The MMS Scope

Minnesota Microscopy Society

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

february 2019

In this Issue:

19th Annual MinnTS

(**Minn**esota **T**echnical **S**ymposium)

www.minnts.org

Thursday, March 7

ADVANCES IN 3D PRINTING

Amy Sissala
R&D Senior Print Engineer,
Stratasys, Ltd.

Prof. Michael McAlpine
Associate Professor of
Mechanical Engineering,
University of Minnesota

SCHEDULE on MAR 7

4:30 p.m.	*Tours Begin* – Ecolab Central Plant, Food & Beverage, & Pest Training Facilities (**ALL NEW!**)
5:15 p.m.	Last tour departs
5:00-6:00 p.m.	Registration, social with refreshments
6:00-7:00 p.m.	Dinner
7:00-7:15 p.m.	Welcome message, introductions (Gary Korba)
7:15-8:00 p.m.	**Amy Sissala** – *Introduction to 3D Printing*
8:00-8:15 p.m.	Break
8:15-9:00 p.m.	**Prof. Michael McAlpine** – *3D Printing Functional Materials & Devices*

LOCATION

Ecolab Schuman Campus,
EcoCafe
Eagan, MN **map it**
Enter through **Building E**.

655 Lone Oak Drive, Eagan, 55121

RESERVATIONS

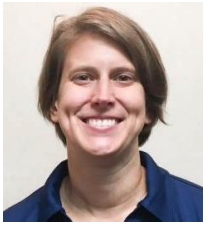
Cost: $30 **Deadline:** Sun., March 3, 11:59pm

Reservations may be made via PayPal by going to the MinnTS website at www.MinnTS.org. Use the MMS reservation link.

*To cancel a reservation, email **reservations@mnmicroscopy.org**. Include name, society you made reservation through, and phone number where you can be reached. No refunds for cancellations after March 3.*

MinnTS | 19th Annual Meeting
continued

SPEAKER BIOS



Sissala

Amy Sissala is a Senior Print Quality Engineer at Stratasys. Her responsibilities include tuning new systems and new materials to satisfy project needs and customer demands. Prior to Stratasys, she performed computer analyses on U.S. Navy submarines at General Dynamics Electric Boat in Connecticut. Sissala holds a master's degree in mechanical engineering from Rensselaer Polytechnic Institute and a bachelor's degree in architectural engineering from Illinois Institute of Technology.

McAlpine

Michael C. McAlpine is the Benjamin Mayhugh Associate Professor of Mechanical Engineering at the University of Minnesota. Dr. McAlpine's research group focuses on 3D printing functional materials and devices. His work in 3D printing of bionic ears, neuronal stem cells, and "bionic eyes" (photodiode arrays), has been frequently featured in national television and print media. He was formerly an assistant professor of mechanical and aerospace engineering at Princeton University where he conducted research on materials capable of generating power from human motion.

ABSTRACTS

Sissala: *What is 3D printing? What is the technology inside the printer? What do people make?* Amy Sissala's presentation will include on an overview of 3D printing, focusing on fused deposition model (FDM) type printers and Stratasys technology. This presentation will outline the different technologies and show how current Stratasys customers are using 3D printing day to day.

McAlpine: The ability to three-dimensionally interweave biological and functional materials could enable the creation of devices possessing unique and compelling geometries, properties, and functionalities. Indeed, interfacing active devices with biology in 3D could impact a variety of fields, including regenerative bioelectronics, smart prosthetics, biomedical devices, and human-machine interfaces. Biology, from the molecular scale of DNA and proteins, to the macroscopic scale of tissues and organs, is three-dimensional, often soft and stretchable, and temperature sensitive. This renders most biological platforms incompatible with the fabrication and materials processing methods that have been developed and optimized for functional electronics, which are typically planar, rigid and brittle. A number of strategies have been developed to overcome these dichotomies. Our approach is to use extrusion-based multi-material 3D printing, which is an additive manufacturing technology that offers freeform, autonomous fabrication. This approach addresses the dichotomies presented above by (1) using 3D printing and imaging for personalized, multifunctional device architectures; (2) employing 'nano-inks' as an enabling route for introducing diverse material functionality; and (3) 3D printing a range of functional inks to enable the interweaving of a diverse palette of materials, from biological to electronic. 3D printing is a multiscale platform, allowing for the incorporation of functional nanoscale inks, the printing of microscale features, and ultimately the creation of macroscale devices. This blending of 3D printing, functional materials, and 'living' platforms may enable next-generation 3D printed devices, from a one-pot printer.

