



American Chemical Society Student Affiliates University of Pittsburgh



Welcome! Welcome! Welcome back! As fast as the speed of light, summer has passed and the fall semester is, once again, upon us. Ditch your flip-flops and sunscreen, and gather up your pencils, notebooks and TI-84s. Get ready for another exciting chemistry-filled semester! There will certainly be panicked late-night cram sessions and moments of doubt, but I have no doubts that we'll also cram in gigamoles of fun.

Fellow upperclassmen, it's kinda crazy that we've gotten to call Pitt our second home for this long. As a part of the class of 2024 I didn't get to see much of the campus my first year. I didn't get to shake the hands of my professors or get totally lost trying to find my gen chem lab. But it wasn't wholly bad...we all got to bring our "therapy pets" to class and take lectures from bed. And even though most of us missed out on the chaotic fun of freshmen orientation, we still made great friends in 2020. But, man, am I so glad that we now get to experience Pittsburgh in-person together.

Pitt is an amazing place to call home. My advice to all you fresh-faced first years: embrace the unknown. Take advantage of every opportunity. Check out the city, talk to professors about their research, or join a club. There are so many student organizations to get involved in. Whether you are a Chemistry major or not, I suggest joining the American Chemical Society (where EVERYONE AND ANYONE is welcome) for meetings in Chevron 132 Fridays at noon. ACS members are amazingly kind and cool people who love to learn science and volunteer in their Pittsburgh community. By joining ACS you'll certainly find a network of generous upperclassmen who'd be thrilled to teach you the ropes of campus life.

I also want to remind everyone to be kind to themselves this semester. Your health and wellness come above all else. Take a break, go for a walk, catch up with old friends, make time for your passions. First years, just a little tip: it's okay if things don't end up the way you expected. Keep up with your work, but when you need help don't be afraid to let your professors or UTAs know. Plus, you have all of us in ACS who are happy to support you in every way we can.

Whether you're in your first year or coming into your last, I'm so glad we'll be experiencing a new school year together.

Have a great semester! Hail to Pitt!

Victoria Zerbach, Newsletter Editor

2022-2023 ACS-SA Officers and Staff

Alex Crane-Co-President
Shay Habeb-Co-President
Jess Cash-Co-Vice-President
Vincent Villani-Co-Vice-President
Lauren Nedrow-Co-Secretary
Efthimis Deligiannidis-Co-Secretary
Tyler Augi-Co-Treasurer
Ci Catalano-Co-Treasurer



Holly Krug -Technology Officer
Jake Costantino- Outreach Coordinator
Paul Ghanous- Outreach Coordinator
Dhruthi Gundurao-Feature Writer
Victoria Zerbach- Newsletter Editor
Sophie Bazydola-Green Chem Writer

Visit us at <http://www.chem.pitt.edu/acs-sa/>

INTRO TO GREEN CHEMISTRY

by: Sophie Bazydola-Green Chem Writer



Hi, my name is Sophie Bazydola, and I am your Green Chemistry Contributor for the 2022-2023 term. I am a sophomore chemistry major with an interest in sustainability. Through the articles I will write for the newsletter this year, I hope to raise awareness and foster an interest in sustainability and environmentalism that will be carried into your future professions and lifestyle, chemistry-related or not.

The use of chemicals can be dangerous, and by the mid-1900s we began to see the effects: global warming; increased instances of cancer, birth defects, and genetic mutations; harm to the health of humans, ecosystems, and the environment; a hole in the ozone layer. Green chemistry was developed in response to these issues, but one act passed in the United States was key to it becoming an established field. This act declared that US policy should be reshaped to eliminate pollution at the source through changes to raw material sourcing, production processes, and recycling². Previous policies focused on treatment and disposal and often fell short of protecting the environment and our health. The Pollution Prevention Act also resulted in research grants funded by the EPA and the U.S. National Science Foundation, which increased interest and contribution to research in this field³. Funding, research, and overall interest in green chemistry, as well as policies that required changes in our usage of chemicals and the processes involving them, increased internationally. By the mid-1990s, networks of research and communication within green chemistry were developing in western countries. Today, green research spans many other scientific fields, such as environmental science, medicine, public health, and more, and is being performed internationally (even on our campus!).

Green chemistry is a field that is rethinking our current procedures and processes in chemistry and engineering. It can look like reducing or eliminating the use of toxic chemicals, reducing chemical waste, or increasing the efficiency of chemical reactions¹. It focuses on stopping pollution and harm to our planet at the source, rather than cleaning it up later. The EPA lists twelve principles of green chemistry, which highlight the variety of possible applications and research in this field. The principles are as follows:⁴



1. **Prevent waste.** Waste can be byproducts that would have to be disposed of, excess reagents, etc. The goal is to have zero waste or to be able to clean it up.
2. **Maximize atom economy.** The goal is to have the highest proportion of starting atoms in the final product, with few side reactions occurring and creating undesired products.
3. **Design less hazardous chemical syntheses.** The goal is to create chemicals that, during creation and use, pose little to no toxic risk.
4. **Design safer chemicals and products.** Design efficient yet nontoxic chemicals.
5. **Use safer solvents and reaction conditions.** Try to avoid “auxiliary chemicals”, but when they are needed, use the safest ones possible.
6. **Increase energy efficiency.** Try to remain at room temperature and standard pressure for reactions. Deviating from these conditions requires large amounts of energy.
7. **Use renewable feedstocks.** Feedstocks are starting materials; use renewable ones rather than depletable ones whenever possible.
8. **Avoid chemical derivatives.** Derivates will require additional reactants and generate more waste.
9. **Use catalysts, not stoichiometric reagents.** Catalysts are both consumed and produced by reactions, creating a cycle that reduces waste.
10. **Design chemicals and products to degrade after use.** In case products find their way into the environment, they should be designed so they break down into harmless substances.
11. **Analyze in real time to prevent pollution.** Monitor and control synthesis to minimize/eliminate the formation of byproducts.
12. **Minimize the potential for accidents.** Store chemicals properly to reduce the potential for chemical accidents that would pollute the surrounding environment.

