

THE MIDLAND CHEMIST

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Chair Column – Midland Strong

Mark Jones, Chair, Midland Section ACS



“Entropy always wins.” “Anything that can go wrong, will go wrong.” Both are inexact restatements of the Second Law. Some may say that the Second Law was on display last week in our local area. Disorder replaced order. Work was lost as order fell into disorder, just as thermodynamics would have it. Work, many years of work, is gone.

Murphy’s Law is misnamed a law. It is an observation, a probabilistic treatment of possible scenarios. It does not govern action, it describes outcomes. Entropy is similarly not a force that acts on a system, it is an observable, a term introduced to explain dispersion of energy in a system. Entropy isn’t capable of winning or losing, it is only a tool to help us understand nature.

Thermodynamics and physics explain the flood, but can’t explain what happened next and continues to happen as I write this. There are no thermodynamic equations that explain altruism. Economic theory even fails. Insistent that all act only in rational self-interest, economics doesn’t explain altruism. Yet altruism is real and on display all over the Midland area. Crews of volunteers are helping throughout Midland. News reports indicate that people were turned away from local shelters. Not those needing assistance. They were cared for. Volunteers and gifts were turned away. The outpouring of altruism exceeded the need.

I am saddened by the losses experienced across the community, relieved no lives were lost. I observed the pain as I worked to help friends recover, pain many are going through. My heart goes out to those that suffered losses. The dam breaches and resulting destruction, in a thermodynamic sense, created an irreversible loss of work. That sounds bad, yet thermodynamics gives reason for hope. Work brings order to disorder and work is underway. The Second Law precisely pertains to isolated systems. It doesn't pertain here. Thermodynamics doesn't contain altruism terms. It doesn't address the willingness to come the aid of a neighbor. It doesn't address the willingness to pitch in and ensure that no one is isolated. Physical systems will be rebuilt. Time and effort will restore order, erasing many, if not most, impacts of the flood. We can't reverse the flood, but our community is moving forward, working toward recovery. Midland will go on. It is a strong community. Midland Strong.

Continuing COVID-19 Pandemic Precautions

Amanda Palumbo and Gina Malczewski, Midland Section ACS

As a precaution against the COVID-19 pandemic, and in compliance with best practices as advised by government agencies, a number of Midland Section ACS events will be hosted virtually only, postponed until further notice, or cancelled entirely.

Our committees have a selection of exciting networking and career development events coming up once the public health situation allows. Many thanks for your continued community support and partnership.

For the most up-to-date information on events and activities, please visit <http://www.midlandacs.org/>, or <https://www.facebook.com/MidlandACS.org/>.

Chemistry Students Participate in the National Chemistry Competition

Michael Tulchinsky, Chemistry Olympiad Chair, Midland Section ACS

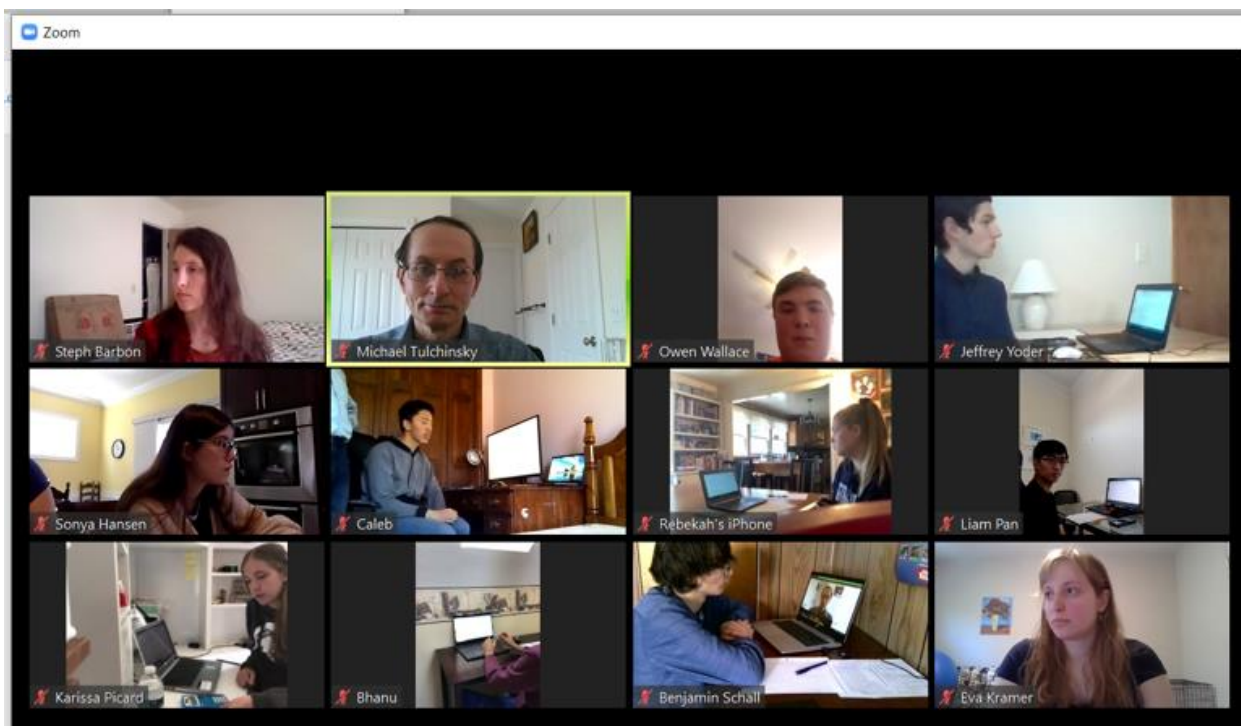
Nine high school students from Bay, Midland, and Saginaw counties participated virtually in the National Exam of the 2020 U. S. National Chemistry Olympiad (USNCO) on April 26. Due to the COVID-19 restrictions in many states, the written exam was carried out online while the lab practical was canceled.

