

Newsletter for the Kalamazoo Local Section of the American Chemical Society

December 14, 2017

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2017 KACS Executive Officers

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Steve Secreast

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Dr. Brian Eklov

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Vacant

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Councilor

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MESSAGE

from the Chair

This was a bit of rough year, 2017, what with the hurricanes, earthquakes, volcanoes, wildfires, ridiculous politics and politicians, and the shameful and horrendous acts of violence. But some worthwhile events did occur.

In the world of chemistry the IUPAC approved this year four new chemical element names. Now for the first time in quite a while all the existing rows in the periodic table are filled. And all elements in the table, currently 118 of them, have names. KACS felt this occasion deserved recognition, so teamed up with the people of Kalamazoo to celebrate. That celebration was captured in an eight minute, twenty-four second movie that can be viewed at this web address: <https://youtu.be/zaZmjnkyEk8>. Check it out, a definite affirmation that love of chemistry is alive and well in Kalamazoo.

Also this year, KACS participated in multiple Kalamazoo Earth Day events, including the local March for Science. KACS also celebrated National Chemistry Week with our annual K Valley Museum Day, which was very well attended. The KACS annual Recycled Poster Event in Bell's Back Room continued its run again this year as a most popular local science event. KACS co-hosted with Kalamazoo College this year a very successful Speed Networking Event for local chemistry college students. KACS also put together and submitted a successful ACS National Historic Chemical Landmark nomination, recognizing the steroid chemistry work of Kalamazoo Upjohn Company scientists spanning 1950-1990. And of course we celebrated the 75th anniversary of KACS this year.

All in all, contrary to the many world events that occurred, this was a very non-disastrous, successful year for KACS. Well done Kalamazoo American Chemical Society Local Section. Happy holidays, happy new year, and let's continue the good work in 2018.



RESULTS

KACS Elections

Here are the results from this year's local section officer election:

Angela Willson –
re-elected as Secretary for a two-year term

Bill Schinzer –
elected as Treasurer to carry out the remaining year of the current two-year term

Lydia Hines –
re-elected as Councilor for a three-year term

The open Chair-Elect and Chair positions had some write-in nominations, but none that were willing to serve.

As a post-election note, Luke Chadwick stepped up willing to take the 2018 Chair-Elect position. Look for a profile on Luke in a future newsletter.

So, for 2018, KACS officers will be:

Executive Committee

Chair-Elect –	Luke Chadwick
Chair –	Steve Secreast (continuing by default)
Past Immediate Chair -	Brian Eklov (continuing by default)
Secretary -	Angela Willson
Treasurer -	Bill Schinzer
Alternate Councilor -	Doug Williams
Councilor -	Lydia Hines

Committee Leaders

Communications -	Chris Pruis
Education -	James Kiddle

REPORT

KACS Speed Networking

On the evening of 10 October at the K College Hicks Student Center, the Kalamazoo College Chemistry Department and Career Planning Office cohosted with KACS, a speed networking event for area chemistry college students. The purpose of the event was to connect local chemistry college students (K College, WMU, KVCC) with local working chemists (KACS members serving as mentors) for information sharing.

The event set up was like that for speed dating, with participating students rotating through 5-minute face-to-face time with participating mentors. The students asked questions related to establishing and building chem-related careers and the mentors provided answers and information based on personal experience. The evening ended with refreshments and time for free-style follow-up interaction between the students and mentors. KACS provided prizes for the participants including some randomly awarded ACS student memberships (paid for via grant money provided by ACS).

Event feedback from mentors and students alike was highly positive, with the event considered a valuable and worth-while success. Jackie Srodes from the K College Career Planning Office summarized: "What a FANTASTIC event last evening for the area college students and members of the Kalamazoo American Chemical Society that served as mentors!!" Jeff Bartz, Chair of the Kalamazoo College Chemistry Department added: "I've had several students stop and thank me for the event. Thank you to everyone involved!" The organizers agreed that we would like to see this become an annual event.

Many thanks to the KACS members that served as mentors: Ashok Patel, Beth Nagash, Bill Schinzer, Brian Eklov, Brianna Galli, Bridget Lorenz Lemberg, Charissa Oliphant, Chris Prais, Dave Erdman, Denis Billen, Derek Sheehan, Doug Williams, Jana Deering, John Manski, Julie Lorenz, Mara Birndorf, Rachel Wilson, Susan Sheehan, Tim Johnson, Tom Mulhern, Val Vaillancourt.

Photos show the excellent student – mentor engagement the event achieved.



