

The Magazine for ACS Student Affiliates
February/March 2007

in *Chemistry*

Collaboration



Teamwork is Everywhere

Passport to Science

Linda Wang, associate editor for *Chemical & Engineering News*, describes trends and opportunities for science students studying abroad.

Looking for Chapter Activity Ideas?

Look right here! Lead Program Associate Robin Y. Lindsey has compiled a list for you to use.

Interesting Web Sites

This issue of *in Chemistry* is focused on collaborations. These organizations have student chapters with which Student Affiliates Chapters could partner.

- **www.aiche.org/students/**
The American Institute of Chemical Engineers has a Students Page with resources and information about student chapters.
- **www.nobcche.org**
The National Organization for the Professional Advancement of Black Chemists and Chemical Engineers offers information about NOBCChE events and links to resources.
- **www.sacnas.org**
The Society for Advancement of Chicanos and Native Americans in Science encourages Chicano/Latino and Native American students to pursue graduate education and obtain the advanced degrees necessary for science research, leadership, and teaching careers at all levels. Under "Membership," you can view a list of the organization's chapters across the nation.
- **www.setac.org**
The Society of Environmental Toxicology and Chemistry has regional chapters on three continents. Look under "Who We Are" for their student services.

Graduate School Web Links

Considering graduate school? Then check out these Web links:

- University of Nebraska-Lincoln:** <http://chem.unl.edu/index.shtml>
- University of Texas at San Antonio:** <http://utsa.edu/chem/index.htm>
- Temple University:** <http://www.chem.temple.edu>
- SUNY, College of Environmental Science & Forestry:** <http://www.esf.edu/chemistry>
- University of Tennessee:** <http://www.chem.utk.edu>
- University of Cincinnati:** <http://www.che.uc.edu>
- University of San Francisco:** <http://www.usfca.edu/mschemistry>
- Oklahoma State University:** <http://www.chem.okstate.edu>
- Wayne State University:** <http://www.chem.wayne.edu>
- University of Central Florida:** <http://www.cas.ucf.edu/chemistry/index.php>
- McMaster University:** <http://www.chemistry.mcmaster.ca/graduate>
- Florida Atlantic University:** <http://www.science.fau.edu/chemistry>
- Indiana University, School of Informatics:** <http://www.informatics.indiana.edu/>
- University of New Orleans:** <http://www.chem.uno.edu>

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in Chemistry

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COURTESY OF NORTHERN TEXAS COMMUNITY COLLEGE



COURTESY OF ACS MIDDLE GEORGIA SECTION



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COURTESY OF CATHERINE HUNT

Re-igniting our Commitment to Science and Technology

Education, Collaboration, and Innovation!

BY CATHERINE T. (KATIE) HUNT

It is with great pleasure that I am sitting down to say “Hello to the Future.” I sincerely believe that you, the students of today, are the scientists, technologists, and policymakers of tomorrow. From your ranks will come the leaders we will need at all levels in our organizations – from teachers, to professors, to college presidents; from technicians, to senior scientists, to CEOs; and from interns, to staffers, to members of Congress.

In a recent ACS leadership course, I learned that extraordinary leaders bring together three things: alignment (clear priorities, organizational focus, and teamwork), competency (skills to get the job done), and passion (seemingly unbounded energy and enthusiasm). An interaction that brings together alignment and competency without passion results in a chore that is not much fun for anyone. Competency and passion without alignment falls into the category of a mere hobby that can be personally fulfilling, yet doesn't move the organization forward. Alignment and passion without competency yields a “rookie” effort that results in weak implementation, at best.

That said, when you see an award-winning Student Affiliates chapter, you can see all three of these leadership characteristics shining through! From both students and advisors alike, there is a clear energy and enthusiasm for the science, an uncanny alignment on positively communicating chemistry, and an innate ability to reach out to the community. This is a warm and wonderful collaboration ... a true partnership.

So, what is my ACS presidential agenda? The answer is no less than re-igniting our commitment to science and technology. I believe that the keys to success in this endeavor are:

- Education to engage legislators, the media, the public, and the next generation;
- Collaboration to build a vibrant and vocal technical community; and
- Innovation to recreate our companies, our universities, and ourselves.

How does the Student Affiliates program fit with my ACS agenda?

Beautifully! Student Affiliates chapters represent an extraordinary example of collaboration. These cooperative relations can occur in a variety of forums, including ones between and among:

- Students and their advisors, and between SAACS chapters and local teachers/schools (they've been doing chemistry demos for years);
- SAACS chapters and ACS local sections across states (organizing their own scientific meetings complete with keynote speakers and poster sessions); and
- SAACS chapters and regional meeting program teams (coordinating outstanding undergraduate programming).

Each of these forums tests our commitment, builds our confidence, and ultimately develops professional leadership skills.