While a lot of work still needs to be done, production and procedures surrounding chemicals have improved greatly since the 20th century, and improvements to the health of the environment reflect that. Without green chemistry, much of this progress would not have been possible and this field has proven to be an essential part of our response to climate change and other environmental concerns. [For References, please go to CHVRN 107](#)

Chemistry: Summer Travel Edition

By: Dhruthi Gundurao, *Feature Writer*

“What do you think about graphene? It seems like it could be very useful if it is mass produced.”

Many of you are probably wondering what graphene is and if you do know maybe you're wondering why I'm asking such a vague question. Before I answer your questions let me introduce myself! I'm Dhruthi Gundurao, a rising junior, and this year's feature writer for the newsletter. Each month I will try to discuss topics that are typically not discussed in our classes to give you a wider understanding of chemistry.

Now that the introductions are done, why did I ask if you knew anything about graphene? The truth is I was actually asked this question about 3 weeks ago when I was hanging out with my cousin at my grandparents' house while in India. After having spent 10 weeks in the beginning of the summer doing research on the very topic of graphene, I was hoping to escape chemistry and any related topics on this long overdue trip back to the motherland. Considering that graphene is such a niche aspect of chemical research, specifically materials research, this was not in 100 years a question I would have expected while eating ice cream and catching up with my cousin after nearly six years.

As someone who's always excited to talk about this research, whether it's to complain about the common occurrence of something going horribly wrong or to occasionally celebrate a breakthrough, I could not have been more enthralled to have been asked a question about my opinion on something that I have such extensive knowledge about. However, I think the more exciting part about this conversation was the realization that chemistry exists more intertwined within our lives that we may sometimes notice. The last thing someone going on vacation would expect is to be talking about a niche topic but it has since led to me to keep an eye open for ways in which chemistry can directly or indirectly creep up in various aspects of my life.

Now looking back on this vacation, every new food that I tried, every new and old location that I travelled to, and even the countless times spent idly sitting in traffic has the potential to allow me to explore this subject that I love so fondly from a new perspective. Often, we get so consumed in the tedious process of going to classes, processing the new information that we learn and keeping it nicely tucked in our brain to reiterate on exams that we forget why we're even taking these classes and their real-world implications. I implore each of my fellow chemistry enthusiasts, ACS members and anyone with even a remote curiosity about chemistry to take a moment to look at the countless ways that numerous concepts that you have learned or researched about may have crept up in unexpected aspects of your lives. With that I'll be back again next month with another interesting way for all of us to perceive chemistry in our everyday lives!

2231 Tentative ACS Fall Schedule



September

- 2** Officers Meeting with Pictures
- 9** Welcome Back Meeting— *with pizza*
- 16** Career Services-*with Ashley Steffy*
- 23** Meet Our New Faculty-*with Dr. Wes Transue*
- 30** All About Graduate School-*with Dr. Steve Weber*



October

- 7** Preparing for National Chemistry Week- "Fabrics"
- 8** Registration- *with George*
- 28** Celebrate Fall- *with cider, donuts, pizza & pumpkin painting*



November

- 4** Green Chemistry Seminar – *with Dr. Nesta Bortey-Sam*
- 11** Chemistry In Pittsburgh
- 18** Professional School Panel
- 26** Thanksgiving Recess

December

- 2** Town Meeting
- 9** End of Term Farewell *with Snacks*





American Chemical Society

Student Affiliates, University of Pittsburgh

Membership Application

This is a powerful professional organization for the benefit of individuals interested in chemistry and related fields. Our organization offers exciting extracurricular activities and many outstanding opportunities for our members, including:

- 1 WEEKLY MEETINGS**-to plan activities, provide interesting speakers, discuss ideas, and keep students aware of what is happening in the scientific community.
- 2 ANNUAL TRIPS**-Each year we sponsor (a) trip(s), to external chemistry environments, as well as for social enjoyment. Significantly reduced rates are available to active members. In the past few years we have traveled to New Orleans, Atlanta and New York.
- 3 PROFESSIONAL NETWORKING**-Our organization has many opportunities to make contacts with professionals in both the scientific industry and academia. Student affiliates also have the opportunity to join the National ACS.
- 4 SOCIAL ACTIVITIES**-We sponsor many activities throughout the year just for fun.

Our meetings are held every Friday at 12:00 noon in Room 150 Chevron Science Center. To join, complete the application form below and come to one of our meetings. Our first meeting will be September 9, 2022 but you may join any time throughout the year.

Name: _____

School Address: _____

Phone: _____

Major: _____ Year in School Fr. So. Jr. Sr.

E-mail: _____

May we include your name, number and e-mail on the published phone list? YES NO

To submit this form by mail, send it to ACS-SA, Box 24, Chevron Science Center, University of Pittsburgh, Department of Chemistry, Pittsburgh, PA 15260. Be sure to include the \$15.00 dues (make checks payable to the University of Pittsburgh). It is possible to be active even if you can not attend the meetings. For more information, see our display case in the lobby of Chevron Science Center.

