

# THE MIDLAND CHEMIST

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## Chemistry Students Recognized for Participation in National Chemistry Competition

**Michael Tulchinsky, Chemistry Olympiad Chair, Midland Section ACS**

Ten high school students from Bay, Midland, and Saginaw counties participated in the National Exam of the 2019 U.S. National Chemistry Olympiad (USNCO) on April 27 at Saginaw Valley State University (SVSU). The National Exam is part of a four-step competition in the selection process to the International Chemistry Olympiad (IChO). Before the National Exam, 228 candidates took part in the local competition. The Local Exam students represented all five counties in the geographic area of the Midland section and came from twelve high schools: Bay City Western, Breckenridge, Calvary Baptist Academy, Carrolton, Chesaning Union, Freeland, Heritage, H. H. Dow, John Glenn, Midland, Mt. Pleasant, and Saginaw Arts and Science Academy (SASA). Ten high score students were nominated and took part in the National Exam. These outstanding

chemistry students were recognized and received gifts at the ACS Midland section Annual Recognition Banquet on May 1<sup>st</sup>. The students are: David Lin from H. H. Dow High School, chemistry teacher Adam Colvin; Katherine Perry and Olivia Johnson from Midland High School, chemistry teacher Jeffrey Yoder; Bhanu Mamillapalli and Joseph Kopka from SASA, chemistry teacher Dr. David Allan; Andrew Dudewicz and Megan Sulkanen from Heritage High School, chemistry teacher Melanie Galonska; Brady Failing from Bay City Western High School, chemistry teacher Gwenyth Kieser; Olivia Gilpin from Chesaning Union High School, chemistry teacher Melyssa Lenon; and Todd Cnudde from John Glenn High School, chemistry teacher Sandra Schafer. David Lin achieved the best score at the local test among all 228 participants.

Overall about 1,000 high school chemistry students across the country take the qualifying national exam every year. Twenty best students are invited for training to the Chemistry Olympiad Study Camp to be held this year at the University of Maryland at College Park, MD, in June. The top four will represent the U.S. at the 51<sup>st</sup> IChO in Paris, France, July 21-30, 2019.

The Midland section of the ACS supports both local and national exams. Professor Michael Coote from the Department of Chemistry of SVSU hosted the national exam, which consists of two written tests and a lab practical, Dr. Anne-Catherine Bedard of Dow gave a presentation on French culture, and Dr. Robert Kennedy, also of Dow, volunteered as a proctor. Ms. Diana Deese organized the banquet where the ten students and their teachers were recognized. Dr. Michael Tulchinsky from Dow coordinated the activities in both local and national exams.



From left to right: Joseph Kopka, Andrew Dudewicz, Bhanu Mamillapalli, David Lin, Katherine Perry, Todd Cnudde, Megan Sulkanen. Not shown: Olivia Gilpin, Olivia Johnson, Brady Failing.

## Longest-Time Current Midland Section Members Recognized at Awards Banquet

*Wendell L. Dilling, Director and Historian, Midland Section ACS*

In this, the centennial year of the Midland Section, we decided to invite as a special guest to the Awards Banquet, held on May 1, the person who has been a current member of the Midland Section the longest. The earliest current member is Donald McCollister, who joined the ACS in 1942 and came to Midland that same year. He thus has been a Midland Section member for 78 years or 78% of the life of the Midland Section. The second earliest current member is Charles Raley, who joined the ACS in 1943 and came to Midland in 1947. Unfortunately, neither of these two members were able to attend the Awards Banquet.

However, we were fortunate to have the Midland Section's third earliest current member, Dr. David C. Young, attend with his wife Laura. Dave joined the ACS in 1948 while a student at the University of Florida. After receiving his PhD degree, Dave came to Midland in 1950 and joined Dow's organic research lab. He has been an ACS member for 72 years and a Midland Section member for 70 years. Dave is a special Midland Section member in that he has been very active, having served a term or more in each of the Section elective offices, including 21 years as a councilor. At the national level he served as District II director for two terms or six years on the national board of directors and was selected as a candidate to run for president-elect of the National ACS in 1981. Dave was presented with a plaque noting his participation in this part of the Section's centennial celebration.

## Chemist Beata Kilos-Réaume of Dow on the Art of Catalysis and Finding Her Sweet Spot

*Reprinted from Industry Matters Newsletter May 23, 2019*

*By: Leigh Krietsch Boerner, special to C&EN*

Beata Kilos-Réaume in the lab. Credit: Dow



Beata Kilos-Réaume is a catalyst aficionado. While studying chemistry at Adam Mickiewicz University in Poznan, Poland, she attended a talk about zeolites by her future PhD adviser. Kilos-Réaume was fascinated by the materials, which began a catalytic love affair that's still going on. She continued her study of catalysts through graduate school, where she split her time between her native Poland and France, where she traveled as a Marie Curie Host Fellow at the Institute of Research on Catalysis and the Environment of Lyon. After a brief return to Poland and a 3-year postdoc at the University of California, Berkeley, in chemical engineering, Kilos-Réaume landed at Dow Chemical, where she's been since 2008. Catalysis, she says, "is

a field full of opportunities, where there's a lot of fundamental knowledge that still needs to be developed."

At Dow, Kilos-Réaume has also worked on social causes. She helped found the Women Chemists Committee of the Midland Section of the American Chemical Society as well as GROW (Growing R&D Opportunities for Women), which helped Dow institutionalize unconscious-bias training and launched career development and mentoring programs.

**What's the problem that keeps you up at night?**

Catalysis is half art, half science. When I'm trying to design a new catalyst, I feel I have to see the atoms, just like a sculptor has to see what the stone is telling them it contains.

**What was the last experiment you ran?**

I'm working on several projects right now, mostly focusing on designing new catalysts for alkanes and alkenes functionalization. So I'm designing the catalysts, doing a lot of synthesis to make the right arrangements of the molecules to create certain sizes of cages, domain sizes, and to precisely control the active sites I am designing.

**What's your favorite lab tool?**

My microreactors for testing the catalysts. That's the heart of how I get the catalysts' performance data. In some cases I can also monitor catalyst changes during the reactions using in situ FT-IR [Fourier-transform infrared spectroscopy] or Raman spectroscopy. If I don't have this performance data, that's only wishful thinking or guesswork if the catalyst you created works or not.

**What's your morning routine like?**

I set the alarm for way too early and hit snooze about 12 times. Then I snuggle with my Pomeranian, Jack; walk him; grab breakfast; and head to the lab.

**What's your favorite fun or interesting science fact?**

Some of the chemicals we're discovering today were actually discovered hundreds of years ago. For example, some of the pigments used in Renaissance paintings are new to us.

**What are you reading now?**

A biography of Winston Churchill. He was basically a scientist at heart, but he was also an artist.

**Why did you choose to be a chemist?**

I'm a scientifically inclined woman from Poland. What do you think?

Chemistry is the sweet spot where, today at least, theoretical and empirical research are really linking together to drive big breakthroughs.

Link to article online: [Industry Matters Newsletter Kilos-Reaume](#)



## 2019 Midland Section 28th Annual Awards Banquet

*Diana K. Deese, Chair, Midland Section Awards Committee*

2019 celebrates the 150<sup>th</sup> anniversary of the Periodic Table. While there are 118 elements on that table, the 28<sup>th</sup> annual Midland Section ACS recognition banquet had 247 attendees at our tables, with over 80 being recognized for their dedication to chemistry and the related sciences.

Dr. Byungil Ahn, Associate Professor of History from Saginaw Valley State



University, opened the program with an interesting talk on noodles and how their spread across the globe was due to the innovation of chopsticks and the fork. Punctuating the idea that one may never know the value of their invention.



Element 10: Neon. Calm, cool, and collected are our 10 **Chemistry Olympiad Finalists**. They may be non-reactive under the pressure of the National tests, but, add a little charge and they are ready to light up the world with their knowledge. (*Find out more on this program in the article by Michael Tulchinsky, also in this issue of "The Midland Chemist".*)

<i>Olivia Gilpin</i>	<i>Chesaning Union</i>
<i>David Lin</i>	<i>H. H. Dow</i>
<i>Andrew Dudewicz</i>	<i>Heritage</i>
<i>Megan Sulkanen</i>	<i>Heritage</i>
<i>Todd Cnудde</i>	<i>John Glenn</i>
<i>Katherine Perry</i>	<i>Midland</i>
<i>Olivia Johnson</i>	<i>Midland</i>
<i>Bhanu Mamillapalli</i>	<i>SASA</i>
<i>Joseph Kopka</i>	<i>SASA</i>
<i>Brady Failing</i>	<i>Western</i>



Element 37: the atomic number of Rubidium, and, the number of **Outstanding High School Chemistry Students** receiving certificates from the Midland Section. Like Rubidium, these students are seeking a actual application for their knowledge, and, strangely, an inordinate number of recipients responded "flame test" when asked what their favorite chemistry experiment had been. (Rubidium was discovered as an unexplained line in a flame test.) Because of this, the little swag bag containing a commemorative poker chip, a wallet periodic table, and an ACS mole; also contained a packet of "Funky Flames".

<i>Benjamin Hale</i>	<i>All Saints</i>	<i>Isabelle Richardson</i>	<i>Breckenridge</i>
<i>Paige Wolfe</i>	<i>Alma</i>	<i>Myra Marr</i>	<i>Breckenridge</i>
<i>Abby Taylor</i>	<i>Alma</i>	<i>Annaira Romero</i>	<i>Bridgeport</i>
<i>Jade Essex</i>	<i>Arthur Hill</i>	<i>Erin Kisser</i>	<i>Bullock Creek</i>
<i>Tatum Hantla</i>	<i>Bay-Arenac Community</i>	<i>Noah Brown</i>	<i>Calvary Baptist Academy</i>
<i>Ginea Spicher</i>	<i>Bay City Central</i>	<i>Emily Jaremba</i>	<i>Carrollton</i>
<i>Thane Deming</i>	<i>Bay City Western</i>	<i>Jamie Valkenburg</i>	<i>Chem-Ministry</i>
<i>Chelsea Schripsema</i>	<i>Beal City</i>	<i>Katelyn Ferry</i>	<i>Chesaning Union</i>
<i>Ashley Dittmar</i>	<i>Birch Run</i>	<i>Kenzie McCoy</i>	<i>Coleman</i>



<i>Madelyn Maurer</i>	<i>Frankenmuth</i>	<i>Kaitlyn Bootz</i>	<i>Mt. Pleasant</i>
<i>Liam Pan</i>	<i>Freeland</i>	<i>Matthew M. Kinney</i>	<i>Sacred Heart Academy</i>
<i>Ashwin Saxena</i>	<i>H. H. Dow</i>	<i>My'Eisha Lee</i>	<i>Saginaw</i>
<i>Seth Byrne</i>	<i>Hemlock</i>	<i>Benjamin Schall</i>	<i>SASA</i>
<i>YiFan Jiang</i>	<i>John Glenn</i>	<i>Sarah Lotor</i>	<i>Shepherd</i>
<i>Thomas Middleton</i>	<i>John Glenn</i>	<i>Lauren Travis</i>	<i>Shepherd</i>
<i>Tyler Parent</i>	<i>The Midland Academy</i>	<i>Grace Rabishaw</i>	<i>St. Charles</i>
<i>Jacob V. Miller</i>	<i>Midland</i>	<i>Ryan Downs</i>	<i>St. Louis</i>
<i>Connor Sexton-Neal</i>	<i>Morey FlexTech</i>	<i>Mikayla Lietzke</i>	<i>Swan Valley</i>

Element 7: Nitrogen – a key component of nitroglycerin. And, I'll bet our 7 **Outstanding College Students** have experienced a little angina with each semester's bill. Or, maybe a little element 83, in the pink form, did the trick. Your education has been a valuable investment and, whether heading for a graduate degree or into the work force, the Midland Section wishes health and prosperity to our awardees.