I firmly believe that no single company, university, or scientific society should go it alone ... so, why should you and your fellow Student Affiliates? I urge you to think “outside of the box” – or more to the point, outside your normal circle of collaborators. Think about partnering with your local libraries for chemistry demos, possibly in collaboration with the ACS Division of Chemical Information. Or, consider working with your local section government affairs group to bring the expertise of ACS members to bear

on science policy through the Legislative Action Network – the Society's electronic grassroots program for updating members on federal legislation and facilitating contact with members of Congress.

And I encourage you to be innovative. Try a different communication medium – like wikis or blogs to brainstorm ideas or drum up interest in new programs, podcasting to recognize contributions of your favorite SAACS advisor, or webcasting to ... (you fill in the blank!). And when you are ready for funding, consider writing an Innovative Activities Grant proposal.

The future will require us all to work together to address substantive technology issues. What types of issues? For starters, consider the Sustainability of Energy, Food and Water ... or Better Living through Biotechnology: from Materials to Biomaterials to Tissue Regeneration (the themes for the ACS national meetings for Spring '07 in Chicago and Fall '07 in Boston, respectively).

Every opportunity that I've had to interact with Student Affiliates has touched my heart and renewed my faith. I envy you all, because your participation in an ACS Student Affiliates chapter offers almost limitless possibilities. There is no question in my mind that your SAACS experience will better prepare you for the exciting and challenging experiences that lie ahead.

Thank you, from the bottom of my heart, for your dedication, commitment, and camaraderie. I look forward to working with you to achieve our ACS vision: Improving people's lives through the transforming power of chemistry. **ic**

CATHERINE T. HUNT is the 2007 ACS president and leader for technology partnerships at Rohm & Haas.

Always wanted to know what other chapters are doing... but never had the opportunity to ask? SAACS Chapter Spotlight includes questions and answers designed to inform and inspire chapters, as well as their faculty advisors. We encourage you to contact the chapters and advisors below to find out more!

If your chapter and advisor would like to be featured in the SAACS Chapter Spotlight, please contact Alicia J. Chambers at 800-227-5558, ext. 6176 or e-mail a_chambers@acs.org.

Florida Southern College

Lakeland, FL

Chapter president: Jonathan Revels

Number of chapter members: 22

Number of ACS Student

Affiliates: 10

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

Q What is your most successful recruiting event/method?

A We do several events that allow students to get involved with the community as well as accumulate community service hours. This keeps them involved and they tend to tell their friends about these activities, getting them interested in joining. One of our most successful and popular activities was when we collected toys for Toys for Tots last year. To encourage donations, we hosted a social cookout, for which the admission was one toy.

Q What is the most unique activity your chapter sponsors?

A Each month, we host laboratory activities for students in the AP chemistry course. Eight chapter members and 16 high school students have participated.

Q Does your chapter participate in NCW? What types of activities do you sponsor?

A The chapter always participates in NCW. We have an ongoing partnership with a local elementary school that serves predominantly low-income and minority children. This year we are collaborating with the local high school and a children's museum to offer free admission to the first 50 kids who arrive. We will also conduct activities such as slime-making and observing the tensile strength of

spaghetti! We are expecting about 100 children for this event.

Q Has your chapter presented research findings and/or chapter activities at a poster session?

A Chapter members have attended spring ACS national meetings since 2001. If students have been engaged in research, we encourage them to present posters. We have also presented our community outreach program at the poster sessions.

Q How often does your chapter meet?

A The chapter meets at least once a month; we schedule more meetings around NCW and ACS national meetings.

Q What methods of communication are used to inform chapter members of chapter activities?

A We rely on posters around the science building, word of mouth, professors' announcements in classes, and e-mails. Our meetings and activities are included in the students' monthly calendar.

Q How much money does your chapter normally gross as a result of fundraising?

A We raise between \$300 and \$600.

Q What is your most successful fundraiser to date?

A The most successful fundraisers currently are sales of lab safety glasses and T-shirts. Students who travel to ACS meetings also hold car washes.

Faculty Advisor Carmen Valdez Gauthier, 6 years

Q Why/how did you become a faculty advisor?

A When I arrived at Florida Southern College in 1999, the department's SAACS chapter had been inactive for several years. Having been a Local Section Career Coordinator, I felt that the students needed to know what ACS has to offer and to be active in ACS. I talked to the students enrolled in my inorganic chemistry course and we started the reactivation process. One of the students, Amy Rowley, was the catalyst. She was a strong leader and set a great example for the undergrads. The students are now the proud recipients of two outstanding and two commendable SAACS chapter awards.

Q What is your role as a faculty advisor?

A I serve as a mentor and make them aware of opportunities. I see

my role as a liaison with the ACS local section and ACS as a whole. In addition, I am a facilitator. Over the summer, I host a meeting with the officers where we discuss what it means to be a leader, review the previous year's activities, and plan a master calendar for the upcoming year.