Prior to the National Exam, 184 students took part in the local competition held the week of March 9 using the problems recommended by the American Chemical Society. The candidates from Bay City Western, Carrolton, Freeland, Heritage, H. H. Dow, John Glenn, Midland, Saginaw Arts and Science Academy (SASA), and Shepherd high schools participated in the Local Exam which was administered by their teachers. These schools are located in four mid-Michigan counties within the geographic boundaries of the Midland section. The exams were collected and graded at Saginaw Valley State University (SVSU) and the highest scoring contestants were nominated to sit at the National Exam. Nine students accepted nominations and took part in the written test: Caleb Qiu and Sonya Hansen from H. H. Dow High School (chemistry teacher Adam Colvin); Sam Yoder and Rebekah Stanley from Midland High School (chemistry teacher Jeffrey Yoder); Bhanu Mamillapalli and Benjamin Schall from SASA (chemistry teacher Dr. David Allan); Owen Wallace from John Glenn High School (chemistry teacher Sandra Schafer); Liam Pan from Freeland High School (chemistry teacher Dr. Tom Short);

and Karissa Picard from Bay City Western High School (chemistry teacher Gwenyth Kieser). Caleb Qiu achieved the best score among all 184 contestants at the Local Exam and he also received the top score among the nine Midland section participants at the National Exam.

This year 778 high school chemistry students across the country took the qualifying national exam. The top twenty students have been invited to train at the Chemistry Olympiad Virtual Study Camp, May 31-June 12, 2020, which is organized by the American Chemical Society in collaboration with the Chemistry Department of the University of Maryland at College Park, MD. The top four will represent the U.S. at the 52nd International Chemistry Olympiad (IChO), planned to be held this year remotely in Istanbul, Turkey, in mid-July 2020, with an online closing ceremony.

Volunteers affiliated with the Midland section of the ACS helped with both local and national exams. Dr. Mark Jones, the 2020 Chair of the Midland section, put together a template with his signature for the ACS certificates recognizing all Local Exam participants. Professor Michael Coote of the Department of Chemistry at SVSU graded the local exams, Dr. Stephanie Barbon of Dow served as a National Exam proctor, and Ms. Eva Kramer of Washington University hosted an online Zoom session during the National Exam. Dr. Michael Tulchinsky of Dow coordinated the activities.



Picture 1. The students are taking the National Exam online via Zoom while the proctors are watching. Top row, from left to right: Stephanie Barbon, Michael Tulchinsky (proctors), Owen Wallace, Sam Yoder. Middle row, from left to right: Sonya Hansen, Caleb Liu, Rebekah Stanley, Liam Pan. Bottom row, from left to right: Karissa Picard, Bhanu Mamillapalli, Benjamin Schall, Eva Kramer (host).



Picture 2. Professor Michael Coote of SVSU is grading the Local Exam answer sheets.

