# 45TH ANNUAL
# UW SYSTEM CHEMISTRY FACULTIES MEETING

**Oct. 25-26, 2019**
Hosted by the UW Oshkosh Chemistry Department

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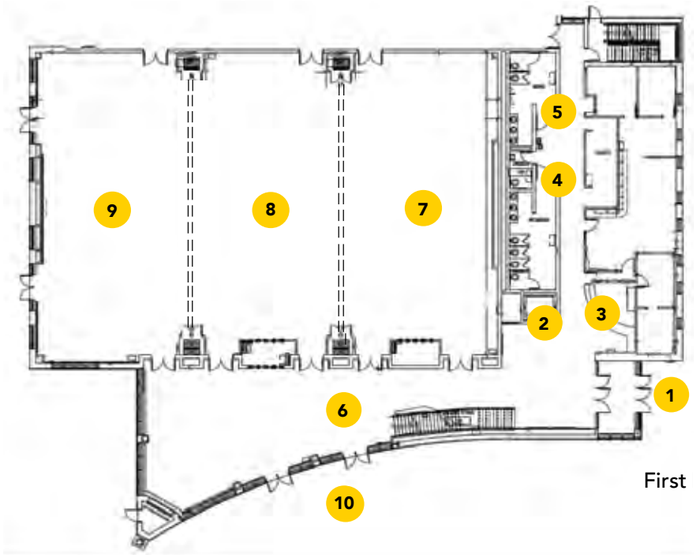
# CULVER FAMILY WELCOME CENTER

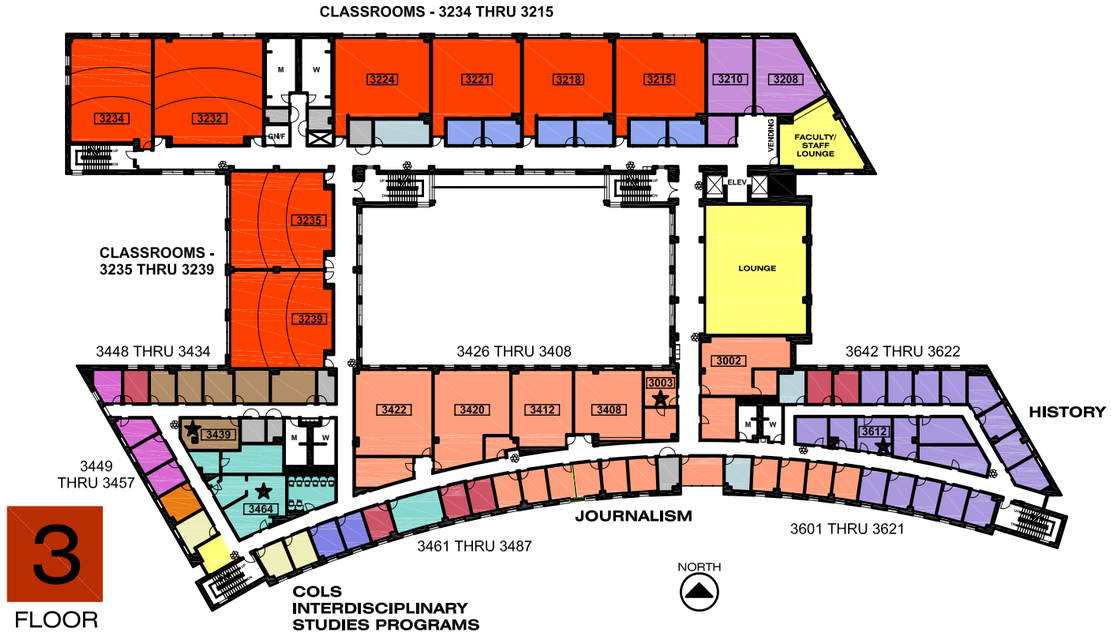
First Level

1. Main entrance
2. Elevator
3. Receptionist area
4. Women's restroom
5. Men's restroom
6. Great Hall
7. Grand Ballroom A
8. Grand Ballroom B
9. Grand Ballroom C
10. Patio




First Level

# SAGE HALL

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**Parking Information**
Free Parking is available in the Culver Family Welcome Center (CFWC) parking lot on Friday night. Saturday events will be held in Sage Hall. Parking is available in the Yellow Shaded lot #7 or 13. Parking in any other lot may result in being ticketed.

