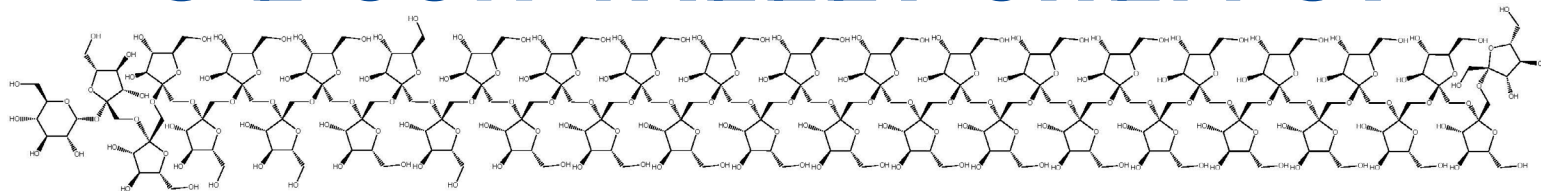


# SILICON VALLEY CHEMIST



## TABLE OF CONTENTS

Presentation on Status of PFAS	1
Chair's Message	1
What are forever chemicals, and do they last forever?	2
2023 Election of New Officers	2
Upcoming Events	3
Mosher Award Winners for 2023	4
Empowering Academic Researchers to Strengthen Safety Culture Workshop	4
Women Chemists of Color Fall Networking	4
Chemistry of Wine in the UCSC Arboretum	5
National Chemistry Week 2023 SVACS Event	6
Bay Area Chemistry Symposium	7
BUBBLE Grant Application Deadline	8
Shining Light on Solar Cells & Their Material Impacts	9
ACS PRIDE-Merck Graduate Research Award	10
2023 Nobel Prize in Physiology or Medicine	10
Selected ACS Publications News / Interesting and Cool Science in the News	11
2024 Green Chem. & Eng. Conference	12
Chemistry Quiz	12
Why You Can't Recycle Your Pants - Until Now	12
Spotlight on Theodore Gray's Posters & Books	13
New Members: October 2023	14
New Members: Sept 2023 Corrected List	14
2023 Nobel Prize in Chemistry Infographic	15



## Introduction and Status of PFAS, a Diverse Family of >12,000 Forever Chemicals

Nadine Ding, Ph.D., Volwiler Fellow with Abbott Laboratories

Sponsored by the **Golden Gate Polymer Forum**

Online via Zoom, **Thursday, October 26, at 6:30 PM**, Free/\$5 Donation

**Registration required** (Registration Deadline: October 25th at 1PM)

### Abstract:

PFAS news has bombarded the airway, news media, and social media recently. One may ask exactly what PFAS chemicals are and why they are forever chemicals. This webinar will discuss the diverse nature of PFAS. Using PTFE synthesis as an example, I will discuss the source of PFAS contamination on the environment and humans. While low molecular weight PFAS surfactants are toxic, high molecular weight polymeric PFAS are "polymers with low concern" by European policy guidelines, and they play a critical role in many 21st century technologies and in our daily life. I will briefly discuss the multitude of PFAS applications in a wide variety of technologies, and then provide a detailed focus through the example of one medical device in order to illustrate the benefit/risk profile of



*continued on next page*



## Chair's Message

Natalie McClure

October 15-21 is National Chemistry Week (NCW). This is a week when ACS sections across the country hold outreach events designed to promote the value of chemistry in everyday life. The mission of NCW is to reach the public, particularly elementary and secondary school children, with positive messages about chemistry to:

- Make a positive change in the public's impression of chemistry;
- Promote a mechanism for effectively mobilizing ACS local sections; and

*continued on next page*

THE  HEALING  POWER  
OF CHEMISTRY 

PFAS, continued from front page

using fluoropolymers. In the presentation, I will also discuss the proposed regulations across different geographies and their potential impact on industrial use and on society.

**Speaker Background:**

Dr. Nadine Ding is a fellow of the American Institute for Medical and Biological Engineering. She is also a Volwiler Fellow with Abbott Laboratories. She was the design leader of XIENCE drug eluting stent (DES), the flagship product of Abbott Vascular, where she was responsible for the polymer selection, drug release profile design, coating formulation development and refinement, coating and product characterization, the product scale-up, and troubleshooting/OOS (Out-of-spec) investigation. She also made critical contributions to worldwide regulatory filings and approvals and to later generation XIENCE product design and manufacturing. Nadine's other expertise areas include bioresorbable polymer design and characterization for short- and long-term implants, lubricious coating design and troubleshooting, material biocompatibility assessment, restrictive substance assessment, and PFAS impact assessment. Nadine has over 100 US patents. She received her PhD degree in chemistry/polymer science from the University of Southern California.

Chair's Message, continued from front page

- Motivate the ACS membership through local section activities.

This year's theme is "The Healing Power of Chemistry". Our section will celebrate NCW with an impressive series of events. We will hold events at the Martin Luther King Library in San Jose, the Redwood City Library, Ronald McDonald House, and the Salinas Community Science workshop. We are trying to expand our events to reach students who may not have the opportunity to do much hands-on experimentation. I think this series of 4 events nicely fulfills that goal. The students will make hand lotion, study the effect of pH on Milk of Magnesia, and explore the natural products found in many medicinal plants. We will also have some of the "old" standby favorite experiments: slime, Boo Bubbles (CO<sub>2</sub> bubbles), and UV color changing beads. These events are great fun and the students, and their families generally leave with increased enthusiasm about science. If you would like to volunteer at one of these events, please let us know.

The end of the year is also the time when we need to conduct our elections for the Silicon Valley local section members who will serve on the Executive Committee for 2024. We are always happy to involve more chemists in our local section. All you need to do is let someone on the Executive Committee know of your interest. Even if you don't want to serve as an officer, we would be delighted to have more participation at our

## What are forever chemicals, and do they last forever?



[Watch video on YouTube](#) | [Read associated article](#)

"Forever chemicals are known for being water-, heat- and oil-resistant, which makes them useful in everything from rain jackets to firefighting foams. But the chemistry that makes them so useful also makes them stick around in the environment and in us — and that could be a bad thing."

## 2023 Election of SVACS Officers, Councilors, Alternate Councilors for 2024

Voting Period: November 7 to November 30, 2023

**SVACS members will receive an email notification to cast their votes online. Affiliate members may not participate in the election. Student members may vote and sign petitions, but they may not run for office.**

**To help you be more informed when you receive this notification, a sample ballot is shown below. Biographies and candidate statements will be posted by November 5th on the [Silicon Valley Section's website](#).**

**How to petition to be on the ballot:**

Prior to November 5, 2023, any member or affiliate of the Section may, in writing or from the floor at a meeting to conduct governance business, nominate additional candidates for office, provided that the candidates are members of the Section, and the nomination is seconded by another member or affiliate. Nominations shall be equally valid as those from the Nomination Committee. All candidates nominated shall have indicated willingness to serve if elected.

