

THE MIDLAND CHEMIST

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Contents

2022 Turner J. Alfrey Visiting Professorship Lecture Series, June 7.....	1
2022 Central Regional Meeting of the American Chemical Society, June 7–10.....	3
Water Quality Testing – Volunteer Adventure Opportunity, July 29–31.....	4
2nd Annual Trivia Night in the Park Event, June 23.....	5
Student ACS Members Socialize at the Spring ACS National Meeting	6
A Little Despair on Earth Day.....	6
An Exciting Earth Day Expo!	8
Bridging Technology: How Completing the Wrong Application Form Launched a Career	10
Please Consider the Midland ACS Scholarship Fund in Your 2022 Giving!	13
ACS Division of the History of Chemistry Centennial.....	14
In Memoriam – Corwin Jay Bredeweg	15
In Memoriam – Theodore William Selby	16
Upcoming Dates, Events, and Other Updates.....	17

2022 Turner J. Alfrey Visiting Professorship Lecture Series, June 7

Clare Light, Project/Event Coordinator, MSU St. Andrews

Date: Tuesday, June 7, 2022 Time: 9:00 AM to 5:00 PM

Location: MSU St. Andrews, 1910 West St. Andrews, Midland, MI 48640

Guest Lecturer: **Dr. Christopher K. Ober** (photo at right)

Join us at MSU St. Andrews for a full day of lectures with Dr. Christopher K. Ober of [Cornell University](https://www.cornell.edu). Dr. Ober and his associate will discuss topics in controlling polymer structure at nanometer-length scales.

[Christopher Ober](https://www.cornell.edu) is the Francis Bard Professor of Materials Engineering at Cornell University. He has pioneered new materials for photolithography and studies the biology-materials interface. Ober received his B.Sc. in Honours Chemistry (Co-op) from the [University of Waterloo](https://www.uwaterloo.ca), Ontario, Canada, in 1978, and his M.S. and Ph.D. in [Polymer Science & Engineering](https://www.polymer.mtu.edu) from the [University of Massachusetts \(Amherst\)](https://www.umass.edu) in 1982.



From 1982 until 1986, Ober was a senior member of the research staff at [Xerox Research Centre of Canada](https://www.xerox.com) where he worked on marking materials. Ober joined Cornell University in the Department of Materials Science

and Engineering in 1986. He recently served as Interim Dean of the College of Engineering. He is presently Director of the [Cornell Nanoscale Facility](#).

He is a Fellow of the ACS (2009), APS (2014), and AAAS (2014). He is a SPIE Senior Member (2018). He received the [ACS Award in Applied Polymer Science](#) in 2006, the Gutenberg Research Award in 2009, the Society of Polymer Science Japan (SPSJ) International Prize in 2013, and the Japan Photopolymer Science and Technology Outstanding Achievement Award in 2015. Ober was President of the IUPAC Polymer Division (2008 – 2011), Chair of the Interdivisional Subcommittee on Materials Chemistry (2011 – 2017), and is an elected member of the IUPAC Executive Committee (2014 –2021).

To attend the 2022 Turner J. Alfrey Visiting Professorship Lecture Series, please register by no later than Friday, June 3, 2022. For further event information, please contact Clare Light at lightcla@msu.edu.

AGENDA AND LECTURE SUMMARIES

9:15 AM *Extreme UV Patterning for Fast Electronics: Making Materials Vanish with Nanometer-Scale Precision*

Today with the advent of extreme ultraviolet (EUV, 13 nm wavelength) lithography, we will be able to make structures on the order of 10 nm and smaller. But we still have a considerable amount of research to do to achieve this, given EUVs atom-based absorbance characteristics and the importance of inorganic elements in the periodic table. This presentation will provide a basic background in advanced lithography and will discuss recent work in molecular glasses and metal-organic clusters to make advanced photoresists. Also described will be work in progress involving scissioning polymers and polymers with controlled sequences to address the issue of stochastic control in achieving sub-10 nm resolution.

10:15 AM *Three-Dimensional Microfabrication Using Two-Photon Chemistry: Materials Systems for Two-Photon Lithography*

Three-dimensional lithography is an important tool in additive manufacturing. However, most of these methods operate at rather large mm length scales and use polymer melts or traditional stereolithography. By using near IR wavelengths and 2-photon absorbing processes, it is possible to directly shape 3D materials at length scales of a few hundred nanometers. This presentation will describe work from our group and from the science community on topics ranging from photonics to life science applications. This presentation will survey photo-crosslinked rigid materials including recent commercial systems. In addition, this presentation will describe recent work on soft systems including hydrogel materials and elastomers.

11:30 AM *Controlled Surfaces for Anti-Fouling Behavior: Toxicant Free Anti-Fouling Coatings for Marine Applications*

Marine fouling is a major contributor to energy costs and production of CO₂ due to the large volume of international shipping every year. Every surface that sits in the ocean is a potential home for fouling flora and fauna. To deal with this, copper loaded paint is used to prevent fouling, but this leads to the accumulation of copper in harbors around the world. In this talk, we discuss the use of amphiphilic (combined hydrophilic and hydrophobic) surfaces combined with active components to inhibit fouling without toxicants. These active components interfere with chemical processes used by marine plants and

animals to adhere to surfaces. The effect of the chemical and surface structure of specifically tailored surface-active block copolymers on anti-fouling and fouling resistant behavior will be described.

