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April/May 2010

# in *Chemistry*

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### Science Elements Podcasts

Spread the word to your friends and throughout your outreach community! Now everyone can listen to the latest episodes of "Science Elements" on their web browsers. These podcasts are fun and interesting to scientists and nonscientists alike and make cutting-edge scientific discoveries from ACS journals available to a broader public audience.

[www.acs.org/scienceelements](http://www.acs.org/scienceelements)

### Web Guide to Research for Undergraduates (WebGURU)

WebGURU is an interactive web-based tool developed by Northeastern University to assist undergraduates through the hurdles of undergraduate research experiences. The site includes a wealth of information on the technical aspects of undergraduate research, a discussion board, case studies, scholarships and fellowships that support undergraduate research, and tips on presenting your research at scientific conferences.

[www.webguru.neu.edu](http://www.webguru.neu.edu)

## Interesting Articles

### Academia or Industry? Finding the Right Fit

Elisabeth Pain provides valuable advice on choosing a career. There is no such thing as research in academia and research in industry, and first-time job seekers should view the employment marketplace as an array of specific opportunities, each with its own characteristics. *Science*, May 22, 2009.

[http://sciencecareers.sciencemag.org/career\\_magazine/previous\\_issues/articles/2009\\_05\\_22/caredit.a0900066](http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2009_05_22/caredit.a0900066)

### Transferable Skill Sets for Job Seekers

Marketable job skills can be broken down into five basic categories – skill sets – that job seekers can use in their resumes to show applicable skills from one job/career to the next.

[www.quintcareers.com/cover\\_letter\\_transferable\\_skills.html](http://www.quintcareers.com/cover_letter_transferable_skills.html)

### Profiles in Science: Marshall W. Nirenberg

The National Library of Science provides a fascinating account of Marshall W. Nirenberg. This biographical sketch includes information about his professional, personal, and political life as well as his synthetic RNA and Poly-U experiments, his work on translating the genetic code, and more.

<http://profiles.nlm.nih.gov/JJ/>

## Behind Every Successful Student Chapter... Is a Dedicated and Enthusiastic Faculty Advisor!

BY GEORGE H. FISHER



COURTESY OF GEORGE H. FISHER

**F**aculty advisors are important to the success of ACS student chapters. Their guidance in cultivating chapter members into future leaders and chemists impacts not only students, but also the school and the greater chemistry community.

To work well with chapter officers, a great faculty advisor needs patience, perseverance, interpersonal skills, and the ability to mentor and guide (but not dictate). The faculty advisor is there to provide suggestions, continuity, and memory as the student leadership changes from year to year. The advisor coordinates activities and handles logistics for programs. However, it's vital that advisors let members take ownership of the student chapter. While advisors may encourage chapter members to seek their help and advice, it's important that students have the opportunity to make the decisions. Advisors can help students keep on track and meet deadlines, but effective advisors don't hesitate to let students learn from their mistakes. It's the students' chapter, and if they pay attention to their advisors, they'll learn and grow.

Two of the greatest challenges facing a faculty advisor are how to foster involvement among the members who are not officers and how to encourage the officers to delegate responsibility. It makes the role of the faculty advisor easier each time a student finds a niche in the organization and flourishes in it.

Advisors also help to teach students about the importance of being professional and having a positive attitude. Having a clear sense of professional ethics and being skilled in leadership, soliciting and managing chapter funds, and other areas will serve students not only as chemistry majors but also in life. Many chapter advisors also encourage and help students to attend local, regional, and national ACS meetings to present chapter activities and research posters and to interact with students and professional chemists. Such experiences can change their whole perspective on the chemistry profession.

The faculty advisor is a liaison between the student chapter and the wider chemistry community, including local industry and schools (other universities, as well as elementary, middle, and high schools), the ACS local section, and national ACS. The advisor tries to provide opportunities for students to interact with practicing chemists and learn what their future careers can offer. It's exciting for advisors to help foster a sense of community among students and encourage them to become leaders. One of the most rewarding aspects of being a faculty advisor is seeing students succeed and mature professionally. **ic**

GEORGE H. FISHER is a professor of chemistry and faculty advisor of the ACS student chapter at Barry University.



*Share what's going on in your chapter! If your chapter would like to be featured in the ACS Student Chapter Spotlight, please contact Audley Burke at 800-227-5558, ext. 4565, or a\_burke@acs.org.*

COMPILED BY AUDLEY S.V. BURKE

## Seton Hill University Greensburg, PA

**Chapter president:** Michael Washington

**Chapter members:** 18

**ACS student members:** 10

**Institution environment/ composition:** Small, private, suburban, 4-year institution

### Q What is your most successful fund-raiser to date?

**A** We have raised significant funds through our annual Christmas and Easter candy sales to assist with activity expenses and travel expenses to ACS meetings. We've been fortunate to work with a well-known regional candy company, Sarris Candy, that is well organized and successful in offering fund-raising opportunities.

### Q Do you have any unique positions?

**A** We have a historian, who maintains a chapter binder containing all the materials needed for the annual chapter report and who is also responsible for organizing and arranging photographic records of chapter events.

### Q How did you celebrate National Chemistry Week (NCW) and Chemists Celebrate Earth Day (CCED)?

**A** Our chapter sponsors an activity table at the NCW celebration held at the Carnegie Science Center in Pittsburgh, organized by the Pittsburgh ACS local section. We also participate in the Adopt-a-Highway cleanup, and host Mole Day games in the student dining hall. Our chapter celebrates CCED by hosting an outreach activity on campus with middle school students.



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

**A** The Adopt-a-Highway project is one example. We clean a 2.5-mile section of highway along a local city park. Also, our chapter sponsors an annual major outreach activity with inner-city middle school students entitled, "Middle School Students Go to College for a Day for Hands-On Science." This activity is funded by a grant from the Society for Analytical Chemists of Pittsburgh.

### Q What are some interesting ways your chapter recruits and retains its members?

**A** We recruit members during the annual Club Fair sponsored by the College Student Government Association. Also, chapter officers visit the general chemistry classes to speak to students who may be interested in joining our chapter. We retain members by personal encouragement from the faculty advisor and bimonthly enrichment and social activities hosted by the chapter.



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

**A** We post flyers on the chapter bulletin board and at key locations on campus. We also use e-mailing, texting, and Facebook. Chemistry faculty members and staff help promote our activities by making announcements in classes.

**Faculty Advisor**  
**Susan Yochum, 15 years**

### Q Why/How did you become a faculty advisor?

**A** Fifteen years ago, our school was a college for women and I thought it was important to have a female chemist as the advisor and role model. Although Seton Hill has been coed since 2002, promoting women in science remains an important part of our mission. I always welcome the opportunity to work with the students in this formative extracurricular activity.

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

**A** During the past few years, students' lives have become so busy that scheduling time to meet with officers and getting enough students to participate in activities has been challenging. It's also more difficult to attend all of the chapter activities.

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

**A** Have a co-advisor. Then there are two people available to meet with students, attend and assist with activities, and give encouragement and affirmation. The chapter should have a mission statement, job descriptions for officers, and committees with clearly defined tasks and goals. Advisors should schedule standing meetings with the chapter president and officers and provide an environment where the students can generate and implement their ideas. Encourage chemistry as well as social activities. Outreach activities with school children and groups, such as the Girl Scouts, help members develop a sense of service and help them see the importance of chemistry outside of the classroom. Student participation in ACS and other professional scientific meetings is extremely important.

