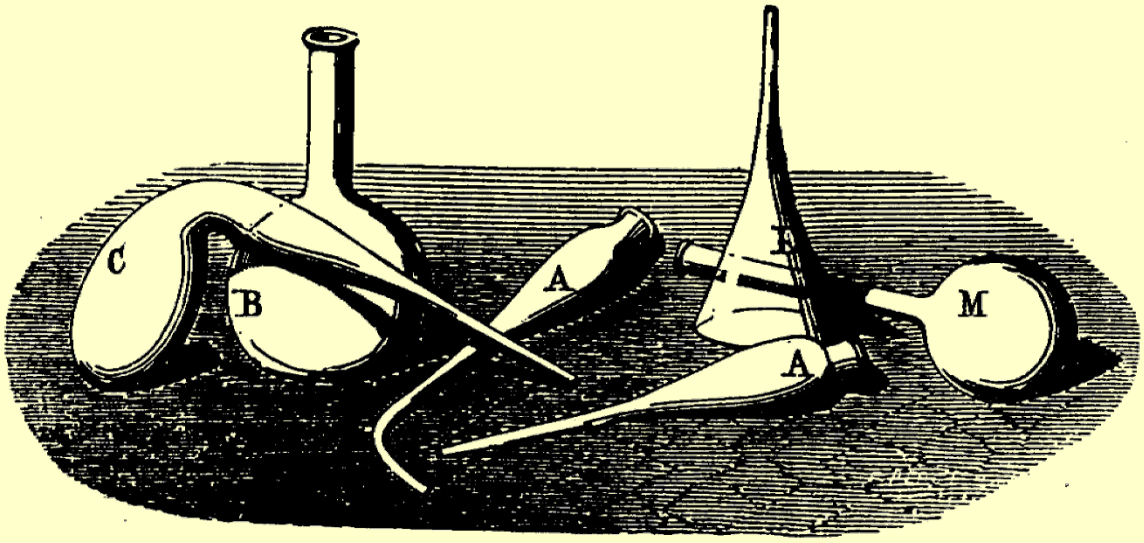
American Chemical Society

DIVISION OF THE HISTORY OF CHEMISTRY



NEWSLETTER, PROGRAM & ABSTRACTS

Fall 2025 ACS National Meeting
Washington, DC
August 17-21

Christine Hahn, Program Chair

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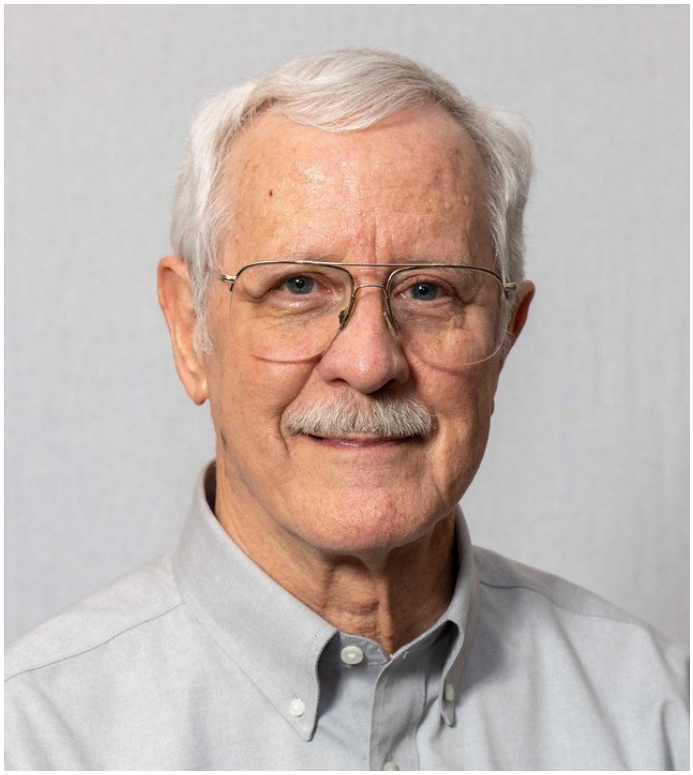
Mission Statement

The Division of the History of Chemistry (HIST) of the American Chemical Society (ACS) seeks to advance knowledge and appreciation of the history of the chemical sciences among chemists, educators, students, historians of science, and the broader public by

- Encouraging research and scholarship in history of the chemical sciences;
- Providing a welcoming environment for the discussion of history of chemistry in a variety of venues, particularly in symposia at national ACS meetings;
- Serving as a resource for chemical scientists in general, and members of the ACS in particular, who seek to understand the roots of their discipline, sub-discipline, or interdisciplinary subject;
- Recognizing major achievements from the past in the chemical sciences and the individuals who made those achievements;
- Publishing a scholarly journal in history of chemistry;
- Interacting with other organizations interested in the history of science; and
- Adding value to the ACS by helping it achieve its vision and missions.

Division Governance

Message from the HIST Division Chair



Fall 2025 will be the first national meeting with the new Fall format. There will be no divisional Sunday in-person programs, with divisional sessions beginning on Mondays. There will, however, be broader ACS programming on Sundays. Fortunately, the Spring meetings will continue with the old pattern, so HIST programming will begin on Sunday, March 22 in Atlanta, GA. The fall meeting will be August 23-27 in Chicago, IL, with a repeat of the Sunday pattern this year, unless ACS comes to its senses and reverts to the old pattern. I am not holding my breath.

We are doubly honoring Seth Rasmussen in Washington, DC. As announced earlier, Seth is the recipient of the 2025 Joseph B. Lambert HIST Award. His award symposium will be held Tuesday, August 19 during the fall ACS meeting. Seth has also won the 2024 Paul R. Jones Outstanding Paper Award for the best paper in the Bulletin for the History of Chemistry for 2024, 2023, 2022 for his paper, "Edward Frankland and the Birth of Organometallics (1), "*Bull. Hist. Chem.* 49(2) (2024), 111-121. Seth is a Professor of Chemistry at North Dakota State University.

Joe Jeffers and Daniel Rabinovich have been recently named HIST Fellows. They join HIST

Fellows Stephen Weininger, Thomas Strom, Mary Virginia Orna, David Lewis, Joseph Lambert, Ned Heindel, Arthur Greenberg, Carmen Giunta, Ben Chastain, Ronald Brashear, Alan Rocke, Seth Rasmussen, and Vera Mainz. The designation of HIST Fellow recognizes HIST members who have made a significant impact on the advancement of history in the chemical sciences, as well as dedicated service to the division.

ChemHIST Talks is a series drawn from the HIST speakers at the two national ACS meetings each year and are chosen by vote of the Executive Committee. The webinars are typically on a Wednesday, noon, approximately a month after a national meeting. The ChemHIST Talks videos are available on the HIST youtube channel:

https://www.youtube.com/@histacs.

We hope to see you at the HIST sessions Monday, Tuesday, and Wednesday, August 18-20 at the Walter E. Washington Convention Center. Visit us at the SciMix Division Row on Monday evening. HIST posters will also be available for interaction at SciMix.

DIVISION OF THE HISTORY OF CHEMISTRY
COUNCILORS' REPORT
American Chemical Society – Hybrid Council Meeting
San Diego, CA
March 23-27, 2025

A. Election Results:

1. Candidates for President-Elect, 2026

• The Committee on Nominations and Elections (N&E) presented to the Council the following *nominees* for selection as *candidates* for President-Elect, 2026: Christina Bodurow, Dawn Mason, Sheila Murphy, and John Warner. By electronic ballot, the Council selected **Christina Bodurow and Dawn Mason as candidates for 2026 President-Elect.** These two candidates will join any additional candidates selected via petitions to stand for election in the fall 2025 national election.

2. Candidates for Directors for Districts II and IV

• The Committee on Nominations and Elections announced the results of the election held prior to the Council meeting to select candidates from the list of nominees for Directors from District II, and District IV to serve on the Board of Directors for the term 2026-2028. By electronic ballot, the Councilors from these Districts selected **Kimberly Agnew-Heard** and **Mary Engelman** as **District II** candidates and **Lisa Houston** and **Milagros (Milly) Delgado** as **District IV** candidates. Ballots will be distributed to members residing in District II and District IV in the fall for election of a Director from each District.

3. Candidates for Directors-at-Large

• The Committee on Nominations and Elections announced the selection of the following candidates for **Director-at-Large** for the 2026-2028 term: **Anna Cavinato, Donna Friedman, Malika Jeffries-**

EL, and Will Lynch. The election of two Directors-at-Large from among these four candidates and any selected via petition will be conducted in the fall. Ballots will be distributed to the Council in the fall.

B. Other Council Actions:

1. Highlights from Committee Reports and Key Actions

• On the recommendation of the Committee on Committees (ConC), Council voted [Yes 405 (99.26%) / No 3 (0.74%)] to continue the Committee on Chemical Technical Professionals and, subject to the concurrence of the ACS Board of Directors, the Committees on Budget & Finance, Education, International Activities, and Patents and Related Matters.
• On the recommendation of ConC, and with the concurrence of the Council Policy Committee (CPC), Council voted [Yes 403 (99.26%) / No 3 (0.74%)] to amend the duties of the Committee on Patents and Related Matters (CPRM) and change its name to the Committee on Intellectual Property (CIP), subject to the concurrence of the ACS Board of Directors. This change reflects the committee's mission and vision statements, which refer to "intellectual property" generally rather than elevating patents above other forms of intellectual property.

• ConC announced the opening of the committee preference form to all ACS members began on March 3 and will run through July 3. Councilors interested in serving on an ACS Committee in 2026 should go to CMTE.acs.org to complete their preferences.
• On the recommendation of the Committee on Nominations and Elections (N&E), and with the concurrence of the CPC, Council voted [Yes 374 (95.90%) / No 16 (4.10%)] in favor of increasing the number of Councilors on N&E to 19, subject to the concurrence of the ACS Board of Directors. These additional committee members will support the increased workload from the addition of six Zone Councilor slates to N&E's duties.

• On the recommendation of the Committee on International Activities (IAC), Council voted to approve the creation of new International Chemical Sciences Chapters in Ghana [Yes 383 (96.96%) / No 12 (3.04%)], Ecuador [Yes 389 (97.98%) / No 8 (2.02%)], and Northeast China [Yes 357 (89.70%) / No 41 (10.30%)], subject to the concurrence of the ACS Board of Directors.
• On the recommendation of the Committee on Local Section Activities (LSAC), Council voted [Yes 372 (97.13%) / No 11 (2.87%)] to dissolve the Penn/Ohio Border Local Section. This takes effect on January 1, 2026, and members are being contacted about joining neighboring sections.

• On the recommendation of the Committee on Membership Affairs (MAC), the Council voted [Yes 359 (95.48%) / No 17 (4.52%)] to approve the 2026 Schedule of Dues and Benefits, subject to the concurrence of the ACS Board of Directors.
• The Committee on Constitution and Bylaws (C&B) reported the certification of 21-unit bylaws since the fall 2024 meeting. They include 14 Local Sections: Akron, California, Connecticut Valley, East Alabama/West Georgia, Joliet, Kalamazoo, Lehigh Valley, Mississippi, Ole Miss, Orlando, San Gorgonio, San Joaquin Valley, Sierra Nevada and South Carolina; three Divisions: Cellulose and Renewable Materials (CELL), Chemistry and the Law (CHAL), and Medicinal Chemistry (MEDI); and four International Chemical Sciences Chapters: Australia, Bangladesh, East and Northeast India, and West India.

• The Committee on Economic and Professional Affairs (CEPA) reported on the state of the evolving employment landscape for the chemistry enterprise. ACS Careers programs have seen continued growth and remain a valuable resource for members experiencing career transitions. The updated Professional Employment Guidelines will be up for action at the fall Council meeting. Councilors are encouraged to reach out to CEPA@acs.org for more information on the draft guidelines.

• The Committee on Education (SOCED) reported on their continued efforts to advance chemistry education for all. The ACS Policy Statement on Science Education is currently under revision and the revised *ACS Guidelines and Recommendations for Teaching Middle and High School Chemistry* will be available soon for the upcoming academic year.

2. Resolutions

The Council passed several resolutions:
- In memory of deceased Past President Attila Pavlath
- In memory of deceased Councilors
- In sincere appreciation of the San Diego Section, host Local Section for the ACS Spring 2025 meeting, as well as the Divisional program chairs, symposium organizers, and ACS staff for the planning and execution of the meeting.

The ACS Spring 2025 meeting was held from March 23-27. As of March 26, there were 15,332 registrations (14,251 in-person and 1,081 online). The ACS Fall 2025 meeting will be held in Washington, DC, from August 17-21, 2025.

3. Actions of the Board of Directors - Executive Session

The ACS Board of Directors met in Executive Session on March 21-22, 2025, in San Diego, CA. The Board considered several key strategic issues and responded with numerous actions. The meeting opened with a reflection on Inclusion and Belonging.

a. Board Actions

• Upon the recommendation of the Editor Search Committee, the Board voted to approve the appointment of an Editor-in-Chief of the journal *ACS Earth and Space Chemistry*. The appointment will be announced after the individual has been notified and appropriate arrangements for their service have been made.

• Upon recommendation of the Society Committee on Publications, the Board voted to approve the reappointment of several ACS journal editors. The reappointments will be announced after the individuals have been notified and appropriate arrangements for their continued service have been made.

