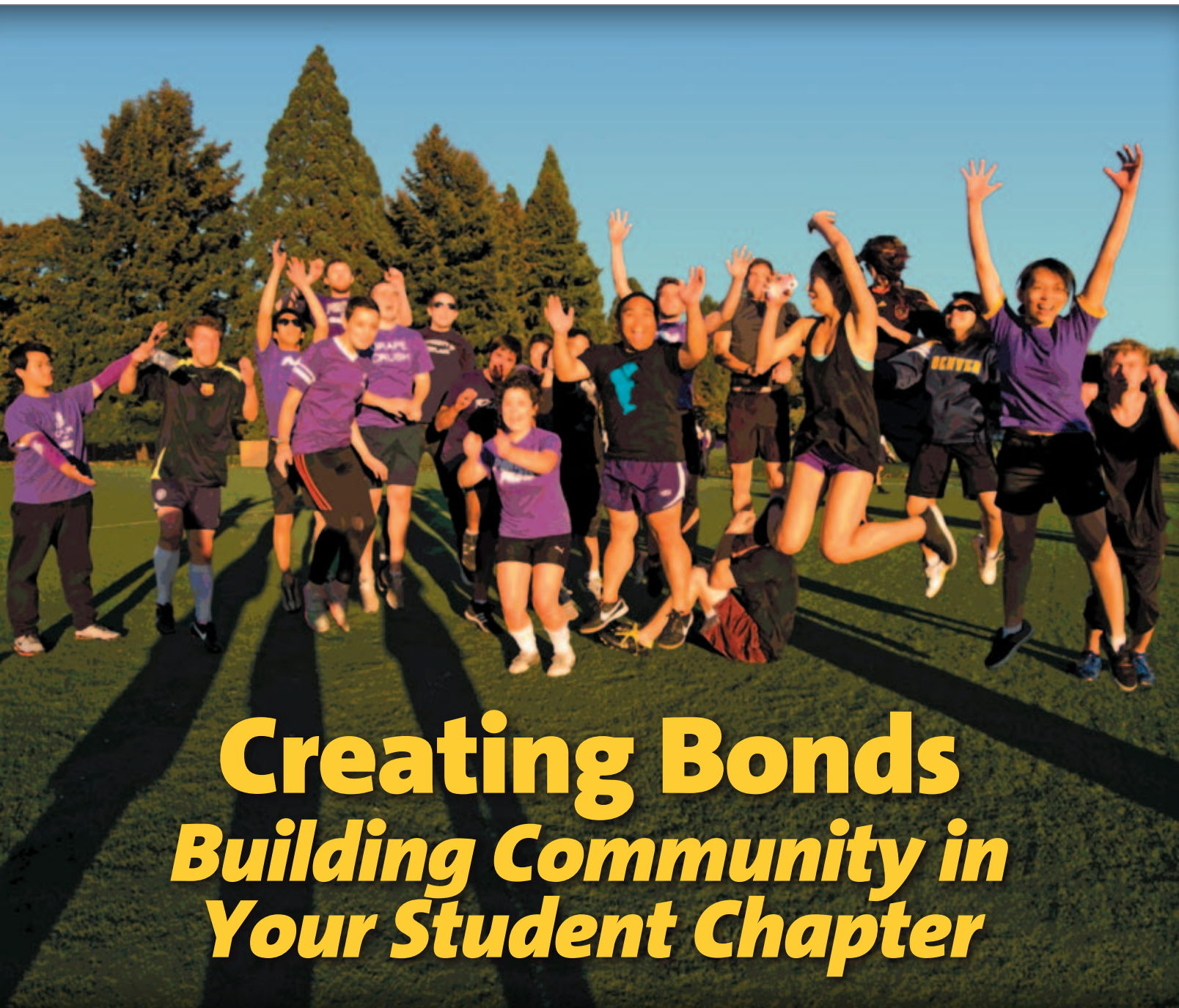


# inChemistry

THE MAGAZINE FOR ACS STUDENT MEMBERS

February/March 2013



## **Creating Bonds Building Community in Your Student Chapter**

**ALSO IN THIS ISSUE** • **Field Trips: The Perks that Come from Venturing Off Campus** PAGE 8



**ACS**  
Chemistry for Life®

• **The Science of Style: Doing Outreach with Girl Scouts** PAGE 11

• **Involving Commuter and Off-Campus Students in Chapter Activities** PAGE 14



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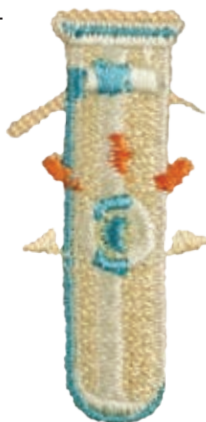
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Cover: The University of Portland (OR) chapter celebrates a soccer goal during its annual throw-down competition with the biology club. 23



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# EDITORIAL: Chemistry: A Solid Foundation for a Bright Future

BY MARINDA LI WU

**L**et me begin by saying thanks and congratulations! Thanks for choosing to study chemistry; congratulations on selecting a course of study that should benefit you, no matter what you eventually decide to do in your career. When I was in high school, I considered majoring in chemistry or French. Although I still love learning about different cultures and foreign languages, I've always been glad I majored in chemistry.

The great thing about majoring in science and developing a technical background is that you can go on to do just about anything you choose. Opportunities for a person with a science foundation are widespread: marketing, science policy, journalism, manufacturing, and even politics are just a few that come to mind.

Some people get advanced degrees in science and go into research or education; others enter medical, dental, or veterinary schools; still others augment technical degrees with an MBA, a law degree, or another advanced specialized degree. To name just one interesting example, Margaret Thatcher, Britain's first female prime minister, started as a chemist. The more well-rounded your education, the more competitive you can be in the global marketplace.


I'm often asked what advice I have for students. At the 44th International Chemistry Olympiad held last July in Washington, DC, I shared four things that have helped me throughout my personal and professional life:

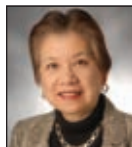
- Always work hard and strive for excellence.
- Have passion for whatever you choose to do.
- Have confidence and believe in yourself!
- It's also important to have some fun along the way.

No matter which path you choose after college, I hope you will remember to share with others the benefits that chemistry contributes to everyday life. You can easily become a Chemistry Ambassador by signing up at [www.acs.org/chemistryambassadors](http://www.acs.org/chemistryambassadors). Make a difference. Why not try it?

I've met with leaders of sister chemistry societies around the world. It turns out that one of the biggest challenges we all face is the general public's negative image of the chemical industry, and often chemistry itself. Therefore, it is critical that we instill in both policy makers and the general public a better appreciation of the many benefits for society created by chemistry. I hope you will consider becoming a vocal advocate as I have, not only for chemistry, but for science and technology too.

One of my ACS presidential initiatives is to identify challenges and opportunities related to the global chemistry enterprise. To help chemists better prepare themselves to compete in this arena, I established a Presidential Task Force, "Vision 2025: Helping ACS Members Thrive in the Global Chemistry Enterprise." We are working in the areas of promoting job growth, collaboration, education, and advocacy.

I hope to have an opportunity to meet some of you during my travels. If you see me at a meeting somewhere, please come up and introduce yourself. I can be reached at [m.wu@acs.org](mailto:m.wu@acs.org), and welcome your ideas. Best of luck — with whatever you choose to do! 



Marinda Li Wu, Ph.D., is founder and president of Science Is Fun! in Orinda, CA, and president of ACS. Find her at Marinda Wu on Facebook.

PHOTO: PETER CUTTIS PHOTOGRAPHY

## FEBRUARY

- 15** Women Chemists Committee  
Eli Lilly Travel Grant  
applications due

## MARCH

- 1** Applications for ACS  
Scholars Program due  
([www.acs.org/scholars](http://www.acs.org/scholars))
- 14** Pi Day
- 21** ACS Innovative Activities  
Grant applications due
- 21** ACS Community Interactions  
Grant applications due
- 22** Activity Fact Sheets due for the  
Chem Demo Exchange event  
at the 245th ACS National  
Meeting in New Orleans, LA

## APRIL

- 7–11**  
245th ACS National Meeting,  
New Orleans, LA
- 22** Chemists Celebrate Earth Day

## MAY

- 15–17**  
44th ACS Central Regional  
Meeting (CERM), Mount  
Pleasant, MI
- 22** ACS Student Chapter Reports  
due

## JUNE

- 5–8**  
Great Lakes Regional Meeting  
(GLRM), La Crosse, WI

## JULY

- 21–24**  
Northwest Regional Meeting  
(NORM), Corvallis, OR

# Present Your Research at the 246th ACS National Meeting

Indianapolis, IN – September 8-12, 2013

Join more than 12,000 chemical science and engineering professionals at the 246th ACS National Meeting.

To be considered for a poster presentation, submit an abstract via the Program and Abstract Creation System (PACS) at <http://abstracts.acs.org>

**Abstracts Deadline: April 1, 2013**

For more information about the Undergraduate Program in Indianapolis, e-mail [undergrad@acs.org](mailto:undergrad@acs.org) or go to [www.acs.org/undergrad](http://www.acs.org/undergrad)



TAKE  
THE  
LEAD!

Photo © 2012 iStockPhoto

## BY NICOLE DI FABIO AND CHRIS ZEIGLER

February/March 2013



## ACS Staff

ACS staff are professionals hired by the Society to fulfill the directives of the Board, Council, and committees. They are also responsible for collaborating with ACS members to develop and implement programs, products, and services that meet the needs of the Society's membership.

Staff Divisions report to the Executive Director and CEO.

### Education

The ACS Education Division supports educators, students, and chemical professionals through programs and resources that enhance chemical education; support professionals working in academia and industry; prepare future generations of scientists; and engage children in learning about the power of chemistry.

### Membership & Scientific Advancement (MSA)

MSA serves the needs of members and chemistry practitioners by providing scientific and professional services that advance their success. MSA facilitates the advancement of science through technical meetings, online content, diversity, professional courses, green chemistry programs, and international activities. MSA also supports thousands of volunteers annually in increasing public awareness of chemistry, and provides support to more than 20 ACS governance committees, working groups, and task forces.

### Publications

The Publications Division provides the worldwide scientific community with a comprehensive collection of the most cited peer-reviewed journals in the chemical and related sciences.

ACS Publications publishes more than 35 journals, *Chemical & Engineering News*, ACS Legacy Archives, and the ACS Symposium Series via its award-winning web-based platform. ACS journals are ranked first in citations or Impact Factor in seven core chemistry categories as well as eight additional categories.