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## Spelman College Atlanta, GA

**Chapter presidents:** Tamara Wilson and Rebekah Flowers

**Chapter members:** 40

**ACS student members:** 26

**Institution environment/**

**composition:** Small, private, urban, minority serving, 4-year, women's institution

### Q What is your most popular chapter activity?

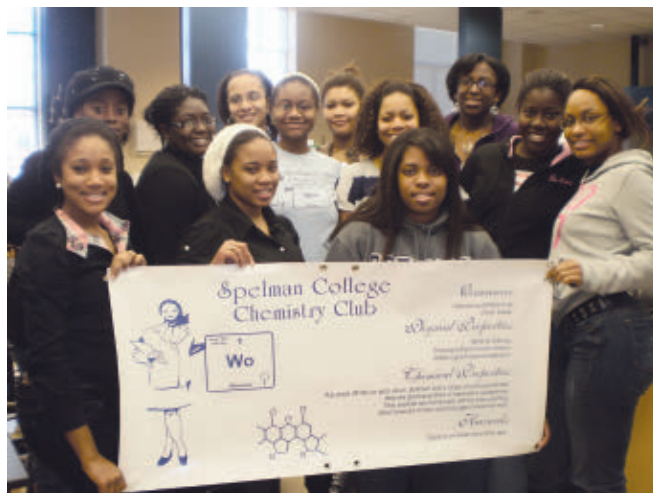
**A** Annually, our ACS student chapter works with the local Atlanta chapter of NOBCCHE (National Organization for the Professional Advancement of Black Chemists and Chemical Engineers) to host Super Science Saturday. This event is designed to inspire and spark the interest of young students in science by demonstrating various chemical reactions. Over 300 elementary and middle school students participate in this event.

### Q How did you celebrate National Chemistry Week?

**A** For NCW, we hosted events every day of the week, including a Breast Cancer Awareness booth, where we passed out pink ribbons and breast health pamphlets. We also made presentations in general chemistry lectures, performed chemistry demonstrations for elementary school students, and made Mole Day door decorations.

### Q What are some of the interesting ways your chapter recruits and retains its members?

**A** We host a booth at the Student Organization Fair during Freshman



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Week to recruit new students. Also, last semester we had our first chemistry club induction ceremony. It was a full program with students taking oaths and receiving certificates. We believe that by participating in this ceremony, members will take more of an interest in participating in club activities and staying active.

### Q What local ACS student chapters have you collaborated with?

**A** Our chapter works closely with the Morehouse College ACS student chapter. We participate in the Atlanta AIDS Walk as a team and co-host movie and bowling nights. We also select a "Mr. Chemistry" — from Morehouse — who participates in our college's Homecoming Pageant and Ball.

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



**A** Our ACS student chapter holds elections prior to the start of the next academic year. We hold our elections during our last general meeting of the spring semester.

### Faculty Advisor

**Kimberly M. Jackson,**

3 years

### Q Why/How did you become a faculty advisor?

**A** Becoming the faculty advisor was an obvious natural progression for me, since I believe that one of my missions in life is to empower women of color to do "dynamic science." I also believe that our ACS student chapter is an important organization on campus, serving as a voice for students interested in the chemical and biochemical sciences.

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

**A** The greatest challenge for me is finding funds to provide more students with the opportunity to attend regional and national ACS meetings.

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

**A** It is exciting for me to see the spark the students have when they interact with elementary school students and expose them to science.

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

**A** Allow the students to take charge of their ACS student chapter. Stay open so that the students can come freely to you with any concerns or questions. **IC**

## GOT FACEBOOK?!

We have developed a Facebook page, complete with group and fan pages. Student members can access this page to learn about happenings at ACS, view pictures from meeting events, and network with other student members nationwide. Just look up Audley "UNDERGRADPROGRAMS" Burke in the search box and send us a friend request.

**Why Wait? Join Now!**



# A Case of Real Chemistry

Collaborating  
with an ACS High  
School ChemClub  
Helps Everyone  
Involved

BY ERIC STEWART

**I**F YOU'RE READING THIS, IT'S VERY LIKELY THAT you're a member or a faculty advisor of an ACS student chapter at a college or university.

But it's far less likely that you were a member of an ACS ChemClub when you were in high school — primarily because these groups are relatively new (even though they're growing fast). They offer enriching experiences in chemistry for the high school students involved, and they also represent a great opportunity for your chapter to expand its outreach to local schools, serve as ambassadors for your institution, and have fun in the process.

## What is a ChemClub?

ACS launched ChemClubs as a pilot program in 2005 to gauge the level of interest among high schools for such organizations and to determine which types of materials and activities would be most helpful.

In some ways, a ChemClub is similar to an ACS student chapter at a college or university. The program makes a variety of resources available to the teachers and students involved. In the case of ChemClubs, the resources tend to be structured activities organized around monthly or quarterly themes. For example, as this article was being written in November 2009, the theme for the month was "The Chemistry of Fall," and resources included activities and experiments investigating the chemistry involved in changing leaf colors. Other themes are built around holidays, giving them a fun, timely connection for the high school students.







ALL PHOTOS COURTESY OF THE UNIVERSITY OF HOUSTON

UH chapter members Gabriel Clyde, Justin Khinne, Mike Pham, and an unidentified friend planting a tree.



UH chapter officers Tony Pontifes, Ngoc-Thuy Pham, Emily Huckaby, Kim Ngo, Lily Yang, and Anusha Shah.



The pilot was a success, and now the program is in full swing. In fact, the number of established clubs has been growing at an almost exponential rate, according to Michael Mury, senior education associate in the high school office at ACS. "The first year we started with 12 clubs," he notes, "and in the following years we saw the number climb to 50, then 125, and we are now at 240."

That growth was essentially all done by word of mouth — but now the program is beginning to expand its communication and marketing efforts to encourage even more schools to establish ChemClubs. That's where you and your chapter can play a role.

## How your chapter can help — and benefit

Collaboration with a ChemClub can take many forms and often involves activities that your organization already does, but taken to another level. For example, the high school students may be interested in doing their own outreach to even younger students and can use your chapter members' ideas and guidance in performing interesting, safe demonstrations for children at elementary schools, youth organizations, and other venues.

At the same time, it's a mutual relationship, says Andie Schlather, who served as president of the ACS student chapter at the **University of Houston (UH)** last year. "We assisted the students in DeBakey High School's (DHS's) ChemClub with their activities, gave suggestions and performed some demonstrations, and even helped them get supplies. We also asked them to work with us at some of our events, including helping us at our table at Cat's Back, a big kickoff event where UH clubs and organizations introduce themselves to the campus community." It was the first time that many of the younger students had been on the UH campus, Schlather adds, "and they loved helping out and being in a college environment."

By the same token, the UH chapter members have helped at the ChemClub's after-school meetings. "Naturally, the high school students also like to do fun stuff," notes Schlather, who graduated in December and will attend graduate school

in the fall. "The most popular experience by far was making liquid nitrogen ice cream — I don't know anyone who didn't love that!"

ACS student chapter members can also help by simply answering the high school students' questions. "I know my kids really appreciate the networking aspect," says Barbara Williams, chemistry teacher at DHS and advisor of the school's ChemClub. "They're very motivated to figure things out by asking the college students questions such as, 'Why did you pick this college?' and 'Why did you decide to major in chemistry?'"

Talking with undergraduates who are closer to graduation, they're interested in finding out what type of career opportunities there are and what the students plan to do after graduation."



## Getting started

In DHS's case, the drive to establish a ChemClub began in 2008, sparked by the enthusiasm of one highly motivated high school student and aided by the ACS student chapter at UH.

For several years, Simon Bott, chemistry professor at UH and faculty advisor of the institution's ACS student chapter, had overseen a

scholarship competition in which DHS was active. "Last year," Bott recalls, "one of our scholarship winners was from DHS, and she and her teacher, Barb Williams, mentioned they were thinking of starting a chemistry club. I suggested they contact ACS to get a ChemClub application, and they took it from there."

Williams believes ACS student chapters can plant the seeds for such programs at the high school level by doing some proactive outreach. "High school teachers who are already involved in ACS may know about the ChemClub

**They're very motivated to figure things out by asking the college students questions such as, 'Why did you pick this college?'**





Gabriel Clyde and Tony Pontifes at a UH chapter bake sale.



Students at UH checking out the ACS student chapter's National Chemistry Week exhibit on the chemical elements.



UH students performing demos at a local school.

program," she observes. "But many more are not and would probably be glad to learn about it. I think it could also work as a great recruitment effort for the university."

## Seeing an impact

Another value of collaborating with a ChemClub is that you can have a unique and powerful impact on young minds. "When I taught high school chemistry," recalls Mury with a laugh, "I could talk to my students all day long about some topic I thought was important, and their response might be, 'Sure, whatever.' But if a college student came in and said the exact same thing, more than likely they'd think it was awesome advice. I think it's having someone closer to their age, someone whom they can look up to, that really sparks their interest."