• Upon recommendation of the Board Committee on Professional and Member Relations, the Board voted to approve a screened list of nominees for the 2026 Award for Volunteer Service to the ACS.

• Upon recommendation of the Board Committee on Professional and Member Relations, the Board voted to approve a screened list of nominees for the 2026 Priestley Medal.

• The Board received an extensive briefing and approved several recommendations from the Committee on Executive Compensation. The compensation of the Society's executive staff continues to be reviewed regularly by the Board.

• The Board approved minutes from the Board Executive Session on December 6-7, 2024, and ratified interim Board actions to approve member appointments for the Board Committee on Executive Compensation for the 2025-2027 term.

b. Board Discussions

• The Board Chair, Wayne Jones, facilitated a discussion about opportunities to increase efficiency and agility and modernize Board operations while ensuring the Society's long-term strategic success. The discussion focused on an ongoing review of the Board's standing committee structure. He also provided an opportunity for the Board to discuss themes emerging from feedback Board members have received from the ACS member community.

• The CEO, Albert Horvath, facilitated a strategic discussion with the Board on a new approach to increase ACS impact through philanthropy.

c. Reports

• The CEO, Albert Horvath, and his staff, reported on organizational updates, financials, and audit results, the 150th anniversary of ACS, rebranding efforts, talent management and other ACS activities. He shared the strong performance of ACS in 2024 and growth across many areas. He highlighted:

- ❍ Strengthening and deepening engagement with our global community

- ❍ Holding virtual annual member gathering, allowing our global members from Southeast Asia, the Middle East, Africa, and Latin America to connect and learn about ACS activities, member benefits, region specific programs, and career-related sessions

- ❍ Increasing the global reach of our ACS journals across all key regions by 24 percent as compared to the prior year

- ❍ Publishing through our more than 90 journals, over 74,000 peer reviewed articles, a 15 percent increase from 2023

- ❍ Delivering 346 million article downloads, up 13 percent over 2023.

- ❍ Releasing the CAS BioFinder platform, marking an expansion of CAS products into the life sciences sector

• The presidential succession shared updates with the Board on their significant activities and initiatives on behalf of the Society and its members.

• The Committee on Budget and Finance Chair, Natalie LaFranzo, reported on the strong financial

position of the organization.

• The Committee on Public Affairs and Public Relations Chair, Carolyn Ribes, provided an update on plans for the Board to visit with legislators in June to advocate for science.

• The Committee on Strategic Planning Chair, Will Lynch, assembled a working group of directors to shape the June Board meeting strategic discussion topic.

• The Committee on Professional and Member Relations Chair, Katherine Lee, brought recommendations forward to the Board.

• The Governing Board for Publishing provided updates from the Presidents of ACS Publications and CAS, including the full launch of BioFinder in 2025.

• Written reports were reviewed from the 2024 CEO Initiative Fund, General Counsel, Human Resources, Treasurer, and the Committees on Chemical Safety, Education, International Activities, Minority Affairs, Publications, Senior Chemists, Strategic Planning, and Women Chemists.

C. HIST Councilor

Roger Egolf is serving as a member of the Divisional Activities Committee (DAC) and its Governance subcommittee. This is the subcommittee that looks at petitions coming to Council and reviews the Annual Reports from the Divisions.

Submitted by Roger Egolf

News and Announcements

Awards

2025 Joseph B. Lambert HIST Award

The recipient of the 2025 Joseph B. Lambert HIST Award of the Division of the History of Chemistry (HIST) of the American Chemical Society is Seth C. Rasmussen. Professor Rasmussen is a member of the faculty in the Department of Chemistry and Biochemistry at North Dakota State University, Fargo, ND. The HIST Award is for outstanding achievement in the history of chemistry and is international in scope. This award is the successor to the Dexter Award (1956-2001) and the Sydney M. Edelstein Award (2002-2009), also administered by HIST.

The HIST Award consists of an engraved plaque and a check for $1500 and will be presented to Professor Rasmussen at the Fall National Meeting of the American Chemical Society in Washington, DC, in August 2025. Additional information about the award can be found in the Spring 2025 Newsletter as well as on the HIST website at:

http://acshist.scs.illinois.edu/awards/hist_award.php

Submitted by Vera Mainz

2024 Paul R. Jones Outstanding Paper Award

Seth C. Rasmussen of North Dakota State University is the recipient of the 2024 Paul R. Jones Outstanding Paper Award for "Edward Frankland and the Birth of Organometallics (1)," *Bull. Hist. Chem.* 49(2) (2024), 111-121.

Seth Rasmussen obtained his B.S. in Chemistry from Washington State University in 1990. He obtained his Ph.D. in Inorganic Chemistry from Clemson University in 1994, with thesis "Synthesis and Design of Conjugated Organic Metallopolymers Containing Ruthenium Chromophoric Units" working with John D.

Petersen. He was a Postdoctoral Fellow (1995-1997) and an Instructor at the University of Oregon from 1997-1999. Seth joined North Dakota State University in 1999 and became a full Professor in 2012. He spent his first sabbatical leave (2018) in Australia as a Fulbright Senior Scholar with the Centre for Organic Electronics in Newcastle. He is very active in the Divisions of the ACS that deal with polymers, and with his local Section.

Seth's time at the University of Oregon allowed him to develop his interests in the history of chemistry, including its incorporation in his teaching. He joined the HIST division in 2000 and was soon giving papers at meetings. His first paper presented to HIST was in 2004 at the Anaheim ACS Meeting: "Advances in 13th Century Glass Manufacturing and Its effect on Chemical Progress." Seth's interest in glass remains strong and he has become a recognized expert in the history of glass. He has also contributed to the use of history in the teaching

of chemistry and gave his first talk on this topic in 2004 at the 18th Biennial Conference on Chemical Education. Seth has become a prolific presence at HIST meetings ever since his first presentations.

Seth has served the HIST Division with distinction since 2008, when he became the Program Chair. His term, until 2017, was characterized by a high level of organization, a great broadening of both the number and scope of the papers, and an example of inter-Division cooperation. One of his greatest achievements was the establishment of the *Springer Briefs in the History of Chemistry* book series, of which he is the Series Editor. It has resulted in a great increase in both the number and quality of books published in America on the History of Chemistry. Most recently, he served as Chair of the HIST Division (in all three versions) from 2019-2024. In 2025, Seth received the Joseph B. Lambert HIST Award for Outstanding Achievement in the History of Chemistry (see above).

Seth Rasmussen is now uniformly respected in the worldwide community of the history of chemistry. He is a Fellow of the Royal Society of Chemistry, an ACS Fellow, and was one of the second cohort of HIST Fellows. He serves on editorial and advisory boards of journals and represents HIST on various international bodies in the history of chemistry.

Seth's first paper to appear in the *Bulletin for the History of Chemistry* was the written form of the talk he gave in 2004: Vol. 33, No. 1, 28-34 (2008). He has since written 10 more papers and one book review for the *Bulletin* and qualifies as the most prolific of *Bulletin* authors in the 21st century.

Seth previously won the 2018 OPA for his paper "Cuprene: A Historical Curiosity Along the Path to Polyacetylene," Vol. 42, No. 1, 63-78 (2017). The paper concerns the product of the polymerization of acetylene under various conditions. It is an exhaustive chronicle of the many attempts to both synthesize and characterize the products of this reaction. The moniker "cuprene" was acquired when copper or copper oxide were used as a catalyst under high temperature conditions. The paper contains a fascinating figure of the final product that was chosen as the cover figure for Volume 42, Number 1. The colored product was a highly crosslinked hydrocarbon sheet. Once the original polymer was initiated, the temperatures were sufficient to promote further reactions with newly activated acetylene. In addition to the demanding historical research necessary for this topic, Seth has added his modern knowledge of the chemistry of polymerization. He compares the result to polyethylene which can be prepared in a "low density" form that is highly branched due to further reactions of the system after initiation of the reaction.

In addition to his work in glass and polymers, Seth has a longstanding interest in organometallic chemistry. It was thus a natural choice to write a historical biography and scientific evaluation of the work of Edward Franklin (1825-1899) in this currently recognized paper. Seth always digs deep and finds the full scope of a historical subject. He cites and analyzes the early work of Cadet, a Parisian apothecary, on "fuming arsenical liquid." Eventually Robert Bunsen achieved both understanding and full characterization of this early organometallic compound. Berzelius also contributed to the research and named the substance cacodyl.

The realities of lower-class life in England made Franklin's early life challenging, but he was blessed by a position with Lord Lyon Playfair, one of the greatest scientists in England. Another member of Playfair's laboratory was Herman Kolbe, who had obtained his Ph.D. under Bunsen. The two eager chemists also returned to Bunsen's lab for more work. This led to an appointment at Queenwood College in Hampshire. When Frankland returned to Bunsen's lab, he brought a sealed tube containing a reaction between zinc and ethyl iodide. Further work led to a Ph.D. from Marburg in 1849. Frankland then worked with Liebig at Giessen. He extended his work on zinc compounds, which led to his appointment as Playfair's successor at Putney and soon to Owens College in Manchester in 1851.

Seth's contention that Frankland should be viewed as "The Father of Organometallic Chemistry" is centered on the following figure:

Hydrogen series.	Methyl series.	Ethyl series.	Butyl series.	Valyl series.	Amyl series.	Phenyl series.
ZnH	$Zn(C_2H_3)^*$	$Zn(C_4H_5)^*$	$Zn(C_6H_7)$	$Zn(C_8H_9)$	$Zn(C_{10}H_{11})$	$Zn(C_{12}H_5)$
AsH_2^*	$As(C_2H_3)_2^*$	$As(C_4H_5)_2$	$As(C_6H_7)_2$	$As(C_8H_9)_2$	$As(C_{10}H_{11})_2$	$As(C_{12}H_5)_2$
SbH_3^*	$Sb(C_2H_3)_3$	$Sb(C_4H_5)_3$	$Sb(C_6H_7)_3$	$Sb(C_8H_9)_3$	$Sb(C_{10}H_{11})_3$	$Sb(C_{12}H_5)_3$
PH_3^*	$P(C_2H_3)_3^*$	$P(C_4H_5)_3$	$P(C_6H_7)_3$	$P(C_8H_9)_3$	$P(C_{10}H_{11})_3$	$P(C_{12}H_5)_3$

Figure 6. *Frankland's table of known (*) and predicted alkyl species relative to the parent hydrides (36a).*

Frankland soon expanded on this family of compounds, coined the term *organometallic* in 1852, and developed both forms of transmetallation, a fundamental reaction of organometallic chemistry.

Submitted by Vera Mainz

Obituary

James Marshall

5/19/1940-3/28/2025

Dr. James L. Marshall, son of Madison Lincoln Marshall and Irene VanEman Marshall, native of Denton, TX, passed away peacefully on March 28, 2025, at age 84. He earned his B.S. in chemistry at Indiana University in 1962, and his Ph.D. in organic chemistry at Ohio State University in 1966. The following year Dr. Marshall joined the Department of Chemistry at the North Texas State University (now University of North Texas, UNT). At UNT he was involved in conformational analysis utilizing carbon-13 nuclear magnetic resonance coupling constants. During the early 1980s Dr. Marshall spent six years at Motorola, Inc., Ft. Worth, where he developed the laboratory facilities for the Advanced Manufacturing Technology Program. In 1987 he returned to the University of North Texas where he conducted materials research, and in the 1990s he initiated research in chemical history.

His research at UNT has resulted in over 250 publications, including a reference book on NMR, and several books on the history of chemistry and laboratory chemistry. At UNT Dr. Marshall served as Director of Industry-University Cooperative Research Center, Director of the Center for Materials Characterization, and Chairman of the Department of Chemistry. He also taught countless students to love chemistry. Always the jokester, he would ingest maple syrup disguised in a motor oil bottle or drink liquid nitrogen, always to catch his students' attention and show them learning is fun. Students loved Jim in class, and he also was chosen as an Honor Professor by The UNT Student Association for 1988-1989 school year, a "Top Prof" by Mortar Board in 1989, and an Outstanding Faculty Member by Sigma Phi Epsilon in 1995.

Dr. Marshall has served as Chairman of the Dallas-Ft. Worth Section of the American Chemical Society, and during the period 1995-2003 was Managing Editor of The Southwest

Retort, an ACS publication of the Southwest Regional. He has served as an ACS national tour speaker for many years. He married his late wife Virginia R. (Jenny) Marshall in 1998, he and his wife developed an extensive work, "Rediscovery of the Elements," and in 2010 completed their work and prepared a DVD describing their travels and the results of their research. Their research received international acclaim, for example being reviewed in Nature (2005, 436(25) 1082-1083) and their work also won “Best Paper Award” in the Bulletin for the History of Chemistry in 2004.

Dr. Marshall has created the only collection of elements in the world that contains not only all the natural elements, but authentic samples of minerals from the original sites that he and Jenny collected over the 16 years of their collaboration, viewable with explanations through his You Tube site https://www.youtube.com/@rediscoveryoftheelements5753.

Service to the ACS and chemical research was recognized by his inclusion in the 2011 class of Fellows of the American Chemical Society. He retired from UNT in 2017 as an Emeritus Professor and continued his extensive writings on the history of the chemical elements. In August of 2024, he, along with his late wife Jenny, received the American Chemical Society Lambert Award for his outstanding achievements in the history of chemistry for their work on the Rediscovery of the Elements.

