THE MIDLAND CHEMIST

A publication of the Midland Section of the American Chemical Society

June 2025, Vol. 62, No. 6

Contents

Chair Column

Krishnaja Duvvuri, Chair, Midland Section ACS

Dear Reader,

As we approach the midpoint of the year, it's an ideal moment to reflect on recent efforts and look ahead to the exciting opportunities that lie ahead. It's also a timely occasion to highlight the activities of the Outreach Committee under the inspiring leadership of the committee chair, Gina Malczewski. Many readers already know Gina for her tireless dedication and passion—qualities that have been instrumental in cultivating a strong, vibrant culture of outreach within our Section. Read on to learn more about the Outreach Committee's popular activities and ways you can get involved.

The Outreach Committee focuses on bringing STEAM (Science, Technology, Engineering, ART and Math) activities and knowledge to ALL ages, with special focus on K-12 students. Our desire to connect with the general public comes from a belief that understanding basic scientific principles and the scientific process is crucial to making informed decisions about many critical social issues. We also want to provide science role models and educate young people about career options in all the sciences.

Midland ACS has long been involved in local science fairs and public "walk by" events with hands-on and interactive activities. A major local thrust in the 1990s to support teachers in science education resulted in workshops for educators ("Bringing Science to Life in the Classroom")—all written, presented and supplied by Midland ACS. Additional locally-produced teacher workshops ("Sci-Tech: Next Generation") followed, and with the advent of the National ACS "Science Coaches" program, interaction with educators has continued uninterrupted. As word has spread of the breadth and nature of Midland ACS offerings, more and more requests for our programs have resulted, with collaborators that have included local K-12 schools, Michigan State University, Midland Center for the Arts, Creative 360, Central Michigan University, Grace A. Dow Library, Girl Scouts, Boy Scouts, and Bay County YMCA. Midland Outreach has presented at Michigan Science Teacher Association conferences, Pittcon Meetings, and Delta College Girls' Day Out events. Middle school camps have been offered since 2018 (even virtually during COVID, with loaned computers)—they have covered many topics, featured expert speakers, and involved special field trips. Almost all Midland ACS programs are free.

There are many metrics for the success of Midland ACS outreach. In 2024, there were 43 K-8 events offered and 72 Outreach programs overall, with an average of about 80 attendees per event. Feedback is usually collected, and responses like "three kids had a ton of fun, including our 7-year-old who wants to be a scientist" make the effort worthwhile. Connie Kennedy, K-12 Math & Science Instructional Support Specialist for Bay City Public Schools says, "The support of the Midland Chapter of the American Chemical Society has been a true asset to Bay City Public Schools. Their involvement—from volunteering at career fairs and leading dynamic STEM presentations to improving school spaces and offering expert science coaching—has enriched our students' learning experiences and strengthened our science programs in meaningful ways."

Anyone can volunteer for Outreach—there are different kinds of events/opportunities, and many activity/program options have already been developed, with write-ups and lots of materials available in storage for use. Safety considerations are paramount, and training is always offered for public-facing events. Formats range from "walk-by" to presentations with group hands-on experiences. There are many people in our Section with significant Outreach experience, including Dave Stickles and Diana Deese and others from the MidMichigan Technicians Group. Calls go out from Outreach leaders periodically for volunteers; anyone can get their name on the "list"—just contact Gina Malczewski (reginamalczewski@gmail.com), and she will direct your request or keep your contact information for the future (no obligation attached). Some of the busiest times for Outreach are in the spring around Earth Day (Chemists Celebrate Earth Week, CCEW), late June through early August (for summer camps and Midland's River Days), and in the fall around Halloween and National Chemistry Week (NCW). New activities are developed frequently, aligned with the themes for CCEW and NCW, or as specifically requested by hosts. Participating in Outreach can be challenging, but it is tremendously rewarding—teaching others deepens one's own understanding of chemistry, and helping people realize the importance and relevance of chemistry opens hearts and minds to new knowledge and their opportunities to participate (even WITHOUT fires and explosions)!

Biography

Gina Malczewski received a PhD from the University of Michigan in Biological Chemistry, and teaching certification from SVSU in Biology, Chemistry and General Science. She did postdoctoral studies at Michigan Molecular Institute and worked as a researcher at Dow Corning for 29 years. She has been heavily involved in Science Outreach through the Midland Section of the American Chemical Society since 2008, organizing and teaching middle school summer camps, teacher workshops, teaching in classrooms and leading events for the general public. Gina is an ACS Fellow, and received an award from Gov. Gretchen Whitmer as an outstanding senior volunteer in 2019. She also volunteers for the Red Cross, and for HELPS International in Guatemala, where she has done stove and water filter installations, as well as educational workshops for teachers and culinary support for medical teams. Zumba, biking, and art are among her past-times, and she is very proud of husband Frank and three sons, daughter-in-law Jessica and grandson Wesley.

Whiskey Pull – Project Seed Fundraiser

Hunter Woodward, Director, Midland Section ACS

A CALL FOR DONATIONS

The Midland ACS is organizing its first ever "whiskey pull" in which each purchased ticket will earn the holder a random bottle of whiskey from a selection of bottles. About half the bottles are rare bottles collected by our team over time, and about half of them will be donations from friends of the Midland ACS. We hope to use the funds from this event to support our 2025 Project SEED efforts. Please contact Michelle Rivard at project-seed@midlandacs.org to donate a bottle. Bottles can be big or small and of any monetary value, so long as they are unopened. All donations are appreciated, so please consider purchasing a bottle or looking in the back of your cabinets!

ACS Project SEED is a long-running initiative by the American Chemical Society that provides economically disadvantaged high school students with hands-on summer research experiences in chemistry-related fields. Students work in academic, industrial, or government labs under the mentorship of professional scientists, gaining exposure to real-world research and career pathways. The program also offers scholarships, virtual camps, and professional development, aiming to broaden access to STEM education and careers. The Midland ACS's local Project SEED efforts have been recognized nationally for its positive influence, sponsoring about a dozen students each summer.