Q What challenges have you faced in your position?

A Sometimes, lack of support from my colleagues, many of whom do not attend the social events that are organized by the chapter. Another challenge is serving as referee in the elections. We used to conduct our elections by raising hands, but that proved to be a disaster; we now use ballots.

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

A Getting to know students outside the classroom, seeing them mature and take their leadership roles very seriously, and watching them conduct community outreach activities. Many who are now in graduate school or in the workforce are still in touch; they still reminisce about their experiences at ACS national meetings.

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

A I would recommend a few things: 1) Convince one of your colleagues to serve as a co-advisor; 2) Get support from the administration; 3) Host a retreat for the officers — once school starts it is very hard to plan events; 4) Work with your ACS local section; 5) Have your students practice writing proposals for small grants; and 6) Read FANmail and participate in the activities that ACS has for faculty advisors.



COURTESY OF FLORIDA SOUTHERN COLLEGE

Northern Kentucky University

Highland Heights, KY

Chapter president: Joel Deye

Number of chapter members: 30

Number of ACS Student

Affiliates: 12

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

Q How do you retain members from year to year?

A We plan various social events and participate in intramural activities. For example, this year our chapter sponsored flag-football and dodgeball teams that competed with other student organizations.

Q What is your most popular chapter activity?

A National Chemistry Week is our most anticipated event of the year. Our chapter is the sole source for NCW activities in the Northern Kentucky area. This year we visited six area libraries to present demonstrations for elementary age children — and everyone who participated had a blast! Also, on Mole Day our chapter coordinated over 100 students, faculty, and staff to form a human periodic table.

Q Has your chapter presented research findings and/or chapter activities at a poster session?

A Each spring, members of our SAACS chapter attend the ACS national meeting to present a poster highlighting our activities. This is in addition to the posters our members present on their undergraduate chemistry research.

Q What methods of communication are used to inform chapter members of chapter activities?

A The major method of communication is e-mail. However, we also post messages on our website (<http://studenthome.nku.edu/%7Esaacs/>), hang posters and flyers across the campus, and encourage faculty to mention our activities in their lectures and labs.

Q What is your most successful fundraiser to date?

A Our major fundraiser is goggle sales. Each year, we also sell discount books and T-shirts that we design.

**Faculty Advisor
Keith Walters, 3 years****Q Why/how did you become a faculty advisor?**

A After the former advisor of the SAACS chapter left NKU, the group had fallen into some disrepair. I was the junior faculty member of the department at the time, and the chair felt that I could better connect with the students than some of the senior department members. I had honestly not thought about being a SAACS advisor at the time, and I quickly learned about the very large amount of work that was involved in having a successful chapter! In order to better handle the workload, I have been a co-advisor with another junior faculty member, Heather Bullen, for the last year.

Q What is your role as a faculty advisor?

A In addition to the typical guidance duties as a faculty advisor, I have played a synergistic role, directing the seminar/invited speaker program for the department. Traditionally our SAACS chapter members have selected speakers to invite to our department, and during the last three years, this program has greatly expanded. We have one of the most active invited speaker programs at NKU, with an average of four speakers per semester. These seminars have ranged from academic speakers to those in industrial and government chemistry positions. As is true for most SAACS chapters, the NCW program is a large part of our fall semester activities. We are the only organization to provide NCW programming to the three northernmost counties in Kentucky and also serve the suburban counties of Cincinnati, Ohio, typically giving five “magic shows” during the week. With the addition of a co-advisor, there has been consid-



COURTESY OF NORTHERN KENTUCKY UNIVERSITY

erably less demand on my time during the fall. I also serve as co-advisor to the Gamma Sigma Epsilon chapter that we founded at NKU in 2005.

Q What challenges have you faced in your position?

A As I've mentioned, the time demands of being a faculty advisor are enormous. Balancing these responsibilities with teaching and undergraduate research can be very challenging. Since we are largely a commuter campus, another common challenge for NKU student organizations is to maintain student interest and involvement when many have part-time jobs or family responsibilities. The SAACS chapter is no exception, although we have been successful attracting members by varying the meeting times and topics. Occasionally, eliciting faculty support for our activities has also been a challenge. While our chair is always behind the SAACS program and our activities, other senior faculty members do not always “buy in” to what we are trying to accomplish. Such situations lead to even larger time demands on the faculty advisors.

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

A Obviously, experiencing NCW is a real highlight, as many students (even those who are shy) really shine when they get in front of kids and show how cool chemistry is. What has even become more rewarding, however, is to take students to ACS national

meetings. In many cases, our students have not traveled very far from Cincinnati, so going to cities such as San Diego, Atlanta, and Anaheim has been an amazing experience for them. They also learn that they are great chemists with their own expertise to share with other Student Affiliates, and it comes as a surprise to many that our modest school can compete in the “big leagues” of chemistry.