<i>Zachary Lincoln</i>	<i>Alma College – Chemistry</i>
<i>Frahade Martinez</i>	<i>Alma College – Biochemistry</i>
<i>Julia A. Angst</i>	<i>CMU – Chemistry</i>
<i>Alexandria Aspin</i>	<i>SVSU – Chemistry</i>
<i>Haley E. Kopkau</i>	<i>CMU – Biochemistry</i>
<i>Justin Royer</i>	<i>SVSU – Biochemistry</i>
<i>Andrew Hogan</i>	<i>Delta College – Chemistry</i>



Pictured here with colleague and presenter, Rebecca Field, how can **Nicole Roberts** (Kolb Elementary), not love the periodic table? Element is in her title! As our recipient for **Outstanding Achievement in Elementary Level Science Teaching**, Nicole has wonderful ways of getting her students to be curious about the world and thinking outside the box. At the end of each year, she organizes a STEAM event for over 600 students, where they can showcase to the community what they have learned about science. Ms. Roberts teaches the kids how to work in small groups, how to effectively communicate, and how to use the scientific method to improve on their experiments. Thank you, Nicole, for encouraging the curiosity of so many young minds!

We all know, like carbon, science teachers are the foundation to the life of our industry. Versatile, organic, and certainly diamonds when subject to pressure, **Darci Merrillat** (pictured to the left) receives the **Outstanding Achievement in Middle Level Science Teaching** for being Bay City Western Middle School's carbon element and for putting heart into her lesson plans. As told to the audience by Allison VanDriesche (pictured on the right), when teaching the cardiovascular system, Darci put a call out to all her people on social media during deer season and over 100 hearts were donated for her students to dissect. When the school needed rats to study, Darci put on a movie night, featuring "Ratatouille" and raised sufficient funds to purchase the critters. Finding creative ways to fund supplies is not the only thing she does to advance science at Western Middle School. Darci also participates in Delta College's Math and Engineering Experience and collaborates with industry professionals to make sure her curriculum meets Next Generation Science Standards...and then shares them with the school district. Congratulations, Darci!



High school is where the love of chemistry fully indoctrinated and high school chemistry teachers are the gold standard for a student's first in-depth exposure to the real fundamentals of chemistry. The 2019 **Outstanding Achievement in High School Chemistry Teaching Award** goes to **Rick Cahoon** (Shepherd High School). Rick's students excel due to experiential learning. This was evident when, unexpectedly, the presenter of his award was unable to attend (the element of surprise!) Without hesitation, two of his students immediately jumped up to extoll the virtues of Mr. Cahoon's teaching style. Not only does Rick take a strong interest in the achievement of his students, he recently updated the chemistry curriculum, implemented new technology, designed several new experiments, and, enhanced educational rigor and critical thinking skills. Thank you, Rick, for instilling a general chemistry enthusiasm in students!

If high school teachers are the gold standard, college chemistry professors are platinum. They must take the general enthusiasm for chemistry and carefully craft it so that the student sees a clear career path. Receiving the **Outstanding Achievement in College Chemistry Teaching**, **Jeffery A. Turk** (Alma College) is responsible for inspiring many students to be where they are today. Christine Cuthbertson (pictured) credits his engaging lectures, considerable time spent explaining concepts, and his summer research opportunities, to her success. Professor Turk also made it possible for students to attend ACS conferences and work as teaching assistants. His investment in his students does not end with graduation as, I have heard, he frequently checks in on them after they have left Alma College. Our sincere gratitude to you, Professor Turk!



2019 marks the first year for the "**Encouraging Women in the Chemical Sciences**" award sponsored by the Women Chemists Committee. This annual award is meant to recognize significant accomplishments by individuals who have stimulated or fostered the interest of women in chemistry, promoting their professional developments as chemists or chemical engineers. **Beata Kilos-Reaume** (Dow) has embodied the fundamentals of this award and Lauren McCullough is proud to present her with the WCC's inaugural award. As Marie Curie inspired many women, we equilibrate you, Beata, as our radiant Radium.

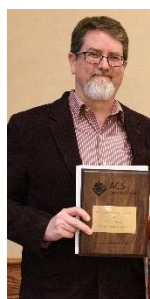
(While we have her captive here in this image, "Congratulations" to **Lauren McCullough** for being recognized at the ACS National level for **Local Section Outreach Volunteer of the Year!**)





The **Outstanding Chemical Technology Student** is selected by the Mid-Michigan Technicians Group. **Lindsay Alarie** (Delta College). Lindsay was selected for this honor because of her excellent communication skills, the intelligence she exhibits for chemistry, her dedication to her studies, her self-motivation, and her work ethic. She hopes to apply her knowledge to the geology and water resources of the Great Lakes. Lindsay, we salute you with the element oxygen accompanied by 2 hydrogen.

When you look at the periodic table and notice the wide central block of transition metals, you realize they are the strong, sturdy, stable metals of science. This is the group that represents the technicians. This year, we recognize 2 powerhouse elements of our industry.



#### **Outstanding Chemical Technician(s):**

**Weston Tulloch** (Dow – pictured left): Pulling a single crystal eutectic silicide, setting up a state-of-the-art solar lab, implementing operating procedures, designing process equipment, and synthesizing new molecules are just a few of Wes' undertakings. He consistently demonstrates his awareness and application of scientific rigor through the use of statistical tools, and, uses his background in material science and mechanical aptitude, to make himself a versatile and valuable member of many teams.

**Matthew Yonkey** (Dow – pictured right): Matthew has played a key role in novel battery electrolyte materials, low dielectric coatings for electronic materials, flame retardants for polyurethane materials, synthesis of new adhesive formulations, and development of new catalysts for olefin polymerization, all of which are critical to Dow's research strategy. His leadership and organizational skills have had a noticeable impact on his department and he has championed several safety initiatives while maintaining a high level of productivity.



Congratulations, Gentlemen, and, Thank You for being the best mentors and role models to all your peers!



Volunteers are like the actinides. They share commonalities with the rest of us but are a little more diverse in how they give of their time...few and far between, here and gone as they move through multiple opportunities. Our **Outstanding Science Education Volunteer, Jennifer Reil** (Dow) has been volunteering as a Dow Ambassador/ACS Science Coach for several years. She enthusiastically provides hands-on demonstrations at local elementary and middle schools helping teachers explain the concepts of chemistry. She seeks to learn new presentations and goes where she is needed. Moving in and out of hundreds of little minds. Congratulations, Jennifer, on your recognition!

**Outstanding Service to the American Chemical Society: Dale LeCaptain** (Central Michigan University). That is Dale to the right, stylishly modeling his H<sub>2</sub>OQ hat and backpack that he shamelessly paraded around the event ☺. As an Analytical Chemistry professor at CMU, Dale exuberantly designs learning to engage students to their fullest capacity. He has served as faculty advisor to the ACS student group at CMU (which receives national recognition each year), pioneered the Analytical Lab portion of the Quantitative Analysis course at the Biological Station for CMU on Beaver Island, has been active with the Younger Chemists Committee, and speaks frequently at venues such as the Chippewa Nature Center. Most recently, Dale has co-designed and implemented the H<sub>2</sub>OQ program (water quality experiment) which involves teachers and thousands of students in the Great Lakes Bay Region. This program exemplifies





the prominence of science in our watershed region. Just as stars shine (because of transmitting hydrogen into helium) and energy abounds according to Einstein's mass-energy equivalence, we salute you, Dale, with element number 1. Thank you for your guiding light and boundless energy in service to science!

When you look at the atomic number of each element you know how many positively charged protons are in the nucleus and an equal number of electrons existing in probability clouds, as in you might expect them to be in one place...but they can be in any place at any given time. So it goes with our volunteers. They possess a positive attitude and, at any given time you may find them sharing their passion for chemistry and the related sciences, in a variety of ways in many places. Like the spin of the electrons shaping the periodic table, these individuals create unique ways to contribute which helps shape our industry, and, in return, all of us benefit. For such amazing people, we have six **"Salutes to Excellence"** and three **"Special Appreciation Awards"**.

**"Salutes to Excellence":**

**John Metcalf:** (Good Design LLC) - *"In recognition of his expert design assistance with the Section's centennial historical exhibit. For guiding the team through three years of planning and making our vision a reality, you deserve our sincere gratitude. We salute your remarkable creativity and patience."*



**Jay Martin:** (Central Michigan University) - *"In recognition of his expert guidance and enthusiastic support of the Section's centennial historical exhibit. For providing consultation, student supervision, assistance with oral histories and overall perspective during three years of exhibit planning, you have earned our greatest respect and sincere appreciation."*

**Valentina Woodcraft** (pictured right): (DuPont) - *"In recognition of your Volunteer Time in support of the 2019 CERM, Dow STEM Ambassadors, and Youth Tutoring. Your contributions of time and talent to the ACS, the Midland Section, and to, not only the scientific community, but the community at large, have made a significant impact and an immeasurable difference."*



**Clifford Todd** (pictured left): (Dow) - *"In recognition of your Expertise and Enthusiasm in Microscopy, Spectroscopy and Spectrometry. For providing leadership, innovation, analysis, and interpretation in the field of Material Science and contributions of time and talent to the Michigan Microscopy & Microanalysis Society."*

**Patrick Smith:** (Michigan State University) - *"In recognition of your Expertise in Biomaterials and Green Polymer Chemistry. For providing leadership, educational opportunities, and for your continual participation in the field of bio-based chemicals and materials and contributions of time and talent to the ACS, the Midland Section and the scientific community at large."*

**Bernadette Harkness:** (Delta College) - *"In recognition of your Time and Enthusiasm for Project SEED (Summer Experience for Economically Disadvantaged). For coordinating and securing mentors and students since 2011. Through your efforts, 16 area economically disadvantaged high school students were able to work in real laboratories, with real scientists, impacting their lives forever."*

## Special Appreciation Awards:



**Emily E.C. Deese**, Student, Michigan State University (pictured left): *Hospitality Star* - “for always filling in at any station, over the past 8 years, to help make the Midland Section Awards program a success.” Emily has stepped in as photographer, registration assistant, typesetter, set-up crew, clean-up crew, and just about any “gopher” job we have asked her to do...with no complaints, and for the simple payment of strawberry cake and chicken with supreme sauce.