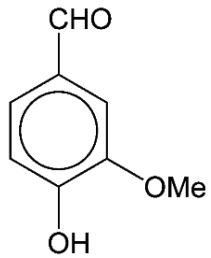
Whiskey Chemistry

Hunter Woodward, Director, Midland Section ACS

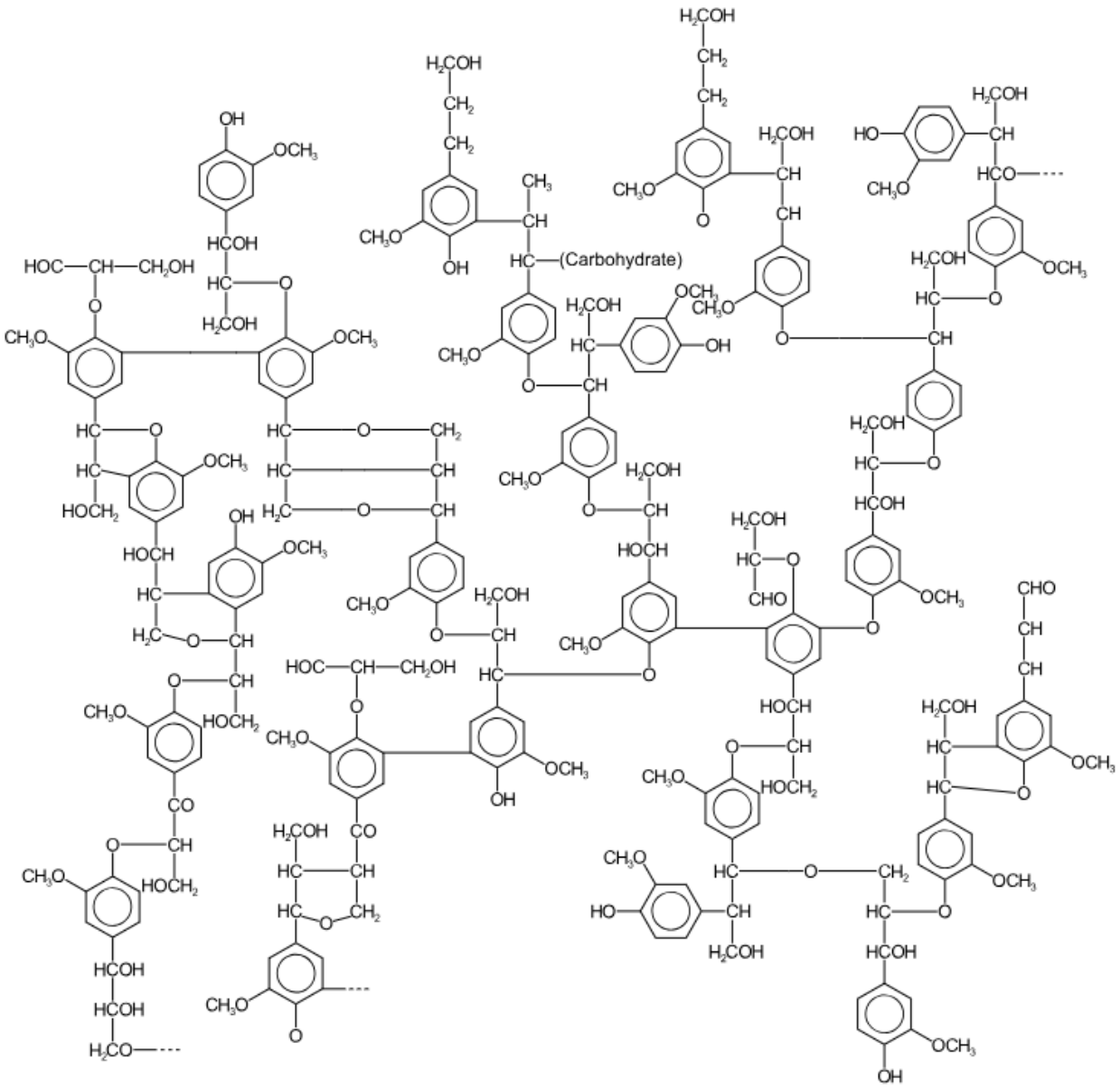
"Poems are made by fools like me,
But only God can make a bourbon."

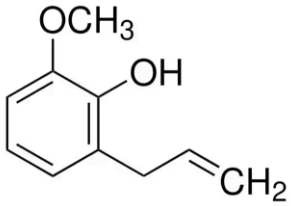
Even if you don't enjoy bourbon, you probably know that there are "good" and "bad" varieties, and everything in-between. For the unfamiliar I will simply state that bourbon is a corn-based whiskey that must be aged in a brand-new internally charred oak barrel. All bourbons are whiskeys, but not all whiskeys are bourbons. Because bourbons are made in brand-new oak barrels, and because the recipe is somewhat fixed (and 99.9% water/ethanol), how could one be better than another, with dollar amounts spanning three orders of magnitude? As a chemist it has always fascinated me, since all the differences in quality must surely be due to a minor fraction of the 0.1% of molecules that aren't water or ethanol! Can't we just synthesize "good" bourbon in a lab?

Bourbon's flavor and color come from a complex mixture of molecules that develop during fermentation, distillation, and especially aging in the charred oak barrels. Here are the most common and influential compounds:

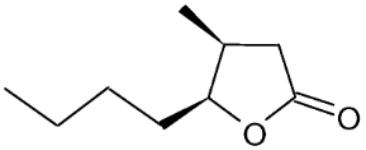


Vanillin is the most recognizable "note" in the fugue that makes bourbon taste like bourbon. It is sweet and aromatic like vanilla, hence its name. It comes from the lignin in the oak barrels, but that alone requires chemistry, and chemistry requires heat and time. Can you spot the vanillin in the lignin structure below? What other molecules might be made?





How about eugenol? It is described as spicy and clove-like and gives bourbon its characteristic warmth.



If that was an easy question, how about oak lactones? These molecules add a richness and complexity to bourbon that is often ascribed to coconut. The presence of oak lactones (both cis- and trans-) clearly means there is a lot more going on than lignin derivatives.

Things get even more complicated from here, because the oak has been charred and so sugars have been degraded and lots of chemistry is present. Guaiacol and syringol contribute a smoky, almost medicine-like note. Furfural and 5-methylfurfural offer almond- and caramel-like sweetness and nuttiness and can even hint of freshly baked bread. Finally, the fermentation process that makes ethanol also creates small molecules like esters which give fruits their sweet smells (e.g., bananas, pears, and apples) and phenolics which, although bitter, can greatly contribute to the complexity of the whiskey.

In addition to flavor, bourbon has a distinct color. Tannins from the oak and Maillard reaction products contribute to the deep amber hue of the whiskey but also add to some of its complex flavors. Nevertheless, what we have listed here is a reasonable recipe. We should be able to make a synthetic blend, and yet we are doomed to fail.

