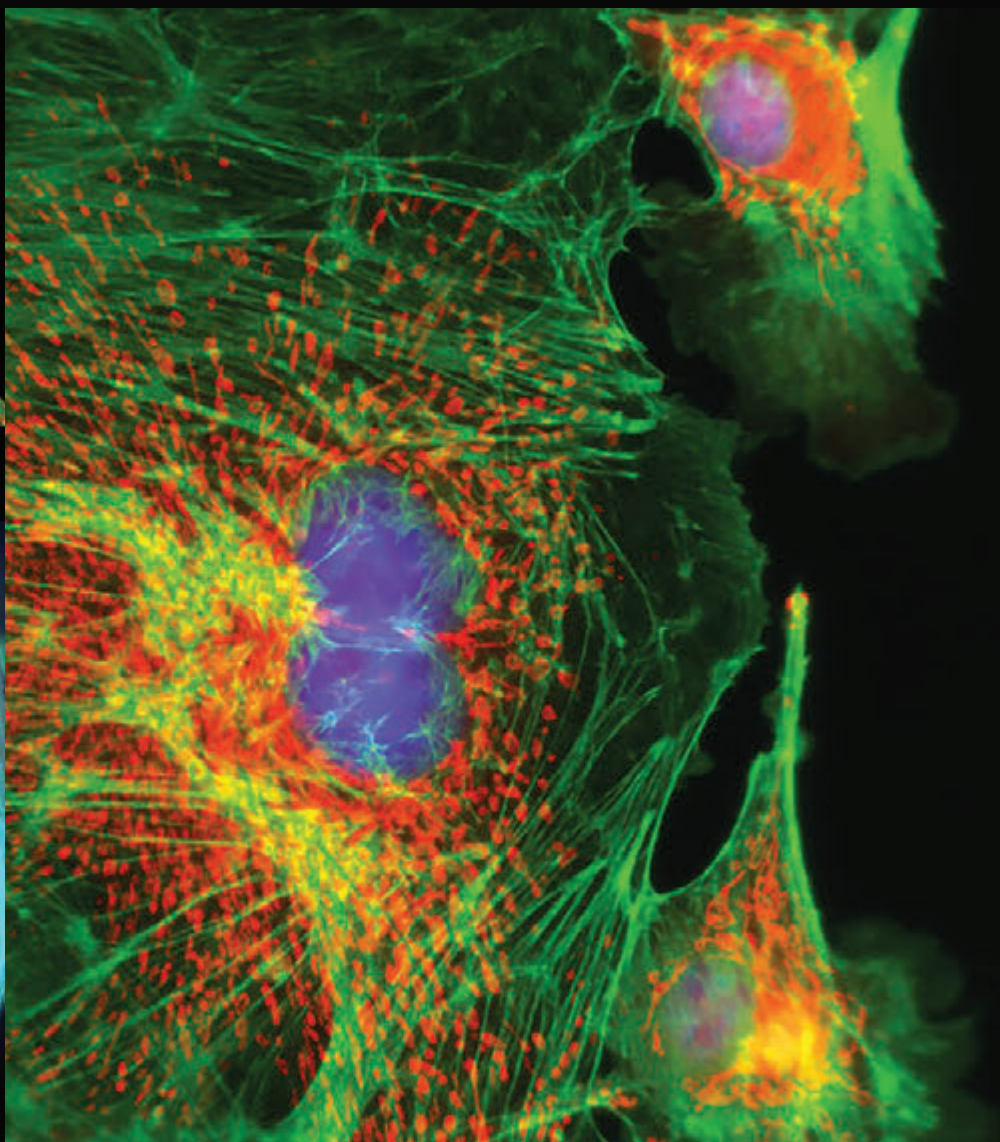
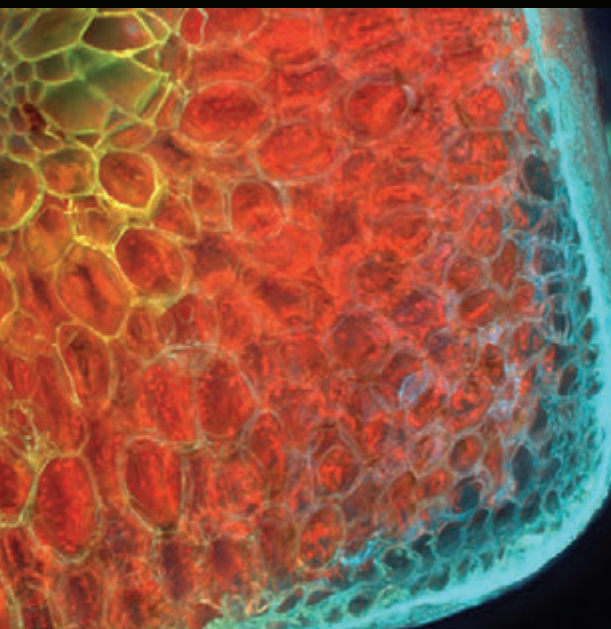
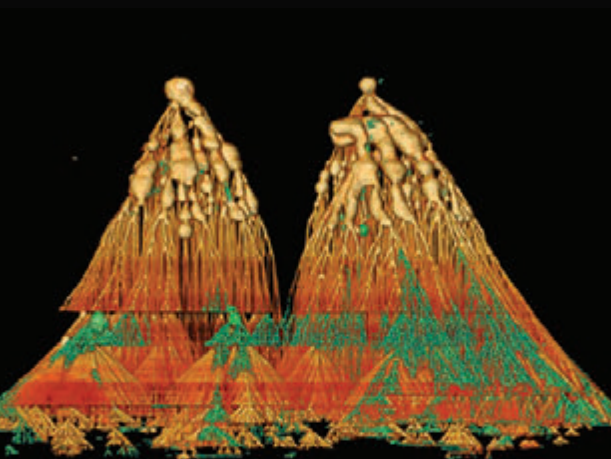
M&M²⁰²¹