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

A First and foremost, you won't (and can't) fix everything in a single year. Identify one or two major themes to work on during the year, and go from there. Never skip an annual report, since the feedback you obtain from your submission really helps to identify areas of improvement for your chapter. Again, sharing the advisor responsibilities with another faculty member is a big help whenever possible. Lastly, make sure that you empower your SA officers. It is, after all, their organization — they have to take ownership of the year's activities and plans. At the same time, however, know the limits of your officers, especially when you consider all the other demands on their time (coursework, job, family, etc.). Finding that ideal workload balance between officers and advisor is one of the hardest things for an advisor to do, and it's different every year!

LOOKING FOR CHAPTER ACTIVITY IDEAS?



COMPILED BY ROBIN Y. LINDSEY

ACS Student Affiliates chapters across the U.S. and Puerto Rico are engaged in exciting, innovative, and educational activities. In order to give all chapters the opportunity to expand their activities, we will continue to highlight chapters and their work as reported in the chapter reports. Submit your report with a good description of your activities, and your chapter's activity just might appear in a future issue of **in Chemistry**. If you have questions about any of the activities listed below or would like further information on how to implement them, please contact the SAACS chapter directly. Good luck!

Department/College Service

University of Maryland, College Park, MD
The SAACS Chapter at the University of Maryland-College Park hosted chemistry activities for kids at Maryland Day, an annual celebration at the university.

How long did it take to plan the activity and what was involved?

The planning took about a month. It involved choosing demos to perform, selecting hands-on activities for kids, and identifying any other displays we wanted to share with the public. We gathered all of the necessary reagents and equipment, and practiced the demos ahead of time.

What planning resources did you use?

We obtained the protocols for the experiments from various books on chemical demonstrations. We found the recipes for Silly Putty and 'oobleck' on the Internet.

How many SAs participated?

Five Student Affiliates participated in setting up the booth, running the activities, performing the demos, and cleaning up afterward.

How many people attended the event?

Maryland Day is a large annual campus-wide event, and last year it drew about 80,000 people to campus.

Approximately 100-150 people visited our booth and took part in the activities, which included making various substances, observing the distillation apparatus, and watching our demos.

What was the age range of the audience?

The audience included college students and professors, as well as families from the area. The children ranged in age from 5 to 14 years old.

How long did it last?

The event was held from 10:00 a.m. to 4:00 p.m. on a Saturday in April.

What safety equipment was required?

The Student Affiliates wore lab coats and those performing the demos wore goggles. Because the distillation apparatus was very hot, we also put up signs warning people not to touch the set-up.

For more information, contact Doug English, faculty advisor,
denglish@umd.edu.

National Chemistry Week/Mole Day/Earth Day

Nazareth College of Rochester, NY
The SAACS Chapter at Nazareth College of Rochester posted chemistry trivia questions each day during NCW.

How long did it take to plan the activity and what was involved?

The activity took only about a week to plan, although brainstorming for the event began very early in the semester. Planning this activity involved finding chemistry trivia that would not only be interesting, but would also teach students some scientific history, as well as fun facts about elements.

What planning resources did you use?

Chapter officers planned the event, finding the information for the trivia questions online, as well as in scientific textbooks and journals.

How many SAs participated?

Seven Student Affiliates participated.

How many people attended the event?

The trivia questions were posted in the Science Center, which is visited by science as well as non-science majors.

What was the age range of the audience?

All participants were over the age of 18.

How long did it last?

The trivia questions were posted throughout National Chemistry Week. We posted various trivia questions every day, as well as the answers to the previous day's questions.

What safety equipment was required?

No safety equipment was necessary for this activity.

For more information, contact Lynn O'Brien, faculty advisor,
lobrien9@naz.edu. 



ROBIN Y. LINDSEY is a lead program assistant in the ACS Education Division.

Partnerships for Success

Northeast Texas Community College's Creative Outreach Efforts

BY ELIDA V. BONILLA AND MARY C. HEARRON

THE STUDENT AFFILIATES Chapter of the American Chemical Society at Northeast Texas Community College (NTCC) is a small but vibrant and successful chapter. Our success is due to several factors, including three actively involved faculty advisors and a strong belief in promoting partnerships for success. These partnerships have provided us with ample opportunities for outreach to local schoolchildren and teachers, and have provided funding that allows our chapter to interact with the community by promoting chemistry and the excitement that comes from learning science.

Partnering with Communities in School

Since 2003, our chapter has partnered with the Communities in School (CIS) program at NTCC to provide science demonstrations and hands-on activities to local elementary, middle, and junior high schools. The mission of CIS is to “connect with business and industry, local public schools, NTCC, and families in providing young people access to community resources that will help them to successfully learn, stay in school, graduate, and prepare for life.”