Can Mixing Cleaning Chemicals Kill You?

Vickie Langer, Co-Editor, The Midland Chemist

Chemical cleaning products are generally safe to use as long as we read the labels and use them properly, but mixing of incompatible cleaning products can be deadly! Due to the COVID-19 virus and cleanup from the recent catastrophic flooding, we may be using more chemical cleaners than ever. Please consider watching this short safety video from the American Chemical Society: [Can Cleaning Chemicals Kill You?](#)

Some common cleaning chemical incompatibilities that are highlighted in the video are summarized below.

Bleach and Ammonia are incompatible

Bleach: Solutions containing sodium hypochlorite

Ammonia: Solutions containing ammonium hydroxide (blue window spray, all-purpose cleaners, etc.)

Mixing of bleach and ammonia forms chloramine gas. Chloramine gas then reacts with the sodium hypochlorite to form dichloramine and nitrogen trichloride. These reaction products irritate the eyes and lungs. While not likely to be fatal, this exposure may lead to an emergency room visit.

Bleach and Alcohol are incompatible

Bleach: Solutions containing sodium hypochlorite

Alcohol: Isopropyl alcohol (rubbing alcohol), ethanol

Mixing bleach and alcohol forms hydrochloric acid, chloroacetone, and chloroform vapors. These products irritate the eyes and absorb into the skin.

Drain cleaners may be incompatible with each other

Various types of drain cleaners may include concentrated solutions of oxidizers, acids, or bases.

Oxidizers: hydrogen peroxide, sodium hypochlorite, nitrate

Acids: sulfuric acid, hydrochloric acid

Bases: sodium hydroxide, potassium hydroxide, aluminum oxide

Pouring a drain cleaner into a drain that already contains an incompatible chemical can result in an unplanned chemical reaction.

For example, a drain cleaner containing sodium hypochlorite mixed with one containing hydrochloric acid can react to form chlorine gas. Exposure to chlorine gas chemically burns the throat and lungs and causes asphyxiation. This exposure can be fatal or cause long-lasting health effects. **If a yellow gas is generated by cleaning chemicals, evacuate the area immediately and call 911!**

In a second example, a drain cleaner containing a base, such as sodium hydroxide, mixed with one containing acid, such as sulfuric acid, will cause an exothermic reaction that may lead to scalding water or steam billowing from the drain.

For safer cleaning with chemicals, do not mix incompatible products together or use them on the same surfaces or drains at the same time. Know which chemical cleaners are already present before adding any additional cleaners.

The examples given here are not all-inclusive. Always read the warning labels on cleaning products to check for proper use and chemical compatibility.

2020 Spring Awards Nominations – Deadline Extended to June 1

Diana Deese, Awards Committee Chair, Midland Section ACS

The Spring Awards Banquet has been cancelled due to the uncertainty of the COVID-19 situation and in light of schools being cancelled for the remainder of the school year. However, we are still planning to recognize students and select recipients for the various award categories:

- Outstanding Elementary Level Science Teaching
- Outstanding High School Chemistry Teaching
- Science Education Volunteer of the Year
- Outstanding Achievement and Promotion of the Chemical Sciences
- Promotion of Diversity in Chemistry, Related Sciences and Engineering
- Outstanding Service to the American Chemical Society
- Team Innovation Award
- Outstanding Middle Level Science Teaching
- Outstanding College Chemistry Teaching
- Outstanding Chemical Technician

I have extended the deadline for submitting nominations to June 1, 2020. I will begin sending out letters and certificates/plaques to awardees in mid-May (for high school students and as received thereafter) and in June

for college students and other awardees (so that the committee can select recipients where needed and plaques can be engraved).

A comprehensive list of awardees will be posted on the Midland Section ACS website in July or August and also in local newspapers. We are also investigating alternatives to the banquet that might be possible later in the summer.

Award criteria can be found in the [January 2020](#) issue of the *Midland Chemist* or by request from dkdeese@dow.com.

(Electronic submissions are acceptable and preferred.)

Phone: (989) 636-9915, E-mail: awards@midlandacs.org or dkdeese@dow.com

Central Regional Meeting Rescheduled to November 2020 **CERM 2020 Organizing Committee, American Chemical Society**

The health and well-being of our members, attendees, and staff is paramount. As a result of the rapidly changing situation related to the spread of and recovery from the Coronavirus pandemic (COVID-19), we are rescheduling the [2020 Central Regional Meeting](#) (CERM) to November 2020.