## Office of the Secretary and General Counsel (OSGC)

OSGC is responsible for supporting the Council and the Board of Directors and their activities and working with them and senior management to develop and implement a comprehensive and coherent strategy for the Society. This division is also charged with developing supporting strategies, implementing and evaluating plans, and communicating a clear, consistent message about the Society — and about chemistry — to the public, news media, public and elected officials, the chemical enterprise, and ACS members.

### Research Grants

The Office of Research Grants is responsible for the administration of the research grant programs of ACS. These grants include the Herman Frasch Foundation Grants, the Irving S. Sigal Postdoctoral Fellowships, and the Teva USA Scholars Grants, and the ACS Petroleum Research Fund research grant program.

### Chemical Abstracts Service (CAS)

CAS finds, collects, and organizes all publicly disclosed information about chemical substances. It builds and maintains the world's largest collection of data regarding molecular substances, reactions, and related content that is vital to the work of researchers. CAS also manages SciFinder®, an online resource that searches the most comprehensive collection of chemical substance and reaction information, and provides access to more related references than any other scientific search service. SciFinder® offers researchers a one-stop shopping experience, with flexible search and discover options based on users' input and workflow. You can search for substances, reactions, and patent and journal references — anytime and anywhere you want.

As you can see, membership in ACS provides you with many opportunities to really get involved in your profession. We encourage you to take advantage of these opportunities, now and as you advance through your career. **irc**



Nicole Di Fabio is a senior education associate in the ACS Undergraduate Programs Office. Chris Zeigler is an education associate in the ACS Undergraduate Programs Office.

## WHERE TO LEARN MORE

### ACS MEMBER HANDBOOK

The ACS Member Handbook briefly outlines your ACS member benefits. Please visit [acswebcontent.acs.org/memberhandbook/](http://acswebcontent.acs.org/memberhandbook/) for complete details on all the benefits, products, and services afforded to you as a member.

### ACS AND YOU

ACS and You is a free online course specially designed for people who are either new to ACS or new to an ACS leadership role. This course will help you learn about the structure of the organization, the responsibilities of its leaders, and opportunities to volunteer or lead. It will also help you learn where you fit in this complex organization, your personal and professional benefits, and how to get involved and help set the future direction of ACS. To sign up for ACS and You, simply visit [www.acs.org/leaderdevelopment](http://www.acs.org/leaderdevelopment) and click "Online courses." **irc**

# Feast upon the

at the 245th ACS National Meeting in New Orleans, LA

## SUNDAY, APRIL 7

**Undergraduate Hospitality Center**  
8:30 A.M. – 5:00 P.M.

**Making the Most of Your First ACS National Meeting**  
9:00 – 9:45 A.M.

**Graduate School Reality Check, Step I: Getting in**  
10:00 – 11:00 A.M.

**Graduate School Reality Check, Step II: You're in — Now What?**  
11:00 – 12:00 NOON

**Networking Social with Graduate School Recruiters**  
11:00 A.M. – 4:00 P.M.

**Chem Demo Exchange**  
11:00 A.M. – 12:30 P.M.

**Technical Symposium: How to Become an Exemplary Teaching Assistant**  
1:00 – 2:30 P.M.

**Technical Symposium: Computational Neuroscience Advances in Drug Abuse and Addiction**  
1:00 – 2:30 P.M.

**Workshop Part I: Essential Skills for Success — Oral Presentation of Scientific Results**  
2:45 – 4:00 P.M.

**Workshop Part II: Essential Skills for Success — Write Like a Chemist**  
4:00 – 5:15 P.M.

**Making Demos Matter Workshop**  
4:00 – 5:30 P.M.

**Student Chapter Awards Ceremony**  
7:00 – 8:30 P.M.

**Undergraduate Social**  
8:30 – 11:00 P.M.

## MONDAY, APRIL 8

**Undergraduate Hospitality Center**  
8:00 A.M. – 5:00 P.M.

**Workshop: Award-Winning Outreach Programs**  
9:45 – 11:15 A.M.

**Understanding Climate Science: A Scientist's Responsibility**  
8:30 – 11:30 A.M.

**Workshop: Employment in Chemistry — Academics, Industry, Small Business, and Government**  
9:45 – 11:15 A.M.

**Undergraduate Research Poster Session**  
12:00 NOON – 2:30 P.M.

**Eminent Scientist Lecture: "Computation and Collaboration for Chemical Discovery"**  
Kendall Houk, UCLA  
3:00 – 4:00 P.M.

**Undergraduate Speed Networking with Chemistry Professionals**  
4:00 – 5:30 P.M.

**The Kavli Foundation Lecture**  
5:30 – 6:30 P.M.

**Sci-Mix/Successful Student Chapter Poster Session**  
8:00 – 10:00 P.M.

## TUESDAY, APRIL 9

**Water: A Grand Challenge for Science and Society**  
8:30 – 11:00 A.M.

**Chemistry and the Environment Film Series, Movie TBA**  
NOON – 2:00 P.M.

*All events are sponsored or co-sponsored by the Society Committee on Education Undergraduate Programs Advisory Board.*

**CHAIR:** Matthew J. Mio, University of Detroit Mercy, MI

**PROGRAM CHAIR:** Jeffrey D. Evanseck, Duquesne University, Pittsburgh, PA

*Program format and times are subject to change.  
Please consult the final program.*



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# Opportunities!

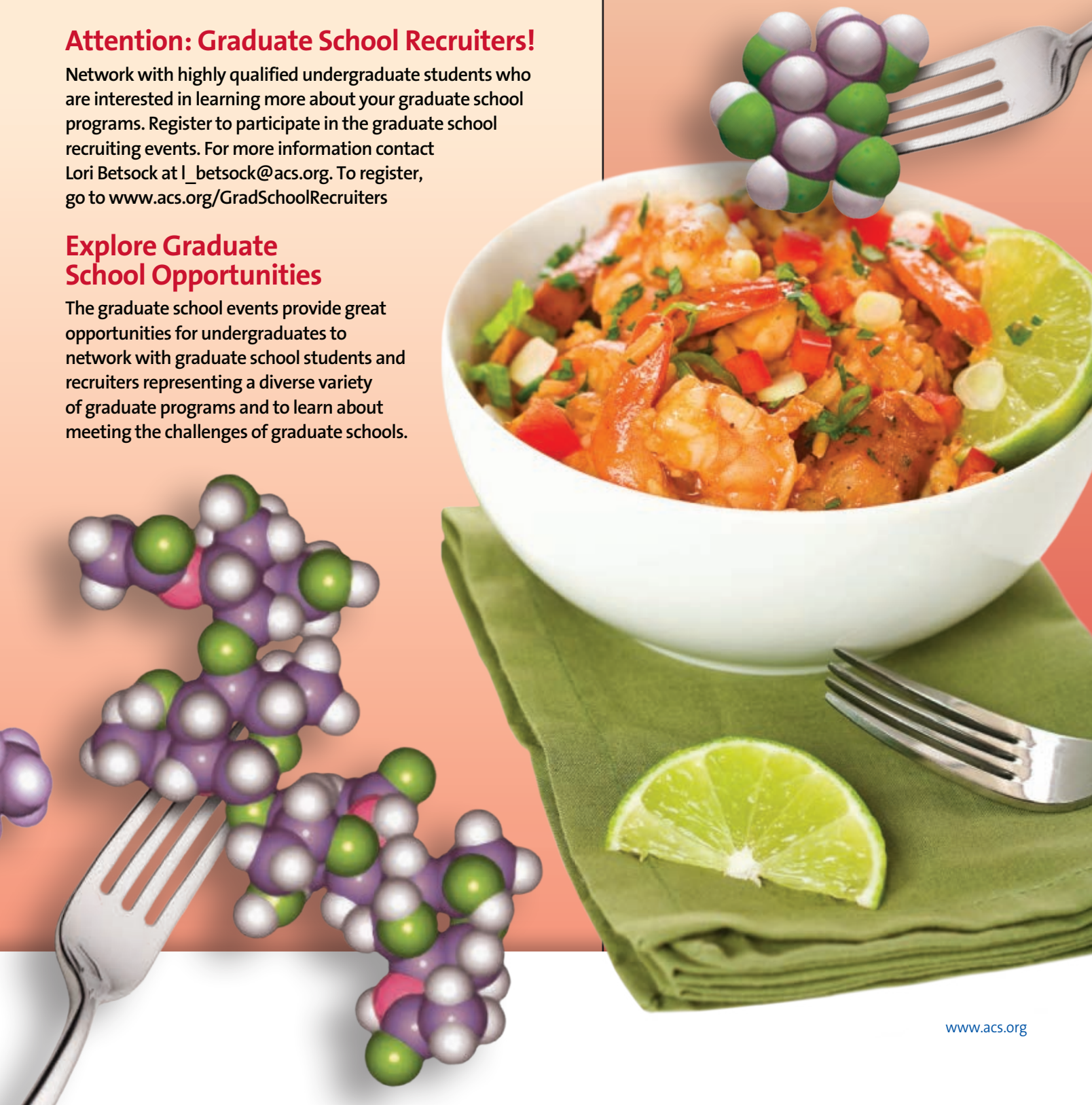
Ernest N. Morial Convention Center • April 7–11, 2013

## Attention: Graduate School Recruiters!

Network with highly qualified undergraduate students who are interested in learning more about your graduate school programs. Register to participate in the graduate school recruiting events. For more information contact Lori Betsock at [l\\_betsock@acs.org](mailto:l_betsock@acs.org). To register, go to [www.acs.org/GradSchoolRecruiters](http://www.acs.org/GradSchoolRecruiters)

## Explore Graduate School Opportunities

The graduate school events provide great opportunities for undergraduates to network with graduate school students and recruiters representing a diverse variety of graduate programs and to learn about meeting the challenges of graduate schools.





# Chapter Field Trips

## *The Hows and Whys and a Few Ideas to Get You Going*

BY ALLISON PROFFITT

**T**here's a lot of chemistry happening beyond the walls of your university or college, and field trips aren't just for grade school anymore!

Many ACS student chapters have been venturing outside campus boundaries to take advantage of opportunities to see science in action, learn about career options in chemistry, and network with local chemists. Although field trips take some forethought and planning, they are well worth the effort and will likely be a popular addition to your chapter's event schedule. In fact, the biggest challenge may be deciding which field trip to take first!

### The business trip

No matter how good your instruction at school, there's nothing like seeing a job for yourself. Field trips and site visits give students the opportunity to put job descriptions in context. After a presentation by the president of Grifols Biologicals in Los Angeles, student members from California State University (CSU) Long Beach received a factory tour. After suiting up head to toe, they witnessed the process of producing a drug on the industrial scale. The chapter also visited the Orange County Sanitation District in Fountain Valley, CA, where they donned hard hats and toured the plant, learning about each step of the sanitation process. Along the way, they talked with chemists about their daily routines and gained a better understanding of what sanitary chemists do.

