



# The MMS Scope

## Minnesota Microscopy Society

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

sept 2017

### In this Issue:

#### Fall program:

Guest speaker and internationally-recognized TEM expert Dr. Chongmin Wang from the DOE's Pacific Northwest National Lab (PNNL) in Washington will kick off the society's 2017-2018 year of events on 9/21 at the Ewald Conference Center in St. Paul. Mark your calendar today and register by **9/14!**

#### Coming up:

Microscope Day on November 4, MinnTS on March 6, and Spring Symposium on May 4, 2018. Save the dates on your calendar now and plan to participate.

#### Don't miss:

MMS is excited to announce the launch of our newly designed website. Same url, new look!



Scanning/Transmission Electron  
**Microscopy and Spectroscopy  
beyond Abberation Correction:**  
*In-situ* Microscopy for  
**Watching while It Happens**



#### Chongmin Wang

Senior Research Scientist,  
Environmental Molecular  
Sciences Laboratory (EMSL),  
Pacific Northwest National  
Laboratory, Richland, WA



#### LOCATION

University Enterprise Labs  
Ewald Conference Center  
[1000 Westgate Dr.](#)  
[St. Paul, MN 55114](#)



**Ewald**  
Conference Center at UEL

Enter on the south side of the  
building by the UEL overhang.  
[Google map.](#)




#### RESERVATIONS

Cost:

- Member: \$10
- Non-member: \$20
- Student: \$5

Registration deadline:

**Thursday, Sept. 14, 11:59 p.m.**

Reserve a spot today via PayPal   
@ the MMS Events page:

[www.mnmicroscopy.org/events](http://www.mnmicroscopy.org/events)

(NOTE: Scroll down to bottom of page  
and click the "BUY NOW" button under  
'Register for the Fall Meeting.')



#### SCHEDULE on SEP 21

- |                  |                |
|------------------|----------------|
| 6:00 – 6:30 p.m. | Check-in       |
| 6:30 – 7:30 p.m. | Catered dinner |
| 7:30 – 8:30 p.m. | Speaker        |

## MMS Fall Kickoff Event | continued



### SPEAKER BIO



**Chongmin Wang** received his B.Sc. and M.Sc. in physics from Lanzhou University in China and Ph.D. in materials science and engineering from the University of Leeds, UK. He worked at Max-Planck Institute for Metal Research in Stuttgart in Germany as an Alexander von Humboldt Research Fellow, National Institute for Materials Science in Japan, and Lehigh University in Pennsylvania, focusing on atomic level study of grain boundary structure and chemistry using S/TEM.

He is currently a chief scientist at Pacific Northwest National Laboratory (PNNL) and his research interests include the state of the art S/TEM imaging and spectroscopy and their application to materials characterization, especially *in situ* and *operando* S/TEM techniques for energy materials application.

He is one of the pioneers of the *in-situ* TEM technique for rechargeable battery research, which has earned him prestigious honors, including the 2012 Microscopy Today Innovation Award, 2016 MRS Innovation in Materials Characterization Award (shared with Frances Ross of IBM T. J. Watson Research Center and Niels de Jonge of Leibniz Institute for New Materials, Germany); 2015 Journal of Materials Research (JMR) Paper of the Year Award; and the 2017 PNNL Laboratory Director's Award for Exceptional Scientific Achievement.

Chongmin has published 360 journal papers, with recent work on rechargeable batteries published in many high profile journals, and several book chapters with total citations of 16,000 and an H-index of 65, and he has delivered 60 invited talks. He is serving as the principal editor of the *Journal of Materials Research* and is a Fellow of the Materials Research Society.



### ABSTRACT

Over the last decades, we have witnessed tremendous progress in the development of aberration corrected scanning/transmission electron microscopy. As a result of this development, imaging and spectroscopy of materials at atomic scale appears to be a routine practice. The question now comes to how we extend these methodologies to analyze material process under reaction or operating condition, typically such as real-time observation of catalytic process, oxidation/reduction, charge and mass transport during battery operation. Approaches that are employed to provide *in-situ* observation of chemical reactions and microstructural evolution include, but are not limited to: the use of differential pumping technologies, the modification of sample holders to enable the application of an external stimulus such as an electromagnetic field or stress, using thin membrane closed cells for experiments involving liquids or gases, and use of liquid with low vapor pressure. In view of these developments, in this presentation I will focus on *in-situ* techniques that developed for probing into the structural and chemical information of energy storage materials, highlighting direct observation of structural evolution, phase transformation and their correlation with mass and charge transport, providing insights into how active materials fade during the cyclic charging and discharging of a battery. In perspective, challenges and possible direction for further development of *in-situ* S/TEM imaging and spectroscopic methods for both functional and structural materials will also be discussed.



