



2019 Highlights of ACS Achievements

An annual report from Thomas Connelly
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During 2019, ACS was able to build on the momentum from 2018, and to accelerate the rate of progress. Our Core Value of Safety was once again prominent across the Society. One important step was the decision by ACS Publications to take over the *Journal of Chemical Health and Safety*, formerly published by Elsevier. ACS Publications has plans to make the journal a dynamic representation and modality for projecting our commitment to Safety as a core value.

Based on the Board action in December 2018, adding Respect as a core value, alongside Diversity and Inclusion, was also an important core value focus in 2019. ACS joined, as a charter member, the AAAS Societies Consortium on Sexual Harassment in STEM. Within ACS, hotlines and other mechanisms for reporting concerns at national meetings were put in place. Dorothy Phillips continues to represent ACS on the AAAS Coalition for Science and Human Rights. Steps were taken to review our awards and recognition policies in the context of our Respect core value. These deliberations include discussions with sister societies in the US and other countries. Diversity, Inclusion and Respect will be an important subject for ACS volunteers and staff in 2020.

Our Membership team worked hard to deliver our second consecutive year of membership growth, ending the year with >152,000 members. Membership was truly 'everyone's responsibility'. For example, ACS Publications contributed new members through attendance at ACS Publications symposia, and through a membership offer made to new peer reviewers. Similarly, Education helped by increasing the number of joint American Association of Chemistry Teachers (AACT)/ACS members. Scientific Advancement helped through members secured at the Green Chemistry & Engineering Conference, and through an offer to PRF proposal reviewers. And, it is gratifying that the percentage of ACS staff who are members of ACS has now grown to 35%.

2019 was also a pivotal year for the advancement of our Membership 2.0 effort. Extensive effort led to definition of possible membership models; preparations were made for tests during 2020 and 2021. Important IT work was completed and demonstrated which will give us the systems flexibility to begin to customize our membership offerings for the first time.

Equally important was the progress that was made with governance redesign that will provide agility and flexibility needed for membership test and package design and pricing. During 2020, our membership team will also be working closely with Board members and other volunteers serving on the Task Force on the Future of Meetings.

ACS Green Chemistry Institute held its Green Chemistry & Engineering Conference in conjunction with the 9th International Conference on Green and Sustainable Chemistry in Reston, VA. The conference was very well attended, including about 30% of attendees from industry. The 2019 Green Chemistry Challenge Awards were held in conjunction with EPA, our historic cosponsor. We are pleased that for 2020, EPA will continue to work with us in this area. PRF has also undertaken efforts to streamline its meetings and to revise its proposal review practices.

Education had a strong year with its first full year of the ACS Bridge Project, with our first cohort completing its bridge year. Bridge graduates are now enrolled at our bridge sites and our partner universities. Near yearend, we received exciting news of a major commitment from the Genentech Foundation to support the ACS Bridge Project. We completed our pilots for international chemistry undergraduate program approvals at our seven sites. The Committee on Professional Training (CPT) is now conducting a pilot to inform a global chemistry department recognition program. AACT membership grew to nearly 7,000, including thousands who are joint members of both AACT and ACS. Working closely with Board members and other volunteers, Education worked on the future of ACS leadership training, leading to major revisions. This work identified further opportunities for our overall efforts in professional training; the subject of additional work this year. More exciting news, the US team won three gold medals and one silver at the 51st International Chemistry Olympiad (IChO) in Paris. This was also the first year for our IChO camp at the University of Maryland, College Park, after nearly 20 years at the US Air Force Academy.

The Office of the Secretary and General Counsel (OSGC) worked with both the Board and Council on the most significant revisions to the Society's governing documents since 1948. It was gratifying to see the proposed revisions approved by the Council in August, and ratified overwhelmingly by the entire membership in October. OSGC staff also promoted chemistry and its practitioners to the media, ACS members, and directly to the public.

- Media outreach resulted in more than 29,400 articles in print and online news media outlets with a potential audience of more than 42.4 billion online (a single individual can be part of multiple audiences) and 79.5 million in print and broadcast.
- ACS produced and distributed 43 weekly PressPacs, 62 embargoed press releases, and 60 other releases that highlighted more than 140 ACS published journal articles and Society news.
- ACS published 47 *Reactions* videos, with all videos in the series receiving a total of more than 8.0 million views on Facebook and YouTube. *Reactions'* Facebook page and YouTube channel each have more than 300,000 followers.
- ACS Experts fulfilled more than 100 requests from the news media for scientists to help with stories. These requests came from news outlets including *Agence France-Presse* (AFP, which is France's version of AP), *AP*, *BOOM!* (a Spanish game show), *Boston*

Globe, the New Yorker, NPR's "Science Friday," Scholastic Science World and Wired, as well as from general audiences.

- Communication training modules were developed and posted as a shared office resource in 2019. The library currently includes training modules for staff to use when talking about science communication, advocacy training and online communication.
- The National Historic Chemical Landmarks program held several dedication and re-dedication ceremonies to recognize the following:
 - St. Elmo Brady, first African-American to earn a Ph.D. in chemistry (February)
 - Upjohn Co.'s R&D in steroid medicines (May)
 - Dow's combinations of gas chromatography and mass spectrometry (June)
 - The discovery of more than a dozen elements at Lawrence Berkeley National Laboratory (rededication; August)

The International Year of the Periodic Table of Chemical Elements (IYPT) provided special opportunities for outreach during 2019. Starting with the IYPT kickoff in Paris, and at events running throughout the year until the closing ceremony in Tokyo during December 2019, presented many opportunities for ACS represented by Bonnie Charpentier and the presidential succession. Activities at the national meetings, and in the local sections, including of course National Chemistry Week and Chemists Celebrate Earth Week also celebrated IYPT. IYPT events were also held at the rededication of the National Historic Chemical Landmark at Lawrence Hall of Science, a symposium cosponsored by ACS and NSF held in November at the National Academy of Science, and at the fall Executive Director's (Staff) Briefing.

HR had a very busy year with the incorporation of our six staff core competencies – Candor, Change Agility, Continuous Improvement, Global Mindset, Partnership Building, and Solutions Focused – into our performance management system. Staff training has been held in these competencies. 2019 was also an important year for senior staff recruiting. HR also completed successful searches for the Treasurer and Chief Financial Officer, the Vice President of Development, and for the President of ACS Publications. Based on our 2018 Employee Engagement survey results, each staff unit has been working on an engagement plan during 2019. Continuing improvement in our collaboration skills will be essential.