**Dimi Katsoulis**, Dow (pictured left): “for Co-chairing the 50th (2019) CERM and being the driving force in making it a premier scientific event for the Midland Section and Central Region”. Dimi has spent over 2 years assembling high-caliber speakers, put in place themed and classical symposia, and included workshops aligned to NGSS standards for local educators, as well as many special events. He has surrounded himself with trusted, capable people who have helped to make this event possible.

**Gina Malczewski**, Dow Corning Corp.-retired (pictured right): “for chairing the Midland Section 100th Cmte. and overseeing events, including the display at the Doan History Center, to make the year-long section centennial celebration a success”. Gina is, undoubtedly, a powerful force and tireless volunteer within our section. Her endless activities in the arena of Outreach events, are, with prejudice, some of the best in the country. *Note: Gina is also a nominee for the Governor’s Senior Volunteer Award for which awardees will be announced later this year.*



This last section of recognitions must be representative of the Noble Gasses on the periodic table. They surpass the business of the common rabble. These individuals have been there, done that, paved the way for the rest of us, and now, get a certificate for it. This year, in recognition of the Midland Section’s 100<sup>th</sup> Anniversary, **David Young** (pictured right) was presented with a special longevity certificate for being an ACS member for 72 years and a Midland Section member for 70 years.



### 50 Year / 60 Year / 70+ Year ACS Membership Certificates:

#### 50 Years

Frank James Knoll  
Marguerite L. Leng

#### 60 Years

Oswald U. Anders  
Eugene R. Moore

#### 70 Years

Gerard C. Sinke

(Pictured are Oswald Anders on the left and Eugene Moore on the right.)

And, so comes to the end, another wonderful year full of so many accomplishments. As one final tribute to the 150<sup>th</sup> anniversary of the periodic table, we challenged our audience; anyone who could sing the ASAP Science song, “The Elements of the Periodic Table” would be awarded a special prize. We had one taker, Patti Kopkau, a teacher (*not of science*) from Whittemore-Prescott High School, who did an outstanding job...until we hit the lanthanides. But, in all honesty, to the tune of the “Can-Can”, who can sing them that fast! For her bravery, we gave her the Periodic Table display. Well done!



I want to thank everyone who attended and put up with all my cheesy periodic table jokes. Who can't laugh at such musings as:

Alloys— isn't that when Iron Man teams up with the Silver Surfer?

Or, if 16 sodium atoms walk into a room, who comes in next? (Batman)

How about, "What is Cole's Law"? (thinly sliced cabbage)

Maybe letting the students know that HOMEWORK is an acronym for Half My Energy Wasted On Random Knowledge?

Oh, I have so many more that I could go on and on...but, until next year, Science On!

Regards,  
Diana



*(Pictures of the event can be found on the Midland Section website under Awards)*

**Join ACS at the Creative 360 Community Garden!**

**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 at the office (989) 837-1885**

<b>6' x 10'</b>	<b>\$20</b>
<b>6' x 12'</b>	<b>\$25</b>
<b>6' x 18'</b>	<b>\$30</b>

- **PLOTS WILL BE TILLED** by June 2 (weather permitting)
- **WATER and ACCESS** available and **FREE 24/7**
- **COMPOST PILE** will be available
- **EDUCATIONAL Programs** also planned
- **ACS** will also help you donate your excess produce to local food pantries and/or culinary programs
- **QUESTIONS?** Contact Creative 360 or Gina Malczewski [reginamalczewski@gmail.com](mailto:reginamalczewski@gmail.com)



## Turner J. Alfrey Visiting Professorship Lecture, June 3

**Melanie Kaufman, Senior Communications Manager, Michigan State University**

MSU St. Andrews in Midland will once again host the Turner J. Alfrey Visiting Professorship Lecture, on Monday, June 3, 2019. The program will run from 9:00 AM – 5:00 PM at MSU St. Andrews, in Midland.



Professor Craig J. Hawker will be our distinguished guest and main lecturer. Two other assistant lecturers from the Craig Hawker research group at UCSB, Morgan Schultz and Neil Dolinski, will also be with us that day.

The [Professor Craig Hawker](#) research group is an interdisciplinary group involved in a wide range of fundamental and applied materials chemistry and molecular engineering challenges. Current topics span the development of new polymer synthesis strategies to the fabrication of nanostructured materials for applications in biomaterials and energy research.

Craig J. Hawker is the Director of the California Nanosystems Institute (CNSI), Dow Materials Institute, and Facility Director of the Materials Research Lab at the University of California, Santa Barbara (UCSB). He holds the Alan and Ruth Heeger Chair in Interdisciplinary Science and is the Clarke Professor within CNSI. Hawker is a member of the Materials Department and the Department of Chemistry and Biochemistry at UCSB and came to UCSB in 2004 after eleven years as a Research Staff Member at the IBM Almaden Research Center in San Jose, CA.

The full day's agenda and lecture topics are as follows:

9:00 AM	Introduction of Speakers
9:15 AM	The Power of Organic Chemistry in Polymer Synthesis
10:15 AM	Design and Monitoring of Photopolymerization and Photoswitches
11:30 AM	Nanostructured Materials via Polymerization-induced Microphase Separation
12:30 PM	Lunch Break
2:30 PM	Architecture and Asymmetry in Block Polymer Self-assembly
3:30 PM	Multi-material 3D-printing through Wavelength-selective Polymerizations

To register to attend this year's Turner J. Alfrey Visiting Professorship Lecture, please go to [2019 Turner J. Alfrey Program](#), and for any questions, please contact Melanie Kauffman at [kauffman59@msu.edu](mailto:kauffman59@msu.edu).

**“A Century of Science and Service” is NOW OPEN!**  
*Gina Malczewski and Gretchen Kohl, Midland Section ACS*

Build your own molecules! See an electron microscope! Admire the molecular substructure of Silly Putty! You can do all this and more at the **Midland ACS Centennial Historical Exhibit**.

After more than three years of effort, the exhibit honoring the centennial is open at the Herbert D. Doan Midland County History Center, 3417 W. Main St. in Midland. The exhibit features panels of information and images that address History, Leadership, Communication, and Education, and a tower that highlights four materials invented/developed by Midland ACS members: Saran™ (polyvinylidene chloride), Styrofoam™ polystyrene, Silly Putty, and superabsorbent polymer (sodium polyacrylate). Three videos allow visitors to see “A Day Without Chemistry”, outreach highlights (assembled by Erin Royalty’s Computer Technology class at H.H. Dow High School), and “Unintended Consequences of the Breast Implant Controversy”. Midland ACS member and CMU Associate Professor Janice Tomasik is featured in the latter. A special quilt and “Periodic Table” are also part of the exhibit, which runs through the end of the year.



Artifacts on display include a kaliapparatus (part of the ACS logo) blown by Wyse glass, the minutes from the first Midland ACS meeting, a chemistry set from 1936, and past awards received by the section or its members. These will likely change over time, especially as we obtain loans from the Science History Institute.

**Starting in June, the exhibit will be open for the summer Monday-Friday 9-5, and weekends 12-4 pm.**

The exhibit committee thanks all our benefactors: H.H. and Grace A. Dow Foundation, The Charles J. Strosacker Foundation, the Rollin M. Gerstacker Foundation, the Doan Family Foundation, the local ACS Section, and ACS Corporation Associates—as well as Designer John Metcalf, Dr. Jay Martin, Gary Skory and Marc van Horn, Nathan Bublitz and Casey Peacock.

Adjunct events will be hosted in the Doan Center Atrium; the next one is June 9 at 1 pm, **focusing on science and art with Saran and other plastic wrap**—space is limited, so please register at <https://docs.google.com/forms/d/e/1FAIpQLSdpVt6Ge8X4veNailsOfZWOG-M06cXomYhO26jfgxvZBpncNw/viewform>

Please also visit the centennial website at <http://midlandacs100.org> for more information.

Photo credit: Gina Malczewski

**I'll Drink to That! - A Special Program at Grape Beginnings Winery Directs Proceeds to Midland ACS**  
*Gina Malczewski and Gretchen Kohl, Midland Section ACS*

Wines from Grape Beginnings Winery (GBW) on Main Street were featured at our Centennial Exhibit opening and also at the exhibit fund-raiser ("A Night at the Museum") event last July. We now have wines set aside for purchase at GBW with special Centennial labels. In addition, **the week of CERM, 10% of the proceeds from all GBW wine purchases will be donated to Midland ACS**. All you have to do is mention CERM at the time of purchase.

**Grape Beginnings Winery Supports the Midland ACS Centennial**  
*Gina Malczewski, 2019 Centennial Committee, Midland Section ACS*



The Midland ACS  
**CENTENNIAL  
HISTORY EXHIBIT**  
Herbert D. Doan County History Center  
3417 W. Main St Midland, MI  
**FREE!**  
**OPEN 9-5PM M-F,  
SAT 6/9/19 12-4 PM**



**Purchase Centennial Wines  
(or others) from  
Grape Beginnings Winery**

**...if you  
Mention CERM ,  
10% of those bottle proceeds  
will be donated  
to Midland ACS**





## ACS 2019 Central Regional Meeting Program Description

### *Shaun Ahn and Dimi Katsoulis, CERM 2019*

Join the American Chemical Society's Midland Local Section as they celebrate their 100<sup>th</sup> anniversary and the 50<sup>th</sup> anniversary of our Central Regional Meeting in Midland, Michigan from Monday June 3<sup>rd</sup> to Saturday June 8<sup>th</sup> 2019.

