Volume 109, No. 8 October 2022

THE CHEMICAL BULLETIN

Chicago Section of the American Chemical Society Newsletter

Fred Basolo Symposium and Dinner

Friday, October 14, 2022, 3:15–8:45 PM CDT

Inorganic Chemistry in Control of Biological Processes: From Werner Chemistry to the Greasy Kid Stuff

Professor Thomas O'Halloran
Foundation Professor of Microbiology & Molecular Genetics and Chemistry at Michigan State University

Discovery Synthesis of Inorganic Functional Materials in the Digital Age

Professor Matthew Rosseinsky
Professor of Chemistry at University of Liverpool

Basolo Symposium
Friday, October 14

Northwestern University (Tech LR3)
2145 Sheridan Road
Evanston, IL 60208

3:15–3:30 PM	Refreshments
3:30–4:30 PM	Dr. Thomas O'Halloran 2021 Basolo Award Winner
5:00–6:00 PM	Dr. Matthew Rosseinsky 2022 Basolo Award Winner

Reception and Dinner
Friday, October 14

Hilton Garden Inn
1818 Maple Avenue
Evanston, IL 60201

6:30–7:30 PM	Reception
7:30–8:30 PM	Medal Presentations and Dinner
8:30–8:45 PM	General ACS Meeting Dr. Mark Cesa

Deadline to register is Thursday, October 6th at 6 PM

IN THIS ISSUE

MEET THE SPEAKER

Thomas O'Halloran is Foundation Professor in the Department of Microbiology & Molecular Genetics and the Department of Chemistry at Michigan State University. His research focuses on new inorganic compounds that could lead to a treatment for certain types of blood, breast, and brain cancers. Professor O'Halloran earned his Ph.D. in Bioinorganic Chemistry from Columbia University and M.A. in Chemistry from the University of Missouri. He completed postdoctoral training at Massachusetts Institute of Technology. Prior to joining MSU, Dr. O'Halloran was a faculty member at Northwestern University.

Dr. O'Halloran's research focuses on the discovery of soluble metal receptor proteins, the pathways they participate in, and the mechanisms by which they regulate cellular events and the physiology of organisms. The program uses an interdisciplinary approach to elucidate chemical mechanisms, protein structures, regulatory metal ion fluxes, and the physiology of metal receptors. Dr. O'Halloran's work has defined a new family of metal receptors—metalloregulatory proteins—that regulate gene expression in response to changes in metal ion concentration. He is also known for his work establishing another class of metal receptors known as metallochaperone proteins that govern metal flow through the cell. More recently he is focusing on the inorganic phenotypes of metastatic breast cancer: this work reveals how cells differentially control iron, copper and zinc quotas in normal and tumorigenic cells. Related studies led to the discovery of anticancer agents, including platinum-family drugs, that target emerging metal-regulated pathways.

TALK ABSTRACT

Inorganic Chemistry in Control of Biological Processes: From Werner Chemistry to the Greasy Kid Stuff

Transition metals are accrued to high levels by all cells and 30% of genes in most genomes encode metal-dependent proteins. Management of the cellular metallome involves specific transporter as well as *metallochaperone* and *metalloregulatory* proteins that conduct metal cofactors to appropriate intracellular targets or sense metals and regulate discrete processes like transcription, translation and cell division. Metal occupancy in these factors mediates a diverse array of cellular decisions including cell cycle control and differentiation in eukaryotes and activation of pathogenicity in prokaryotes. Recent structural and biophysical studies reveal molecular mechanisms for transducing these signals and the extreme thermodynamic sensitivity of these metal-responsive molecular switches. While steady-state concentrations of free copper and zinc ions are generally quite low in the cytosol, transient increases are seen in signaling events and in specialized compartments. Unexpectedly, we have found that stepwise fluctuations in zinc concentration are also required for maturation and function of germ cells across the tree of life. The best understood of these mechanisms are found in mammalian egg and sperm cells at the time of fertilization and in the earliest steps of embryo development. Single-cell x-ray fluorescence microscopy, LA-ICP-TOF-MS, and STEM-EDS studies reveal that billions of zinc atoms per cell undergo translocation, including events known as "zinc sparks," before the embryonic development can proceed. We find that zinc, and now manganese, are released from thousands of compartments which contain, on average, millions of metal ions (***Nature Chemistry,*** 2015 and 2021). These newly discovered inorganic fluxes, metalloregulatory receptors, and metal-trafficking mechanisms constitute an emerging level of information transfer in biological signaling networks. Studies of this kind are revealing targets for development of new diagnostic and therapeutic interventions in health and disease.

MEET THE SPEAKER

Matthew Rosseinsky studied Chemistry at the University of Oxford, receiving a B.A. in 1987 and D. Phil. in 1990. He then moved to AT&T Bell Laboratories in Murray Hill, New Jersey, where he was a Postdoctoral Member of Technical Staff. In 1992, he returned to Oxford as a Lecturer in Inorganic Chemistry and Student (Fellow) of Christ Church. In 1999, he moved to the University of Liverpool as Professor of Inorganic Chemistry.

Professor Rosseinsky has been awarded the Harrison Memorial Prize (1991), Corday-Morgan Medal and Prize (2000), and Tilden Lectureship (2006) of the Royal Society of Chemistry (RSC). In 2009, he received the inaugural De Gennes Prize from the RSC—a lifetime achievement award in materials chemistry that is open internationally and is one of the RSC's three premier awards. He was Distinguished Lecturer in Inorganic Chemistry, Northwestern University (2006), Zernike Lecturer, Rijksuniversiteit Groningen (2009), and won the C.N.R. Rao Award of the Chemical Research Society of India in 2010. In 2017, Rosseinsky was Muetterties Lecturer at the University of California, Berkeley and the Lee Memorial Lecturer at the University of Chicago.

Matthew Rosseinsky was elected to the Royal Society in 2008 and in 2011 was awarded the Hughes Medal of the Royal Society "for his influential discoveries in the synthetic chemistry of solid state electronic materials and novel microporous structures." In 2017, he was awarded the Davy Medal of the Royal Society "for his advances in the design and discovery of functional materials, integrating the development of new experimental and computational techniques." He is currently a Royal Society Research Professor (since 2013).

Professor Rosseinsky works on the synthetic chemistry, design, and discovery of solid state materials, which have applications ranging from catalysis to superconductivity. A current focus is the development of new methods of identifying functional materials with an emphasis on the integration of experiment with computational methods.