Despite efforts using state-of-the-art chemistry, you cannot create a good bourbon by simply mixing ingredients together. There are peer-reviewed studies that have used chromatographic and mass spectrometric techniques to characterize the chemical composition—or "recipe"—of bourbon. A 2020 study titled "Analysis of Barrel-Aged Kentucky Bourbon Whiskey by Ultrahigh Resolution Mass Spectrometry" used Fourier Transform Ion Cyclotron Resonance Mass Spectrometry (FT-ICR-MS) and Liquid Chromatography–Tandem Mass Spectrometry (LC-MS/MS) to analyze bourbons aged for 0, 2, 4, and 6 years, all made from the same mash bill.[1] They found:

1. A significant increase in chemical complexity with aging.
2. Most changes occurred in the first two years of barrel aging.
3. Even bourbons aged in adjacent barrels showed notable chemical differences.

This last finding suggests that bourbon's flavor profile is influenced by subtle environmental and material factors. In theory, you could mix ethanol, water, and flavor compounds like vanillin, lactones, and esters to mimic bourbon. However, bourbon contains hundreds to thousands of compounds, many in trace amounts, that interact in complex ways. Reactions like oxidation, esterification, and lignin breakdown occur slowly over time and are hard to replicate artificially, and the way flavors meld and evolve during aging is difficult to simulate with simple mixing. It is no secret that major distilleries often experiment with recipes and conditions.[2] Often these experiments are sold under different names or not sold at all to prevent negative feedback from failed results. Additionally, some efforts have experimented with rapid aging or molecular reconstruction of spirits using GC-MS data and flavor chemistry, but these products often fall short of the depth and authenticity of traditionally aged bourbon.[3-4]

What about accelerated production? It is generally accepted that longer-aged bourbons are better, with some taking one or two decades to produce. Making good bourbon faster would certainly be desirable, if only the process were understood. Buffalo Trace Distillery is attempting exactly this with what they call “Warehouse X.”[5]

It is a climate- and light-controlled facility designed to test what makes good bourbons good and whether this can be accelerated. Even with this facility, the gears of science have ground slowly. Their first experiment lasted between 2013 and 2016,[6] where they discovered that barrels grown in sunlight were no better than in the dark (a long bourbon myth is that "honey barrels" next to warehouse windows are better than those toward the center of the warehouse). Their second experiment lasted until 2019, where the barrels were held at constant temperature and pressure.[7] Those barrels were then transferred to a normal warehouse to finish aging—experimental results won't be known for a few more years. The current experiment by Warehouse X is an accelerated temperature cycle to encourage the ebb-and-flow relationship between the alcohol and the wood. This cycle normally lasts one day/night cycle, but here they are attempting multiple cycles per day. Other distilleries have attempted similar experiments with very few positive results.

In conclusion, while modern chemistry can identify and quantify the myriad compounds that contribute to bourbon's unique flavor and color, the intricate and time-dependent processes of aging in charred oak barrels cannot be easily replicated by simply mixing ingredients, nor can the process be easily accelerated using climate control. The complexity and subtle interactions involved in bourbon production ensure that authentic bourbon remains a product of both art and science, deeply rooted in tradition and craftsmanship.

Hunter Woodward
Corked Chemist

One final note: By law, bourbon must be aged in new charred oak barrels, and so a synthetic version wouldn't legally qualify as bourbon. So, I suppose we'd better stop trying and let the laws of nature own this one.

[1] Yang, K., Somogyi, A., Thomas, C. *et al.* Analysis of Barrel-Aged Kentucky Bourbon Whiskey by Ultrahigh Resolution Mass Spectrometry. *Food Anal. Methods* **13**, 2301–2311 (2020). https://doi.org/10.1007/s12161-020-01850-z

[2] reddit.com/r/bourbon/comments/uiz94x/review_500_makers_mark_dna_project

[3] distilling.com/distillermagazine/eighty-years-of-rapid-maturation-studies

[4] thewhiskeywash.com/whiskey-styles/american-whiskey/rapid-aging-whiskey-technology-game-changer-gimmick

[5] thewhiskeywash.com/whiskey-styles/bourbon/inside-warehouse-x

[6] whiskeyreviewer.com/2016/11/buffalo-trace-warehouse-x-lab-releases-first-results-113016

[7] thespiritsbusiness.com/2019/11/buffalo-trace-concludes-warehouse-x-temperature-test

Project Seed Whiskey Pull Flyer

Amanda Palumbo, Publicity Committee Chair, Midland Section ACS

Project SEED
AMERICAN CHEMICAL SOCIETY

ACS Local Section
Serving Midland, Saginaw, Bay, Gratiot, and Isabella Counties

DONATE BOURBON, SUPPORT STEM

Donations will provide paid summer research experiences for economically-diverse high school students

Bourbon bottle donations
Everyday favorites to rare finds to be raffled and auctioned.

Monetary donations
Support internship stipends, lab supplies, and safety equipment.

Fundraiser Dates:
Details coming soon!

Fundraiser Locations:
EverNorth, 3 Bridges, and more...
Details coming soon!

Let's raise a glass to opportunity, equity, and the future of science.
Thank you for your support!

CONTACT
MICHELLE RIVARD
PROJECT-SEED@MIDLANDACS.ORG

Plastics Hall of Fame Recognizes Stavropoulos

Mark Jones, Director, Midland Section ACS

William "Bill" S. Stavropoulos was included in the 2025 inductees into the Plastics Hall of Fame. Stavropoulos served as both Chairman and CEO of The Dow Chemical Company and has had a large impact on the company and Midland. He became CEO first in November 1995, serving in the role until 2000. In November 2002, he returned to the role until the end of 2004.

His tenure marked many changes for the company and for the Midland area. In 1998, some of Dow's most recognized brands were lost with the divestiture of DowBrands to S. C. Johnson & Son. DowBrands, the consumer products division of Dow Chemical included well-known products like Ziploc, Saran, Handi-Wrap, Fantastik, Dow Bathroom Cleaner with Scrubbing Bubbles, and Spray'N Wash. It also effectively marked the end of the Dow Company Store.

The acquisition of Union Carbide made Dow a much larger industrial chemical and plastics manufacturer. During Stavropoulos' tenure, the company sought to be involved in most key plastics, acquiring both polypropylene and PET businesses. Polyurethanes acquisitions buttressed that area of Dow's polymer portfolio. Many of those acquisitions have now been divested.