1. **Sage Hall**
2. **Culver Family Welcome Center**
3. **Parking Lot #7**
4. **Parking Lot #13**
5. **Culver Family Welcome Center Parking Lot #6**

**Internet Access**
Free WiFi is available. Select Titan WiFi Guest from your list of available networks. Use your email address to log in as a guest. No password is required.

**Gender Neutral Bathrooms**
Gender neutral and family bathrooms can be found around campus, including in Sage Hall (rooms 1231, 2231, 3231, 4231) and Culver Family Welcome Center (room 106). For a complete campus listing, reference: **uwosh.edu/gec/resources/all-gender-restrooms**

**Lactation Spaces**
UW Oshkosh offers several spaces around campus for nursing mothers, all with locking doors and access to power outlets. Refrigerator space is available within the Culver Family Welcome Center.

See the following webpage for more information:
**uwosh.edu/gec/resources/lactation-rooms**

# UNIVERSITY OF WISCONSIN OSHKOSH

## WHERE EXCELLENCE AND OPPORTUNITY MEET

UW Oshkosh is part of the robust University of Wisconsin System—one of the largest systems of public higher education in the country. As a member of the System, UW Oshkosh provides students with state-wide resources and ensures top academic quality and accountability.

With a strong research focus and national ranking in sustainability, Titans demonstrate on a daily basis what students can do to change the world. UW Oshkosh offers nearly 200 majors, minors and emphases, in addition to 15 graduate programs and two doctoral programs. UW Oshkosh provides academic programs that meet 21st century needs, through nationally recognized general education curriculum that celebrates inclusive excellence, fuels imagination and champions critical thinking.

## WELCOME FROM THE CHANCELLOR

On behalf of the University of Wisconsin Oshkosh and the University's Department of Chemistry and College of Letters of Science, welcome to the 45th Annual University of Wisconsin System Chemistry Faculties Meeting. We are proud to host you. As chemistry is my own discipline, I am especially delighted to make you feel at home at UW Oshkosh.

As a public, regional, comprehensive university of three campuses in a thriving region, UW Oshkosh educates more than 16,000 students. Your gathering and the spirit of collegiality and partnership it is built upon exemplify our commitments to collaboration, professional networking and the sharing of teaching and research breakthroughs and innovations. UW Oshkosh is always thrilled to serve as a forum for new ideas, insight and expertise while helping highlight trends and common opportunities on the horizon.

I thank the UW Oshkosh Department of Chemistry and our College of Letters and Science faculty members and leadership for helping organize and host this year's meeting. You will find that we prize these opportunities to interact and engage with our UW System colleagues. It heightens the quality of the educational experiences we provide students and deepens the positive influence and impact of our research and service.

An outstanding lineup of speakers, session topics and presentations awaits you. Make the most of your time, and please enjoy all that UW Oshkosh, this city and our region have to offer.

Thank you for joining us and for your many, life-changing contributions to your institutions, the UW System and the state of Wisconsin

Chancellor Andrew J. Leavitt

# WELCOME FROM THE CHEMISTRY DEPARTMENT

Welcome back to UW Oshkosh. We are pleased to show you how our campus has grown since we hosted the Chemistry Faculties Meeting in 2006. We now span three campuses – Fond du Lac, Fox Cities, and Oshkosh – and this weekend's events are being held in two new buildings, the Culver Family Welcome Center and Sage Hall.

The primary goal of the meeting is to share ideas about chemistry and chemical education. Thank you to the members of the organizing committee: Jennifer Schuttlefield Christus, Kevin Crawford, Sharon Hawi, David Miles, Greg Potratz and Yijun Tang who have planned a variety of thought-provoking sessions. We hope this opportunity to meet new people, renew acquaintances, and encounter diverse perspectives on teaching and research will serve as a catalyst for innovations in your departments.

Brant Kedrowski and Jennifer Mihalick
Co-chairs, UW Oshkosh Department of Chemistry



## The campuses of UW Oshkosh

UNIVERSITY OF WISCONSIN OSHKOSH

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# FRIDAY, OCT. 25

| | | |
|---|---|---|
| 4:30-6 p.m. | Registration | Culver Family Welcome Center |
| 5-6 p.m. | Poster and Vendor Sessions | Ballroom A and B |
| 6-8 p.m. | Dinner | Ballroom C |
| 6:45 -7 p.m. | Welcome | Ballroom C<br>UW Oshkosh Cancellor Andrew Leavitt |
| 7-8 p.m. | Friday Night Keynote Address | Ballroom C<br>Dr. Paul M. Voyles<br>Department of Materials Science and Engineering, UW Madison |
| 8-10 p.m. | | Social Mixer<br>Cash Bar<br>Poster Session<br>Vendor and attending mixer |