Lab tours also provide opportunities to see the how equipment and techniques used in university chemistry labs are used in industry. In addition, tours introduce chapter members to new types of instrumentation. University of Central Missouri

(Warrensburg) student members toured Acceleration Laboratory Services in Lee's Summit, MO, and received tutorials on several instruments to which they did not have access at their university. For younger undergraduates, lab tours can provide a practical introduction to instrumentation they will soon encounter in upper division coursework, while upper-level students get the opportunity to learn how specific techniques are used in an industrial setting.

Site visits often give students the opportunity to interact with more chemists

than a career seminar would. CSU Chico student members toured the environmental analytical lab at TestAmerica Laboratories in Sacramento, CA. It was a helpful experience for the students to see industry positions with which they were unfamiliar. The tour also introduced students to new instruments, allowed them to ask questions about chemists' daily routines, and gave them a firsthand





look at the responsibilities that different types of chemists have.

The inquiry isn't unidirectional, though. Site visits also give local companies a chance to meet the newest class of chemists and promote their companies, internships, and job positions. At CSU East Bay, student members visited Bayer, enabling them to build connections with valuable resources for future internships or job positions. After the



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PHOTO COURTESY OF UNIVERSITY OF TENNESSEE AT MARTIN

LEFT: UTM chapter president Gilbert J. Forgays under the influence of the Van de Graaf electrostatic generator at the AMSE in Energy in Oak Ridge, TN.

TOP: UTM students exploring exhibits at the AMSE.

CENTER: IUPUI students receiving a private tour of the Fountain Square Brewery (Indianapolis, IN), including the on-site brewing laboratory.

BOTTOM: Group photo of the UTM participants in the Oak Ridge tour of the Y-12 History Center and the AMSE.

Carroll University (Waukesha, WI) chapter tour of Aldrich Chemical, many members quickly applied to their undergraduate programs, and at least one member was able to parlay this experience and the contacts made into a job following graduation.

## The spirited trip

Maybe just as important as networking, though, is the opportunity for chapter members to spend time together as a group away from campus. Field trips to breweries, wineries, and — in the case of the University of Puerto Rico-Humacao — the Bacardi rum distillery give students who are nearing the end of their undergraduate careers a chance to relax and enjoy their colleagues — and chemistry at work in the “real world.”

The student members of Indiana University-Purdue University Indianapolis (IUPUI) toured the Fountain Square Brewery. “I reached out to a few local breweries and found Fountain Square to be a great fit, as the owner had a background in microbiology and chemistry,” says Tomas Meijome, chapter president. The student members got a private tour in which they observed the brewery’s microbiological techniques that ensure optimal chemical conditions in their microbrews, and also got a peek at the brewing laboratory on site.

The student members at Louisiana State University (Baton Rouge) also toured a local brewery and prepared for the trip by watching the ACS webinar “Tapping into the Chemistry of Beer and Brewing” (<http://acswebinars.org/bamforth>).

## A bit of history

Local historic sites and graveyards might not be the most obvious choices for a field trip, but they often have a wealth of interesting knowledge to share. At

Mercer University (Macon, GA), students joined a local historian on a tour of a local graveyard. The historian regaled the students with stories about the role of chemistry in Macon 150 years ago, highlighting how doctors, lawyers, pharmacists, builders, and entrepreneurs all used chemistry. When the chapter members at Messiah College (Mechanicsburg, PA) travelled to the Joseph Priestley House in Northumberland, PA, they learned a great deal, not only about his pioneering



work in chemistry and his discovery of oxygen, but also about the dangerous experiments he performed at home in the process of making his landmark discoveries.

## The more the merrier

Many chapters used their field trips to drive home — or discover — the multidisciplinary nature of the science. CSU Sacramento students toured the Novozymes facility in Davis, CA, where guides showed how multiple fields collaborate to facilitate their enzyme production.

Another multidisciplinary approach that some chapters use is to plan their field trips in conjunction with other scientific organizations on campus. For example, CSU Long Beach joined forces with the Biology Student Association to tour the Orange County Crime Lab in Santa Ana. Meanwhile, members of both the University of Michigan, Dearborn ACS student chapter and the university's Society of Physics Students toured the Fermilab in Batavia, IL. It was a great experience and showed that there is room for overlap and inquiry among the scientific disciplines.

Other student chapters invited groups from off-campus to join them. University of Detroit Mercy (MI) students joined the Education Committee of the Detroit Local Section and 30 area high school chemistry teachers to tour Pewabic Pottery in Detroit. Participants observed the kiln room and the giant ovens that bake the water out of ceramic pieces to harden them. The group then visited a studio where clay was processed and made ready for use in molds, and also learned about the inorganic chemistry of colored paints and salt glazes. Afterward, they were taken to a workshop where they designed and painted ceramic tiles to take home.

Student members at the University of Tennessee at Martin (UTM) combined their field trip with an outreach program to local high school students, with the help of an ACS Innovative Activities Grant. Coinciding with the 100th anniversary of Mme Marie Curie's 1911 Nobel Prize in Chemistry, a group of 24 college and high school students visited Oak Ridge, TN, and toured the Y-12 History Center and the American Museum of Science and Energy (AMSE) to learn the history and science behind nuclear technology, including how nuclear technology is used in electricity-producing power plants.

## Planning and logistics

Trip planning should begin by polling the chapter members and finding out which types of events are most interesting to members. "Tailor your activities to what members want to do and you will be more likely to have a great turnout of students," advises Elizabeth Ebensperger, chapter president at Carroll University.

Scheduling is the most common challenge student groups reported. Some trips — like a brewery tour, for example — can be planned for a weekend, but most outings need to be arranged during the week. "Start considering days that work for everyone super-early in the semester, get a list of two or three laboratories/trips you would like to take, and start calling them right away," advises Christina Dobson with the University of Central Missouri. "Check with the lab and make sure that this is something they

## A Few Field Trip Ideas

**C**hemistry is everywhere, so the opportunities for field trips are nearly endless. But to get your planning started, here's a list of spots other ACS student members have visited:

- Pharmaceutical companies
- Industrial chemical companies
- Science museums and historic sites
- Forensic laboratories
- Public health labs
- Oil refineries
- Wineries
- Breweries
- Glass factories
- Power stations
- Dairies
- Environmental test labs
- Sanitation facilities
- Pottery factories.

### PLANNING FIELD TRIPS

Planning off-campus trips may take a month to a full semester to arrange. Here are tips and ideas for planning an off-campus event.

- Establish with the host an appropriate dress code.
- Arrange an orientation/preview for students prior to the event.
- Plan transportation arrangements.
- Establish time of departure and return, and length of tour.
- Specify cost(s) to students, if any.
- Observe appropriate safety precautions.
- Conduct a follow-up discussion.
- Send appropriate thank-you notes!

allow, ask if there is a minimum/maximum amount of attendees, and ask when is a good time to visit."

Taking a field trip to a facility that is local is usually the best bet for student groups. It makes transportation easier and keeps the overall trip shorter, so it will interfere with fewer schedules. One reasonable place to start, then, is with the ACS local section. Reach out and see which ACS members have connections to facilities that you would be interested in touring. Chances are, there will be a local section member who can at least give you an introduction to any local lab or facility. For example, students from the University of Detroit Mercy were able to tour Midwest Analytical in Ferndale, MI (a specialty analytical laboratory) by connecting with owner Kevin O'Mara, a chemist active in the Detroit Local Section.

Dave Tiberi, president of the Saint Vincent College (Latrobe, PA) chapter, recommends keeping the tour group fairly small — less than 20 people. "It is much easier to get a small group to a location."

Making field trips work for your chapter depends on choosing the right trip for the audience and planning well. As Tiberi says, "The easier it is to organize a trip, the more trips you can make!" **inc**



Allison Proffitt is a writer and editor based in Nashville, TN.

# Teaching Girl Scouts the Science of Style

## *A Successful Collaboration between the Greater Pittsburgh Area Women Chemists Committee and ACS Student Chapters*

BY RACHEL HARRIS

**W**hen you think of Girl Scouts, images of pre-teens selling cookies, braiding friendship bracelets, and eating s'mores likely come to mind. But you will probably be as surprised as we were to learn that such activities are just a tiny part of a bigger picture.

When the Greater Pittsburgh Area Women Chemists Committee (GPA-WCC) was looking for an outreach project for our inaugural year, we were thrilled to find that the Girl Scouts of Western Pennsylvania had numerous opportunities for us to get involved in their community. Among other STEM (science, technology, engineering, and mathematics) badges that the Girl Scouts organization offers, girls could earn the new Science of Style badge.

As a group of chemists with extensive knowledge of both science and style, the GPA-WCC created Couture, Cosmetics, and Chemistry, an event that aims to encourage female involvement in the sciences by teaching girls in grades 6–10 the chemistry behind accessories and makeup. From the idea's inception in October to its realization in April, this event was a hugely collaborative effort that involved volunteers at all academic and professional levels.

### From the ground up

Bringing together a brand-new Girl Scouts badge and our fledgling organization presented a number of challenges for us. Having no previous experience in planning an outreach event from scratch, we drew ideas from the University of Pittsburgh's highly successful Saturday Science program, an effort by the institution's ACS student group that brings female and minority high school students to



campus for an engaging, hands-on laboratory experience. We wanted to create a similar learning environment that allowed for a lot of different activities to be completed in a relatively short program, and that would also provide our guests with one-on-one face time with other young women in the sciences.



PHOTO COURTESY OF UNIVERSITY OF PITTSBURGH

Partnering with your local Girl Scout Council is a great way to enhance your outreach efforts. Contact volunteer management staff at your local Girl Scout Council. The councils are happy to work with you to develop a program that works toward a badge, or is simply a fun activity for girls.

In addition, the event was designed with the requirements for the Science of Style badge in mind. The badge description offers some flexibility in choice of activities, so we wanted to include hands-on experiments that were relevant to the chemical sciences. There are five major steps involved with completing the badge:

- Testing skin care and makeup
- Examining the science behind fabrics and accessories
- Exploring the science behind hair products and perfume
- Investigating the sociology of style
- Formulating future style.

Each area included several suggested activities girls might do to fulfill the badge requirements. Step 2, "Examining the science behind fabrics and accessories," for example, could involve testing sunglasses for ultraviolet (UV) shielding (which is the activity we chose to offer), as well as learning about outdoor fabrics or grading a gem. To narrow down the possibilities, we held a series of planning meetings to ensure that the Girl Scouts had the best experience possible.