2019 was an important year for our Strategic Planning office. Having spent prior years codifying our Society's Board-led strategic planning process, during 2019, revisions were made to create a multiyear planning cycle. For staff execution, preparations are underway for our most significant overhaul to our 10-year operations planning since 2017.

Our Finance team had a strong year in streamlining and simplifying its operation through the elimination of the Probable 1 Forecast, and simplifications to the Society Program Portfolio Management process. The elimination of the P1 caused no operational problems, and likely saved about one FTE, marbled throughout the staff.

The Development team had a banner year under the leadership of its new Vice President Audrey Rogerson. The team completed a strategic reassessment of its strengths and gaps. Steps were taken to centralize efforts for sponsorships, as well as philanthropic giving.

Efforts are underway to expand our donor base to include more foundation effort. Reallocation of our development effort has resulted. Total Development funds raised exceeded \$6M; our largest total in more than a decade. This total includes a major commitment by the Genentech Foundation for the ACS Bridge Project, and a generous bequest by the Joseph D. Loconti Foundation to Project SEED.

Information Technologies led the effort to install a new platform for ACS Publications content delivery. The increased functionality has been appreciated, and the ‘go-live’ was achieved with minimal disruption. Our IT team also invested heavily in enhancements to our Membership-related systems, providing ease and flexibility for online renewals, among other functionality. IT collaboration between Washington and Columbus continues to find opportunities to streamline and simplify our operations.

CAS continues to deliver valuable scientific information solutions that power global research, discovery and innovation. The number of customer organizations now benefiting from efficiencies using the modernized SciFinder[®] platform nearly quadrupled. Rollout of new predictive retrosynthesis capabilities within SciFinder[®] were also implemented, improving workflow efficiencies for researchers. Additionally, significant progress was made with advancing the STN franchise and in expanding CAS Service offerings that help organizations maximize the value they receive from their relationships with CAS.

ACS Publications’ manuscript submissions grew 6% and articles published grew 9% to 57K. Several new peer reviewed titles began publication. Our first-ever partner publishing arrangement was concluded with the American Society for Mass Spectroscopy. ACS Publications also launched a new publication platform.

Important progress was made with our Open Access (OA) efforts. *ACS Central Science* saw its impact factor grow to 12.837. *ACS Omega* published more than 2500 papers, a 25% increase over 2018. The Governing Board for Publishing and ACS Board of Directors supported important next steps for our OA publishing strategy.

ACS continued its great strides in our Globalization efforts. ACS Board Member Ingrid Montes led the efforts and submitted the final Society Programs Globalization Report in December 2019. Global membership continues to grow – more than 30,000 scientists and engineers, 20% of our total members. The total roles, staff and contractors, for ACSI now exceeds 140 in 22 countries. We are now routinely holding gatherings for ACS members at international chemistry conferences around the world.

Working with seven other national and regional chemistry societies on four continents, the second ABCChem conference is now planned for December 2021 in Marrakech, Morocco. And, the eighth PacifiChem will be held in Honolulu, December 15-20, 2020.

Thanks to another year of strong revenue growth in CAS and ACS Publications, careful cost management across the Society, and exceptionally strong equity and bond markets, all five Board financial guidelines were met.

GOAL 1—Provide Information Solutions – Deliver indispensable chemistry-related information solutions to address global challenges and other issues facing the world’s scientific community.

- **SciFinder[®]**

Retrosynthesis capabilities were successfully deployed within **SciFinder[®]** during 2019. Experimental Retrosynthesis launched in Q3, and the first phase of Predictive Retrosynthesis was shared with customers in Q4. Additional SciFinder[®] capabilities introduced in 2019 included Boolean search, wildcard capabilities, and enhanced ChemDraw integration.
- **Formulus/CAS Formulations**

The new CAS Formulations content collection was released to customers in Q4 2019, available through four different applications to support distinct customer needs. A stand-alone **Formulus** product was designed for formulators, a module on STNext is focused on patent searchers, a module in SciFinder[®] supports the traditional scientific researchers, plus the CAS Formulations content collection is available through the Services programs to support customer AI and workflow integration initiatives.
- **CAS Services, Analytics, and Insights**

New teams were assembled of specialized solutions engineers, content experts, data scientists, and technologists extending our ability to deliver customized solutions to customers.
- **CAS Future Leaders**

The CAS Future Leaders program received a record number of applications and recognized 30 new elite Ph.D. students and postdoctoral scholars from around the world to blaze a trail toward scientific leadership.
- **ACS Publications Summary Highlights**

ACS Publications experienced strong revenue growth, supported by an increase in Open Access publishing across the journal portfolio. Manuscript submissions grew 6%, published articles grew 9%, and citations increased by over 7%. Over 40% of the journals experienced record impact factors. Several new titles were launched in 2019, including a new ‘partner publishing’ arrangement for the *Journal of the American Society for Mass Spectroscopy*. ACS Publications increased its global programming and representation, supporting the international nature of scientific research. An entirely new content delivery platform was launched, helping to drive further increase in journal usage (to over 156 million downloads during the year). *Chemical & Engineering News* continues to innovate, with new technology solutions to enhance discovery, readership and accessibility.
- **Scientific Journals Continue to Deliver Global Influence**

The portfolio of ACS peer-reviewed journals continue to represent the most trusted, most cited, most read scientific publications in their respective fields. During 2019 all key editorial and quality metrics increased, with over:

- 57,000 articles published
- 156 million full text article downloads
- 3.4 million total citations reported
- 40% of journals achieving their highest ever Impact Factor

The portfolio of peer-reviewed journals was further strengthened with several key additions:

- The *Journal of Chemical Health & Safety* was acquired from the eponymous division, and relaunched as *ACS Chemical Health & Safety*.
- The *Journal of the American Society for Mass Spectrometry* was introduced as a partner publishing activity, a synergistic collaboration with the American Society for Mass Spectrometry.
- *ACS Materials Letters* was introduced and published its first six issues in 2019.
- Two environmental science journals were approved for launch, with their first issues scheduled for publication in 2020: *ACS ES&T Water* and *ACS ES&T Engineering*.