The benefits don't end there, Williams observes. Looking back on her first year as ChemClub faculty advisor, she says, "I've been able to put more emphasis on teaching chemistry as an everyday occurrence — not just a series of equations that my kids will never see again. The experiments and activities have allowed me to raise the level of critical thinking that I can expect from my kids. It's personalized chemistry for them," she concludes, "and also made me a better teacher."

## Tips for success

The best time to contact high school teachers about the ChemClub program is at the beginning of the school year, when they are still finalizing their programs for the coming school year, notes Schlather. She also recommends that you start with those local high schools that members of your chapter attended or with which you already have connections.

If the high school's chemistry teacher has not yet heard

**Another value of collaborating with a ChemClub is that you can have a unique and powerful impact on young minds.**



UH Students performing a demo at a middle school.

about the ChemClub program, you can offer to send them a brochure. Mury notes that the program has ample supplies of a new informational brochure, which chapters can order by e-mailing [hschemclubs@acs.org](mailto:hschemclubs@acs.org) or visiting [www.acs.org/chemclub](http://www.acs.org/chemclub). "I don't think there's any teacher at the elementary, middle, or high school level," Schlather observes, "who would turn down a chapter's offer to help, especially if it comes early enough in the school year."

Of course, if a high school already has a chartered ChemClub, you can volunteer the services of your chapter to assist in whatever way is most helpful. When collaborating with a high school group like a ChemClub, Bott cautions, "try not to take transportation or schedules for granted. Many high school kids may not be able to simply drive to your campus or just 'pop over' for a meeting at 1:30 in the afternoon. Working out scheduling and logistical issues can be as much of a challenge as anything else."

## An eye on the future

The bottom line is that, while ChemClubs are primarily designed to enrich the high school chemistry student experience, they're also great for expanding your own chapter's efforts for building connections with educators and the community.

"In my opinion," says Schlather, "if high school students are only learning to memorize the periodic table and how to convert grams to moles, it's not enough. I think it would be much more helpful if students learn at an earlier age about the fun and exciting things that chemistry can offer. If there were more young students excited about chemistry, our country probably wouldn't be in this crisis of not having enough teachers in math and science." **ic**



**ERIC STEWART** is a freelance writer and editor based in Arlington, VA.

# Photo Chemistry

***Capturing the energy and enthusiasm  
of ACS student members...  
showcasing the activities, events,  
and accomplishments of  
their chapters.***

COMPILED BY LORI BETSOCK

JUPITERIMAGES



Bryan Martin (Boise State University, ID) uses liquid nitrogen to inflate a balloon.



Ryan Alexander, Emily Smothers, Luke Sturner, and Ethan Adams (Belmont University, Nashville, TN) conduct a flame test.



Lauren Pagel and Crissy Anderson (Chapman University, Orange, CA), sport their safety goggles at the Santa Ana Zoo during National Chemistry Week.



Goh Jo Lyn, Katie Trousil, Lauren Wong, and Chris Nobile (California State Polytechnic University, Pomona) monkey around after conducting National Chemistry Week events at the Santa Ana Zoo.



Evan Beauvilliers, Aaron Cohen, and Karen Lagasse (Rensselaer Polytechnic Institute, Troy, NY) help kids create crown ethers and temporary tattoos of elements.



Chapter members (Western State College of Colorado, Gunnison) create a new twist on the classic "elephant's toothpaste" demonstration for a Halloween event.



University of Nebraska-Omaha student chapter members sponsor a dance to benefit Habitat for Humanity.



Wendy Hom (Polytechnic Institute of New York University, Brooklyn) speaking to a Girl Scout troop during an outreach event.



University of Michigan ACS chapter members take part in the annual "Battle of the ChemClubs."





William Eckenhoff, Matthew Taylor, Ashley Biernesser, Sean Noonan, and Jonathon Gibbons (Duquesne University, Pittsburgh, PA) jump for joy at the ACS National Meeting in Salt Lake City.



A child watches as ACS chapter members (Grand Valley State University, Allendale, MI) create CO<sub>2</sub>-filled bubbles from the end of a PVC pipe.



Lisa Fazzino (University of Puget Sound, Tacoma, WA) helps make apple cider at the chapter's Biannual Cider Squeeze.



## Be Candid! Get Your Picture in *inChemistry Magazine!*

Here's an opportunity to get some great publicity for your chapter. Send us your best photos of ACS student members engaged in chapter activities to feature in an upcoming issue of *inChemistry*. We're looking for high resolution pictures that show members involved in club activities and with each other — action shots, funny photos, or interesting images that tell a story about your chapter and who you are. No posed group shots, please! E-mail your photos to [I\\_betsock@acs.org](mailto:I_betsock@acs.org).



Jennifer Beveridge, Maura Barrett, Vicki Constant, Olivia McGovern, Laura Fox, Deanna Belsky, Jon Henninger, and James Shellhammer (Indiana University of Pennsylvania) celebrate National Chemistry Week at the Carnegie Science Center in Pittsburgh.



Christian Squire (Western State College of Colorado, Gunnison) pedaling his way across campus to the Chemistry Halloween Show.



Jabrii Rasulallah, Breanna Cobbins, Oyebola Oladeinde, Brittany Fisher, LaSharon McAlilly, and Jaslin Bennett (Morgan State University, Baltimore, MD) discuss chemistry during a chapter tutoring session.



Northeastern University ACS chapter members participate in a recycling fashion show to help raise environmental awareness. The outfits were made from re-used and recyclable materials.

# The Retention Saga

## Keeping Student Chapters Thriving Year-Round

BY ALLISON PROFFITT



ACS STUDENT CHAPTERS HAVE TO compete for students' time along with many other undergraduate activities — both academic and social — and sometimes keeping the momentum high can be difficult. A lot of chapters are finding that they can successfully recruit members...but then partici-

pation and interest drop off. Eventually, the same few members are running the club and showing up for meetings and events.

Retention means keeping students involved and excited year-round, not just at the beginning of the year or only during National Chemistry Week. Three ACS student chapters that have had success keeping their students active and their clubs thriving credit the hard work of their executive boards and careful planning.

### Add variety to spice up chapter life

Offering a range of chapter activities can make a huge difference in chapter participation. "I think a variety of activities throughout the year is very helpful and keeps students interested," says Mark Sabo, chapter advisor at **Catawba College** in Salisbury, NC.

Jessica Bound, vice president of the Catawba chapter, agrees that different kinds of events keep everyone involved. "If we offer fun, social things to do, it helps students feel that we're not lacking in any way. It creates a good atmosphere in which you can still have some structured meetings and get down to business when you need to." Catawba hosted a campus-wide movie night and a glass jewelry workshop in addition to hosting speakers and regular chapter meetings.

Phil Hamzik, president of the ACS student chapter at **Northeastern University** in Boston, says his club hosts annual trips. "They become events that all of our



Catawba College student chapter members performing a demo.

COURTESY OF CATAWBA COLLEGE



members look forward to continuously,” Hamzik explains. “They’re usually coordinated with the seasons. For instance, in the early fall we go to an amusement park; in late fall we go apple picking. In January, we go snow tubing and to a Boston Celtics game.”

Andrea Lebed is a past president of the Northeastern chapter, and she mentions the importance of working with other student groups to vary activities and expand the chapter’s reach on campus. “A big thing we started doing was collaborating with other clubs on campus, because I know a lot of students think, ‘Oh, I’m a chemistry major. Let’s join some other clubs with other kinds of interests.’ So we collaborated with [a student group for environmental action] and put on recycling fashion shows.”

## Connect with the campus community

Being connected to the campus community helps in other ways as well. Angela Peters, chapter advisor of the ACS student chapter at **Clafin University**, cites strong university support as one of the keys to success. “We are able to retain our students because everybody at the university buys into what we do,” she says of the historically black university in Orangeburg, SC. “ACS is embedded in everything we do in the School of Natural Sciences and Mathematics. So not only do the chemistry and chemical engineering students know about ACS and its goals and mission, but the math and computer science students do also.”

Northeastern also enjoys a high level of support from the university and chemistry department. The chemistry department chair is really involved with the chapter, says Jordan Swift, chapter advisor. “I think that helps keep everyone involved, because they know professors are looking out for them and are really interested in what [the students] are doing.”