Written petitions can be sent to the Secretary. You may also contact the Secretary if you have any questions. A petition must include the following: name of the proposed candidate, the proposed

committee meetings and events. You can see from our website, and from all the newsletters, that we are a pretty active local section, so there is likely to be something of interest to anyone who would like to get involved. The officer's names and contact details are all shown at the end of this newsletter if you would like to get more information.

Lastly, the Mosher award committee has

position, and the name and ACS membership numbers for both the candidate and the person who is seconding the nomination. All petitions must be submitted to the [Secretary](#) by November 4th.

----- **Sample Ballot** -----

Chair-Elect (3-year commitment, will be Chair-elect 2024, Chair in 2025, and Immediate Past Chair in 2026) VOTE for ONE (1)

- To be announced
- Write-in \_\_\_\_\_

Treasurer (2-year term) Vote for ONE (1)

- Ihab Darwish
- Write-in \_\_\_\_\_

Councilor (3-year term): 2 open positions (2024-2026). Vote for two (2)

- Natalie McClure
- Grace Baysinger
- Write-in \_\_\_\_\_

Alternate Councilor (3-year term): 1 open position (2024-2026). Vote for one (1)

- Karan Dikshit
- Howard Peters
- Write-in \_\_\_\_\_

announced the 2023 recipients: Bruce and Cynthia Maryanoff. We are always delighted to give the Harry and Carol Mosher award to a distinguished chemistry couple, and the Drs. Maryanoff meet all our criteria. Their amazing accomplishments are outlined elsewhere in the newsletter. The 2023 award will be given in January 2024, so stay tuned for more information.

# CALENDAR OF EVENTS

<https://www.siliconvalleyacs.org/events/>

- October 2023 -

- Oct 7** **Wines from great vintages to wildfire catastrophes: merging natural products chemistry fundamentals with sensory evaluations. A workshop to gain a 21st century perspective.**  
Prof. Emeritus Phil Crews, UC Santa Cruz  
Sponsored by Silicon Valley ACS Section  
Wine-tasting & networking, a discussion of winemaking, and garden strolls  
12:30pm-3pm at UC Santa Cruz Arboretum & Botanic Garden, \$15 regular, \$10 students, Free for under 21. [Registration required](#) by September 29th. [View Flyer](#) for more details.
- Oct 11** **Exploring Health and Environment: Navigating Chemicals in Our Everyday Lives**  
Prof. Sonya Schuh, Saint Mary's College of California  
A joint event between the California local ACS section & the Association of Women In Science, East Bay Chapter  
5:00-7:30pm at 4D Molecular Therapeutics, #200 Conference Room, 5959 Horton St., Emeryville; Free; [Registration required](#)
- Oct 12** **Green-by-Design: Award-winning Innovations in Biocatalysis**  
Sponsored by ACS Webinars and the Pharmaceutical Roundtable of the ACS Green Chemistry Institute  
11am-Noon, Online via Zoom, Free, [Registration required](#)
- Oct 13** **Women Chemists of Color Fall Networking Event**  
Sponsored by ACS Women Chemists Committee  
Noon-1pm, Online via Zoom, Free, [Registration required](#)
- Oct 19** **A Bond Worth Forming: The Rise of Targeted Covalent Inhibitors**  
Sponsored by ACS Webinars and CAS  
11am-12:30pm, Online via Zoom, Free, [Registration required](#)
- Oct 20** **National Chemistry Week, Ronald McDonald House**  
Sponsored by Silicon Valley ACS  
Volunteers needed. Please [contact us](#).
- Oct 21** **Kid Makers: Pop Up Hands-on Chemistry for Middle School Scientists**  
Sponsored by ACS Silicon Valley and Redwood City Public Library (RCPL)  
11-11:30am, RCPL Downtown Location, 1044 Middlefield Road, Redwood City, Free, [Learn more](#)
- Oct 25** **CAS SciFinder<sup>®</sup> Live: What's New and Upcoming**  
Sponsored by CAS (Chemical Abstracts Service)  
11am-Noon, Online via Zoom, Free, [Registration required](#)
- Oct 26** **Introduction and Status of PFAS, a Diverse Family of >12,000 Forever Chemicals**  
Nadine Ding, PhD, Volwiler Fellow at Abbott Laboratories  
Sponsored by the Golden Gate Polymer Forum (GGPF)  
6:30-7:30pm, Online via Zoom, Free/\$5 Donation, [Registration required](#)  
(Deadline: October 25, 1pm)
- Oct 29** **Empowering Academic Researchers to Strengthen Safety Culture (ACS CHAS Peer Led Workshop)**  
Sponsored by the ACS Division of Chemical Health and Safety (CHAS)  
11am-2:30pm, Online via Zoom, \$25 per participant, [Registration required](#) (Deadline: October 12, 2023)

- November 2023 and Beyond -

- Nov 3** **4th Annual Bay Area Chemistry Symposium (BACS) 2023**  
Robertson Auditorium, UCSF  
For more information on sponsorship & registration:  
[bayareachemistrysymposium.com](http://bayareachemistrysymposium.com)  
[View and share flyer](#)
- Nov 4** **Shining Light On Solar Cells And Their Material Impacts**  
Rachel Woods-Robinson, PhD  
Sponsored by California ACS  
10:30am-Noon, Online via Zoom, Free, [Registration required](#)
- Nov 15** **Programmable Shape Morphing & Responsiveness of Composite Hydrogels**  
Prof. Jinhye Bae, UC San Diego  
Department of NanoEngineering & Materials Science and Engineering  
Sponsored by the Golden Gate Polymer Forum (GGPF)  
6:00-7:00pm, Online via Zoom, Free/\$5 Donation, Registration required.  
Details TBA on <http://ggpf.org>

# The Harry & Carol Mosher Award for 2023

by Howard Peters, Chair, SVACS Mosher Award Committee



Dr. Bruce Maryanoff

Dr. Cynthia Maryanoff

Dr. Bruce Maryanoff and Dr. Cynthia Maryanoff have been selected to receive the 2023 Harry and Carol Mosher Award. The **Mosher Award** has been presented by the ACS Silicon Valley Local Section since 1980.

Bruce Maryanoff received a BS and PhD at the Drexel Institute of Technology in Philadelphia and was a postdoctoral fellow at Princeton. He then embarked on a decades-long career in research and management with Johnson & Johnson. He is currently a Visiting Investigator at the Scripps Research Institute in La Jolla, CA. [View biography](#)

Cynthia Maryanoff received a BS at Drexel University and a PhD at Princeton University. She performed postdoctoral research at Princeton. She joined Johnson & Johnson for a long career in research and management. She is currently a Foundation Distinguished Professor at the Baruch S. Blumberg Institute in Doylestown PA. [View](#)

## biography

Both Maryanoffs have long been active in the pharmaceutical industry in drug discovery and management. They are long-term active participants and supporters of ACS activities. They are founders of the **Maryanoff Scholars** - an annual program to assist undergraduate chemistry students in research in chemistry at

Drexel University. The Maryanoffs also founded **Absolute Palate**, LLC, a coffee company specializing in single-estate 100% Kona coffee, with two coffee farms in Hawaii.