MICROSCOPY & MICROANALYSIS

VIRTUAL MEETING



Meeting Guide & Exhibitor Directory



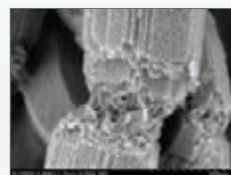
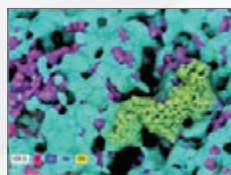
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Future Meeting Dates

Questions?

TECHNICAL MEETING CONTENT:

2021 Program Chair

Elizabeth Wright

University of Wisconsin-Madison

MM2021ProgramChair@microscopy.org

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Registrar

MMRegistration@conferencemanagers.com

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Visit <http://the-mas.org> to find out the benefits of MAS membership.



July 23-27, 2023
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July 28-August 1, 2024
CLEVELAND, OH



July 27-July 31, 2025
SALT LAKE CITY, UT



COVER IMAGES:

Top left:

Native vanadium dendrites by Sarah Gain, Centre for Microscopy, Characterisation and Analysis, University of Western Australia, Perth, Australia

Bottom left:

Aloe vera leaf by Jose Martinez-Lopez, Química Tech Microscopy and Microanalysis, Juarez, Mexico

Right:

Rat endothelial cells by Damon Strom, WITec GmbH, Ulm, Germany



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On behalf of the Microscopy Society of America and the Microanalysis Society, we invite you to join us August 1-5, 2021, for the Microscopy & Microanalysis 2021 Virtual Meeting. We have created an even better virtual meeting, building off of our experience from M&M 2020. The 2021 event features platform and poster presentations, a robust trade show, and opportunities to connect with old friends and make new friends.

The Program Committee, led by Elizabeth Wright, Eric Stach, Vincent Smentkowski, and Andrew Herzing, has developed an exciting group of symposia, spanning advances in instrumentation and techniques development, as well as applications in the analytical, biological, and physical sciences.

The main meeting will be preceded by the ever-popular Sunday Short Courses and two Pre-Meeting Congresses. Students and early-career professionals are especially encouraged to participate in the MSA Student Council's 5th Annual Pre-Meeting Congress that highlights outstanding work by student and postdoctoral fellow attendees. On Monday morning, the Plenary Session kicks off the scientific program with an exciting set of lectures in Biological sciences with plenary speakers, Dr. Kizzmekia Corbett, a senior research scientist in the Vaccine Research Center at the NIH, and Dr. Jason McLellan, a Professor in the College of Natural Sciences at the University of Texas, Austin, are coronavirus experts. Dr. Corbett and Dr. McLellan are at the pandemic frontlines with cryo-EM structural and functional studies of SARS-CoV-2 and the development of COVID-19 vaccine candidates. The Physical sciences plenary will take place on Tuesday morning and will feature, Dr. Ondrej Krivanek, co-founder and president of Nion Co., who won the 2020 Kavli Prize in Nanoscience for sub-Ångstrom resolution imaging and chemical analysis using electron beams.

In addition to the strong scientific program, what sets the M&M meeting apart is the Exhibit Hall, the world's largest annual microscopy exhibition, which showcases the latest instrumentation and accessories. Don't miss the highly popular vendor tutorials, held Monday through Wednesday after hours in the Exhibit Hall. Other educational opportunities throughout the week include focused biological and physical science tutorials, educational outreach programs, and our Technologists' Forum special and roundtable sessions.

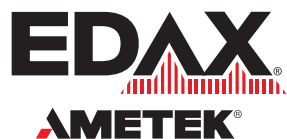
As always, M&M 2021 will be the premier meeting to attend to stay abreast of the latest technologies, hear about new developments in applications across all areas of microscopy and microanalysis, and most importantly network with colleagues.

Peter A. Crozier, Arizona State University
President, Microscopy Society of America