Stavropoulos joined Dow in 1967 in R&D in Indianapolis in pharmaceutical research, starting what would become a 39-year career with the company. His Bachelor of Science degree is from Fordham University and he received his Ph.D. in medicinal chemistry from the University of Washington. He moved into business leadership in 1977 when he was appointed to lead Dow's polyolefins business. According to the Hall of Fame, "He played a pivotal role in commercializing linear low-density polyethylene (LLDPE) under the trade name DOWLEX®, a product that expanded Dow's influence in the plastics industry. His vision and ability to identify emerging opportunities positioned Dow as a leader in the market." He is also credited with sponsoring the development of INSITE® Technology in 1992. The constrained-geometry metallocene catalysis developed in Midland and scaled in Freeport was revolutionary. It is a major component of the current Dow and making the company into a leader in LLDPE. Again, citing the Hall of Fame, "These innovations revolutionized industries, with applications in medical and healthcare (e.g., diapers and protective garments), consumer products (e.g., footwear), transportation (e.g., automotive bumpers), and packaging. Today, Dow produces over 15 billion pounds of these products annually, maintaining its status as a global leader in polyolefin technologies."

Stavropoulos led the company to adopt the first 10-year environmental and safety goals, pledging $1 billion to achieve them. Dow was the first in the industry to set such goals. These ambitious initiatives set a new standard for the chemical industry.

Stavropoulos also played a major role in bringing professional baseball to Mid-Michigan. In 2005, he took the lead in bringing the minor league Great Lake Loons to Midland. He established the Michigan Baseball Foundation (MBF). MBF built the Dow Diamond in 2006 to 2007 on the site near 47 Building, once The Dow Chemical Company's global headquarters. Stavropoulos continues to serve as Founder, Chief Executive Officer.

Also recognized in this year's inductees into the Plastics Hall of Fame is George W. (Bill) Knight. He was a polymer scientist who had a large role in the development and success of Dow's polyethylene technology, both solution-phase Ziegler-Natta and metallocene. Stavropoulos and Knight join other Dow and Midland members of the Hall, including Willard Dow, Walt Schrenk, Bud Rubens, and Raymond F. Boyer, to name a few. The Plastics Hall of Fame is at plasticshof.org

2025 ACS ChemLuminary Awards

Krishnaja Duvvuri, Chair, Midland Section ACS

Hi! I am excited to share that the Midland Section ACS has been selected as a finalist for 2025 ChemLuminary Awards in an impressive breath of categories as follows. The winners will be announced at the National Fall Scientific meeting in August.

- Chemists with Disabilities Inclusion Award**: SUMMARY of Engagement with Special Needs Students**
- Outstanding Local Section Industry Event: **A Day in the Life of an Industrial Scientist**
- Outstanding Sustainability Activities: **SUMMARY of Sustainability Programs for 2024**
- Outstanding Performance by a Local Section - Medium Small Size Category
- Best Overall Local Section Minority Affairs: **Summary of 2024 Diversity and Inclusion Committee Events**
- Outstanding Project SEED Program Award - Small Site: **Summary of Midland LS Project SEED 2024 Program**
- Best New Communications Program: **"What is your Why?" Chair Column**
- MAC Industry Engagement & Outreach: **Fall Scientific Meeting Career Expo**
- Outstanding Engagement with K-8 Students: **SUMMARY of K-8 Engagement for Midland ACS 2024**
- Most Outstanding Local Section Women Chemists Committee: **Summary of Women Chemist Committee Activities**
- Outstanding New Local Section Younger Chemists Committee: **Summary of 2024 YCC events**
- Outstanding or Creative Local Section Younger Chemists Committee Event: **ACS YCC & MMAIChE Collaboration: MiOps Plant/Lab Tour**

This remarkable achievement is a reflection of the dedication, creativity, and hard work of every single volunteer of the Midland Section. A BIG thank you to all the committees for your outstanding events, to Erin Vogel for your inspiring leadership, to both Erin and Gina Malczewski for their exceptional documentation in the annual report, and to each of you for making 2024 a successful and inspiring year. Let us continue the same in 2025 😊

H20 Q 2025 Michigan Student Sustainability Summit

Selena Macias, H2O Q Coordinator

It was a fantastic day for science, sustainability, and student leadership at the 2025 Michigan Student Sustainability Summit, as more than 300 students from over 30 schools gathered at Michigan State University in East Lansing! Hosted by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), this annual event offered a dynamic space for young students to connect with peers, engage with community leaders and sustainability experts, and celebrate youth-led environmental initiatives that are making a real impact in Michigan. "*It's more than just teaching science, we're inspiring the next generation,"* said Jasmin Carney, a CMU senior and dedicated H2O Q volunteer.

As part of the summit's interactive programming, students rotated through a variety of breakout sessions designed to deepen their understanding of environmental issues and inspire hands-on involvement. H2O Q, a local environmental education program that brings together educators, community organizations, and partners, hosted one of the sessions, offering students hands-on science experiences focused on local water systems. At the H2O Q station, students explored water quality firsthand by collecting samples directly from the nearby Red Cedar River using equipment provided by the ACS Midland Local Section, then broke into smaller groups for hands-on water quality testing.

H2O Q volunteers brought diverse expertise to guide students through comprehensive water quality testing. I guided students through measuring conductivity (TDS), turbidity, and dissolved oxygen (DO), while Dale LeCaptain, H2O Q Director, focused on teaching about and testing for nitrates and phosphates. Jasmin Carney, CMU senior, led lessons on pH and alkalinity. In addition to our H2O Q team, two representatives from EGLE supported the activities throughout the day. H2O Q volunteer Mark Jones led an afternoon session teaching students about microplastics, sharing the new H2O Q microplastics experiment that is under development. Microplastics testing at the river's edge also illuminated the presence of microplastics in filtered samples examined under the microscope.

Hands-On Learning with Dale LeCaptain & EGLE Volunteer:
Exploring Nitrates and Phosphates (photo provided)

Beyond the technical aspects, volunteers emphasized the broader importance of clean water and environmental stewardship. Students learned how to conduct scientific tests while gaining insight into how these parameters reflect local ecosystem health and how data-driven action can address environmental challenges in their communities. The 2025 Summit highlighted how young people are leading environmental change, with H2O Q's participation demonstrating the program's commitment to inspiring youth advocacy. EGLE coordinated and hosted a great event using the facilities at MSU. The H2O Q team participation was generously supported by the ACS-Midland Local Section, and Central Michigan University. CMU's Monica C. Holmes Clean Water Initiative provides key support for the H2O Q efforts. Support allows H2O Q to work with students from around the state and region, creating a more sustainable future for Michigan.