The project on the Rediscovery of the Elements resulted in a massive archive produced by all the modalities of the modern historian. The original work was published as a series of articles in *The Hexagon*, the official journal of the professional chemistry fraternity Alpha Chi

Sigma. The first one was: "Rediscovery of the Elements: Tellurium and Faţa Băii (Fascebanya), Romania," James L. Marshall and Virginia R. Marshall, *The Hexagon of Alpha Chi Sigma*, 91, No. 3, Fall, 43-45, (2000). The last one was: "Rediscovery of the Elements. The Alchemical Journey. Part 3." J. L. Marshall and V. R. Marshall, *The Hexagon of Alpha Chi Sigma*," 112(1), 10-13, (2021). More than 50 articles in all were published. In order to make the full corpus more available, the Marshalls produced a DVD containing photographs and maps of the discovery sites. The initial version was published in 2010; it has since been updated and is now available as a third edition (2021) that can be accessed on the internet at:
https://sites.chemistry.unt.edu/~jimm/REDISCOVERY%206-10-2021/

As Jim often said, "And, when you want something, all the universe conspires in helping you to achieve it." — Paulo Coelho, The Alchemist; and the universe conspired to allow him and Jenny to achieve the Rediscovery dream.

Among his many hobbies included bird studying, flying, and hiking, and he was an avid naturalist. James was an active flight instructor (private; instrument; twin) for decades, and among his students are included American Airline pilots. James has hiked the Grand Canyon several times, including all the way twice - once with his son Cristopher. In his high school and college years, he was active in music – he was First Chair tuba in the state of Alabama, 1957 and 1958; and during the years 1959-1960 he was the tuba player in the Charlotte Symphony in North Carolina.

Dr. Marshall was preceded in death by his fourth wife, Jenny Marshall, and two siblings, Drs. William and Ernest Marshall. He is survived by his sister Dr. Madilyn Fletcher and his two heartbroken children, Cristopher Marshall. M.Ed. and Dr. Pamela A. Marshall (to whom he instilled his love of science), their spouses (Cindy Marshall and David Lelsz) and three amazing grandchildren, Griffin Marshall, Garyn Marshall, and Stephanie Lelsz.

To update on what is currently going on with the Rediscovery of the Elements: Dr. Pamela Marshall's brother Cristopher inherited the element and mineral collection and is planning an interactive display in his home. Dr. Pamela Marshall inherited the website and updated his YouTube channel with high-definition videos. They had only been in low definition, so this is a big improvement. They all have appropriate ADA compliant captions as well.

She also is doing the final update for the Rediscovery website and making sure all the Hexagon articles are there and how to share the most recent Walking Tour items. She is hoping this will be completed by the end of the year 2026.

Finally, Dr. James Marshall wanted to convert it into a book. The book mostly should have all the information James and Jenny gathered and synthesized over the years somewhere physical for future historians and chemists, as the website will go away eventually.

If anyone in HIST who would like to assist with any of these projects or just helps to think through what the book would look like, it will be appreciated; please contact:

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HIST News

From the HIST Historian's Desk

The year 2025 has been busy for the Historian. The symposium on 18th century chemistry in San Diego was a resounding success. A special issue of the Bulletin in currently in preparation based on this topic.

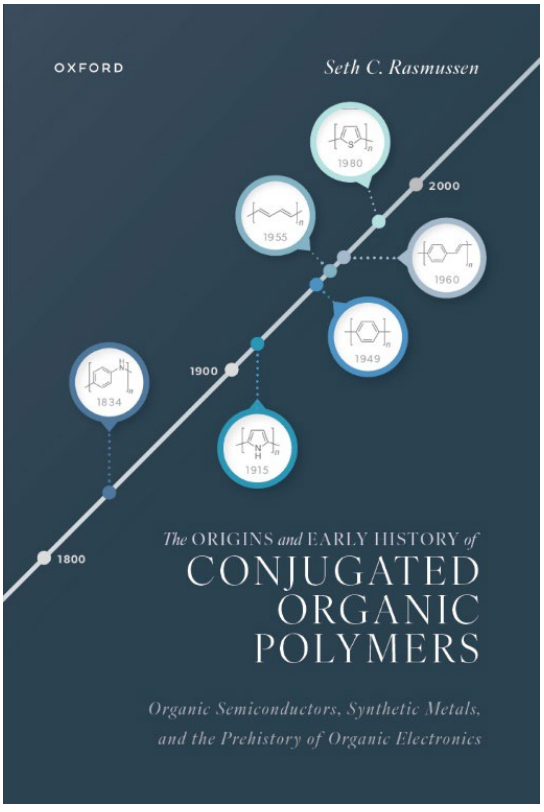
One of the world sites of chemical history is Cambridge University. Hasok Chang chairs the Department of the History and Philosophy of Science. The HIST Historian is a regular participant in the seminar series AD HOC. This Spring he presented a talk on his new book: From Heat to Thermal Science: A History of Thermodynamics. The book is currently in press with Springer, thanks to Seth Rasmussen.

The year 2025 is the International Year of Quantum. The HIST Historian, in collaboration with Carmen Giunta, Henry F. Schaefer III, and the ACS Webinar team presented a webinar on the History of Quantum Chemistry. More than 1000 people joined this event.

Submitted by Gary Patterson

The Origins and Early History of Conjugated Organic Polymers

A new book by Seth C. Rasmussen, *The Origins and Early History of Conjugated Organic Polymers. Organic Semiconductors, Synthetic Metals, and the Prehistory of Organic Electronics*, was released by Oxford University Press in July 2025 (ISBN 978-0-197-63816-3). Conjugated organic polymers first drew significant interest in the late 1970s when metallic-looking plastic films of polyacetylene were shown to exhibit conductivities in the metallic regime after treatment with various oxidizing agents. These results formed the basis for awarding Alan MacDiarmid, Alan Heeger,



and Hideki Shirakawa the 2000 Nobel Prize in Chemistry for the "*for the discovery and development of electrically conductive polymers*." However, contrary to the common belief that these materials date to only the late 1970s, reports of electrically conductive polymers date back to the early 1960s, with the study of conjugated polymers as a whole dating back to the early 19th century.

The culmination of over 10 years of exhaustive research, *The Origins and Early History of Conjugated Organic Polymers* rethinks the accepted historical narrative of conjugated organic polymers, challenges the established interpretations, and provides new insights into these fascinating electronic materials. This book charts the history of the first six primary parent polymers, beginning with the introduction of polyaniline in 1834 and continuing up through the development of polythiophenes and low bandgap polymers in the 1980s. Finally, the book concludes with a chapter that places these materials within the larger history of organic and carbon-based conductors, outlines the early application of these materials to electronic devices, and then closes with a reflective discussion on the nature of discovery and the official wording of the Nobel Prize of 2000.

Submitted by Seth C. Rasmussen

HIST at the 27th International Congress of History of Science and Technology

HIST recently represented the history of chemistry on the world stage in Dunedin, New Zealand. In cooperation with the Congress on the History of Chemistry and Molecular Sciences (CHCMS), HIST co-sponsored the symposium *Chemistry in the Asia-Pacific Region: Examining Exchanges and Circulation sustaining Chemical Practice* for the 27th International Congress of History of Science and Technology (ICHST, June 29-July 5, 2025). Envisioned as a successor

The in-person speakers of the HIST-CHSMS sponsored symposium from left to right: Prof. Joris Mercelis (Johns Hopkins), Dr Brigitte van Tiggelen (Science History Institute), Prof. Seth Rasmussen (North Dakota State), Prof. John Webb (Swinburne University of Technology), Prof. Yoshiyuki Kikuchi (Aichi Prefectural University), Prof Ian Rae (University of Melbourne), and Prof. David Lewis. Photo by Debbie Lewis.

to the successful HIST-organized 2015 Pacifichem symposium *Historical Evolution of the Chemical Community in the Countries of the Pacific Rim,* the new ICHST symposium was co-organized by Yoshi Kikuchi (CHCMS) and Seth C. Rasmussen (HIST, CHCMS) and featured 10 oral presentations (8 in-person, 2 virtual) over the final two days of the conference. In addition to Rasmussen's presentation, the symposium also featured talks from additional HIST members and associates, including David E. Lewis, Ian Rae, and Brigitte Van Tiggelen. This HIST-sponsored activity successfully introduced HIST to a broader audience and proved that HIST contributes significantly to the collective world-wide scholarly pursuit of the history of chemistry.

Submitted by Seth C. Rasmussen

Great Lakes Regional Meeting 2025 (GLRM)

A HIST symposium took place at the GLRM, June 4 – 6, 2025, at Appleton, WI, organized by Seth Rasmussen and David Lewis.

Submitted by Joe Jeffers

Call for Nominations for the 2026 Joseph B. Lambert HIST Award

The Division of History of Chemistry (HIST) of the American Chemical Society (ACS) solicits nominations for the 2026 Joseph B. Lambert HIST Award for Outstanding Achievement in the History of Chemistry. This award, formerly known as the Dexter Award and then the Edelstein Award, continues a tradition started in 1956. Lists of previous recipients of the Edelstein Award and its predecessor Dexter Award are available at https://acshist.scs.illinois.edu/awards/hist_award.php.

This award is sponsored by and administered by the Division of the History of Chemistry (HIST). The recipient chosen to receive the HIST Award is presented with an engraved plaque and the sum of $1500, usually at a symposium honoring the recipient at the Fall National Meeting of the ACS, which in 2026 will be held on August 25th in Chicago, IL. The award is international in scope, and nominations are welcome from anywhere in the world. Previous winners of the Dexter and Edelstein Awards include chemists and historians from the United States, Canada, Germany, France, the Netherlands, Hungary, and the United Kingdom.

Each nomination should consist of all of the following:

- A complete curriculum vitae for the nominee, including biographical data, educational background, awards, honors, list of publications, and other service to the profession;
- A letter of nomination summarizing the nominee's achievements in the field of the history of chemistry and citing unique contributions that merit a major award;
- At least two seconding letters;
- Copies of no more than three publications.

If material is sent as a pdf file, please combine into one file in the order requested above. Only complete nominations will be considered for the award. All nomination materials should be submitted (either as e-copy or as hard-copy in triplicate) to HIST for arrival no later than **December 31, 2025**.

Send an e-copy to Vera V. Mainz at mainz@illinois.edu OR alternatively send three (3) hard copies sets to:

Vera V. Mainz, HIST Sec/Treas
2709 Holcomb Drive
Urbana, IL 61802 USA

Submitted by Vera Mainz

Call for Nominations for the Paul Bunge Prize 2026: History of Scientific Instruments

The German Chemical Society (Gesellschaft Deutscher Chemiker, GDCh) and the German Bunsen Society for Physical Chemistry (Deutsche Bunsen Gesellschaft für Physikalische Chemie, DBG) invite proposals for the Paul Bunge Prize 2026.

The prize is awarded annually by the Hans R. Jenemann-Foundation and is named after Paul Bunge (1839-1888), one of the most important makers of precision balances in the second half of the nineteenth century.

The Paul Bunge Prize honours outstanding research publications on all aspects of the history of scientific instruments. The prize is endowed with 7,500 Euro. It is awarded for either individual books or papers published within the last five years, or for lifetime achievements. Submitted works may be published in English, German, or French.

Applications and proposals should include the publications to be considered, a curriculum vitae and a full list of publications. The Advisory Board of the Hans R. Jenemann Foundation will decide on the prize winner.

The award ceremony will take place in Lübeck, Germany, in March 2026 on the occasion of conference of the History of Chemistry division of the German Chemical Society.

Submit your application or nomination, including cover letter, CV and publications, **by 30 September 2025** via the online form at https://www.gdch.de/paulbungepreis. Printed copies can be sent to the GDCh office attn: Dr. Ralph Wieneke. Digital versions are however preferred. Contact:

Gesellschaft Deutscher Chemiker
Dr. Ralph Wieneke
Varrentrappstr. 40-42
60486 Frankfurt a.M., Germany
r.wieneke@gdch.de
(+49) 69/7917 311

Submitted by Vera Mainz

Call for Nominations for the Partington Prize 2026 (SHAC)

The Partington Prize, established by the Society for the History of Alchemy and Chemistry (SHAC) in memory of Professor James Riddick Partington, the Society's first Chairman, is awarded every three years for an original and unpublished essay on any aspect of the history of alchemy or chemistry. The prize consists of five hundred pounds (£500) if awarded to a single essay. Alternatively, it may be divided or not awarded at all.

The competition is open to anyone with a scholarly interest in the history of alchemy or chemistry who, by the closing date of 31 December 2025, has not reached 35 years of age, or if older is currently enrolled in a degree program or has been awarded a master's degree or PhD within the previous three years. No restriction is placed on the nationality or country of residence of competitors. Only one entry is permitted from any competitor.

The prize-winning essay will be published exclusively in the Society's journal, *Ambix*. It must not have been submitted to any journal, including *Ambix,* at any time before 30 April 2026. Essays must be submitted in English. Essays must be fully documented using the conventions used in the current issue of *Ambix* and include an abstract of no more than 200 words. Essays must not exceed 10,000 words in length, including the abstract, references and footnotes.