Heather Lowers, United States Geological Survey
President, Microanalysis Society



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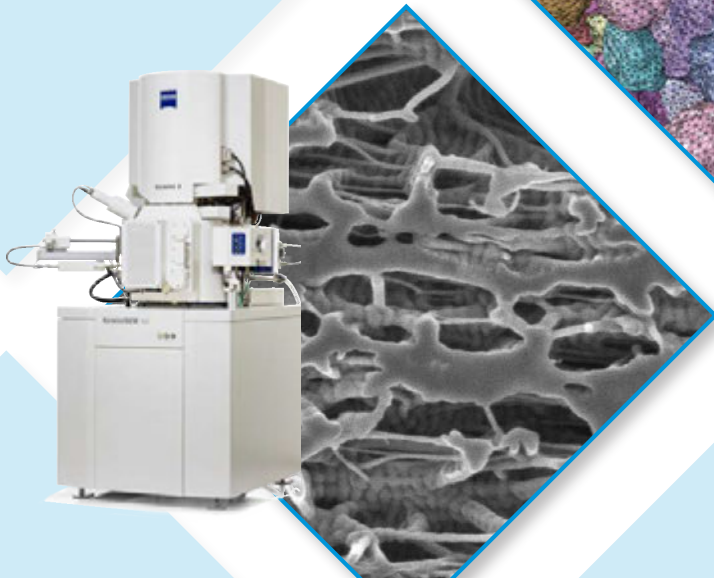
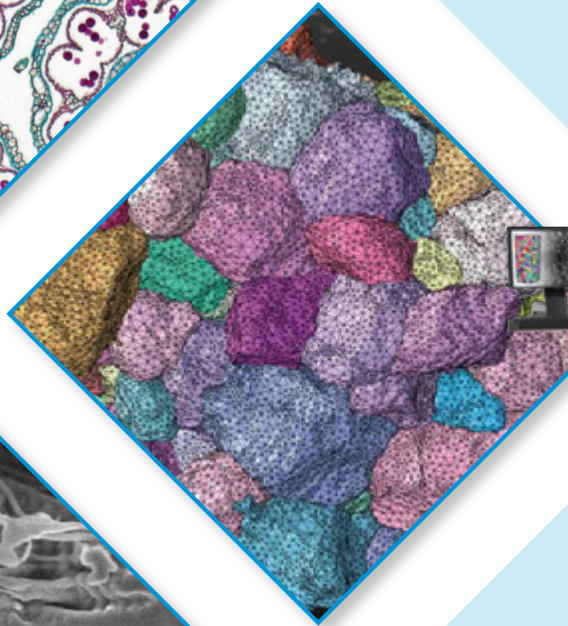
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*Represented data: EELS of h-Boron Nitride spectrum at 60 keV, 105 pA, 100 s exposure, collected with DECTRIS ELA ®.
Courtesy of NION Co*

Planning Update – Going Virtual

Due to ongoing health concerns related to the coronavirus that causes COVID-19, availability of the COVID-19 vaccine, global and organizational travel restrictions, and additional concerns shared by the microscopy and microanalysis community in recent surveys, MSA and MAS have decided to cancel the in-person meeting originally scheduled for August 1-5, 2021 in Pittsburgh, Pennsylvania, USA. For the health, safety, and well-being of the entire community, we will convert the M&M 2021 Meeting content into a virtual (completely online) meeting in its place.

M&M 2021 Virtual Registration Rates			
	Early (On or before June 15)	Regular (Beginning June 16; ending July 24)	Onsite (Beginning July 25)
Registration Type	Member/Non-Member	Member/Non-Member	Member/Non-Member
Full Meeting	\$250 / \$325	\$300 / \$375	\$350 / \$425
Student Full Meeting	\$40 / \$60	\$50 / \$70	\$60 / \$80
Emeritus Full Meeting <i>(requires Emeritus membership in MSA)</i>	\$125	\$125	\$125
Post-Doctoral Researcher Full Meeting	\$125 / \$200	\$150 / \$225	\$175 / \$250
Pre-Meeting Congresses <i>(separate registration required)</i>	\$75 / \$150	\$95 / \$170	\$115 / \$190
Student - Pre-Meeting Congress <i>(separate registration required)</i>	\$20 / \$40	\$30 / \$60	\$40 / \$70
Sunday Short Course <i>(separate registration required to attend)</i>	\$199 / \$274	\$219 / \$294	\$239 / \$314
Student - Sunday Short Course <i>(separate registration required to attend)</i>	\$45 / \$120	\$55 / \$130	\$65 / \$140

ONLINE REGISTRATION WILL REMAIN OPEN THROUGHOUT THE MEETING.

We encourage you to register in advance!

- For the most up-to-date registration information, visit <http://www.microscopy.org/MandM/2021>
 - Registration can be submitted online at: <https://www.microscopy.org/MandM/2021/registration>
- We encourage you to register in advance and as early as possible.
- **Register early to receive a discounted registration rate.**
 - Member rates apply to all members (MSA, MAS). Membership will be verified.

Cancellation and Refund Policy

Refund requests received prior to July 8, 2021 will be honored less a \$65 administrative fee. No refunds will be issued for cancellations (for any reason) received on or after July 8, 2021. E-mail: MMRegistration@conferencemanagers.com or fax (571) 730-3072.

Accessibility

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

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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



2020 KAVLI AWARDEE

Ondrej Krivanek, PhD

President, Nion Co.
Affiliate Professor at Arizona State University



Top, left:

Detail from *Diatom triangle* by Larry Gouliard, Jr., Independent Microscopist, Pekin, IL

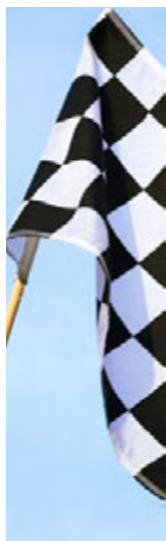
Middle, left:

Detail from *Thin Film Crystals* by Karl Gaff, K Gaff Microscopy, Dublin, Ireland

Bottom, left:

Detail from *Gold nanocubes* by Vasile-Dan Hondoroaba, Federal Institute for Materials Research and Testing, Berlin, Germany

Virtual Meeting Highlights



GET READY!

Watch your email on **Wednesday, July 28!** A link with your personal login credentials will be emailed to you at the email address that you registered with. At that point, the meeting platform will be open for browsing.