REPORT

Student Reception

On 28 October KACS threw a reception for the Kalamazoo chemistry student chapters, at the Kalamazoo Curling Club. The purpose of the event was to say thanks to the WMU Chemistry Graduate Student Association (CGSA), the WMU Chem Club and the Kalamazoo College Chem Club for their community outreach work. A big part of what makes the annual KACS events like Chemists Celebrate Earth Day and Chemistry Day at the Museum successful, is the demonstrations and volunteer work done by the student chapters.

The reception involved an opportunity to try the sport of curling, followed by refreshments, with KACS providing some ACS student memberships as prizes (paid for with ACS grant money). Many thanks to the Kalamazoo Curling Club member volunteers for getting us out on the ice.

Photos show that a very fun time was had by all.

Photo A: KACS at the Kalamazoo Curling Club.

Photo B: Chem students and curling club coaches on the ice.

Photo C: Kristi Tullis of the CGSA celebrates her perfect shot to the center of the scoring rings (yellow rock), making Bri Leddy of the Kalamazoo College Chem Club smile while waiting her turn.

Photo D: Sarut Jianrattanasawat of the CGSA delivers a rock like curling veteran.

Photo E: Liz Knox of the Kalamazoo College Chem Club shows Olympic-quality rock throwing style.

Photo F: Curling coach Garnet Eckstrand signals “great shot” to Bri Leddy down-ice, as Bri’s blue shot rock slides into scoring position.



UPDATE

Lab Coat Initiative

Earlier this year KACS received Innovative Grant money from ACS to purchase lab coats labelled with our KACS logo. The purpose of this initiative is to have lab coats available for use by KACS members and local chemistry students, providing needed lab personal protection equipment, and providing a mechanism for promoting KACS and instilling a sense of identity for KACS members.

Here are some photos of the lab coats in action:

Photo A: Dr. Jeff Bartz (Dept. Chair), Mr. Mike Walsh and Dr. Dwight Williams of the Kalamazoo College Chemistry Department.

Photo B: Kristi Tullis (WMU CGSA Leader) and Angela Willson (KACS Secretary) bringing chemistry to Amberly Elementary School (Portage).

Photo C: KACS Executive Committee and Student Chapter Leaders modelling the lab coats.

Photos D and E: Kalamazoo College Chem Club working Chemistry Day at the Museum.

Photos F-I: Scenes from the KACS-produced, promotional/educational short movie: *Elements of Kalamazoo*.



REPORT

National Chemistry Week Event

Unlike other years' beautiful October weather on our Chemistry Days, this year the 14th of October was an unusually rainy and cool day in Kalamazoo. An enthusiastic group of 60+ volunteers - 15 ACS members, 5 ACS student members and 40 students or other colleagues from 2 high schools and 3 local colleges and several industries, etc. - gathered to present 25 separate hands-on activities and demonstrations and to hand out resources to over 1000 attendees at our much-anticipated 31st 4-hour event at the Kalamazoo Valley Museum, the venue which has graciously been our host for this event for the past 30 years. Publicity had been sent to K-12 teachers and to other public venues by e-mail and social media, and through the medium of TV to the broader community in SW Michigan, and even to the northern Indiana border by friends of friends who learned of it through the museum's and our announcements! Given the theme of this year's event, **Chemistry Rocks!** colleagues from the Kalamazoo Geological and Mineral Society joined us, and they presented some of their displays and talked to the patrons regarding how chemistry and geology are intertwined.

Below are three pictures of favorite activities: Elephant Toothpaste, Slime, and Oobleck.





THANK-YOU LETTER

National Chemistry Week Event

Hi KACS!

We had a wonderful night at our second Lake Center Elementary "I<3 STEM" night on November 30, 2017. We estimate that there were over 800 people and I'm not counting the number of students in attendance. There seems to have been a balanced distribution of attendance across the 5 – 11 year old range. It's rumored that some of the public heard and came to check it out too. This is an event we hope to do again.... as it went SUPER well 😊 "Big Shout outs" to the Kalamazoo Section of the American Chemical Society for providing booklets and funding for our event. With your support we were able to purchase needed materials, and the Celebrating Chemistry booklets were given out in handle bags, along with trading cards that featured STEM professionals. The WMU ChemClub table (picture included below) helped the children make slime and change copper pennies to "silver or gold" pennies.

On behalf of the Lake Center PTO, the students, staff and families, thank-you!

Sincerely,
Stephanie Norg
STEM event organizer
Lake Center Elementary
Portage, MI



TRIP REPORT

254th ACS National Meeting

Gabe Kornis' (50+ yr ACS member) gives his personal impressions from the 254th ACS National Meeting, August 20-24, 2017, Washington DC

A. Organic Chemistry

1. *Robert Burns Woodward Centennial Symposium*

For those of us who are old enough, and had the pleasure of attending the 2 to 4 hour lectures given by RB Woodward and admiring the structures drawn with multi colored chalks on a black board, this Symposium was an emotional experience.