All entries should be sent in the form of two separate e-mail attachments in Microsoft Office Word (preferably 2013 or later) to prizes@ambix.org. The first attachment should be headed "Partington Prize Entry 2026" and should give the author's name, institution, postal address, e-mail address, date of birth (and, if relevant, the date of the award of the master's degree or PhD), the title of the essay, and the word count. The second attachment should be the essay, which should not identify the author either by name or implicitly.

Entries must arrive before **midnight GMT on 31 December 2025.** The decision of the Society will be final on all matters. The result of the competition will be announced by 30 April 2026.

Submitted by Annette Lykknes on behalf of SHAC

Other announcements of interest to HIST members

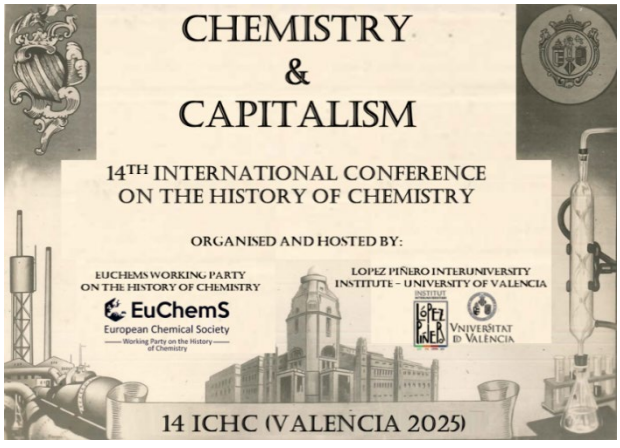
Lecture Conference of History of Chemistry 2026

The lecture conference History of Chemistry 2026 of the German Chemical Society (GDCh) takes place March 19-20, 2026, at Lübeck, Germany. It is open to all aspects of the history of chemistry and the chemical industry, as well as related topics. In addition to the plenary lecture by Prof. i. R. Dr. Bettina Wahrig (titled: Ladies' Paradise or Workers' Hell? – Debates during the Establishment of Large-Scale Plastics Production around 1900) and the presentations by the recipients of the Paul Bunge Prize and the Bettina Haupt Prize, current contributions will be presented and discussed in panel discussions. For more information contact:

Dr. Gisela Boeck
gisela.boeck@uni-rostock.de
0381-7998713

Submitted by Christine Hahn

14th International Conference on the History of Chemistry (14ICHC), June 11-14, 2025



Every other year the Division of History of Chemistry - EuChemS organizes an international conference on the history of chemistry, open to colleagues from all over the world. The general aim of the conferences organized by the Division is to facilitate communication between historical interested chemists, museum curators, science educators, and historians of chemistry, and to gather the community on a regular basis. The 14th International Conference on the History of Chemistry (14ICHC) (14 ICHC) took place June 11-14, 2025, in Valencia, Spain, on the shores of the Mediterranean Sea.

The 14 ICHC was hosted by the Lopez Piñero Inter-University Institute – University of Valencia, an academic institution which supports research projects and outreach activities on historical and social studies on medicine, technology, science and the environment. The Institute is located in a restored 18th century palace in the center of the city of Valencia, where the Historical-Medical Library and the Scientific-Medical Collection of the University of Valencia are located, with permanent and temporary monographic exhibitions.

The general conference theme was Chemistry & Capitalism with the aim to foster debates about the relationship between chemistry, broadly constructed industry, environment, and regulations through a historical perspective.

Submitted by Christine Hahn

SHAC Autumn Meeting

The Society of History of Alchemy and Chemistry (SHAC) Autumn Meeting will take place October 16-17, 2025, at the Science History Institute, Philadelphia

It is intended that the first day of this two-day meeting will cover the history of alchemy and early modern chemistry, while the second day will discuss the history of chemistry from then to the modern period.

Papers on any aspect of the history of alchemy and chemistry, including their historiography will be presented. The SHAC chair, Professor Frank James has closed accepting paper on May 31, 2025, but may be contacted (frank.james@ucl.ac.uk).

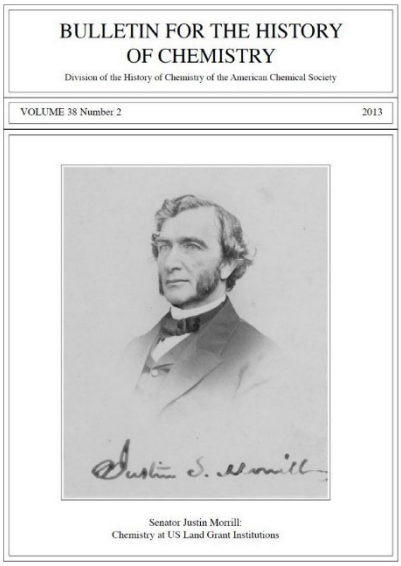
Submitted by Rob Johnstone

BULLETIN FOR THE HISTORY OF CHEMISTRY

A publication of the Division of the History of Chemistry of the American Chemical Society

Available online: http://acshist.scs.illinois.edu/bulletin/index.php

PAPER SUBMISSIONS: Articles of 4-20 pages, double-spaced (excluding references) should be submitted electronically by email attachment to the Editor, Carmen Giunta, at giunta@lemoyne.edu.
The title of the article should be of reasonable length (up to 15 words); a subtitle may be included if appropriate. Authors should strive to make the title descriptive of the specific scope and content of the paper. Preferred file formats for submissions are .doc, .docx, and .rtf.
Full instructions for authors can be found at http://acshist.scs.illinois.edu/info/bull-info.php


BULLETIN FOR THE HISTORY OF CHEMISTRY
Division of the History of Chemistry of the American Chemical Society
VOLUME 38 Number 2 2013
Senator Justin Morrill:
Chemistry at US Land Grant Institutions

All matters relating to manuscripts, etc. should be sent to:

Prof. Carmen Giunta
Editor, *Bulletin for the History of Chemistry*
PO Box 522
Manlius, NY 13104
Email: giunta@lemoyne.edu

HIST Programming

Message from the HIST Program Chair

First, my congratulations to Seth Rasmussen for the 2025 Joseph B. Lambert HIST Award and the 2024 Paul R. Jones Outstanding Paper Award. Congratulations also to Joe Jeffers and Daniel Rabinovich being named HIST Fellows.

As Joe Jeffers pointed out earlier, with the Fall 2025 Meeting, a new programming format has been introduced. We will start our program on Monday with a joint symposium "History of Quantum Chemistry" in collaboration with COMP and PHYS. This is a continuation of the celebration of the International Year of Quantum Science and Technology, which started on June 4th with the very successful ACS Webinar, "The History, Heroes, and Theories That Created Quantum Mechanics". We hope this full-day symposium with speakers, who are established theoretical and computational chemists, and presentations on a variety on concepts and important people in the early stage of quantum chemistry will attract also a high number of attendees. On Monday noon there will be one poster presented for the symposium on the History of Quantum Chemistry. Monday evening HIST is listed with 12 poster presentations for SciMix. As usual HIST will be present at Division Row. I want to thank Kristine Konkol who has updated the division poster.

On Tuesday we celebrate Seth Rasmussen and his accomplishments at the HIST Award Symposium with the main theme of the history of materials, a great passion of the awardee. Other talks reflect on the activities of HIST in the past. This will be a very interesting symposium. Information about the Award Dinner after this symposium on Tuesday evening is provided in the section below. I thank Joe Jeffers for the organization of the Award Dinner.

The Tutorial and General Paper symposium will take place on Wednesday. It comprises the morning session with six oral presentations, at noon there will be three poster presentations, and in the afternoon one virtual talk is scheduled. This is the first time we host a virtual session. Among the presentations of the Tutorial and General Papers from diverse topics I would like to highlight the presentation by Mark Chalmers, the new Curator of the Oesper Collections at the University of Cincinnati. In addition, at this Fall 2025 Meeting there will be a symposium "In Honor of Prof. George Schweitzer" organized by NUCL and co-sponsored by HIST.

Next year we will celebrate 150 years of the ACS and in this spirit a few divisions wish to collaborate with HIST. For Spring 2026 at Atlanta, five other symposia are planned besides the regular Tutorials and General Papers. One symposium will be organized by Seth Rasmussen on the "History of Nomenclature, Terminology, and Symbols" with nominal co-sponsorship by NST. A joint symposium with CHED and YCC "Teaching Chemistry Using History, Art, and Pop Culture" will be organized by Sara Hubbard and Sharon Hamilton. HIST will support the

symposium "150 Years of Building the Foundations" organized by Allison Smith from YCC and co-sponsored by CHED, PROF, and SCC. The BIOT division wishes to organize a joint symposium with HIST on "Historical Perspectives on Biotechnology Breakthroughs". Finally, HIST will be nominal co-sponsor of the YCC symposium "Chemistry & Film," also organized by Allison Smith.

For the Fall 2026 meeting in Chicago, a symposium that we have had been planning for a long time will be take place: "Past ACS Presidents: Frank Wigglesworth Clarke (1847-1931)." This will be a joint symposium with GEOC as F. W. Clarke was one of the co-founders of that division. Another interesting symposium will be co-organized with AGFD, namely "Advances in Agricultural and Food Chemistry in the past 150 years."

Now I welcome you to our Fall 2025 Meeting at Washington DC, and wish you all a pleasant stay, enjoyable program, and safe travels.

Christine Hahn, *HIST Program Chair*

HIST SYMPOSIA, Fall 2025 ACS National Meeting (August, 17-21, 2025)

Schedules and abstracts are listed at the end of this Newsletter.

HIST Award Banquet

As part of its activities at the Fall 2025 ACS National Meeting, the History of Chemistry Division is pleased to host the 2025 HIST Award Banquet honoring Seth Rasmussen. The Banquet will be held at Tortino Restaurant, 1228 11th St NW, Washington DC, at 6:30 pm, Tuesday, August 19. It will include an appetizer and a la cart main dish, exclusive of alcohol. (Italian Restaurant in Washington, DC | Tortino Restaurant). Tickets are $65 per person. The ticket covers the cost of the meal, nonalcoholic drinks, tip, and tax. Alcoholic beverages are available for additional cost from the cash bar. Tickets can be purchased from Vera Mainz, HIST Secretary-Treasurer. You can pay Vera via check or cash (exact amount preferred) at the banquet or when you see her during the meeting. If you plan to attend, please RSVP by August 16th (Saturday) via email to Vera Mainz (mainz@illinois.edu).

UPCOMING MEETINGS AND HIST DEADLINES

Subject to change. Check the HIST website (http://www.scs.illinois.edu/~mainzv/HIST/) for updates.

Spring ACS 2026, National Meeting (Atlanta, GA, March 22-26, 2026)

Tutorials and General Papers. (Seeking contributions) Organizer: Christine Hahn, Department of Chemistry, Texas A&M University-Kingsville, Kingsville, TX 78363, Phone: 361-593- 3592, Email: Christine.Hahn@tamuk.edu

History of Nomenclatures, Terminology, and Symbols. (Invited and contributed) Joint symposium with NST Committee. Organizer: Seth C. Rasmussen, Department of Chemistry and

Biochemistry, North Dakota State University, NDSU Dept. 2735, P.O. Box 6050, Fargo, ND 58108-6050, Phone: 701-231-8747, Email: seth.rasmussen@ndsu.edu.

Teaching Chemistry Using History, Art, and Pop Culture. (Invited and contributed) Joint symposium with CHED and YCC. Organizers: Sara E Hubbard and Sharon Hamilton, Department of Chemistry, Patterson School of Natural Sciences, Ouachita Baptist University, Jones Science Center 214**,** OBU Box 3664, 410 Ouachita St., Arkadelphia, AR 71998, Phone: 870.245.5533, Email: hubbards@OBU.EDU, hamiltons@OBU.EDU.

150 Years of Building the Foundations (Invited only) Joint symposium with YCC, nominal co-sponsors CHED, PROF, and SCC. Description: The half-day symposium will include talks from each speaker on their career journeys and lessons learned, followed by a panel discussion. Invited speakers have a wide breadth of backgrounds and include both established and rising chemists influential in the field, as we have tried to encompass a wide range of perspectives. Organizers: Allison Smith, Department of Chemistry, University of Minnesota Twin Cities, Email, amscrik@gmail.com; Julian Bobb, Email: julianbobb770@gmail.com.

Historical Perspectives on Biotechnology Breakthroughs. (Invited and contributed) Joint symposium with BIOT. Description: This symposium traces the historical development of biotechnology, from early fermentation techniques to modern synthetic biology and biopharmaceuticals. Presentations will highlight key milestones, such as the discovery of recombinant DNA and monoclonal antibodies, and their societal impact. Format: Half-day session, in-person, with 1–2 invited historians and biotech pioneers, plus contributed talks from BIOT members on historical context. Organizers: Rajib Saha, Email: rsaha2@unl.edu, University of Nebraska-Lincoln, Krunal Mehta, Email: krunal.mehta@merck.com.

Chemistry & Film (Invited only), joint symposium organized by YCC, with CHAS, CHED, CPRC, INOR, and HIST (nominal cosponsors), Allison Smith, amscrik@gmail.com, Patrick Fedick, patrick.w.fedick.civ@us.navy.mil.