Platform or Poster recordings can be viewed, and text chat questions/messages may be posted starting Wednesday, July 28, when you get your login information.

ATTEND SPECIAL EXHIBITOR SESSIONS

Exhibitors are excited to offer LIVE Vendor Tutorials and special “Exhibitor Spotlight” sessions. Interested in a particular exhibitor? Go to their booth and click “Spotlight Session”. Or check out the Megabooth “Vendor Tutorials” section for the full list of live Vendor Tutorials. A full list of all Exhibitor-sponsored sessions, content, and networking meetings is under Full Schedule.

VIEW THE LIVE PLENARY TALKS – Monday & Tuesday Morning (10 AM U.S. Eastern Time)

Grab your favorite morning drink and watch live-streamed talks and Q&A from our world-renowned plenary speakers.**

PLATFORMS, POSTERS, and SOCIALS, OH MY!

Check out the HUNDREDS of posters and platform talks available 24/7 on-demand. Attend one of the many social events, or a members’ meeting. Find something fun and meet new people.

VISIT THE EXHIBIT HALL

During staffed exhibit hall times, company reps will be standing by to answer your questions and chat with you about your microscopy product and services needs! Or join exhibitors in Spatial Chat for face-to-face discussions.

ALL THE WAYS TO INTERACT

1. **“Inbox”** is where you can send and receive PRIVATE messages to and from other participants. (Private messages are only between registered attendees/exhibitors.)
2. **New this year**, we will be using **SPATIAL CHAT** for all platform session discussions and networking. Spatial Chat is a free-form networking platform where you can jump from room to room and from conversation to conversation!
3. **Session Discussions and Chats** are PUBLIC conversations and Q&A for each session. They are available to read or continue the conversation anytime, next to the session video!
4. **Browse the Attendee and Speaker** list to see who you know!

*** Too late or early for you? Have a meeting at work, or a date with your spouse? These talks will be recorded and available on demand until September 7.*

M&M 2021 Major Society Awards

Header: Detail of *Zosterograpus microtubules* by Andrea Brothers, A.B. Brothers Microscopy, Manassas, VA



Major Society Award Winners

BURTON MEDAL—BIOLOGICAL

Reto Fiolka, University of Texas Southwestern

BURTON MEDAL—PHYSICAL

Huolin Xin, University of California, Irvine

ALBERT CREWE AWARD

Wenpei Gao, North Carolina State University

HILDEGARD H. CROWLEY AWARD FOR OUTSTANDING TECHNOLOGIST, BIOLOGICAL SCIENCES

Trace Christensen, Mayo Clinic

CHUCK FIORI AWARD FOR OUTSTANDING TECHNOLOGIST, PHYSICAL SCIENCES

Karen Bustillo, Lawrence Berkeley National Laboratory

MORTON D. MASER DISTINGUISHED SERVICE AWARD

Leona Cohen-Gould, Weill Cornell Medicine

GEORGE PALADE AWARD

Yong Zi Tan, The Hospital for Sick Children

DISTINGUISHED SCIENTIST – PHYSICAL SCIENCES

Maximilian Haider, PhD, CEOS GmbH
Knut W. Urban, PhD, University of Stuttgart

DISTINGUISHED SCIENTIST – BIOLOGICAL SCIENCES

David Agard, PhD, University of California, San Francisco



Major Society Award Winners

PRESIDENTIAL SCIENCE AWARD

Hideyuki Takahashi, JEOL Ltd

PRESIDENTIAL SERVICE AWARD

John Fournelle, University of Wisconsin, Madison

PETER DUNCUMB AWARD FOR EXCELLENCE IN MICROANALYSIS

Yimei Zhu, Brookhaven National Laboratory

KURT F.J. HEINRICH AWARD

Katherine Burgess, U.S. Naval Research Laboratory

BEST PAPER AWARDS M&M 2020

BIRKS AWARD—BEST CONTRIBUTED

Sponsored by JEOL

Sheryl Singerling, U.S. Naval Research Laboratory

TEM Structural and Compositional Studies of Presolar SiC Grains and Their Relation to Raman Spectra

COSSLETT AWARD—BEST INVITED

Sponsored by MAS

Yu Yuan, McGill University

Secondary Fluorescence Correction for Quantitative X-ray Microanalysis Integrated in a User-Friendly Framework

CASTAING AWARD—BEST STUDENT

Sponsored by Cameca

Berit Goodge, Cornell University

Sub-Ångstrom EDX Mapping Enabled by a High-Brightness Cold Field Emission Source

MACRES AWARD—BEST INSTRUMENTATION/SOFTWARE

Sponsored by Oxford Instruments

Aurelian Moy, University of Wisconsin, Madison

BadgerFilm: An Open Source Thin Film Analysis Program

Society Fellows and Meeting Awards



MSA Professional Technical Staff Awards

ANALYTICAL SCIENCES

Daniel Ruscitto, PhD, GE Research

Joseph Simpson, MS, Oak Ridge National Laboratories

BIOLOGICAL SCIENCES

Bryan Sibert, PhD, University of Wisconsin – Madison, Cryo-EM Research Center,
Midwest Center for Cryo-Electron Tomography

PHYSICAL SCIENCES

Stephen Boona, PhD, Ohio State University, Center for Electron
Microscopy and Analysis

Sz-Chian Liou, PhD, University of Maryland



MAS 2021 Fellows

Alan Sandborg, Retired from EDAX

Vincent S. Smentkowski, GE Research



MSA 2021 Fellows

Sergei Kalinin, Oak Ridge National Laboratory

Robert Klie, University of Illinois, Chicago

Paul Kotula, Sandia National Laboratories, Albuquerque, NM

Pamela F. Lloyd, Air Force Research Laboratory (AFRL)

Rhonda Stroud, Naval Research Laboratory

Chongmin Wang, Pacific Northwest National Laboratory

Additional awards will be announced during the meeting.