In conjunction with CIS and the Society of Physics Students (SPS) group at NTCC, our chapter submitted a grant proposal to the Texas Education Agency through its State Engineering and Science Recruitment (SENSR) fund. Our proposal was initially funded for \$25,000 and has recently been renewed for the same amount.

The SENSR grant enabled us to purchase and equip a 20-foot enclosed



Members of the NTCC SAACS Chapter pose in front of their Science Road Show Trailer.

cargo trailer that houses our mobile science unit for our “Science Road Show.” The trailer is colorfully decorated on the outside with science graphics and the logos of our college, ACS, and SPS, as well as the logo of a local trailer manufacturer, Big Tex Trailers, which made a major contribution toward the purchase of the trailer itself.

The SENSR grant also helped us equip the trailer with innovative shelving that allows us to safely transport all materials necessary for our elaborate chemical demonstration shows. Prior to every Science Road Show, our SAACS chapter works with SPS members to prepare the materials for transport to local schools. We have brought our program to at least 10 different elementary and middle schools within our college’s service area.

The success of this program has created such a tremendous demand that our chapter has to work hard to keep up. We are booked weekly during the spring

semester, and recently had to modify the program to include bringing the students to our campus for the demonstrations. With transportation provided by CIS, students from all over northeastern Texas are bused to the NTCC campus during the last week in May. We offer two shows a day for three days.

To accommodate the large crowds, we book the Whatley Center for the Performing Arts on campus. The auditorium seats approximately 600, and we usually play to a packed crowd. Generally, up to a dozen Student Affiliates participate at any one show, along with two or three faculty advisors. Our program allows us to perform demonstrations and experiments on topics such as conductivity, gases and gas laws, flammability, pressure, centripetal forces, chemical reactions, and acids and bases. Safety is always a priority – before, during, and after every demonstration.

COURTESY OF NORTHEAST TEXAS COMMUNITY COLLEGE



Student Affiliates serve as judges at the Educational Service Center Regional Science Fair.

COURTESY OF NORTHEAST TEXAS COMMUNITY COLLEGE

The Science Road Show allows local schoolchildren the opportunity to see and participate in science first-hand. When our Student Affiliates see the faces of children involved in these demonstrations and hear them cheering for more, they know that they are making an impact in the children's lives. The experience that we gain in setting up laboratory equipment, performing demonstrations, and communicating basic science

concepts to students and their teachers allows us to increase our own understanding of science in a way that goes well beyond the traditional classroom and laboratory experience.

students in 49 school districts within the Region 8 service area. Our partnership contract with Region 8 ECS requires us to provide them with at least 25 student judges, for which our SAACS chapter is remunerated \$1,250. By serving as judges for the science fair, we have the opportunity to see how excited young children can be about science. Our Student Affiliates serve as role models for these budding young scientists, who in turn get



Science Road Show demonstrations draw a full house.

COURTESY OF NORTHEAST TEXAS COMMUNITY COLLEGE

to see how interested our members are in them and the scientific principles that they are investigating.

Partnering for the fair

When we serve as judges for the fair, we wear our red, white, and blue chapter shirts featuring our NTCC SAACS logo, which is made from the elemental symbols for

Another partnership that our SAACS chapter is actively involved in is with the Educational Service Center (ECS) in our area, Region 8. The Center's vision is to "create a partnership between school districts, teachers, school board members,

universities and community colleges, community members, and business leaders to provide quality services for school improvement that will prepare students to cope with the challenges of the future."

Every spring, our ECS sponsors a science fair open to all elementary and middle school stu-

Nitrogen, Technetium and Carbon (NTcC). We view each participant's project and listen to his or her presentation, and then follow with a question-and-answer session. Then the judges retire to a private area to determine the winners in each category as well as a "best in show" winner.

The funding we receive for judging the science fair entries allows us to purchase additional supplies for our Science Road Show and to attend the spring ACS national meeting.

Partnership with government

Through a new partnership with Northeast Texas Municipal Water District, our chapter has received \$5,000 for water quality monitoring at two locations on Big Cypress Creek in the Big Cypress Watershed. Two faculty advisors and four students participate in the field work and water monitoring. The funding provides equipment, travel expenses, and student stipends for participation. As a result of this grant, students are exposed to quantitative and qualitative data collection, instrumentation, and fundamental scientific principles.

Participants learn to calibrate and use a YSI multi-probe instrument to monitor parameters such as dissolved oxygen, pH, conductivity, and temperature. Additionally, water at these locations is monitored for nitrates and phosphates. Data are recorded on a bi-weekly basis, analyzed, and reported to the water district semi-annually. We plan to present a research poster on our work at the spring ACS national meeting.