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# SATURDAY, OCT. 26

| | | |
|---|---|---|
| 7:30-8:30 a.m. | Breakfast | Sage Hall 3rd Floor Lounge |
| 7:30-8:30 a.m. | Department Chairs Meeting | 3rd Floor Faculty/Staff Lounge Sage Hall (turn right off of the elevators) |
| 8:45-9:30 a.m. | Saturday Morning Keynote Address | 3232 Sage Hall<br>Marisa K. Trapp, Senior Environmental Health Specialist, Certified Hazardous Materials Manager<br>UW System Office of Risk Management |

## BREAKOUT SESSIONS

### BREAKOUT SESSION #1
**9:45-10:45 a.m.**
**Sage Hall**

- Upcoming UW System Safety Audit
  Moderator: Sheri Lense
  Room: 3218 Sage Hall
- Shared equipment access
  Moderator: Paul Voyles
  Room: 3221 Sage Hall
- 2-year | 4-year Integration: Lab Times
  Moderator: Jenny Schuttlefield Christus
  Room: 3235 Sage Hall
- Communicating Science in Classroom: Dealing with Science Skeptics
  Moderators: Kevin Crawford and Brian Walsh
  Room: 3224 Sage Hall

### BREAKOUT SESSION #2
**11 a.m.-noon**
**Sage Hall**

- Creating a safety plan for your department
  Moderator: Greg Potratz
  Room: 3218 Sage Hall
- Lab fees
  Moderator: Bill Wacholtz
  Room: 3221 Sage Hall
- 2-year | 4-year Integration continued
  Moderator: Caroline Geary
  Room: 3235 Sage Hall
- Communicating Science in Research and Outreach
  Moderators: Kevin Crawford and Brian Walsh
  Room: 3224 Sage Hall

**Break**
10:45-11 a.m.

| | | |
|---|---|---|
| Noon-1:30 p.m. | Lunch | 3rd Floor Lounge |
| 12:30-1:30 p.m. | Saturday Luncheon Keynote Address | 3232 Sage Hall<br>Dr. Yijun Tang, 2019 Regents Scholar Awardee<br>Department of Chemistry, UW Oshkosh |
| 1:30 p.m. | Closing | |

# KEYNOTE #1

**Friday night, 7–8 p.m.**
Culver Family Welcome Center
Ballroom C

**The Fast, the Slow, and the Complicated: Spatially Heterogeneous Dynamics in Supercooled Liquids**

**Paul M. Voyles**
Materials Science and Engineering Department
University of Wisconsin-Madison

We typically think of liquids as spatially uniform, with the same composition and atomic motions everywhere. However, there is a growing body of evidence that for supercooled liquids – liquids below the freezing temperature – this is not true. Supercooled liquids exhibit spatially heterogeneous dynamics at the nanometer scale. Dynamics in these systems are characterized by a structural relaxation time, $\tau$, which is (very approximately) the time it takes a molecule to gain or lose a neighboring molecule. $\tau$ is connected to the viscosity by the Debye-Stokes-Einstein equation. In supercooled liquids, $\tau$ varies an order of magnitude at a length scale of order 10 intermolecular separations, or just a few nanometers in most liquids. Spatially heterogeneous dynamics may play a central role in the molecular nature of the glass transition and in the nucleation kinetics of crystal phases from supercooled liquids.

In this talk, I will review some of the evidence for spatially heterogeneous dynamics in supercooled liquids and describe some of the clever indirect experiments devised for measuring them. Then, I will discuss recent experiments in my group to use a new form of electron microscopy, electron correlation microscopy (ECM) to visualize spatially heterogeneous domains in supercooled liquid directly in real space. Our ECM measurements reveal an increasing dynamical length scale and time scale as the liquid is cooled toward its glass transition temperature. I will close with some speculation about future experiments and implications for the glass transition.

Paul Voyles is a Harvey D. Spangler professor in the Materials Science and Engineering Department at the University of Wisconsin-Madison and director of the Wisconsin Materials Research Science and Engineering Center. He earned degrees in physics from Oberlin College and the University of Illinois, Urbana-Champaign, then worked as a post-doctoral member of technical staff at Bell Labs in Murray Hill New Jersey. He joined UW-Madison in 2002 as an Assistant Professor. His research specialty is the structure of materials, investigated primarily with electron microscopy, supplemented by simulations and data science. He has worked on metallic and other glasses and on materials for microelectronics, spintronics and superconductors. He has published over 150 journal articles, book chapters and conference proceedings.