CALENDAR of EVENTS

3 MAY 2019

MMS Spring Symposium
Minnesota Science Museum
120 W. Kellogg Blvd.
St. Paul, Minn.
7:30 a.m. – 4:00 p.m.

Topic: *Non-Traditional and Emerging Microscopy Techniques*

Speakers:

- **Stuart McKernan, retired 3M Materials Scientist**
  Electron Beam-Sample Interactions
- **Sören Eyhusen, Business Dev. Mgr., Carl Zeiss Microscopy**
  Ion Beam Microscopy
- **Liang Gong, Senior Research Scientist, 3M**
  AFM-IR Spectroscopy
- **Muhammad Nazir, Applications Engineer, Bruker Co.**
  High-Resolution Fluorescence Microscopy
- **Speaker TBD**
  Atom Probe Technology

DON'T FORGET!

Please remember to pay your 2019 MMS membership dues.

PROJECT MICRO SPRING 2019

Project MICRO

Project MICRO has a busy spring on deck! Thank you to all the devoted and new volunteers who are making time to help inspire the next generation of microscopists. Mark your calendar and plan to get involved!

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SPRING SCHEDULE

Feb. 21	5:30-7:30pm	Echo Park Elementary Family Engineering Night (Burnsville)
Mar. 15	tbd	Eagle Creek Elementary Science & Art Fair (Shakopee)
Apr. 04	5:30-7:30pm	Hamilton Elementary Science Night (Coon Rapids)

DECEMBER 2018 SUMMIT BREWING TOUR PHOTO ALBUM

The Minnesota Microscopy Society enjoyed visiting the Summit Brewery and Tap Room in St. Paul on Dec. 6, 2018. Representatives from Ecolab provided an excellent tour of the facility and beer-making process, as well as some commenting on their role in supporting the brewery. Afterwards, we enjoyed some great beer, food from Potter's Pasties, and good conversation with about 20 MMS colleagues. Thanks to all who participated!

FISCAL REVIEW

MMS Cash Flow Summary
01/01/2018 through 12/31/18

INCOME		
Dues		
Corporate	3,000.00	
Patron	475.00	
Regular	330.00	
Student	40.00	
Sustaining	400.00	
Total Dues		**4,245.00**
Interest Income		**30.94**
MinnTS Meeting Registration		**2,756.46**
Miscellaneous Income		**139.00**
Spring Symposium Income		**6,785.00**
TOTAL INCOME		**13,956.40**
EXPENSES		
PayPal Credit Card Fees		**361.59**
Insurance		**326.17**
Meeting Expenses:		
MMS Regular Meeting Expenses	1,089.00	
MinnTS Meeting Expenses	2,778.65	
Total Meeting Expenses		**3,867.65**
Miscellaneous		**0.00**
Newsletter		**660.00**
Project Micro		**182.74**
Spring Symposium Expense		**6,909.05**
TOTAL EXPENSES		**12,307.20**
OVERALL TOTAL		**1,649.20**

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Corporate Sponsors are the backbone of financial support for the Society. These members make it possible for the Society to support Project Micro and to cover many expenses of the 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.

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All microscopists are urged to support their Society at one of the membership levels offered below. Often, supervisors will support MMS memberships out of their project budget because they recognize that it is a very inexpensive way to maintain and increase the skills of their microscopists. If you have been a member over the years and recognize the value of MMS to the community of microscopists it serves, consider upgrading your membership this year to the Patron or Sustaining level. Thank you.

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Affiliation_____ Phone (_____)_____

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E-mail address_____

(Newsletter notifications will be e-mailed to the address above.)

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Payment: Check ☐ PayPal ☐

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