Our first meeting was an informal brainstorming session of experiment ideas for each of the badge requirements. There were a number of experiments that we would have loved to do, but felt that they might take too much time or were geared toward older students (such as having the girls make their own sunscreen, then test it with a UV spectrophotometer). We also wanted to provide a well-rounded explanation of makeup by explaining some drawbacks, such as the harmful chemical additives that are present in certain cosmetics.

For our second meeting, we came up with a schedule of rotating activities for the event and finalized the procedures for each activity. In addition, we developed a supply list and budget.

At our final meeting, the week before the event, several volunteers participated in a dry run of all the experiments, going through the procedures and making sure everything was working as it should. During this time, several adjustments were made to ensure that the activities would run smoothly on the day of the event.

### Lip-smacking lip balm

Once we decided on the activities, we wanted to incorporate many different areas of chemistry that relate to makeup and fashion. One of the activities was making homemade lip balm from natural ingredients. For background, we discussed the properties of oils and their importance in moisturization, as well as additives that might be used in commercial cosmetics and the benefits of homemade makeup.

We showed the girls how to make lip balm with four basic ingredients: beeswax, sunflower oil, essential oil, and honey.



# girl scouts western pennsylvania

To make the lip balm, we worked with the girls to melt three tablespoons of beeswax and five teaspoons of carrier oil together in a large test tube in a hot water bath (or double boiler), stirring until the ingredients were combined. After that, the girls added one teaspoon of honey and six to seven drops of essential oil. Getting the honey to dissolve into the wax was the trickiest part; we warmed the honey slightly in another test tube before mixing it with the melted wax. The girls then poured the mixture into containers and let it sit 20 minutes before covering or moving.

To examine the science behind accessories, the girls tested the UV absorption of sunglasses. While shining UV light on sunglasses, we explained the basic principles of the electromagnetic spectrum and the harmful effects of UV rays. Using a UV detector behind the sunglasses, the Girl Scouts came to understand how their cool shades also protected their eyes from damage.

To explore hair products, we dyed several samples of hair with different colors (the clippings were graciously donated by a local salon). Then we helped the girls examine them under a microscope at 100x after different lengths of time and compare them with the undyed hair sample. We explained the types of chemicals that hair dye contains and what they do to one's hair — but looking at the hair under high magnification really illustrated the breakage and other damage that hair dyes cause.

### Stylish Shrinky Dink pendants


To give the girls an opportunity to formulate future style, we focused on making environmentally friendly jewelry from recycled materials. Do-it-yourself Shrinky Dinks can be made from any type of plastic container marked with the recycling label 6 (polystyrene). For background on this activity, we explained the basic concepts behind polymers and plastics, the importance of recycling and sustainability, and how to figure out what kind of plastic you have by looking at the recycling label.



## How I Became Involved with the WCC— and How You Can Too

**G**PA-WCC volunteers for the Science of Style Girl Scout event included members from the ACS student chapters at the University of Pittsburgh and Carlow University, as well as graduate students and professors from Carnegie Mellon University.

I became involved in the GPA-WCC two years ago when the local Pittsburgh WCC chapter had just formed. One of my professors, Michelle Ward, thought a WCC chapter would be a good way for more women to get involved in the ACS and other chemical societies specific to Pittsburgh. I became the inaugural outreach coordinator because I had done a lot of outreach with ACS and wanted to become more involved with organizing events that would encourage girls to go into the sciences.

Want to get involved with the WCC or start your own local chapter? The National WCC maintains a contact list of existing local chapters on their website. If there is not currently a local chapter in your area, you can contact [wcc@acs.org](mailto:wcc@acs.org) for information on starting one! 

To make her pendant, each girl cut a piece of plastic into desired shapes about three times the size that they wanted the final dimensions to be. Then they used a hole punch to make a hole in each Shrinky Dink so they could hang it on a necklace strand. Using colored Sharpie pens, the girls drew their desired designs onto their pendants. Our volunteers used heat guns to shrink the pendants. As the girls watched, the pendants curled and flattened as they shrank on an aluminum foil surface. During this process, the plastic shrank to about one-third of its original size and became five to six times as thick. Once the plastic cooled, the girls added metal jump rings and strung the pendants onto recycled yarn or twine. Girls could also use this same process to make pins or bracelets!

### Properties of fabrics

After the lab rotations, there was a 25-minute break for snacks and juice. Afterward, we investigated the sociology of style by conducting a short lecture-style presentation and demo on women's athletic outfits from the 1800s to the present. We explained some big themes from a female historical perspective: the Health Movement of the 1800s, the creation of women's colleges, and Title IX. Of course, these explanations were accompanied by hilarious pictures of old sports gear, from corset-wearing tennis players to bloomer-style gym shorts. For the demo, we gave the Girl Scouts small squares of absorbent cotton fabric and technical wicking fabric. They used drop-per pipets to put drops of water on each fabric sample. We explained that technical fabrics had a similarity to the Shrinky Dinks they had made earlier, in that they also contain synthetic polymers. The girls were so amazed at how the water beaded and slid right off the wicking fabric that they asked for more fabric to take home with them!


## Encouraging future scientists

For our final activity, we showed the girls another kind of timeline: the journey from middle school student to chemistry professor. The purpose of this was to allow the Girl Scouts to picture themselves as future scientists by showing real people going through the process. At the front of the room, we had two Girl Scout volunteers (one in middle school and one in high school). The next logical step, of course, is undergraduate study as a chemistry major, so a college student joined them, along with a graduate student, a postdoc, and finally a chemistry professor. Tara Meyer, a chemistry professor volunteer from the University of Pittsburgh, explained to the girls how to progress from one stage to the next. Seeing the progression took the abstract idea of becoming a scientist and turned it into something relatable and concrete. At the conclusion of the demonstration, each Girl Scout received a certificate of completion in addition to a badge.

## Working with your local Girl Scout Council

You can become a program partner with your local Girl Scout Council by contacting its volunteer management staff. They are happy to work with you to help you develop a program that works toward a badge, or is simply a fun activity for girls of any age. The advertising for our event was done through our local council's website and print publications. We charged a nominal fee of \$10 per Scout, which covered the cost of the food, badge, and most supplies. If your student chapter is considering a similar program, my advice is start early! We contacted the Girl Scouts in October for an event in mid-April.

## Additional considerations

Here are some additional tips we learned along the way that your student chapter may find helpful. It is helpful if some chapter members are current or former Girl Scouts because they can have great ideas from similar projects in their past that can be repurposed as a more science-oriented activity. If these are new activities that no one has experience with (as was the case with us) going through a dry run with your volunteers is essential because they need to understand the potential safety issues and should be familiar with the procedure. Our event was such a success largely because of our amazing volunteer turnout, so smaller chapters with fewer members might find it difficult to host a large number of Girl Scouts — we had at least one volunteer per participant. It's certainly not necessary to have your volunteers outnumber the participants, but it was great to have so much help. Smaller chapters should consider teaming up with nearby chapters or other local science organizations to host something on this scale. 



*Rachel Harris graduated from the University of Pittsburgh in 2012 after serving as co-president of its ACS student chapter; she also is former outreach coordinator for the Greater Pittsburgh Area WCC. Currently, she is a first-year graduate student at Northwestern University.*

# Students on the Move

## *Keeping Commuter and Off-Campus Students Engaged in ACS Chapter Activities*

BY BLAKE ARONSON

**K**eeping members actively engaged in chapter activities is challenging for many ACS student chapters, but especially so for those at community colleges (CCs) with a high percentage of students who commute from home or live off campus.

While individual situations vary, as a group commuter students tend to be less engaged in campus activities than students who live on campus. Since nearly three-quarters of undergraduates either commute to campus from home or live off campus, ACS student chapters are finding some very creative ways to attract these students and keep them actively involved as members.

### Know your members' needs

Tyler Jenish, recent president of the Anne Arundel CC (Arnold, MD) chapter, had a 45-minute commute to campus, which gave him a personal stake in making chapter activities matter to members living off campus. In general, Jenish observes, members "are attentive to their interests" — so it makes sense to select and plan events based on what is most likely to attract attendance and participation. For example, if a large number of chapter members are nursing students, the chapter could invite a nurse to be a guest speaker, or if members are curious about forensic science, the chapter could arrange for a tour of a forensics laboratory.

At Cincinnati State Technical and CC (OH), a large number of students in introductory chemistry courses have plans to take higher-level chemistry courses. According to chapter president Kinshasha (Kat) Azariah, these students find opportunities for informal chemistry education provided by an ACS student chapter particularly appealing. "Our hook is that chemistry is a challenge for everybody, so join us and get free tutoring!" she says.

The chapter at Los Angeles City College (CA) focuses on student-driven activities to engage members. One of the first activities chapter members do each year is design their own chemistry show. As faculty advisor Terry Boan jokingly puts it, "No one ever complains about blowing

up a pumpkin." The chapter's president, Ikenna Onyia, refers to the chapter as a family. The group

is tight-knit, and members participate in activities in between semesters. Get-togethers, bike rides, and similar activities help keep the chapter members interacting even when class is out.

At Saint Louis CC (MO), students frequently go straight into the workplace after graduation, so the chapter activities focus on professional development opportunities. To help members build relationships with potential colleagues and employers, the chapter lines up field trips and guest speakers by working with local businesses that hire program graduates. Chapter members also participate in ACS local section activities, providing valuable networking opportunities.

Recent chapter president Jordan Aach credits faculty advisor Donna Friedman with helping new officers connect their work in the chapter with skills they will one day need in the workplace. For her part, Friedman is effusive regarding the students' skills, noting that by the time they graduate, officers can take minutes, run a meeting, keep records, manage a budget, and set and follow an agenda. "I'm really proud of them," she says.

### Be flexible

Commuter and off-campus students are only on campus for a limited part of the day. Transportation issues, inclement weather, jobs, and family obligations can make return trips to campus difficult to impossible.