The 2023 Mosher Award event of a dinner, presentation and lecture will occur in January 2024 in the Silicon Valley of California. A more detailed notice regarding the Mosher Award Event will follow in the December issue of the SVACS newsletter, **Silicon Valley Chemist**.



## Empowering Academic Researchers to Strengthen Safety Culture

### ACS CHAS Peer Led Workshop

We are excited to announce the upcoming ACS Division of Chemical Health and Safety (CHAS) Virtual Workshop **Empowering Academic Researchers to Strengthen Safety Culture**, scheduled for Sunday, October 29, 2023, from 11:00 AM to 2:30 PM Pacific Time, and will be hosted via Zoom. **Registration** for this workshop is \$25 per participant. (Registration deadline: Thursday, October 12, 2023).

**About the Workshop:** This interactive workshop provides an opportunity for frontline researchers in academic institutions to learn more about safety culture and gain skills to be leaders in safety. Our target audience is graduate students, postdocs, and undergraduates in STEM departments, but we also welcome faculty and safety professionals interested in supporting the development of Laboratory Safety Teams (LST) and strengthening

their institution's safety culture.

If your department has already established an LST, this workshop can also help it grow and mature as well as build connections among students across universities who are working hard to strengthen their safety culture.

Upon completion, attendees will receive a certificate of participation, a valuable addition to your resume or portfolio.

Thank you for your support in making academic research environments safer and more productive.

**Learn More:** **Srijana Pandey** is one of the moderators for this workshop and can answer any questions you may have.

For those interested in learning more about Academic Laboratory Safety Teams (LST), please see <https://www.acs.org/labsafetyteams>



**OCTOBER 13, 2023**  
**3:00 – 4:00 P.M. ET**

WOMEN CHEMISTS COMMITTEE



## Women Chemists of Color Fall Networking Event



Dr. Wei Gao

Fellow, The Dow Chemical Company;  
Fellow, ACS Polymer Chemistry Division; and  
Career Consultant for ACS Career Services

### Discussion Topics

1. Exploring and implementing self-care strategies as a Women of Color in Chemistry
2. Being your authentic self in your professional life
3. Building your network/collaboration for balancing cultural expectations and career advancement



**REGISTER HERE:** <https://acswcc.org/event/women-chemists-of-color-fall-networking-event/>

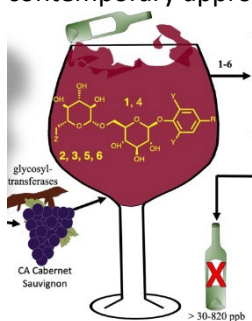
## The Silicon Valley ACS invites you to the UC Santa Cruz Arboretum for wine-tasting & networking, a discussion of winemaking, and garden strolls

Saturday, October 7, 2023, 12:30-3pm at the UC Santa Cruz Arboretum & Botanic Garden, Horticulture Room 2. Cheese, fruit, and veggies will be served. All attendees 21 years+ will receive a glass of wine during the reception (12:30pm-1pm) and will taste four different wines during Phil Crews' presentation (1pm-3pm). [Reservations required](#) by September 29<sup>th</sup>: \$15 regular, \$10 students, Free for under 21. Pay at the door with cash or check. Includes access to the UC Santa Cruz Arboretum all day, 9am-5pm.

### Wines from great vintages to wildfire catastrophes: Merging natural products chemistry fundamentals with sensory evaluations. A workshop to gain a 21<sup>st</sup> Century perspective.

Prof. Phil Crews, Department of Chemistry & Biochemistry, UC Santa Cruz

**Abstract:** Wine is a complex liquid comprised of many bioorganic compounds in a 12.5% alcoholic solution with a pH range of 3-4. Wine quality assessment and winemaking methods have been in place for many centuries. Nowadays, contemporary approaches to winemaking are quite scientific as many aspects of this complex drink appear to be understood. For example, there is an excellent contemporary book, "[Understanding Wine Chemistry](#)" (Waterhouse et al., 2017). Decades ago, *Wired Magazine* reported on the [Grapes of Math \(GoM\)](#) in a comprehensive article to underscore that consulting companies exist to help winemakers craft award winning wines. The GoM approach uses databases created via metabolomics approaches. On the other hand, many subscribe to the idea that successful winemaking and wine quality evaluations can be achieved by just using a "right-brained" approach. In this wine-centric event we will explore principles of wines and winemaking through natural products & sensory evaluations. Different flavor outcomes achieved in winemaking as a function of grape variety and the terroir differences of vineyards in California will be illustrated. The approaches to wine creation will be explored using case examples. Everyone at the workshop will have a chance to dissect the major and minor complex flavors and aromas associated with wines and to correlate them with a few key biomolecules. Answers to vexing questions will be sought by examining outcomes derived from tasting and talking about three different Burgundy style California wines. Also discussed will be recent advances obtained by the Santa Cruz campaign (UCSC & SC Labs) using small molecule natural product wine chemo-markers to forecast wine quality damage caused by wildfire smoke. *Recommended reading before the workshop:* <https://doi.org/10.1021/acs.jnatprod.2c00028> (open access)



**Biography:** Phil Crews is a California native and has spent most of his academic career in the state. He received his B.S. from the University of California at Los Angeles and his Ph.D. from UC Santa Barbara working with Domenick Bertelli. After becoming a postdoc at Princeton University, in 1970, he started as an Assistant Professor and is currently an Emeritus Professor for the Chemistry and Biochemistry Department at UC Santa Cruz. The primary goals of his research group were to understand the chemistry of tropical marine sponges and marine-derived fungi. Bioassay-guided isolation assisted in the discovery of natural products potent against human diseases such as cancer and neglected tropical diseases. The search for novel active compounds incorporated elements of structure elucidation, employing state-of-the-art nuclear magnetic resonance (NMR) techniques. [Crews Lab site](#)

A passionate home-winemaker and wine educator, he took his "hobby" public. Specializing in Burgundian and Rhone style wines from select coastal vineyards, the [Pelican Ranch Winery](#) is a family owned and operated winery in the heart of Capitola. Established in 1997, the winery is just a few blocks from Monterey Bay, which provides a constant, cool, coastal influence that allows for the making of fine elegant wines.



# NATIONAL CHEMISTRY WEEK 2023 HEALING POWER OF CHEMISTRY

A FREE, interactive experience for kids of all ages and their families featuring:

- Chemistry Wheel of Fortune where everyone wins a prize!
- Hands-on chemistry activities for kids, about the healing power of Chemistry!
- Pick up your free copy of “Celebrating Chemistry” the ACS publication for kids.

Free. No registration required.

**SATURDAY,  
OCTOBER 21**  
11 a.m. - 2:30 p.m.

Dr. Martin Luther King, Jr. Library  
Children’s Room  
150 E. San Fernando Street  
San José, CA 95112  
(408) 808-2355

To arrange an accommodation under the Americans with Disabilities Act for library-sponsored events, please call 408-808-2183 at least three business days prior to the event.