BASOLO RECEPTION

Appetizer: Caesar Salad

Entrée selection (choice of 1):
- New York Strip Steak (beef)
- Salmon Wellington (fish)
- Quinoa Stuffed Peppers with mushroom and zucchini in marinara sauce (vegetarian/gluten free)

Dessert: Chocolate lava cake

Dinner Cost
$48 per person

Hilton Garden Inn
1818 Maple Avenue
Evanston, IL 60201

Registration
https://chicagoacs.org/meetinginfo.php?id=185&ts=1663639043

chicagoacs@ameritech.net

847-391-9091 (Chicago ACS office)

https://planitpurple.northwestern.edu/event/517785

kelly.levander@northwestern.edu

Deadline to Register
6 PM on October 6, 2022

TALK ABSTRACT

Discovery Synthesis of Inorganic Functional Materials in the Digital Age

The need for new materials to tackle societal challenges in energy and sustainability is widely acknowledged. As demands for performance increase while resource constraints narrow available options, the vastness of composition, structure and process parameter space makes the apparently simple questions of where to look for and how to then find the materials we need a grand challenge to contemporary physical science.

This talk will emphasise that discovery synthesis of new inorganic materials is at the extreme forefront of this endeavour. Using the functional properties of thermal conductivity and solid state transport of lithium ions, I will illustrate how expanding our understanding of how to arrange atoms for function leads to outperformance.

The talk focuses on the experimental synthesis of new materials (i.e., materials without structural precedent in the databases). It will illustrate with recent examples how decision support for the expert synthesis researcher can increasingly be provided with digital tools, based on physical models and also on machine learning from well-curated experimental data.

The aim is to engage those interested in inorganic chemistry, materials chemistry, condensed matter physics, materials science and generally in digital routes to predict and understand materials.

LETTER FROM THE CHAIR

Sustainability in a Changing World– ACS in Chicago!

For the first time since 2007, the ACS held its National Meeting here in Chicago. With a theme of "Sustainability in a Changing World," the Fall 2022 meeting was held on August 20–25 at McCormick Place. The Chicago Section had the privilege (and responsibility) to host the meeting. More than 9,700 persons attended in-person, and more than 2,000 attended virtually. Our National Meeting Team organized and carried out a well-received set of activities and contributions for the attendees. Here are some highlights:

ChemLuminary Awards

The Chicago Section won two ChemLuminary Awards for its achievements in 2021:

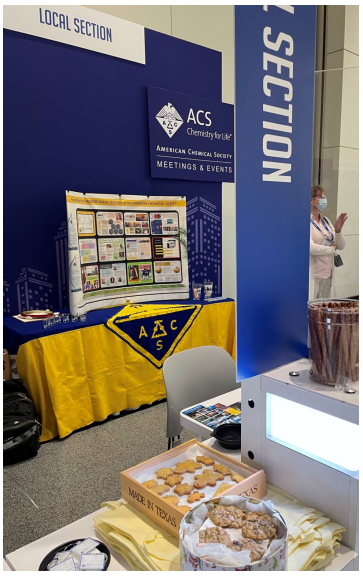
- Outstanding American Association of Chemistry Teachers (AACT) Support
- Outstanding Community Involvement in CCEW

Please congratulate **Sherri Rukes** and her co-volunteers for their exceptional work on these activities! The Chicago Section was also recognized, along with 11 other local sections who formed the Eastern US YCC Partnership, for its contribution to earn the Outstanding or Creative Local Section Younger Chemists Committee Event.

Chemical Bulletin Special Issue

Amber Arzadon and Irene Cesa prepared an excellent special issue of *The Chemical Bulletin* that contained a series of articles of interest not only to members of the Chicago Section but also to ACS members from around the country and the world. There were articles about the 1920 ACS National Exposition in Chicago, the 95th anniversary of the ACS Women Chemists Committee, Local Initiatives for a Sustainable Future, Chicago Sites Inspired by Women, students' reflections on their Project SEED experiences, a catalog of Safety First articles, and a selection of ChemShorts for Kids articles, all intended to be of interest to a broad national audience. The issue can be found at: https://chicagoacs.org/images/downloads/Chemical_Bulletin/2022_09_chembull.pdf

Local Section Counter



At the registration area, **Peggy Schott, Ken Fivizzani and Nicolas (Nic) Gerst** organized a well-functioning and busy "welcome counter." They recruited more than a dozen volunteers from among local students and Board members who helped attendees with their questions about local attractions, restaurants, and meeting details. Nic baked some excellent cookies for the counter as well! Bookmarks commemorating the section and providing web links to our website and the special issue of *The Chemical Bulletin* were available (we have plenty more!), along with lapel pins, refrigerator magnets, and items from the national Women Chemists Committee were all provided as giveaways for attendees. A rotating banner advertising the section and the welcome counter appeared on the ACS website and the ACS Meetings app.

Local section counter volunteers Penghao Li, Bethel Shekour, Brittney Williams, and Nic Gerst.

LETTER FROM THE CHAIR

Sustainability in a Changing World – ACS in Chicago!

(Continued from page 4)

Thematic Events
A PowerPoint presentation about Local Initiatives for a Sustainable Future at several Chicago-area colleges, universities, national laboratories, and industry was run on a continuous loop at the Welcome Counter. The information for the presentation was compiled by **Dave Crumrine and Irene Cesa.**

Social Event
Margy Levenberg organized a wonderful reception, "Meet the Gibbs Medalists," on Monday evening, August 22nd, at the Hyatt Regency McCormick Place Hotel. Ten past Gibbs Medalists and Gibbs Jurors attended, along with several ACS national leaders and approximately 75 attendees. The highlight of the reception was Maria Bakalis, a local educator who appeared as Mme. Marie Curie and mingled with all the guests. **Amber Arzadon** prepared special posters for the reception to commemorate Gibbs Medalists and highlight the medalists in attendance.

Gibbs Medalists at the reception: Joseph Francisco (2022), Cynthia Burrows (2018), Zhenan Bao (2020), Sharon Hammes-Schiffer (2021), Mark Cesa (Section Chair), Maria Bakalis as Marie Curie (1921), Tobin Marks (2001), John Hartwig (2015), Maurice Brookhart (2010), and Sylvia Ceyer (2007).