Puzzles in *The Midland Chemist* – A New One, Absolute Configuration

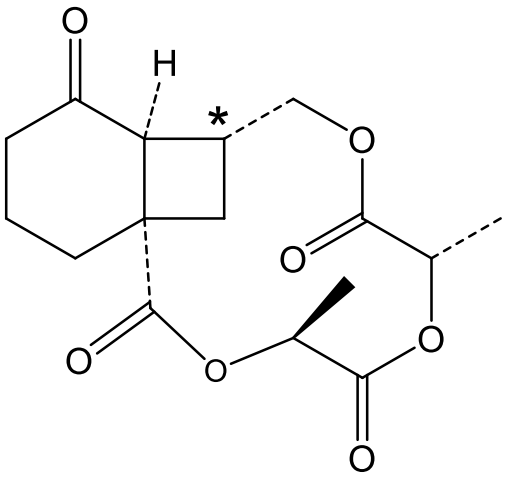
Wendell L. Dilling, Past Midland Section Historian

The Midland Chemist has occasionally contained questions or puzzles for readers to solve. The six puzzles that Editor Dr. Muthyala Ramaiah originated were in the September 1988 to April 1989 issues. One or two winners selected by random drawing among the correct answers would each receive $5 and have their names reported in the next issue. These six questions or puzzles related to math, or chemistry, or music.

Later six chemistry related cross-word puzzles, ChemPuzzlers, were printed under long-term editor Ann Birch's direction in the April 2000 to December 2005 issues. The first one was a trick puzzle. No prize money was offered for solving these puzzles.

Now let's try a puzzle that is actually useful. Organic chemists have devised a system for specifying the absolute geometry of organic compounds. This system allows for the specification and visualization of enantiomers (mirror images) (Eliel, E. L.., Wilen, S. H., Mander "Stereochemistry of Organic Compounds," John Wiley & Sons, New York, 1994, p 103-112; Chemical Abstracts, Index Guide, 1985, N-Z, Part 2, p 202-203, Chemical Abstracts Service, Columbus, OH). Trying to determine the designations, **R** and **S**, can be real puzzles sometimes.

For starters, try to determine the correct designation for the starred carbon in the following compound:



The authors who reported this compound have given the incorrect designation for this atom. Can you determine the correct designation? Send your answer to me at w.dilling@att.net. The correct answer and first person with the correct answer will be reported in an upcoming issue of *The Midland Chemist*. Only one answer per person. Good luck.

2025 Turner J. Alfrey Visiting Professor Lecture Series, June 3

Karol Miller, Administrative Assistant, The Axia Institute, MSU St. Andrews, Midland

MSU St. Andrews is pleased to announce the 2025 Turner J. Alfrey Visiting Professor Lecture Series. Our guest lecturer this year will be Prof. Karen I. Winey, Harold Pender Professor of Engineering and Applied Science, Department of Chemical and Biomolecular Engineering, University of Pennsylvania.

Date: Tuesday, June 3, 2025 Time: 9:00 AM to 4:00 PM
Location: MSU St. Andrews, 1910 West St. Andrews Road, Midland
Guest Lecturer: Prof. Karen I. Winey

Prof. Karen I. Winey

About Karen Winey

Karen I. Winey is the Harold Pender Professor of Engineering and Applied Science with a 50:50 appointment between the Department of Chemical and Biomolecular Engineering and the Department of Materials Science and Engineering. Karen earned her Ph.D. in polymer science and engineering from the University of Massachusetts, Amherst, and joined the Penn Engineering faculty after a brief postdoc at AT&T Bell Labs. Karen has made significant contributions to the field of polymer science, particularly in the understanding of and manipulation of unique polymer nanocomposites and ion-containing polymers. She has a strong record of service including as an Associate Editor for *Macromolecules*, Chair of the Division of Polymer Physics within the American Physical Society, Department Chair of Penn's Materials Science and Engineering Department, and a variety of advisory boards.

Research Interests

The focus of the Winey research group is hierarchical and nanoscale morphologies in polymers and connecting these morphologies to the underlying chemical structure as well as the mechanical, thermal, and transport properties of the materials. We employ a variety of experimental and computational tools to probe the structural and physical properties of advanced polymers including X-ray scattering, electrochemical impedance spectroscopy, and time of flight SIMS. Targeting a variety of energy-related and membrane applications, we study and design functional polymers to improve selective ion and proton conductivity. In polymer nanocomposites, our current interests focus on nanoparticle dynamics across a range of time and length scales. Our newest project focuses on polymer-to-polymer upcycling to convert waste polyolefins to higher value polymers. Our dynamic and highly cited research group is currently funded by the National Science Foundation, the Department of Energy Basic Energy Sciences, and industry.

Dr. Hoda Shokrollahzadeh Behbahani

Dr. Hoda Shokrollahzadeh Behbahani

Accompanying Prof. Winey will be Dr. Hoda Shokrollahzadeh Behbahani. Hoda joined the Winey research group as a postdoctoral researcher after completing her Ph.D. in Chemical Engineering at Arizona State University. During her Ph.D. work, Hoda focused on developing innovative solutions to climate change and water scarcity. Her dissertation, titled "Polysulfones for Sustainability Related Applications," explored functionalized polysulfone-based polymers for direct air capture of CO_2 and the development of enhanced, greener desalination membranes. Hoda's research in the Winey group is focused on the characterization

of functional polymers derived from the upcycling of polyolefins, aiming to enhance sustainability and innovate material reuse.

- Lectures will take place in person at MSU St. Andrews, in Midland.
- Networking luncheon included from 12:30 – 2:00 PM in the MSU St. Andrews Rotunda, sponsored by the Midland Section of the American Chemical Society.
- Prof. Winey and her associate, Dr. Hoda Shokrollahzadeh Behbahani, will deliver five, 45-minute talks throughout the day.
- Time will be allowed for Q&A and discussion.

Registration is open now through Sunday, June 1, 2025, by clicking here.

This is a free event, but pre-registration is required to help plan for the networking luncheon. Please share information about this event with others that may be interested in attending. For more information, please contact Karol Miller at mill2785@msu.edu.