Fall 2026 ACS National Meeting (Chicago, IL, August 23-27)

HIST Award Symposium, TBA

Past ACS Presidents: Frank Wigglesworth Clarke (1847-1931) (Invited and contributed), joint symposium with GEOC. Organizers: Gary Patterson, Vancouver, WA 98661, Phone: 412-480-0656, Email: gp9a@andrew.cmu.edu, Carmen Giunta, PO Box 522, Manlius, NY 13104, Phone: 315-632-4992, Email: giunta@lemoyne.edu, and Ian Bourg, Princeton, New Jersey 08544, Phone: 609-258-4541, Email: bourg@princeton.edu

Advances in Agricultural and Food Chemistry in the Past 150 Years. (Invited and contributed) joint symposium with AGFD. Organizers: Michael Tunick, Email: mht39@drexel.edu; Roger

Egolf, Email: rae4@psu.edu, Pennsylvania State University - Lehigh Valley Campus, 2809 Saucon Valley Road, Center Valley, PA 18034, Phone: 610-285-5110.

Tutorial and General Papers (Seeking contributions) Organizer: Christine Hahn, Department of Chemistry, Texas A&M University-Kingsville, Kingsville, TX 78363, Phone: 361-593- 3592, Email: Christine.Hahn@tamuk.edu

Future Meetings

SERMACS/SWRM-2025, October 26-29, 2025, Orlanda FL:

Lessons and Inspiration from the History of Chemistry (Seeking contributions) Organizers: Nicolay V. Tsarevsky, Department of Chemistry, Southern Methodist University 3215 Daniel Avenue, Dallas, TX 75275, Phone: 214-768-3259, Email: nvt@smu.edu; Christine Hahn, Department of Chemistry, Texas A&M University-Kingsville, Kingsville, TX 78363, Phone: 361-593- 3592, Email: Christine.Hahn@tamuk.edu

Western Regional Meeting (WRM), October 25-28, San Jose, CA

HIST Symposium. Organizers: Lee Latimer (Email: lhlatimer@mindspring.com) and Matt Greaney (greaney19@gmail.com)

Proposed Symposia

History of Small Businesses, (Invited and contributed), joint symposium with SCHB, Xu Simon, xufits@gmail.com, and Christine Hahn, Department of Chemistry, Texas A&M University-Kingsville, Kingsville, TX 78363, Phone: 361-593- 3592, Email: Christine.Hahn@tamuk.edu

For updates and additional information, e.g., on symposia at regional ACS meetings, please check the HIST website (https://acshist.scs.illinois.edu/)

Final Program

DIVISION OF THE HISTORY OF CHEMISTRY (HIST)

C. Hahn, *Program Chair*

Sunday, August 17, 2025: Evening

Location: Walter E. Washington Convention Center, Room 205

5:00 – 7:00 **HIST Executive Committee Meeting**

Monday, August 18, 2025: Morning session

Joint Programming with COMP and PHYS

Location: Walter E. Washington Convention Center, Room 151B

History of Quantum Chemistry

C. Hahn, *Organizer*
L. Wang*, Presiding*

8:00 Quantum chemistry: Early history and chemical philately. **D. Rabinovich**

8:30 Looking back to Bohr's model of bonding. **T. Terencio**, M. Becerra

9:00 Quantum chemistry: The Mulliken and Pauling legacy. **W.C. Ermler**

9:30 Intermission

10:00 Frontiers of computational research for innovations in Chemistry through the advancement of Quantum Chemistry. **L. Wang**

10:30 Bridging the gap between chemists' and physicists' views of molecules: History and recent developments of multicomponent quantum chemistry. **Y. Yang**

11:00 Towards ab initio realizations of Collins' conjecture. **A.Y. Zamani**, K. Carter-Fenk

Monday, August 18, 2025: Noon

Location: Walter E. Washington Convention Center, Hall C

History of Quantum Chemistry – Poster Session
12:00 PM - 2:00 PM

C. Hahn, Organizer

Comparative analysis of quantum approaches for solving the electronic structure problem. **A.R. Mazumder**, S. Mazumder

Monday, August 18, 2025: Afternoon session

Location: Walter E. Washington Convention Center, Room 151B

History of Quantum Chemistry

C. Hahn, *Organizer*
W. C. Ermler, *Presiding*

2:00 Quantum chemistry at the University of Cambridge. **R.G. Bone**

2:30 Life and quantum science of Arno Rudolf Bohm. **R.A. Bohm**

3:00 Innovations of Jan Erik Almlöf: Long-lasting influence on quantum chemistry. **A.K. Wilson**

3:30 Intermission

4:00 Quantum dots in science and engineering: The beginning and the future. **N.N. Mateeva**

4:30 Quantum chemical calculations of transition-metal systems: A personal perspective. **M.B. Hall**

5:00 40 years of quantum chemical calculations: from punched cards to AI. **E. Kraka**

Monday, August 18, 2024: Evening

Location: Walter E. Washington Convention Center, Hall C

HIST (with COMP and PHYS) Sci-Mix and Division Row

8:00 PM – 10:00 PM

Glue and adhesives: A chemical history. **G.R. Wyllie**

Domestic science and materials. The case of Agnes Pockels and surface chemistry. **B. Van Tiggelen**

Ozone hole: Discovery and impact. **C.J. Giunta**

Lazar Solomonovich Polyakov's contributions to science and technology. **M.O. Lisunova**

How new chemical detection methods led to the discovery of acetaminophen as a useful drug. **A. Haddy**

Shielding through time: Exploring the history and teaching of Slater's Rules. **G. Lee**, R.M. Jones

History and philosophy of calories and respiration. **A. Cherbonneaux**

From glass to plastic: The past and future of cell culturing glassware. **R. Orkin**, L. Cruz

From clay to gold: Recreating ancient alchemical techniques. **A. Slavick-Gierlach**, R.R. Srinivasan, M. Rumor

Looking back to Bohr's model of bonding. **T. Terencio**, M. Becerra

Quantum dots in science and engineering: The beginning and the future. **N.N. Mateeva**

Life and quantum science of Arno Rudolf Bohm. **R.A. Bohm**

Tuesday, August 19, 2025: Morning session

Location: Walter E. Washington Convention Center, East Overlook

HIST Award Symposium

D. E. Lewis, *Organizer*, *Presiding*

8:00 Introductory Remarks.

8:10 Archaeological chemistry: A multidisciplinary analysis of the past. **M. Orna**

8:40 Those who served – HIST secretary/treasurers in the first 100 years. **V.V. Mainz**

9:10 Ozone hole: Discovery and impact. **C.J. Giunta**

9:40 Intermission

10:00 Remarkable but little-known American contribution to the invention of the periodic table: The work of Charles F. Chandler and Charles S. Peirce. **G.S. Girolami**

10:30 History and chemistry of tanning and leather in antiquity: A deeper look. **C.L. Heth**, B. Schmidt

11:00 Soap production and use in the Middle Ages: Continuing the story of its chemical technology. **K.L. Konkol**

11:30 Domestic science and materials. The case of Agnes Pockels and surface chemistry. **B. Van Tiggelen**

Tuesday, August 19, 2025: Afternoon session

Location: Walter E. Washington Convention Center, East Overlook

HIST Award Symposium

D. E. Lewis, *Organizer*, *Presiding*

2:00 Who discovered PVC? Early research on polymers derived from "Dutch oil" (ethylene chloride) and similar substances. **A.J. Rocke**

2:30 Early studies in DNA structure determination. **J.S. Jeffers**

3:00 Glue and adhesives: A chemical history. **G.R. Wyllie**

3:30 Intermission

3:50 Acetylene and aniline chemistry in the snow: North Dakota and Russia. **D.E. Lewis**

4:20 Why materials? A retrospective of 25+ years of historical research. **S.C. Rasmussen**

Wednesday, August 20, 2025: Morning session

Location: Walter E. Washington Convention Center, Room 208AB

Tutorial and General Papers

C. Hahn, *Organizer*
N. V. Tsarevsky, *Organizer*, *Presiding*

8:00 How new chemical detection methods led to the discovery of acetaminophen as a useful drug. **A. Haddy**

8:30 Strained organic molecules: The rococo era (1950s through 1970s). **A. Greenberg**, J.F. Liebman

9:00 Historical perspective on elemental discoveries and the periodic table. **L. Bambalas**

9:30 Lazar Solomonovich Polyakov's contributions to science and technology. **M.O. Lisunova**

10:00 Intermission.

10:20 From coal and lime: The story of calcium carbide. **N.V. Tsarevsky**

10:50 Oesper collections' new exhibition at the University of Cincinnati. **M. Chalmers**

11:20 Withdrawn

Wednesday, August 20, 2025: Noon

Location: Walter E. Washington Convention Center, Hall C

Tutorial and General Papers

12:00 PM – 2:00 PM

C. Hahn, N. V. Tsarevsky, *Organizers*

From clay to gold: Recreating ancient alchemical techniques. **A. Slavick-Gierlach**, R.R. Srinivasan, M. Rumor

History and philosophy of calories and respiration. **A. Cherbonneaux**

From glass to plastic: The past and future of cell culturing glassware. **R. Orkin**, L. Cruz

Wednesday, August 20, 2025: Afternoon session

Digital Meeting: Digital Session

Tutorial and General Papers

C. Hahn, N. V. Tsarevsky, *Organizers*, *Presiding*

3:00 Shielding through time: Exploring the history and teaching of Slater's Rules. **G. Lee**, R.M. Jones

ABSTRACTS

Quantum chemistry: Early history and chemical philately

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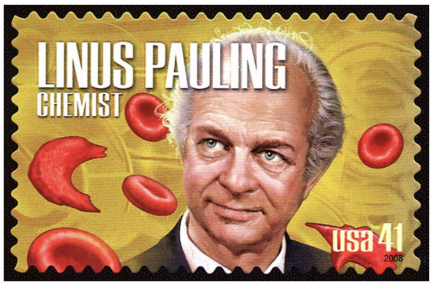
On June 7, 2024, the United Nations proclaimed 2025 as the International Year of Quantum Science and Technology (IYQ). Accordingly, the year-long, worldwide initiative will celebrate the contributions of quantum science to technological progress over the past century and raise awareness of its importance to sustainable development and education. In this regard, the field of quantum chemistry emerged in the 1920s with the application of quantum mechanics to chemical systems, starting with the work of Walter Heitler and Fritz London to explain the chemical bond in the hydrogen molecule. This presentation will use postage stamps and other philatelic materials to illustrate the history of quantum chemistry, from the pioneering work of Planck, Einstein, Bohr, Schrödinger, Heisenberg, Born, Dirac and others (mainly in the realm of physics) to the development of valence bond theory by Linus Pauling. In the ensuing decades, the field of quantum chemistry evolved to address fundamental questions in chemical structure, bonding, and reactivity, often relying on a variety of spectroscopic methods to explain and predict experimental observations in chemistry, physics, and materials science.



Looking back to Bohr's model of bonding

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Bohr's model is known as one of the roots of the quantum history. In undergraduate courses, sometimes in basic chemistry or sometimes as introduction to quantum chemistry, Bohr model is always a pilar of early lessons. The idea of a classical model where electrons can jump from one orbit to another was interesting and attractive, because it could represent the excitation of electrons between different orbits. Its strength resides in the ability to explain the spectral lines of the hydrogen atomic emission spectrum, and the relation with different energy levels. However, it is always a model rapidly presented as a failure, a model that cannot grasp the complexity of nature which highlights the success of the quantum theory. Beyond hydrogen, Bohr's approach can be extended to Helium or hydrogenoid but shows directly limits for multi-electronic systems. While Bohr model is famous in undergraduate studies for its inefficiency, Bohr has been an amazing scientist, responsible for the development of the quantum theory as we know it and has been awarded the Nobel Prize of physics in 1922 for his contribution. Not only did he fabricate an early model for the hydrogen atom but also tried to make one of the first chemical bonding models, derived from his atomic model. This presentation is focused on this specific aspect: Bohr's initial approach to bonding, if he abandoned it or tried to combine it with the other theories from several brilliant minds of his time. We try to follow how his opinion on his model changed over time and to bring a current view about his chemical bonding approach, now that the entire quantum theory has been developed.

Quantum chemistry: The Mulliken and Pauling legacy

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The field of quantum chemistry began within two years following the publication of Schrödinger’s wave equation in 1926. Two main theories based on Schrödinger’s development emerged independently and extended quantum mechanics to the study of chemical bonding, molecular structure and molecular spectra. One of these theories is attributed to Robert Mulliken, while the other is credited to Linus Pauling. Each of these researchers followed his initial publication with numerous seminal studies. The formulation of Mulliken’s molecular orbital theory and Pauling’s valence bond theory are discussed. Selected applications of these theories from the perspective of personal interactions with first, second and third generation quantum chemists are presented.

Frontiers of computational research for innovations in Chemistry through the advancement of Quantum Chemistry

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Starting with the definition of Quantum Chemistry, this talk focuses on its history, of beginning with the Schrödinger equation to ab initio calculations, and culminating in DFT. The presentation will cover advancements in Quantum Chemistry within both time-independent and time-dependent frameworks, as well as the development of computational instrumentation. The discussion will also address the size and complexity of systems using Quantum Chemistry. Many of the historical discussions are drawn from the literature cited in references 1-3.