Outreach Events
Sherri Rukes worked with the ACS Committee on Community Activities on the ACS Kids Zone Presidential Outreach Event that was held at Navy Pier on Saturday, August 20. Many local section volunteers helped organize and participated in the event. Also, Sherri and her colleagues organized a scavenger hunt for attendees to find items of interest to chemists within the national meeting and in the city of Chicago! Clues were posted on the ACS Meetings App and winners received prizes at the Welcome Counter.

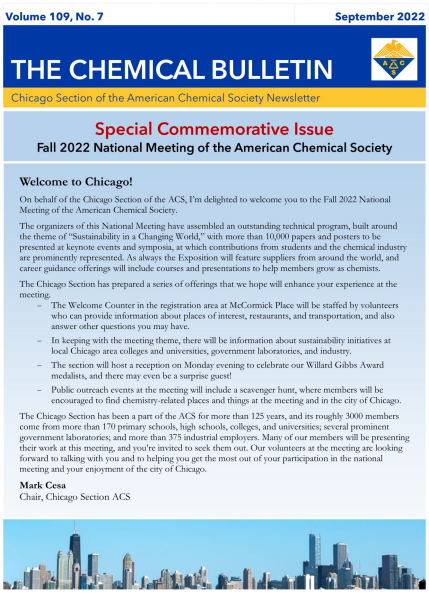
Recognition for Undergraduates
Bob Chapman presented certificates of recognition from the Chicago Section to well over 120 students who presented posters on their research at an in-person session on Sunday, August 21, and at a virtual poster session on Monday, August 22.

Please join me in thanking all of our volunteers on the National Meeting Team: Peggy Schott, Ken Fivizzani, Matt Van Duzor, Nicolas Gerst, Amber Arzadon, Irene Cesa, Margy Levenberg, Sheri Rukes, Avrom Litin, Dave Crumrine, Mike Koehler, and Tim Marin; all of the volunteers who helped with ACS Kids Zone, the scavenger hunt, the reception, and the Welcome Counter. Special thanks as well to ACS Staff support persons who guided us in organizing our events.—MARK CESA

Bob Chapman (left) presenting certificates to students at the Undergraduate Research Poster Session.

Chicago Connection

Chicagoland-area members were excited to attend the Fall ACS meeting in their local section this year. National meetings are the perfect opportunity to collaborate and network with scientists from all over the world. From hosting a welcome desk and Gibbs-themed reception to publishing a commemorative issue of *The Chemical Bulletin*, our volunteers shared local information with the attendees.



Volume 109, No. 7 September 2022

THE CHEMICAL BULLETIN

Chicago Section of the American Chemical Society Newsletter

Special Commemorative Issue

Fall 2022 National Meeting of the American Chemical Society

Welcome to Chicago!

On behalf of the Chicago Section of the ACS, I'm delighted to welcome you to the Fall 2022 National Meeting of the American Chemical Society.

The organizers of this National Meeting have assembled an outstanding technical program, built around the theme of "Sustainability in a Changing World," with more than 10,000 papers and posters to be presented at keynote events and symposia, at which contributions from students and the chemical industry are prominently represented. As always the Exposition will feature suppliers from around the world, and career guidance offerings will include courses and presentations to help members grow as chemists.

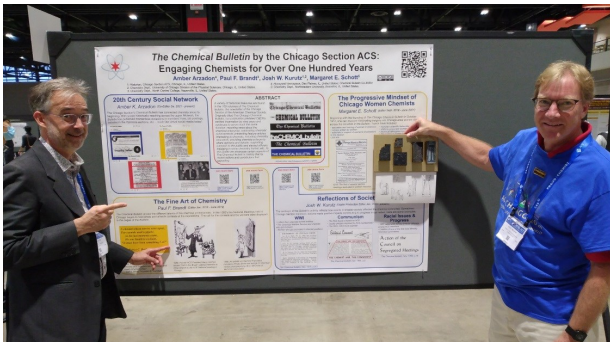
The Chicago Section has prepared a series of offerings that we hope will enhance your experience at the meeting.

- The Welcome Counter in the registration area at McCormick Place will be staffed by volunteers who can provide information about places of interest, restaurants, and transportation, and also answer other questions you may have.
- In keeping with the meeting theme, there will be information about sustainability initiatives at local Chicago area colleges and universities, government laboratories, and industry.
- The section will host a reception on Monday evening to celebrate our Willard Gibbs Award medalists, and there may even be a surprise guest!
- Public outreach events at the meeting will include a scavenger hunt, where members will be encouraged to find chemistry-related places and things at the meeting and in the city of Chicago.

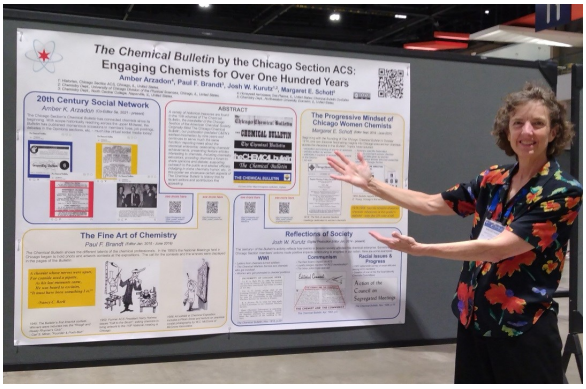
The Chicago Section has been a part of the ACS for more than 125 years, and its roughly 3000 members come from more than 170 primary schools, high schools, colleges, and universities; several prominent government laboratories; and more than 375 industrial employers. Many of our members will be presenting their work at this meeting, and you're invited to seek them out. Our volunteers at the meeting are looking forward to talking with you and to helping you get the most out of your participation in the national meeting and your enjoyment of the city of Chicago.

Mark Cesa
Chair, Chicago Section ACS

Numerous local section members presented posters and talks at the meeting. Current and past editors of the *Bulletin* presented the poster titled "*The Chemical Bulletin* by the Chicago Section ACS: Engaging Chemists for Over One Hundred Years." It described the rich history of the Chicago ACS newsletter. Josh Kurutz formatted the poster using a simple, modern layout that included QR codes to obtain more detailed information (https://chicagoacs.org/22fall_poster_bulletin).



Josh Kurutz and Paul Brandt presenting their poster.



Margaret Schott takes her turn presenting the poster.