All of our partnerships provide us with opportunities to interact with various members of our community on the local, regional, and state levels. The funding from each of these partnerships allows us to attend almost every meeting of the East Texas Section of ACS, and we have hosted section meetings on our own campus. Our Student Affiliates have gained insight into seeking funds for various activities, promoting science and chemistry in the community, and practicing leadership and research skills — insights that are generally unavailable to undergraduate students in a small, rural community college. **EC**

Partnering with government

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ELIDA V. BONILLA is a sophomore biomedical sciences major and president of the NTCC SAACS chapter. MARY C. HEARRON is a faculty advisor of the NTCC SAACS chapter. Additional faculty advisors are James Archer and Lawrence Brough.

joining together

Student Affiliates partnerships in action

BY ALLISON BYRUM PROFFITT

ACS PRESIDENT-ELECT CATHERINE T. Hunt is calling for partnerships and collaborations across the Society, and in many ways Student Affiliates are already there.

In her election platform, Hunt encouraged ACS members to build strong partnerships across academia and industry. Collaboration, she says, is key to the future of science and research. "Science and technology partnerships are essential," she explains. "Just as no one company can go it alone, no scientific society should go it alone." Hunt calls for joining forces with other scientific organizations and leaders in industry and academia, and urges individual members to partner together to actively represent ACS.

Student Affiliates play a vital role in the future of these partnerships. Through interactions with other Student Affiliates chapters, ACS local sections, and other chemical and scientific organizations, Student Affiliates can model the interactions Hunt hopes the Society as a whole will strive toward and lay the groundwork for future partnerships.

Joining forces

One of the most natural collaborative efforts is to work with other scientific organizations. As you may know, the Society is working to strengthen its rela-

tionships nationally with groups like the American Institute of Chemical Engineers (AIChE), the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCChE), and the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS). In the same way, Student Affiliates chapters are encouraged to reach out to the student chapters of these and other organizations to develop alliances and joint projects.

The University of Puerto Rico-Río Piedras Student Affiliates co-hosted a research conference with Minority Access



COURTESY OF UNIVERSITY OF PUERTO RICO-RÍO PIEDRAS

to Research Careers to encourage undergraduate students to continue on to graduate research. Though the conference wasn't limited to chemistry, it gave the attendees insight into research opportunities and the chance to meet and get to know other minority scientists.

In Waynesburg, Pennsylvania, many Waynesburg College SAACS members are also members of the student chapter of the Society of Analytical Chemists of Pittsburgh. Students active in both groups benefit from networking and professional development opportunities in both circles.

There may be student chapters of other scientific organizations on your campus (see the Web sites listed on the inside cover). Take the initiative to reach out, and expand your network within the scientific community.

ACS collaborations

If reaching out to other scientific organizations seems daunting, there are plenty of collaborative opportunities within ACS to consider as alternatives. For example, several SAACS groups have spearheaded joint events with ACS local sections and other Student Affiliates chapters.

With 10 active SAACS chapters in one local section, opportunities for joint events abound for Puerto Rican Student Affiliates. The University of Puerto Rico-Río Piedras was one of ACS Immediate Past President William Carroll's stops on his Extreme Tour during National Chemistry Week. The Río Piedras Student Affiliates chapter and the Puerto Rico Local Section took advantage of Carroll's visit to work together on a massive outreach program, *Festival de Química*.

More than 100 Student Affiliates representing 10 Student Affiliates chapters on the island worked together to staff interactive tables and inquiry-based activities throughout the day for a "Scout University." At this event, more than 500 Boy Scouts earned science badges, and 180 earned chemistry merit badges and the 2005 National Chemistry Week patch. Afterwards, the *Festival de Química* event began, featuring 12 Student Affiliate-staffed stations presenting chemistry demonstrations for all 500 Scouts, their families, and the community.

Student Affiliates chapters from Inter American University campuses in San

Juan and San Germán, the Pontifical Catholic University in Ponce, the University of Turabo, and the University of Puerto Rico campuses at Aguadilla, Arecibo, Cayey, Humacao, Mayagüez, and Río Piedras participated in presentations on a range of chemical concepts, including bubbles, polymers, density, and more. The interactive components focused on teaching fundamentals of chemistry and the scientific method.

Ingrid Montes is both the Río Piedras SAACS faculty advisor and the local section National Chemistry Week chair. It was important to her, she explains, to get as much of the ACS community involved as possible, because one of the main goals for the events was to "ensure participation of all of the Student Affiliates chapters in Puerto Rico."

Meetings grant from the ACS Undergraduate Programs Office. The end result was a day-long program including a Successful ACS Student Affiliates Programs Workshop featuring Student Affiliates from Millersville, Wilkes, and St. Francis Universities, as well as a Chem Demo Exchange, a panel discussion on



Scenes from *Festival de Química*, an outreach program held during National Chemistry Week in Puerto Rico.