Bridging the gap between chemists' and physicists' views of molecules: History and recent developments of multicomponent quantum chemistry

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The concept of a molecule has historically been viewed differently by physicists and chemists. Physicists tend to favor fully quantum mechanical descriptions of all particles, while chemists typically rely on the Born–Oppenheimer approximation, envisioning molecules as systems with well-defined classical nuclear positions and quantum-mechanical electrons. Multicomponent quantum chemistry, which treats both electrons and nuclei quantum mechanically, originally aligned more closely with the physicists' perspective. However, recent developments offer a compelling reconciliation of these viewpoints.This talk traces the historical development of multicomponent quantum chemistry, from its origins in the mid-20th century to its modern resurgence as a practical framework for incorporating nuclear quantum effects into molecular simulations. Particular emphasis is placed on the recently developed constrained nuclear-electronic orbital (CNEO) method, which combines the rigor of quantum nuclear treatment with the interpretability and efficiency of classical molecular simulations. By bridging the quantum and classical pictures, CNEO enables the inclusion of nuclear quantum effects—such as quantum nuclear delocalization, shallow tunneling, and zero-point energy—within classical molecular simulations. As a result, CNEO has demonstrated remarkable success in modeling vibrational spectroscopy, hydrogen bonding, ground- and excited-state proton/hydrogen/hydride transfer, as well as hydrogen absorption processes. With computational costs comparable to traditional density functional theory calculations, CNEO offers a powerful and accessible tool for future quantum chemical studies—particularly in chemical, biological, and materials systems involving hydrogen.

Towards ab initio realizations of Collins' conjecture

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Under the auspices of Collins' conjecture, which suggests that the electron correlation energy is approximately proportional to the Jaynes entropy of the one-electron density matrix, an ab initio approach formulated under an entropy-inspired repartitioning of the electronic Hamiltonian is presented. This ansatz produces canonical orbital eigenvalues each shifted (renormalized) by entropic contributions expressed as subsets of scaled pair correlation energy terms present in second-order Møller-Plesset (MP) perturbation theory. The advantage of this approach is its ability to capture both static and dynamic correlation effects in many-electron systems. Such capabilities are important for describing instances of strong correlation, including those arising from orbital degeneracies that appear upon molecular bond dissociation. A scaling factor in our alternative description of the correlation energy at the MP2 level is a positive constant η modulated to closely reconstruct the correct density matrix at the dissociation limit. This is unique from previously developed methods that rely on concepts extraneous to finite systems (e.g. temperature or chemical potential) and fit correlation parameters to energies already obtained with higher-level theories. Through entropic renormalization, we also maintain the positive semidefinite structure of the correlated density at dissociation, which is a condition of N-representability. The performance of the proposed method, called ηMP2, and its related variants is assessed for estimating single bond dissociation energies (BDEs) for set of small, closed-shell molecules composed of first and second row elements. Total entropies and natural orbital occupation numbers (NOONs) calculated with ηMP2 are compared with those obtained from correlated wavefunction methods. Further details on the context and utility of different representations of Collins' conjecture for connecting information entropy to the electron correlation energy are also highlighted. This study thus provides numerical evidence supporting the general tendency of the Jaynes entropy, a positive quantity, to monotonically increase with a decrease (more negative) electron correlation energy.

Comparative analysis of quantum approaches for solving the electronic structure problem

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In this project, we tackle the electronic structure problem, an NP-hard challenge in computational chemistry involving determining the distribution and energy of electrons in a given molecular system. Solving this problem is essential for understanding material behavior at the atomic level and has far-reaching applications in material design, photovoltaics, nanotechnology, and drug discovery. Due to the high complexity of electronic structure calculations, classical methods face computational limitations, but

recent quantum computing advances show promising potential for addressing this problem within quantum simulation. Our primary goal is to accurately and efficiently estimate a molecular system's ground state energy given its electronic Hamiltonian. The Variational Quantum Eigensolver (VQE) is the leading algorithm in this area, favored for its low circuit depth, variational guarantees, and hybrid quantum-classical approach, making it both practical for Noisy Intermediate-Scale Quantum (NISQ) devices and potentially capable of achieving quantum advantage. In parallel, the classical Hartree-Fock method is used as a baseline for comparison, offering a well-established and efficient way to approximate the electronic structure of a system.
In our work, we implement VQE with various optimizers, alongside the classical Hartree-Fock method. Each algorithm's speed and accuracy are tested on a diverse set of molecules, allowing us to analyze their performance in relation to molecular properties and algorithmic assumptions. Ultimately, our findings are summarized in a practical guide for industry users, such as those in pharmaceutical and chemical manufacturing, to help them select the most suitable algorithm for determining a molecule’s electronic structure based on its properties.

Quantum chemistry at the University of Cambridge

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I will summarize some of the landmark research in quantum chemistry that was carried out at the Department of Theoretical Chemistry in the University of Cambridge, UK, and published on by scientists in that department, in the late 20th century, culminating in part in the 1997 award of the Nobel Prize to John Pople (jointly with Walter Kohn of UCSB).

Life and quantum science of Arno Rudolf Bohm

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With the passing of Arno Rudolf Bohm on December 29, 2024, the physics world lost an accomplished scientist who helped the physics world keep its bearings. He did this by forcing "riggings" onto Hilbert Space. It was thus called "Rigged Hilbert Space" by Israel Gelfand, one of its first users and a friend of Bohm. These simplifications as well as symmetry were used for spectral analysis and other quantum mechanical methods. We discuss these methods and how they fit into the life of Arno Bohm who spent most of his life deep in the pursuit of mathematical physics, writing manuscripts and publishing books e.g. Quantum Mechanics. He leaves behind a legacy of Physics at The University of Texas at Austin. Though "rigged" in place in Austin Texas, Bohm collaborated internationally and traveled often to incorporate ideas from the entire world. We present in this memorial a telling of his travels and what he learned in these escapades.

Quantum dots in science and engineering: The beginning and the future

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The quantum dots, or artificial atoms, demonstrate the quantum mechanical principles of larger particles. When excited with laser light, the colloidal solutions of quantum dots produce fluorescence, which depends on the size of the particles – the larger the size, the greater the wavelength of the fluorescent radiation. In 2023, the Nobel Prize in Chemistry was awarded to Moungi Bawendi, Louis Brus, and Alexei Ekimov, who independently created the quantum dots in the late 1980s and early 1990s**.** Ekimov studied copper chloride nanocrystals, which he grew in glassy matrixes, and found that their optical absorption properties depended on their size. The enormous potential of this discovery was clear from the very beginning. Brus studied the quantization effects in light absorption in colloidal suspensions of cadmium sulfide nanocrystals. Since the optical properties depend on the size of the nanoparticles, the control of the process has become of primary importance. In 1993, Christopher Murray, David Norris, and Moungi Bawendi published a paper in the Journal of the American Chemical Society demonstrating how colloidal nanocrystals of cadmium chalcogenides could be grown with an unprecedented level of control by a hot injection method. The discovery continues to impact all areas of science and technology – bioimaging, photovoltaic and light emitting devices, and biomedical applications. In this presentation, we will go through the beginning and the events preceding the discoveries of Bawendi, Brus, and Ekimov, acknowledge other scientists involved in the process, and look at current and future developments.

Quantum chemical calculations of transition-metal systems: A personal perspective

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Quantum calculations on transition metals began with numerical atomic calculations by Hartree on Cu^+ with simple atomic orbital (AO) product functions (no exchange, 'Hartree calculations'). This work was soon followed by numerical Hartree Fock calculations and analytical Hartree-Fock-Roothaan (HFR) calculations. The latter development was essential for calculations on molecules and solids. Although there was early work on HFR calculations of transition metal diatomic molecules, chemists understanding of the electronic structure of transition metal complexes was rooted in ligand-field theory and valence-bond concepts. As helpful as these methods were in understanding UV-visible spectra and describing chemical bonds in these complexes, chemists wanted a more complete understanding of the bonding in these complexes and a more predictive methodology. The work of Wolfsberg and Helmholtz led the way into molecular orbital calculation of polyatomic transition metal complexes. Their methodology was a forerunner to related methods such as the semiempirical extended Hückel methods by Hoffmann and coworkers and the approximate ab initio method developed by Fenske and coworkers.

The development of Gaussian-type orbitals (GTO) led to our ability to do all electron HFR calculations on larger transition complexes and organometallics. As these calculations began to reach their limit, it became clear that methods beyond the one-electron approximation inherent in HFR calculations would be needed. Early developments for transition metal complexes proceeded along two lines: (1) using perturbation methods being developed for organic systems by Pople and others and (2) using density functional (Xa) methods being developed for solid-state systems by Slater and others. Our group was an early proponent of the former for transition metal systems, but the Symposium that I organized for the National ACS meeting in Orlando, convinced me that density functional theory (DFT) would be the best route to study the larger systems that interested me. These studies included transition-metal hydrides and dihydrogen activation, carbon-hydrogen activation, metalloenzymes including hydrogenases, and DMSO reductase, non-innocent ligands including dithiolenes and NO, and metal-metal bonding.

40 years of quantum chemical calculations: from punched cards to AI

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My fascination with quantum chemistry began in high school, where I dreamed of doing chemistry on a computer. I imagined using calculations to support experimental work and perhaps even replace some of the more dangerous and foul-smelling experiments with elegant simulations. This passion led me to Bayer Leverkusen for specialized training, where I learned to program computers the hard way: by writing Assembly machine codes punched onto cards. But my curiosity was not satisfied. To deepen my understanding, I pursued a degree in chemistry at Cologne University, where I explored the theoretical foundations behind these calculations. I was drawn deeper into the captivating world of quantum chemistry, where solving the Schrödinger equation became an endless pursuit, a quest to capture nature's complexity as closely as possible. My early work focused on small systems using highly empirical methods, but as my knowledge and programming skills grew, I developed more sophisticated algorithms. This progress allowed me to tackle larger molecules, such as benzene, a significant achievement at the time. Over the years, I witnessed the exponential growth of computational power and software capabilities, transforming the field of quantum chemistry at a breathtaking pace. What once took days of computation can now be accomplished in seconds, enabling us to move beyond simple models and simulate entire reaction mechanisms within enzymes. Today, with the advent of machine learning, we are entering an exciting new era. AI-driven models are revolutionizing quantum chemical research, accelerating discoveries, and unlocking possibilities that once seemed beyond reach. This talk offers a personal reflection on 40 years of advancements in quantum chemical calculations, tracing the remarkable journey from punched cards to AI-assisted simulations, and exploring the thrilling future that lies ahead.

Archaeological chemistry: A multidisciplinary analysis of the past

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The ACS Division of the History of Chemistry is the custodian of possibly the largest and most comprehensive collection of volumes specifically on the topic of Archaeological Chemistry in the world. While it might be difficult to measure this content against other contenders, the oeuvre consists of nine volumes published between 1974 and 2020. This paper will detail the development of the latest of these volumes under the co-editorship of the presenter and the honoree of this symposium, Seth Clayton Rasmussen. “Archaeological chemistry is a topic which, when mentioned in a general public gathering, makes heads turn, eyes brighten, smiles burst forth and questions emerge.” This, the opening sentence of the volume under discussion, has held true for the entire 47-year history of this series. While the original symposium that gave rise to the volume, held at the 2019 ACS Spring meeting in Orlando, consisted of three sessions (Metals, Glasses Ceramics and Organic Materials, and Color in Archaeology and Pedagogy) the final volume contains four sections (Archaeological Chemistry as related to educational applications, materials science, organic materials and coloring materials). The rearrangement came about because four of the symposium speakers, one international and three domestic, did not contribute to the volume, whereas four international contributors were added to complete the volume. The volume was published in hardcover by Cambridge Scholars Publishing, Newcastle upon Tyne, UK in 2020 and in softcover in December, 2024.

Those who served – HIST secretary/treasurers in the first 100 years

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HIST celebrated its 100th anniversary as an American Chemical Society technical division in 2024. During its first 100 years sixteen individuals have served as secretary/treasurer of the HIST division. This talk will present a short biography of each. In order of service, the secretary/treasurers were: Lyman Newell (1922-1926), Tenney L. Davis (1927-1934), Mildred Grafflin (1935-1940), Ralph E. Oesper (1941-1947), Sidney M. Edelstein (1948-1965), Sr. St. John Nepumocene (1966-1969), Desmond M. C. Reilly (1970-1972), David H. Wilcox, Jr. (1973-1974), Wyndham D. Miles (1975), Robert M. Hawthorne (1976-1979), Natalie Foster (1980-1983), Robert H. Goldsmith (1984-1985), William B. Jensen (1986-1989), John Heitmann (1990-1991), Harold Goldwhite (1992-1994), and Vera V. Mainz (1995-to date). Mary Virginia Orna served as treasurer (1989-1990), during a period when the position was split.