# BACS



BAY AREA CHEMISTRY SYMPOSIUM  
connecting industry + academia

an ACS  
sponsored  
event



Please join us for

The 4<sup>th</sup> annual **Bay Area Chemistry Symposium**, an ACS sponsored symposium for Synthesis and Design in Medicinal & Process Chemistry



WHEN

Friday, November 3<sup>rd</sup>, 2023

WHERE

Robertson Auditorium, UCSF

SUBMIT

Abstracts for talks & posters today!

This symposium, unique in the Bay, will provide an ideal forum for students, postdocs, and industrial chemists to meet and exchange ideas covering themes in chemical biology, synthesis, and computational chemistry. The 2023 symposium will feature keynote seminars from leading local academics & industrial chemists, as well as short talks from students, postdocs, and industry researchers. A lively poster session promises a much-anticipated return to networking with local chemists through this opportunity to learn about cutting-edge chemistry across the Bay Area's outstanding institutions. Visit our website for more details!

## OUR 2023 KEYNOTE ACADEMIC SPEAKERS



Prof. Kevan Shokat  
UC San Francisco



Prof. Carrie Partch  
UC Santa Cruz



Prof. John Hartwig  
UC Berkeley

Last year's BACS was  
generously supported by our

## INDUSTRY SPONSORS



For more information on sponsorship & registration, visit: [bayareachemistrysymposium.com](http://bayareachemistrysymposium.com)





# Shining Light on Solar Cells and Their Material Impacts

## Webinar, Saturday, November 4, 2023, 10:30AM

California Section  
American Chemical Society



All are welcome  
Saturday, November 4, 2023

### Title

Shining light on solar cells and  
their material impacts

### Time

10:30 – 11:00 am  
Chatting

11:00 am  
Talk and Discussion

### Reservation

Please visit the CalACS website  
[www.calacs.org](http://www.calacs.org) to register for this  
meeting or use Brown Paper Tickets.

RSVP here!

Please register before Thursday,  
November 2, 2023, 12 noon. Your  
email address is needed to send the  
ZOOM link, which will be shared with  
attendees on or before the day of the  
event via Brown Paper Tickets.

### Cost

Free!

### About the Speaker



Rachel Woods-Robinson, PhD

communities, and loves outdoor adventuring. She co-founded “Cycle for Science,” in which scientists go on bicycle tours and visit K-12 classes to teach hands-on lessons about sustainability, and she instructs “Cycle the Rockies” (Wild Rockies Field Institute), an immersive month-long course in which undergrads ride bicycles across Montana to learn about local energy and climate impacts.

Rachel Woods-Robinson (she/her) received a B.S. in Physics from UCLA, and a Ph.D. at U.C. Berkeley and Berkeley Lab designing new crystals for solar energy by combining computational chemistry, thin film growth, and device fabrication. Rachel recently started as a Postdoctoral Fellow at University of Washington’s Clean Energy Institute to study environmental and human impacts of such new solar materials. In addition to research goals to curtail climate change, Rachel aims to support scientists in sharing our work accessibly and engaging collaboratively with our

### Abstract

Addressing climate change requires transitioning to renewables such as photovoltaic solar panels, but one key barrier to this transition is that we need better materials. In this talk, we’ll start at the sun and then zoom into a solar panel all the way down to the nanoscale, highlighting materials challenges that scientists face at each length scale to make solar more efficient, reliable, and sustainable. We’ll meet the different material components, such as absorbers and transparent conductors (TCs), and I’ll share some of my research into designing new TCs for solar. Next, we’ll zoom back out to discuss challenges we face beyond the lab in bringing solar to society, including critical raw materials, environmental impacts, and “green sacrifice zones.” Lastly, I’ll share some insights from my outreach project Cycle for Science and college course Cycle the Rockies.

### Questions?

Please contact Elaine Yamaguchi at [eyamaguchi08@gmail.com](mailto:eyamaguchi08@gmail.com)

# ACS PRIDE-Merck Graduate Research Award

Application Deadline: November 1, 2023

[Apply Here](#)



The **ACS PRIDE Merck Graduate Research Award** annually recognizes up to six individuals

who will present their research at an awards symposium held during the Spring ACS national meeting.

Awardees will receive a \$1,500 stipend to cover Spring ACS national meeting expenses along with a one-year mentorship program that pairs them with an industry employee. They will present their research at an ACS PRIDE-Merck Graduate Research Award half-day symposium.

## Who can apply?

To apply for the ACS Pride-Merck Graduate Research Award, you must:

- Be enrolled as a graduate student at a university based in the US or at a campus abroad.
- Be a member of the Division of Professional Relations (PROF) and a member of the subdivision ACS Pride
- Be available to present your research at the National meeting where you will receive your award. This will take place at the spring national meeting that follows your application submission.
- Complete the application prior to the deadline with all components submitted.

## When would the award be presented?

The awards will be presented during the ACS spring national meeting. Award recipients will receive a check prior to the meeting to support travel costs. Those receiving the award that cannot attend the national meeting in person are expected to return the award funds but will still maintain their awardee status.

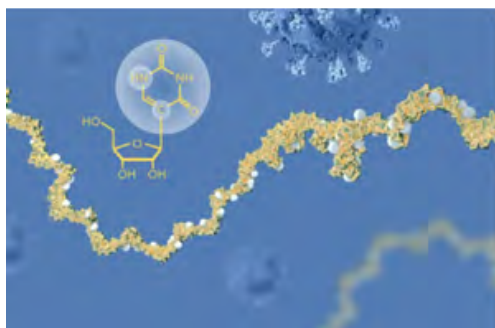
## What should be included in the award application package?

- Research abstract (no more than 2500 characters in length)
- Confirmation that the graduate student can participate in the spring meeting in person.
- Personal statement that reflects the candidate's journey as an LGBTQIA2S+ individual in STEM. Candidates are encouraged to include any volunteer experiences that focus on LGBTQIA2S+ issues but are not required to do so. Personal statements should be no more than 500 words in length.
- A copy of their C.V. or resume
- Proof of enrollment at a US based institution for graduate studies
- A letter of recommendation in support of the applicant is strongly encouraged but not required.
- Confirmation of the ability to use their name and likeness in publications.

All application materials must be submitted by November 1, 2023. For more information, please contact: [awards@acsprof.org](mailto:awards@acsprof.org)

## 2023 Nobel Prize in Physiology or Medicine

The **2023 Nobel Prize in Physiology or Medicine** jointly to Katalin Karikó and Drew Weissman for their discoveries concerning nucleoside base modifications that enabled the development of effective mRNA vaccines against COVID-19. See [press release](#) and [scientific background](#)



**WHAT ARE RNA VACCINES?**

**SARS-CoV-2**

**Viral RNA** The virus's genetic material. Contains instructions for making proteins.

**Spike protein** Proteins which help the virus penetrate cells and facilitate an infection.

The genetic code of the SARS-CoV-2 virus is made up of RNA. Scientists isolated the part of this genetic code that contains the instructions for making the virus's spike protein.