The poster covered four topics:

- The Progressive Mindset of Chicago Women Chemists by **Margaret Schott** (https://chicagoacs.org/22fall_poster_bulletin progressivewomen)
- 20th Century Social Network by **Amber Arzadon** (https://chicagoacs.org/22fall_poster_bulletin-20thcenturysocial)
- The Fine Art of Chemistry by **Paul Brandt** (https://chicagoacs.org/22fall_poster_bulletin-art)
- Reflections of Society by **Josh Kurutz** (https://chicagoacs.org/22fall_poster_bulletin-reflections)

We would like to highlight the election information on pages 7 and 8. Every vote counts, so please don't forget to cast your vote. If you are not on our 2023 slate but would like to get involved, you can volunteer to be a 2023 committee member or chair. The section is always looking for new voices and perspectives. Please visit the following web page to volunteer: https://chicagoacs.org/Volunteer.

—AMBER ARZADON AND IRENE CESA

Chicago skyline at night.

ELECTION

2023 Chicago ACS Election

Election time is just around the corner and we are pleased to share the following slate of candidates developed by the Nominations Committee for the Chicago Section. The election for Chicago ACS officers will begin Saturday, October 15th, and will run through Wednesday, November 9th. Members will be notified by email or postcard with specific details about how to participate and vote in the section election. Election winners will be notified by email and the results will be announced on our website as well as at our monthly meeting in November. New officers will take office in January 2023 with the first Board of Directors meeting of the new year. Please contact the Chicago Section Office at office@chicagoacs.org if you do not receive your election materials, which will be sent by email from AssociationVoting.com and will contain your election-only password.

Complete information about each candidate may be found on our section website. Statements from candidates for Chair-Elect appear on the following page. **Please remember to VOTE!**

2023 ELECTION SLATE

Chair-Elect
Anita Mehta
Vivian Sullivan

Vice Chair
Paul Brandt
Michael Koehler

Secretary
Amy Balija*

Treasurer
James Kiddle
Michael Morello*

Directors
(seven to be elected)
Aistė Baumhardt
Sharada Buddha*
Irene Cesa
Nicolas Gerst*
Katie Gesmundo*
Vince Hradil
Meilin Huang
Russ Johnson
Fran Kravitz
Ilana Lemberger
Avrom Litin
Jana Markley*
Raelynn Miller
Rebecca Sanders
Andrea Twiss-Brooks

Councilor
(one to be elected)
Ken Fivizzani
Michael Koehler

Alternate Councilor
(four to be elected)
Omar Farha*
Ilana Lemberger*
Milt Levenberg*
Avrom Litin*
Margaret (Peggy) Schott

*Incumbents

Memorial bookmarks created for ACS Chicago 2022 by Peggy Schott, with central image designed by Aistė Baumhardt.

ELECTION

2023 Chair-Elect Candidate Statements

Anita Mehta

It is truly an honor to be one of two candidates for Chicago ACS Section Chair-Elect, and I write to ask for your input and your consideration in the ACS election this fall.

I am the President and CEO of Chicago Discovery Solutions based in Plainfield. I bring to the ACS Chicago community over 30 years of experience working in industrial chemistry research and development, culminating in 24 US-issued patents and 26 publications in peer reviewed journals. In addition to leading pioneering research, I have chosen to share my love of chemistry with students by teaching part time at major universities such as Delhi University, Manchester University, and our very own Northwestern University and Chicago-area community colleges. I have served the Chicago Section of ACS as Director and as Co-chair of the Women Chemists Committee.

The cause close to my heart is to improve the public's perception of Chemistry. The average person sometimes does not appreciate the benefit of chemical development, while the negative image of chemicals in cosmetics and household items, coupled with decreased government funding, can disillusion younger generations to select other professions. Indeed, enrollment numbers for chemistry have declined in recent years. In this aspect I greatly admire the efforts of our Chicago section to organize and demonstrate Chemistry in the Illinois State Fairs by running a few simple experiments to make chemistry accessible to the public and spark an interest in it.

If elected to the role of Chair-Elect of the Chicago ACS Section, I will maintain continuity by promoting our section's programs, activities, and community outreach, and growing the section's membership. In addition, I will lay extra emphasis on promoting Chemistry to public and high school students. I look forward to working closely with our section's outstanding volunteer leaders, including the Board of Directors and the Division and Committee Chairs.

Thank you for your support.

Vivian Sullivan

If elected to the role of Chair-Elect of the Chicago ACS Section, I will support our section's programs, activities, and community outreach events as they continue to grow in scope and impact. I will work closely with the section officers on new initiatives for the section's growth in membership and impact. I look forward to working closely with our section's outstanding volunteer leaders, including the Board of Directors and the Division and Committee Chairs.

As Chair-Elect, I will participate to the best of my ability in supporting our many outreach and membership activities. As we continue to take the lessons in blending remote and in-person experiences and offering a broad mix of opportunities to our members, we will build on our rich history as a key component of the Chicago area chemistry community. I believe we can also expand our section's impact by fostering contacts with other local scientific organizations.

I have worked in a national laboratory for over twenty years as an analytical radiochemist and program manager. I hope my mix of laboratory and administrative experience will bring a unique skill set that will be of use to the Chicago ACS Section.

Additionally, since 1999 I have been a member of the local chapter of Iota Sigma Pi, a national women's chemistry honor society. With Iota Sigma Pi, I have served as Vice President, Secretary, Membership Affairs Coordinator and President of our local chapter. I have served the Chicago ACS Section as a Director and as a member of the by-laws committee, and I participated in the update of the election administration process.

Report from the Fall 2022 ACS Council Meeting

The Fall 2022 National Meeting of the ACS was held in person in Chicago and virtually, August 21–25, 2022. The theme of this meeting was "Sustainability in a Changing World." Dr. Angela K. Wilson, ACS President, presided over the Hybrid Council Meeting on August 24, 2022. The Chicago Section was represented at Council by the following nine councilors: Paul Brandt (Public Relations and Communications), Mark Cesa (International Activities), David Crumrine (Constitution and Bylaws), Ken Fivizzani (Committee on Economic and Professional Affairs), Russell Johnson (International Activities), Fran Kravitz (Ethics), Josh Kurutz, Margy Levenberg (Meetings and Expositions), and Tim Marin (Nomenclature, Terminology and Symbols).

Election Results: By electronic ballot, the Council elected Raychelle Burks, Anne M. Gaffney, Will E. Lynch, and Frankie K. Wood-Black for three-year terms (2023–2025) on the Council Policy Committee (CPC). Lydia E.M. Hines was elected to serve through 2023. By electronic ballot, Council elected William F. Carroll, Jr., Ella L. Davis, Carmen Gauthier, Thomas H. Lane, and Jason Richie for three-year terms (2023–2025) on the Committee on Committees (ConC). By electronic ballot, Council elected Michelle V. Buchanan, Alan B. Cooper, Kelly M. Elkins, Ellene Tratras Contis, and Kathryn E. Uhrich for three-year terms (2023–2025) on the Committee on Nominations and Elections (N&E).