**Molecules to Materials** 2019 ACS CERM will be a premier technical event featuring many notable scientists from throughout the region and beyond. Melanie S. **Sanford**, Craig J. **Hawker**, Tobin J. **Marks**, A.N. **Sreeram**, Joseph M. **DeSimone**, and the National ACS Board of Directors are just a few of the scientific luminaries contributing to the stimulating program designed to engage the whole brain. In recognition of the important role that chemistry and science play in our world, the technical program will be augmented with several public activities that showcase the value of **Chemistry in Everyday Life**, including Chemistry in the Arts with special guest **Mark Golden**, astronaut **Scott Kelly**, STEM Night at the Dow Diamond Stadium with Los Angeles Dodgers' professional baseball affiliate the **Great Lakes Loons**, chemistry education workshops at the Michigan State University Midland STEM Center, and a wrap-up of the **ACS CERM Regional Experiment**.

The ACS CERM will be hosted in Midland, Michigan from Monday June 3<sup>rd</sup> to Saturday June 8<sup>th</sup> 2019 at the modern facilities of [The H Hotel](#) and its 8,000 square-foot H.H. Dow Leadership Academy, with special events held at the [Midland Center for the Arts](#), [Dow Diamond Stadium](#), and Michigan State University's Midland STEM Center near the [Whiting Forest](#) of Dow Gardens.

**Registration is open now.** Information about registration, accommodations, and up-to-date program details can be found on the meeting website, [acscerm2019.org](http://acscerm2019.org). Registration includes breakfast, lunch, and coffee breaks throughout the day at The H Hotel's H.H. Dow Leadership Academy.

**TECHNICAL PROGRAM** Featuring a national-caliber cadre of speakers from across the chemical sciences in an intimate, modern setting that maximizes interactions among participants, the 2019 Central Regional Meeting's **Molecules to Materials** technical symposia offer attendees access to some of the world's leading chemists, materials scientists, engineers, and innovators.

Beginning on Tuesday June 4<sup>th</sup> through Friday June 7<sup>th</sup>, each morning will open with plenary talks by speakers **Marks**, **Hawker**, **Sanford**, and **Sreeram**, respectively, followed by a full slate of technical symposia.

Special thematic symposia have been designed to highlight research and development in Adhesion, Surfaces, and Interfaces; Metalloproteins, Model Complexes, and Metals in Medicine; Cosmetic Chemistry: The Science Beyond Beauty; Developing Sustainable Chemistries, including Principles, Tools, Drivers, and Case Studies; Novel Chemistries to Enable High Performance Buildings; Feedstock and Energy Related Catalysis; Chemical Tools for Investigating Biology; The Central Nature of Diversity in Organic Chemistry; Synthesis and Characterization of Advanced Polymeric Materials; Polymer and Colloid Science: Fundamentals and Applications; Process Chemistry and Development; Chemistry and Transportation; Chemical Safety in the Undergraduate Curriculum; Materials for Advanced Separations; and a special event that illustrates achievements from the ACS Central Region Chemical Heritage. In addition, there will be classical symposia in focus areas in organic, bio-organic, inorganic, and analytical chemistries as well as chemical education, and health and environmental safety and regulatory chemistry.

Joseph M. DeSimone will headline the ACS BMGT *Bill Talk™* on Friday June 7<sup>th</sup> to engage attendees in the spirit of entrepreneurship.

The full listing of technical symposia, final program, and daily schedule may be found at [acscerm2019.org](http://acscerm2019.org).

**NATIONAL CHEMICAL HERITAGE LANDMARK** 2019 ACS CERM programming will conclude on Saturday evening, June 8<sup>th</sup>, with the National Chemical Heritage Landmark dedication for the advancement of the GC-MS coupling that originated in the Midland, Michigan, Dow Chemical Spectroscopy Labs in 1955. The ceremony will take place in the Dow Lounge of The H Hotel.

**EXHIBITION** A vendor exposition will be hosted daily to help attendees become familiar with the latest cutting-edge products and services offered by participating organizations. At the time of publication, organizations participating in the 2019 ACS CERM include: Fisher Scientific, Agilent, Bruker Optics, Midland Moose Works, Advion, Macherey-Nagel Inc., Thermo Fisher Scientific, Biotage, Hiden Analytical, and Impact Analytical.

**COURSES & WORKSHOPS** Educators, from K-16 levels, will be offered a full range of programming at the 2019 ACS CERM. Continuing education credits (SCECHs in the state of MI) will be offered for many of the K-12 programs scheduled. The 2019 ACS CERM would like to welcome teacher candidates.

Programming will be aligned to NGSS standards. Green Chemistry, laboratory safety, STEM teaching and assessment methods will be among the topics covered.

Topics and programming will also center on engaging non-traditional educators, including those who home school and those who teach STEM in informal environments such as museums, libraries, summer camps, or after school programs.

Planned workshops may be viewed in their entirety at the event website, [acscerm2019.org](http://acscerm2019.org). Highlights for educators include Green chemistry/toxicology at the MSU STEM extension; Creating a STEM Elementary School using Project Lead the Way concepts at the Central Park STEM School; Mark Bourgeois's "Virtues and Values in Science Education" at the Chippewa Nature Center, including dinner and a tour; Introduction to 3-D Printing in the Science Curriculum; and Melanie M. Cooper's "Chemistry, Life, the Universe and Everything."

**EVENTS** Activities to complement the 2019 ACS CERM scientific symposia and programming will start with a welcome reception at the Midland Center for the Arts ([MCFTA](http://MCFTA)) on Monday, June 3<sup>rd</sup> 2019.

The welcome reception will be held in the MCFTA's main gallery where attendees can register for the event and catch up with friends and colleagues while enjoying appetizers, drinks, and locally made ice cream before strolling through the *Chemistry in the Arts* exhibition. *Chemistry in the Arts* celebrates the contributions of chemistry to creativity and will be open to the public as a means to highlight ***Chemistry in Everyday Life***. The reception will begin at 5:00 PM and conclude at approximately 8:00 PM. Join Mark Golden, CEO of [Golden Artist Colors Inc.](http://GoldenArtistColorsInc), at 7:00 PM as he tells the story of the company's thoughtful approach to serving artists and the challenges that Golden Artist Colors has overcome to provide both one of the most widely used professional lines of acrylic paints on the market today and the enthusiasm to customize paint for many famed

artists of our time. All reception attendees are welcome to attend with a complimentary ticket through the MCFTA box office. Transportation between The H Hotel and MCFTA is included with registration.

***Chemistry in Everyday Life*** will highlight the role of chemistry and science on discovery, 7:00 PM, Tuesday, June 4<sup>th</sup> 2019, with a lecture by [Captain Scott Kelly](#), “The Sky is Not the Limit: Lessons from a Year in Space.” Tickets may be purchased through the MCFTA’s box office for \$25 per person. Captain Kelly will offer transcendent insights that inspire and challenge attendees to dream big, test the status quo, and “choose to do the hard things.”

Wednesday evening, June 5<sup>th</sup> 2019, the American Chemical Society’s Central Region will celebrate the contributions of its members at the annual Awards Banquet. Special guests will include award recipients as well as the American Chemical Society’s [National Board of Directors](#). Tickets to this event may be secured during registration for the 2019 ACS CERM.

The ACS CERM’s [Regional Experiment](#) – a year-long citizen science activity that engaged middle school students in a water quality study of the Central Region – will wrap up on Thursday, June 6<sup>th</sup> with a tailgate at the Dow Diamond Stadium. All CERM attendees are encouraged to participate in this evening that will include a Career Mentoring Panel as part of the ACS CERM program, a Networking event, including game ticket and dinner for attendees, STEM Night at Dow Diamond with a high school robotics competition, and professional baseball. ***Chemistry in Everyday Life*** will be on display from 4:00 PM until the game concludes.

**LODGING** Midland’s The H Hotel is the host property for the 2019 ACS CERM. Accommodations at The H Hotel – as well as other properties – are available through the event website, [acscerm2019.org](#), or directly through the hotel. Breakfast and lunch are included with CERM registration and will be served on the premises of The H Hotel. For additional dinner and evening options, participants are encouraged to explore charming downtown Midland’s fine restaurants and shops, rail trail, and the landmark Tridge, all within walking distance.

**REGISTRATION** Registration for the 2019 ACS CERM is now open. Please note that special event tickets for *Chemistry in the Arts*, Captain Scott Kelly, and the STEM Night at Dow Diamond have deadlines in May, about two weeks ahead of the meeting. High participation by attendees and the public is expected. We recommend that you secure your registration and event tickets as soon as possible. On-site registration will continue through June 8<sup>th</sup> 2019. For details, please visit the event website, [acscerm2019.org](#).

**WITH SPECIAL APPRECIATION** Event sponsors include the Dow Chemical Company Foundation, the Dow Corning Foundation, DuPont, Trinseo, American Chemical Society Division of Business Development and Management, American Chemical Society of Professional Chemists, the American Chemical Society’s Division of Small Chemical Businesses, the American Statistical Association, the Society of Cosmetics Chemists, the Midland Center for the Arts, the Midland Baseball Foundation, and the Midland Section of the American Chemical Society.



## KEY CONTACTS

- Dimi Katsoulis – CERM 2019 General Co-Chair / MCFTA Liaison
- Matthias Ober – CERM 2019 General Co-Chair / Website Development
- Valentina Woodcraft – CERM 2019 Steering Committee / Website
- Wendy Sparschu – CERM 2019 Steering Committee
- Shaun Ahn – CERM 2019 Technical Program Co-Chair
- John Roberts – CERM 2019 Technical Program Co-Chair
- Brian Marinik – CERM 2019 Finance / MCFTA Liaison
- Doug Beyer – CERM 2019 Treasurer
- Gina Malczewski – CERM 2019 Chemical Education Co-Chair
- Michelle Rivard – CERM 2019 Chemical Education Co-Chair
- Jaime Curtis-Fisk – CERM 2019 Regional Chemistry Experiment
- Mindy Keefe – CERM 2019 Chemistry & the Arts
- Sam Costanzo – CERM 2019 Exposition Co-Chair
- Brett Zimmerman – CERM 2019 Exposition Co-Chair
- Lori Keith – CERM 2019 Website
- Kurt Brandstadt – CERM 2019 - Advisor
- Tom Lane – CERM 2019 - Advisor
- Amy Martin – CERM 2019 - Chair for Registration

## **Captain Scott Kelly – The Sky Is Not the Limit: Lessons from a Year in Space, June 4** ***Midland Center for the Arts***

See event details at the MCFTA website: [MCFTA – Captain Scott Kelly](#)

One of a select group of Americans who embody a defining moment in the nation's history, he captivated the world and seized the imagination of millions during his record-breaking voyage—proving that the sky is not the limit when it comes to the potential of the human spirit. On his trip, Scott, together with his identical twin brother Mark on Earth, paved the way for the future of space travel and exploration as the subjects of an unprecedented NASA study on how space affects the human body.