Supporting the expansion and innovations surrounding publishing activities, ACS invested in overhauling and redesigning the digital publishing platform (pubs.acs.org). The new responsive design is more intuitive for users, and also provides a sound framework for further growth and scalability.

To complement the upgrading of the online delivery platform, the article PDF (still the most favored format for readers) was enhanced. The new format includes numerous dynamic links to improve reader experience, and is being rolled out in January 2020.

- **Open Access Initiatives**

2019 has seen an acceleration of Open Access (OA) publishing across the global scientific publishing environment. Building on ACS's leading activities, the Society has:

- Secured a growing number of transformative 'Read & Publish' agreements across seven countries, coupling subscription licenses with open access publication credits. These arrangements encourage open access publishing while recognizing the challenges in adapting funding and resourcing at a local level.
- Developed a world-class automated system to simplify the author experience in publishing OA and aligning institutional funding with publishing activities.
- Developed *ACS Omega* to build on its strengths. During 2019 the journal attracted over 4,400 submissions and published over 2,500 papers (an increase of 25%).
- Supported *ChemRxiv* as it continues to gain traction from the global research community. *ChemRxiv* has now posted over 3,300 preprints since its launch in 2017. During 2019 the service welcomed the Chinese Chemical Society and the Chemical Society of Japan as co-owners, alongside ACS, GDCh and RSC, making this a true collaborative activity for the global chemistry community.

- **Building Operational Excellence**

To support the research community, ACS Publications is continually honing and improving the services we provide throughout the publication process. ACS journals are renowned for providing among the fastest time-to-publication in the industry. During

2019, numerous ‘back office’ activities were improved to ensure rapid and high quality handling of manuscripts from submissions, through peer review, and for those selected, to final publication as a journal article.

- **Innovation**

- Several Artificial Intelligence (AI) technologies were utilized in pilots to enhance journal operations and researcher experience.
- An enhanced and broad taxonomy of scientific terms was created in order to semantically describe each article’s scientific content to allow new methods for discovery of relevant research.
- ACS played a leading role in two broad industry initiatives aimed at streamlining access to scholarly content. Both SeamlessAccess.org (formerly RA21) and GetFTR (Get Full Text Research) were developed and announced during 2019.

- **Expanded Global Presence**

Reflecting the global nature of scientific advancement, ACS Publications also advanced the Society’s organizational goal for increased global presence through selective appointment of ACS-International staff in Asia, Europe and Latin America. This has led to a direct increase in strategic activities in these territories.

Through 2019, 63% of new editorial appointments were from outside North America.

- **Market Outreach and Community Development**

Over the course of 2019, ACS Publications has organized or co-hosted numerous events to support strategic objectives. These events include:

- A three day ACS Publications Symposium held in Singapore focusing on ‘innovation in materials science and technology’.
- 4 Forums, including a half day event aligned to the second CAS and C&EN Brazilian Women in Chemistry award. The event and accolade recognizes early career female scientists as well as leaders in industry and academia.
- At 42 ACS On Campus events, collectively, over 4,500 attendees interacted with ACS staff, editors and other key contacts.
- 6 *ACS Materials Letters* Summits; half day events promoting the launch of this new journal with cutting edge research discoveries. Over 550 delegates attended, in total.
- 4 Department of Science and Technology (Government of India)/ACS workshops were held in India, attracting 1,500 early career researchers.

In total, these events attracted almost 7,000 delegates, many of whom were or have become ACS members.

To commemorate the 150th anniversary of the Periodic Table of Elements, C&EN organized a selection of activities throughout the year including a special issue containing essays by periodic table experts; a Q&A and reception with Sir Martyn Poliakoff; an element-themed Chemistry in Pictures photo contest; an IYPT trivia event; and a “periodic poetry” contest.

Through careful consolidation and focused utilization, social media engagement for ACS Publications increased steadily:

- Twitter followers increased to 325K (up 29%); engagement (likes, retweets, plays or click throughs) increased by 37%.
- Facebook followers also increased, to 267K (up 6%); engagement increasing 15%.

ACS Reviewer Lab attracted almost 120K users, demonstrating significant interest and value in this free online training site. The *ACS Publishing Center*, the consolidated site delivering material of use and interest to authors attracted 1M user sessions in 2019.

- **C&EN Media Group**

C&EN completed a transformation in culture within its newsroom to emphasize speed, growth and continuous improvement. In addition to numerous program activities, through the year C&EN:

- Launched C&EN Chemistry Update, a voice-activated daily information briefing accessible via Amazon's Alexa and Google Home.
- Partnered with News Catalyst, supporting newsroom product training programs.
- Launched a new and improved App for smart phones 'Chemistry News by C&EN'.
- Rolled out additional translation services, to now include Portuguese and Arabic.
- Introduced 'diversity in journalism' tracking, to inform and improve diversity of the source (writer) of content and the subject of the content (where relevant).

- **National, Expo, Regional & Specialty Meetings (Also Supports Goal 2)**

More than 28,000 people combined attended the ACS national meetings in Orlando, FL and San Diego, CA in 2019. In all, nearly 23,000 scientific papers were delivered. For the first time, the Kavli lectures during the Fall San Diego National Meeting were not only streamed as a member benefit via the ACS website but also broadcasted to other areas within the Convention Center for viewing by meeting attendees. The Career Fair was rebranded and renamed to Career Navigator LIVE! It was expanded to include new networking areas and more career consultants' offices and spaces. The mobile meeting app was used by a growing majority of attendees across both national and selected regional meetings. The San Diego National Meeting Exhibitor Prospectus was awarded Art of the Show for 2019 by the International Association of Exhibitions and Events (IAEE) for a second year in a row. Five hundred companies, encompassing 77,300 net square feet, exhibited. Out of those, over 66 were brand new to ACS.

ACS also enabled the organization of seven ACS regional meetings in 2019, which included a joint regional meeting of the Southwest and Rocky Mountain regions. The 2019 meetings attracted over 5,700 attendees combined, with over 3,700 scientific papers, and over 200 exhibiting companies. A visible ACS presence was created for all seven regional meetings.

Additionally, the specialty meetings team supported 15 meetings during the year, including five international meetings. Total attendance for supported specialty meetings was ~2,300. In 2019 the team also negotiated venue contracts for 20 future meetings.