## CALENDAR of EVENTS

**4 NOV 2017**

### Microscope Day (9th year!)

Minnesota Science Museum  
St. Paul, Minn.  
12:00 – 4:00 p.m.



**6 MAR 2018**

### 16th Annual MinnTS (Minnesota Technical Symposium)

Ecolab Innovation Center  
Eagan, Minn.  
5:00 – 9:00 p.m.



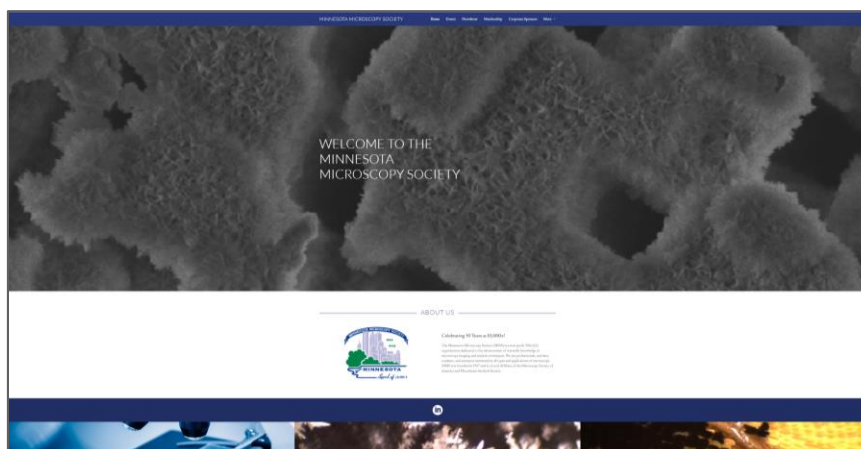
**4 MAY 2018**

### MMS Spring Symposium

Minnesota Science Museum  
St. Paul, Minn.  
7:30 a.m. – 4:00 p.m.



## CHECK OUT OUR NEW WEBSITE



[WWW.MNMICROSCOPY.ORG](http://WWW.MNMICROSCOPY.ORG)

The MMS website has been redesigned to make it easier to navigate and more user-friendly. Thanks to the hard work of Abby Mark and Ann Palmer, the new site has a much more modern design, provides quick access to the events calendar and communicates the MMS message to current and prospective members. Information is now all organized into the top menu items. Be sure to check it out!



## MMS Cash Flow Summary 01/01/2017 through 08/23/17

### INCOME

#### Dues

Corporate	2,700.00
Patron	575.00
Regular	210.00
Student	15.00
Sustaining	400.00

**Total Dues** **3,900.00**

**Interest Income** **0.60**

**MinnTS Meeting Registration** **2,976.13**

**Miscellaneous Income** **125.00**

**Spring Symposium Income** **4,395.00**

**TOTAL INCOME** **11,396.73**

### EXPENSES

**PayPal Credit Card Fees** **271.61**

**Insurance** **326.17**

#### Meeting Expenses:

MMS Regular Meeting Expenses 622.27

MinnTS Meeting Expenses 2,917.52

**Total Meeting Expenses** **3,539.79**

**Miscellaneous** **601.53**

**Newsletter** **550.00**

**Project Micro** **111.04**

**Spring Symposium Expense** **4,901.41**

**TOTAL EXPENSES** **10,301.55**

**OVERALL TOTAL** **1,095.18**



## MMS CORPORATE SPONSORS

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 in 2016-2017. To become a Corporate Sponsor, complete and return the MMS membership form at the end of the newsletter.

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The Minnesota Microscopy Society would like to express sincere thanks to our Sustaining and Patron Members. These members provide financial support to the organization above the standard membership fee. This additional support makes it possible for MMS to maintain its financial well being. To become a Patron or Sustaining Member, complete and return the MMS membership form at the end of the newsletter.

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**Webmaster:** Bede Willenbring, retired,  
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URL has changed!

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## MINNESOTA MICROSCOPY SOCIETY | MEMBER INFORMATION FORM

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.

Dr  Mr  Mrs  Ms  First Name \_\_\_\_\_ Last Name \_\_\_\_\_

Affiliation \_\_\_\_\_ Phone (\_\_\_\_\_) \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

E-mail address \_\_\_\_\_

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

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Student (\$5-\$9)  Basic (\$10-\$24)  Patron (\$25-\$99)  Corporate/Sustaining (≥ \$100)

Payment: Check  PayPal

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