## Roll out the welcome mat

One of the biggest tricks to member retention is to build a strong sense of community within the group itself. This begins as soon as new students arrive on campus — or earlier! At

Northeastern, says Swift, potential students meet student chapter members at open houses and ‘introduction days’ before they enroll at Northeastern; in addition, incoming freshmen who have expressed an interest in chemistry are assigned to a mentoring group of four to five freshmen led by two upper-classmen. The goal is for new students to “have someone to go to, to ask questions, or encourage them to go



Members of the Clafin University student chapter.

to the meetings,” explains Swift. “And these mentors are also required to go to the meetings and events that we have for the first-year students.” The mentoring relationship continues through the first year, with social events in both the fall and spring semesters to build relationships and community.

One of Peters’ goals is to engage the broader community. “In the summer we have a bunch of programs, including ones for middle school kids and pre-college students, in which our ACS members serve as counselors. When it’s time for a seminar, our students will sign up to give the seminar and give a PowerPoint presentation about ACS and science.” By the time freshmen arrive on campus, they are likely to already be interested in being a part of the chapter.

Once students have joined the chapter, keeping everyone in the loop through e-mails, a chapter website, or a blog helps everyone feel that they have access to what’s going on within the club.

Amy Kallmerten, last year’s president of the ACS student chapter at Northeastern, stresses the importance of students feeling like they belong and also emphasizes the role of the president and executive board in establishing that rapport. “One of the things that was really important when I was president was just getting to know every single member on a first-name basis — because if people feel like you’ll notice if they’re not there, they’ll keep coming and be excited about seeing everyone and stay involved. But if they feel like they kind of ‘fly under the radar’ and aren’t noticed, then they may just think, ‘Why bother coming?’”

**...If people feel like you’ll notice if they’re not there, they’ll keep coming and be excited about seeing everyone and stay involved.**



Northeastern University ACS chapter members majors preparing for National Chemistry Week activities.

## Take a road trip

Many chapters attend the spring ACS national meeting, and including as many students as possible in the trip goes a long way toward building a cohesive and connected group. "Attendance at national meetings is so important because you get to see other students from other colleges like yourself," says Sabo. "Every time we take students to the national meeting, they come back with a different mind-set. They see the professionalism of their career."

This year, Catawba has invited anyone who is interested to attend the national meeting, even though the trip expenses may not be fully covered. "We're fund-raising like crazy," explains vice president Bound, "but it may come down to where we have to pay for our own plane tickets." Still, planning and fund-raising for the trip has kept attendance high. To travel with the chapter, a student should have been involved in about 75% of chapter events — which include everything from business meetings to school chemistry presentations to doughnut sale fund-raisers.

**"Every time we take students to the national meeting, they come back with a different mind-set. They see the professionalism of their career."**



Claflin University ACS student members at Felton Laboratory School.

COURTESY OF CLAFLIN UNIVERSITY

Of course, the national meeting isn't the only prize that serves as a worthy "carrot" to motivate students and keep a club active and lively. "One thing that's unique about Northeastern is that we put such a heavy emphasis on experiential education," explains Hamzik. The university includes several co-ops in a five-year curriculum. Because the student members know their audience, he adds, "We continually try to provide professional development activities like résumé writing and interview workshops. We also bring in employers and host panels with students who are currently on co-ops."

## Understand YOUR members' needs

Kallmerten points out that there is not a "one size fits all" solution. "Talk to the members and find out what they're looking for in a group, because every group is going to be different," she says. Bound believes that participation should be voluntary, with attendance increasing because students are excited about what's going on. "You can't say you have to attend 7 out of 10 meetings if you want to be in the club...it puts people off," she says.

The keys to achieving better member participation and retention are planning a varied event schedule, cultivating the strong support of faculty, and building a sense of camaraderie within the chapter through recurring social activities, campus and community outreach, and working together toward common goals. That is the combination that keeps ACS student chapters thriving. **ic**



ACS student members attend the 2009 ACS national Meeting in Washington, DC.

MIKE CIESIELSKI



**ALLISON PROFFITT** is a writer and editor based in Singapore and covering science all over the world. When she's not writing, she's traveling as much as she can.



# Our Newest National Historic Chemical Landmark

## Cracking the Genetic Code

By JUDAH GINSBERG

**M**ARSHALL W. NIRENBERG WANTED TO have fun. "If I am going to work this hard," he recalled recently, "I might just as well have fun — and by fun, I mean I wanted to explore an important problem and discover things."

Nirenberg joined the staff of the National Institutes of Health (NIH) in 1959, and he needed to find a subject to investigate. "At that time," he observed four decades later, "the mechanism of protein synthesis was incompletely known and messenger RNA had not been discovered." Over the decade that followed, Nirenberg would become a central contributor to the deciphering of the genetic code — a scientific accomplishment that was formally recognized by ACS last year (see box). Nirenberg died January 15, 2010, at the age of 82.

There has been intense interest in the field of protein synthesis since James Watson and Francis Crick used Rosalind Franklin's data from X-ray diffraction images of DNA to electrify the scientific world in 1953 with their model of DNA: the double helix. Watson and Crick's famous article in *Nature* initiated a worldwide quest to discover the genetic code that translates DNA's information into proteins.

Nirenberg's initial goal was to determine whether DNA (deoxyribonucleic acid) or RNA (ribonucleic acid), copied from DNA, was the template for protein synthesis. In a famous experiment conducted in 1961, Nirenberg and Heinrich Matthaei, a postdoctoral fellow from Germany, showed that synthetic RNA made of a chain of multiple units of uracil (a nucleotide) instructed a chain of amino acids to add phenylalanine. The uracil chain, known as poly-U, served as a messenger directing protein synthesis. The experiment proved that messenger RNA transcribes genetic information from DNA, directing the assembly of amino acids into complex proteins. The key to breaking the genetic code — in effect, molecular biology's Rosetta Stone — had been discovered.


After Nirenberg and Matthaei "cracked" the first "word" of the genetic code, scientists raced to translate the unique code words for each amino acid in hopes of someday reading the entire genetic code of living organisms. Nirenberg won this race, identifying nucleotide combinations for the incorporation of other amino acids. Nirenberg found that the coding units for amino acids contain three nucleotides (a triplet). Combining four nucleotides in three genetic codes yields 64 possible combinations ( $4 \times 4 \times 4$ ), sufficient to describe 20 amino acids.

In 1964, Nirenberg and Philip Leder, a postdoctoral fellow at NIH, discovered a way to determine the sequence of the letters in each triplet word for amino acids. By 1966, Nirenberg had deciphered the 64 RNA 3-letter code words (codons) for all 20 amino acids. The language of DNA was now understood, and the code could be expressed in a chart.



### Recognizing the Breakthrough

ACS designated the deciphering of the genetic code as a National Historic Chemical Landmark on November 12, 2009, in a ceremony at NIH in Bethesda, MD. Then-ACS President Thomas H. Lane presented a commemorative plaque to Michael Gottesman, deputy director for intramural research at NIH. For more information on this and other chemical landmarks, visit [www.acs.org/landmarks](http://www.acs.org/landmarks).

In 1968, Nirenberg won the Nobel Prize in Physiology or Medicine for his seminal work on the genetic code. He shared the award with Har Gobind Khorana (University of Wisconsin), who mastered the synthesis of nucleic acids, and Robert Holley (Cornell University), who discovered the chemical structure of transfer-RNA. Collectively, the three were recognized "for their interpretation of the genetic code and its function in protein synthesis." 



JUDAH GINSBERG, a freelance writer and consultant living in Alexandria, VA, manages the National Historic Chemical Landmarks Program for the ACS.

# |Rxn's and Soln's|

In this issue's Reactions and Solutions, chapter officers share their chapters' successes in overcoming challenges.

COMPILED BY LORI BETSOCK

## → BLOG



### Setting and Reaching a Chapter Goal

Our ACS chapter decided to attend the ACS national meeting in San Francisco to accept an ACS Outstanding Chapter Award and present a poster on our chapter. Determined to get to the meeting, we pulled all of our resources together. We received money through numerous avenues, including our Student Government Association and a donor through Newberry College's Office for Institutional Advancement. Our chapter also did a fund-raiser in which we taught local Girl Scouts the basic concepts of forensic chemistry. Finally, we applied for an ACS Travel Grant. Though this was a lot of work, it goes to show that anything is possible when you network and use your resources wisely. We truly enjoyed going to the meeting to learn more about chemistry and to collaborate and network with colleagues in chemistry from across the world.

