



The MMS Scope

Minnesota Microscopy Society

Local affiliate of the Microscopy Society of America
and the Microanalysis Society

March 2026

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quick links:

MMS Events

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Events page

Spring Symposium

May 1st, 8:30 am-4:15 pm
MN Landscape Arboretum

→ Speaker Bios

- ◆ Melissa Mauer-Jones
- ◆ Binxin Fu
- ◆ Tirzah Abbott
- ◆ Sue Okerstrom

→ POSTER PRESENTATION

OPPORTUNITY for

Undergraduate, graduate,
and post-docs and all
others!

[Click here to register](#) your
poster by April 27th.

Also in this issue:

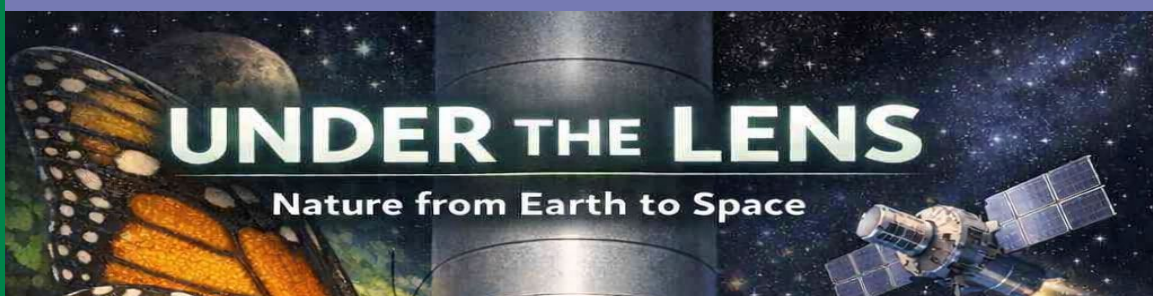
- New MMS Officers
- Past Events: MMS Tour
- Project Micro Update
- Sponsors
- Cash Flow

MMS Member Dues

Please remember to submit
your membership dues for 2026
calendar year.

[Click HERE to submit](#)

MMS Annual Spring Symposium



TOPIC

Under the Lens: Nature from Earth to Space

DATE

Friday, May 1st, 2026

LOCATION

[Minnesota Landscape Arboretum](#) in MacMillan Auditorium
3675 Arboretum Drive
Chaska, MN 55318



LANDSCAPE ARBORETUM

REGISTRATION

[Registration](#) deadline **Thursday, April 23rd**

COST

Members \$85, Non-Members \$95,
Students and K-12 Teachers \$25
Cost includes breakfast, lunch, coffee/snacks