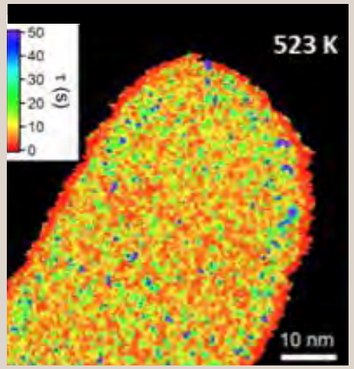



Image of spatially heterogeneous dynamics in the supercooled liquid of a Pt-based metallic glass nanowire heated above its glass transition temperature

# KEYNOTE #2

**Saturday morning, 8:45 – 9:30 a.m.**
**3232 Sage Hall**

**Overview of the Upcoming UW System Safety Audit for Labs**

**Marisa K. Trapp**
Senior Environmental Health Specialist, CHMM
University of Wisconsin System, Office of Risk Management

Marisa Trapp, Senior Environmental Health Specialist in the UW System Administration Office of Risk Management, will present an overview of general lab safety elements and trends. Marisa's role within the UW System Administration is to provide compliance assistance and best management practice guidance to UW campuses in environmental and occupational health and safety regulatory programs. Her talk will include an update on the upcoming laboratory safety audit in 2020, highlight laboratory safety best practices and guidance for campuses from a UW System perspective, and provide a review of the OSHA Lab Standard regulations. The presentation will include time for Q&A.

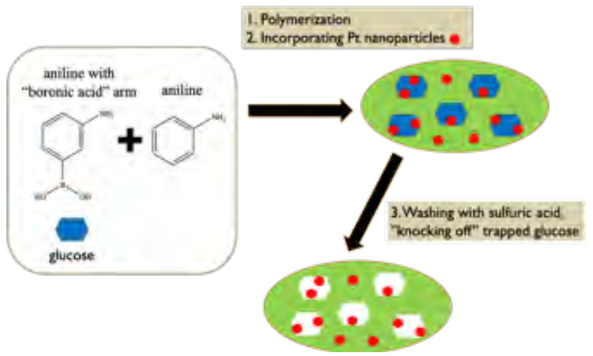
# KEYNOTE #3

**Saturday luncheon, 12:30 – 1:30 p.m., 3232 Sage Hall**

**Polymer-Metal Composite in Glucose Detection**

**Yijun Tang**
Associate Professor, Chemistry Department
University of Wisconsin Oshkosh
2019 Regents Scholar Award Winner

Yijun Tang earned his BS in Chemistry from Beijing University, China, MS in Chemistry from Michigan State University and PhD in Biomedical Sciences from Oakland University in Michigan. After joining the chemistry faculty at UW Oshkosh in 2009, he has focused his research on surface modification of electrodes to broaden the application of chemical sensors.




Enzyme-based glucose sensors have some limitations when the pH is altered. Under very acidic and very basic conditions, an enzyme-free glucose sensor is required. To mimic the functions of glucose oxidase, a composite made of polymers and metal nanoparticles was fabricated. The polymer not only provides the support for the metal nanoparticles or the catalyst for the glucose oxidation but also is designed to be selective towards glucose molecules. For these purposes, polyaniline(PANI) and poly(vinylferrocene) (PVF), the representatives of two different types of conductive polymers, have been tested. Attempts have also been made to enhance the selectivity. In this presentation, the current progress of this ongoing project is reported.

## POSTER SESSION

**1. Student Growth Mindset Can Improve if Introduced by Professors in STEM Courses**

Lori Trimble, Jessica Bonjour, Kirsten Crossgrove, Kris Curran and Lauren Von Rueden

University of Wisconsin Whitewater, Whitewater, WI

**2. Flexible Assignments Provide the Pillars for Self-Determination Theory: Competence, Autonomy and Relatedness**

Jessica Bonjour[1], Barbara Beaver, Kris Curran, Kirsten Crossgrove

University of Wisconsin Whitewater, Whitewater, WI

**3. Bacterial Manganese and pH Homeostasis: Structure-function Analyses of Manganese Transporters**

Katherine Senn[1], Jennifer Schmitz[1], Eli Martinez[1], Rilee Zeinert[1], Luke Seuffer[1], Ellen Otto[2] and Lauren S. Waters[1]