Thus, the May 27-29 dates were cancelled for health and safety reasons. Please join the ACS Columbus Section as we reschedule to November 2020. A full refund of registration fees for the cancelled dates will be processed by the ACS.



We will continue to monitor and follow the state and national government safety guidelines to keep everyone safe. Thank you for your patience as we continue to "Plan with Optimism and Decide with Science" in approaching the rescheduled November 2020 event (dates to be published soon).

Please visit the [Central Regional Meeting website](#) for additional information, or reach out to us directly by e-mail at reglmtgs@acs.org for any questions. Again, please join us as we reschedule the May CERM meeting to November 2020 in Columbus.

Online Earth Day Programs – It's Not Too Late! **Gina Malczewski, Outreach Committee, Midland Section ACS**

The Midland Section of the ACS recently co-sponsored four Zoom Seminars with Michigan State University. If you missed them the first time through, you can still view the recordings at the related links below. These talks were intended for audiences 12 years of age and up.

Paul Gross: The Scientific Truth about Global Warming

https://www.youtube.com/watch?v=cPd8S_8PQtE&feature=youtu.be&fbclid=IwAR1ewlWrNc3lbhXsAu2LlIfefzxCM10-K-uHLVfWck4fmReuTCjCGj-4dtU

Peter Sinclair: Here Today – Renewable Solutions to Climate Change

<https://www.youtube.com/watch?v=eODFBAvTlIo&feature=youtu.be&fbclid=IwAR1CViFX0vPoM6IYx0UJSzqTO9C9hfuGHVE6qflld0xzEnGlo2nzFmGN8>

Dana Kirk: The Food Waste Challenge – Opportunities and Technologies to Address the Global Problem

https://www.youtube.com/watch?v=0w-yR_fDH4Q&feature=youtu.be&fbclid=IwAR3JYuHpdJ_aPnouXSuNVEDjGsq_rPWcb0fQNR3GoH6YLyQLy09kL0KND6Q

Sandra Svoboda: From Rust to Resilience – What Climate Change Means for Great Lakes Cities

<https://youtu.be/m5BiNArdZLc>

Three different experimental/demonstration videos can also be seen at the links provided below. These are appropriate for adults as well as young children and review some important chemical concepts like properties, reactions, and states of matter.

Water and purification: <https://youtu.be/FOCGQ2hYQYE>

Polymers and bioplastics: https://youtu.be/ff1g_Haa8zA

Carbon dioxide and climate change: <https://youtu.be/kEuvaJlkiY>

Finally, we are planning to offer earth-friendly volunteer opportunities later in the year.

The ACS / Creative 360 Community Garden will be going forward this year, too. It may be especially important this year given the potential food shortages. All gardeners are encouraged to donate their “extra” produce to local food pantries. All ACS produce and herbs are donated locally. Please see the garden flyer on the next page.

Creative 360 Community Garden Invitation
Gina Malczewski, Outreach Committee, Midland Section ACS




Come join ACS at
the Creative 360
COMMUNITY GARDEN!
Pesticide- and Herbicide-free Gardening
1517 Bayliss St., Midland, MI

Many plots are available: Rent by check or credit card (989) 837-1885

5' x 10'	\$20	Gardening will be permitted with social distancing. Schedules will be considered depending on attendance.
6' x 12'	\$25	
6' x 18'	\$30	
6' x 30'	\$40	

- Tour and information is available at this link: <https://www.youtube.com/watch?v=r-jxxPzHmWo&feature=youtu.be>
- FREE Water available 24/7: Schedule will be set up if necessary for social distancing
- PLOTS WILL BE TILLED in early May (weather permitting)
- COMPOST PILE will be available
- EDUCATIONAL Programs will occur with resolution of public health situation
- ACS will also help you donate your excess produce to local food pantries and/or culinary programs
- QUESTIONS? Contact Laura Brigham: (Brigham@creative360.org)
or Gina Malczewski: reginamalczewski@gmail.com

2020 Fall Scientific Meeting – Save the Date, October 10
Anirudha Banerjee, 2020 Fall Scientific Meeting Chair, Midland Section ACS