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Sign up for **VENDOR TUTORIALS** here! These popular sessions are presented on Monday, Tuesday, and Wednesday evenings after the exhibit hall has closed for the day. Don't miss out – advance registration is required!

The **TECHNOLOGISTS' FORUM** (TF): Attention Technologists! Stop by to find out how you can grow and develop your skills, your professional career, and your network by joining the Forum!

The **PLACEMENT OFFICE** is MSA's job-listing service. Post a job, peruse job listings, post a resume, and/or find that perfect candidate for your job opening. All for **FREE** during the meeting!

The Microscopy Society of America offers several programs to help its **LOCAL AFFILIATED SOCIETIES** hold successful meetings through the Tour Speaker and Meeting Funding programs. For more information on programs and participating societies:



CERTIFICATION BOARD – Find out about MSA's certification program for Electron Microscopy Technologists and how being certified can help you in your next job search!

MICROSCOPY TODAY and **MICROSCOPY and MICROANALYSIS** are the society's two publications – one a magazine format, the other a peer-reviewed scientific journal. Information for authors and advertisers is available here.

EDUCATIONAL OUTREACH – Browse materials and find out how to start an outreach program in your local area. Get details on the special programming at the M&M meeting for educators and kids of all ages.

Visit the **Project MICRO** display to learn about this organization's education and outreach goals.

Join other MSA members to promote specific disciplines relevant to microscopy and microanalysis by becoming a member of a **Focused Interest Group (FIG)**.

Meet with **MSA Student Council** officers and learn about the growing community of students, postdocs, and early-career professionals in microscopy and microanalysis. Build your professional network, share experiences, discuss research, and find out how to get more involved with the most dynamic group of young professionals that microscopy and microanalysis has to offer.

Visit <http://microscopy.org>

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*)

Monday, August 2 (Cont'd.)

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

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 (*3DEM FIG*)

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 Roundtable: Technical Careers in Microscopy – PhD Not Required

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

2:30 pm – 3:00 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

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.)

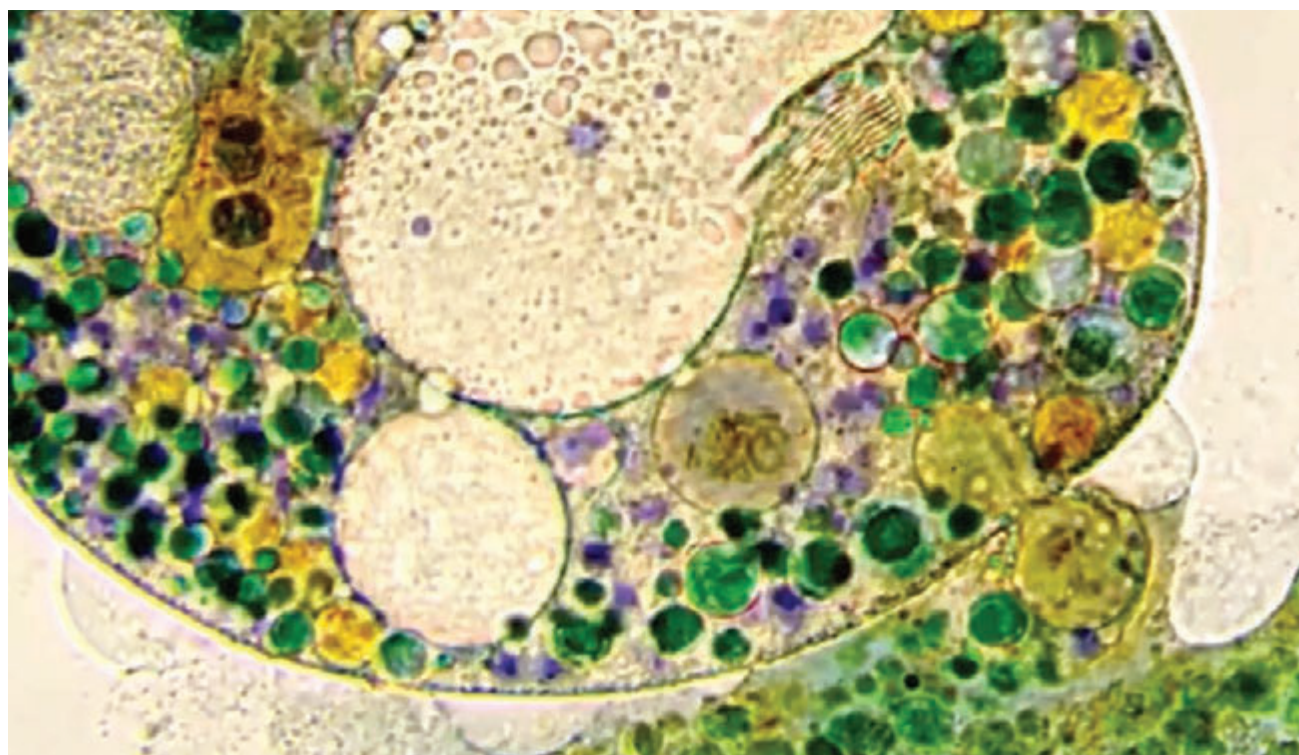
11:30 am – 12:30 pm	Platform Sessions (Cont'd.) A10.3 - Unresolved Challenges in Quantitative X-ray Microanalysis B04.3 - Michael Rossmann Memorial Symposium B07.3 - Challenges and Advances in Electron Microscopy Research and Diagnosis of Diseases in Humans, Plants and Animals (<i>FIG associated</i>) 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 (See MAS Booth for details)