Posted by Mickey



### Increasing Member Involvement and Motivation

A challenge that Simmons College ACS chapter faced at the beginning of this year was the question of how to get people motivated and involved with the chapter. To overcome this obstacle, we decided to try to entice new membership with interesting uses of chemistry. During the undergraduate student activities fair, we demonstrated the properties of liquid nitrogen by doing frozen chocolate fondue with fruit and marshmallows; this generated much interest in our chapter from the student body. At our table, we also promoted some of the other events that our chapter was planning, as well as our first meeting of the semester, where we performed another hands-on activity: making silly putty. At this meeting, we got a phenomenal turnout of new students, both science and nonscience majors. The chapter learned that by putting on activities that are accessible to people at all levels of chemical knowledge, everyone would have more fun, while also learning something beneficial.

Posted by Katrina



### Overcoming Fund-Raising Challenges

The spring ACS national meeting was in San Francisco — exactly 2,392 miles away from our university in Northern Kentucky. To enable 24 research students to attend the conference, our chapter needed to make a lot of money in a short time. We first held a bake sale and made about as much as one could during a two-day sale. We also applied for a travel grant and received a chunk of money from that. Finally, we

decided to work events at our sports arena on campus, where we receive 10% of the sales of our booth. By working concerts like Jay-Z and Papa Roach, we were able to raise half of our goal. Our chapter needed to raise a lot of money and, with dedication from our advisors and chapter members, we have found creative ways to meet our goal.

Posted by Elizabeth



### Preparing for Officer Succession

Most chapter officers have a vested interest in the future success of the group. No one wants to leave their beloved chapter in inexperienced hands, especially after dedicating their time, energy, and sanity to accomplish chapter goals. At Western Kentucky University, when we realized that three of our four officers were graduating in the spring,

our executive board devised an action plan and named it, "Operation: Underclassmen Leadership Training."

Our action plan completely changed the way officers led. Throughout the school year, many jobs that had been done solely by the officers were split between an officer and an underclassman. We found that most inexperienced potential leaders are willing to help — especially when they are asked in a way that doesn't make it seem like the responsibility will fall on their shoulders.

Operation: Underclassmen Leadership Training has enabled many freshmen and sophomores to gain leadership experience by helping organize events, keeping track of inventory and financial records, and doing a slew of other things. Now, as May approaches, our beloved chapter is no longer in danger of being left to inexperienced hands. When the current leaders graduate, our chapter will be led by eager, experienced members who are capable of keeping it on the path to success.

Posted by CJ



### Increasing Meeting Attendance

One problem our chapter faced was getting students to attend the first meeting of the academic year. In the past, our ACS student chapter held meetings just before our chemistry seminar at 10:30 a.m. on Thursdays, a time that often conflicted with classes. Because of this, the attendance was consistently low, which often led to a low turnout at

other chapter events.

At the beginning of this school year, our executive board decided to try something new to counter this problem: we scheduled the meetings in the evening at 6:15. In addition, to really draw in students to learn more about our chapter, we made our first meeting extremely social and informal. We had



## → BLOG continued

a liquid nitrogen ice cream social. Spending about two weeks advertising this event with different media, including e-mails, flyers, Facebook, and our student chemistry webpage, allowed us to reach a wide range of students. On the evening of our first meeting, we had over 30 attendees! Since then, each of our meetings and events is filled with 10 or more members. Knowing how to reach out to our peers and keeping an open-door policy for everyone interested in chemistry has definitely helped us succeed in exposing our university to chemistry and ACS.

Posted by Sunny



### Increasing Member Participation

Recruiting members who are genuinely interested in our chapter's activities has been a challenge of ours for quite a while. We would frequently find ourselves with members who viewed their membership as just a way to enhance their professional school applications. This hurt our meeting attendance and greatly hindered our ability to offer quality

activities. While we had high attendance at some events (e.g., lectures from professional school representatives, national meetings, and social events), other events, such as meetings and community service events, were poorly attended.

To solve this, we decided to establish a point system, where members had to attain a minimum threshold of points before they could attend these select events. To earn points, members had to attend a certain number of business meetings, help with community activities, and participate in at least 90% of the chapter's general activities.

We now see a great increase in our chapter's attendance and an improved effectiveness of our work for the community and campus. We even earned the Student Organization of the Year Award on campus that year. Great success!

Posted by Shannon



### Using Technology to Boost Member Involvement

Let's face it...trying to organize chapter meetings can be a challenge. The real problem comes when everyone is willing to come but can't because of work or classes. My chapter ran into just this sort of conundrum. Poor turnout is an issue no chapter leader wants to leave unaddressed, but the simple logistics

of getting all our members together doesn't always work. This semester, we had terrible turnout compared to the previous one. No matter how hard I tried, I couldn't find a time when everyone could get together to discuss our activities. Not surprisingly, we found our answer in technology. Instead of insisting everyone be present for our meetings, we got all the e-mail addresses from our members and created the "TC3 (Texarkana College Chemistry Club) Bulletin." All we do is type up the minutes from

every meeting and send them out through a "series of tubes" to all our members. It doesn't take much to keep all your members involved and informed.

Posted by Ethan



### Re-Evaluating and Moving Forward

Last year our chapter went through a leadership development assessment, which led to a fresh start for our chapter. We reached our educational goals by creating new outreach programs, going on field trips, and attending the ACS national meeting. This led our chapter to receive an Outstanding Chapter Award from ACS. Although our leadership

team worked diligently to provide better programming and more activities for the chapter, we still didn't see as much member participation as we desired.

This year, we are still experiencing problems with member involvement. In the words of our co-president, Jen Bruno, we need to "explore ways to get these members involved and to 'lead without authority' to light a proverbial fire under these students to get them involved the way they say they will be." We are now working to delegate chapter responsibilities and projects to members to allow them to grow *with* the chapter. In turn, students will feel like they are part of a family, where everyone is involved in bringing the mission of ACS into fruition in our college and community. The idea is to change the atmosphere to consistently engage the members and build a family.

Posted by Alyssa

**MICKEY BIGG** is a junior majoring in chemistry with a concentration in forensic science and a minor in criminal justice. He serves as co-vice-president of the ACS student chapter at Newberry College, SC.

**KATRINA THISTLE** is a sophomore majoring in biochemistry at Simmons College, Boston, and is the treasurer of her ACS student chapter.

**ELIZABETH WALSH** is a junior chemistry major at Northern Kentucky University, an undergraduate researcher, and the activities coordinator for her ACS student chapter.

**CJ PRUITT** is a senior and ACS student chapter president at Western Kentucky University. In the fall, she plans to attend graduate school at the University of Alabama (Tuscaloosa) to pursue a Ph.D. in physical or analytical chemistry.

**SUNNY HUANG** is a junior chemistry major at the University of Southern Indiana intending to pursue an M.D./Ph.D. She is the current president of her ACS student chapter.

**SHANNON WOODRUFF** is a senior chemistry major at the University of Mary Hardin-Baylor in Belton, TX. He has been involved with the UMHB ACS student chapter since 2006 and has been its president since 2007.

**ETHAN MCBRIDE** is a sophomore at Texarkana College, TX and ACS student chapter president. He plans to attend the University of Arkansas at Fayetteville in the fall to pursue a B.S. in chemistry.

**ALYSSA HUEBNER** is a senior biology and psychology major, chemistry minor at Florida Southern College and is graduating in May. She begins a two-year post-baccalaureate fellowship at the National Institutes of Health in June.

# A Career Involving Problem Solving, Relationship Building, and Much More!



## Technical Sales... It May Not Be What You Think

BY LISA M. BALBES

**H**AVE YOU EVER CONSIDERED A career in technical sales? Most scientists have not. But for some, helping customers solve problems through the creative use of new technologies or helping them navigate through a regulatory process is a satisfying and rewarding career.

A career in sales might be right for you if you:

- enjoy interaction with people;
- like science but not the lab;
- are self-motivated;
- are interested in the business of science; and
- want to use your problem-solving and persuasion skills in a new way.