[1]University of Wisconsin Oshkosh, Oshkosh, WI
[2] College of St. Benedict, St. Joseph, MN

**4. Producing Polymer-Quantum Dot Composite Materials Through Direct Ligand Reaction**

Aaron Evans, Kimberly Mackiel, Cordell Schrank and Samuel R. Alvarado

University of Wisconsin River-Falls, River Falls, WI

**5. Lessons Learned from Five Years of Consortium Programming Targeting Postdocs and Female Faculty at Primarily Undergraduate Institutions**

Erin Winterrowd[1] and Jennifer E. Mihalick[2]

[1]Regis University, Denver, CO
[2]University of Wisconsin Oshkosh, Oshkosh, WI

**6. Using Calibrated Peer Review (CPR) to Teach Scientific Writing and Critical Thinking Skills**

Breeyawn Lybbert

University of Wisconsin–Green Bay, Manitowoc Campus, Manitowoc, WI

**7. Focus on Flavor—Helping Small Brewers Make Big Decisions: Course-embedded Collaborative Research and Outreach**

Scott Bailey-Hartsel

University of Wisconsin Eau Claire, Eau Claire, WI

**8. Reimagining a Support Course for General Chemistry and College Algebra at UW-Green Bay, Manitowoc Campus**

Amy J. Kabrhel* and Megumi Onoda **

*Department of Chemistry
**Department of Mathematics and Statistics
University of Wisconsin–Green Bay, Manitowoc Campus, Manitowoc, WI

**9. Thermodynamics of an Electrochemical Reaction using Instructional Grade Amplifiers and A-to-D Converters as an Experimental Design Exercise in Physical Chemistry Laboratory**

Jonathan H. Gutow

University of Wisconsin Oshkosh, Oshkosh, WI

**10. Cross-Electrophile Coupling, Deoxygenation, and Cycloaddition, Oh My! Metal-Mediated Organic Transformations via Mechanochemistry**

Rebecca Haley

University of Wisconsin - River Falls, River Falls, WI

**11. β-helix structural resiliency affords accommodation of both an organized internal water network and 200 Å$^3$ void volume.**

Christopher N. Woods[1], Megan R. Wimmer[1], Walter R.P. Novak[2], Daniel P. Grilley[1] and Todd M. Weaver[1]

[1] University Wisconsin – La Crosse, La Crosse, WI

[2]Wabash College, Crawfordsville, IN

**12. Inhibition of Bcl-2 Family Proteins Sensitizes Metaphase-arrested HeLa S3 Cells to Apoptosis Induced by Mild Hyperthermia**

James R. Paulson, Savanna Suydam, Rachel Luedke, Kalista Paszczak

University of Wisconsin Oshkosh, Oshkosh, WI



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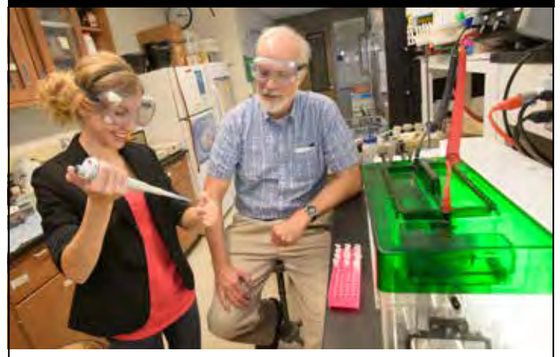

The University of Wisconsin Oshkosh offers American Chemical Society certified bachelor's degrees in chemistry and biochemistry, as well as bachelor's degrees in biomolecular science and in chemistry - secondary education.

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# SPARK BY MARK MOULTON

Spark dynamically symbolizes the moment of creation, or inspiration. It is the unfolding of space and time, the instantaneous burst of creative energy that spawns a universe or a new idea. Beginning at a point located near its Periodic Plaza, Spark sweeps up and away from an explosive opening, illustrating that twinkle-in-time when physics or intuition jumps a gap to become action and reality.

One-hundred-and-nine laser-cut elemental symbols perforate the conical form and create a striking chaos of information that is active with visual movement. The symbols are arranged, not periodically, but by scale in accordance with their abundance in the Earth's crust, with the more abundant elements on a larger scale. The Periodic  Table, arranged in a circular form at the sculpture's base, reinforces the idea that this visual puzzle has a more meaningful pattern.