SCHEDULE

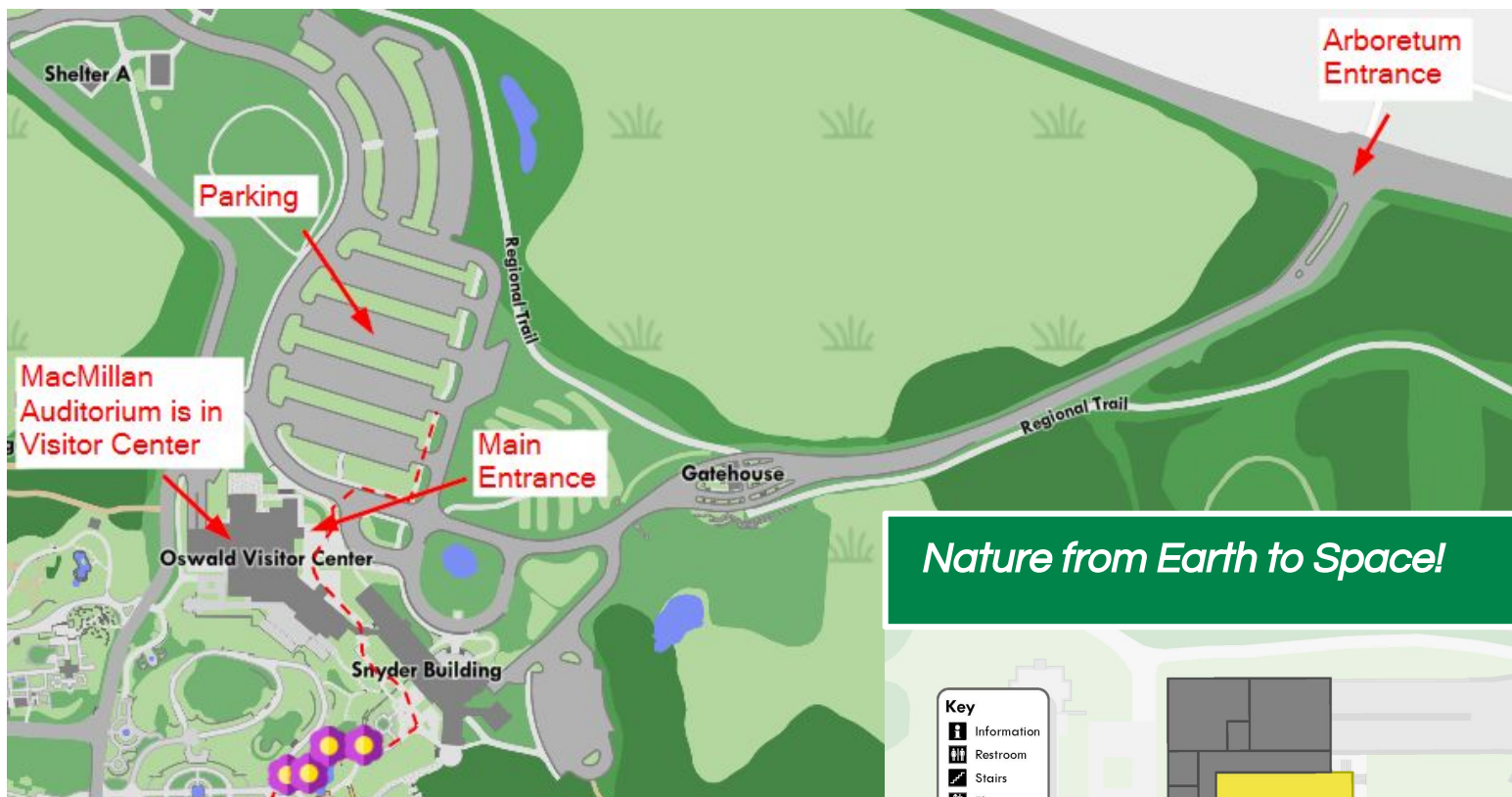
8:30 -9:15 am	Registration, breakfast, vendor displays
9:15 - 9:30 am	Welcome
9:30 -10:30 am	Melissa Mauer-Jones
10:30-11:30 am	Binxin Fu
11:30 -1:00 pm	Lunch & Vendor Displays
1:00 -1:45 pm	Poster Session
1:45 - 2:00 pm	Business Meeting
2:00 - 3:00 pm	Tirzah Abbott
3:00 - 4:00 pm	Sue Okerstrom
4:00 - 4:15 pm	Close

MMS Annual Spring Symposium

Location



LANDSCAPE ARBORETUM



Nature from Earth to Space!

POSTER PRESENTATION OPPORTUNITY!

The Minnesota Microscopy Society is seeking poster presentations for its annual Spring Symposium! We welcome posters showcasing work that incorporates any form of microscopy. Undergraduate and graduate students, as well as postdoctoral researchers and lab technicians, are encouraged to participate.