The ACS historian, Jeffrey Seeman, showed many original hand written letters, notes, photographs, the iconic blue tie, etc., retrieved from the Harvard archives. Also present were the two Woodward children, now in their forties. Crystal Woodward, his daughter, who is an artist, gave a talk on the elegance and beauty of Woodward's structures and growing up in a household where chemistry was king.

Also contributing to the symposium was Sarah Reisman from Cal Tech, a new star in the field of natural product synthesis. She described the synthesis of polyhydroxylated diterpenoids, such as ryanodol and ryanodine, as well as some alkaloids. Some of the novel techniques she applied were nickel catalyzed asymmetric reductive cross coupling, concise synthesis through straight oxidation, and the coupling of smaller intermediates, instead of straight linear synthesis.

2. C-H Activation continues to be of major interest in both academic and industrial labs. The traditional methods utilized are by directing group assisted activation, base mediated metalation, or free radicals.

A novel approach presented is C-H activation via deprotonative zincation applied selectively to numerous heterocycles. Benzoyl hydroxylamine was used for the introduction of amines and the azide group into non activated arenes.

Corinna Schindler from the University of Michigan described the use of iron(III) catalysts for carbonyl - olefin ring closing metathesis to form 5- and 6-membered carbocycles, *in contrast to Grub's olefin – olefin metathesis*.

A novel selective alkene hydrosilylation catalyzed by bis(amino)amide nickel complexes is highly efficacious with turnover numbers of up to 10,000. Many functional groups are tolerated in the process.

3 . High throughput experimentation for industrial and academic applications was discussed by Melodie Christensen, MerckResearch & Development. While originally developed for the discovery of biologically active compounds, it is now widely used for reaction optimization. High throughput experimentation was successfully applied to enantioselective syntheses, identification of the ideal catalyst, Suzuki – Miyaura cross coupling reactions, and to minimize byproduct formation.

B. Medicinal Chemistry

1. Chronic Neuropathic Pain was the topic for a full morning session. Well over 15 million people in the US suffer chronic pain, and novel, selective medications are urgently needed. Adenosine is known to exert potent analgesia in animal models of neuropathic pain, and in limited clinical trials, in humans. Recent studies have shown that adenosine reduces pain through the A3AR target, and that some A3AR agonists decrease neuropathic pain in models, without analgesic tolerance or side effects from opioid and endocannabinoid based drugs. A number of A3AR agonists for clinical developments have been discovered, but their names or structures were not divulged.

Northwestern University workers have utilized the 4 - endocannabinoid system as a target for neuropathic pain treatment. A number of cannabinergic ligands with good binding and functional properties were discovered which lacked undesirable CNS activities. While Lyrica, the present gold standard for neuropathic pain, does suffer of delayed activity, two of the ligands discovered did not. When injected via a mini-pump long term relief was observed.

Bristol Myers Squibb researchers utilized adaptor associated kinase 1 (AAK1), as a new therapeutic target for neuropathic pain. AAK1 knock-out mice exhibited reduced pain behavior and a reduced neuropathic pain response. 5 - Benzo[c][2,7]naphthyridin-5(6H)-one and 5H-chromeno[3,4-c]pyridine were identified as a possible treatment for neuropathic pain .

2. Chagas disease or trypanosomiasis is an infection caused by the parasite *Trypanosoma cruzi*. It is widely spread in South America and it is estimated that over 2 million people suffer from this disease. No drugs have been approved by the FDA due to serious side effects. Based on X-ray structure analysis, a potent inhibitor named VNI was found effective in mice infected with Tulahuen strain of *T. cruzi*. Using this structural information, another candidate named VFV was identified. It has no toxicity, good bioavailability, and it is not a mutagen. Clinical trials are planned for the near future.

3. Resistant Hypertension.

There are about 76 million people in the US who have hypertension. Minorities of these patients do not respond to any of the medications approved by the FDA, and risk heart failure, or other related diseases.

Aldosterone promotes increased blood pressure. Its biosynthesis is catalyzed by several enzymes including CYP11B2. Small molecule inhibitors of CYP11B2 lower aldosterone concentration and decrease high blood pressure. Researchers at Merck and related organizations synthesized a number of compounds which are CYP11B2 inhibitors. LC1699, the lead candidate, displayed potent and selective inhibition of CYP11B2, dose dependent lowering of aldosterone, good pharmacokinetic properties in the rat and monkey, and good physical properties.

Visit our website www.kalamazooacs.org



Do you have questions, comments, or would like to contribute to this newsletter?
Send an email to Christine Pruis, Communication Chair at ACSkzoo@gmail.com