- Kavli Lectures**

At the Spring ACS National Meeting in Orlando, the Kavli Foundation Emerging Leader in Chemistry Lecture was delivered by Dr. Trisha L. Andrew of the University of Massachusetts Amherst. The Fred Kavli Innovations in Chemistry Lecture was presented by Dr. Samuel Kounaves of Tufts University. At the Fall National Meeting in San Diego, the Kavli Foundation Emerging Leader in Chemistry Lecture was delivered by Dr. Thomas Markland of Stanford University. The Fred Kavli Innovations in Chemistry Lecture was presented by Nobel Laureate Professor Frances Arnold of the California Institute of Technology.
- Graduate & Postdoctoral Chemist**

Staff partnered with the Graduate & Postdoctoral Scholars Office to reimagine their magazine -- *Graduate & Postdoctoral Chemist* -- into a digital product. Over the course of seven months, the team worked through the details of creating a new microsite on existing infrastructure, addressing areas of design, functionality and workflow. The effort was agile and collaborative, involving a team of nearly thirty staff from Education, IT, and Membership & Society Services. The new site had a soft launch to a limited audience at the Fall National Meeting and was broadly launched later in September.
- ACS Petroleum Research Fund**

The ACS Petroleum Research Fund (PRF) awarded 177 grants for fundamental research in chemistry, engineering, and geology out of 824 proposals reviewed in 2019, providing a total of \$17.735 million in research funding. Individualized constructive feedback was provided to the unsuccessful applicants. Since the first grants were awarded in 1954, PRF has provided a cumulative total of \$704 million for “advanced scientific education and fundamental research in the petroleum field.”
- 2019 ACS Safety Summit**

The second ACS Safety Summit was held on March 1-2, 2019, and focused on chemical safety education. Participants identified several strategic opportunities, such as curating a safety education toolbox and developing a rubric for creating and assessing safety case studies, which ACS could pursue to enhance safety education.
- 23rd Annual Green Chemistry & Engineering (GC&E) Conference/9th International Conference on Green and Sustainable Chemistry (GSC)**

The 2019 GC&E/GSC-9 Conference was held June 11-13, 2019, in Reston, Virginia. The theme of the conference was “closing the loop” in the chemical life cycle, and Professors Joan Brennecke (The University of Texas at Austin) and Philip Jessop (Queen’s University Canada) served as conference co-chairs. There were 610 registrants and 31 percent of attendees were from outside the US.
- ACS Green Chemistry Institute Industrial Roundtables**

 - Pharmaceutical Roundtable*

Roundtable membership continues to increase, currently with 34 members, including associate and affiliate members. The new website www.acsgciper.org was launched in 2019 and is the go-to place for the Roundtable’s public-facing activities, including

- new tools, grants, publications, and upcoming events and trainings. The website also has a Roundtable members-only section to support their teamwork. Six grant recipients were awarded a total of almost \$250,000 in research funding in 2019, and the Roundtable awarded \$26,000 in travel grants. The Roundtable held its first ever face-to-face meeting in China and held events in India to support its global reach.
- *Chemical Manufacturers Roundtable*
The final AltSep report to National Institute of Standards and Technology (NIST) is complete and a public version of the report was finalized in December. Progress continues on the High Performance Computing for Manufacturing (HPC4Mfg) grant, with Phase II completed.
 - *Hydraulic Fracturing Roundtable*
The roundtable completed its collaboration with the Montana State Center of Biofilms Engineering to investigate the enzymatic degradation of biofilms. Unfortunately, the study results were negative. The Roundtable will consider expanding its scope in 2020 to include oil and gas.

- **ACS-FDA Colloquium**

ACS signed a Memorandum of Understanding with the Food and Drug Administration (FDA) to collaborate on a colloquium series promoting the best science and practices associated with food chemistry and regulatory science. The first colloquium on “Frontiers in Flavor Chemistry” was held at FDA on June 4.

- **ACS-NSF IYPT Colloquium**

With support from the National Science Foundation, ACS organized a colloquium on “Perspectives in Chemistry: 150 Years of the Periodic Table” at the National Academies on November 20. Speakers presented their perspectives on the history of the periodic table, discoveries that have shaped society, current trends in chemistry research, and opportunities that will impact the future.

GOAL 2—Empower Members and Member Communities – Provide access to opportunities, resources, skills training, and networks to empower our members and member communities to thrive in the global economy.

- **A Robust Membership**

In 2019, the Society closed the year with over 152,000 members. Through creating new value, streamlining the join and renew process, and working with the ACS Committee on Membership Affairs to develop innovative membership benefits and dues initiatives, we continue to understand and act upon findings to ensure that this growth is sustainable in the future.

Another bright spot was ACS’s international membership rising to a record high of over 30,000 members, now representing 20% of our total membership. Growth in undergraduate and graduate student membership was also observed, ensuring a more robust pipeline of future chemists and lifetime members.

Separately, the number of ACS members working in industry continued to decline in 2019. However, an encouraging sign was the pace slowing to the smallest decrease in at least the last five years.

- **Regional International Chapter Leadership Summits**

In the fall of 2019, 65 chapter leaders from 28 ACS International Chemical Sciences Chapters (ICSCs) and ACS International Student Chapters (ISCs) convened for two (regional) International Chapter Leadership Summits. The summits, which covered The Americas and The Middle East & Africa, were designed to equip volunteer leaders with tools and resources needed for chapter management; and, to strengthen the member community and engagement within and among their chapters. Following the summits, chapter leaders have reported improved coordination between their groups and are now collaborating to plan events and activities in service of the members in their regions.

- **ACS Industry Matters Launch**

ACS Industry Matters launched in April 2019, and over the course of the year, achieved its three primary goals: (1) Establish regular communication between ACS and its industry members, (2) Provide industry members with original content featuring insights, observations, and other information to help them advance professionally, and (3) Provide industry members, particularly those who typically don't do so, with an additional opportunity to contribute content. With a 25% open rate, 10,000 industry members are engaging with ACS via this new channel. The piloted launch also provided an opportunity to utilize new technology to test and validate plans to provide more personalized interactions with members. The ongoing production demonstrates that industry executives and other experts are willing to contribute content and share information on a regular basis to help industry members advance.