12:30 PM Lunch Break

2:00 PM *Polymer Brushes: Valuable Tools for Interface Engineering*

Polymer brushes are a common feature in many biological surfaces. “Grown from” polymer brushes only a few tens of nanometers thick are remarkable materials for modifying the chemistry and mechanical properties of surfaces. Polymer brushes, because of their surface confinement, are typically stretched from the surface when compared to identical unattached polymer segments and confinement provides them with useful barrier properties. With the development of living radical polymerization, it has become possible to create a wide variety of brushes tailored for numerous applications in a range of surface environments. In this presentation we discuss brush growth, brush stabilization, brush patterning, and the effect of brush stiffness in a range of applications depending on the nature of the local environment.

3:00 PM *Mixed Ionic-Electronic Conductors: A Computational / Experimental Study*

Organic conducting materials with dual ion/electron transport functionalities can be achieved by careful design of two-component liquid crystal (LC) oligomers. Such materials are finding use in applications that range from sensors to energy storage materials. Such materials can spontaneously self-assemble into 2D smectic mesophases with alternating ionic and electronic conducting channels. It was believed that symmetric LCs were usually associated with strong structural ordering, but complicated techniques were always needed to fabricate such films with high quality due to their high mesophase temperatures. In this study, symmetric and asymmetric thieno[3,2-b]thiophene (BTTT)-based amphiphilic LCs were synthesized via Suzuki and Stille coupling reactions. Their structural arrangement and charge-transport properties were investigated by molecular dynamics simulation and advanced characterization techniques including grazing incidence wide angle X-ray diffraction (GIWAXS). Electrochemical impedance spectroscopy (EIS) was used to measure the ionic and electronic conductivities upon the additions of dopants. Low molar mass and polymeric systems will also be described.

2022 Central Regional Meeting of the American Chemical Society, June 7–10

Vickie Langer, Co-Editor, The Midland Chemist

The Huron Valley Local Section is hosting the 2022 Central Regional Meeting of the American Chemical Society, June 7-10, 2022. This four-day event will take place at Eastern Michigan University's Student Center.

ACS Regional Meetings feature technical programming to help you stay up to date on the latest research and keep you connected with chemists in your region. Visit the meeting website for more information: [2022 Central Regional Meeting](#).



Water Quality Testing – Volunteer Adventure Opportunity, July 29–31
Dale LeCaptain, Councilor, Midland Section ACS

ACS MEMBER VOLUNTEER / BEAVER ISLAND MULTI-DAY EXPERIENCE

The ACS Midland Local Section H₂O Q Committee is offering three interactive exploration days of various fresh water sources in northern Lake Michigan in and around the Central Michigan University Biological Station (CMUBS). The excursion will focus on volunteer training in H₂O Q (the citizen science outreach program for middle and high schools) by exploring the water chemistry of various locations.



The excursion is open to members of the ACS Midland Local Section and their immediate families. Children under age 12 may be restricted from certain portions of the trips, and young children are welcome but are not included in the programming.

The three themed days of planned programming and their tentative order is listed here:

Friday, July 29 – Garden Island & Lake Michigan

Lakes and water sources of this uninhabited island just north of Beaver Island

- Small watercraft trip to Garden Island, inland hike to lake and other sites
- CMUBS analytical laboratory instrumentation tour
- Lake Michigan water quality and sampling (Emerald Isle Ferry) presentation
- *Evening adventure:* Harbor cruise aboard *The Resolute* (additional fees apply)

Saturday, July 30 – South Beaver Island

Lakes, marshes, creek, and bays of the low population density and diverse water systems

- Lake Geneserath, Fox Lake, Miller's Marsh, Iron Ore Bay & Creek
- Side explorations may include the south light house, a short hike, exploration of native snake populations, and other island iconic sites
- *Evening adventure:* Stories, wildlife, and adventures of Barney's Lake & Protar's Tomb

Sunday, July 31 – North Beaver Island

Water quality of developed use areas of Beaver Island in and around St. James

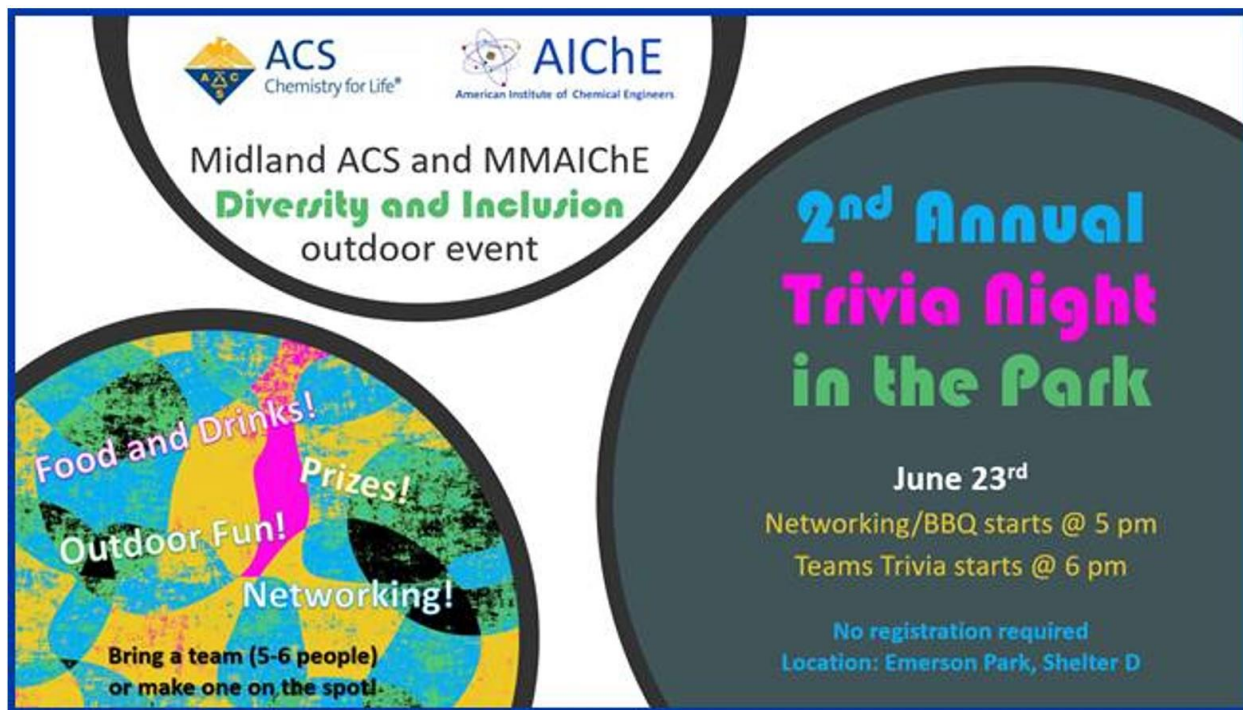
- Water chemistry of golf courses (additional fees apply)
- Font Lake and the harbor
- Water chemistry of brewing
- Side explorations may include hiking up Mount Pisgah, CMUBS Boat House (formerly US Coast Guard), Harbor Light, Gull Harbor, and other iconic sites
- *Evening adventure:* BBQ and bonfire at CMUBS