Committee Reports and Key Actions: Council Policy Committee (CPC) reported that both Council meetings in 2023 will be held in a hybrid manner, similar to what councilors experienced in Chicago. On the recommendation of the Committee on Committees (ConC) and with concurrence of CPC, Council approved the continuation of the Committee on Public Relations and Communications (CPRC). On the recommendation of the Committee on Divisional Activities (DAC) and with concurrence of CPC, Council approved the Petition to Amend the Duties of the Committee on Divisional Activities, providing greater authority to step in and assist divisions with inactive Executive Committees. On the recommendation of the Committee on Local Section Activities (LSAC) and with CPC concurrence, Council approved the Petition for a change in Section Name from the Northeast Tennessee Section to the Tennessee-Virginia Highlands Local Section. On the recommendation of the Committee on Membership Affairs (MAC) and with CPC concurrence, Council approved the Petition to Amend the Application and Dues Process for Corporation Associates, allowing Corporation Associates to set fees based on a sales revenue model (formerly based on number of chemists employed).

Council Special Discussion: President Wilson introduced and led a special discussion on "ACS for the Future." She sought councilor input on positive initiatives, programs or events that would greatly benefit ACS members or ACS at large. Three specific questions were posed to Councilors for their input and suggestions: 1) What can be accomplished to enhance the ACS experience? 2) Why (or how) do you think it would make a difference? 3) Who would be tasked with leading this effort (e.g., a section, committee, division, or other)? Councilors provided their ideas and thoughts, and relevant Society units will receive this input within the next several weeks.

Meetings and Expositions: As of August 24, 2022, the Fall ACS National Meeting had 11,619 registrants, (9,355 in-person and 2,264 virtual). The Chicago Section will be reimbursed at least $4677.50 for our meeting expenses ($5000 maximum reimbursement). If you have any questions or comments about the above information, please contact me or one of your other councilors. You may contact me at kfivizzani@wowway.com.—KEN FIVIZZANI

Safety and Sustainability in Hood Operations

Chemical fume hoods are a defining feature of modern chemical laboratories and an essential engineering control to prevent exposure to toxic and other hazardous chemicals. Balancing the essential safety function of fume hoods against their energy consumption is an important goal for institutions seeking to make their operations more efficient. This **Safety First!** report describes recent progress and efforts currently underway to reduce energy usage due to laboratory ventilation and hood use.

As noted in the special feature on local sustainability initiatives in the September issue of *The Chemical Bulletin*, the University of Chicago has adopted a comprehensive, data-driven Sustainability Plan to improve operations across its campuses. Its top priority in this area is to reduce greenhouse gas (GHG) emissions, and the university has set an ambitious target of reducing overall GHG emissions by 50% by 2030. With laboratories at the University of Chicago comprising only 10% of building area but accounting for 38% of building energy use, reducing energy usage in laboratories is an important part of the plan to reduce GHG emissions. Laboratory ventilation and fume hoods comprise 60–75% of electricity use in chemistry laboratories. Most of the energy cost of fume hoods comes from heating or cooling the intake air when hoods are running. (A typical hood may exhaust up to 1000 cubic feet of conditioned air per minute when running.)

Short term energy savings at the University of Chicago rely on behavioral changes through a robust "Shut the Sash" campaign aimed at closing sashes on laboratory fume hoods when not in use. This very simple measure can reduce overall energy use in chemistry laboratories by 5%. Closing the sash to reduce airflow in a hood requires a variable air volume (VAV) system that adjusts the volume of air taken from the enclosure when it's not being used and the sash is closed.

A VAV hood that operates at a minimum exhaust volume with the sash closed may reduce the rate of intake air required to be heated or cooled by a factor of five. Collaborative teams involving students, faculty and staff at the University of Chicago have constructed interactive online tools to help laboratory workers compare annual ventilation costs based on the size and sash height of fume hoods and their face velocity. Users can convert the data to metric tons of CO_2 equivalents released due to electricity use and visualize how changing parameters can influence GHG emissions.

For institutions looking at longer-term solutions for reducing energy consumption due to laboratory ventilation, options include adopting more efficient hood designs, such as reduced air volume (RAV) or variable air volume (VAV) control devices, installing ductless fume hoods, and using localized exhaust snorkels when and where appropriate. Existing traditional or constant air volume hoods can be retrofitted with VAV devices called Venturi valves in the ductwork just above the hood enclosure. These funnel-shaped devices connect to a controller that monitors air flow at the hood face and the position of the sash. When the sash is lowered, the valve narrows, reducing the volume of air that is exhausted to the outside. Another alternative for reducing energy consumption due to laboratory ventilation requirements is to switch to filtered, ductless fume hoods. Ductless hoods feature integrated filters that can be filled with a variety of filter media to capture and remove contaminants. While ductless hoods cost more initially than conventional fume hoods, their installation costs are much lower, they require substantially less "replacement" air, and they can be relocated if needed. Switching to ductless hoods requires careful hazard and risk analysis of the nature and amount of chemicals that will be used to ensure effective filtration.

—IRENE CESA

Teacher Excellence Award

The **2022 Teacher Excellence Award** was presented to **Katherine Goebel** of Buffalo Grove High School at the ACS Chicago Section Education Night meeting on September 16, 2022, at Benedictine University. The award recognizes Ms. Goebel for outstanding contributions to and support for the teaching of high school chemistry in the Chicago Section.

Russ Kohnken, Angel Johnson, Katherine Goebel, and Mark Cesa.

The awardee provided the following statement about her teaching philosophy:

> "Model imperfection. Wanting/being perfect doesn't serve anyone in the learning community because humans are infinitely variable. Instead, be authentically vulnerable in your failures to be better than today. Share what you know and learn, welcome differences in opinion as a chance to not only keep yourself accountable, but also as a way to grow your practice. Do it humbly for your students, for your fellow educators, and for your community. Have fun creating and trying new things, together with others. Evaluate without judgment, but instead with the goal to be better, so that students can share that vision, and through that experience, find joy in the process of learning. Appreciate and accept your teammates' super powers and areas of improvement as your own. Develop a community of growth and influence that can affect change by supporting and building others up."