With awe-inspiring stories from space and personal reflections on leadership, teamwork and testing limits, Scott inspires others to believe that they can reach any goal, no matter how ambitious or audacious. As he looks back on the expedition that shuttled him into history books, audiences revel in the presence of a true American hero and gather unique takeaways on persistence, resilience and self-determination that transform the way they view their own journey through life.

A book signing will follow the conversation.

### **If you love fresh vegetables and are looking for a place to grow them...**

***Gina Malczewski and Gretchen Kohl, Midland Section ACS***

Rent a plot at the Creative360 Community Garden at 1517 Bayliss Street! The Garden is the home of the Midland ACS recycled bottle greenhouse (built in 2015); it has 6' x 10', 6' x 12' and 6' x 18' plots for \$20, \$25, and \$30 respectively. Water is free and easily accessible; plots will be tilled soon. We are collaborating with Master Gardeners, and expect a successful season! Since 2015, Midland ACS has donated about 1000 lbs. of fresh produce and herbs to local food pantries and culinary education programs.

### **Paddle or Pedal Your Way to CERM 2019, June 5**

***Tami Sivy (SVSU) and Dale LeCaptain (CMU), Midland Section ACS***

The SVSU and CMU ACS student members would like to invite everyone to Paddle the Chippewa River or Pedal the Chippewa Trail from the Chippewa Nature Center back to the Tridge in downtown Midland.

This fun event includes:

- Transportation from the H Hotel to the Chippewa Nature Center
- Kayak or Bicycle provided (sign up, or bring your own equipment)
- Dinner at Oscars in downtown Midland

There is a \$5.00 registration fee for the Paddle or Pedal event for any ACS CERM attendee to participate. To sign up, please go to <https://www.signupgenius.com/go/70A054BADAA2EA20-paddle>.

Departure time from the H Hotel will be 5:30 PM. You will be driven from the H Hotel to the Chippewa Nature Center, and then it's up to you to paddle or pedal back to the Tridge in downtown Midland.

A follow-up dinner for all Paddle or Pedal participants is being arranged at Oscars, in downtown Midland, starting at 7:00 PM. Actually, Paddle or Pedal participation is optional for participating in the dinner at Oscars. If you're not into paddling or pedaling, just feel free to join us for dinner.



**SAGINAW VALLEY  
STATE UNIVERSITY**

COLLEGE OF SCIENCE, ENGINEERING & TECHNOLOGY



**Wednesday, June 5<sup>th</sup>**  
**Paddle or Pedal your way to**  
**CERM 2019**

ACS Student Member Network Social



The SVSU & CMU Student members invite EVERYONE to:  
Paddle the Chippewa River OR pedal the Chippewa Trail from  
Chippewa Nature Center to the Tridge (downtown Midland)

Includes:

- Transportation from the H Hotel to the Chippewa Nature Center.
- Kayak or Bicycle provided (sign up or bring your own equipment)
- Dinner at Oscars (downtown Midland)

- **\$5 registration Fee** for ACS CERM attendees\*

<https://www.signupgenius.com/go/70A054BADAA2EA20-paddle>

➤ 5:30 pm departure from the H Hotel

➤ Dinner at Oscars starting at 7 pm\*\*

\* To register for CERM 2019 <https://acscerm2019.org/>

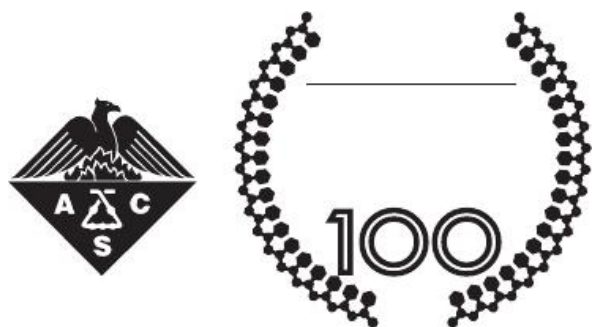
\*\* paddle/pedal participation is optional for dinner Participation





## Attention All Philatelists!!!!

*Gretchen Kohl, Midland Section ACS*

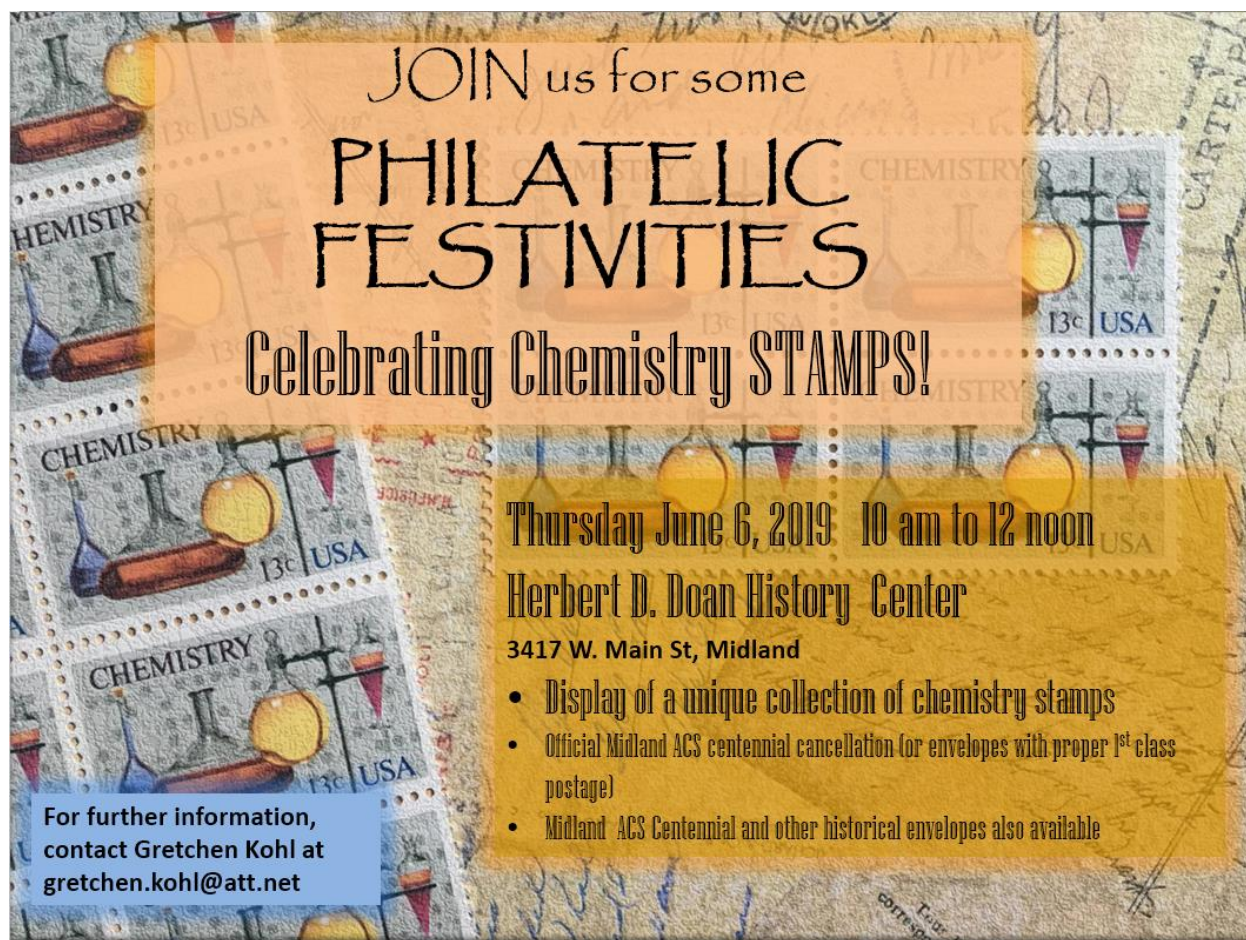


During CERM, specifically on June 6, 2019, the Midland Section of the ACS will have its own postal station for a few hours, issuing hand cancellations with a special postmark! For stamp collectors (philatelists) this is a big occasion to get a rare collectable! The special postmark was designed by our designer/artist who worked with the Section on our new Centennial Museum exhibit, and will have the basic components listed above. The special postal station will be set up in the atrium of the Herbert D. Doan Midland County History Center, at 3417 W. Main Street, Midland, Michigan, and staffed by employees from the Midland office of the US Postal Service.

This event is totally open to the public! For collectors or not! Bring all your own mail to be hand stamped and mailed. Or, you can choose from some of the commemorative envelopes that will be on display, one especially designed for this event. For the purchase of the envelope and the stamps equaling postage for the day, these envelopes can be cancelled to become a collectable or souvenir of our Section Centennial.

There will also be a display of stamp memorabilia from John and Sean Blizzard and others that you won't want to miss! For more information contact Gretchen Kohl ([Gretchen.kohl@att.net](mailto:Gretchen.kohl@att.net) or 989-708-9066).

**Celebrating Chemistry Stamps, June 6**  
*Gretchen Kohl, Midland Section ACS*



JOIN us for some  
**PHILATELIC  
FESTIVITIES**  
Celebrating Chemistry STAMPS!

Thursday June 6, 2019 10 am to 12 noon  
Herbert D. Doan History Center  
3417 W. Main St, Midland

- Display of a unique collection of chemistry stamps
- Official Midland ACS centennial cancellation (or envelopes with proper 1<sup>st</sup> class postage)
- Midland ACS Centennial and other historical envelopes also available

For further information,  
contact Gretchen Kohl at  
[gretchen.kohl@att.net](mailto:gretchen.kohl@att.net)

**CERM BILL Talk Featuring Dr. Joseph DeSimone – June 7 Luncheon Meeting**  
**Matthew Grandbois, Communications Chair, ACS Division on Business Development & Management**

I am part of the ACS Division on Business Development & Management (BMGT) executive committee as their communications chair, and I'd like to share an advertisement with the Midland ACS local section's YCC and SCC groups regarding one of the events we are sponsoring at CERM 2019. We will be hosting our Inaugural Regional Meeting BILL Talk on Friday, June 7, from 12:00 to 1:00 PM in the H Hotel where Dr. Joseph DeSimone will be giving a "TED Talk" style presentation on his experiences translating university research to the marketplace.