Room and board are being offered at cost to participants (\$50-\$70 per person per day). This water quality excursion is an ACS volunteer opportunity. CMUBS is an active Great Lakes research facility that is allowing us the opportunity to do mission-aligned volunteering in water quality chemistry outreach.

Early registration ends May 31 as space is limited and lodging will be assigned on a first come, first served commitment! Registration will continue until July 15 as space permits. Contact Dale LeCaptain at dale.lecaptain@cmich.edu for more details and sign-up information.

2nd Annual Trivia Night in the Park Event, June 23

Anne-Catherine Bedard, Diversity & Inclusion Committee Chair, Midland Section ACS



Please join us for an evening of networking, food, drinks, and trivia! Bring a team (5-6 people) or make one on the spot. BBQ and networking begin at 5:00 PM. Trivia begins at 6:00 PM. Location: Emerson Park, Shelter D, Midland.

Admission is free, but please RSVP so that we will know how much food to prepare. You can respond to this event on Facebook at <https://fb.me/e/3AWvUA9dT>. Please share this news with your respective network and plan to join us. For more information or any questions, please contact Anne-Catherine Bedard at diversity@midlandacs.org.



Student ACS Members Socialize at the Spring ACS National Meeting

Dale LeCaptain, Councilor, Midland Section ACS

Dateline: Sunday, March 20, 2022

Location: Spring ACS National Meeting, San Diego, California

Student members from the Midland local section made time for some socializing during the recent Spring ACS National Meeting in San Diego. Pizza, euchre, plenty of stories from the poster session that just ended, as well as travel stories in what is hopefully a return to in-person meetings going forward were shared.



This somewhat annual spring meeting tradition was back this year where students from SVSU and CMU gathered with faculty, and in years past with alumni and friends from the Midland local section. This time it was with CMU students (8), CMU faculty (2), SVSU students (5), and SVSU faculty (3). Please plan to join us in the Spring of 2023 in Indianapolis!

Pictured (left to right): Dr. Ben Swarts, Emma Doederlein, Marc Dean, Izzy Gaidhane, Jonathon Giglio, Caleb Whittaker, Dr. Tami Sivy, and Katie Sowell. Photo courtesy of Dr. Dale LeCaptain.

A Little Despair on Earth Day

Mark Jones, Director and 2020 Chair, Midland Section ACS

Editor's note: This article is reprinted, in part, from the Thursday, May 5, 2022, issue of *ACS Industry Matters Newsletter*, an online news publication of the American Chemical Society. At the National ACS level, Mark Jones is a member of the ACS Committee on Public Relations and Communications and the National Historic Chemical Landmark Committee.



I am standing in an auto parts store on Earth Day. Staring at the windshield wiper display triggered a sense of despair.

I've experienced every Earth Day. I remember the excitement of the first Earth Day in 1970. I remember the feel of protest. There was anger. It had been less than a year since the [Cuyahoga River fire](#) captured the nation's attention. The same for the [Santa Barbara oil spill](#). I clearly remember the focus on visible pollution. Concern over pesticides was there too. [Joni Mitchell](#) implored farmers to put away DDT, to leave the birds and bees unharmed. The ecology flag seemed like it was everywhere. There was a real sense of us versus them – the “them” being polluters, litterers, and those spraying pesticides.

Progress, some clearly a direct result of the outpouring on the first Earth Day, was made. We now have an Environmental Protection Agency in the U.S. We didn't in 1970. The visible pollution that was a big inspiration for the first Earth Day is largely a thing of the past. Environmental regulations and societal expectations stopped many of the worst offenses.

I was a budding chemist in 1980, still in college. Earth Day was far more subdued. There was a sense of accomplishment. DDT was gone. Banned. The same with lead in gasoline. There was significant legislation passed since the first Earth Day, including the Clean Air Act, the Clean Water Act, and the Marine Protection, Research, and Sanctuaries Act, sometimes called the [Ocean Dumping Act](#). We were driving more efficient vehicles. Things were better and still improving. It seemed like we had the "them" on the run.

I'm now seeing my 53rd Earth Day. The language and symbolism around Earth Day have changed. I haven't seen an ecology flag flying in years. Sustainability and circularity were not topics on the first Earth Day. Neither was climate change. Litter was a topic, but not microplastics. On this Earth Day, climate change is a major topic. Visible pollution is no longer the focus. It is the invisible pollution that now captures attention – the greenhouse gases we all emit. We are asked not to drive, not to use single use plastics. This Earth Day is far more about personal behaviors and choices. It is no longer us versus them, it is us versus us.