- **Office of Awards & Member Recognition**

More than 2,000 ACS members participated in the Office of Awards & Member Recognition programs in 2019 via the ACS National Awards Program, ACS Fellows Program, and/or the ACS ChemLuminary Awards. Members were either recognized with a National Award, inducted as an ACS Fellow, honored for grassroots activities, or helped identify or select the recipients.

- **Entrepreneur Pitch Competition**

The first ACS Entrepreneur Pitch Training and Competition was held in the Expo Hall during the San Diego Meeting. The event was attended by over 50 attendees, and garnered engagement across a large sector of investors and innovators in the entrepreneurial space. The winner of the competition was Phytoption, whose mission is to transform agricultural commodities to enabling ingredients for healthcare, personal care, crop care, and food. Their first go-to-market product is coffee creamer.

- **Global Customer Service Enhancements**

In 2019, ACS launched a local member services contact in China and rejuvenated the contact process for India. In service of our members and their careers, these contacts

provide over 6,500 ACS members in those markets with a convenient and expanded ways to receive support in the local language and during local business hours.

- **ACS Career Days**

Six ACS Career Day events were conducted in partnership with ACS local sections in 2019. The events, targeting mid-level career seekers, included workshops, employer showcases and networking activities to support continued professional advancement. Individual career consulting appointments were made available exclusively to ACS members. Each event averaged 60 participants with over 63% of attendees reporting that the ACS Career Day was the first time they attended a live, in-person ACS event. Nearly half (60) of the 129 non-member attendees joined ACS onsite. Ninety-eight percent of attendees indicated that they were satisfied or very satisfied with the events and, 92% reported that they would immediately apply what they learned during the day.

- **American Association of Chemistry Teachers (AACT) Expands Reach and Resources**

In 2019, the AACT website, teachchemistry.org, reached a total of over 2.3M sessions. The online resource library now has 817 items, and the number of peer-reviewed articles in *Chemistry Solutions* increased to 166. In addition to hosting 22 webinars, AACT also organized a track of workshops at the ChemEd 2019 conference and live-streamed four K–8 workshops. AACT membership increased to 6,714, an 18% growth since 2018. Social media channels are being utilized to increase renewals and other join campaigns are underway. Calling campaigns and data collection are improving member retention.

- **Transitions Into Faculty Careers Supported**

The [Postdoc to Faculty \(P2F\) workshop](#) was held in Atlanta, GA in July. A series of [new faculty workshops](#) and post-workshop events for participants from two-year colleges, minority serving, primarily undergraduate, and research intensive institutions included two 3-day workshops in June in Pasadena, CA and in August in Washington, DC, and a 2-day workshop held concurrently with the ACS Southwest Regional Meeting in Savannah, GA in October. Post-workshop events, such as follow-up topical webinars, fostered engagement and continuous learning among the cohorts.

- **New Website and Systems Facilitate Access and Use of ACS Professional Education**

A new ACS Professional Education website www.proed.acs.org, Learning Management System, and eCommerce/Registration system are facilitating access to short, lecture/laboratory, and online courses, improving the ability to deliver online content globally, and streamlining the process for attendees to register and take a course.

- **ACS Career Pathways and ACS Leadership Development System Offer Online Events**

In 2019, four online Career Pathways events were held, expanding the reach of workshops at ACS meetings and ACS Career Days. “Engaging and Motivating Others”, a virtual training based on the “Engaging and Motivating Volunteers” course in the ACS Leadership Development System, was delivered for participants in China in November and in West Africa in December.

- ACS ChemClubs Program Engages High Schools and Celebrates the Periodic Table**
Increased use of social media and a focus on the International Year of the Periodic Table resulted in 518 ACS ChemClubs for the 2018-2019 academic year, 146 of which are new. Over 60 clubs throughout the US and world updated the Periodic Table of Moles.
- Insights and Resources Shared During Visits to ACS Student Chapters**
ACS Student Chapter visits were initiated in 2019 with trips to six different campuses across the US. Chapters requested discussion sessions rather than programming, providing opportunities to learn more about chapter and student needs, help problem solve and strategize, and share information about ACS and its resources.
- Growth in ACS Technical Division Memberships**
In June, ACS added a [new online form](#) that allows members to join ACS Technical divisions and subdivisions at any time. It is a simple one-page form that does not require a login and is mobile friendly. Divisions can link to the form easily in their communications and sign up members at events using a mobile device. Previously, members needed to wait for the renewal cycle or send in a paper form to subscriber services to join a new division. In addition, we are continuing to offer new members the opportunity to join three technical division for free. This initiative (started in March 2018) is part of a strategy to allow new members to explore what several divisions have to offer as they decide what community is right for them. A marketing campaign continues to make new members aware of this benefit and the new online form. These efforts are bearing fruit. In 2019, there were **20,463** free divisional memberships activated compared to 13,331 in 2018. The total number of divisional memberships was **97,146** at the end of the year compared to 91,141 in 2018.
- Connecting Division Program Chairs**
At the fall national meeting in San Diego, James Takacs, Chair, Committee on Divisional Activities, hosted a breakfast meeting for program chairs in order to provide them with a venue to collaborate on programming and discuss programming needs and aspirations. This meeting, started in 2018 by then ACS President-Elect Bonnie Charpentier, has grown to include participation by the Committee on Meetings and Expositions and meetings staff. It had 42 participants, representing 21 technical divisions. The breakfast was so well received that in 2020, it will be held at both National Meetings and should see the inclusion of divisions that only run programming at the spring meeting.
- Research Proposal Writing Training**
Petroleum Research Fund (PRF) personnel provided research proposal writing training sessions at numerous venues including Careers Workshops at both National ACS Meetings, the Postdoc to Faculty workshop, the Young Faculty workshop, the Green Chemistry Summer School, and the Younger Chemist Committee Spring Meeting in Orlando. A webinar on grant writing was also offered in August.
- Development Office Staffing**
In June, the ACS welcomed a new VP for Development, Audrey Rogerson, reporting directly to the Executive Director and CEO. Buoyed by a major commitment by

Genentech Foundation for the Bridge Project, total funds raised in 2019 topped \$6 million, the largest fundraising achievement over the past 10 years.