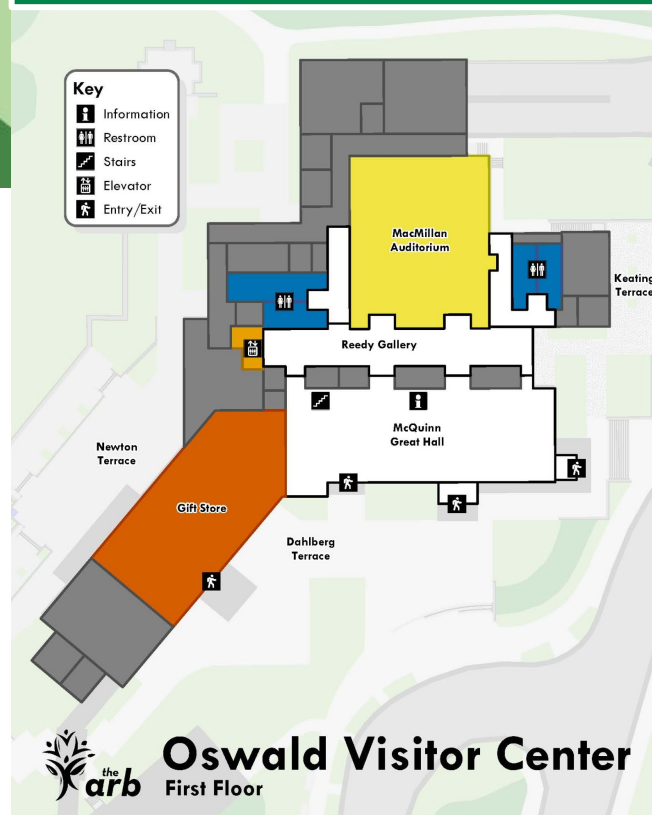
Poster requirements:

- Incorporates microscopy images or data
- Maximum size is 28" x 36" (horizontal or vertical alignment)
- Maximum of two official presenters per poster

Register your poster here by April 27th:

<https://forms.gle/ecMap5TLriVjJAzp7>

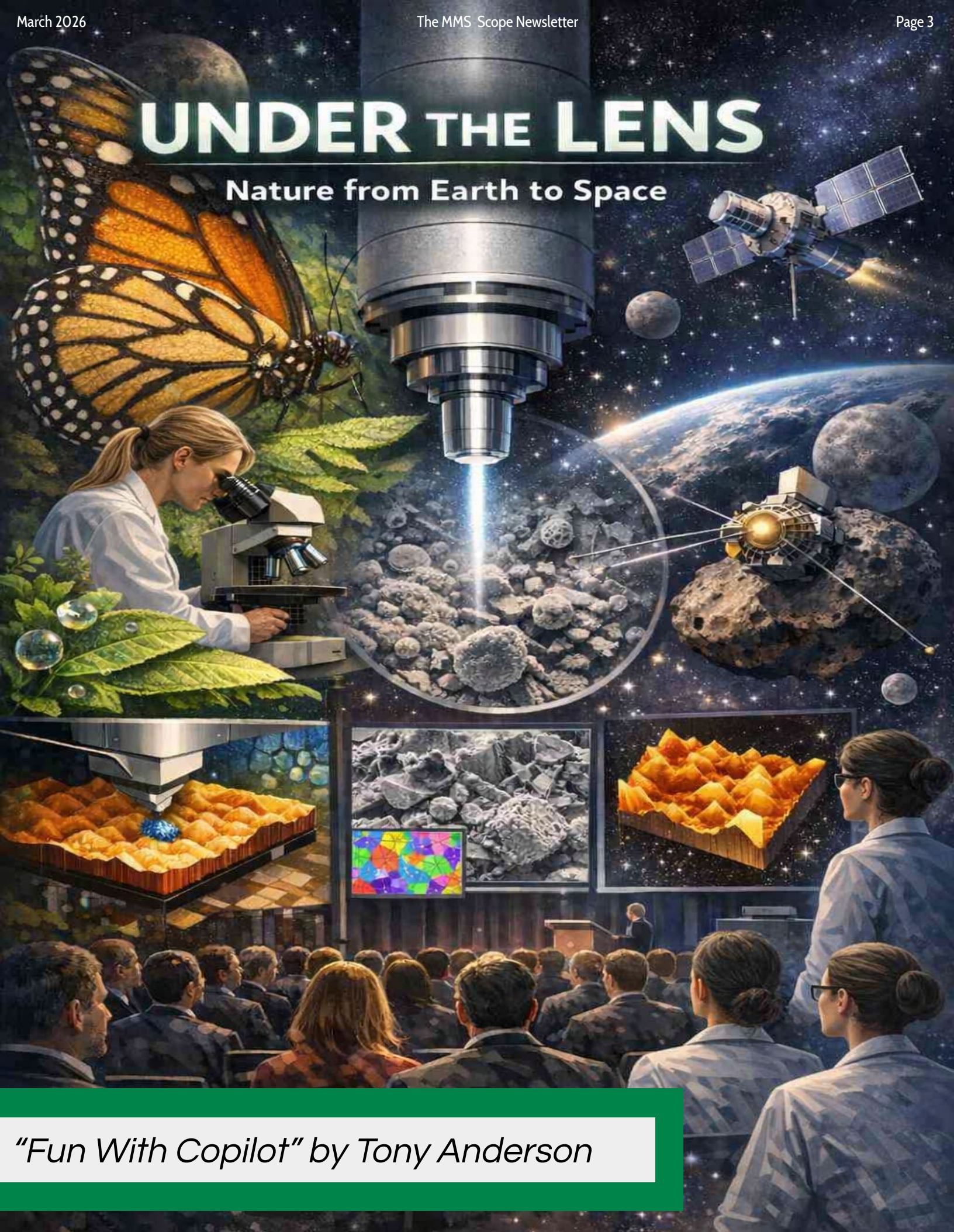
Any questions, please contact Dan Westholm (dwesthol@css.edu)