The underlying motivation remains unchanged – to protect the planet, to be better stewards of its resources. To conserve, not waste. Buying auto parts on Earth Day, I confronted a case that makes little sense to me, a case where a clearly more material efficient, more sustainable choice was taken away from me. It is a case where we did it better on the first Earth Day.

In 1970, I purchased windshield wiper refills. The wiper arms were effectively permanent parts of the car. On Earth Day 2022, there are no refills, only complete wiper arm assemblies available for purchase. It's so wasteful. Three times as wasteful is what I determined.

The 2022 wiper assembly is 207 g, delivered in a 45 g package. Careful disassembly let me determine that the rubber part, what used to be sold as a refill, weighs only 56 g. An old refill package lurking in my shed weighed only 40 g, and it came with two refills. So, in 1970, replacing a wiper with a refill required only about 76 g of material. That is a difference of 176 g. According to the windshield wiper manufacturer's sites, blades should be replaced [every six months](#). Following that advice for all [U.S. cars](#) would produce more than a million metric tons of unnecessary trash. There is no circularity either. Auto parts stores don't recycle any part of the wiper blades. I can't recycle any of the pieces in my community. While there may be other examples of regression from sustainability of this level, I can't think of any. Most things, thanks to efforts like Earth Day, have gotten better, not worse.



Wiper blades serve as a reminder that our efforts for circularity and sustainability still can fall short. Our journey is not over. For all the progress made since the first Earth Day, windshield wipers are an example where we've regressed. On this Earth Day, the more sustainable wiper choice – what we used to use – is not available. Refills were removed as an option, motivated by something other than sustainability. I checked several manufacturer's websites. There is a lot of information on when to replace and how to replace wiper blades, but nothing on sustainability. They must not care. It is up to us, on this Earth Day, to find a way to make them care.

An Exciting Earth Day Expo!

Gina Malczewski, Director and Outreach Committee, Midland Section ACS

Warm weather, 48 exhibitors, and three food trucks helped to attract many community members to this year's free Earth Action Expo at Dow High School, in Midland, on Sunday, April 24, from 12:00 to 4:00 PM. Many presenters offered activities aligned with the National ACS theme, *The Buzz about Bugs: Insect Chemistry*.

There were five electric cars on display and one hybrid, with a free overnight Tesla on loan given as one of the raffle prizes. There were many craft options, a 3-D printing display, hissing cockroaches, preserved insects of many kinds, and lots to see and do. The SVSU STEM bus and representatives from multiple environmental groups were also present.

Exhibitors were available to discuss nuclear and renewable energy, offer seeds and seed pots, and showcase natural products, cooperative markets, watershed tours, and Saginaw Bay sailing excursions. A large Wastewater Treatment truck was also popular. "Passports" with prizes encouraged kids to visit a variety of booths, and face painting was also available. Well over 300 people attended the event.

At the ACS booth, desiccated cochineal bugs were extracted to make carmine dye. The dye was then pH-tested and its acid-base properties were used to make great tie-dye art pieces. Edible grasshoppers and roasted crickets, as well as seeds and seeded paper with food waste mitigation information were also given away. One person wrote the following for feedback: "Love all the hands-on experiments. Thank you!"

We greatly appreciate the months of work from our committee, the donation of the tent from Dow, the dozens of volunteers who helped with set-up, clean-up, and check-in, and our NOBCCHE sponsor who covered the cost of lunch for the volunteers. Thank you!



Wastewater treatment truck (Photo by Cyndie Roberts)



Committee member Amanda Palumbo with DTE mascot (Photo by Cyndie Roberts)



SVSU STEM bus (Photo by Cyndie Roberts)



ACS booth with cochineal dye
(Photo by Gina Malczewski)



Face-painting booth (Photo by Gina Malczewski)



Bridging Technology: How Completing the Wrong Application Form Launched a Career **Steve Keinath, Co-Editor, The Midland Chemist**

Editor's note: This article is reprinted, in part, from the Thursday, May 12, 2022, issue of *ACS Industry Matters Newsletter*, an online news publication of the American Chemical Society. In this article, Midland Section ACS member Michelle Rivard shares the very unusual, perhaps unique way that she came to be a chemical technical professional.



Michelle Rivard, Research and Development Technologist, Dow

Michelle Rivard is a research and development technologist at Dow, and the winner of the 2018 ACS National Chemical Technician Award for excellence and professionalism among technicians, operators, analysts, and other applied chemical technology professionals. In 2019, she received the E. Ann Nalley Central Region Award for Volunteer Services to her Local Section, ACS National, and the Central Region. In 2021, she received the ACS Midland Section ACS Award for Science Education Volunteer of the Year, and in 2022, the Midland Section ACS Award for Outstanding Service to the American Chemical Society.

She is currently a member of the Delta College Chemical Technology Advisory Board. She has held several positions within the Midland Section of the ACS, including Chair-Elect, Director, and Treasurer. She is the Midland Section ACS Coordinator of Project SEED and Co-Chair of Kids and Chemistry Outreach. She served on the National ACS Project SEED Committee (2012-2021), and chaired the Scholarship sub-committee, and is currently serving on the Committee of Technician Affairs (2022). She is an active member of Dow's Midland Research and Development Technologist Group, the Midland Section ACS, and the Mid-Michigan Technician Group.

At Dow, Michelle has been a key contributor in the development of robust quantification methods of cyclic volatile methylsiloxane (cVMS), and has developed new approaches for sample extraction, cleanup, and derivatization. She has also been involved in projects to understand the effects of filler structure on silicone sealant performance and differentiation of sealant families.