- **M. Frederick Hawthorne Award**

Following the approval of the ACS Board of Directors in December 2018 to create a new national award in honor of M. Frederick Hawthorne, the Development Office's fundraising effort to establish an endowed fund in support of the award was successfully completed in 2019. The award will be known as "The M. Frederick Hawthorne Award in Main Group Inorganic Chemistry" and will be granted to a researcher who makes significant contributions to chemistry involving the elements of groups 1, 2, and 13-18 in the periodic table.

GOAL 3— <i>Support Excellence in Education – Foster the development of innovative, relevant, and effective chemistry and chemistry-related education.</i>
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- **Providing Tools to Promote Outreach and Education (Also Supports Goals 1, 2)**

Two live ACS Program-in-a-Box interactive webcasts were produced during the year. The first celebrated the "International Year of the Periodic Table" in February followed by the National Chemistry Week theme, "Marvelous Metals", in October. These unique online science events combined to reach 18,000 attendees and 733 groups, of which 97% of group leaders were confirmed as ACS-affiliated. Each event provided these ACS member group leaders an easy and convenient way to engage their community's student and early career members through a free interactive event. Attendees shared over 2,700 posts and photos on social media, pushing the event hashtag #ACSPIB into the top 10 trending topics on Twitter during both events. The global reach of ACS Program-in-a-Box continues to expand with a total of 43 groups joining internationally in 2019.

- **New ACS Approval Application and Review Platform Developed for Chemistry Programs**

Universities utilizing the ACS Review and Approval process for their Chemistry Programs Bachelor's degree are transitioning to a new Salesforce-based platform for this process. Following the migration of the database systems, the use of pre-applications began in 2019, with collection and review of annual and periodic reports to follow in early 2020.

- **Global Chemical Sciences Departments Participate in Pilot Program**

Representatives from 23 chemical sciences departments in 15 countries participated in a pilot ACS global exchange on the development of safety skills of postsecondary degree students.

- **ACS Bridge Project Launched**

The establishment of the [Inclusive Graduate Education Network](#) and the [ACS Bridge Project](#) are being supported by a five-year \$2.3 million alliance grant from the NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering & Science (NSF INCLUDES) program (NSF-1834545). Two

components, designed to increase the number of underrepresented minority students who receive doctoral degrees in chemical sciences, launched in 2019.

– **ACS Bridge Program**

- Two inaugural ACS Bridge Sites and four ACS Bridge Partnership Departments selected in the spring have been joined by four more Partnership Departments. Eight ACS Bridge Fellows started their studies at three ACS Bridge departments this fall.

– **ACS Bridge Travel Awards**

- A cohort of 14 undergraduate students received support to attend the Spring 2019 ACS National Meeting in Orlando meeting. Travel awards also supported the attendance of 18 students at the annual meeting of the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE), a project partner.

– **Genentech Foundation Grant**

- Support from the Genentech Foundation was secured for the Bridge Project, significantly boosting the NSF-funded program. The Genentech-funded effort includes support for at least 30 Bridge fellows transitioning from undergraduate school to a graduate program; a career-kickstarter workshop for graduate students and postdocs; a professional-development “bootcamp” for undergraduates; a two-day career conference for graduate students; and the establishment of an online learning community.

• **NSF Innovations in Graduate Education Grant Supports Summit**

Community input on approaches and tools for assessing and improving the use of individual development plans (IDPs) with graduate students was obtained during a two-day summit in December. The summit is part of a nationwide project, led by ACS and supported by a three-year NSF Innovations in Graduate Education grant.

• **ACS Career Kickstarter Joins the Collection of Career Development Resources**

This two-day workshop leverages the career planning process used in the online tool ChemIDP.org and complements other resources for those making the transition from being students to chemistry professionals, including the Career Pathways program, webinars, and the online ACS *Graduate & Postdoctoral Chemist* and *inChemistry* magazines.

• **Project SEED Stipends Plans for New Application Platform and Stipend Increases**

In preparation for 2020, a new online platform for Project SEED proposals and student applications is being put into place. Stipend amounts will increase in 2020.

• **New Partners and Sponsors Enhance the U.S. National Chemistry Olympiad**

The U.S. National Chemistry Olympiad, a multi-tier competition for U.S. High School students, continued with improvements in 2019. Roughly 16,000 students competed in the first round of competition, 1000 competed in the second round, 20 were selected for a 10-day study camp, and four were selected to represent Team USA at the International Chemistry Olympiad. The study camp, sponsored by the Chemours Corporation, was hosted at the University of Maryland at College Park and featured career presentations in

addition to rigorous technical training in various areas of chemistry. Team USA continued its historically strong performance at the international competition by winning one silver and three gold medals.



2019 Team with medals: Left to right are Edward Jin, Anton Ni, (Testudo the team mascot) Yajvan Ravan, and Albert Liu. Photo credit: Melissa Barranger-Mathys

- **Get the Facts Out About Middle and High School Teaching**

The “Get the Facts Out” project, supported by the National Science Foundation Improving Undergraduate STEM Education Initiative (NSF-1821710 and 1821462), is aimed at changing the misperceptions around careers in teaching science and math in secondary schools. Information about the Get the Facts Out project and tool kit was disseminated to the chemistry community via a *Journal of Chemical Education* editorial, fall ACS national meeting symposium, ACS Comment in *C&EN*, and the website www.acs.org/getthefactsout.

Get the
Facts Out



- **ACS Chemical Lab Safety Series for High School**

A set of six videos addressing high school lab safety issues have been produced and are available through the YouTube ACS Channel, as well as the AACT website. The videos explore examples and applications of the four principles of safety using the RAMP acronym: **R**ecognize the hazards; **A**ssess the risks of the hazards; **M**inimize the risks of the hazards; and **P**repare for emergencies. The videos also show examples of how to integrate RAMP into lab activities.