Agenda and Lecture Topics:

9:00 AM – Introduction and Housekeeping Items – MSU St. Andrews Staff

9:15 AM – Lecture #1 – Prof. Karen I. Winey
Nanoparticle, Segmental and Chain Dynamics in Polymer Nanocomposites.

10:15 AM – Lecture #2 – Prof. Karen I. Winey
Ionomers and the Impact of Precise Microstructures on Mechanical Properties.

11:15 AM – Morning Break

11:30 AM – Lecture #3 – Dr. Hoda Shokrollahzadeh Behbahani
Polymer to Polymer Chemical Transformations to Produce Specialty Plastics from Waste Polyolefins.

12:30 PM – Lunch Break
Lunch will be served in the MSU St. Andrews Rotunda with food provided compliments of the Midland Section of the American Chemical Society.

2:00 PM – Lecture #4 – Prof. Karen I. Winey
Ionomers and the Impact of Precise Microstructures on Transport Properties.

3:00 PM – Lecture #5 – Prof. Karen I. Winey
Proton Conductivity in Hydrated Fluorine Free Polymers.

4:00 PM – Closing Remarks – Robert Bubeck, MSU St. Andrews

This is a free event, but pre-registration is required to help plan for the networking luncheon. Please register no later than Sunday, June 1, 2025, by clicking on 2025 Tuner J. Alfrey Visiting Professorship Lecture Registration. Please share information about this event with others that may be interested in attending. For more information, please contact Karol Miller at mill2785@msu.edu.

Great Lakes Regional Meeting (GLRM 2025), June 4-6

Steve Keinath, Co-Editor, The Midland Chemist

Editor's note: The information contained in this article is reprinted, in part, from a National ACS email communication to all ACS members, dated January 23, 2025.

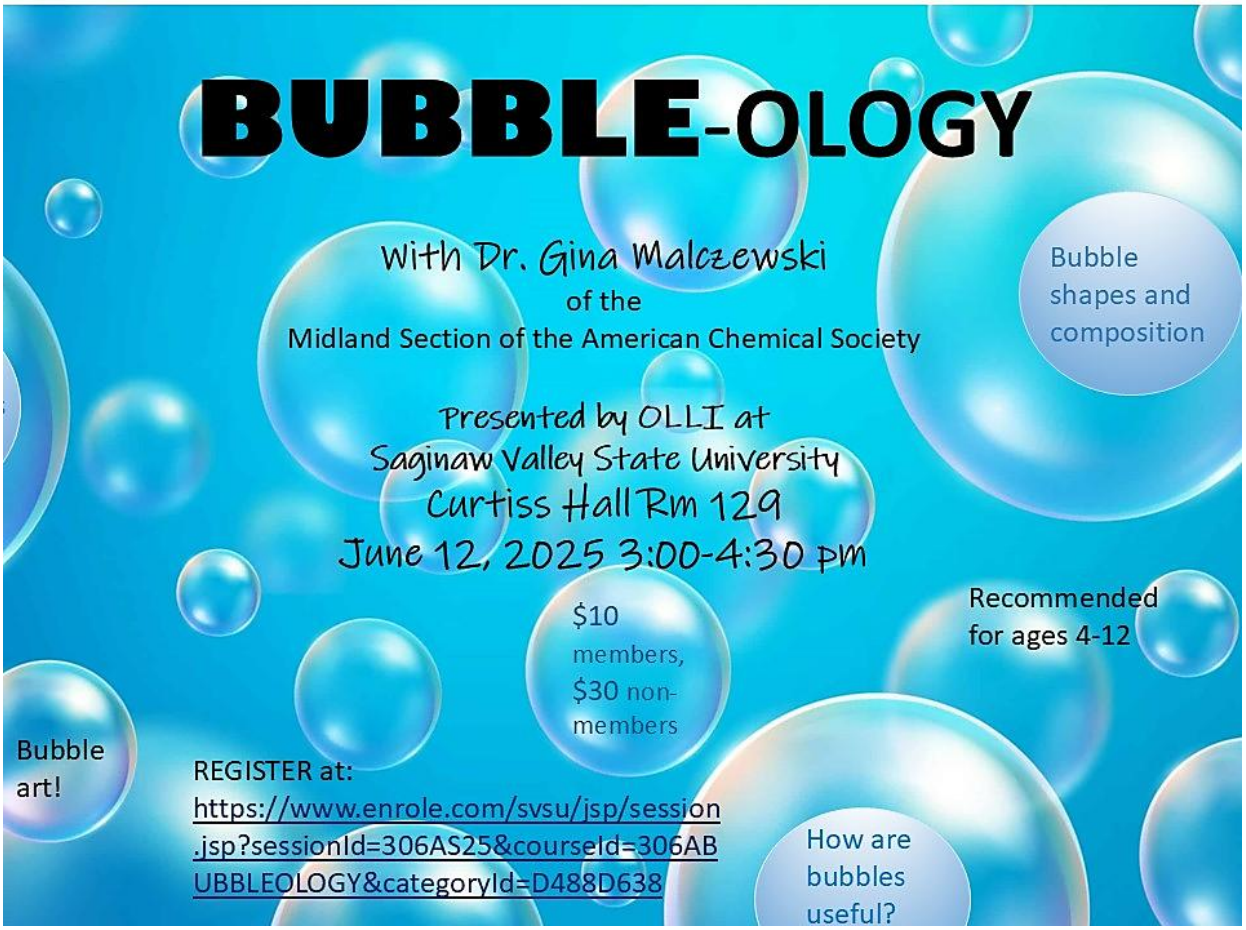
GLRM 2025 will be held from Wednesday to Friday, June 4 - 6, 2025, in Appleton, WI, hosted by the Central Wisconsin and Northeast Wisconsin Local Sections.

This year's theme is ***Chemistry for a Better Planet***. Chemistry has led to hundreds of innovative solutions over the last several centuries and it will continue to do so. Chemistry helps us gain a better understanding of the world around us, in all facets of life – health care, environmental science, and more. Chemistry and the planet are closely intertwined with one another and there are connections at all different levels and scales. With this theme, we hope to encourage curiosity and ingenuity to explore and discover all the possibilities that exist between the two.

Visit the website to find a list of the programming divisions and planned symposia open for submissions.