Registration for the BILL Talk and Luncheon can be found on the CERM registration page under Special Events: BMGT Divisional/Dr. Joseph DeSimone [https://acschem2019.org/meeting-registration/?sc=190410\\_mtg\\_em\\_regional\\_CERM\\_od](https://acschem2019.org/meeting-registration/?sc=190410_mtg_em_regional_CERM_od). Let me know if you have any questions or requests, Matthew Grandbois, Strategic Market Manager, DuPont Electronics & Imaging, E-mail: [matthew.grandbois@dupont.com](mailto:matthew.grandbois@dupont.com), Phone: 508-787-4607. Thank you.



**Dr. Joseph M. DeSimone**  
CEO and co-founder of Carbon, Inc.

**H Hotel, Midland MI**  
**Friday, June 7, 2019 12:00 PM – 1:00 PM**

Dr. DeSimone will present a TED style talk entitled **Translating university research to the marketplace** providing insights from his remarkable career in academia and as a successful serial entrepreneur. His talk highlights this special luncheon supporting and recognizing excellence in the business of chemistry.

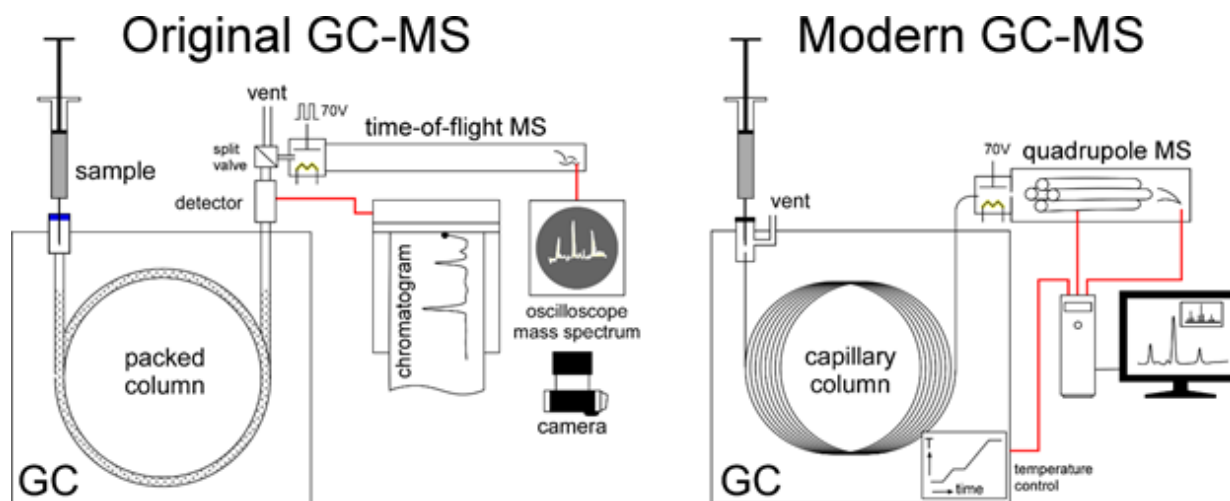


## National Historic Chemical Landmark Dedication and Reception, June 8

*Mark Jones, Midland Section ACS*

A well-kept secret, known by many analytical chemists, is about to be exposed. Midland will soon be recognized as the birthplace of GC-MS, or gas chromatography-mass spectrometry. On June 8th, the American Chemical Society will declare Midland a National Historic Chemical Landmark for the invention of this important technology at Dow Chemical. Dow researchers Fred McLafferty and Roland Gohlke demonstrated the first pairing of gas chromatography with mass spectral detection in the winter of 1955. GC-MS is now one of the most widely deployed, most powerful technologies in the analytical chemist's toolbox. Chromatography separates a mixture into individual components, with each chromatographic peak being analyzed by a mass spectrometer. Components are identified unambiguously when both characteristic retention times and mass spectral fingerprints match reference materials. When analyzing unknown materials, the mass spectrum provides tentative identifications, dramatically reducing the number of possible matches. Because of its power and sensitivity, the technique is widely used in medicine, forensic analysis, environmental testing, drug testing and more.

The Landmark designation will be made during the ACS Central Regional Meeting on June 8 starting at 6:30 PM. ACS President Bonnie Charpentier will make the Landmark presentation. A short program will describe the invention, evolution, and future of GC-MS and includes a video from Fred McLafferty, still going strong at age 96, describing the invention. Ronald A. Hites, Ph.D., Distinguished Professor at Indiana University and Phil Strempel, Ph.D., Business Development Manager at Agilent Technologies will also provide their insights. Michigan State Senator Jim Stamas will be on hand to present a State Resolution that he sponsored recognizing the birth of this important technology in Midland. The program and reception will conclude by 8:30 PM. Check the CERM program for the exact location of the event.



Many changes have occurred since the first demonstration of the GC-MS. The original instrument developed in Midland, with a time-of-flight MS and a camera for collecting mass spectra, is a far cry from today's computer controlled, quadrupole mass filter instruments. Far removed as it was, it clearly demonstrated the power of the combined technique.



Delving into the history of the GC-MS recalls a time when both gas chromatography and mass spectrometry were in their infancy. It was a time of rapid innovation, with methods and equipment in flux. The GCs used were built by Roland Gohlke at Dow. GC operates by taking advantage of the differing affinities different vapors have for surfaces. In a GC, a mixture is first vaporized by rapid heating in a flow of gas. The vapor and the carrier gas are pushed into a tube that in the 1950s was packed with small particles. Properties of the solid particles, like porosity or nature of a coating, slow some compounds more than others. In the race to get through the column, small, light compounds get to the end faster than big, heavy ones. Watching at the end of the tube or column with a specialized detector produces a signal as each compound elutes or exits from the column. Plotting the signal gives a peak for each component in the mix. Run in the same way, the pattern of peaks is reproducible. Compounds can be identified based on the time it takes to get through the column, the retention time. Calibrating a GC with known compounds gives the ability to identify components in a mixture based on retention time. Powerful as it is, chromatographic retention time alone is insufficient to unambiguously identify a component in a mixture. There is always a chance that two chemicals will have the same retention time. Roland Gohlke packed his own GC columns. Tide™ detergent powder was a common packing and Midland resident Frank Scheidt recalls how everyone knew when columns were being packed due to the distinctive detergent smell permeating the entire site. Columns were loaded in one of the taller stairwells in the Research Campus and then coiled once filled.

Mass spectrometry was also in its infancy. Most instruments still hearkened back to J.J. Thomson's earliest work with cathode ray tubes where bending ion beams with a magnetic field created patterns distinctive to the ionized substances. All mass spectrometers work under vacuum. Ions are manipulated and accelerated with electric fields, ultimately hitting a detector. In 1955, mass spectrometers were being sold by multiple manufacturers. These more-advanced instruments could identify and analyze pure materials pretty well, and understanding of how molecules fragmented when hit by electrons led to the development of ways to use the spectra to determine molecular composition and structure. For every chemical, a spectrometer produced a chart or "mass spectrum" that revealed the structure of the original, intact molecule. Any compound will break into the same ions under the same conditions, creating a unique mass spectrum, a fingerprint that can be used to identify the material. 70 V became the standard electron energy and libraries of mass spectral fingerprints soon became available to aid in the identification of unknown materials. When two or more materials are present, the mass spectrum is a combination of the spectra of each of the components. Rather than a clear fingerprint, the result is a mess that can't always be used to identify the components. MS is great for pure materials, but not so great for mixtures. Mass spectrometers typically measure either a raw or amplified ion current, in essence letting the ions directly create a measurable current. Magnetic sector instruments of the mid-1950s accelerated ions produced by shooting electrons through a vapor. Substances were leaked into an ion source and directed through a magnetic field where the collection of ions bends and separates like light through a prism. These magnetic sector instruments were cumbersome and slow. Detroit-based Bendix Corporation introduced commercial time-of-flight instruments. These pulsed an ion source and accelerated the resulting ions through a long drift tube. The velocity of any ion, and, therefore, the time it took to traverse the drift tube, were dependent on the mass-to-charge ratio. Amplifying the current resulting from the ions hitting a detector at the end of the drift tube yields a full mass spectrum for each pulse of the ion source. Mass spectra could be read out directly on an oscilloscope rapidly, much more rapidly than a magnet could be scanned.

When Fred McLafferty heard about the Bendix time-of-flight mass spectrometer, he knew that its speed could make it possible to couple with a GC. He reasoned that adding the power of mass spectrometry to identify pure components with the power of chromatography to separate a mixture into pure components would be more than additive. Adding a third dimension of data overcomes and compensates for the shortcomings of

each individual method. Matching the retention time and mass spectra of a compound would seal the identification in a way chromatographic retention time alone could never do. Using chromatography to separate a mixture into pure components allows identification and quantitation impossible by taking a mass spectrum of a mixture. He and Roland Gohlke packed up one of Roland's GCs and drove to Bendix for testing, resulting in the first successful GC-MS operation. Coupling the GC through a leak valve they made allowed them to see mass spectra of the GC effluent. A thermal conductivity detector recorded the chromatogram while spectra showed up only on an oscilloscope. This was far before computer data acquisition was possible and there was no way to record the electronic signals directly. Having proven the concept, Dow purchased a Bendix mass spectrometer and the optimization continued. First, they added a camera, manually triggered when a chart recorder showed a chromatographic peak was eluting, to capture the mass spectra for analysis. The first paper McLafferty and Gohlke published showed photographs of the oscilloscope screen showing the mass spectra. This gave way to an ultrafast chart recorder, the first of many modifications in the evolution of GC-MS to the devices of today.

Mass spectrometers work on several different principles. The Bendix MS used by Gohlke and McLafferty was a time-of-flight (TOF) instrument where the time it took ions to traverse a long tube produced a spectrum. Bendix began marketing a GC-MS device in 1959, but the first commercial success was LKB Instruments Inc.'s Model 9000, which debuted in 1965. The LKB instrument was a magnetic sector instrument, now sped up enough to match the chromatogram. Gone was the need for a separate GC detector, MS was now the detector. Other companies followed suit, including Finnigan Instruments, Perkin Elmer, and Hewlett Packard, now Agilent. Several other advances paved the way for GC-MS to go mainstream. The first was the development of small, fast mass filters that were far superior to the TOF or magnetic sector instruments. The introduction of the quadrupole mass spectrometer made possible smaller, less expensive GC-MS.