ACS
Chemistry for Life®

American Chemical Society Midland Section
2020 Fall Scientific Meeting

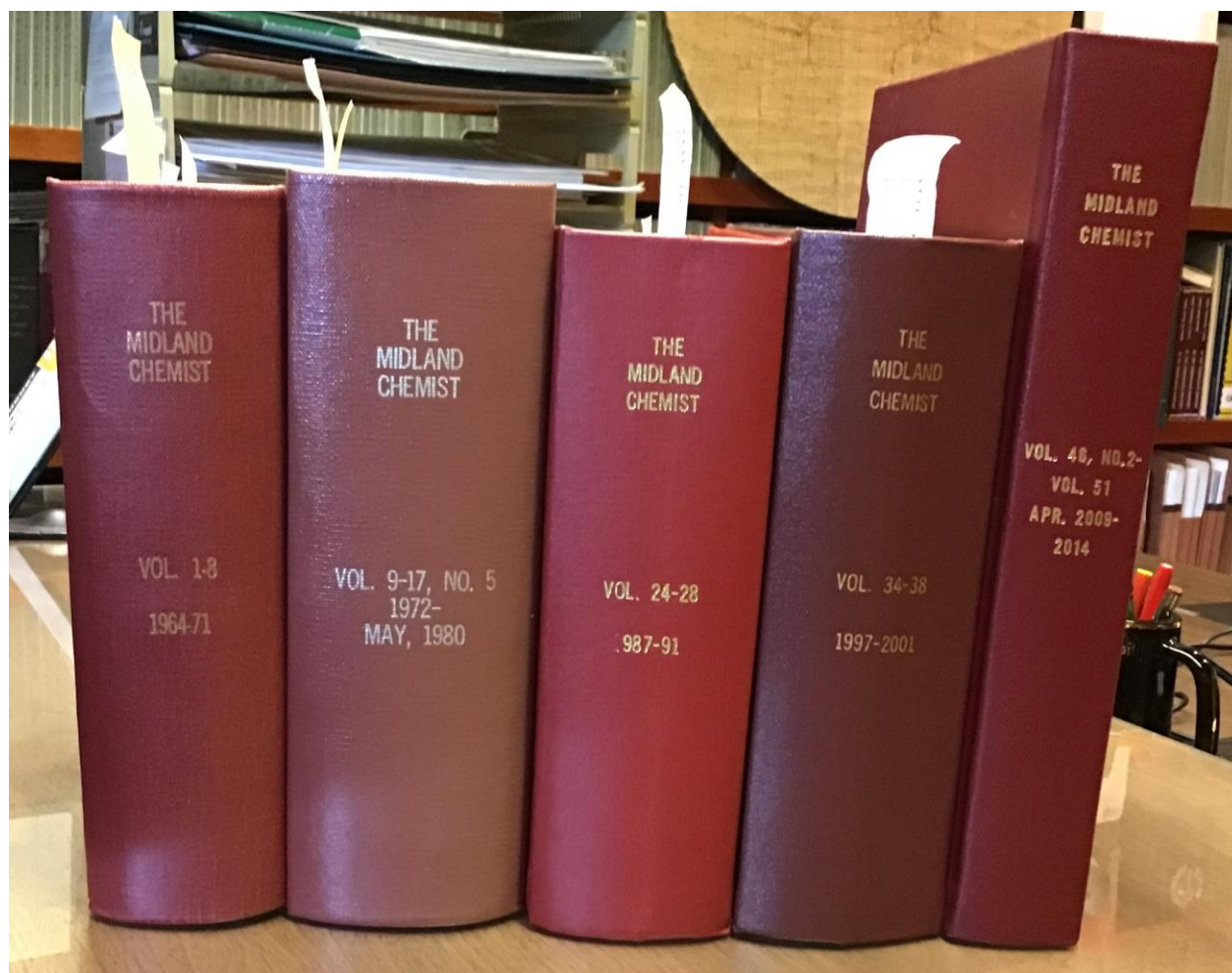
Sticking with Chemistry

Save the Date:
October 10, 2020
SVSU

Sponsored by ACS Midland Section

The graphic features a collage of images: a car headlight, a scientist in a lab coat and gloves, a scientist in safety glasses, and a molecular structure. The background is a mix of yellow and blue geometric shapes.

In Past Issues of *The Midland Chemist*
Wendell L. Dilling, Director and Historian, Midland Section ACS



From these volumes . . .