**RNA INSTRUCTIONS** → **LIPID NANOPARTICLES** → **VACCINE SHOT**

Synthetic RNA which codes for the virus spike protein is packed in lipid nanoparticles (very small fat droplets). This stops our bodier's enzymes breaking it down and helps our cells take it in.

**Human cell** → **Synthetic RNA** → **Immune response**

Once the synthetic RNA is inside one of our cells, the cell follows the RNA instructions to produce the virus spike protein. Its production then triggers an immune response in our bodies.

**RNA VACCINES: BENEFITS AND CHALLENGES**

**VACCINE PRODUCTION**

RNA is easy to make in a lab, so RNA vaccines can be developed quicker than other vaccines.

**SAFETY OF THE VACCINES**

RNA can't cause infections and is broken down by normal processes in our cells. An RNA vaccine hasn't been licensed for use in humans before but they've been under development for several years for other viruses, including influenza, HIV, and Zika.

**STORAGE AND TRANSPORT**

Some RNA vaccines must be stored at low temperatures to remain stable, which makes storage and transport more challenging.

**RNA VACCINES FOR COVID-19**

Several proposed vaccines for COVID-19 are RNA vaccines. They can be based on two different types of RNA.

**mRNA vaccines** Moderna, Pfizer & BioNTech, CureVac

**saRNA vaccine** Imperial College, Anctenus

**mRNA AND saRNA: WHAT'S THE DIFFERENCE?**

The structures of mRNA and saRNA are similar but have a key difference, as the diagrams below show:

**mRNA** mRNA stands for messenger (ribonucleic acid). It has a 5' cap and a 3' poly-A tail. It is translated into proteins. It has untranslated regions (UTRs) which help it to be translated. It has a 5' cap and a 3' poly-A tail. It is translated into proteins.

**saRNA** saRNA stands for self-amplifying ribonucleic acid. It has a 5' cap and a 3' poly-A tail. It is translated into proteins. It has untranslated regions (UTRs) which help it to be translated. It has a 5' cap and a 3' poly-A tail. It is translated into proteins.

As saRNA produces more copies of itself once it's in a cell, it can be given in smaller doses than mRNA vaccines. This makes the cost per dose lower and means higher numbers of doses can be produced from the same volume of vaccine.

ROYAL SOCIETY OF CHEMISTRY | ©Anty Brunning/Compound Interest 2020 for the Royal Society of Chemistry | www.compoundchem.com | @compoundchem | This graphic is shared under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 license.

[Enlarge image](#) | [View Associated article](#)



# Selected ACS Publications News / Interesting and Cool Science in the News

## Selected ACS Publications News

**ACS, Elsevier, and ResearchGate resolve litigation, with solution to support researchers** (Coalition for Responsible Sharing news, September 15, 2023)

**ACS Publications provides a new option to support zero-embargo green open access** (ACS News Release, September 21, 2023)

**AI in Research and Peer Review: Facing the Future with Integrity** (ACS Axial, September 27, 2023)

**The American Chemical Society Offers a New Twist on the Article Processing Charge: An Interview with Sarah Tegen** (The Scholarly Kitchen, October 2, 2023)

**Improving Diversity and Inclusivity in Peer Review and Publishing** (ACS Axial, September 29, 2023)

**Preprints and Post-Publication Peer Review: The New Age of Publishing** (ACS Axial, September 28, 2023)



## Interesting and Cool Science in the News

**The 2023 Nobel Prize in Chemistry Goes to Mounji G. Bawendi, Louis E. Brus, and Alexei I. Ekimov** (ACS Axial, October 4, 2023)

**The 2023 Nobel Prize in Physiology or Medicine Goes to Katalin Karikó and Drew Weissman** (ACS Axial, October 2, 2023)

**Arrays of quantum rods could enhance TVs or virtual reality devices** (NSF Research News, September 28, 2023)

**Arsenic Preserved the Animals, but Killed the Museum** (New York Times – Science Times, September 23, 2023)

**Asteroid Benu, OSIRIS-REx, and the Apollo 11 moon microbe scare: The challenge of bringing home samples from space [includes transcript]** (Tiny Matters podcast, October 4, 2023)

**Atmospheric circulation weakens following volcanic eruptions** (NSF Research News, October 5, 2023)

**Blood Cells Mutated in Old Age Protect Against Alzheimer's Disease** (Stanford Wu Tsai Neurosciences Institute News, August 24, 2023)

**California's Charge: The state has made an ambitious plan: 100 percent carbon-free electricity by 2045.** (Stanford Magazine, September 2023)

**Chameleon-inspired coating could cool and warm buildings through the seasons** (ACS Press Release, September 20, 2023)

**The Chemistry of Count Dracula** (ACS Axial, October 4, 2023)

**A Closer Look at Squid Skin** (ACS Axial, September 7, 2023)

**'Computer vision' reveals unprecedented physical and chemical details of how a lithium-ion battery works** (SLAC News, September 13, 2023)

**COVID vaccines linked to unexpected vaginal bleeding** (Nature news, September 25, 2023)

**The deepest known ocean virus lives under 29,000 feet of water** (Popular Science, September 25, 2023)

**Developing a less invasive test for inflammatory bowel disease** (ACS Press Release, September 7, 2023)

**Digital transformation in the chemical industry: Steps to a sustainable future** (CAS Insights, September 29, 2023)

**Dinosaur feathers contain traces of ancient proteins, study finds** (SLAC News, September 22, 2023)

**DOE awards a SLAC-led research team \$12 million to help improve response time to dangerous pathogens** (SLAC News, September 7, 2023)

**Exascale revolution: Supercomputers unleash a new era in biophysics discovery** (NSF Research News, October 3, 2023)

**Fiber-infused ink enables 3D-printed heart muscle to beat** (NSF Research News, September 7, 2023)

**The future of quantum mechanics: Unraveling entanglement's secrets** (Stanford Engineering, September 29, 2023)

**The future of the gut microbiome** (Stanford Engineering, September 22, 2023)

**Ground(water) Breaking Science in the San Joaquin Valley** (NASA News, September 22, 2023)

**How is ceviche 'cooked?'** (video) (ACS Press Release, September 11, 2023)

**How much does wildfire smoke influence air quality trends?** (Stanford News, September 20, 2023)

**How sleep deprivation can harm the brain** (ACS Press Release, September 6, 2023)

**It's flu season: What's in the shot? Should we be worried about avian influenza? And the promise of a universal vaccine [includes transcript]** (Tiny Matters podcast, September 20, 2023)

**'Lab-on-a-drone' sends science skyward to keep track of smelly air pollution** (ACS Press Release, September 14, 2023)

**Lego struggles to find the right chemistry to replace oil-based virgin plastics** (Chemistry World, September 29, 2023)

**Making plant-based meat more 'meaty' — with fermented onions** (ACS Press Release, September 5, 2023)

**Mapping methane emissions from rivers around globe reveals surprising sources** (NSF Research News, September 18, 2023)

**Metal-mining pollution impacts 23 million people worldwide** (BBC News, September 22, 2023)

**MOFs offer safer solution for handling fluorinated gases that can 'tame the tiger'** (Chemistry World, October 5, 2023)