The next advance was in computer control and data acquisition. Standardization of ionization energy meant that all MS units produce the same fingerprint for the same compound. Libraries of mass spectra were digitized so that computer matching was possible. GC-MS systems could now automatically identify chromatographic peaks. Computer control also allowed temperature control the GC. The ability to ramp temperature shortened elution times and narrowed chromatographic peaks. Narrower peaks are easier for MS to detect.

Improvements in vacuum technology were also important. Turbomolecular pumps replaced cumbersome and messy diffusion pumps. Production of oil-free vacuum systems reduced contamination and maintenance, dramatically improving operability of systems.

The next big advance was the widespread adoption of wall-coated, open tubular or capillary columns, replacing packed columns. These columns work well with very small amounts of material, well-suited for the great sensitivity of MS. They also provide very narrow, sharp chromatographic peaks. Their improved resolving power makes GC-MS even more powerful for trace analysis.

The invention of the GC-MS spawned a number of other hyphenated techniques. Coupling liquid chromatography with MS gives LC-MS. GC with infrared spectroscopy gives GC-IR. The list goes on, all started with the first coupled technique, GC-MS.

Advances in both chromatography and mass filters continue with no sign of stopping. Self-contained portable units capable of being carried with one hand are now on the market. These allow analysis on-site at crime scenes, environmental events, fires and more. Bigger, more powerful GC-MS units still populate labs for

particularly careful analyses. GC-MS is now the go-to technology in modern chemistry labs. Applications include development of new pharmaceuticals and analysis of their purity, detection of chemical warfare agents and explosives, screening of athletes' urine for banned performance-enhancing substances, and checking food quality and safety. The technology has come a long way from the foundational experiments of Gohlke and McLafferty. Their pioneering work demonstrated that it was possible to couple GC with MS to create a powerful tool. They never could have grasped how powerful, how ubiquitous, or how important the technique would become.

### **Take Note: A Suite of Special Events Celebrated Earth Day 2019**

***Gina Malczewski and Gretchen Kohl, Midland Section ACS***

The commemoration of Earth Day recently afforded opportunities to attend several interesting local ACS events. A committee of Kristen Getzin (MCFTA), Gretchen Kohl, Gina Malczewski, Michelle Rivard, and Esther Williams (Midland Volunteers for Recycling) worked for months on local programming to celebrate the National ACS theme "Take Note—The Chemistry of Paper". All the events took place in April and May.

On April 24th, Gina Malczewski and Andy Bacigalupo offered in-class food science cafes at Dow High School focused on vegetables. Two periods of students (more than 150) were treated to "Green Cuisine" composed of sautéed vegetables with a glaze made from an apple cider vinegar infusion.

Peter Schloop of the Saginaw office of the Secret Service (USSS) presented on counterfeit currency (we had the opportunity to examine and compare some) and other USSS responsibilities on April 25th.

Our traditional Earth Day event, the expo at MCFTA, was held April 27; over a dozen exhibits featured "green" and theme-related activities including the hands-on paper chemistry experiments offered at the ACS booth. A "passport" contest featuring Periodic Table element stamps assigned to each booth culminated with a drawing for a large stuffed "mole". About 150 attended.

On May 4, two Dow High art students, Claire Newman and John Schriber, helped Gina Malczewski present a STEAM program entitled "The Possibilities of Paper" involving three hands-on art projects: paper mache, sculpture with playing cards, and quilling.

A Live Zoom event on May 23rd ("Paper Trail: Secrets and Science of an Amazing Material") with Dr. Steve Keller of Miami University, focused on paper chemistry and processing; samples of many paper types were tested and compared, with Steve's guidance. A link was offered for home attendance, and the presentation from Oxford, OH was also broadcast to locations in Flint and Wittenberg, OH.

Earth Day Illustrated Poem Contest winners, including those whose works were sent on to National, were celebrated at a reception at Creative 360 on May 28.



Photo credit: Gina Malczewski

## Sidney Harris Cartoon

*Submitted by Jeff Seeman, Department of Chemistry, University of Richmond*

Editor's note: The Division of the History of Chemistry has received an ACS Innovative Grant that will provide 12 free Sidney Harris cartoons to ACS local sections for their use in newsletters or monthly communications or on their website.



"...AND, THEREFORE, I SHARE MY NOBEL PRIZE WITH MY CONSULTANT."

"Many of the select few who receive that call from Stockholm are, by that time in our lives, little more than spokesmen and women. We start off on our life's journey as research scientists striving to catch hold of the coattails of the great and good, only to come to the realization, before too long, that we have reached our sell-by-date. In this Sidney Harris cartoon, the likes of me find oneself at the podium, acting as the mouthpiece for a long line of accomplished young whippersnappers who have sustained and promoted my reputation - to the point where I am left holding a hot potato, thanks to all of them."

— Fraser Stoddart, Northwestern University  
[Shared the 2016 Nobel Prize in Chemistry with Jean-Pierre Sauvage and Bernard L. Feringa]



### American Chemical Society Midland Section FALL SCIENTIFIC MEETING CALL FOR ABSTRACTS Oral & Poster Presentations



## MARVELOUS METALS

26 October 2019 | SVSU

Registration • Follow the Sign Up Genius Link at <http://www.midlandacs.org/> • Deadline: 7 October 2019

Submission • Please Submit Title & 300 Word Abstracts to [acsfallsubmits@gmail.com](mailto:acsfallsubmits@gmail.com) • Deadline: 30 September 2019

Sponsored by ACS Midland Section and SVSU Chemistry Club



## 2019 Fall Scientific Meeting – Call for Abstracts

*Elizabeth Santos, 2019 Fall Scientific Meeting Committee, Midland Section ACS*

### Announcing the 2019 Fall Scientific Meeting

Saturday, October 26, 2019, 8:00 AM – 5:00 PM, Curtiss Hall, Saginaw Valley State University

Check-in starting at 7:30 AM. Meeting theme: *Marvelous Metals*

The Midland Section of the ACS and the SVSU Chemistry Club cordially invite you to participate in this year's Fall Scientific Meeting and explore our theme of *Marvelous Metals*! The event will feature morning oral presentations and an afternoon poster session.

#### Keynote Speaker

Dr. Jerzy Klosin (Fellow, Core R&D) from Dow will present on "Development of Molecular Catalysts for the Production of Ethylene-Based Copolymers"



#### Additional Featured Speakers

Prof. Ronald Tackett – Kettering University

Prof. Martin Crimp – Michigan State University

Prof. J. Wayne Johns – University of Michigan

Prof. Gabriel Caruntu – Central Michigan University

A complete program and abstract book will follow.

#### Important Dates

Abstract Submission Deadline for Poster and Oral Presentations: September 30, 2019

Fall Scientific Meeting Registration Deadline: October 7, 2019

#### Call for Abstracts

For poster and oral presentations, please submit a title and a 300-word abstract to [acsfallsubmits@gmail.com](mailto:acsfallsubmits@gmail.com).

Oral presentations will be 20 minutes in length with 10 minutes for Q&A. Posters have suggested dimensions of 48" x 36". Strict adherence to the meeting theme is not a requirement.

#### Event Cost

This meeting is FREE! All registrants are encouraged to join us in the SVSU Marketplace Café for lunch, where you can purchase your meal directly. The first 100 students to register for the meeting will receive a complimentary meal ticket.

#### Registration

To ensure that name tags are available for all presenters and attendees, please use the [2019 FSM SignUpGenius](#) page to register. This will also ensure that we have adequate accommodations for all attending. For more information or any questions, contact Elizabeth Santos ([EMSantos@dow.com](mailto:EMSantos@dow.com)).

## In Past Issues of *The Midland Chemist*

**Wendell L. Dilling, Director and Historian, Midland Section ACS**

**50 Years Ago, *The Midland Chemist* 1969, 6, No. 2 (May), 2.**

In *ACS Membership – Up for Grabs?* by J. E. Dunbar, Editor: “At the recent Minneapolis meeting the Council entertained proposals for bringing high school chemistry teachers into the ACS when they are not eligible for membership. Such proposals included direct national affiliation analogous to student affiliation, modified admission requirements and dues for such teachers, and/or the establishment of a Society of Secondary School Chemistry Teachers sponsored by or affiliated with ACS. In the same vein, an enlarged program for services to high school chemistry might encourage a great fraction of eligible teachers to become ACS members.

It is interesting to note that the doctor of philosophy in chemistry is usually not considered legally qualified to teach high school chemistry because of his lack of credits in the education curriculum.”

**40 Years Ago, *The Midland Chemist* 1979, 16, No. 5, 157.**

In *Seeing is Believing – Learning Chemistry through Chemistry Demonstrations*: by Gary Essenmacher

“The Midland Section of The ACS Presents a Special May Program,

Speaker: Professor Bassam Z. Shakhshiri, University of Wisconsin-Madison

Time: Monday, May 21, 1979, 8:00p.m.

Place: 47 Building Auditorium, Dow Chemical Co., Parking available in lots at State and Larkin Streets

Note: This meeting is open to the public including children accompanied by an adult

About the Program:

Professor Bassam Z. Shakhshiri, an associate professor of chemistry at the University of Wisconsin–Madison, is an expert in the use of educational technology for the teaching of chemistry. For our May program he will illustrate several chemical principles via interesting and instructive demonstrations. From examples of polymerization and chemical luminescence to birefringence and paramagnetism, it should be a very enlightening evening. The program will be geared for the individual with some knowledge of chemistry or chemical education but promises to be interesting and enjoyable for the uninitiated as well. The meeting is open to the public, so bring the entire family especially those high school or junior high science enthusiasts.”

**30 Years Ago, *The Midland Chemist* 1989, 26, No. 4, 3.**

In *Chairman’s Column* by Gretchen Kohl, Chairman, ACS Midland Section: “On a sad note for the Section, Ramaiah left the area thus ending his illustrious ‘second career’ with the Chemist. He has been a very innovative editor. Along with the still anonymous “special friend of the Chemist,” who donates the \$5 awards, Ramaiah instituted the monthly Contest Feature. The labeling and mailing of the magazine are now also done by the Arnold Center, another idea of the Editor’s, that not only is more cost effective but provides additional work and income for the area’s physically challenged individuals. Most recently, Ramaiah has seen the fruition of his many year search for an improved means of publication composition, namely his collaboration with Nelson Rondan in the very successful desktop publishing venture. I’d like to take this opportunity to thank Editor Ramaiah, for all of his dedicated work and for the caring that he’s shown for the Section, apparent in every page that he’s published. On behalf of the Section and the Board, we thank you, Ramaiah, and wish you well in your new endeavors. Ramaiah will be passing his editorial mantle to Nelson Rondan during this issue.”