- ***Journal of Chemical Education* Special Issue**
In December, the *Journal of Chemical Education* published a special issue on “Reimagining Chemistry Education: Systems Thinking, and Green and Sustainable Chemistry.” ACS GCI promoted the special issue to potential authors and contributed to four of the articles published in the December issue.
- **Green Chemistry Student Awards**
ACS GCI recognized the following students and postdoctoral scholars for excellence in their green chemistry research and studies:
 - The **2020 Kenneth Hancock Memorial Award** winners are Ariel Fernandez Guzman, University of Costa Rica, and Metin Karayilan, University of Arizona.
 - The **2020 Joseph Breen Memorial Fellowship** winners are Emily Chapman, Augsburg University, and Giulia Ischia, University of Trento.
 - The **2020 Ciba Travel Awards in Green Chemistry** winners are Mollie Enright, University of Toledo; Tyler Roberts, University of Arizona; Alia Rubaie, Santa Clara University; and Lorianne Shultz, University of Central Florida.
- **ACS Green Chemistry Student Chapters**
ACS GCI acknowledged the green chemistry accomplishments of 51 domestic ACS Student Chapters and four International ACS Student Chapters. The award-winning chapters will receive their awards at the Spring 2020 ACS National Meeting in Philadelphia.
- **Summer School on Green Chemistry and Sustainable Energy**
The annual ACS Summer School on Green Chemistry and Sustainable Energy was held at the Colorado School of Mines from July 16-23, 2019. The program engaged 63 graduate students and postdoctoral scholars in a week of interactive lectures, poster sessions, group projects, problem-solving sessions, and networking. The program was sponsored by the ACS Petroleum Research Fund, ACS GCI, the Colorado School of Mines, and New Belgium Brewing.
- **Joseph D. Loconti Fund for Project SEED.**
ACS received a significant grant from the Joseph D. Loconti Foundation in support of Project SEED. Ten percent of the grant will be used to provide summer fellowships and college scholarships for economically disadvantaged high school students. The remainder of the grant will establish the Joseph D. Loconti endowed fund, providing enduring support for renewable annual college scholarships.
- **Heh-Won Chang, PhD Fellowship in Green Chemistry**
Private support was secured to establish the Heh-Won Chang, PhD Fellowship in Green Chemistry. This endowed fellowship will be awarded to two graduate students who are currently conducting green chemistry research on the use of greener synthetic pathways, use of greener reaction conditions, and/or the design of greener chemicals.

GOAL 4—Communicate Chemistry’s Value – Communicate – to the public and to policymakers – the vital role of chemical professionals and chemistry in addressing the world’s challenges.

- **Grant Support for Global Outreach at Chemistry Festivals Expanded**

In 2019, a total of 30 grants (up to \$3,000 each) were awarded to support Chemistry Festivals.

- **Festival Training Institute Held in Peru, at ACS Regional Meetings, and Online**
Delegates from Guatemala, Uruguay, and ACS Student Chapters in Costa Rica, Jamaica, and Mexico joined the ACS Peru International Chemical Sciences Chapter for a Festival Training Institute from June 18–21, 2019, in Lima, Peru. An introduction to courses within the ACS Leadership Development System was included with the training.
 - Workshops based on the Chemistry Festival Training Institutes (www.acs.org/otp) have been piloted as the Outreach Training Program at Mid-Atlantic, Northeast, and Southeast ACS Regional Meetings. A seven-week online version has also been offered as an on-demand, webinar version, and completed by 60 people.

- **International Year of Chemistry (IYPT) Celebrated**

ACS joined the International Union of Pure and Applied Chemistry and other chemical societies around the world in celebrating the 150th anniversary of Dmitri Mendeleev’s periodic table of chemical elements. A wide range of IYPT activities were held throughout the year, reaching ACS members, the general public, and young audiences. An internal staff committee coordinated with staff across ACS. Information about events and resources were communicated internally via staff meetings and an ACS Network group and externally via an ACS website, www.acs.org/iypt.



- **Advancing the ACS Policy and Legislative Agenda**

OSGC staff endorsed and worked closely with stakeholders to advance our legislative agenda as defined in our ACS public policy statements:

- H.R.34, the Energy and Water Research Integration Act was passed on May 1, 2019, by the House Science, Space, and Technology Committee to improve energy efficiency and water use.
- An amendment was accepted by voice vote on H.R.4230, The Clean Industrial Technology Act (CITA) to include sustainable chemistry research as part of their legislative focus and activities. ACS negotiated with the American Chemistry Council and other partners on specific language.

- ACS advocated for three main components to the Higher Education Act reauthorization, including a request for bipartisan action. Two priorities were included in the bill: increased and sustained support for STEM teacher training; and opportunities to strengthen and broaden participation from underrepresented groups in the STEM education and workforce pipeline. Staff is actively working to ensure that our third priority-- supporting graduation research opportunities--is included in final passage.
 - ACS worked with Senator Coons (D-DE) to draft a resolution honoring IYPT. The resolution was co-sponsored by Senators Daines (R-MT), Capito (R-WV) and Peters (D-MI). Senate Resolution 283 was passed in late July with unanimous support.
 - Both the House and Senate passed ACS endorsed, bipartisan “Hidden Figures” bills to award Gold Medals to Katherine Johnson and Dr. Christine Darden and to posthumously award Congressional Gold Medals to Dorothy Vaughan and Mary Jackson for their previously unrecognized contribution to NASA during the space race.
 - The House passed H.R. 2051, The Sustainable Chemistry Research and Development Act by voice vote on December 9, 2019. If enacted, the bill would create a federal task force focused on coordinating and promoting green and sustainable chemistry. Given the impending impeachment proceedings in the Senate, outlook for passage there probably won’t happen until 2020.
- **Promoting Chemistry and Its Practitioners to Media and the Public.**
For 2019, OSGC staff provided chemical information to the media, ACS members and directly to the public. We also revamped our science communication training.
 - Media outreach resulted in more than 29,400 articles in print and online news media outlets with a potential audience of more than 42.4 billion online and 79.5 million in print and broadcast.
 - ACS produced and distributed 43 weekly PressPacs, 62 embargoed press releases, and 60 other releases that highlighted more than 140 ACS published journal articles and Society news.
 - ACS published 47 *Reactions* videos, with all videos in the series receiving a total of more than 8.0 million views on Facebook and YouTube. *Reactions*’ Facebook page and YouTube channel each have more than 300,000 followers.
 - ACS Experts fulfilled more than 100 requests from the news media for scientists to help with stories. These requests came from news outlets including *Agence France-Presse* (AFP, which is France’s version of AP), *AP*, *BOOM!* (a Spanish game show), *Boston Globe*, *the New Yorker*, NPR’s “Science Friday,” *Scholastic Science World* and *Wired*, as well as from general audiences.
 - Communication training modules were developed and posted as a shared office resource in 2019. The library currently includes training modules for staff to use when talking about science communication, advocacy training and online communication.
 - The National Historic Chemical Landmarks program held several dedication and re-dedication ceremonies to recognize the following:
 - St. Elmo Brady, first African-American to earn a Ph.D. in chemistry (Feb.)
 - Upjohn Co.’s R&D in steroid medicines (May)