Scan QR Code to register poster!

UNDER THE LENS

Nature from Earth to Space



"Fun With Copilot" by Tony Anderson

Melissa Maurer-Jones, Ph.D. *Speaker 1*

University of Minnesota Duluth

TOPIC

Small Particles, Big Impact: Microplastics in the MN Water

ABSTRACT

Plastics are a pervasive part of everyday life and a central challenge in the environment. Environmental stresses such as sunlight, temperature fluctuations, wet/dry cycling or microbial forces affect the longevity or degradation of plastics. Assessing the fate of plastics under these stresses allows us to accurately predict the service lifetime of plastics used in infrastructure (or evaluate the extent of the plastic pollution problem. This talk will center around some of the fundamental chemistry questions the Maurer-Jones group asks around how plastics degrade and what are the implications for them in the environment. Insights my group has made we will be a jumping off point to explore some questions or concepts around the future of plastic materials.



SPEAKER BIO

Dr. Melissa Maurer-Jones completed a BS in chemistry at University of St. Thomas in St. Paul MN and a Chemistry Ph.D. at University of Minnesota - Twin Cities working for Dr. Christy Haynes where she studied the toxicity response of mammalian and bacterial models to engineered nanoparticles. She went on to do a postdoc with Dr. Kris McNeill at ETH Zurich studying the environmental photochemistry of a plastic material. Dr. Maurer-Jones has been at UMD since 2016 where she is currently an Associate Professor in the department of Chemistry and Biochemistry and Director of Graduate Studies for the Chemistry MS program.