50 Years Ago, *The Midland Chemist* 1970, 7, No. 5, 2.

In *Boyer To Receive Borden Award*: "Dr. Raymond F. Boyer of the Dow Chemical Company will be the recipient of the 1970 Borden Award in the Chemistry of Plastics and Coatings at the Spring, ACS Meeting May 24-29 in Toronto. Most of his work at Dow has been in the field of high polymers, which has resulted in some 20 U.S. patents and 60 published papers which deal with the physics and physical chemistry of these polymers. His current interests include polymer multiple transitions and relaxations and their effects on mechanical properties."

40 Years Ago, *The Midland Chemist* 1980, 17, No. 5, 257.

In *March ACS Board Highlights*: "Jim Edmonds, general chairman of the Midland Fall Scientific Meeting, told board members at the March 19 meeting that the theme for this year's conference would be the industrial-academic interface. He announced the appointment of six committee chairpeople: Steve Erickson, program;

Ann Fleming, publicity; Pat Cannady, registration; Sandra Jones, keynote; Cathy Hintze, social, and Kay Amemiya, meeting place.”

30 Years Ago, *The Midland Chemist* 1990, 27, No. 4, 3.

In *Chairman’s Column* by Bill Pike, ACS Midland Section Chairman: “As I write this column, I look forward to the 22nd ACS Central Regional Meeting at Saginaw Valley State University next week. Hopefully, by the time you read this, many of you will have the opportunity to take advantage of the ready access of the meeting and enjoyed the many excellent papers, expositions, and social events there. The Section is indeed fortunate to have hosted this meeting and owe many thanks to Pat Dreyfuss, her many helpers, and SVSU.”

20 Years Ago, *The Midland Chemist* 2000, 37, No. 4, 3.

In *Spring Recognition Dinner Honors Members, Students, and Educators* by Chitra Subramaniam: “*Food, fireworks, and fun!* These three words marked the annual Recognition Dinner of the Midland Section of the American Chemical Society held at The Dow Chemical Company on April 19, 2000. This event is organized by the Midland Section every year, and awards are presented for outstanding achievement in various aspects of the chemical sciences. The evening began with a splendid dinner. This was followed by a presentation by Jim Malek on pyrotechnics. Jim Malek is a technical information specialist with Dow Corning Corporation. He is also an expert on the art, craft, and science of pyrotechnics and is an active member of several leading organizations related to that science.”

10 Years Ago, *The Midland Chemist* 2010, 47, No. 3, 4.

In *Kids & Chemistry Shares “Chemystery” with Boy Scouts - Boy Scout Merit Badges* by Lisa Thackery, Outreach Member: “In honor of the 100th anniversary of the Boy Scouts of America, the Midland Section of the American Chemical Society, in cooperation with the Midland Historical Society and Dow Corning, sponsored a special “Chemystery” event, at which 60 boys aged 12-16 were afforded the opportunity to earn merit badges in Chemistry.”

Upcoming Dates, Events, and Other Updates

- June 1 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection at [Midland Section WebEx Board Meeting June 2020](#), phone number: 989-633-1166.
- June 1 – **Deadline for Midland Section ACS Spring Awards nominations** to honor outstanding educators, volunteers, and colleagues. For more information, contact Diana Deese, Midland Section ACS Awards Committee Chair, at dkdeese@dow.com or 989-636-9915.
- August 3 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection at [Midland Section WebEx Board Meeting August 2020](#), phone number: 989-633-1166.
- August 16-20 (Save the Date) – Fall 2020 National ACS Meeting & Exposition, San Francisco, CA. Meeting theme: *Moving Chemistry from Bench to Market*. For more information, and to submit an abstract, please see <https://www.acs.org/content/acs/en/meetings/national-meeting/abstract-submission.html>.
- September 8 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection at [Midland Section WebEx Board Meeting September 2020](#), phone number: 989-633-1166. **Please note: This Board meeting is being held on Tuesday evening, not the usual Monday evening.**
- October 5 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection at [Midland Section WebEx Board Meeting October 2020](#), phone number: 989-633-1166.
- October 10 (Save the Date) – 2020 Midland Section ACS Fall Scientific Meeting. Location: Saginaw Valley State University. Meeting theme: *Sticking with Chemistry*.
- November 2 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection at [Midland Section WebEx Board Meeting November 2020](#), phone number: 989-633-1166.
- November (Save the Date, Dates TBD) – 2020 ACS Central Regional Meeting, Columbus, OH. For more information, please see https://cerm2020.org/?sc=200226_mtg_em_regional_CERM_od.
- December 7 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection at [Midland Section WebEx Board Meeting December 2020](#), phone number: 989-633-1166.

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