For these students, convenience and flexibility are essential. Some chapters find that an easy solution is to vary the times of chapter meetings and activities, so that as many members as possible have the opportunity to participate at least some of the time. Popular times

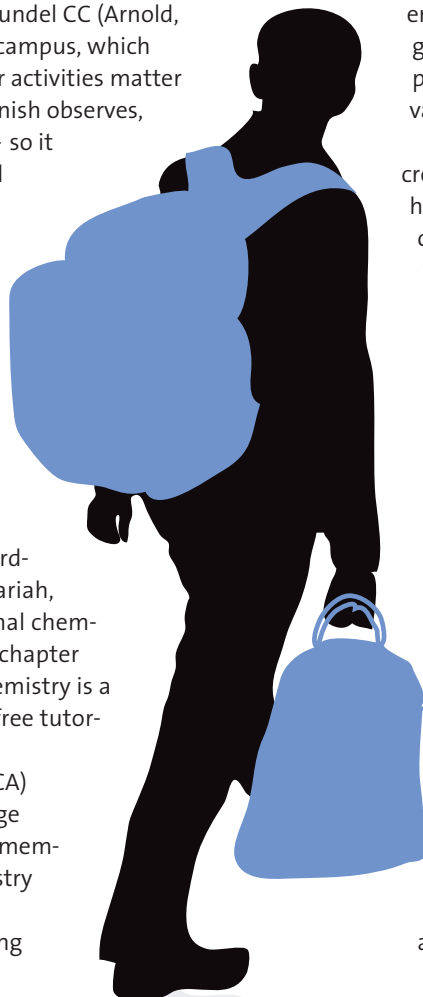




PHOTO COURTESY OF LOS ANGELES CITY COLLEGE

LA City College chapter activities are student-driven, and members have become very tight-knit. Each year they plan a chemistry show and arrange get-togethers during school breaks so members can stay in touch with one another.

include immediately after large lecture classes, during lunch (especially if you can provide the food), evenings, and weekends.

Best times will depend on how you organize chapter activities and what works best for the students at your school. For example, the Anne Arundel CC chapter holds weekly officers' meetings in order to plan chapter activities. Because planning is done primarily by the chapter officers, they are the only ones who need to be present, simplifying scheduling. The activities themselves are held at a variety of times of day, so that there is at least one activity that every member can attend.

In contrast, the St. Louis CC chapter comprises primarily students in the chemical technology program. Because most students are on the same schedule, meetings can be scheduled around common classes. Lunchtime activities are particularly popular.

Flexibility should also extend to the activities themselves. When the Cincinnati State chapter participated in an all-day campus event, volunteer shifts were only 15 minutes long. The short shifts allowed members to set schedules that worked best for them, even if they could only participate for a few minutes between classes and other commitments.

### Make it worth the effort

Participating in extracurricular activities can become a real hassle, especially if members have limited transportation options or family commitments. So make

sure that meetings and activities are interesting and worthwhile. Sometimes professors give extra credit for participation in chapter activities. Mostly, though, chapters focus on what interests their members most.

A little organization can go a long way. Tracy Lynn, faculty advisor for the Anne Arundel CC chapter, tries to ensure that everyone attending a meeting leaves with a specific and manageable action item. She has found that when members know exactly what they need to do, they are more likely to follow through and do the tasks. For activities that require coordination among many people, such as scheduling volunteer shifts for the chapter's National Chemistry Week booth, officers create and share a grid with the names of all the volunteers and their assignments.

The Cincinnati State chapter uses a similar strategy, assigning its members highly focused tasks that can be completed in about an hour. Azariah reports that officers are looking into ways to minimize the amount of time spent in meetings and options for holding virtual meetings.

### Use social media

Good communication is essential. For example, the Anne Arundel CC chapter relies on a combination of mass e-mails, Facebook, on-campus bulletin boards, and classroom announcements to share information about activities. Activities are open to anyone who is interested, and membership is open to anyone participating in two or more activities (that's the flexibility mentioned earlier).

Likewise, the Los Angeles City College chapter uses Google Groups to keep in touch with members and schedule activities. Chapters also use



ISTOCK





LEFT: Cincinnati State chapter members Kinshasha (Kat) Azariah, Sharonda Hall, Triska R. Thomas, and Jeremy Sauerland converse at a recent meeting. CENTER: Cincinnati State chapter president Kinshasha (Kat) Azariah receives the Cincinnati Student Leadership Award from Wyatt Cotton. RIGHT: St. Louis CC outgoing chapter president Jordan Aach passes the gavel to the incoming president, Sandra Warner.

## ACS Network Student Chapters Toolkit

BY ACS STAFF

The ACS Network is the Society's social media platform. As a member of your ACS student chapter, you can use this resource to connect with your chapter and with other chemists, develop a profile, and collect friends. You log on to the Network with the same ACS ID and password you use to renew your dues or to access *C&EN* or other publications online.

### COMMUNICATING AND PROMOTING ACTIVITIES

Chapters can use the ACS Network to remind their members of an event or advertise a program by starting a discussion or posting an announcement. Organizers or officers can update their status and remind other users about upcoming events. You can choose to follow or track a group, person, or piece of content so that it appears on your activity stream, and also set your preferences to receive e-mails concerning content you're tracking.

A group can be set up for the entire chapter. This group can be used to host discussions among members, blog, and post documents to facilitate conversation among chapter members, especially before and after your meetings. You can use the Network to help your chapter decide as a group which events to sponsor by voting on ideas and events. And by using the events tool, you can invite members to participate in activities, and owners of a group can post pictures or share a video for all members to see.

### EXECUTIVE TOOLS FOR OFFICERS

The ACS Network also has some very powerful and easy-to-use tools that can support the work and duties of student chapter officers. Officers can form a private group to keep minutes, notes, and any other documents generated for and by chapter officers, and the group can become a permanent place to keep documents as chapter officers change. Meanwhile, the document and file upload tools provide more efficient ways for groups to write or review documents.

Interested in learning more? Access the Student Chapters Toolkit at [www.acs.org/student-network-kit](http://www.acs.org/student-network-kit).

## Checklist for Engaging Commuter and Off-Campus Students

- Hold activities at varied times.
- Ask if faculty are willing to offer course credit for participation.
- Have a communication system for those who cannot make meetings.
- Provide a variety of ways members can participate.
- Assign specific action items to members, even if they are small tasks.
- Engage members in planning activities.

other social media, such as the ACS Network, to keep members informed; in fact, the ACS Network recently released a Student Chapters Toolkit (see sidebar) for this purpose.

ACS student chapters can play a key role in keeping commuter and off-campus students engaged in chapter activities and help them to get the most out of their education. With a little flexibility, ingenuity, and communication, ACS student chapters — and *all* their members — can really take off.



Blake Aronson is a senior education associate in the ACS Education Division's Office of Two-Year Colleges.

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*Approximately 100 scholarships will be awarded.*

# Speed Networking 101: The Hows, Whys, Dos, and Don'ts

## Tips on Taking Part in a Fun, Valuable Event at the ACS Spring National Meeting

BY MARISA SANDERS

If you're a networking newbie, or just want to work on your networking skills in a fun and low-stress environment to improve your chances of success, ACS is offering a unique, free event for undergraduate students at the 245th ACS National Meeting in New Orleans, LA.

The Undergraduate Speed Networking with Chemistry Professionals event will be held on Monday, April 8, 2013, from 4:00–5:30 p.m. in the Ernest N. Morial Convention Center. It will offer a unique, highly efficient way to make connections with dozens of potential colleagues quickly and painlessly. At the same time, you'll get valuable practice in your networking skills, including active listening, making your elevator speech, and more.

At the event, you'll essentially have a series of brief conversations with one chemistry professional after another. These could include chemists from all job sectors — including academia, industry, government, and non-profits, as well as entrepreneurs, self-employed chemists, graduate students, and retired chemists.

The one common thread is that they are all there for the express purpose of meeting chemistry undergraduates like *you*!

### Networking: symbiosis in action!

Networking generally refers to the act of exchanging information, contacts, and experience for social or professional purposes. It's a symbiotic relationship, where you and your connection work to help one another, and both parties benefit.

You may be thinking: "Why would someone want to network with *me*? How can I be of any use? I'm merely a college student!" You'd be surprised. Your connection might be the chair of an ACS local section who needs students to volunteer at an upcoming science fair. Or your connection might like to meet one of the professors at your university, and needs an introduction. The possibilities are endless!

Remember that follow-up is vital in networking; it cultivates the relationship. So when the time allotted for your chat

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### SPEED NETWORKING "DOS"

The following is a list of networking tips that will help you at the Speed Networking event as well as other networking opportunities you may encounter. If you follow these steps, you will likely have a successful networking experience!

1. **Relax.** Networking is supposed to be an enjoyable activity — it's not like you're undergoing a root canal or being forced to become "BFFs" with your new connections!
2. **Smile and stand up straight** (maybe try practicing this in the mirror beforehand). You'd be surprised at how far a smile can go. It's also not a bad idea to chew a piece of gum or have a mint beforehand. Bad breath is often a turnoff for many. (Be sure to dispose of the gum or mint before you begin networking. Gum smacking and blowing bubbles will leave an impression — but not the one you want!)
3. When you meet a person, **shake his or her hand firmly** (but not too tightly!) and try to couple this action with good eye contact. A firm handshake and eye contact convey confidence and self-esteem.
4. **Exchange business cards.** Business cards contain all your essential contact information for maintaining your connection, so you don't want to be caught without one! If you run out or don't have any yet, write your name and e-mail address on slips of paper in advance. It's not the best, but it will do.

(If you RSVP for the Speed Networking event at [undergrad@acs.org](mailto:undergrad@acs.org) by March 29, 2013, you will receive free business cards, so this part should be easy.)

5. **Find out each person's name and occupation.**
6. **Give your elevator speech.** An elevator speech is basically a 30-second overview of your knowledge, skills, accomplishments, and goals. The expression is derived from the rough amount of time you might have to speak with someone during a brief elevator ride. It should be compelling and memorable.  
Naturally, you can engage in an actual conversation after your elevator speech — well, sort of. I'm sure you've noticed that in most conversations, people generally prefer to talk more than listen. Let the professional have the floor, but be sure to ask follow-up questions. These include queries like, "What do you like most about your career?" or "What's a typical day on the job?" You could ask about internship possibilities, how the person got started in their career, or whether they can offer any job-seeking advice or recommend career resources. You'll leave a nice lasting impression by asking thoughtful questions.
7. **Last but not least, try to jot down notes** on the back of the person's business card as they speak. This will make it easier for you to remember what the person shared if you have to follow up at a later point.

DO!





*My name is Malcolm Smith, and I'm currently a junior at Acme University, where I'm working toward a B.S. in chemistry with a focus in organometallics and food science. I've worked in two different labs: one focusing on nickel carbonyls and the other on pH's effect on top note flavors in potato chips. While I'd love to pursue either, I think my real passion lies in working in the flavor industry, preferably savory flavors and extracts.*

## SAMPLE ELEVATOR SPEECH

### Think You're Not Ready? Think Again!

If you're leery of the idea of networking in general, consider this: you probably do it already, almost every day. Whether you're updating your Facebook status, tweeting, or just reblogging photos on Tumblr, the moment you hit "enter," you're instantly sharing your ideas and creating a personal brand. In fact, although you may not realize it, you're probably a social networking guru!

Social networking is a great way to sustain friendships, but what if you long for more? Professional relationships? Connections? More friends who are chemists? (Hey, it can't hurt!) That's when old-fashioned, face-to-face networking comes into play... and it requires a lot of the strategies you use in social networking, plus a few tactics and techniques all its own.