Describe your job as a chemical technical professional (CTP). What is your favorite part of your job?

I am an analytical technologist in Dow's Analytical Science Department. I primarily support Dow's silicone business by either ensuring compliance or solving problems utilizing analytical equipment and techniques such as gas chromatography (GC) and mass spectrometry.

One project that I am particularly proud of is starting a walk-up user lab for fast and routine GC analysis at work. It's been running for three years, and I still support the lab today. I also help different groups with GC analysis from creating custom methods to hardware, maintenance, and troubleshooting.

Additionally, I solve tough challenges on project teams from manufacturing issues to customer challenges to product development of new materials. My favorite part is empowering others to succeed by providing my characterization expertise. I also enjoy seeing new areas and chemistries as well as meeting new people.

What types of daily tasks do you tackle as part of a typical workday?

I work on a variety of projects at once, so my tasks vary from day to day. They include attending project meetings as well as prepping, running, and analyzing samples, and communicating results to the project teams. I troubleshoot equipment and help drive a culture of safety. I also enjoy being an advocate for chemical technology by volunteering with the ACS.

Currently, I am a Science Coach at Coleman Elementary School and the Project SEED (Summer Experience for the Economically Disadvantaged) coordinator for the ACS Midland Local Section. I am also a Director for both the Midland Local Section and the Mid-Michigan Technician Group. At work, I am on the steering committee for Dow's Midland R&D Technologist Group and Dow's Core R&D Inclusion Team. I am also on the National Committee for Technician Affairs and the secretary for the ACS Division of Analytical Chemistry. So, sometimes my workday includes travel to a conference or a classroom.

How does your job provide “a bridge”? For example, between the lab and consumer, science, and manufacturing, or idea and implementation?

To provide a bridge means to connect two or more people, groups, or things. I help make connections every time I participate in an R&D project, whether it's personally providing the benchmark data that bridges the gap between an idea and implementation or setting up the team to analyze their own samples. The bridge between research and development and manufacturing also exists when we have a manufacturing issue and I give a recommendation for testing or generate the data that helps identify the root cause.

What key factors went into deciding to become a CTP?

Well, I didn't exactly decide to become a CTP. I took a detour in life, got lucky, and ended up doing something I really love. Long story short, the wrong application ended up giving me a rewarding career. At the time, I thought I was applying to Dow Corning as a College Co-op, but due to a mix-up with the application I went through the whole hiring process and was offered a full-time position as a chemical operator. After several years, I found the job unfulfilling. Lots of individuals find being a chemical operator rewarding, but it wasn't a good fit for me. I needed more and I didn't really know what that more was. It's hard to find the motivation to work a job that isn't the right fit for you.

I had some great co-workers who encouraged me to go back to school – taking advantage of the tuition reimbursement program at Dow Corning – and apply for a CTP job within R&D. That was a pivot point for me. I went back to school, earned a B.S. in biochemistry, and started this position more than 18 years ago. For me to enjoy my career, I needed the mental challenge of analyzing data, collaborating on projects, and teaching others.

If you could do it over, would you still choose a CTP career?

Yes, absolutely! I love my job. Would I do it differently? Sure, I would like to think that I would take a more direct route to becoming an analytical technologist, but then I wouldn't be the person I am today. Several of my connections and mentors have been professors that I studied under as an “older” student. And, I know more about the perspectives of manufacturing operators, which helps when we are solving problems together.

What's the one thing you wish you had learned earlier in your career?

How to tell a compelling story of the work I do – aka “selling myself.” My managers ask me what I did all year and I give them a list of the things I did. They say, “that’s great, but what was the impact?” Um ... seriously ... um ... I don’t know. I personally struggle with this. I feel like I don’t know the buzz words and that everyone else was given a playbook but somehow, I was absent that day. Over time, I have learned how to communicate impact, but it is not something that comes easy to me, and I remind myself how to employ this skill time and again. The secret is, it is what you did (action), why it matters (context), and the outcome (results).

Think about an early career CTP. What advice do you have to help them advance?

Join an employee group at work or professional society like the ACS or a role-specific group like the Mid-Michigan Technician Group and get involved. Actively volunteer and step outside your comfort zone. This is the best way to create an extensive and useful network. My biggest successes have come from opportunities presented through the networks I have cultivated.

What is the one skill or personal trait that you believe to be the most instrumental in your success?

I’ve developed my personal brand as the “go-to person.” If I can’t help you, I usually know someone that can, or I make it my mission to find that person through others. I’ve done this by developing an extensive network both inside and outside of Dow, ACS, and career organizations through volunteerism.

You won the 2018 ACS National Chemical Technician Award. Do you recall what you did with the honoraria that came with the award? And where is the plaque you received?

If I recall correctly, I bought myself a very nice and expensive Fossil purse from the mall next to the convention center in New Orleans where I received my award. Fossil purses are my guilty pleasure. My plaque is proudly displayed in my office at Dow. I even have a cool poster board that CTA sent to me that highlights my award. It is posted right outside my office.

How does the satisfaction of winning the ACS NCTA compare to Michigan beating Ohio State in their annual football rivalry, probably the most intense in college sports?

Wait ... was that Michigan or Michigan State that beat Ohio? Sorry ... I am not really into sports unless it’s to socialize. I’m that annoying person that talks the whole time. Anyway, early in 2020, before the pandemic, I had an opportunity to train outreach volunteers to do classroom water quality testing at Ohio State and I found it quite intense that everywhere on campus, every letter “M” was crossed out. That had to take some serious time! The satisfaction and intensity they felt when crossing out that last M would not even compare to the intense satisfaction that I felt seeing my life’s work and accomplishments being recognized by CTA and ACS.