BUBBLE-ology, June 12

Gina Malczewski, Outreach Committee, Midland Section ACS



STEAM Stew Camp, June 23-27

Gina Malczewski, Outreach Committee, Midland Section ACS

STEAM Stew 2025

Sniff and Savor Science

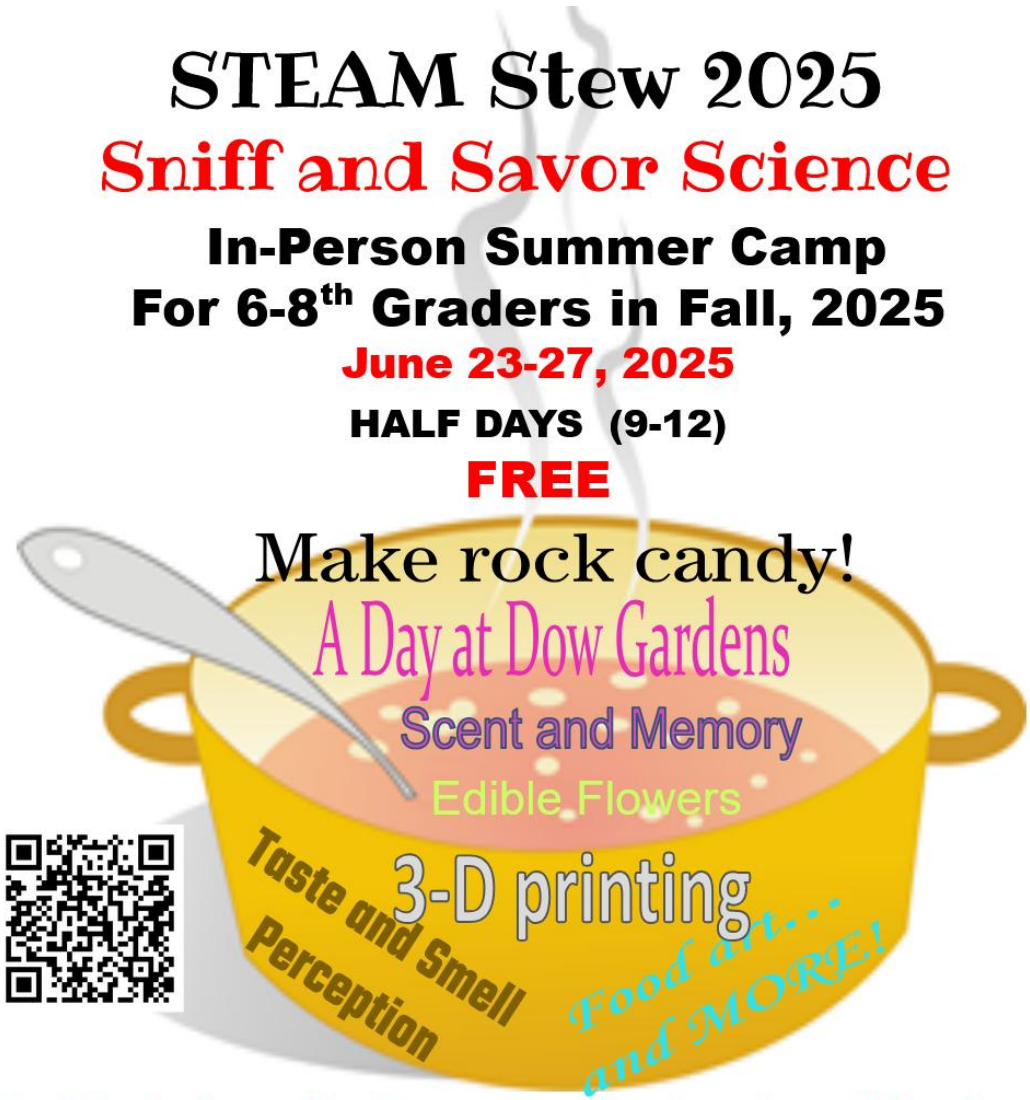
In-Person Summer Camp

For 6-8th Graders in Fall, 2025

June 23-27, 2025

HALF DAYS (9-12)

FREE



Watch for details on midlandacs.org or email: reginamalczewski@gmail.com

Info: https://events.anr.msu.edu/StAndrew2025StemStew/

Registration:

https://events.anr.msu.edu/register.cfm?eventID=D2AD9B5CAA50291A417169ED7AEBBD50B9488DB50ED7A071C91C42837DA6A21C&regisProcessID=241DB40946CE6AC72174EF6867A7463008D137EFE6B15DDE0F8DC1DF3365D0B3

MICHIGAN STATE UNIVERSITY | MSU St. Andrews American Chemical Society

Are You a pHoodie?, July 17

Gina Malczewski, Outreach Committee, Midland Section ACS

ACS Fall 2025 National Meeting & Exposition, August 17-21

Steve Keinath, Co-Editor, The Midland Chemist

Editor's note: The information contained in this article is reprinted, in part, from a National ACS email communication to all ACS members, dated January 8, 2025.

This in-person and digital meeting will be held in Washington, DC, and globally from August 17-21, 2025. Please see **ACS Fall 2025**.

This is your chance to share your research with the chemistry community. ACS Fall 2025 brings together chemistry professionals, educators, and students worldwide to discover and share research, network, and advance careers. These meetings are an excellent opportunity for professionals and students to showcase their work and connect with colleagues in all areas of chemistry. Visit the website to learn more about the symposia open for submission.

Joint CERM 2025 and Midland Section ACS 2025 Fall Scientific Meeting, October 16-17

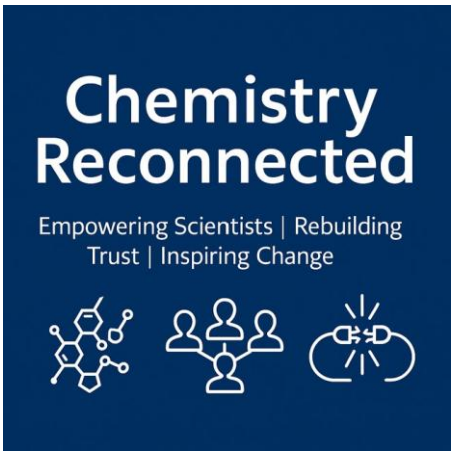
Dale LeCaptain, Councilor, Midland Section ACS

Meeting Theme – Chemistry Reconnected: Empowering Scientists in a Disconnected World

Location – Central Michigan University, Mount Pleasant, MI

Date and Time – Thursday, October 16, 1:00 PM to ?? through Friday, October 17, morning, afternoon, and evening (tentative)

For More Information – Dale LeCaptain, General Meeting Chair, Central Michigan University, lecap1dj@cmich.edu



In a time marked by social fragmentation, misinformation, and growing challenges to scientific integrity, **Chemistry Reconnected** serves as both a call to action and a source of empowerment. This year's joint Central Regional Meeting (CERM 2025) and the Midland Section ACS 2025 Fall Scientific Meeting

(FSM) invites scientists across disciplines – chemists, engineers, educators, and students – to come together in restoring trust, strengthening community, and championing the role of science in society.