**Moonshot effort aims to bioprint a human heart and implant it in a pig** (Stanford News, September 28, 2023)

**A Mysterious Hidden Force Is Generating Water on The Moon** (Science Alert, September 18, 2023)

**New dog, old tricks: New AI approach yields 'athletically intelligent' robotic dog** (Stanford News, October 4, 2023)

**New tool supports private industry in minimizing impacts to nature's services** (Stanford News, September 26, 2023)

**Oceans in a new light** (Stanford Doerr School of Sustainability, September 12, 2023)

**Parks on historic trash incinerator sites could have lead hotspots, study shows** (ACS Press Release, September 12, 2023)

**Pharma data management: Revealing breakthroughs that lie in darkness** (CAS Insights, September 12, 2023)

**Pink Diamonds Erupted to Earth's Surface after Early Supercontinent's Breakup** (Scientific American, September 19, 2023)

**Prada to design Nasa's new moon suit** (BBC News, October 5, 2023)

**Quantum computer unveils atomic dynamics of light-sensitive molecules** (NSF Research News, October 5, 2023)

**Recent advances in bread research** (ACS Press Release, September 19, 2023)

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continued from front page

**Recent advances in melon and gourd research** (ACS Press Release, September 6, 2023)

**Recent advances in oral health and tooth research** (ACS Press Release, October 2, 2023)

**Rubber plumbing seals can leak additives into drinking water, study says** (ACS Press Release, September 6, 2023)

**The science of light** (Stanford Engineering, September 20, 2023)

**Scientists achieve the tricky task of compressing liquids** (Nature News, September 27, 2023)

**Soil microbes help plants cope with drought, but not how scientists thought** (NSF Research News, September 12, 2023)

**Some spiders can transfer mercury contamination to land animals, study shows** (ACS Press Release, September 13, 2023)

**A source of carbon — a building block of life — is found on Jupiter's moon Europa** (NPR, September 22, 2023)

**Stanford-led WastewaterSCAN project adds six new disease targets** (Stanford News, October 5, 2023)

**Striking rare gold: Stanford researchers unveil new material infused with**

**gold in an exotic chemical state** (Stanford News, September 28, 2023)

**Testing, testing, testing: How researchers make sure the LSST Camera is the best it can be** (SLAC News, September 29, 2023) [LSST=Legacy Survey of Space and Time]

**Using 'spent' coffee and tea to boost shelf life and nutritional value of cakes** (ACS Press Release, September 20, 2023)

**The very first beat: how a heart starts to pulse** (Nature video, September 27, 2023)

**Watching paint dry — to understand and control the patterns it leaves behind** (ACS Press Release, September 28, 2023)

**What can we do about ultraprocessed foods?** (Knowable Magazine, September 20, 2023)

**When the Chemistry Clicks** (ACS Axial, September 27, 2023)

**Why does our skin feel 'tight' after using a facial cleanser?** (Stanford News, September 26, 2023)

**Work on why scientists seem to enjoy licking rocks scoops chemistry Ig Nobel** (Chemistry World, September 15, 2023)

## 28th Annual Green Chemistry & Engineering Conference

Call for Symposium Topics: Deadline is October 14, 2023



On behalf of the ACS Green Chemistry Institute and the 2024 GC&E Co-Chairs, you are invited to submit a symposium proposal for the **28th Annual Green Chemistry & Engineering Conference**, held next June 3-5, 2024, in Atlanta, Georgia.

**Submit your proposal:** The call to submit your proposal is open now until October 14th. Proposals across the breadth of green and sustainable chemistry and engineering topics are welcome, with an emphasis on the overarching theme of the conference, "AI-Enabled Green Chemistry."

How can artificial intelligence (AI) enable green chemistry and engineering innovations that underpin global sustainability challenges? **Read the Call for Symposia** for details on the topics included and the submission process.

**Conference Tracks:** For this year's conference they

will be highlighting several tracks or focus areas to ensure we encompass as many diverse topics as possible, including:

- AI-Enabled Green Chemistry
- Synthesis & Catalysis
- The Circularity of Chemicals/Materials
- Sustainable Product Design
- Chemistry Education
- Polymers
- Green Energy & Fuels
- Sustainable Process Design

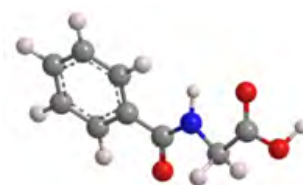
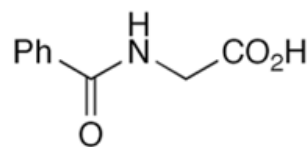
### Student and Postdoctoral Travel Awards:

The ACS Green Chemistry Institute seeks applications for five student and postdoc awards that support travel to the GC&E Conference. Apply by November 17, 2023. [Learn more](#)

CHEMISTRY

## Quiz

If you eat vegetables, you make me.  
What molecule am I?



Answer

## Why You Can't Recycle Your Pants - Until Now

Reactions - Uncover the Chemistry in Everyday Life



**Watch video on YouTube** (12:15 minutes)

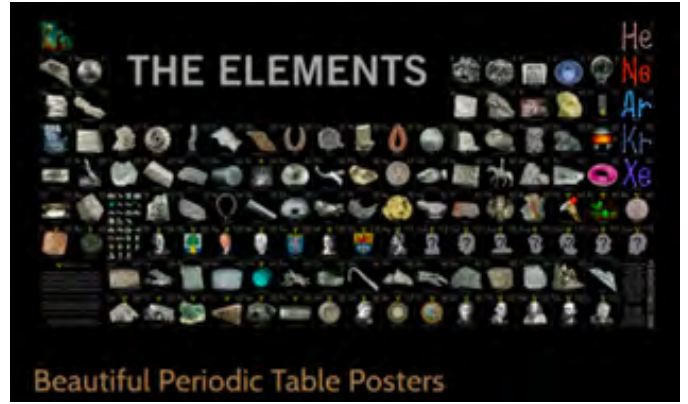
"Have you ever actually recycled a pair of pants or an old T-shirt? You might be able to soon. Lots of clothing is made from cotton and polyester fibers interwoven so closely that it's impossible to separate them without destroying the cotton. In this episode, George tests a newly discovered technique that could solve that problem, potentially changing the way we use and get rid of our clothes." [Learn more](#)