Ozone hole: Discovery and impact

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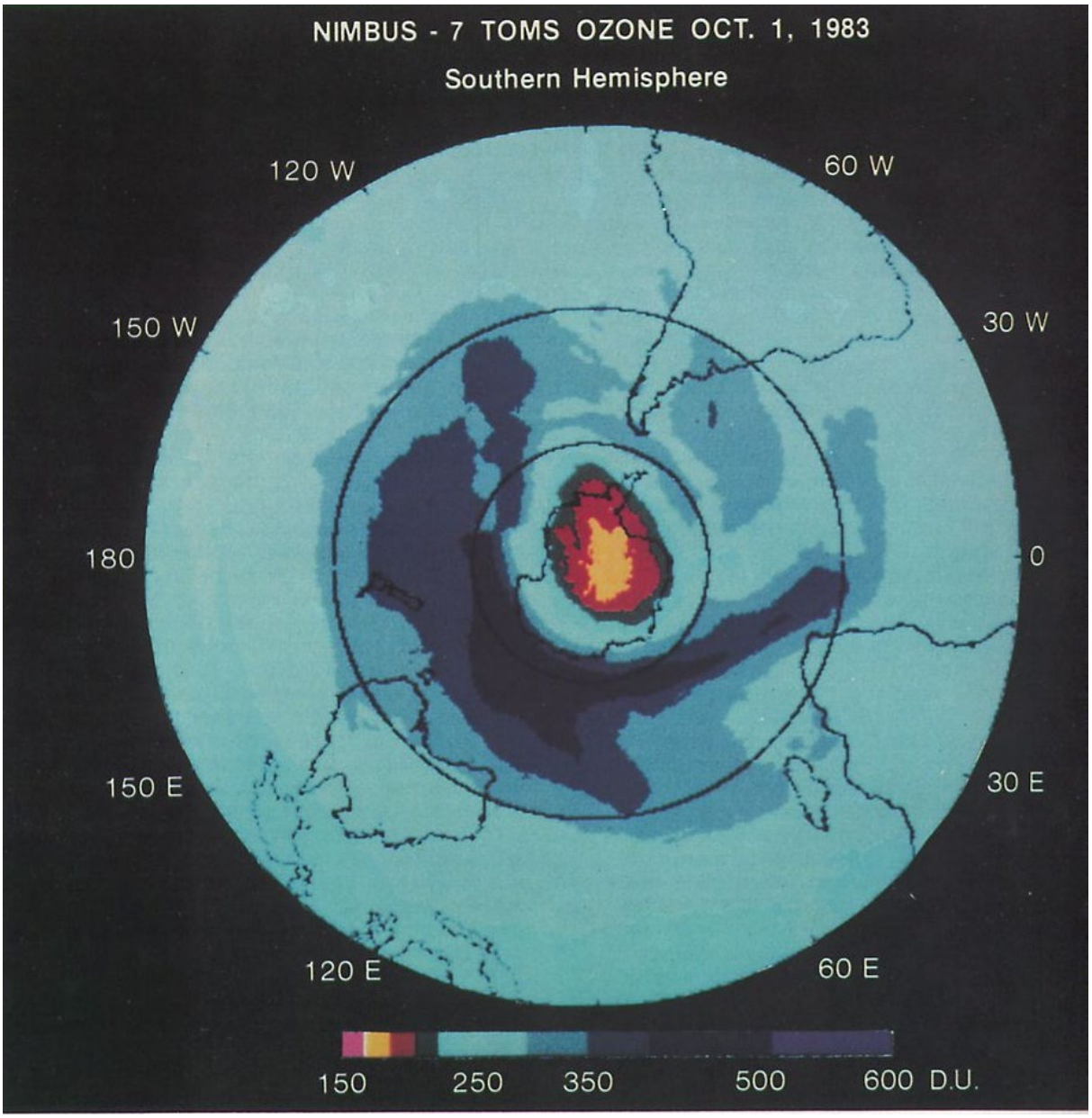
"No one discovered the ozone hole" according to Joseph Farman, widely regarded as one of the discoverers of the ozone hole. The emergence of the ozone hole as a phenomenon in scientific, public and regulatory consciousness will be described. The subsequent intensive investigation and explanation of the phenomenon and international regulation of ozone-depleting substances will be outlined.



Remarkable but little-known American contribution to the invention of the periodic table: The work of Charles F. Chandler and Charles S. Peirce

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This talk will discuss three insightful but often-overlooked papers that appeared anonymously in 1869, which went a long way toward the independent construction of a periodic table almost simultaneously with that devised by Dmitri Mendeleev. The three papers appeared under the title “The Pairing of the Elements” in the April, May, and June issues of the American supplement to the British journal, Chemical News. The principal author of all three papers was the Columbia professor of chemistry Charles Frederick Chandler (1836-1925), but a significant contribution to the third paper was made by the Harvard-trained American scientist, mathematician, logician, and philosopher Charles Sanders Peirce (1839-1914). In these papers, about 50 of the chemical elements are classified according to their atomic weight and atomicity (i.e., valence). The most notable aspect of the classification is the realization that there are relationships and patterns among atomic weights, valences, and chemical properties not just within a group (which was well known) but also between groups. The first paper by Chandler described several two-group arrays of elements that can be considered as significant fragments of the more integrated periodic table proposed by Mendeleev that same year. This paper also pointed out that there are some vacancies in the classification scheme and speculated that the vacant places might someday be filled by the discovery of new elements. The third paper contains Peirce’s remarkable figure of what can be considered as a “split” periodic table in which the vertical axis is atomic weight and the horizontal axis is valence. Although the table is split because elements with even and odd valence are partitioned to the right and left, respectively, the two-dimensionality that is the essence of the periodic law is clearly represented. I believe that the work of Chandler and Peirce should feature more prominently than it does currently in discussions of the history of the periodic table.

History and chemistry of tanning and leather in antiquity: A deeper look

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Well before any surviving written records, early humans began using the hides and pelts of other animals for clothing and shelter, eventually expanding their use to shoes, armor, livestock harnesses and other equipment, and even as a medium for the written word. This expansion could not be accomplished without technological advancements that would lead to successful treatment processes that would slow or stop the decomposition of the raw skins and hides. These processes and a cursory look at the chemistry behind the processes have been previously reported; the current work reviews that history and expands the examination of the molecular processes leading to conversion of raw skins and hides into a unique material commonly referred to as leather.

Soap production and use in the Middle Ages: Continuing the story of its chemical technology

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The earliest written record of soap dates back to Mesopotamian clay tablets from the 3rd millennium BCE, marking the beginning of a long and evolving history in the chemical technology of cleansing agents. Building upon previous research on soap in antiquity, this presentation will focus on its development during the Middle Ages. While medieval soap production was rooted in ancient techniques, it evolved with technological advancements, regional influence, and societal needs. This discussion will trace the chemical innovations in soap production and use from a global perspective, illustrating how the technology adapted and flourished in the medieval context. It will highlight the dynamic interplay between chemistry, society, and culture in the history of soap.

Domestic science and materials. The case of Agnes Pockels and surface chemistry

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When offered access to research facilities at the University of Göttingen by the famous professor Woldemar Voigt in 1893, Agnes Pockels (1862-1935) politely declined, arguing her housewife duties didn't allow her to move out of her household where she was required to take care of her ailing parents. Pockels is among the early pioneers in surface science. She contributed experimental work in the field establishing methods and tools that would be widely in use during the next decades. Voigt's invitation came two years after Pockels had published her first paper in Nature thanks to the support of another surface science pioneer, John William Strutt, 3rd Baron Rayleigh (1842-1919) whom she had sent a letter with the results of ten years of experimentations. The experiments and observations leading to her publication were thus achieved in domestic settings, without any academic education or position, nor connection with a laboratory, and using household and family appliances to build an original instrument designed and built by her. In fact, the so-called "Langmuir trough" (sometimes also known as "Langmuir-Blodgett trough") is based on her original design. This paper will explore whether, and if so, how, the domestic settings impacted Pockels' method of investigation, the use of and approach to materials and the modes of scientific communication.

Who discovered PVC? Early research on polymers derived from "Dutch oil" (ethylene chloride) and similar substances

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There has been uncertainty and a variety of contradictory claims regarding the discovery of certain polymers, especially polyvinyl chloride, derived from halogenated ethylene compounds. The most relevant publications are those of Victor Regnault, August Wilhelm Hofmann, and Eugen Baumann, published between 1835 and 1872. The speaker will strive to clarify these circumstances.

Early studies in DNA structure determination

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The people behind the studies that showed DNA is the genetic material and its gradual structure determination as an antiparallel double stranded “molecule” will be discussed. Among the persons reviewed will be Friedrich Miescher, Richard Altmann, Frederick Griffith, Phoebus Levene, Oswald Avery, Erwin Chargaff, Rosalind Franklin, James Watson, Francis Crick, and Arthur Kornberg.

Glue and adhesives: A chemical history

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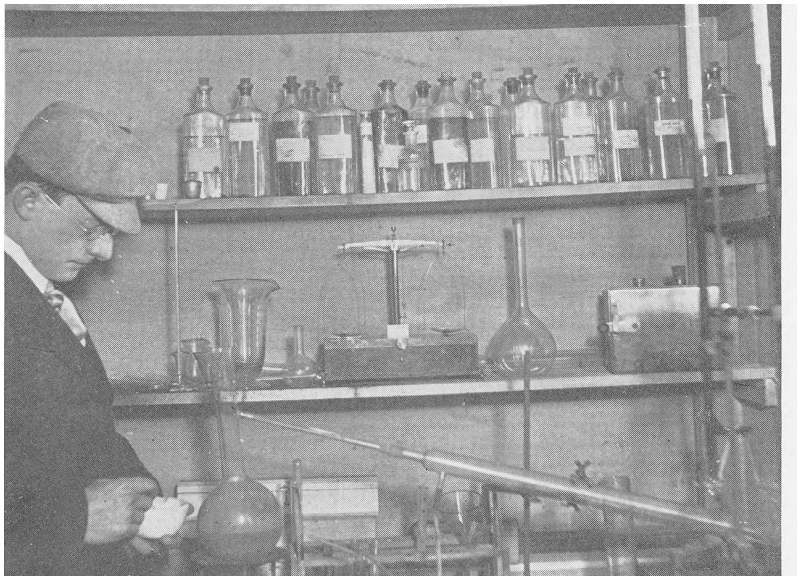
Glue is defined as a sticky substance whose function is to hold or bond two other materials or objects together. One of the earliest uses of a glue dates back approximately two hundred thousand years when early Neanderthals created a sticky tar-like material from birch bark which was then used in the manufacture of primitive tools (Kozowk et al., Sci. Rep. **2017**). The derivation of glues from naturally occurring sources expanded from this time and grew to include pitch and tar-based glues alongside animal-based materials such as skins, bones, hooves, sinew and milk. The Glue Book, by J. A. Taggart (1913, Republican Press, Ohio) provided at that time a comprehensive overview of the preparation and scientific testing of various glues all derived from natural sources. Karlston’s Klister, an adhesive prepared from dissolving celluloid in acetone was created by Axel Karlson in the 1920s. Originally used in the repair of stockings and shoes, this is recognized as the first commercial synthetic adhesive. The twentieth century also witnessed other major developments in the field with the advent of synthetic glues and adhesives including thermoplastics, polyvinyl acetate (aka the ubiquitous school or white glue) and the cyanoacrylate family. This talk will provide an overview of the history of

glues and adhesives looking at both the history and chemistry of these materials from the earliest examples to modern synthetic materials.



Acetylene and aniline chemistry in the snow: North Dakota and Russia

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Following its discovery by Edmund Davy (1785-1857), the acetylene molecule has held a fascination for organic chemists. Its reactivity when contrasts with ethylene — acetylene does not react rapidly with traditional electrophiles but reacts more rapidly than ethylene with transition metal complexes and free radicals. In the 20th century, it became an important raw material in the drug and rubber industries, and the controlled polymerization to polyacetylene became an important part of the Nobel Prize-winning work on organic semiconductors and conducting polymers. Its importance to the war efforts of both sides in World War II was particularly evident in Germany, where the work of Walter Julius Reppe (1892-1969) on acetylene oligomerization mitigated the German need for fuels and rubber, and the Soviet Union, where the work of Aleksei Yevgrafovich Favorskii (1860-1945) on the reactions of acetylene under high pressure became instrumental in Russia's manufacture of isoprene and rubber. Aniline, whose synthesis from nitrobenzene was first reported by Nikolai Nikolaevich Zinin (1812-1880) in 1842, rapidly assumed a central position in the development of the dye and pharmaceutical industries in western Europe. Polyaniline, discovered early in the study of the chemistry of the amine, was first exploited as a dyestuff, but the discovery of its conducting properties in the 1960s opened a whole new field of study of this substance. An overview of the development of acetylene and aniline chemistry will be presented.

Why materials? A retrospective of 25+ years of historical research

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Materials are defined as a substance or combination of substances that constitute a physical object. As such, materials are the chemical species used to produce the various objects used throughout our typical day. Because of this, the history of materials can be viewed as encompassing not only the history of chemistry relating to the synthesis and study of these fundamental chemical species, but through their applications also includes aspects of the histories of physics, engineering, and technology. Furthermore, as materials make up the common physical objects used by all members of society, the history of these materials can also provide insight into the history of a given culture or society. Using examples from his historical studies on various materials over the last 25+ years, the speaker will present arguments as to why the history of materials is a particularly important topic within the greater history of chemistry.