Please Consider the Midland ACS Scholarship Fund in Your 2022 Giving!

Gina Malczewski, Director and Scholarship Committee, Midland Section ACS

Last year in May, **Dr. Wendell and Marcia Dilling** (photo at right) issued a challenge relative to growing the Midland ACS Scholarship Fund. **Few have responded to that call so far, and the fund today currently stands at just over \$72,000.** Please read more below about the history and purpose of this fund. Past scholarship recipients are often highlighted in issues of the *Midland Chemist*.



The Midland Section ACS has been proud to offer scholarships to deserving undergraduate students majoring in a chemical science since 2002. Annually, two to four scholarships are awarded to candidates who have graduated from a high school in one of the Section's five counties (Bay, Midland, Saginaw, Isabella, and Gratiot), are studying at a Michigan university, and are ideally intending to pursue a career in some aspect of chemistry or chemical engineering. Selections are made by a committee and are based on academics, service and extracurricular contributions, and an essay on the student's sources of motivation as well as future plans.

Awards usually range from \$1,000-2,000, depending on the financial performance of the Midland ACS Scholarship Fund (#399) administered through the Midland Area Community Foundation. A long-standing goal of the Section has been to raise the base amount to \$100,000 to serve more students.

Wendell and Marcia Dilling, both trained chemists and stalwart supporters of our Local Section, are prepared to help us reach that goal by donating up to \$18,000 as part of a Challenge Grant to the Scholarship Fund, which currently stands at \$72,100. **They will match 1:1 any new contributions to the fund at the Midland Area Community Foundation over the next couple of years ($\$18,000 \times 2 + \$72,100 = \$108,100$).**

Please consider contributing to this worthwhile cause. **Your donations will help shape the future of chemistry!** If you have any questions about contributing to the Midland ACS Scholarship Fund, please call the Midland Area Community Foundation at 989-839-9661. Thank you.

An online donation form can be found through the following link:

[Midland Section American Chemical Society Endowed Scholarship Fund #399](#)



ACS Division of the History of Chemistry Centennial
Carmen Giunta, Editor, Bulletin for the History of Chemistry

The Division of the History of Chemistry of the American Chemical Society (HIST) is 100 years old in 2022, and we have a present for you!

HIST is the home within ACS for chemists interested in the history of their discipline. Among our activities are publication of a peer-reviewed journal in the history of chemistry, the *Bulletin for the History of Chemistry*, and holding symposia on historical topics at national and regional meetings of the ACS. Both activities involve chemists and historians from around the world. All members and affiliates of HIST receive two issues of the *Bulletin* each year as part of their membership – hard copies delivered by mail as well as electronic access.



In this 100th anniversary year, we have prepared an extra issue of the *Bulletin*, available electronically to anyone (open access). Prominent chemist historians and historians of chemistry were invited to contribute essays on the theme “Novel Insights in the History of Chemistry: Looking Back Yet Mostly Looking Forward.” This theme led to a wide variety of responses, which we have collected together into the following six topics:

- Expansive Approaches to the History of Chemistry
- Foci on Specific Topics
- Multidisciplinary Approaches and Tools
- Thriving, Inclusivity, Diversity, and Equity and the History of Chemistry
- Relationships of Historians and Chemist Historians
- The Past, Present, and Future of the History of Chemistry

We invite you to peruse this commemorative issue online at:

http://acshist.scs.illinois.edu/bulletin_open_access/bull22-vol47-1.php

While you are there, check out 30 years of open-access issues of the *Bulletin of the History of Chemistry*, which are free to all after a three-year window of access exclusively by HIST members and subscribers:

http://acshist.scs.illinois.edu/bulletin_open_access/bull-index.php

Finally, consider joining HIST as a member or affiliate. More information about HIST is available at:

<http://acshist.scs.illinois.edu/index.php>

and a membership form can be found at:

[http://acshist.scs.illinois.edu/HIST%20Brochure\(ACS\)rv2020.pdf](http://acshist.scs.illinois.edu/HIST%20Brochure(ACS)rv2020.pdf)



In Memoriam – Corwin Jay Bredeweg
Steve Keinath, Co-Editor, *The Midland Chemist*

Editor's note: The obituary notice for Corwin Bredeweg as it appears below is reprinted, in part, from the Tuesday, March 29, 2022, issue of the *Grand Rapids Press*. Corwin joined the American Chemical Society in 1963, and at the time of his passing he was a 60-year member of the ACS.



Corwin Jay Bredeweg, age 84, was called home to be with Jesus on March 25, 2022. He was born on December 9, 1937, in the small community of Dorr, Michigan. He graduated from Hope College and then attended the University of Kansas where he earned his PhD in both Chemistry and Mathematics. While in Kansas, he met and fell in love with his beautiful wife, Carolyn Kay (Henderson) Bredeweg. They married and moved to Midland, Michigan, in August of 1963, where he started his lifelong career as a Research Chemist at the Dow Chemical Company. He retired from Dow in 1994.

Corwin and Kay have two daughters, Charlotte A. (Rick A.) Cassiday of Clarkston, MI and Nancy L. (James E.) Baker of Wyoming, MI. Corwin proved himself to be a faithful and dedicated husband, father, and grandfather, true to his family and his faith. Full of strength and honor, he served quietly, doing kind deeds, both big and small, for family, friends, and strangers. Corwin was actively involved in his church, Habitat for Humanity, played City League Volleyball, loved gardening, photography, and traveling in their RV wherever they could possibly take it. There is comfort in knowing that he is in the arms of our loving Savior and that we will be reunited again someday.