# Spotlight on Theodore Gray's Posters & Books

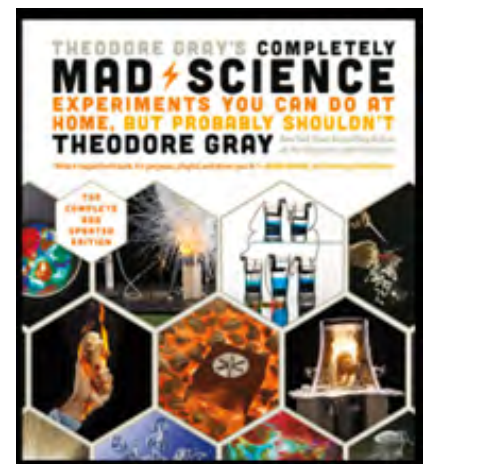
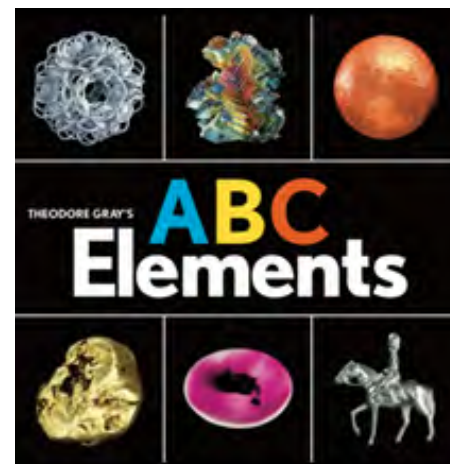
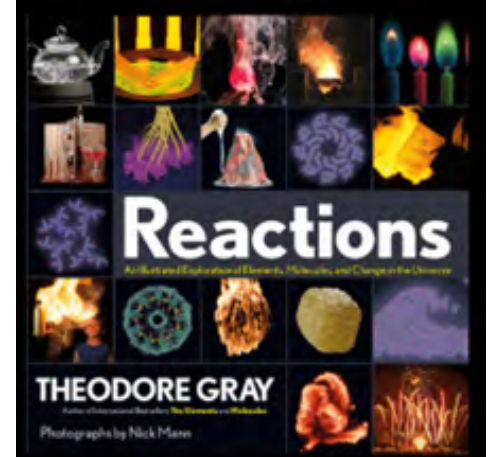
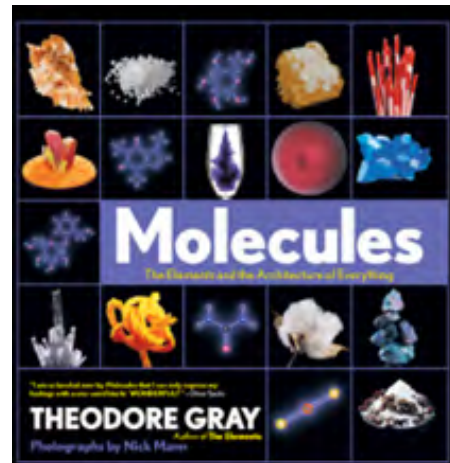
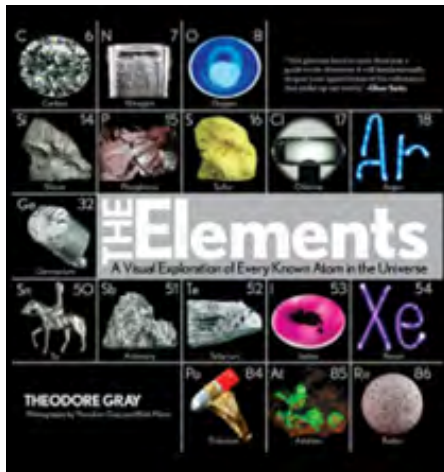
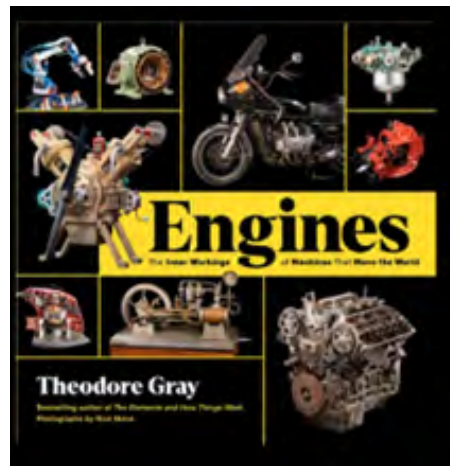
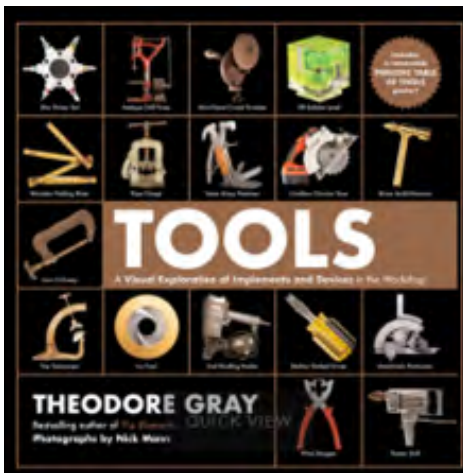
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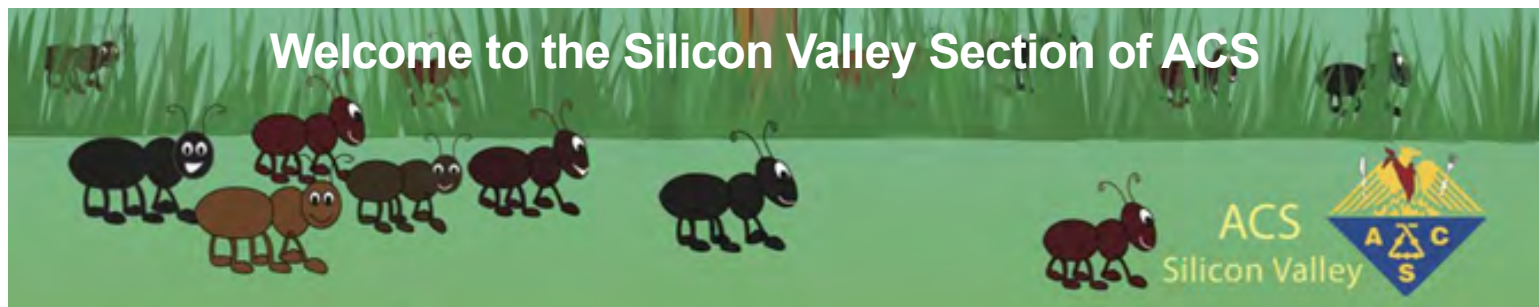
Periodic Table of Tools



Beautiful Periodic Table Posters



# Welcome to the Silicon Valley Section of ACS



Each month, our Silicon Valley local ACS section receives a spreadsheet from national ACS with the names of members new to our section. The members are either new to ACS, have transferred in from other areas, or are the newest members - students. As a welcoming gesture, the SVACS Executive Committee offers new members free attendance at a catered SVACS event. Come join us at our in-person gatherings! To register as our guest for a catered event, **contact us** directly to receive complimentary admission for you and a friend.

We hope you will also join us for an outreach event, like judging a science fair, proctoring the high school Chemistry Olympiad or participating in a National Chemistry Week hands-on experiment event. The local section is a volunteer organization. Attend an event, volunteer to help, and get to know your local fellow chemists. Welcome!