Chemistry is more than molecules – it's a force for connection, truth, and change. Let's reconnect science with society – and empower scientists to lead that transformation.

Possible program topics – Artificial Intelligence and Chemistry, Member Education, and Chemistry Reconnected: A Call to Action. Poster sessions will also be part of the joint meeting's programming.

Volunteer Session Leaders are needed. Please contact Dale LeCaptain at lecap1dj@cmich.edu. Thank you.

Upcoming Dates, Events, and Other Updates

- June 1 – **Preregistration deadline to attend the 2025 Turner J. Alfrey Visiting Professor Lecture Series** program, Tuesday, June 3, 9:00 AM – 4:00 PM, featuring Prof. Karen I. Winey from the University of Pennsylvania. Please register by clicking on 2025 Tuner J. Alfrey Visiting Professorship Lecture Registration. For more information or any questions, please contact Karol Miller at mill2785@msu.edu.
- June 2 (7:00 – 8:30 PM) – Hybrid Midland Section ACS Board meeting, Rotunda Room, MSU St. Andrews, Midland (in person), and via a Microsoft Teams videoconference call connection at June 2025 ACS Board Meeting Teams Link, Meeting ID: 938 651 597 463 5, Passcode: FV2oA7.
- June 3 (9:00 AM – 4:00 PM) – 2025 Turner J. Alfrey Visiting Professor Lecture Series program, featuring Prof. Karen I. Winey from the University of Pennsylvania. For more details, please see the article on pages 13 and 14**.** This is a free event, but pre-registration is required to help plan for the networking luncheon. **Please register no later than Sunday, June 1, 2025,** by clicking on 2025 Tuner J. Alfrey Visiting Professorship Lecture Registration. For more information or questions, please contact Karol Miller at mill2785@msu.edu.
- June 4-6, 2025 (Save the Date) – 2025 Great Lakes Regional Meeting (GLRM), Appleton, WI, hosted by the Central Wisconsin and Northeast Wisconsin Local Sections. Meeting theme: *Chemistry for a Better Planet*. For more information, please visit the **GLRM 2025 website**.
- June 12 (3:00-4:30 PM) – Midland Section ACS outreach program, *BUBBLE-ology*, with Dr. Gina Malczewski, Curtis Hall, Room 129, Saginaw Valley State University. Details on flyer on page 16. To register, go to BUBBLE-ology. For more information or any questions, please contact Gina Malczewski at reginamalczewski@gmail.com.
- June 23-27 (9:00 AM-12:00 PM) – Middle School STEAM Camp, co-sponsored by Midland Section ACS and MSU St. Andrews. Camp theme: *Sniff and Savor Science*. Location: MSU St. Andrews, in Midland. Details on flyer on page 17. Please contact Gina at reginamalczewski@gmail.com if you can help or have any questions.

- July 17 (5:30-6:30 PM) – Midland Section ACS outreach program, *Are You a pHoodie?*, with Chef Timmi Boxey and Dr. Gina Malczewski, St. John's Episcopal Church, in Midland. Details on flyer on page 18. To register, go to pHoodie. For more information or any questions, please contact Gina Malczewski at reginamalczewski@gmail.com.

- August 4 (7:00 – 8:30 PM) – Hybrid Midland Section ACS Board meeting, Rotunda Room, MSU St. Andrews, Midland (in person), and via a Microsoft Teams videoconference call connection at August 2025 ACS Board Meeting Teams Link, Meeting ID: 938 651 597 463 5, Passcode: FV2oA7.

- August 17-21, 2025 (Save the Date) – ACS Fall 2025 National Meeting & Exposition, Washington, DC. This meeting will be a hybrid in-person and virtual meeting. For more information, please see https://www.acs.org/events/fall.html.

- September 8 (7:00 – 8:30 PM) – Hybrid Midland Section ACS Board meeting, Rotunda Room, MSU St. Andrews, Midland (in person), and via a Microsoft Teams videoconference call connection at September 2025 ACS Board Meeting Teams Link, Meeting ID: 938 651 597 463 5, Passcode: FV2oA7. **Please note: This Board meeting is being held on the second Monday of September, not the usual first Monday of most months, due to the Labor Day holiday.**

- October 6 (7:00 – 8:30 PM) – Hybrid Midland Section ACS Board meeting, Rotunda Room, MSU St. Andrews, Midland (in person), and via a Microsoft Teams videoconference call connection at October 2025 ACS Board Meeting Teams Link, Meeting ID: 938 651 597 463 5, Passcode: FV2oA7.
- October 16-17, 2025 (Save the Date) – Joint CERM 2025 and Midland Section ACS 2025 Fall Scientific Meeting, Central Michigan University, Mount Pleasant. Meeting theme: *Chemistry Reconnected: Empowering Scientists in a Disconnected World*. See the article on pages 19 and 20 for more details. For more information or any questions, please contact Dale LeCaptain, General Meeting Chair, at lecap1dj@cmich.edu.

- November 3 (7:00 – 8:30 PM) – Hybrid Midland Section ACS Board meeting, Rotunda Room, MSU St. Andrews, Midland (in person), and via a Microsoft Teams videoconference call connection at November 2025 ACS Board Meeting Teams Link, Meeting ID: 938 651 597 463 5, Passcode: FV2oA7.

- December 1 (7:00 – 8:30 PM) – Hybrid Midland Section ACS Board meeting, Rotunda Room, MSU St. Andrews, Midland (in person), and via a Microsoft Teams videoconference call connection at December 2025 ACS Board Meeting Teams Link, Meeting ID: 938 651 597 463 5, Passcode: FV2oA7.

The Midland Chemist is published twelve times a year by the Midland Section of the American Chemical Society, P.O. Box 2695, Midland, MI 48641-2695, http://www.midlandacs.org. Current and past issues are available at midlandchemist.org.