How new chemical detection methods led to the discovery of acetaminophen as a useful drug

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Acetaminophen, also known as paracetamol in Europe, became a highly popular over-the-counter drug for the relief of fever and pain in the late 20th century. Prior to its rise in popularity, two other chemically related drugs, acetanilide and phenacetin (or acetphenetidin), had been widely used since their discovery in the 1880s. As two of the earliest synthetic antipyretic analgesic drugs, they were important resources in the treatment of infection-induced fever and soon became central components of headache and cold remedies. Both were considered to have negative side effects, particularly acetanilide which could cause cyanosis or bluing of the skin. This spurred on studies starting before 1900 with the goal of discovering the chemical conversions that took place in the body. In the late 1940s, researchers Leon Greenberg and David Lester at Yale University and Bernard Brodie and Julius Axelrod at New York University studied the metabolic processing of acetanilide and phenacetin using newly developed colorimetric detection methods. Blood and urine samples were analyzed for the drugs and their metabolites after conversion into visible light-absorbing compounds, such as azo or indophenol derivatives. This work identified p-hydroxyacetanilide or acetaminophen as a key metabolite, suggesting it may have a role in the analgesic effect of both drugs. Within the next decade acetaminophen became available as a separate drug, eventually becoming the important pain and fever reliever as it is today. The studies of the late 1940s represent one of the first examples of the determination of a drug's metabolic pathway using the techniques of chemical detection.

Strained organic molecules: The rococo era (1950s through 1970s)

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Our monograph Strained Organic Molecules was published almost fifty years ago. Although advances continued as they do so today, the 1950's through the 1970's might be thought of as the "Rococo Era of Strained Organic Molecules." For example, while cyclopropanes ("cyclotrimethylenes") were known in the late nineteenth century, the first identification of a cyclopropene was only made in 1952 with syntheses occurring a few years later. Further advances relied upon newer methodologies, spectroscopies, as well as computational predictions. Sources of strain will be exemplified by angularly strained polycyclic alkanes, crowded alkanes and twisted olefinic linkages, bent triple bonds and cumulenes, non-planar benzene rings, among other structural "pathologies". Starting in the 1960's, [n.m.o]propellanes, having "inverted tetrahedra" were synthesized. Astonishingly, [1.1.1]propellane, the most strained of these was, in fact, synthesized in 1982 and found to be quite stable (despite our prediction to the contrary). And, most amazing, was the synthesis and distillation of tetra-tert-butyltetrahedrane in 1978 just prior to publication.

Historical perspective on elemental discoveries and the periodic table

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The periodic table is one of the most profound achievements in the history of science, serving as a tool for innovation and discovery. It provides an elegant framework for the fundamental building blocks of matter. However, the path to the periodic table that we recognize today began with simpler ideas, such as Aristotle's four-element theory and the alchemists' pursuit of transmutation. It was with the rise of experimental science in the 17th and 18th centuries that elements began to be systematically identified and classified. Antoine Lavoisier's "Table of Simple Substances," published in 1789, was the first attempt to classify the elements and laid the groundwork for the development of the periodic table. While many others contributed to this journey, it was Dmitri Mendeleev's periodic law of 1869 that revolutionized element organization. This system not only accurately organized the 63 then-known elements based on atomic weight, but it also predicted the existence of multiple undiscovered elements. Subsequent discoveries, such as noble gases by Ramsay and Rayleigh and radioactivity by Becquerel, led to the expansion and refinement of the table. Today, there are 118 known elements, and the quest for more is ongoing. This presentation traces the evolution of the periodic table from its earliest conceptualizations to its modern form through fascinating stories of scientific breakthroughs and pivotal advancements. Over centuries, what began as ancient speculations transformed into a precise, systematic science. Beyond its scientific utility,

the periodic table has transcended the confines of textbooks and laboratories, becoming a reflection of humanity’s relentless pursuit of knowledge.

Lazar Solomonovich Polyakov's contributions to science and technology

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Lazar Solomonovich Polyakov, known as financial officer of Russian Imperia, sounded like an old Jewish name who had reflected on the natural sciences by his vision to split the budget between the school and the industry which includes but not limited to metallurgy, railroad, and high technology. Plasmonic nanoparticle UV-visible spectroscopy research is mainly driven by the metallurgy of noble metals such as Au (gold) and Ag (silver). The investments come a way through "Silver Dollar City" up to Argentina. Not silent Golden notable places such as Alaska's full story of the golden rush as well as the long distance connected railway in Russia with notable stories of the Golden Calf (Illya Ilf and Yevgeniy Katayev). Plasma television should not be confused with plasmonic effect; however it might have a tie with Lazar Solomonovich Polyakov. Laser technology has received enormous growth for the last decades in Raman spectroscopy, confocal microscopy, laser flash technology, laser-based lithography. We should acknowledge the latest progress that uses laser light to trap and manipulate microscopic particles, atoms, and even living cells, allowing scientists to study biological systems with great precision, in fusion of soft matter by laser technology in controlled manner, essentially Dr. Arthur Ashkin was awarded the Nobel Prize. Laser lithography is a versatile technique for the creation of microstructures; it involves using light to transfer a pattern onto a substrate. Photolithography processes can be classified according to the type of light used, including ultraviolet lithography, and X-ray lithography. The wavelength of light used determines the minimum feature size that can be formed in the photoresist. "Solo" comes from the word "alone" (single, one) meaning that the solo-system is driven in one direction or provides one sound by a group of the community. Plasmon as a solo was performed by different groups from St. Louis–San Francisco and had significance because of the one sound. "Poly" means "many" with "mono" meaning "one" creates a new compound "polymer" which is interpreted as multiple simple chemical units of "monomers". Novelty is the main factor in science technology, essentially, the pursuit of "new" discoveries is a fundamental aspect of scientific progress. Investment of Lazar Solomonovich Polyakov to aviation is notable at Solomensky district in Kyiv as Kyiv National Aviation University.

From coal and lime: The story of calcium carbide

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In 1837, Edmund Davy (1785-1857), in an effort to prepare potassium by heating a mixture of calcined cream of tartar with charcoal, discovered a new substance, now known as potassium carbide, which reacted with water and released a hydrocarbon, “bicarburet of hydrogen” (acetylene). Davy studied some of the chemical properties of the gas and noted that it burned “with a bright white flame… of greater splendour than that of olefiant gas, under similar circumstances.” Calcium carbide was successfully synthesized from its constituent elements, calcium (in the form of an alloy with zinc) and carbon, in 1862 by Friedrich Woehler (1800-1882), but the interest in and the practical applications of carbides were rather limited until an affordable method for their production was devised. In 1892, Henri Moissan (1852-1907) reported that calcium carbide could be made in an electric furnace from the readily available and inexpensive lime when heated with carbon electrodes. The process was independently discovered and developed by Thomas Leopold Wilson (1860-1915). The practicality of calcium carbide-derived acetylene in illumination was demonstrated, and the first factory for the manufacture of calcium carbide was established in 1895. At the dawn of the 20th century, various carbide lamps were invented and found uses as auxiliary parts for bicycles and devices for the illumination of homes and mines. Although these lamps continued to be used well into the 1960s and beyond, after the Moweaqua Coal Mine disaster (1932) when methane gas was ignited by an open flame carbide lamp, applications in mining sharply declined. The main discoveries related to the production and applications calcium carbide will be traced in this presentation.

Oesper collections' new exhibition at the University of Cincinnati

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The Oesper Collections in the History of Chemistry at the University of Cincinnati (UC) is one of the world's largest curated collections of scientific artifacts, books, journals, photos, and prints related to the history of chemistry and was awarded a National Historic Landmark designation by the American Chemical Society (ACS) in 2022. Thanks to this designation and continued advocacy, the Oesper Collections were incorporated into the preliminary floor plan of the renovations of the historic Old Chemistry building on UC's Campus. The collections were given 110 linear feet of display cases, spanning 3 floors of the newly renovated building to engage students with our one-of-a-kind objects and compelling narratives from the history of chemistry, increasing visibility and awareness of the Oesper Collections. These displays will be installed in July 2025. This enhanced visibility provides valuable learning opportunities for chemistry students to connect with the discipline's rich heritage while inspiring a deeper appreciation for scientific discovery

among the broader campus community. This presentation will detail the implementation of this large-scale display project and feature a remote unveiling of the displays for attendees. Display topics include the lives and achievements of Ralph Oesper and William "Bill" Jensen, history of the periodic table and the discovery of the elements, "The Human Side of Scientists" with focus given to Robert Bunsen, Justus von Liebig, Humphrey Davy, Joseph Priestly, Antoine Lavoisier, and Marie Curie, the coal-tar dye industry, historic cells and batteries, blowpipe and mineral analysis, chemistry's roots in alchemy, and the history of chemistry in Cincinnati.

From clay to gold: Recreating ancient alchemical techniques

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As two of the four pillars of ancient art, the pursuit of imitation silver and gold have been integral to the amassed scientific knowledge of many ancient civilizations, including ancient Mesopotamia. Although it is often reduced to a pseudo-science with little academic merit by popular culture, the Assyrian empire had developed technical procedures for changing the appearance of more common metals to resemble precious metals such as silver and gold. These procedures are detailed on a clay tablet [K7942+] discovered in the ruins of Ashurbanipal’s library in Nineveh (modern-day Iraq). Technical writing is quite rare to find among clay tablets of the Neo-Assyrian era, and thus this tablet serves as an opportunity for more research into ancient chemical knowledge and technique. This research has aimed to use the translation of the tablet to reproduce two chemical procedures: one for imitation silver and one for imitation gold. This would allow for confirmation of Akkadian words into English, further clarification in the translation, and a better understanding of the scientific knowledge that had been acquired by the scholars of the Assyrian empire. While a large part of this research has been an iterative process between attempting chemical procedures in the lab and reworking the translation for accuracy, these translations have additionally been cross-referenced with the work of Oppenheim from the 1960s. It should however be noted that portions of the new translation deviate from the work of Oppenheim. We used an iterative process by checking the partial translations against modern chemical theory for feasibility. The materials considered for this research were limited to those that would have been available in Mesopotamia during the time when the tablets were created. We were able to recreate the procedure described on the tablets using sulfur and various other materials. This research has shown that the Assyrians understood chemistry beyond the modern conceptions of the alchemical race to create gold and silver.

History and philosophy of calories and respiration

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After an estimated 23 years of research, in 1789 the world was first introduced to a brilliantly cool model to describe local heat transfer in chemical reactions: the caloric! The calorie! As the author of this treatise – Traite Elementaire de Chimie (Elements of Chemistry) – Antoine Lavoisier is the first person in the world to organize a book on the chemical properties of substances based on their reactions and products. To produce this research, Lavoisier built many unique machines, like the first calorimeter, engineered with Pierre-Simon de la Place. Lavoisier and his colleagues were the first to people in human history to chemically analyzed the composition of food, the atmosphere, and respiration. 100 years later, it would become the foundation for the thermodynamic measurement of nutrition and human labor force that developed through philosophies of Helmholtz and Faraday, and finally to Rubner and Atwater. Although not all scientists and philosophers agreed to the loss of vitalism in favor of physiological reductionisms, 136 years more, we still use the calorie in nutrition, exercise, and biological applications to this day. Let us trace back this measurement of human thermodynamics and together let us rediscover what science tells us about the chemical thermodynamics of human movement and nutrition.

From glass to plastic: The past and future of cell culturing glassware

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Cell culturing has become a staple method in cell research and is utilized in many disciplines. This entails the removal of cells from an organism and then growing them under controlled conditions that simulate the donor's environment. Wilhelm Roux first introduced this possibility in 1885 when he demonstrated that live cells can be maintained outside of its natural environment. As our understanding for culturing cells advanced, so has its platform. Knowledge and use of cell culturing techniques would become commonplace in the 1950's and 60's, with multiple papers published by famed aviator Charles Lindbergh and 1912 Nobel laureate Alexis Carrel in the 1930's. These developments would differentiate into further fields of study, eventually becoming commonplace in tissue culturing and organ transplants. Until the 1960's, glass was the main platform for cell culturing, however it had its drawbacks as cells were unable to adhere without a coating on the glassware. The rise of disposable plastics would eventually find its way into lab use and replace the majority of the glassware. While many plastics would be used for the purpose of cell culturing, polystyrene (PS) in particular became the most commonly used among labs. This plastic consists of a long hydrocarbon chain, with a phenyl group attached to every alternating carbon atom. Much more

affordable than glass, PS also has a lower melting point than glass, and its surface properties can be easily modified during manufacturing for easier cell to surface adhesion. The material with which we practice cell culturing is as vital as cell culturing itself. With the implementation of biodegradable cell culturing material, cell culturing will now evolve with our environment's best interests in mind.

Shielding through time: Exploring the history and teaching of Slater's Rules

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Now instrumental in explaining electron shielding and effective nuclear charge, the inorganic concept called "Slater's Rules" has a rich history. We aimed to understand the historical development of Slater's Rules and evaluate their presentation across current educational materials. To reach this end, we analyzed primary and secondary historical sources tracing the origin, progression, and application of Slater's Rules, as well as their gradual incorporation into chemical education. In parallel, 13 widely used undergraduate inorganic chemistry textbooks were compared based on their depth of coverage, contextual framing, and discussion of limitations regarding Slater's Rules. These analyses were collectively evaluated to assess how Slater's Rules was distilled into a simplified focus on periodic trends. We observed that the evolution of Slater's Rules can be captured in six key historical milestones. While most textbooks present the rules as a practical tool for estimating effective nuclear charge, they typically exclude historical details and vary in their discussion of theoretical derivations or limitations. In response, we propose a chemistry classroom activity that presents historical case analyses and a milestone-based approach to teaching Slater's Rules, effectively modeling how chemistry as a science has changed over time.

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