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 A06.6 - Full System and Workflow Automation for Enabling Big Data and Machine Learning in Electron Microscopy A11.3 - Portable- and Laboratory-based Approaches to Analysis in Cultural Heritage B02.4 - Cryo-Electron Tomography: Present Capabilities and Future Potential B03.3 - From Images to Insights: Working with Large Multi-modal Data in Cell Biological Imaging P01.7 - Advanced Imaging and Spectroscopy for Nanoscale Materials Characterization P02.2 - Many Detectors Make Lights Work: Advances in Microanalysis of Light Elements in Synthetic and Natural Materials P03.4 - Exploring Beam-sample Interactions for Uncovering the Atomic or Dynamic Nature of Matter P05.5 - Evaluation of Materials for Nuclear Applications P06.8 - Defects in Materials: How We See and Understand Them P08.4 - Advanced Characterization of Components Fabricated by Additive Manufacturing P11.3 - Fast and Ultrafast Dynamics Using Electron Microscopy P12.9 - 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



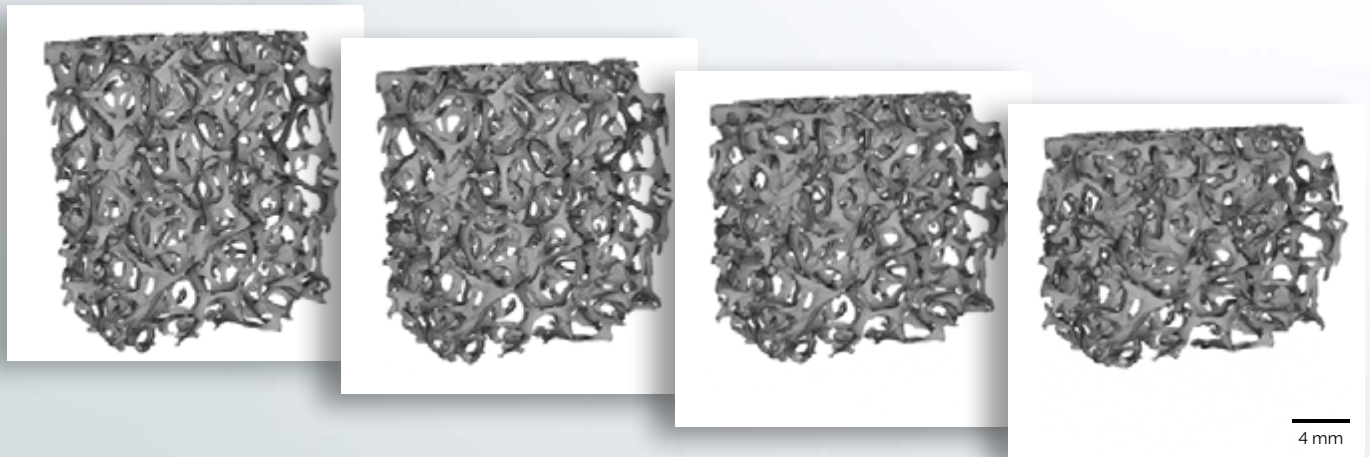
Detail from *Ciliate expels its organelles* by Julia Van Etten, Rutgers University, New Brunswick, NJ