**20 Years Ago**, *The Midland Chemist* **1999**, 36, No. 4, 3.

In *From the Chair...* by Deb Bergstrom, Chair ACS Midland Section: "We all need to know that what we do makes a difference. As employees, employers, members of a professional society or sponsors of activities, we need to feel that our contribution has a positive impact. The activities of many organizations are often invisible to all but the people who are most actively involved. As we are busy trying to make a difference in our technical world, we often do not take enough time to share the positive results of what we do with the other members of our group, the organizations that sponsor our activities, or our community. It is important that we as a group, and as individual members learn to better communicate our positive contributions. Why, because the Midland Section of the American Chemical Society, which has a long standing tradition of award-winning excellence, does make a difference."

**10 Years Ago**, *The Midland Chemist* **2009**, 46, No. 3, 1.

In *Kickin' It in the Park Returns!*, Saturday, June 20, 2009, 10:00a.m. – 3:00p.m., St. Charles Ball Diamonds, Midland, MI, by Dale LeCaptain, Alt. Councilor and Student Affiliate Advisor: "Kickin' it in the Park is back again and ready to raise money for Relay for Life. This fun and worthwhile event brings together teams from many organizations for a day of playing in the sun. Some of the participants include: Younger Chemists Committee, Dow Corning New Hires, Dow Chemical New Hire Social Group, CMU Student Affiliates of ACS, United Way of Midland County, Jaycees, Young Researcher's Community, MidMichigan Technician Group, EDS, MidMichigan Health, Dow Co-Ops, and YMEC. If you are a member of one of these groups, check with your group leadership on how to become involved. All proceeds will be donated to Relay for Life! Donations are tax deductible and receipts are available upon request."

## Upcoming Dates, Events, and Other Updates

- June 3 (9:00 AM – 5:00 PM) – Turner J. Alfrey Visiting Professorship Lecture, MSU St. Andrews, Midland. Professor Craig J. Hawker will be the main lecturer, accompanied by two of his associates, Morgan Schultz and Neil Dolinski, as assistant lecturers. To register to attend this year's Turner J. Alfrey Visiting Professorship Lecture, please go to [2019 Turner J. Alfrey Program](#), and for any questions, please contact Melanie Kauffman at [kauffman59@msu.edu](mailto:kauffman59@msu.edu).
- June 3-8 (7:30 AM – 5:30 PM) – 50th ACS Central Regional Meeting (2019 CERM), The H Hotel, Midland. Celebrating the 50th Central Regional Meeting of the ACS and the 100th anniversary of the Midland Section of the ACS. For more information about 2019 CERM, go to <https://acscerm2019.org/>. To register to attend 2019 CERM, go to <https://acscerm2019.org/meeting-registration/>.
- June 4 (7:00 PM) – Captain Scott Kelly: "The Sky Is Not the Limit: Lessons from a Year in Space." Midland Center for the Arts, presented in collaboration with the 50th ACS Central Regional Meeting 2019. Tickets on sale now. All tickets \$25. For information and to purchase tickets see the MCFTA website at [MCFTA – Captain Scott Kelly](#).
- June 5 (12:00 – 2:00 PM) – 2019 CERM Silver Circle/Younger Chemists Committee Luncheon, The H Hotel, Midland. For more information, see <https://acscerm2019.org/>.
- June 5 (5:30 – 8:00 PM) – Paddle or Pedal event, sponsored by SVSU and CMU ACS student members. Transportation will be provided from the H Hotel in downtown Midland to the Chippewa Nature Center. Kayaks or bicycles will be provided, or you can bring your own equipment. It will be up to you to paddle or pedal back to the Tridge in downtown Midland. A follow-up dinner at Oscar's is included in the \$5.00 registration fee. If you're not into paddling or pedaling, and just want to join in on the dinner, feel free to do that, too. To sign up, please go to <https://www.signupgenius.com/go/70A054BADAA2EA20-paddle>.

- June 5 (6:30 – 8:30 PM) – 2019 CERM Awards Banquet, The H Hotel Ballroom, Midland. For more information, see <https://acscerm2019.org/>.
- June 6-8 – STEM Education Opportunities at CERM. To register for local and free long-distance workshops, go to <https://acscerm2019.org/>. For more information or any questions, please contact Gina Malczewski ([reginamalczewski@gmail.com](mailto:reginamalczewski@gmail.com)) or Michelle Rivard ([michelle.rivard@dow.com](mailto:michelle.rivard@dow.com)).
- June 6 (10:00 AM – 12:00 PM) – Celebrating Chemistry Stamps, Herbert D. Doan History Center, 3417 W. Main Street, Midland. For further information see article and flyer in this newsletter, or contact Gretchen Kohl at [gretchen.kohl@att.net](mailto:gretchen.kohl@att.net).
- June 6 (7:05 PM) – Great Lakes Loons Baseball Game, Dow Diamond, Midland, in conjunction with the 2019 CERM meeting. For more information, please see <https://acscerm2019.org/>.
- June 7 (12:00 – 1:00 PM) – BMGT and CERM 2019 present Dr. Joseph M. DeSimone, *Translating University Research to the Marketplace*, The H Hotel, Midland. For more information, see <https://acscerm2019.org/>.
- June 8 (6:30 – 8:00 PM) – National Historic Chemical Landmark dedication event, Dow Lounge at The H Hotel, Midland, in conjunction with the 2019 CERM meeting. For more information, see <https://acscerm2019.org/>.
- June 9 (Save the Date) – 2019 Midland Section ACS Centennial Exhibit program, *It's a Wrap! – The Science of Saran and Plastic Films*, Herbert D. Doan Midland County History Center, Midland. For any questions, contact Gina Malczewski at [reginamalczewski@gmail.com](mailto:reginamalczewski@gmail.com) or Gretchen Kohl at [gretchen.kohl@att.net](mailto:gretchen.kohl@att.net).
- June 10 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection ([Midland Section WebEx Board Meeting June 2019](#)), phone number: 989-633-1166.
- July 13 (Save the Date) – 2019 Midland Section ACS Centennial Exhibit program, *Super Soaker: Diaper Polymer*, Herbert D. Doan Midland County History Center, Midland. For any questions, contact Gina Malczewski at [reginamalczewski@gmail.com](mailto:reginamalczewski@gmail.com) or Gretchen Kohl at [gretchen.kohl@att.net](mailto:gretchen.kohl@att.net).
- July 21 (2:00 PM) – Save the date for a fun, family *ACS Day with the Great Lakes Loons* baseball outing event, Dow Diamond, Midland. More information will be forthcoming. For questions, please contact Michelle Rivard ([michelle.rivard@dow.com](mailto:michelle.rivard@dow.com)).
- August 5 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection (TBD), phone number: 989-633-1166.
- August 10 (Save the Date) – 2019 Midland Section ACS Centennial Exhibit program, *Scavenger Hunt*, Heritage Park History Campus, Midland. For any questions, contact Gina Malczewski at [reginamalczewski@gmail.com](mailto:reginamalczewski@gmail.com) or Gretchen Kohl at [gretchen.kohl@att.net](mailto:gretchen.kohl@att.net).
- August 25-29 (Save the Date) – 258th ACS National Meeting & Exposition, San Diego, CA. For more information, see <https://global.acs.org/events/258th-ac-s-national-meeting-exposition/>.
- September 9 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection (TBD), phone number: 989-633-1166.
- September 14 (Save the Date) – 2019 Midland Section ACS Centennial Exhibit program, *Styrofoam™: Chemistry and Art*, Herbert D. Doan Midland County History Center, Midland. For any questions, contact Gina Malczewski at [reginamalczewski@gmail.com](mailto:reginamalczewski@gmail.com) or Gretchen Kohl at [gretchen.kohl@att.net](mailto:gretchen.kohl@att.net).
- September 30 – **Abstract submission deadline** for poster and oral presentations for the 2019 Midland Section ACS Fall Scientific Meeting. Location: Curtis Hall, Saginaw Valley State University. Date and time: Saturday, October 26, 8:00 AM – 5:00 PM. Meeting theme: *Marvelous Metals*. Presentation titles and 300-word abstracts should be sent to [acsfallsubmits@gmail.com](mailto:acsfallsubmits@gmail.com). For more information or any questions, contact Elizabeth Santos ([EMSantos@dow.com](mailto:EMSantos@dow.com)).
- October 7 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection (TBD), phone number: 989-633-1166.



- October 7 – **Registration deadline** to attend the 2019 Midland Section ACS Fall Scientific Meeting. Location: Curtis Hall, Saginaw Valley State University. Date and time: Saturday, October 26, 8:00 AM – 5:00 PM. Meeting theme: *Marvelous Metals*. For more information or any questions, contact Elizabeth Santos ([EMSantos@dow.com](mailto:EMSantos@dow.com)).
- October 12 (Save the Date) – 2019 Midland Section ACS Centennial Exhibit program, *Midland Memories: 1919*, Herbert D. Doan Midland County History Center, Midland. For any questions, contact Gina Malczewski at [reginamalczewski@gmail.com](mailto:reginamalczewski@gmail.com) or Gretchen Kohl at [gretchen.kohl@att.net](mailto:gretchen.kohl@att.net).
- October 26 (8:00 AM– 5:00 PM) – 2019 Midland Section ACS Fall Scientific Meeting, Curtis Hall, Saginaw Valley State University. Check-in starting at 7:30 AM. Meeting theme: *Marvelous Metals*. For more information or any questions, contact Elizabeth Santos ([EMSantos@dow.com](mailto:EMSantos@dow.com)).
- November 4 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection (TBD), phone number: 989-633-1166.
- November 5 (6:00 – 8:00 PM) – 2019 Midland Section ACS Centennial Exhibit program, *Author Sam Kean: Stories about Elements and Chemicals in History (and book signing)*, Herbert D. Doan Midland County History Center, Midland. For any questions, contact Gina Malczewski at [reginamalczewski@gmail.com](mailto:reginamalczewski@gmail.com) or Gretchen Kohl at [gretchen.kohl@att.net](mailto:gretchen.kohl@att.net).
- December 2 (7:00 – 8:00 PM) – Midland Section ACS Board meeting, MCFTA Board Room (in person), or via a WebEx conference call connection (TBD), phone number: 989-633-1166.
- December 14 (Save the Date) – 2019 Midland Section ACS Centennial Exhibit program, *Christmas Chemistry and Crafts*, Herbert D. Doan Midland County History Center, Midland. For any questions, contact Gina Malczewski at [reginamalczewski@gmail.com](mailto:reginamalczewski@gmail.com) or Gretchen Kohl at [gretchen.kohl@att.net](mailto:gretchen.kohl@att.net).

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