## New SVACS Members for October 2023

Alexander Al-Zubeidi	Cindy Henderson	Rama Mishra	Anirudh Raman	Caitlin Lin Tsai
Isaac Applebaum	Seoyeon Hong	Ayan Mohamed	Corey Reeves	Melanie Tsui
Alina Arzamassy	Kingston Huang	Dominique Monteil	Isabella Reyes	Karthik Veeravalli
Vasundhra Bahl	Emily R. Hung	Anthony Moritz	Jonathon Ryan	Srishti Venkatesan
Sophia Bailey	Amitha Inturi	Johannes Morstein	Sindhuja Sagar	Sofie Verschraegen
Hassen Bel Abed	Aviva Iyerkhan	Kelsey Mu	Sukeerthi Seetharaman	Diana Jin Wang
Ahanjit Bhattacharya	Taylor Jackson	Srijit Mukherjee	Jack Christopher Sharland	Xin Wen
Benjamin Ross Boswell	Cooper Jamieson	Johanna Nelson Weker	Ishwar Singh	Jake Wood
Gabriel Brenner	Jwwad Mohammad Javed	Hannah Nguyen	Alexandre Sorlin	Newton Wu
Darya Budkina	Chance Jellinek Jellinek	Josefine Eils Nielsen	Nivita Susendran	Alicia Xie
Xufeng Cao	Felipe H. da Jornada	Sahasra Nistala	Uyen Ta	Lexi Xu
Edison Castro	Melissa Jurica	Adedeji Ogunyemi	Kesha Tamakuwala	Shiyan Xu
Indalina Chan	Yehbeen Irene Kim	Su Ilayda Ozcan	Alice Tao	Stella Yang
Sarah Chang	Kasturi Kirubaharan	Jack Petersen	Ahit Kaan Tarhan	Aleksandra Zatirakha
Wania Nagaraju Chanveer	Sanghyuk Ko	Justin Peterson	Steven Teddy	Meng Yao Zhang
Rosie Chen	Sanjeev Kolli	Nandhini Rajagopal	Lea Thai-Savard	Ke Zheng
Ting Chia Chen	Andrew Konstant			
Yongjing Chen	Valentina Kornach			
Herman Ching	Ravi Kotamraju			
Randall Chiu	Jun H. Kwon			
Wai Choi	Susan Larrabee			
Yunsie Chung	Kate Lassman			
Tara deBoer	Thomas Daniel Lavery			
Meaghan M. Deegan	Yunseo Lee			
Evelyn Do	Jiaming Li			
Nhu Doan	Pu Li			
Dylan Dodd	Zhijian			
Kimai Dosch	Wendy Liang			
Mirabelle Feng	Andrew Haoming Lin			
Steven D.E. Fried	Tyler Liu			
Tianren Fu	David Lowe			
Komal Garg	Amber Lu			
Saba Ghazvini	Breanna Lu			
Blanca Gomez	Jennifer Luo			
German Augusto Gomez	James Mack			
Tiffany Gu	Shyama Mandal			
Kiana Harker	Nicole Martin			
Seth Harris	Mike Meyer			

## New SVACS Members for September 2023 Corrected List

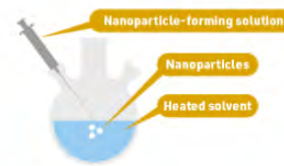
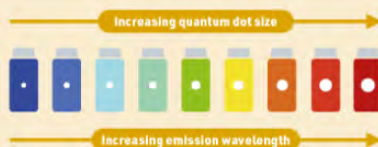
The list of new members published in the September 2023 issue of the newsletter included people with other membership statuses. Below is a revised list of new members for September 2023.

Alexandra Adams	Charlene Alexandra Guimpier	Jayden Stahl
Alma De Jesus Antonio Martinez	Avid Hassanpour	James Stiltner
Zahuindanda Aventura	Michael Hayes	Steven Sullivan
Nahal Bagheri	Kanaka Hettiarachchi	Linh Tram
Hanna Budayeva	Sophia Hollow	Scott Tran
Michael Burroughs	Md Delowar Hossain	Lily Truong
Lucas Cantwell	John Edward Madden	Nicole Vita
Sara Capponi	Benjamin Madej	Breena Walton
Yaoyao Chen	Rimsha Mehmood	Hui Wang
Yilan Chen	Jenny Nelson	Jun Wang
Xinxin Cheng	Efrey Noten	Tong Wang
Thomas Colburn	Maaik Parajes	Zhong Wang
Monty Cosby	Astrid Marisol Parsons	Haibin Wu
Duy-Khoi Dang	Saugat Pokhrel	Kingsley Wu
Matthew Del Bel	Tian Qiu	Xiangyu Xing
Fuhar Dixit	Jadyn Reed	Dandan Yang
Jordan Dotson	William Richards	Haotian Yang
Vincent John Esposito	Minxing Shen	Jingwei Yin
Emma Guiberson	Anthony Vincent Sica	

# The 2023 Nobel Prize in Chemistry

The 2023 Nobel Prize in Chemistry was awarded jointly to **Moungi G. Bawendi**, **Louis E. Brus** and **Alexei I. Ekimov** for the discovery and synthesis of quantum dots.

Quantum dots are nanoparticles of semiconducting materials. Their very small size gives them properties that differ from those of larger particles of the same material. For example, their absorption and emission of light varies with size. This is due to quantum effects arising from electrons in the particles being squeezed together.



In 1981, Alexei Ekimov produced glass tinted with copper chloride. He controlled the size of the copper chloride nanoparticles that formed in the glass and noticed that particle size affected the colour of the glass, with smaller particles absorbing more blue light.

In 1983, Louis Brus created solutions of cadmium sulfide nanoparticles, and noticed that the properties of freshly made and older solutions differed. He also discovered that the smaller the nanoparticles, the bluer the light they absorbed.

In 1993, Moungi Bawendi grew nanocrystals of cadmium selenide of a specific size in a solvent which produced smooth and even particles. This effective method for producing quantum dots paved the way for their use in wider applications.



## WHY DOES THIS RESEARCH MATTER?

QLED televisions use quantum dots to enhance the colours displayed on screen. They are also used in some LED lamps. Future applications could include flexible electronics, tiny sensors, and thinner solar cells.

Nobel Prize in Chemistry press release: <https://www.nobelprize.org/prizes/chemistry/2023/press-release/>

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ACS Local Section  
Silicon Valley

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	Chair-Elect	Todd Eberspacher	Treasurer	Ihab Darwish
	Past-Chair (interim)	Peter Rusch		

<b>Councilors</b>	2021-2023	Grace Baysinger	2022-2024	Sally Peters
	2021-2023	Natalie McClure	2023-2025	Ihab Darwish
	2022-2024	Linda Brunauer	2023-2025	Madalyn Radlauer
	2022-2024	Jane Frommer		

<b>Alternate Councilors</b>	2021-2023	Howard Peters	2023-2025	Amanda Nelson
	2021-2023	Dipti Shingnapurkar	2023-2025	Kristin Schmidt
	2022-2024	Megan Brophy	2023-2025	Laura Yeager
	2022-2024	Anais Nguyen		

<b>Newsletter</b>	Editor	Grace Baysinger	Assoc. Editor	Jane Frommer
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