Binxin Fu, Ph.D. *Speaker 2*

Research Engineer at 3M

TOPIC

From Nano-Contacts to Earthquakes: Probing Fault Mechanics with Atomic Force Microscopy

ABSTRACT

Fault slip and earthquake nucleation are controlled by interfacial processes that operate at the nanoscale, where chemical, mechanical, and thermal effects converge to regulate frictional behavior. Probing reactive solid–liquid interfaces under confinement and stress remains a central challenge in microscopy, particularly when interfacial chemistry, mechanics, and topography evolve simultaneously. This talk explores the application of **Atomic Force Microscopy (AFM)** to probe the calcite-solution interface, providing a direct window into the nanoscale precursors of fault slip. By performing in-situ measurements of interfacial forces and surface topography on the model reactive mineral (calcite) surface, we characterize the mechanochemical and tribomechanical mechanisms that dictate contact stability. Specifically, we examine how surface roughness and temperature influence the kinetics of pressure solution and cementation. Our findings reveal how these processes dynamically alter the frictional strength of calcite contacts, facilitating a transition from stable creep to unstable slip. This work highlights the unique capability of AFM to resolve sub-nanometer topographic changes and piconewton-scale forces, offering critical insights into the fundamental physics of earthquake nucleation that are inaccessible through bulk rock mechanics alone.



SPEAKER BIO

Binxin Fu is a Research Engineer in the Corporate Research Analytical Laboratory (CRAL) at 3M, where she focuses on nanoscale characterization of complex surfaces. She earned her PhD in Environmental Engineering, with research centered on probing solid–liquid and reactive interfaces using advanced scanning probe techniques. Her work leverages atomic force microscopy (AFM) and surface forces apparatus (SFA) to investigate interfacial forces, nanotribological behavior, and surface evolution under confinement. Binxin's research spans reactive mineral interfaces and biomineralization processes in hydrogel matrices, with broader implications for understanding interfacial mechanics in both natural and engineered systems.

Tirzah Abbot, M.S. *Speaker 3*

Ph.D Student in Mineral Physics at Northwestern University

TOPIC

Revealing multiple pathways of ringwoodite and wadsleyite formation in the Catherwood L6 shocked meteorite using transmission Kikuchi diffraction

ABSTRACT

Shock-melt veins in ordinary chondrites record extremely rapid, high-pressure mineral transformations. However, resolving the nano- to microscale mineral assemblages that form and are preserved during these events remains challenging. Here we show that near-axis transmission Kikuchi diffraction (NA-TKD), in the scanning electron microscopy (SEM), combined with energy-dispersive X-ray spectroscopy (EDS), can reliably identify crystal structures and Fe–Mg variations in sub-micron, high-pressure olivine polymorphs across 10–15 μm fields of view, providing new insight into shock transformation processes.

We apply this approach to shock-melt veins in the Catherwood L6 chondrite, where host olivine along the vein margins transforms into dense, randomly oriented clusters of ringwoodite crystals. These textures indicate rapid solid-state transformation under extreme conditions. Olivine fragments entrained within the melt preserve similar ringwoodite-rich cores but develop Fe-rich reaction zones and Mg-rich wadsleyite rims at melt-contact boundaries, along with interstitial majoritic garnet. These features record brief melt interaction, partial dissolution, and recrystallization during shock events.

Together, the observed microstructures define a two-stage, but spatially variable transformation sequence: initial solid-state ringwoodite formation followed by localized melt-mediated overprinting and wadsleyite crystallization. This demonstrates that pressure–temperature conditions vary significantly across a single shock-melt vein, allowing multiple transformation pathways to operate at the same time or in sequence within the same region.

By enabling phase identification, crystallographic orientation mapping, and combined chemical–structural analysis at ~10–30 nm spatial resolution, NA-TKD with EDS provides nanoscale crystallographic mapping within the SEM. This approach makes it possible to reconstruct complex shock transformation histories across micrometer-scale regions, offering a powerful framework for understanding high-pressure processes in planetary materials.



SPEAKER BIO

Tirzah Abbott is a Ph.D. student in Mineral Physics at Northwestern University working with Prof. Steve Jacobsen, and the manager of the Scanning Electron Microscopy (SEM) facility at the NUANCE Center's Electron Probe Instrumentation Center. She earned her B.S. in Geology from Beloit College and her M.S. in Geosciences from Northern Illinois University, with experience spanning paleontology, geochemistry, and mineralogy.