Technical sales is “very relationship-based,” says Badr Astiphan, an account manager at Agilent Technologies. “The core analytical technologies I sell have been around for a long time, and most of my customers understand how they work. My job is really about relationships and solution building. I get to know my customers, understand their needs, and

respond quickly to their requests.” The most successful individuals in technical sales are those who build strong partnerships with their customers.

In order to succeed in sales, you need to truly understand the products or services you are representing, including both the science behind them and how they work. To sell technical services, you may need to also understand government and industry regulations and approval processes. In Astiphan’s case, after graduating from college, he went through a seven-month training program to get to know Agilent’s products and shadowed another sales rep before going out on his own. In many companies, starting out in a technical support role is great preparation for sales, since you learn about the company’s technology, product or service line, and customers. Some companies will hire chemists after they have had a few years of experience in a laboratory and then train them on the company’s products or services.

Technical salespeople spend a lot of time educating potential customers about new and emerging





technologies, services, regulatory processes, and industry standards. "Listening to the customer is the most important part of my interaction with them. It's my job to help them figure out which products will best suit their research needs, and in many cases we are able to save the researcher time in designing their experiments by making them aware of other published work using similar systems," says Frank Dalton, general manager of Pine Instrumentation. "A typical day is spent answering the phone, talking to people about products and how different pieces of equipment fit together, pricing, preparing quotations, and following up with existing customers."

## Travel

Most salespeople cover a particular geographic territory; typically, the larger the company they work for, the smaller each territory will be. They travel extensively to meet with customers and potential customers within that area, to company headquarters for meetings and training, and to scientific meetings. The large amount of travel means salespeople are away from home for extended periods of time, but they usually arrange their own appointments and set their own schedules. For example, Astiphan's territory is half of Houston and part of Austin, and he arranges appointments so that he's in the office Monday and Friday and out from Tuesday through Thursday. In contrast, Dalton's company is very small, so he covers the entire country and travels about one week each month to customers' sites and trade shows. Most of his contacts are by phone and e-mail.

**Technical salespeople spend a lot of time educating potential customers about new and emerging technologies, services, regulatory processes, and industry standards.**

## Marketing

Sales and marketing are two different things, and technical salespeople may or may not be involved in marketing. Marketing groups develop a company's business strategy, determine which product or services to develop, monitor market trends, keep abreast of the competition, and generate leads for the sales team. Marketing also provides resources for sales teams by preparing and publishing information such as brochures, product descriptions, e-mails, and websites to reach and persuade pros-

pects. The sales team implements the marketing plan by contacting one customer or a few customers at a time, building relationships with customers, and working to obtain signed contracts. Opportunities exist for chemists in both sales and marketing.

## Technical sales specialties

There are many specialties within the technical sales field. One of the primary distinctions is inside versus outside sales — that is, whether you answer inquiries that come into the company, or go out and call on potential customers at their place of business.

Another type of specialty is that of manufacturers' representative, a professional who sells several different, usually related, product lines from a small number of different manufacturers (called principals). Manufacturers' representatives work within a specific geographic area and are not employees — so their only compensation is commission.

Many technical sales processes are complex and may continue for several months, typically involving a sales scientist with a detailed technical background paired with a traditional business-oriented salesperson. This allows the sales scientist to focus on the technical aspects of the product or service and the salesperson to focus on the customer and the financial transaction.

Many companies use project managers to help schedule and monitor progress on longer term projects; this position typically requires a person with a technical





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background who can understand the clients' needs as well as the inner workings of the company.

There are also the after-sales support people, who set up, service, and provide support for products. They may be called sales engineers, manufacturers' agents, technical sales support, or other titles, and may or may not be involved in add-on or future sales.

### Rewards

Compensation for most salespeople is a combination of salary and bonuses or commissions. Commissions are based on the amount of sales in a particular territory and are tied directly to performance, so in theory such income is unlimited. The company generally covers travel expenses, although there may be a per diem (daily) limit on food and/or lodging expenses. Promotions can include a higher commission rate, larger or more desirable territory, or elevation to supervisor or marketing manager.

### Getting started

The majority of jobs in technical sales require a bachelor's degree in a scientific discipline, although a few require a higher degree. Sales experience is extremely valuable — anything that puts you in front of people, selling a product. Previous work experience with scientific equipment or services that the company sells is also a plus.

### Career potential

Some large companies hire as many bachelor-level chemists to work in sales-related positions as they hire for their laboratories and manufacturing facilities. In fact, employment of technical salespeople is expected to grow slightly for

**In fact,  
employment  
of technical  
salespeople is  
expected to  
grow slightly for  
all occupations  
through  
2014.**



COURTESY OF FRANK DALTON

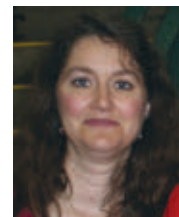
Frank Dalton meeting with Auburn University students.



all occupations through 2014, due mainly to the increasing complexity of technical products.

From sales, there are a number of different paths your career could take. The qualities that make for a successful salesperson — excellent interpersonal skills, self-motivation, attention to detail, and oral and written communication skills — are required for success anywhere in the organization, and working in sales provides a chance to practice these skills on a daily basis. Salespeople are also highly visible within the company. "We are the eyes and ears of the company in the field and the advocate of the customer in the company," says Astiphan, "so we are plugged into product support, product development, and so on. This makes it easy to know when opportunities are coming up."

Technical salespeople are speaking daily with scientists conducting exciting new research or developing the latest new products or technologies. The sales process gives you an opportunity to learn just as much from your customers as they learn from you. So, if you love working with people and want to share your excitement about science with others, technical sales may be the career for you! **TC**



**LISA M. BALBES** is a consultant, freelance technical writer, and author of *Nontraditional Careers for Chemists*, published by Oxford University Press (2006).





**P**ERHAPS THE QUESTION I HEAR MOST OFTEN FROM COLLEGE students and recent graduates is, “How can I create a great résumé if I’ve never had a paying job?” My answer is always the same: “Focus on what you do have: life experience.”

The key is translating your life experiences into transferable skills. These are the skills, knowledge, and character traits that directly relate to the job you are interested in.

For chemistry positions in general, employers are looking for such transferable skills as: strong leadership (managing time and resources, organizing, conceptualizing, etc.); communication (writing clearly and concisely, summarizing, speaking, etc.); analytical thinking (problem solving, organization, etc.); and creativity.

However, it’s best to create a highly targeted résumé for each particular position. So, here are 10 steps to help you create an awesome entry-level résumé.

# 10 Steps to Create an Awesome Entry-Level Résumé

*(Even if You’ve Never Had a Paying Job!)*

BY LISA B. MARSHALL

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## Step 1: List Accomplishments, Goals, and Experiences

The first step is to document and review all of your accomplishments, goals, and experiences. You’ll need to create your CAGE – a document listing your career accomplishments, goals, and experiences. This will be a ‘living document’ that you will maintain through your entire career! Think of it as a repository that you will deposit into and draw from in order to remember all of your experiences that might relate to future positions.

## Step 2: List Activities, Work, and Awards

To start your CAGE, make a list of all activities, groups, and clubs you were part of for the past five years. This should include such activities as Greek life, athletics, internships, major school projects, community service, church/temple/mosque involvement, travel to foreign

countries, volunteer work, and online activities like blogging and posting appropriate material on YouTube and other sites. Of course, you’ll also want to list any paid or unpaid work that you did. Finally, list any awards or certifications you’ve received.

## Step 3: List Examples for Each Activity

For each item on your list, you’ll want to record specific examples of your experience. Let’s say one of the activities you have listed is “ACS student chapter vice president.” You might write:

### ACS Student Chapter Vice President

- Conducted experiments at elementary schools in effort to spark interest in science
- As a chapter officer, helped choose winners in rocket competition
- Delivered scientific presentations and demonstrations to large groups
- Organized stream cleanup event for Earth Day

## Step 4: Identify Transferable Skills

Next, identify transferable skills associated with each of your examples. Again, these are skills you gained that could be important to the jobs you will be seeking.