The Undergraduate Speed Networking with Chemistry Professionals event gives you a fast and efficient way to grow your network... and learn mad skills in the process! This specialized form of networking happens in person, and it's just what it sounds like — a quick, fun, and focused way to meet new people, develop networking and interviewing skills, and gain insight into life after graduation. **irc**

has lapsed and it's time to embark on your next speed networking conversation, do not fret! When the event is over, go back through the contact information and notes you gathered for the people you met, add them on LinkedIn, and shoot them an e-mail thanking them for their time. Use those social networking skills for the greater good of your professional circle!

### SPEED NETWORKING DON'TS

It's probably also worth mentioning that there are a few don'ts of networking etiquette. Whatever you do, do NOT attempt the following:

1. **DO NOT ASK FOR A JOB.** This puts the other person in an uncomfortable position. Instead, ask if internships are available.
2. **Do not talk about business matters only.** Be creative and add personality to the conversation! Maybe find a common interest — books, movies, and sports are a great starting point. If the person responds favorably, talk more about it. If not, move on to a different subject. It's that simple.
3. **Do not mention politics, religion, or other controversial or personal issues.** You want to be remembered for the right reasons, so try to keep the conversation light.
4. **Do not simply hand out business cards or shake hands.** You want to connect with people and develop sound relationships, not simply "get your name out there." Think about it: would you rather friend hundreds of people on Facebook at random merely to increase your friend count, or link to a small fraction of close contacts with many of whom you actually interact? Networking is about *quality*, not quantity.
5. **Do not interrupt others' conversations.** It's impolite and you probably wouldn't want someone doing the same to you.
6. **Do not be shy.** "But I'm so awkward!" you may argue. Oh, please — we all are! Embrace it and be brave.

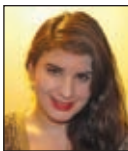
**DON'T!**

### Go forth and network

If you are planning to attend the upcoming ACS Spring National Meeting in New Orleans, take part in the Undergraduate Speed Networking with Chemistry Professionals event, which promises to be an exciting, valuable experience. But even if you can't attend, try to use the tips and strategies explained above in the more run-of-the-mill networking opportunities that you may encounter almost anywhere. These tips can help you obtain maximum results, make professional connections, and learn more about careers in chemistry in no time.

Remember, networking is partly about introducing yourself to others who may benefit from knowing you, and partly about meeting people who may be able to give you advice, recommendations, and additional resources — so it never hurts to keep your networking "radar" up at all times — you never know who might be a great new addition to your network!

Now, go and get 'em! **irc**



Marisa Sanders is a senior at The College of New Jersey (Ewing) and president of the ACS student chapter. She plans to attend graduate school in the fall to study solid state chemistry.

**FREE STUFF**

### RSVP FOR FREE BUSINESS CARDS

If you RSVP for this event by sending an e-mail to [undergrad@acs.org](mailto:undergrad@acs.org) by March 29, 2013, you'll receive a free set of business cards to use at the event.

## PROFILES IN CHEMISTRY

# Paul Andrusyszyn

## *Product Development Chemist*

BY LISA M. BALBES

**P**aul Andrusyszyn loves to get his hands dirty. As a product development chemist, he has spent the past four years creating new products for DuPont. On any given day, he might create something completely new to meet a specific customer's need, or investigate interesting chemistry to create a product that fills a more general market niche. Many of his products are used in cosmetics manufacturing, or are turned into yarns or fabrics to be sold directly to consumers. As a result, he needs to understand the needs of both markets. He also monitors new products and services being introduced by DuPont's competitors, and evaluates whether his company should be working to compete against those products.

No matter how a project starts, Andrusyszyn's challenge is to combine materials and formulate a product that his company can sell. He works with biotechnology-based and biomaterial polymers, making products that will replace traditional petrochemical-based products. Their source material may make them more sustainable, he observes, but adds that "just because a product is bio you can't skip on performance; new products must meet or exceed the same standards as existing products." For example, he is currently working with the sugar fermentation product 1,3-propanediol, for use as a starting material in industrial applications.

### Developing an interest

Andrusyszyn first got interested in chemistry during his high school AP chemistry class. Instead of just watching demos, for the first time he got to work in a real lab and get his hands on the equipment. He was really hooked when, during a lab, he asked his teacher to help because a sample was taking a very long time to filter through a Büchner funnel. "Hands-on" took on a whole new meaning when the teacher put his hand over the funnel, and all the liquid disappeared in a few seconds.

During his undergraduate career, Andrusyszyn taught labs. "I loved teaching labs, because the students were learning that doing something yourself is very different from the picture-perfect way that it appears in the textbook."

Andrusyszyn also conducted undergraduate research in synthetic chemistry and learned how to use the depart-

AGE: 35

JOB TITLE: Product Development Chemist

EMPLOYER: DuPont

LOCATION: Wilmington, DE

UNDERGRADUATE DEGREE: Siena College,  
Loudonville, NY

MASTER'S DEGREE: Boston College, MA



ment's brand-new NMR. He studied phosphorous NMR and, true to his preference for hands-on involvement, he learned how to take the probe out, retune the instrument, and then put the probe back. He strongly recommends lab study while in college. "An internship with the university or an outside company lets you do things instead of watching others, and the only way to find out if you really like anything is to do it yourself." His advice to current undergraduate chemistry majors is to try to do an internship, or be a teaching assistant. "Nothing helps you learn more about a subject than teaching it to someone else."

### First job

In his first job after college, Andrusyszyn worked as a process development chemist at Cyclics Corporation, where he helped design and build a plant to make a new product. He was



PHOTOS: KERRY HARRISON, DUPONT C&E

**Andrusyszyn on the job:**  
**TOP:** Operating a carpet tufter, an industrial “sewing machine” that makes samples of carpet for testing.  
**LEFT:** Standing behind a creel of fibers that are fed into a sewing machine.  
**RIGHT:** Turning the crank of the card winder used to create smaller samples of fiber.

involved in the entire process, from research lab to industrial environment — turning chemistry into concrete and steel. “My company purchased a technology from another company. In order to scale it up to production levels, we had to look at reaction rates, kinetics, and thermodynamics, and work with the engineers. In a plant you want a continuous-flow system, not the multiple pots you have in the lab, and you can’t have five chromatographs. Even the way materials are stirred can have an effect, and many things change when you move to larger scales.” Process chemists learn what affects the process, then use that knowledge to maximize efficiency in the plant. “How fast a reaction filters becomes important, as well as getting impurity levels down below a certain level.” While the job was a challenge for Andrusyszyn, it also gave him a very good sense of what does and doesn’t work when scaling up a synthesis.

## Time for a change

After about five years, one of his college friends called asking if he knew a chemist who might want a job in product development. He was ready to move back to the lab, so he applied and got the job.

Andrusyszyn’s work now involves polymer synthesis — making new structures by changing or removing functional groups, and removing water to drive the reaction forward. “There is no limit to what you can get involved in,” he notes, adding that there’s lots of on-the-job learning. “I had no experience with fibers before coming here, and had to learn how to set up and use machines that measure tensile strength, thickness, uniformity, and other properties of polymers.” The machines are all specialized, but he uses his general knowledge to make inferences, and calls experts when necessary.

## Product development chemist

Most of Andrusyszyn’s time now is spent in the lab, producing formulations — a process that involves mixing compounds together to obtain a stable polymeric product with particular properties. There may be a chemical reaction between the components, hydrogen bonding, micelle formation, emulsification, or a host of other interactions. Whether these interactions are desired depends on the final

application of the product. Micelles, for example, are often desired for cosmetics, but not in other types of products.

“I do the experimental development, and then the final analysis is done by someone else. I try to time things so I can send out several different formulations simultaneously, and they can all be tested together. When the results come back, I talk to the analysts, and sometimes the potential customer, to determine if we met the expectations. A significant amount of my work now is shepherding the process through all the steps, and not just doing the science — which is a responsibility that I did not expect.”

Another thing that surprised Andrusyszyn is that sometimes chemistry is not about the science. “Five or six different projects may all have scientific merit, but the one that is chosen for further development may depend on other factors, including market forces, timing, and sometimes just plain luck. You have



to try not to take it personally when your project is not chosen, and be ready to jump into the next project with wild enthusiasm.”

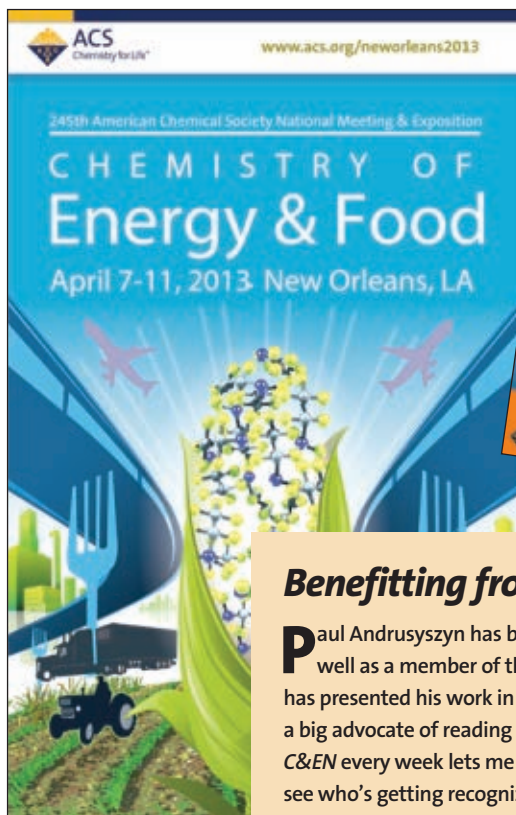
In a typical week, Andrusyszyn works with Schlenk lines, vacuum pumps, funnels, filters, pressurized filtration devices, and so on. “Today, there is more of a computer element to everything, which is both good and bad. You get more reliable results, but you don’t see what’s going on — it’s more of a black box. That makes it even more important to really understand what’s happening in the middle, to know if the answers that you receive are reasonable.” For example, when you’re starting on a brand-new test method, you need to work with it to learn what types of results are reasonable to expect.

Since much of what he works on involves trade secrets, it is difficult for Andrusyszyn to publish papers on his work. However, he communicates his research results in other ways. He has five patents, and recently attended Tech-Con, an annual conference that consists of talks by DuPont employees. Since everyone there is internal to the company, there’s not as much concern about proprietary information as there would be at a public meeting. “The fascinating thing was how everyone talked about how they’d tried 100 variations on a theme before the 101st one finally worked. That’s what they don’t tell you in school: how many trials it can take to get something to actually work.”