Students in the middle Atlantic region took on a large planning project as well. The Middle Atlantic Regional Meeting (MARM), hosted by the Southeastern Pennsylvania and Susquehanna Valley Local Sections in June 2006, was an opportunity for collaboration for SAACS chapters from each of the two local sections.

The SAACS chapters at Millersville University and Wilkes University joined forces to present the undergraduate program at MARM. Together the two chapters applied for and received an Undergraduate Programming at Regional

careers, a poster session for undergraduates, and a reception. Together, the SAACS chapters served over 100 students at their events. Wilkes and Millersville students also worked closely with the two host local sections to staff the registration desk, help with signage, and generally run the regional meeting.

Developing your relationships within ACS is not only great professional development, but fun as well. Make it a goal to reach out to a neighboring SAACS chapter or your local section at least once a year and plan an event to bring the two groups together.

Community collaboration

Outside of scientific partnerships, Student Affiliates are also working to build local connections by collaborating with community groups and programs. From working with schools to volunteering with local government offices, Student Affiliates are seeking out ways to become more involved in their communities.

For example, the University of Puerto Rico-Río Piedras SAACS chapter works closely with the AlaCiMa program, an NSF-funded program designed to train teachers and encourage students to pursue science careers. Together, they host an open house for highly talented high school students and put on an annual “Magic of Chemistry” demonstration. Last year’s event reached 75 high school students, and the Student Affiliates used the opportunity to discuss chemistry and the sciences and to encourage local students to consider a scientific major.

The members of the South Texas College SAACS chapter reached out to their community in a different way. Working with their local section and the local parks and recreation office, the group planted trees throughout the city of McAllen, Texas. Thirty volunteers, including undergraduates and local section members, planted more than 30 trees.

Pair community service with chemistry, and see what your chapter can accomplish! There are many creative ways to link chemistry and service. Take this opportunity to let your community know about the great things chemistry offers.

Social events

Finally, there’s the type of collaboration at which Student Affiliates are especially skilled: social events. Several Student Affiliates chapters have held fun events with other groups to encourage interaction between different communities of scientists.

Morehouse College and Spelman College, two historically black colleges in Atlanta, co-hosted the Undergraduate Social at the fall ACS national meeting in 2006. This was a great opportunity for students from across the country to have some fun at the national meeting and hang out with their future chemistry community colleagues.

“By working with others, Student Affiliates are expanding their networks, collecting new ideas, and enriching their experiences as members of the chemical community.”



The South Texas College SAACS chapter worked with their local section and local parks and recreation office, to plant trees in McAllen, Texas.

On a smaller scale, SAACS chapters have planned social events to bring together groups on their campuses. At the University of Puerto Rico-Río Piedras campus, Student Affiliates have built collaboration into their chapter’s social calendar. The group co-hosted two softball games with the American Medical Student Association. Fifty students and faculty attended, and the games were great successes. They were also excellent opportunities to bring together science majors across several disciplines.

Collaborations don’t have to be completely serious. Some of the most valuable connections can be made in a relaxed atmosphere. When you brainstorm partnering events, remember to plan some fun!

Partnering benefits

Chemistry, like all research sciences, must be a collaborative effort. By working with others, Student Affiliates are expanding their networks, collecting new ideas, and enriching their experiences as members of the chemistry community.

Opportunities for partnership are everywhere for Student Affiliates who know where to look. Start on your own campus and look for ways to work with, or just have fun with, other science students. Reach out to other area Student Affiliates chapters and plan ways to learn from each other — and as a result, you may achieve some goals that are bigger than any one group could accomplish alone. Engage your local ACS section and take advantage of the expertise

and experience available through its members.

Collaboration is crucial to research, but it is just as important to professional development. Student Affiliates can lead the charge — by working together, having fun, and building partnerships that will last well into the future. **ic**



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Want to Make Your Activities

Bigger, Better?

Collaborating with Local Sections Could Be the Key!



COURTESY OF ACS MIDDLE GEORGIA SECTION

BY ERIC R. STEWART

IN CHEMISTRY ORGANIZATIONS OF EVERY SIZE and industry, teamwork and group efforts are not only encouraged — they're often standard operating procedure. It's no mystery: collaboration naturally produces better results.

Your chapter can benefit from collaboration as well, and one of your most valuable potential allies is the ACS local section serving your geographical area. "When local section members and Student Affiliates join efforts," notes Marisa Burgener of the ACS Office of Community Activities, "amazing things are possible! Section members can be sources of useful information, provide you with insights into careers, invite you to monthly meetings, or speak before your chapter."

Not only that, but your area's local section is highly interested in working with you. According to Will Lynch, chair of the ACS Committee on Local Section Activities, "One of the missions of each local section is to interact with and assist future section members — that is, chemistry undergraduates. Local section officers are eager to interact with Student Affiliates chapters in their regions."