Congratulations, Katherine!

2022 CAS Future Leaders

The Chicago ACS Section is pleased to recognize two of its members who were recently named CAS Future Leaders by the National ACS. Now in its 12th year, the Future Leaders program, which is sponsored by the CAS Division, provides opportunities for PhD students and postdocs to gain valuable experience and leadership skills in the chemical information sciences.

The group of 17 chemists from across the world who achieved CAS honors in 2022 included two members of the Chicago ACS Section, Dr. Progna Banerjee of Argonne National Laboratory and Dr. Liang Feng of Northwestern University. Together with the other members of their 2022 Future Leaders cohort group, Dr. Banerjee and Dr. Feng visited CAS headquarters in Columbus, Ohio in August before attending the ACS Fall 2022 National Meeting in Chicago, August 21–25.

Progna Banerjee

Liang Feng

Dr. Banerjee received her Ph.D. in physics and nanomaterials chemistry at the University of Illinois Urbana-Champaign in 2018 and is currently conducting postdoctoral research at Argonne National Laboratory, where she is studying "exotic physical phases for use in quantum information processing and batteries."

Dr. Feng obtained his Ph.D. in chemistry at Texas A&M University in 2020 and is currently carrying out postdoctoral research at Northwestern University. Dr. Feng's research is focused on the development of new porous materials for gas storage and separation catalysis, and biomedicine, and learning about the adsorption mechanisms for these materials.

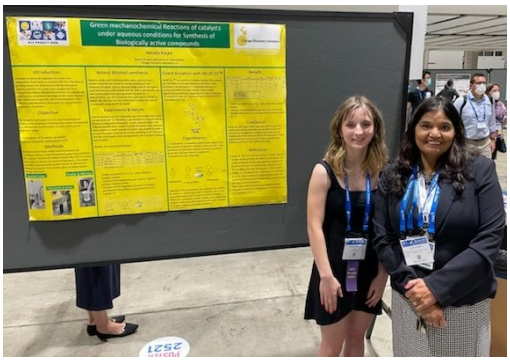
Congratulations from the Chicago ACS!

AWARDS

Project SEED Scholarship Winner

The Chicago ACS is pleased to announce that Natalia Klejka has been awarded the Chicago Section Project SEED Scholarship. Natalia participated in the Project SEED Program conducting research with Anita Mehta at Chicago Discovery Solutions in Plainfield, IL. Natalia's project was green mechanochemical reactions of catalysts under aqueous conditions for the synthesis of biologically active compounds.

Natalia will receive a $6000 scholarship from the Chicago Section Project SEED Scholarship Fund! The scholarship will be awarded over the course of four years ($1500/yr) and requires the recipient to take a science class each year.



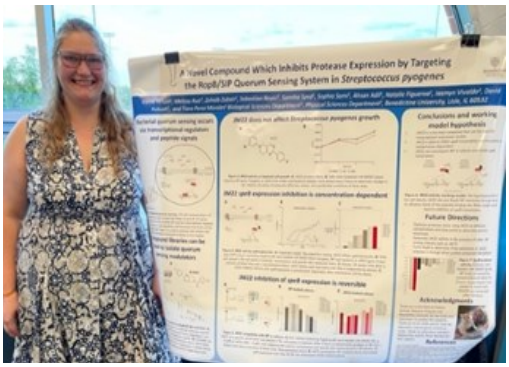
Natalia Klejka and Anita Mehta at the ACS Fall 2022 Meeting.

Congratulations from the Chicago ACS!

Students Present Undergraduate Research

A return to in-person meetings has also led to return of a Chicago ACS tradition that had been on hiatus for two years due to the pandemic. At the recent Education Night meeting held September 16, 2022 at Benedictine University, the College Education Committee hosted a poster session for undergraduate students to present their research. Three students participated in this pre-dinner activity, and they were joined by the 2022 high school Project SEED intern.

The College Education Committee is pleased to announce that Ms. Kierra Pendill of Benedictine University won the prize for the Best Poster presented at the Education Night meeting. Ms. Pendill was awarded a $50 Amazon Gift Card for her presentation entitled "A Novel Compound Which Inhibits Protease Expression by Targeting the RopB/SIP Quorum Sensing System in *Streptococcus pyogenes*."



Kierra Pendill of Benedictine University.

The College Education Committee, chaired by Bob Chapman, thanks our host for the evening, Dr. Tim Marin, and Benedictine University for their hospitality, and the Chicago Section Board for continued support of this important initiative.

Congratulations, Keira!

Scholarship exam winners with their parents and teachers being honored at Education Night.

OUTREACH

State Fair Science Tent

The Chicago Section completed another successful "Illinois Sections of the ACS at the Illinois State Fair" event. As they have every year since 2004, with the exception of 2020, when the Fair was closed due to COVID, the Illinois Sections of the ACS banded together to host a science outreach tent at the Illinois State Fair. This year 54 volunteers, including many students from Illinois colleges and universities, signed up to participate.

The ACS Fall National Meeting scheduled for Chicago this year, starting when the Fair was still open, represented an unusual circumstance for many volunteers from the Chicago Section as well as other local sections in Illinois. With so many potential volunteers planning to attend the National Meeting, the Illinois sections received permission from the Fair liaison to close the tent before the last weekend of the Fair due to inadequate staffing.

About 6,000 visitors came through the Science Tent this year to enjoy the demonstrations and hands-on activities. With the help of Paul Brandt and his co-worker Bruce Spitzer, the ACS local sections were able to offer continuing education (CPDU) credits to every Illinois teacher that visited the tent.

Please visit the State Fair Committee website at https://chicagoacs.net/statefair/ and plan now to join us next year at the Fair!

–FRAN KRAVITZ AND MILT LEVENBERG

NATIONAL MEETING

Scavenger Hunt

Sherri Rukes, chair of the Chicago Section Outreach Committee, created a chemistry-themed scavenger hunt for the ACS National Meeting in Chicago in August 2022. The scavenger hunt, which was hosted on the National ACS Meetings app and the Chicago ACS website, provided chemistry-based clues for 21 city landmarks. Winners of the social media-hosted activity received gift cards and Chicago ACS promotional items. Can you identify these famous sites? (Photos at the bottom of the page.)