Corwin is survived by his wife, two daughters, brothers Roger L. (RuthAnn Henderson) Bredeweg of Stevensville, MI and Wayne A. (Mary Geurink) Bredeweg of Hudsonville, MI; brother-in-law Larry G. Nitz of Hudsonville, MI; sister-in-law Gloria M. (J. Randall) Troxell of Tulsa, OK; four grandchildren, Emily L. (Andrew R.) Vavere of Caledonia, MI, Matthew R. (Nicole Stanley) Cassiday of Oxford, MI, Lauren N. (Aaron M.) Cummings of Sebewaing, MI, and Andrew J. (Katelyn Dykema) Baker of Wyoming, MI; great grandchild Reid A. Vavere of Caledonia, MI; and many other nieces and nephews. He was predeceased by his parents, Henry and Francena (Patmos) Bredeweg; and his sisters Leona G. (Earl J.) VanKoevering and Betty J. Nitz.

Visitation was held on Thursday, March 31, 2022, at Ware-Smith-Woolever Funeral Home, in Midland, MI from 4:00 to 7:00 PM, and on Friday, April 1, 2022, from 10:00 to 11:00 AM at Midland Reformed Church, in Midland, MI. A Celebration of Corwin's Life was held at the church on Friday, April 1, 2022, starting at 11:00 AM, officiated by Reverend Mike Bredeweg, with a luncheon immediately following. Livestream viewing was available at www.midlandreformed.org. An interment service was held at 11:00 AM on Saturday, April 2, 2022, at Forest Grove Cemetery, in Hudsonville, MI. A light lunch was provided at Forest Grove Reformed Church, also in Hudsonville, MI. In lieu of flowers, the family requests donations be sent to Young Life, 2292 West Rockey Weed Road, Stevensville, MI, 49127. Funeral arrangements have been entrusted to the care of Ware-Smith-Woolever Funeral Directors, of Midland, MI.



In Memoriam – Theodore William Selby

Steve Keinath, Co-Editor, *The Midland Chemist*

Editor's note: The obituary notice for Ted Selby as it appears below is reprinted, in part, from the Tuesday, March 29, 2022, issue of the *Midland Daily News*. Ted joined the American Chemical Society in 1954, and at the time of his passing he was a 68-year member of the ACS.



Theodore (Ted) William Selby died peacefully on March 25, 2022, surrounded by family. For 93 years, Ted lived a rich and full life, his keen mind discovering scientific marvels until the end – he proudly received his 58th patent just two weeks prior to his death. Toward the end, he spoke frequently of his excitement to meet the Lord and join Jean, his wife of 67 years, who predeceased him in 2018.

Ted was born on October 19, 1928, in Nebraska City, Nebraska, the oldest son of a scientist and inventor who was frequently transferred for job promotions. Consequently, the Selby clan moved to Iowa, New York City, Chicago, and Detroit. Along the way, young Ted learned the important skills of sharp observation, self-sufficiency, and the ability to connect and build rapport with people of many different backgrounds.

Ted met his wife, Jean Gale Campbell, at the University of Detroit and they were married in 1951. While pursuing his Doctorate Degree in Physical Chemistry from U of D in the 1950s, Ted found his technical calling as a research scientist at General Motors, where he was honored in receiving both the Russell S. Springer and Henry Ford Memorial Awards from the Society of Automotive Engineers, the first time these two awards were presented to the same person.

In 1963, Ted moved his family to Midland to assist Dow Chemical with the expansion of its automotive lubrication capabilities. Ever the entrepreneur, Ted made a tough decision in 1969 to leave a good job at Dow Chemical to pursue his passion for problem-solving in the field of lubrication, and the consulting firm, Savant, was born. With nine children at home at the time, the move was not without considerable risk. However, Ted embraced the belief that the greatest achievements are usually the hardest, but that with faith anything is possible.

Today, that one-man consulting firm has grown into a globally recognized consortium of businesses consisting of a laboratory and research center, manufacturers of advanced laboratory testing instruments, an on-line database of technical data, and precision machining shops. When asked the secret to success, Ted, a devout Christian, always gave credit to God for the many opportunities he was offered, to the strong and steady support of his family, particularly his wife Jean, and to the dedicated employees of the Savant Group – whom he always considered his work family.

Ted is survived by nine children and one foster son, Kathleen Convissor, Mark (Linda) Selby, Shawn (John) Bunch, S. Diane Selby, Scott Selby, Cynthia Selby, Rebecca (Gordon) Cox, Chiara Barbier, Doug (Jennifer) Selby, and Ahmed Jabbar; 18 grandchildren, Joseph (Erica) Cesarz, Naomi (Timothy) Nelson, Esther (Andrew) Kyte, Lucian (Francesca) Cesarz, R. Stephen Cesarz, Julia Convissor, Elizabeth Anne Selby, Daniel Selby, Theodore (Eva Hall) Bunch, Nathan (Sarah Faye) Bunch, Katheryn (Jesse) Parke, Michael Selby, Adrienne (Ben Fierman) Jacobs, Andrea (Brandon Carr) Jacobs, Quinlan Cox, Maitea Cox, Ava Selby, and

Oliver Selby; 11 great grandchildren, Coco Cesarz, Ignatius Cesarz, Wanda Bee Cesarz, Ingrid Nelson, August Nelson, Tobias Kyte, Nolan Kyte, Mason Cesarz, Ella Cesarz, Carlin Parke, and Elizabeth Parke; two siblings, Sharon Selby and Daniel (Maureen) Selby; and numerous nieces and nephews. Ted was predeceased by his wife Jean Selby, son Timothy Selby, son-in-law Richard Cesarz, sister Patricia Selby, and parents Theodore R. and Marge (Bates) Selby.