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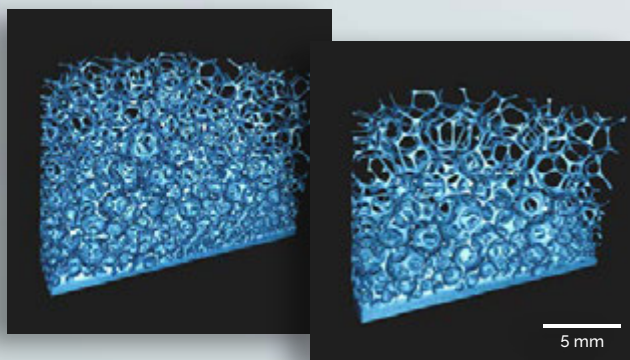
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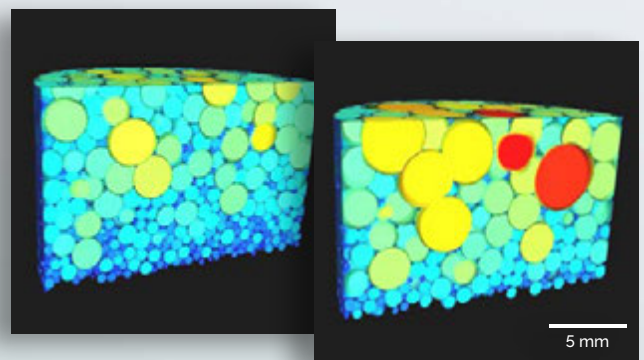
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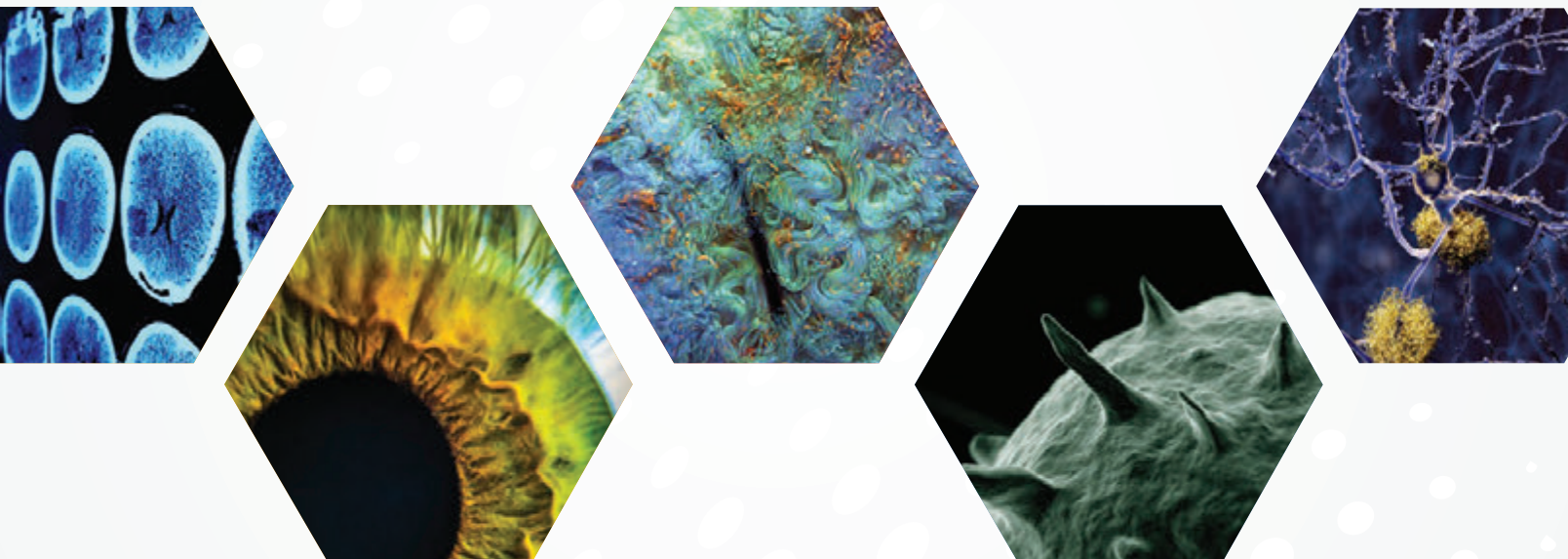


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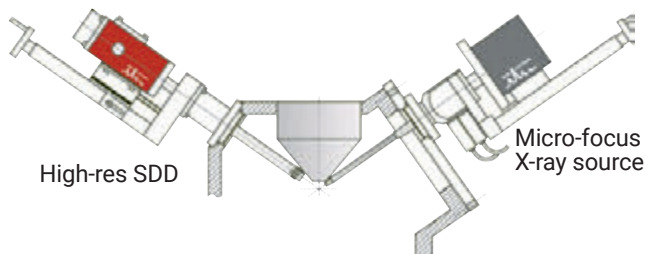
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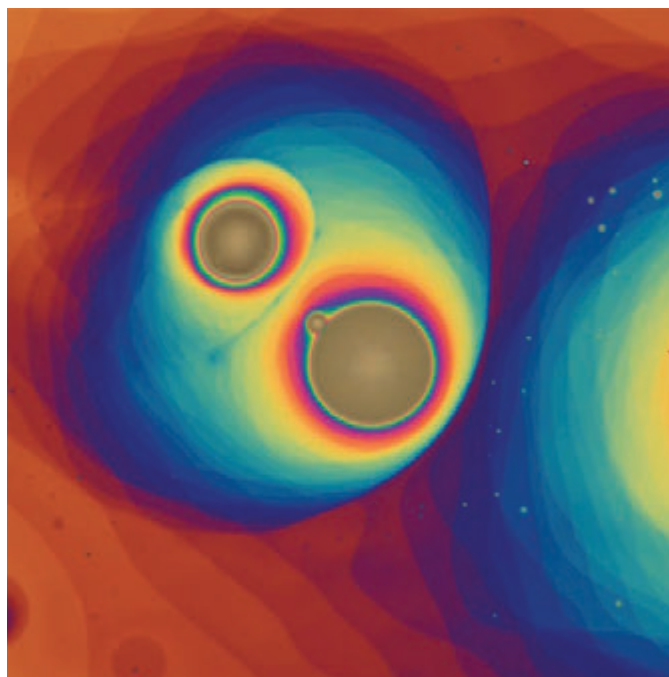
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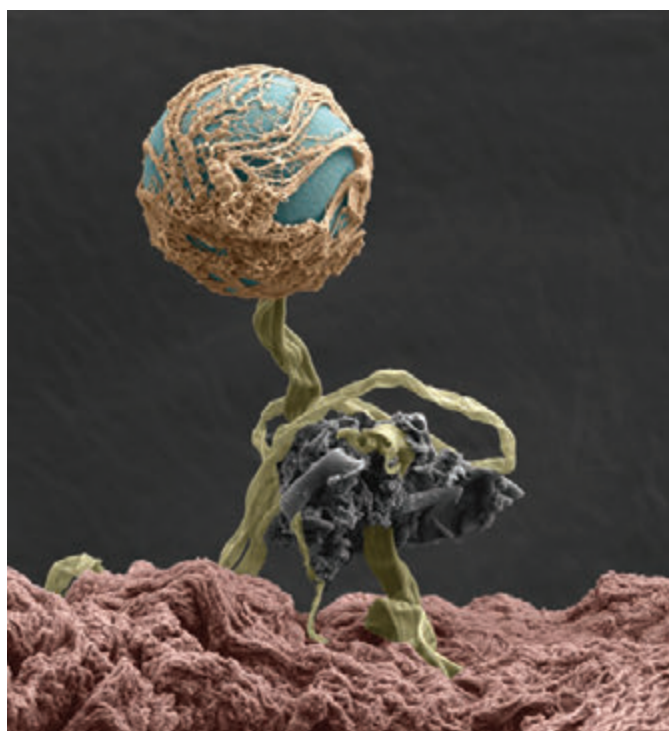
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Soap Film Colors by Gerd Günther, Independent Microscopist, Düsseldorf, Germany.