- Dow’s combinations of gas chromatography and mass spectrometry (June)
 - The discovery of more than a dozen elements at Lawrence Berkeley National Laboratory (rededication; Aug.)
- **2019 Chief Technology Officer Summit**
Staff provided major support for the fifth ACS Chief Technology Officer Summit held September 10-11, 2019 in Washington, D.C. At the conclusion of the Summit, the CTOs reaffirmed their continued interest in the Summit for 2020 and work has already begun to scope out program ideas based on suggestions shared at the Summit. Staff arranged for all of the Summit’s programmatic aspects, including (1) three panels where CTOs, along with external experts, exchanged ideas on the topics of Climate Mitigation; Sustainable Chemistry and the Future of the Chemistry Enterprise Workforce; (2) an evening welcome reception on September 10th that connected CTOs with a variety of DC-based policy related individuals from federal agencies, scientific and academic societies, as well as embassies; (3) an overview of the NSF and the important research they fund and important role they play in the US innovation ecosystem delivered by Dr. Fleming Crim, Chief Operating Officer, National Science Foundation; and (4) a detailed overview of the OSTP innovation portfolio and top priority areas delivered by Michael Kratsios, Chief Technology Officer of the U.S., White House Office of Science and Technology Policy.

ALL STRATEGIC PLAN GOALS—Support for ACS Governance and Operations

- **ACS Maintains a Robust and Evolving Strategic Plan**
The *ACS Strategic Plan* was approved by the ACS Board of Directors at their December 2019 meeting and will launch on the web (at <http://strategy.acs.org>) in January. It provides the basis for all of the Society’s work in support of the Vision, Mission, and Core Values. The strategic plan is the result of broad engagement with governance and staff members, consolidated by the Strategic Planning Committee, and approved by the Board of Directors.
- **Process Improvements to the ACS Strategic Planning Cycle**
In an effort to develop an ACS strategic planning process that continues to add value and is less complex, easier to understand, and that takes less time and resources to produce, the Strategic Planning Committee developed an implementation plan for a 5-year planning process (rather than the current annual process) for rollout in 2020. The plan includes a RACI diagram; a roadmap for each year of the five-year process; a plan to outsource the development of an environmental scan, change drivers, comparative analysis; a communications plan; and a risk management plan.
- **Streamlining Governance Documents**
For the first time since 1948, the Society’s governing documents received significant changes resulting from the *Petition to Streamline the ACS Governing Documents*, which was approved by Council April 3, 2019, confirmed by the Board of Directors April 19, 2019, and ratified by ACS members October 30, 2019. The modified documents are designed to ensure timely, efficient and effective action by placing decision-making at the lowest qualified governance levels. This allows the Society to be more flexible and

efficient in updating its governing documents, to clarify roles and responsibilities, and to maximize interactions among ACS Governance groups.

- **Global Engagement**

Office of the Secretary and General Counsel (OSGC) staff created the Global Coordinating Team, an ACS cross-divisional team tasked with improving coordination on international projects.

- **Support for ACS Governance and Operations**

In 2019, OSGC staff coordinated arrangements and travel logistics, and prepared presentations and/or remarks for many of the following events where the Presidential Succession and other Board members represented ACS, including at two national and six regional ACS meetings; nine local sections; 14 international trips and visits to scientific societies, forums, and universities; and two National Historical Chemical Landmark designations. Staff also supported and organized their participation in multiple meetings across the US with other chemical and scientific societies, university groups, government entities and other similar groups. At just two international events, our staff was able to secure 25 signatories for an ACS authored Joint Agreement on the UN Sustainable Development Goals (SDGs), bringing the total signatories to 42.

- **Speaker Series**

This year the program focused on the new ACS Competencies: Candor, Change Agility, Continuous Improvement, Partnership Building, Global Mindset, and Solutions Focused. Two Town Halls were held featuring our newest ACS leaders Al Horvath, Treasurer & CFO (Finance is All About Adding Value) and Audrey Rogerson, Vice President of Development (Fundraising and Building Relationships). ACS Talks was resumed featuring eight staff speakers from the DC and Columbus campuses. Kate Fryer, Executive Vice President of Membership & Society Services facilitated a “Let’s Chat” session on Membership 2.0 that focused on enhancing member offerings and experiences, and encouraged staff membership. The series concluded this year with a presentation in Columbus (Choose Your Own Adventure, You’re the Star of Your Career Journey) and chat session on continuous improvement by Crystal Richards, Principal & Owner of the Mosaic Resource Group, LLC.

- **ACS STAR Award**

At yearend, the ACS STAR Award program (in its sixth year) has achieved its highest number of award submissions –a total of 258 awards were granted in 2019 – 98 more than in 2018, 13% staff participation overall.

- **Legal Highlights (Also Supports Goal 1)**

- In 2019, OSGC staff expanded the scope of its engagement regarding the prevention of sexual harassment. Starting with the ACS Board of Directors, we made special presentations to more than 275 governance members and more than 35 staff members who serve as staff liaisons to ACS committees on addressing the challenges posed by sexual harassment. As part of these efforts, we instituted a third-party hotline service for reporting incidents of sexual harassment at our national meetings and we updated

- the Legal Resource Manual for Divisions and Local Sections to provide additional information on sexual harassment.
- Working with our Publications colleagues, OSGC staff helped enable a joint pro-competitive initiative among the five largest scholarly publishers in the world: GetFTR. This project is designed to enable entitled researchers to access scholarly content more easily. Legal has taken the lead in drafting the governing documents for this project.
 - **New Offering from Member Insurance: International Life Insurance**

The Member Insurance Board of Trustees expanded the Member Insurance Program’s portfolio with the addition of International Term Life insurance. Working with our broker (Hays), the Trustees contracted with *Unilife*, an online insurance platform, to offer life insurance coverage to members who are nationals of or currently residing in countries outside of the United States (including Puerto Rico) and Canada (unless local or US law prohibits sales to the particular country of residence). Eligible members under the age of 70 may apply for up to \$500,000 of life insurance coverage with terms ranging from 1 – 30 years.