- This Chicago icon was created from 168 substitutional alloy plates, mainly Fe with Cr, Ni, Mn, Mo as well as Si, N_2, P, C and S. The alloy is used in aerospace structures and architectural artwork. Heavy polishing leaves no visible seams.
- This building is composed mostly of the minerals calcite and aragonite, which are different crystal forms of calcium carbonate ($CaCO_3$) obtained from a quarry near Lemont. The building survived the Great Chicago Fire of 1871.
- On December 2, 1942, scientists at this school produced the world's first self-sustaining nuclear chain reaction beneath the West Stand of the school's athletic stadium. The experiment, crucial to the control of nuclear fission, drove a rapid nationwide expansion of the Manhattan Project.
- In May 1894, these bronze figurines took their place on pedestals in front of the museum. In 2022, the figurines were removed to be cleaned—they were high-pressure steamed, checked for corrosion, and given a hot wax.

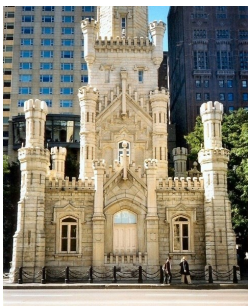


Photo Credits: https://www.pexels.com/photo/cloud-gate-1569012/; https://www.architecture.org/learn/resources/buildings-of-chicago/building/chicago-water-tower/; www.gettyimages.com/photos/chicago-pile-1; Edward Kemeys, Lion (One of a Pair, South Pedestal), 1893, Art Institute of Chicago. Reproduced with permission under Creative Commons Zero Designation.

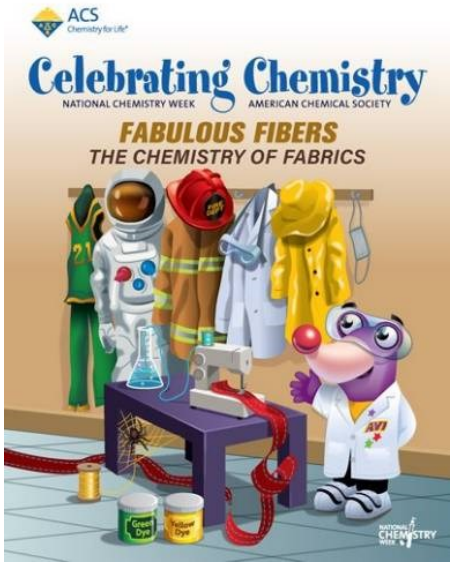
National Chemistry Week

Do natural and synthetic fibers take up color with the same intensity when they are dyed with different substances? Are some fabrics naturally more water-resistant than others? What kinds of fabrics stain most easily? How do stain removers work? Explore these questions and many more during this year's celebration of **National Chemistry Week,** which will run from October 16–22. The theme, "Fabulous Fibers: The Chemistry of Fabrics." offers lots of colorful and interesting opportunities to discover how chemistry affects our daily lives.

The ACS and AACT have compiled a wide-ranging list of resources and hands-on activities for teachers at all grade levels, from K–5 through middle and high school, to enrich their lesson plans. Relevant topics include chemical structure and chemical bonding, oxidation and reduction reactions, and hydrophilic versus hydrophobic properties.

Download a complimentary issue of Celebrating Chemistry, available in English and Spanish, to review the many interesting articles and activities related to this year's National Chemistry Week theme.

- Investigate a nature-inspired invention, hook-and-loop tape
- How to sweat...and not stay wet
- Put your fabric to the test
- Fabrics from the land and the lab
- Marvelous masks
- Focus on fiber
- Dyeing to color fabric

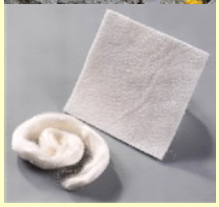


Nothing is more fun for students than creating their own tie-dye T-shirts or other clothing. Check out these great sites for inspiration and ideas!

https://www.parents.com/fun/arts-crafts/kid/tie-dye-with-kids/

https://www.romper.com/p/how-to-tie-dye-with-kids-in-the-safest-possible-way-22901795

From Seaweed to Natural Fibers for Healing Wounds



Sodium alginate is a natural polysaccharide (an ionic polymer) obtained from kelp and seaweed. It is also the principal ingredient in Gaviscon, an over-the-counter drug used to treat heartburn and indigestion. Adding a solution of sodium alginate to calcium chloride gives calcium alginate, which precipitates in the form of smooth, insoluble, gel-like fibers. These fibers can be spun to make gauze-type dressings for burns and other chronic wounds. The fibers absorb exudate from the wounds, helping them heal, and are easily removed by washing with saline solution. See the following article in the *Journal of Chemical Education* for directions on how to do the sodium alginate demonstration and an explanation of the properties and uses of calcium alginate.

https://pubs.acs.org/doi/10.1021/ed083p574

Photo credits:
https://www.pexels.com/photo/wet-yellow-seaweed-on-rocky-shore-3719372/
https://www.winnermedical.com/alginate-dressing/

AACT RESOURCES

Learn About Mole Day

The American Association of Chemistry Teachers (AACT) will host a professional development webinar on October 12, 2022 to introduce teachers to the **Molympics.** This free event designed by high school chemistry teachers includes a variety of activities involving estimation, measurement, dimensional analysis, and problem-solving, combined with a liberal amount of fun, to learn about the mole concept. Join teacher-presenter Doug Ragan as he describes how to host a successful mole day with your students!

Visit the AACT website at https://teachchemistry.org/classroom-resources to learn more about the hundreds of free classroom resources available for middles school and high school science teachers. Resources include demonstrations, lab activities, videos, animations, and simulations on every topic in the middle school physical science and high school chemistry curriculum. Sort resources by grade level, topic, and type of activity to quickly locate lesson ideas for your classroom.

CHEMSHORTS FOR KIDS

Floating People

This is a fun little experiment that you can try with dry erase markers.

Materials

Dry erase markers
Plate or container with a smooth, nonporous surface
Water

Notes: Using a dry-erase marker on porous materials such as fabric will leave permanent stains that will NOT wash off. Do not use Sharpies® or other permanent markers in this activity. Those inks can only be removed with rubbing alcohol.

Experiment

Draw a figure on the surface of a plate or other nonporous container using a dry erase marker. Slowly pour some water onto the plate but not directly onto the drawing. Gently swirl or rotate the plate until the water eventually reaches the drawing. Observe what happens to the marker image.

What's happening?

You should see the drawing pull away or release from the container and float on the surface of the water. A dry erase marker contains pigments(s), alcohol to dissolve the pigment, and a "binding agent" consisting of an oily silicone polymer. The alcohol in the marker ink quickly evaporates, leaving behind the oily polymer and the colored pigment. Water does not mix with the oily polymer and thus will not dissolve it.