### ACS Student Chapter Vice President

- Conducted experiments at elementary schools in effort to spark interest in science  
*Skills:* Teaching, Creativity, Written Communication
- As a chapter officer, helped choose winners in rocket competition  
*Skills:* Teamwork, Organization, Analytical Skills
- Delivered scientific presentations and demonstrations to large groups  
*Skills:* Public Speaking, Creativity, Teaching
- Organized stream cleanup event for Earth Day  
*Skills:* Organization, Collaboration, Leadership

Brainstorm as many examples of transferable skills as you can for each activity. Your activities may not be related to science, but the skills are still transfer-

## TOOLS

- Search jobs  
Apply to any of  
1,000,000 listings.
- Let jobs find you.  
Post your resume

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able to scientific positions. Again, your CAGE should be as detailed as possible, listing all of your activities, with related experiences and transferable skills for each. Depending on how active you have been, you may have several pages of activities, experiences, and skills.

### Step 5: Review Job Descriptions

Next, if there is a specific job you are applying for, list the explicit and implicit skills identified in the job description. You'll need to focus on those to build a targeted résumé. Visit the website of the organization where you are seeking employment; it may provide insight for you as you build your résumé.

Also, as you begin to create each unique résumé, remember there is no one "right way" to do so. Your goal is to create something that quickly communicates your unique value.

### Step 6: Put Contact Information at the Top

Start with the easy part, by listing your contact information at the top. Be sure to include a professional-sounding e-mail address. If you have any doubt, get a new Gmail account. If you maintain a blog, website, or Twitter account, you may want to include those as well. Even if you don't list them here, be warned: it's likely that interested potential employers will find them anyway, so be sure to maintain a professional online presence as well. Avoid overly fancy fonts, and stick to the professional fonts, such as Times New Roman and Arial.

### Step 7: Detail Your Education

Next, create a section labeled education. You should include your college and its location, your major and minor if you have one, and your anticipated graduation

date. Include your GPA, any scholarships you received or honor societies you took part in, and relevant coursework. Think about your coursework as the equivalent of professional experience; after all, both require self-discipline and the completion of similar tasks. More

importantly, it's an opportunity to show off your up-to-date knowledge.

### Step 8: Highlight Key Skills and Interests

The next section of your résumé should highlight three to six primary skills

## Larissa Marshall

1840 Prospect Ridge, Haddon Heights, NJ 08035 • 856.330.1263 • lmarshall@gmail.com

### Objective

Seeking entry-level analytical chemistry position in the environmental industry.

### Education

B.A., Chemistry and Spanish, Franklin & Marshall College, Lancaster, PA, Anticipated May 2010

- Relevant coursework: Instrumental Analysis
- Cumulative GPA: 3.90/4.0, Chemistry GPA: 3.2/4.0
- Summa Cum Laude, Phi Beta Kappa

### Key Skills & Interests

- Analytical chemistry, including HPLC, GC/MS and gravimetric analysis
- Outstanding communication skills: oral presentations, on-line, written and interpersonal
- Skilled at evaluating problems and generating solutions
- Ability to work with people from diverse backgrounds and cultures

### Professional Experience

**Northern Arizona University**, Flagstaff, AZ

*REU Scholarship Recipient*, Environmental Science (May 26 – July 31, 2008)

- Investigated use of biosurfactants to remove metals from industrial waste streams

**Franklin & Marshall College**, Lancaster, PA

*Tutor, General Chemistry* (September 2008 – present)

- Assist individual students in writing laboratory reports and problem-solving
- Lead weekly small group problem-solving sessions

*Student Ambassador (Tour Guide)* (February 2008 – present)

- Lead groups of 20+ prospective students and parents around campus, twice weekly

**Joe's Sandwich Shop**, Parsippany, NJ, (Summers 2007, 2009)

- Served customers, accepted payments, maintained sanitary conditions

### International Experience

*Study Abroad*, Spring 2009 semester, Lund University, Lund, Sweden

- Studied organic chemistry, organic chemistry lab, western art history and Swedish language

*Service-Learning* in Costa Rica (Summer 2008)

- Spent 6 weeks teaching Spanish to children of expatriates working in Costa Rica

### Professional Activities

*American Chemical Society, Student Member* (2007 – present)

- Treasurer, ACS Student Chapter (2009 – 2010)
- National Chemistry Week volunteer, conducting hands-on demos for elementary school students

### Volunteer Activities

*Volunteer, Habitat for Humanity* (2007-2009)

- Have helped build three houses for people in need

### Publications

"Role of Biosurfactants in the Fate and Transport of Metals in the Environment," poster presentation at the ACS National Meeting in Salt Lake City (March 2009)



and/or interests. In this section, you are expressing your passions and primary abilities that relate to the position you are seeking. This is neither a career objective nor a summary — rather, it's some of both. These few bullet points should summarize who you are and where your passions lie. Of course, they should be in alignment with the position you are seeking.

### Step 9: Describe Your Experience

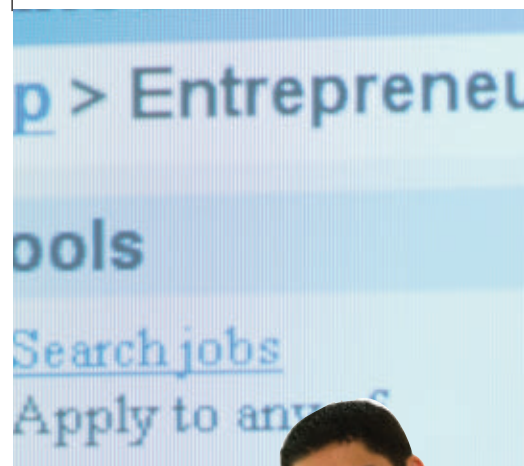
To create your experience section, carefully choose relevant activities and experience from your CAGE. Be sure to choose activities whose transferable skills closely align with the job description. If your CAGE contains pages of activities, then choose the three most relevant activities and highlight two or three example experiences for each. If, however, you only have a few activities, fill in your résumé with more example experiences. Again, the idea is to highlight your most relevant experience by cross-matching to the skills in the job description.

Below your activity experience, you may want to also include a "tools & technologies" section. If you've gained operational or technical experience with particular analytical instrumentation (e.g., microscopy or spectroscopy), list it here. If you have any specialized software or Web skills, including the use of advanced social media, list those too.

**Your active participation in the science community will strengthen your résumé and — who knows? — might also lead to a job offer.**

### Step 10: Strengthen Your Résumé

Finally, whether you're still in school or you've already graduated, you should always be thinking about how to enhance your résumé further. Review your CAGE to figure out which skills might make you a stronger candidate. Internships are an excellent way to gain experience, even after you have graduated. However, it also helps to look for ways to participate in conferences, assist with poster preparation, lead or mentor in your local ACS student chapter, or volunteer at the local science museum. Your active participation in the science community will strengthen your résumé and — who knows? — might also lead to a job offer.



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LISA B. MARSHALL is a communication expert, author, and professional speaker.



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Undergraduate Programs Office staff members Robin Lindsey, Nancy Bakowski, Audley Burke, and Lori Betsock.

# What We Do for You

## A Closer Look at the ACS Undergraduate Programs Office

BY LORI BETSOCK AND AUDLEY S.V. BURKE

THERE ARE NOW MORE THAN 1,000 ACS chartered student chapters and more than 12,000 undergraduate members of the ACS. Undergraduates enjoy most benefits of ACS membership — plus unique services and resources provided by the Undergraduate Programs Office (UPO).

Our office develops and maintains programs to help individual undergraduate students develop professional skills, learn about traditional and nontraditional career options in chemistry, and take advantage of opportunities to network with professional chemists. We also provide many resources for student chapters, including chapter grants and support in starting, reactivating, or re-energizing chapters.

### Resources for individual ACS student members

***inChemistry* magazine** — Since you're reading this article, you've already encountered *inChemistry* magazine. It's published four times each year and is sent to student members, faculty advisors, and chemistry department heads.

As with other UPO resources, the magazine is written to help you transition from a student into a professional chemist and to encourage you to take an active role in your community and your profession. These articles are contributed by professional chemists and freelance writers, along with student authors like you.

**National meeting programming** — We work closely with the Society

Committee on Education (SOCED) Task Force on Undergraduate Programming to plan undergraduate programming at ACS national meetings. These programs typically consist of technical symposia, graduate school events, career workshops, and undergraduate research poster sessions.

Attending an ACS national meeting and participating in these activities helps you learn more about the latest research in various areas and about the educational requirements you need to be successful in these fields. Recent meetings have

tion skills, experience interacting with members of the chemical community, and learn to think on their feet and answer questions about their research.