Since joining NUANCE in 2017, Tirzah has led SEM facility operations, overseeing a team that trains a large and diverse user base and collaborates with academic and industry partners on advanced materials characterization experiments. She is deeply involved in outreach and workforce development, co-founding the Women in Microscopy Conference in 2021 with Dr. Stephanie Ribet and leading the NSF REU program in nanotechnology for the past five years.

Her research focuses on characterizing geological and planetary materials formed in extreme environments using SEM-based diffraction techniques, including EBSD and TKD. She investigates high-pressure mineral transformations in shocked meteorites and studies laser 3D-printed lunar regolith for in situ resource utilization (ISRU) and automated lunar construction in collaboration with ICON Technology Inc. and NASA.

Outside of research, Tirzah enjoys running, biking, sewing, bird watching around Chicago (especially during spring migration), and spending time with her cats.

Sue Okerstrom, M.S. *Speaker 4*

Principal Scientist/Owner at Lichen Labs

TOPIC

Driven to Discover: Nature the Final Frontier

ABSTRACT

Nature is the ultimate innovator, refining materials, structures, and systems over billions of years to solve challenges with efficiency and elegance. Biomimicry, the practice of translating biological strategies into human design, offers a pathway toward advanced materials, sustainable technologies, and innovative engineering solutions.

For microscopists, this living laboratory provides an extraordinary opportunity to investigate functional materials and structures across scales from ecosystems to nano-scale architectures. This presentation explores biomimicry from the perspective of a materials scientist and scanning electron microscopist, highlighting the structure-property-performance relationships underlying biological adaptations.

Using optical microscopy and scanning electron microscopy (SEM) with energy dispersive spectroscopy (EDS), natural specimens are examined to understand how micro and nanostructures enable organisms to function within specific environmental contexts. The talk also discusses practical considerations when applying materials analysis techniques to biological specimens, including conductive coating strategies, variable pressure imaging, and adapting instrument parameters to fragile organic materials.

Case studies include SEM analysis of heavy metal accumulating organisms such as lichens and water hyacinth, which provide insight into biological strategies for concentrating metals relevant to mining remediation and electronic waste recovery. A second study investigates Lepidoptera wing scales using liquid nitrogen freeze-fracture preparation and SEM imaging, revealing complex internal architectures of ridges, pillars, and air gaps responsible for structural color and ultrasound absorption.

These examples demonstrate how microscopy can move biomimicry from observation to engineering principle, positioning nature as a vast and largely unexplored frontier for biomimetic innovation.



SPEAKER BIO

Sue Okerstrom is Principal Scientist/Owner at Lichen Labs LLC. Lichen Labs is a microscopy and biomimicry research and consulting business supporting R&D and problem-solving in companies and new experiences using biomimicry and microscopy in education. She is also the Chief Technology Officer for Reclaiming Critical Metals LLC, leading research and technology development for environmentally responsible reclamation of critical metals from electronic waste and other sources.

Sue's journey into biomimicry began as a Technical Fellow leading a materials analysis lab at Medtronic, a leading medical device company. A short course on biomimicry at an innovation conference changed everything, leading her to a global Biomimicry 3.8 Professional cohort program and exploring nature's solutions at multiple scales, including immersive study in ecosystems of the world graduating with an MS from Arizona State University and professional certificate in the Okavango River Delta, Botswana in 2015.

She also holds an MS in Materials Science and Engineering from the University of Minnesota and a BS in Environmental Studies from Bemidji State University. Sought out by the United Nations for expertise in biomimicry to combat air pollution and climate change, she now collaborates across disciplines to utilize biomimicry and microscopy as tools in engineering, product design, and sustainability.

New MMS Officers

Election of MMS Officers for 2026-27 will be conducted during the Spring Symposium.