## Communication and collaboration

Open communication is important, and so is knowing when to use e-mail, teleconference, or video chats for the most effective information transmission in light of security concerns. Video is a better way to interact than telephone, since it allows you to see the other person’s responses and gestures, and you can better judge their reaction. However, some communication channels can’t be used if you’re going to discuss topics that require extra security or encryption.

Communicating and collaborating is important, and doing so with colleagues in other countries can be especially complicated — “Time zones are a big issue, and time to talk is precious.” DuPont is currently trying to develop products and applications locally, by having local experts start the development, then bring in people from a central research group to help them later in the process, allowing for localization of problem-solving. If the product is developed locally, the people working on it are more in touch with market expectations. For example, people in different locations and climates expect fabrics with very different properties.



## Benefitting from ACS Membership

**P**aul Andrusyszyn has been an ACS member for six years as well as a member of the ACS Polymer Chemistry Division. He has presented his work in poster form at several meetings, and is a big advocate of reading *Chemical & Engineering News*. “Reading *C&EN* every week lets me keep in touch with other companies, see who’s getting recognized, and get short glimpses into other fields of chemistry.” That, along with the people he meets at ACS meetings, helps prepare him for the next step of his career — whatever the next challenge he can get his hands on. **irc**

## Six Sigma Black Belt certification

Andrusyszyn has found that at DuPont, “you really need at least a bachelor’s degree to get in the door. The more advanced degree you have, the more opportunities are open to you.” He has advanced his education by earning a Six Sigma Black Belt certification, which he recommends. All new employees go through Six Sigma Green Belt training, which teaches basic statistics, project development, scientific analysis, and techniques for talking with customers about their needs and wants. Black Belt continues that training, leading into managing one’s own projects. “I really liked learning about conducting statistical analysis, and how to make the most reproducible, highest quality product possible. It’s moving past the research and development phase, and into production. The allowable variances become much smaller.”

Andrusyszyn actually has two other black belts, in tae kwon do and shotokan. He enjoys being a martial artist and instructor — jumping, kicking, punching — and says it “is part discipline, and part exercise.” He is also an amateur astronomer. **irc**



**Lisa M. Balbes**, of Balbes Consultants LLC, is a technical writer/editor and author of *Nontraditional Careers for Chemists: New Formulas for Chemistry Careers*, published by Oxford University Press.

# Throwdown in the Great Northwest!

## *How We Engaged Students with a Little Friendly Competition between Science Departments*

BY ANGELA HOFFMAN AND CELIA GENDRON-HERNDON

**A**t the University of Portland (OR), there has been a long-running, though friendly, rivalry between the biology and chemistry departments. In fall 2011, our ACS student chapter officers decided to stir things up a bit by challenging the biology department to a series of competitions, or as we call them, “throwdowns.”

Our first throwdown between departments was a soccer match. Interest and excitement for the event began to grow as we received official approval to use the turf soccer field on cam-

pus and then thereafter, when a faculty member from the physics department agreed to referee the game.

The soccer match lasted two hours and, although the biology club won, 2–1, the event was a smashing success! More than 100 students and faculty members attended.

With the chemistry department’s throwdown record at 0–1, we needed to even the score. The challenge was to create a winter match-up that would be as popular as the fall soccer match. But the Portland climate created a new wrinkle for us: it would



The chemistry department, in dark shirts, has command of the ball in the soccer throwdown. In the end, the biology department, in light shirts, triumphed, winning the game 3–1.

PHOTO: KEVIN KADOKA



be too cold to have an outdoor throwdown. Whatever we did had to be indoors.

Ultimately, for the winter throwdown, we devised a series of “Minute to Win It” competitions that would answer such critical questions as who could balance a cookie on their nose the longest, or empty a box of tissues the fastest. The activities were made all the more enjoyable with music and free pizza. Members

from both departments attended, and this time, the chemistry department was victorious! Although attendance was not as high as it was for the soccer match, the event was still very successful and our record had improved to 1–1.

The spring 2012 throwdown featured a dodgeball game that took place on campus in the gymnasium. This event was also well attended — but alas, the biology club again won by a score of 2–1, and our record for the academic year was 1–2.

Building on the popularity of last year’s competitions, the 2012–2013 throwdowns have included a new chili cook-off and a soccer rematch, which the biology department won 3–1. We’ve even had a number of chapter alumni who have returned to campus to cheer on the chemistry department. Students are in the midst of planning more competitions for the spring.

The throwdowns have been great fun to organize and the competitions are interesting and engaging to students and faculty. These events have helped to build community within our chapter, promote cooperation between our clubs, and increase camaraderie between our departments. **irc**



PHOTO: KEVIN KADDOGA



**Angela Hoffman, O.S.B.**, is professor of chemistry at the University of Portland, OR, and faculty advisor of the ACS student chapter.

**Celia Gendron-Herndon** is a chemistry major at the University of Portland and is the 2012–2013 president of the University of Portland ACS student chapter.



PHOTO: ANGELA HOFFMAN

TOP: The chemistry department cheering section roots for a win against the biology department.

BOTTOM: The fall 2012 chemistry department soccer team poses for a team photo.



# SPOTLIGHT

## The University of Georgia Athens, GA

COMPILED BY CHRIS ZEIGLER



The University of Georgia®

**Chapter president:** Alexandra Dodd    **Number of chapter members:** ~40    **Number of ACS student members:** ~20  
**Website:** <http://tinyurl.com/UGA-SAACS>    **Institution description:** Large, public, rural, minority-serving, 4-year

**Q: Do you have any unique positions?**

**A:** We have a Kids & Chemistry chair who is in charge of our elementary/middle school outreach. He/she is the face of the chapter in the primary schools in our area. We also have a robust chemistry magic show that has grown increasingly popular over the last few years.

**Q: In what ways does your chapter give back to the community?**

**A:** Our chapter is very involved in local science fairs and participates in a number of events geared toward getting young students excited about science in general and chemistry in particular. We are famous for our Halloween "slime" events held at the State Botanical Garden of Georgia in Athens each October.

**Q: What is your most successful recruiting event/method?**

**A:** Each semester we have a faculty member from the food science department give a lecture on chocolate. He brings a wide assortment of culinary aids (chocolates!) with him as a means of drawing the audience into the lecture. It is our largest and most popular event. A large portion of our new members join during/after the lecture.

**Q: How do you retain members from year to year?**

**A:** We remain active at all times of the year, and make it a point to encourage everyone to contribute and suggest new ideas for maintaining/growing the chapter. When everyone has a vested interest in the chapter, it stays fun and vital.

**Q: What types of activities do you sponsor?**

**A:** In the fall we organized a 5K fun run. We also sponsor events like our annual "Pie Your Professor" fundraiser.

**Q: How involved is your chapter on campus? How do you attract students to activities?**

**A:** We recently co-hosted an international coffee hour with the Thai student organization. Our two organizations provided coffee and food for several hundred attendees. This event is held each Friday and is free for all students. It gave us great exposure to the rest of campus and even garnered a few new members.

**Q: What is your most effective communication tool for promoting chapter activities?**

**A:** Our chapter has its own Facebook page, where we post all of our major announcements and activities. It was something new that we implemented this year, and so far our members have made nothing but positive comments about the page.

**Q: What is your most successful fundraiser to date?**

**A:** Our ACS Study Guide sale. Last fall, we raised approximately \$1,500 by selling study guides to both the general chemistry and organic chemistry students. It was a huge boost for our group. **inc**



The University of Georgia chapter is well known in the greater community for its elementary/middle school outreach program.

**Faculty advisor:**

Richard Hubbard, 5 years

**Q: Why/how did you become a faculty advisor?**

**Hubbard:** I was looking for a good way to get involved with the students/community outside of my normal classroom responsibilities. The previous advisor, James Anderson, was in the process of retiring, and I asked if he would like to pass the position on to me. He agreed, and the following semester I became the advisor.

**Q: What challenges have you faced in your position?**

**Hubbard:** Fundraising, for starters. It costs a lot of money to keep the group running (food/drinks for meetings and Kids & Chemistry supplies). Our fundraising efforts have been very successful, but they take a lot of time and coordination to accomplish. We have had numerous successful "Pie Your Professor" events, as well as an ACS Study Guide sale. Membership is also an ongoing issue. We actively recruit year-round so that we have a constant supply of new students. The recruiting process is exhausting, but very rewarding.

**Q: What has been the most rewarding aspect of your service as a faculty advisor?**

**Hubbard:** I have enjoyed individual interactions with a great group of students, who are all poised to move on to exciting careers. The students keep me coming back for more each year. Their excitement is contagious.

**Q: What advice can you offer those new to the advisor position?**

**Hubbard:** Stay active, be organized, and keep meticulous records. Our main strength has been the ability to plan semesters ahead for our panels and speakers, so that everyone knows what is happening and when. **inc**

# SPOTLIGHT

## Los Angeles City College

Los Angeles, CA

COMPILED BY CHRIS ZEIGLER



**Chapter president:** Ikenna Onyia    **Number of chapter members:** 8    **Number of ACS student members:** 6  
**Website:** <http://tinyurl.com/LACCchemclub>    **Institution description:** Small, public, urban, minority-serving, 2-year

**Q: How do you ensure a smooth officer transition from year to year?**

**A:** At the end of each semester the chapter sponsors a pizza/finals party. We invite all chapter members and hold elections. We have several officer positions for less experienced members, allowing them to gain experience so they can be "promoted" the next year.

**Q: How did you celebrate National Chemistry Week? Chemists Celebrate Earth Day?**

**A:** Our chapter has celebrated NCW every year since 2001 by presenting a student demonstration show. This year the chapter presented its first outdoor show in the main quad. We presented messy, environmentally safe demonstrations like a Mentos/Diet Coke car race, followed by elephant's toothpaste and exploding pumpkins. The Earth Day event, which also will be held in the main quad, will focus on informing and educating the public about the reality (and legality) of organically grown foods. We also will have a reuse activity, where we reuse old vinyl records and ties and make scented bath fizz.

**Q: What are some interesting ways your chapter recruits/retains members?**

**A:** We participate in nearly every campus activity and conduct a different and noticeable demonstration, and in the process, the word about our chapter gets around. The chapter also creates and distributes posters and flyers around campus informing the general population about our activities. We are very demonstration-oriented — but luckily, most members enjoy practicing demonstrations. Moreover, due to budget cuts, most tutoring offered by the school has been cut, so the chemistry chapter offers help during chapter business meetings.

**Q: Do you collaborate with other clubs on campus on activities?**

**A:** Our chapter participates in many activities of the Associated Student Organization, particularly Career Day and Earth Day. The latter event is usually held in the main quad, and we join with other clubs to create a large circle of tables, and then present demonstrations and posters to the public. Off to the side, we usually have musical entertainment.