Ted was a friend and mentor to many. He lived life passionately and left a legacy of curiosity, innovation, faith, and perseverance. His passing marks the end of this chapter of a truly remarkable man.

Visitation was held from 4:00 to 8:00 PM on Sunday, April 3, 2022, at Ware Smith Woolever Funeral Home, 1200 West Wheeler Street, in Midland, with a Wake Service beginning at 6:00 PM.

Ted's funeral service was held at 10:00 AM on Monday, April 4, 2022, at St. Brigid Catholic Church, 207 Ashman Street, in Midland, with burial immediately following.

A Celebration of Life was held from 12:00 to 2:00 PM on Monday, April 4, 2022, at the Midland Center for the Arts, 1801 West Saint Andrews Road, in Midland.

Those planning an expression of sympathy are asked to consider Pinecrest Farms or St. Brigid Catholic Church, both of Midland. Arrangements for Ted Selby have been entrusted to the care of Ware Smith Woolever Funeral Directors, of Midland, MI.

Upcoming Dates, Events, and Other Updates

- May 2 (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, MSU St. Andrews, Midland (in person), and via a WebEx conference call connection at [Webex Board Meeting - May 2022](#), Meeting number: 2651 874 4771, or by phone at Phone number: 650-215-5228, Access code: 2651 874 4771.
- May 4 (5:30 – 9:00 PM) – Midland Section ACS Spring Awards Banquet, Great Hall Banquet & Convention Center, 5121 Bay City Road, Midland. Featured speaker: Wayde Konze, Senior Research Director, Dow. Cost: \$20.00 per person. For more information or any questions, please contact Diana Deese, Midland Section ACS Awards Committee Chair, at dkdeese@dow.com or 989-636-9915.
- June 6 (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, MSU St. Andrews, Midland (in person), and via a WebEx conference call connection at [Webex Board Meeting - June 2022](#), Meeting number: 2651 874 4771, or by phone at Phone number: 650-215-5228, Access code: 2651 874 4771.
- June 7 (9:00 AM – 5:00 PM) – Turner J. Alfrey Visiting Professor Lectureship Series, featuring Guest Lecturer Christopher K. Ober of Cornell University, MSU St. Andrews, Midland. Dr. Ober and his associate will discuss topics in controlling polymer structure at nanometer-length scales. Free event, but [registration](#) is required no later than Friday, June 3, 2022. For more information, please contact Clare Light at lightcla@msu.edu.
- June 7–10, 2022 – Central Regional Meeting of the American Chemical Society, *Archaeometry to Zymurgy*, Ypsilanti, MI. For more information, visit [2022 Central Regional Meeting](#).
- June 23 (5:00 PM to ??) – 2nd Annual Trivia Night in the Park event, Emerson Park, Shelter D, Midland. Networking and BBQ start at 5:00 PM, Teams Trivia starts at 6:00 PM. Admission is free, but please RSVP on Facebook at <https://fb.me/e/3AWvUA9dT> so that adequate food can be prepared. For more information, please contact Anne-Catherine Bedard at diversity@midlandacs.org.

- July 29–31 (Friday to Sunday) – Three-day, ACS Member Volunteer / Beaver Island Multi-Day Experience – water quality testing, volunteer adventure, and camping excursion for families. See the article on page 4 for more information. Contact Dale LeCaptain at dale.lecaptain@cmich.edu for more details and sign-up information.
- August 1 (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, MSU St. Andrews, Midland (in person), and via a WebEx conference call connection at [Webex Board Meeting - August 2022](#), Meeting number: 2651 874 4771, or by phone at Phone number: 650-215-5228, Access code: 2651 874 4771.
- August 21-25, 2022 – ACS Fall 2022 National Meeting and Exposition, Chicago, IL. This meeting is being planned as an in-person and virtual hybrid meeting. Meeting theme: *Sustainability in a Changing World*. For more information, please see [ACS Meetings & Expositions - American Chemical Society](#).
- September 12 (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, MSU St. Andrews, Midland (in person), and via a WebEx conference call connection at [Webex Board Meeting - September 2022](#), Meeting number: 2651 874 4771, or by phone at Phone number: 650-215-5228, Access code: 2651 874 4771. **Please note: This Board meeting is being held on the second Monday of September, not the usual first Monday of most months due to the Labor Day holiday.**
- October 3 (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, MSU St. Andrews, Midland (in person), and via a WebEx conference call connection at [Webex Board Meeting - October 2022](#), Meeting number: 2651 874 4771, or by phone at Phone number: 650-215-5228, Access code: 2651 874 4771.
- November 3 (Save the Date) – Midland Section ACS Diversity & Inclusion Committee program, *A Day in the Life of an Industry Scientist*, Midland Center for the Arts, an event in partnership with the University of Michigan (Flint) and Kettering University. For more information, please contact Anne-Catherine Bedard at diversity@midlandacs.org.
- November 5 (Save the Date) – 2022 Midland Section ACS Fall Scientific Meeting. Location, time, and other details to follow. For more information, please contact Hari Katepalli, ACS Fall Scientific Meeting Committee Chair at fsm@midlandacs.org.
- November 7 (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, MSU St. Andrews, Midland (in person), and via a WebEx conference call connection at [Webex Board Meeting - November 2022](#), Meeting number: 2651 874 4771, or by phone at Phone number: 650-215-5228, Access code: 2651 874 4771.
- December 5 (7:00 – 8:00 PM) – Hybrid Midland Section ACS Board meeting, MSU St. Andrews, Midland (in person), and via a WebEx conference call connection at [Webex Board Meeting - December 2022](#), Meeting number: 2651 874 4771, or by phone at Phone number: 650-215-5228, Access code: 2651 874 4771.



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