MMS Board Officer Recommendations:

President elect: **Christina Foley**

Treasurer: **Dave Burleson**

Secretary: **Patti Sanft**

Christina Foley

Christina is a scientist working in the electron microscopy group of 3M's Corporate Research Analytical Laboratory. Her specialization includes scanning electron microscopy, focused ion beam, and electron diffraction (EBSD/TKD) on a wide range of materials. She has a BSE in Engineering Physics from the University of Colorado at Boulder, and a PhD in Applied Physics from the University of Michigan – Ann Arbor. When not studying tiny things, she is spending time with her husband, Justin, and her little ones, Belle (5) and Cameron (3).



Dave Burleson, Ecolab

Dave is Group Leader of the Laboratory Information Management Systems (LIMS) team at Ecolab. Before joining the LIMS team in 2016, Dave worked in Ecolab's Eagan Analytical Services for 12 years as an analytical chemist and microscopist. Dave has served in various roles on the MMS board since 2015, including President in 2016-17, and Treasurer since 2018. He received his Ph.D. in chemistry from the University of Minnesota. In his free time, he likes to run, hike, camp, travel, and drink craft beer.



Patti Sanft, Uponor North America

Patti is running for the position of Secretary on the MMS Board. She is an Analytical Chemist at Georg Fischer in Apple Valley that makes cross-linked polyethylene pipes for the plumbing industry. Prior to Uponor, Patti was an Analytical Chemist at H.B. Fuller Company in Vadnais Heights working with adhesives. She specializes in material properties testing including rheology, thermal analysis, and imaging with all types of microscopes. Patti has been Secretary on the MMS board since 2007.



Past Event Highlights: MMS Visits...

February Tour

MMS visited EAG Spectro Alloys aluminum recycling center in Rosemount this past February. We had around 18 attendees, including a number of students! It was a very interesting and engaging tour.



Project Micro Update

Cellula:

Project MICRO provided microscope activities before and after four performances of *Cellula* on October 23, 24, and 25, 2025. *Cellula* is a glow-in-the-dark puppet show about mitosis that was presented by Z Puppets Rosenschnoz at the Sabathani Community Center in Minneapolis. An estimated 250 adults and children took part in the activities over the three days (there were two performances on October 25).

Thanks to all the volunteers that helped make these events a success---Rachel Heussner, Stuart McKernan, Dave Burleson, Kathy Burleson, Sue Okerstrom, Gail Celio, Elise Imbertson, and Heather Remore. A special shoutout to Rachel and Stuart for covering multiple performances!



Future Events

Lincoln Elementary School of the Arts:

Project MICRO has been invited to be part of Lincoln Elementary School of the Arts' STEM Night in Anoka on April 23, 2026. The event runs from 5:00-6:15.

Lake Maria State Park:

We are in negotiations for a third annual event at Lake Maria State Park near Monticello, MN. The date will likely be June 13, 2026, time TBA. Details will be sent out to the volunteer email list when they are finalized.

If you are interested in volunteering with Project MICRO, please contact Jeff Payne via email (jeffrose.payne@gmail.com). No experience is necessary.



M&M Registration



M&M 2026 Registration is Open!

This year's annual meeting of the Microscopy Society of America, Microscopy & Microanalysis, is happening **August 2-6** just one state over in downtown **Milwaukee, WI**. Come and see plenary speakers **Thomas F. Kelly**, president of Steam Instruments, and **Wah Chiu**, director of the Division of CryoEM and Bioimaging at the SLAC National Accelerator Lab. There will be platform and poster presentations of cutting-edge research, demonstrations of the latest microscopes, and networking opportunities with folks in the microscopy community.

Early Bird registration prices are in effect from now until **May 7**, but registration will be available until June 25 and onsite. The official housing blocks at nearby hotels are open for reservations, so visit <https://mmconference.microscopy.org/> for more information!

MMS Corporate Sponsors

Corporate Sponsors are the backbone of financial support for MMS. These Members make it possible for the Society to support Project Micro and cover many expenses of regular meetings and the Spring Symposium. MMS gratefully acknowledges the corporate sponsorships provided by the following companies. To become a Corporate Sponsor, complete and return the MMS membership form at the end of the newsletter or go to <https://mnmicroscopy.org/membership>.