**Directory of Experience Opportunities** — The Directory of Experience Opportunities is an online resource that lists co-ops, internships,

fellowships, and summer work opportunities for undergraduate chemical science students. We encourage undergraduates to take advantage of these opportunities in the U.S. and abroad to gain exposure to new industry-level and academic experiences. This enables you to make more informed decisions about your career options and direction.



Students attending the Undergraduate Program events at the ACS national meeting in Washington, DC.



### Support for ACS student chapters

ACS has student chapters at institutions throughout the U.S., including Puerto Rico. Chapters typically engage in community service, chemistry outreach, and professional development activities. By planning and carrying out these activities, student members learn to work together to bring their thoughts and ideas to fruition. Chapter officers and committee chairs gain valuable leadership skills by learning to work with volunteers and by setting project schedules to ensure that their chapters reach their goals.

included programs on careers in public health, pharmaceutical and environmental chemistry, and nanochemistry.

Each year, more than 1,600 undergraduates present their posters at the undergraduate poster sessions at ACS national meetings. Presenting a poster provides valuable networking opportunities with potential employers, graduate school representatives, and other students. Poster presenters gain communica-



Many chapters have partnered with local elementary, middle, and high schools to conduct hands-on demonstrations, tutor, or serve as mentors. To complete these activities, chapter members have to function as teams and work together efficiently, important skills that members carry over to the professional world. Chapters also collaborate with their ACS local sections on a regular basis to plan yearly National Chemistry Week celebrations and to promote Earth Day.

### Regional meeting programming —

We help student chapters to plan the undergraduate programs at regional meetings — workshops and symposia that provide attendees with career-building opportunities on a local level. These programs enable you to network and learn from chemists from your local area, including local section officers and other members of ACS who can become mentors and assist you with career choices.

The UPO offers regional meeting programming grants for active student chapters to plan and host undergraduate programs at regional meetings. Student members gain useful skills working with the steering committee of their respective region — proposal writing and peer review processes, and planning a technical meeting.

### Grants for student chapters —

Student chapters can apply to the UPO for Innovative Activities, Community Interaction, and National Meeting Travel Grants. Going through the grant application process teaches chapter members to prepare proposals and submit mid-year and final reports. These skills are an important facet in the careers of most research chemists.

To apply for an Innovative Activities Grant or a Community Interaction Grant, members of a chapter are required to submit a detailed proposal outlining the project and how it will be of benefit to their chapter and/or community. The grants are reviewed by student chapter faculty advisors under the auspices of SOCED, and grants are awarded based on proposal content. All chapters receive feedback about their proposals and tips

for improving future proposal submissions. Chapters that receive grants are required to submit a mid-year progress report and a final project report.

By going through the grant process, chapter members learn the importance of keeping track of their progress and preparing detailed reports about their activities. In addition, preparing grant reports also introduces chapter members to the practice of financial management, as each chapter must include an itemized summary of how its grant monies were spent.

for their exceptional service and activities during the annual Student Chapter Awards ceremony. These ceremonies have been held since 1992 and give ACS and its officials the opportunity to thank and encourage the student chapters to continue promoting the positive image of chemistry in their local communities.

## We're ready to help

Whether you're interested in the resources and opportunities we offer for individual students, entire chapters,

## We Thrive on Your Feedback!

**UPO staff members continually work to improve the support we offer. If you have any suggestions or feedback to help us better serve you, please let us know.**

**Nancy Bakowski** (n\_bakowski@acs.org) — national meeting programming, career workshops, Leadership Institute, *inChemistry* magazine, and FANmail newsletter

**Lori Betsock** (l\_betsock@acs.org) — Experiential Programs in Chemistry, careers, graduate school recruiting activities, and *inChemistry* magazine

**Audley S.V. Burke** (a\_burke@acs.org) — National Meeting Travel Grants, Community Interactions Grants, Innovative Activities Grants, Undergraduate Programming at Regional Meetings Grants, chapter outreach, and *inChemistry* ACS Chapter Spotlight


**Robin Lindsey** (r\_lindsey@acs.org) — general information, customer service inquiries, ACS student chapter activation/reactivation, chapter activity kits, annual chapter reports, and resource materials



**National recognition** — We play a key role in the selection of ACS student chapters for recognition and sharing outstanding chapters' winning ideas with other chapters.

Student chapters are asked to submit their annual report forms in June of each year. Under the auspices of SOCED, a group of faculty advisors to student chapters then reviews the various activities described in the reports and selects those that are outstanding in terms of originality, impact, or execution. At each ACS spring national meeting, the UPO and SOCED recognize these student chapters

or both, we encourage you to take full advantage of these unique benefits of your membership in ACS.

To learn more about the full spectrum of services the ACS Undergraduate Programs Office provides, go to [www.acs.org/undergrad](http://www.acs.org/undergrad). If you have any questions about any of these programs, please e-mail us at [undergrad@acs.org](mailto:undergrad@acs.org). 



**LORI BETSOCK** is a Senior Education Associate and **AUDLEY BURKE** is an Education Associate in the ACS Undergraduate Programs Office.

**IT'S REVOLUTIONARY!**

# ***The Undergraduate Program in Boston, MA***

**240th ACS National Meeting • August 22-26, 2010**

## Sunday, August 22

### **Undergraduate Hospitality Center**

8:00 A.M. – 5:00 P.M.

### **Graduate School Reality Check**

9:00 – 10:30 A.M.

### **Nutritional Chemistry Symposium**

10:45 A.M. – 12:00 NOON

### **Careers in Chemistry: *What It's Like in the Real World and How Do I Get the Job?***

1:00 – 3:00 P.M.

### **Leadership Training Workshop**

3:00 – 5:00 P.M.

### **Networking Social with Graduate School Recruiters**

5:15 – 6:45 P.M.



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## ACS Student Chapters— Coming to Boston?

Get a National Meeting Travel Grant!

Grants are available to active chapters with students who are presenting individual or chapter posters in the Division of Chemical Education's Poster Sessions.

Apply by June 18, 2010. For more information, contact Audley Burke at [a\\_burke@acs.org](mailto:a_burke@acs.org) or at (800) 227-5558, ext. 4565.

## Attention Graduate School Recruiters!

Showcase your graduate program at the "Networking Social with Graduate School Recruiters" on Sunday, August 22, and the "Graduate School Recruiting Breakfast" events on Monday, August 23. It's a great opportunity to meet and talk with hundreds of undergraduate students who will be attending the 240th ACS National Meeting in Boston, MA.

For more information on how to register for these events, please contact Lori Betsock at [l\\_betsock@acs.org](mailto:l_betsock@acs.org) or at (800) 227-5558, ext. 6188.

# The Chemists Are Coming! The Chemists Are Coming!

### Monday, August 23

#### **Hospitality Center**

8:00 A.M. – 5:00 P.M.

#### **Graduate School Recruiting Breakfast**

8:00 – 9:30 A.M.

#### **Award Winning Outreach Programs— National Chemistry Week Ideas**

9:30 – 11:30 A.M.

#### **Eminent Scientist Lecture and Luncheon**

11:45 – 1:15 P.M.

#### **Undergraduate Research Poster Session**

2:30 – 4:30 P.M.

#### **Sci-Mix/Successful ACS Student Chapter Posters**

8:00 – 10:00 P.M.

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

All events are sponsored or co-sponsored by the Society Committee on Education Task Force on Undergraduate Programming.

**Chair:** Charles Baldwin, Union University, Jackson, TN

**Program Chair:** Sharyl Majorski, Central Michigan University, Mount Pleasant, MI

For more information, contact the ACS Undergraduate Programs Office at 800-227-5558, ext 4480, or go to [www.acs.org/undergrad](http://www.acs.org/undergrad).





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For more information, visit [www.pacificchem.org](http://www.pacificchem.org)

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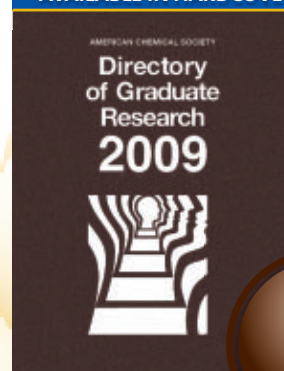
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