Also, since the polymer is less dense than water, the marker drawing floats on the water surface. If you try this activity with a permanent marker, the images will not release from any surface into water. The binding agent in permanent markers is an acrylic polymer that is not soluble in water but also does not have the "oily" character that silicone does.

Extension

Try making an alphabet soup and move the letters around to spell different words! Try to pick up your drawing and see what happens. Can you put it back?

References

https://www.scientificamerican.com/article/make-your-drawings-float/

https://www.thebestideasforkids.com/floating-dry-erase-marker-experiment/

To view past "ChemShorts for Kids" activities, go to: https://chicagoacs.org/ChemShorts

—PAUL BRANDT

FABULOUS FiBERS

THE CHEMISTRY OF FABRICS

OCTOBER 16–22, 2022 • #NCW

NATIONAL CHEMISTRY WEEK

FREE HANDS-ON SCIENCE COMMUNITY EVENT

Join the Chicago Section of the American Chemical Society for a free community event for National Chemistry Week and celebrate the importance of chemistry in everyday life! Learn about this year's theme, Fabulous Fibers: The Chemistry of Fabrics, with 15 exciting hands-on activities. See: Are you Stronger than Cotton? Also, Gaviscon Snakes, Growing Marshmallow, Dyeing with Bugs, A Closer Look at Velcro, Dyeing Different Types of Fabric, Tie Dyeing, Stain Removal, Slime, and many more. Visitors will receive take-home activities and safety glasses!

When: October 15th from 11 am to 4 pm
Where: Navy Pier

Questions about the event, please contact Sherri Rukes at community@chicagoACS.org.

We hope to see you there!

ACS Chemistry for Life®
American Chemical Society

2022 NCW Illustrated Poem Contest
Fabulous Fibers: The Chemistry of Fabrics

The Chicago Local Section of the American Chemical Society (ACS) is sponsoring an illustrated poem contest for students in kindergarten through 12th grade.

Contest Deadline: October 23rd 2022

Prizes: Gift card or science pack

Contact: Sherri Rukes at community@chicagoacs.org

Winners of the Chicago Local Section's Illustrated Poem Contest will advance to the National Illustrated Poem Contest for a chance to be featured on the ACS website and to win prizes!

Write and illustrate a poem using the NCW theme, **"Fabulous Fibers: The Chemistry of Fabrics."** Your poem must be **no more** than 40 words and in the following styles to be considered:

HAIKU - LIMERICK - ODE - ABC POEM - FREE VERSE - END RHYME - BLANK VERSE

Possible topics related to the theme include:

- Natural fibers
- Synthetic fibers
- Chemical synthesis
- Polymers
- Dyeing fabrics
- Hydrophilic
- Hydrophobic
- Properties of fabrics

Entries will be judged based upon:

- Artistic Merit - use of color, quality of drawing, design, and layout
- Poem Message - fun, motivational, inspiring about yearly theme
- Originality Creativity - unique, clever and/or creative design
- Neatness - free of spelling and grammatical errors

Contest rules:

- All poems must be no more than 40 words, and in one of the following styles to be considered: Haiku, Limerick, Ode, ABC poem, Free verse, End rhyme, and Blank verse.
- Entries are judged based upon relevance to and incorporation of the NCW theme, word choice and imagery, colorful artwork, adherence to poem style, originality and creativity, and overall presentation.
- All entries must be original works without aid from others. Poems may be submitted by hand on an unlined sheet of paper not larger than 11" by 14" or scanned and sent via email. Illustrations may be created using crayons, watercolors, other types of paint, colored pencils, or markers. The illustration may also be electronically created by using a digital painting and drawing app on a computer, tablet, or mobile device.
- The text of the poem should be easy to read and may be typed before the hand-drawn or digital illustration is added, or the poem may be written on lined paper, which is cut out and pasted onto the unlined paper with the illustration.
- No clipart or unoriginal images can be used.
- Only one entry per student will be accepted; all entries must include an entry form. If the illustration is created using a digital painting or drawing app, the name of the program must be included on the entry form.
- Acceptance of prizes constitutes consent to use winners' first name, and entry for editorial, advertising, and publicity purposes.

Join the Chicago Section of the ACS to celebrate National Chemistry Week, Halloween, and the importance of chemistry in everyday life!

Learn about this year's theme, Fabulous Fibers: The Chemistry of Fabrics, with 15 exciting hands-on activities.

See: Are you Stronger than Cotton?, Gaviscon Snakes, Growing Marshmallow, Dyeing with Bugs, A Closer Look at Velcro, Dyeing Different Types of Fabric, Tie Dyeing, Stain Removal, Slime, and many more. Visitors will receive take-home activities and safety glasses! A Spooky Demonstration Show will be at 3:30 pm for all to enjoy!

When: October 29th from 11am to 4:30 pm. **Where:** Navy Pier
Demo Show @ 3:30 pm

Questions, please contact Sherri Rukes community@chicagoACS.org

We hope to see you there!

ACS Chicago Wants You – A Call For Volunteers!

Please join the Chicago Section and volunteer for our **NCW Day** at **Navy Pier** on **October 15th** and **SpookFest** at the **Pier** on **October 29th**. We are planning on having several Hands–on Chemistry Stations and many other fun things for kids of all ages. You can volunteer for part of the day or the whole day. All day volunteers will receive money for lunch. This year's theme is Fabulous Fibers: The Chemistry of Fabrics. If you say yes, Sherri Rukes will send you the information about the activities and she will bring all of the supplies. We need your help.

When: October 15th and 29th from **11 am – 4 pm**
Where: Navy Pier, Chicago

Please use the QR code to sign up. Questions - email Sherri Rukes community@chicagoacs.org

https://qr.codes/X57WKv

We hope to see you volunteer!

UPCOMING EVENTS

October 10	Articles due for the November 2022 *Bulletin* issue
October 13	Chicago Board of Directors Meeting
October 14	Basolo Medal Award Presentation and Dinner, Hilton Garden Inn (Evanston)
October 15	Chicago Section Chemistry Day (NCW) at Navy Pier, 11–4 pm
October 16–22	National Chemistry Week (NCW)
October 29	Chicago ACS at Navy Pier "Spookfest"
November 10	Articles due for the December 2022 *Bulletin* issue
November 10	Chicago Board of Directors Meeting

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