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info-gatan@ametek.com

jeffrey.hannon@Bruker.com

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info@ebatco.com

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tom.strader@heartlandbiotech.com

Robert.Passeri@hitachi-hta.com

bbrandt@jeol.com

nicoleh@jhtechnologies.com

sue@lichenlabs.net

hanke@mee-inc.com

PMcS@McSwiggen.com

info@microscopyinnovations.com

snagy@nanoscience.com

Thomasp@ncimicro.com

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If any sponsors are missing from this list, please contact Jason Heffelfinger (jason.r.heffelfinger@medtronic.com).

MMS Sustaining Members and Patrons

The Minnesota Microscopy Society sincerely thanks our Sustaining and Patron Members. These Members provide financial support to the organization above the standard membership. This additional support makes it possible for MMS to maintain financial well-being. To become a Patron or Sustaining Member, complete and return the MMS membership form at the end of the newsletter or go to <https://mnmicroscopy.org/membership>.

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MMS Board & Officers 2025-2026

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Paul, MN; david.burleson@ecolab.com

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celio001@umn.edu

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St. Paul, MN; jeffrose.payne@gmail.com

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Fridley, MN; tony.m.anderson@medtronic.com

Mary Buckett, 3M
St. Paul, MN; mibuckett@mmm.com

Christina Foley, 3M
St. Paul, MN; cfoley2@mmm.com

Mike Odlyzko, U of MN
Minneapolis, MN; michael.odlyzko@umn.edu

Dehua Yang, Ebatco
Eden Prairie, MN; dyang@ebatco.com

Sue Okerstrom, Lichen Labs, LLC
Duluth, MN; sue@lichenlabs.net

Jeff Salisbury, Mayo Clinic
Rochester, MN; salisbury@mayo.com

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Eden Prairie, MN; douglas.stauffer@bruker.com

Swarit Shadman, U of MN
Minneapolis, MN shadm005@umn.edu

Dan Westholm, The College of St. Scholastica,
Duluth, MN dwesthol@css.edu

MMS Cash Flow Summary

1/01/2025 through 12/31/2025

Financial Update

MMS Cash Flow Summary			
01/01/2025 through 12/31/2025			
INCOME			
Donations to MMS			200.00
Dues			
	Corporate	2100.00	
	Patron	450.00	
	Regular	340.00	
	Sustaining	500.00	
Total Dues			3,390.00
Interest Income			408.32
Miscellaneous Income			0.00
Meeting Income			695.00
Spring Symposium Income			<u>6,870.00</u>
TOTAL INCOME			11,563.32
EXPENSES			
Credit Card Fees			314.74
MMS Sponsored Donations			400.00
Insurance			146.12
Meeting Expenses			
	MMS Regular Meeting Expenses	1448.61	
Total Meeting Expenses			1448.61
Miscellaneous			100.00
Newsletter			200.00
Website			99.73
Project Micro			52.25
Spring Symposium Expenses			<u>9,850.28</u>
TOTAL EXPENSES			12,611.73
OVERALL TOTAL			-1,048.41

Join Or Renew Your Membership

Annual membership follows the January 1 to December 31 calendar year. To join or renew your membership, please visit <https://mnmicroscopy.org/membership>. There is also a membership information form on the webpage that we ask everyone complete once per year to ensure we have your latest contact information. If you would rather renew your membership via check, please complete the form below and mail it to our Treasurer.

All microscopists are urged to support their society at one of the membership levels below. Often supervisors will support MMS memberships out of department budgets because they recognize it is an inexpensive way to maintain and increase the skills of their microscopists. If you have been a member for a while and recognize the value of MMS to the microscopist community, consider upgrading your membership to Patron or Sustaining.

MINNESOTA MICROSCOPY SOCIETY | MEMBER INFORMATION FORM

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