**Q: What are your chapter's most popular activities?**

**A:** Our chapter is into outdoor activities! LACC is an inner-city college, and many students do not get to spend time at the beaches or mountains due to cost or distance. Our chapter tries to go on one field trip a semester using funds collected during our fundraisers. Last fall, we took a bike ride from LACC to San Diego, camping along the way. Six chapter members on bikes participated, along with two in the "follow car." This last spring, we went camping in Malibu over

the weekend, sponsored a beach clean-up, and surfed. Finally, in mid-semester members took a one-day hike up Dawn Mountain in Pasadena. Participants either brought the ACS banner with them and displayed it, or wore chemistry T-shirts so passersby would ask questions. **irc**

**Faculty advisor:**

Terry Boan, 11 years

**Q: Why/how did you become a faculty advisor?**

**Boan:** I wanted to show the fun side of chemistry, which is a lot of work, but the rewards are tremendous.

**Q: What challenges have you faced in your position?**

**Boan:** Convincing students that participating in school-related clubs is beneficial and rewarding. Community college students in particular want to spend very little time on campus; they usually are taking classes at several campuses and thus they do not get to experience the sense of community or belonging that students at a single university typically do.

**Q: What has been the most rewarding aspect of your service as a faculty advisor?**

**Boan:** The sense of accomplishment I feel when a former student returns to campus to inform me of his/her success. I believe my role as an advisor is to encourage and prepare students for careers and/or develop a passion for the sciences (especially chemistry). If I can make the students see that it is more enjoyable if one has a deeper understanding of the phenomenon, and that all the hard work they put into their studies will benefit them in the end, then I know it is all worth it. **irc**



The LACC chapter enjoys doing outdoor activities and plans one field trip each semester using money collected from chapter fundraisers.

PHOTO COURTESY OF LOS ANGELES CITY COLLEGE

# SPOTLIGHT

## Northeastern University

### Boston, MA

COMPILED BY CHRIS ZEIGLER



**Chapter president:** Christine Dunne    **Number of chapter members:** 60    **Number of ACS student members:** 35  
**Institution description:** Large, private, urban, 4-year

**Q: Do you have any unique positions?**

**A:** A position that we added last year is that of historian. This position was a beneficial addition to our executive board, because it resulted in better organization of our digital documentation.

**Q: What are your most popular or unique chapter activities?**

**A:** Our chapter enjoys site tours of labs or pharmaceutical companies in the greater Boston area, which is home to multiple chemistry R&D sites. Some of our past site tours include the facilities of the MIT Nuclear Reactor Laboratory, Amgen, and Warner Babcock.

**Q: Do you collaborate with other clubs on campus on activities?**

**A:** We participate in student welcome nights that incorporate majors from both the science and engineering departments. Our on-campus activities (specifically our liquid nitrogen ice cream social and Earth Day flower planting) are open to all students from a variety of clubs. In the future, we are hoping to advertise speakers and activities with other organizations more widely throughout the university.

**Q: Is your chapter active in recruiting prospective students to your university?**

**A:** Our chapter is extremely involved in recruiting prospective students. Members of our chapter attend all of the Welcome Days, Orientation, and Welcome Week activities centered around the chemistry program. Our

members also volunteer to be mentors to the incoming students, which helps engage the students while providing them with an upperclassman who can assist them with their transition to the university lifestyle.

**Q: What is your most successful recruiting event/method?**

**A:** The mentor program is our most successful recruiting method. That said, our liquid nitrogen ice cream social (held at the beginning of the year) helps engage the students, too!

**Q: What are some interesting ways your chapter recruits/retains members?**

**A:** We engage the students by holding monthly events, which include apple picking, sports events, snow tubing, and amusement park trips. Attendance at these events is optional, but provides good bonding experiences for students who participate.

**Q: In what ways does your chapter give back to the community?**

**A:** We volunteer at a soup kitchen in downtown Boston, an activity held once a week at a local church. A more unusual activity involved compiling "molecular Lego" sets for public schools in the Boston area. We also participated as judges in a local science fair.



Monthly social events offered by the Northeastern University chapter provide excellent opportunities for members to bond.

**Q: What is your most effective communication tool for promoting chapter activities?**

**A:** E-mail is our go-to communication tool; we send one out each week to members, highlighting upcoming activities and important dates.

**Faculty advisor:**

Kathleen Cameron, ~1 year

**Q: What challenges have you faced in your position?**

**Cameron:** My challenges are unique. I have a number of roles in the department: co-op coordinator, academic advisor, persistence officer, coordinator of the peer tutor program, and faculty evaluator. As a result, I find it difficult to dedicate the time I would like to participating in our weekly meetings.

**Q: What has been the most rewarding aspect of your service as a faculty advisor?**

**Cameron:** Getting to know the students on the executive board and in the group. The executive board is made up of a group of exceptional students who plan innovative meetings, bring in dynamic speakers, and plan events all over the state. They are hardworking and friendly, and it has been a pleasure to work with them and get to know them. I also enjoy spending time with the students at events (apple picking, snow tubing, etc.) outside of the academic environment.

**Q: What advice can you offer those new to the advisor position?**

**Cameron:** Attend as much as possible! The students are planning terrific events that can be beneficial to faculty and staff too! It's also wonderful to get to know the students you work with in a relaxed atmosphere.



# SPOTLIGHT

## University of Central Arkansas

### Conway, AR

COMPILED BY CHRIS ZEIGLER



**Chapter president:** Venusa Phomakay    **Number of chapter members:** 30    **Number of ACS student members:** 20  
**Website:** [www.facebook.com/groups/100476723414743/](http://www.facebook.com/groups/100476723414743/)    **Institution description:** Large, public, suburban, 4-year

#### Q: How do you ensure a smooth officer transition from year to year?

**A:** After the coming year's officers are elected, the old officers meet with the new ones to discuss what is expected of them. This isn't as cut-and-dried as it sounds, though! We have a themed potluck each year for this special event. Each officer uses a binder to keep track of all of the information for which they are responsible. We pass these binders on to the next officers in a playfully ceremonial fashion, thus inaugurating the new officers.

#### Q: In what ways does your chapter give back to the community?

**A:** One of our chapter's biggest goals is to teach kids about science and spark their interest in it. We demonstrate chemical phenomena to children at local elementary schools and community festivals, where kids can be seen everywhere! In addition, we volunteer in ways that focus less on science and more on just helping people in our community. For example, we participated in the Salvation Army's Angel Tree Distribution Day, in which Christmas gifts are handed out to families who cannot afford them.

#### Q: What are some interesting ways your chapter recruits/retains members?

**A:** Every year the university hosts a fair, where clubs on campus recruit members and encourage student involvement. We distinguish ourselves from others by setting up interactive demonstrations that

draw in potential members. Also, after every meeting we raffle off prizes or host a demonstration in which members can participate. One of our favorite demonstrations is blowing up a hydrogen balloon!

#### Q: What is your most popular or unique chapter activity?

**A:** Our chapter participates in Science Nights at local schools, where our members get the chance to reach out to kids and show them the wonders of chemistry!

#### Q: Do you collaborate with other clubs on campus on activities?

**A:** We collaborate with the physics club on a few activities in order to promote interaction among the sciences. We also often join them for outdoor social events such as hiking trips and picnics.

#### Q: What is your most effective communication tool for promoting chapter activities?


**A:** We maintain a regular schedule by meeting twice a month. At the meetings, we share information and reminders with our members about upcoming activities, such as research seminars, social outings like bowling or hiking, and service opportunities. In addition, we have an activities calendar bulletin board in our chemistry building to remind students of chapter activities.

#### Q: What is your most successful fundraiser to date?

**A:** We worked with the local Chick-fil-A manager to host a fundraiser at their establishment. By producing eye-catching flyers and having our professors announce the event in class, we achieved a high turnout. We received a percentage of indoor sales from the night, and also had donation jars that were filled to the brim by the end of the night.

#### Q: If your chapter has recently attended an ACS regional, national, or local section meeting, how did members benefit?

**A:** Our chapter sent 17 students to the ACS national meeting in San Diego, CA. Our

members had the opportunity to present research to fellow scientists from across the country. Attending the meeting was an eye-opening experience, because being surrounded by all of these people who were passionate about chemistry helped us view our academic field on a national level, which is something difficult for us to imagine at our relatively small university. 

#### Faculty advisors:

Faith Yarberry, 6 years  
 Karen Steelman, 2 years  
 Kristin Dooley, 1 year

#### Q: What challenges have you faced in your position?

**A:** Keeping up with chapter activities is a full-time job, so we share the responsibility and fun! One of us helps with outreach and demonstration activities, the second organizes student travel to national meetings, and the third assists with on-campus meetings and social events. When one of us cannot attend an event or answer student questions, another of us can fill in. We work as a team, so that no one individual feels overwhelmed.

#### Q: What has been the most rewarding aspect of your service as faculty advisors?

**A:** Seeing our chapter go from being completely inactive six years ago to participating in at least one event every week — whether it's a service, research, or social activity. We all got a little teary-eyed when the students showed a slide show of our chapter's members and activities at the end of the year. What great experiences they've had!

#### Q: What advice can you offer those new to the advisor position?


**A:** Get others in your department to help you! Teamwork works! 



PHOTO COURTESY OF UNIVERSITY OF CENTRAL ARKANSAS

To promote interaction between the sciences, the University of Central Arkansas chapter plans social events with the physics club.

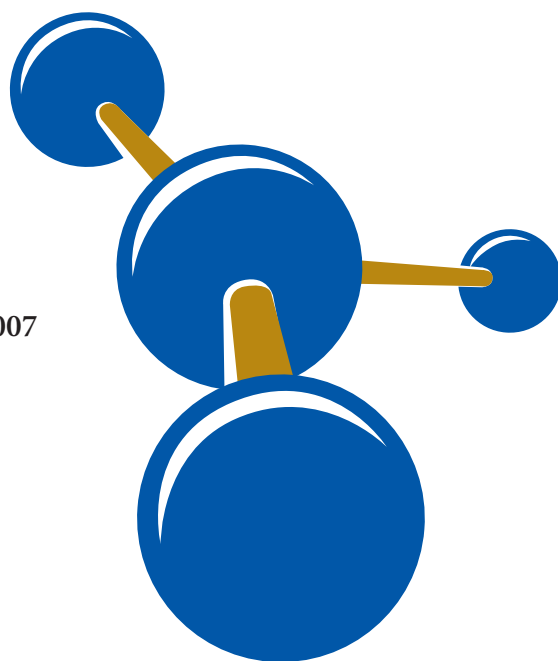
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