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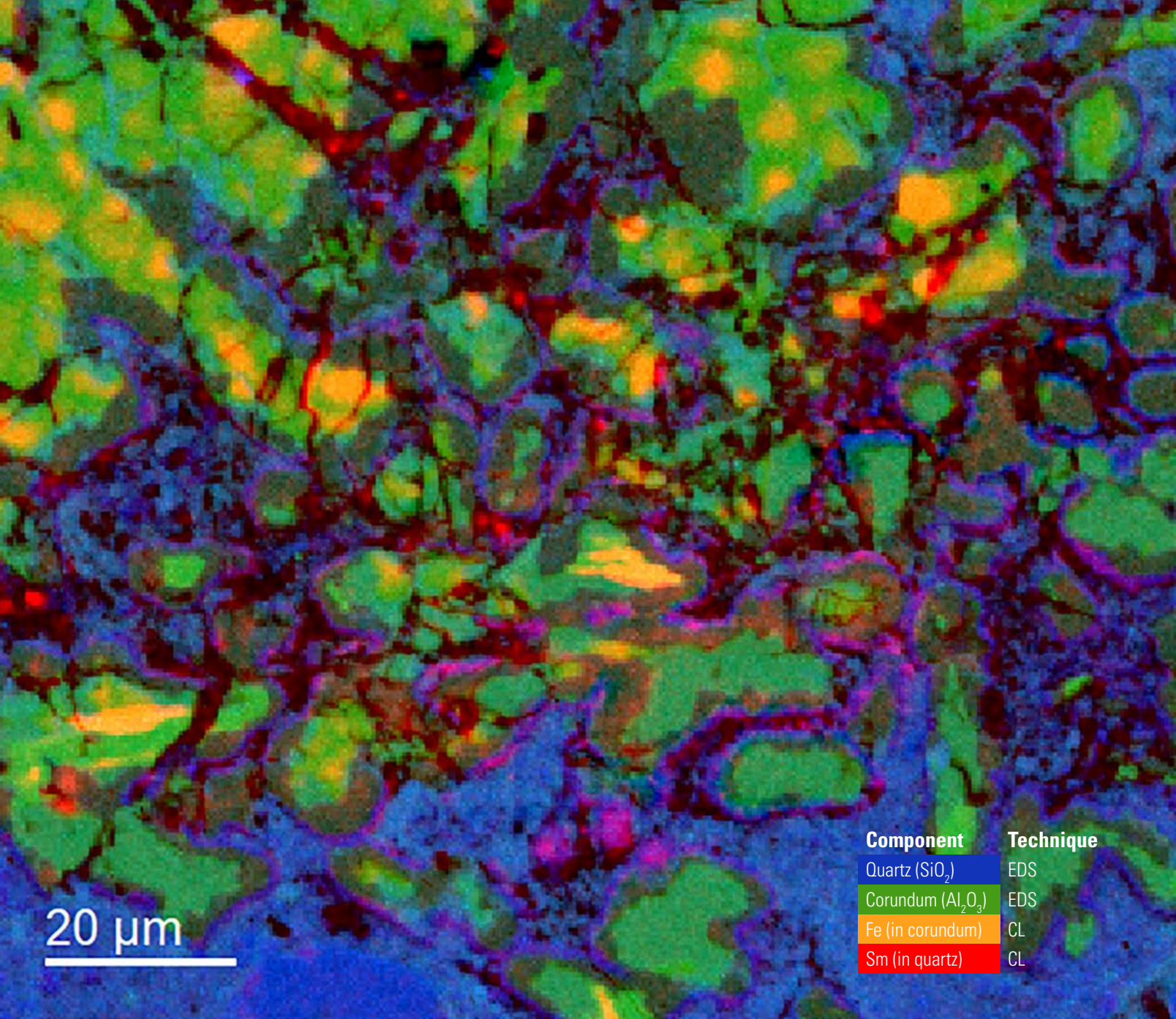
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IMAGE: Cytoskeletal microarchitecture in *Zosterograpus* sp. by
Andrea Brothers, A.B. Brothers Microscopy, Manassas, VA.

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IMAGE:
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