Bob deGroot, an education and outreach director at California Institute of Technology who works for the National Science Foundation Center for the Science and Engineering of Materials, echoes this point. "In my local section in the Los Angeles area," he explains, "there's a very strong focus on outreach. But there's also one of *inreach* — where we reach out to our own members and Student Affiliates chapters and gather them together."

Benefits of teaming

The benefits of teaming up with a local section are numerous, and occur on a variety of levels. Here are just a few.

Outreach with greater impact. One powerful example of the synergy that can occur when Student Affiliates team up with local sections is in events for National Chemistry Week.

Yvonne Akpalu, a professor at Rensselaer Polytechnic Institute and her local section's NCW coordinator, notes that undergraduates were a huge part of her section's successful event. "The college students added a great deal to our event," she recalls. "They displayed a level of enthusiasm for chemistry that the children and parents couldn't miss. And they also served as role models for the young children in a way that our older section members could not. Most of all, there was a beautiful balance between the students serving as role models to the children, and our section members serving as role models to the students. I think the children and their parents could see the happiness and excitement of chemists at each stage of their careers — and we couldn't make a better sales pitch for chemistry than that."

Bigger events, more splash. Another benefit of collaboration with a local section is that by combining efforts, you can reach a much larger audience.

For example, deGroot mentions the impact that occurred when his local section collaborated with Student Affiliates in southern California to participate in the Sally Ride Science Festival. Because the program focuses on engaging middle school-aged girls in science and engineering, deGroot's local section actively recruited women Student Affiliates as participants. "Of course, everyone was welcome," he explains, "but female Student Affiliates were not only able to physically help the girls conduct activities, but also served as living role models." The combination of local section support and the name recognition of the Sally Ride organization, deGroot observes, also made for a stronger recruiting and marketing effort.

Access to more resources. According to deGroot, local sections can offer Student Affiliates chapters significant resources

for activities and events. “In addition to the section’s own resources,” he observes, “they can often leverage even more. For example, section members who work for a supply company can provide materials for demonstrations, while others can offer significant human resources.”

As a member of the Southern California Local Section, one of deGroot’s official roles is National Chemistry Week coordinator. However, he adds, his role is more accurately that of community activities coordinator, since he works with Student Affiliates chapters from a number of institutions in the Los Angeles area on other outreach events throughout the year, such as Chemists Celebrate Earth Day.

Career insights and connections. When a Student Affiliates chapter collaborates with a local section, there are also personal and professional benefits for the individual Student Affiliates involved.

For chemists starting out on their careers, one of these benefits is the opportunity to personally meet, and work side by side with, local professional chemists. Such relationships can be valu-

able in a number of ways. The chemists can share insights about choosing among research and postgraduate options, getting started on a career, and making the best decisions while still in school. They can also help you meet other chemists who may be able to help you in your career — finding employers, preparing yourself for graduate school, and more.

Student Affiliates chapters to collaborate with local sections. “I think it’s important for Student Affiliates to see that they’re part of a larger scientific professional community in the ACS at the local, regional, and national level,” says Mary Carroll, chemistry professor at Union College in Schenectady, New York and faculty advisor of her institution’s chemistry club. “By interacting with working chemists, they can learn about a range of career options they may not have otherwise considered, and build valuable contacts and sources of information for their future careers.”

Getting started is easy

To learn more about collaborating with local sections, talk with your faculty advisor. He or she will have contact information, and in many cases, may already be a member of the local section in your area. Naturally, you can also visit the Student Affiliates program Web page for support and resources (<http://chemistry.org/education/saprogram.html>). Other resources include the ACS Office of Local Section Activities (<http://chemistry.org/localsections>), the National Chemistry

More Ideas for Collaboration

You can increase the impact of almost any type of outreach activity by joining forces with your area’s local section. Here are just a few ideas for joint activities:

- Chemistry demonstrations in local schools
- Participation in NCW and Chemists Celebrate Earth Day events
- Sponsoring on-campus talks by local chemists
- Helping local sections run regional meetings



Looking for Other Partners?

Local sections make natural partners for your chapter — but there are many other potential allies as well. For example, any chapter that has done community outreach or chemistry demonstrations knows the value of coordinating with local elementary and secondary schools.

There may also be other organizations on your campus that you could team up with to create a larger event or attract bigger audiences. And don’t forget to reach out to other organizations in your community that may be allies — Boy Scouts, Girl Scouts, and other youth or civic organizations.

able in a number of ways. The chemists can share insights about choosing among research and postgraduate options, getting started on a career, and making the best decisions while still in school. They can also help you meet other chemists who may be able to help you in your career — finding employers, preparing yourself for graduate school, and more.

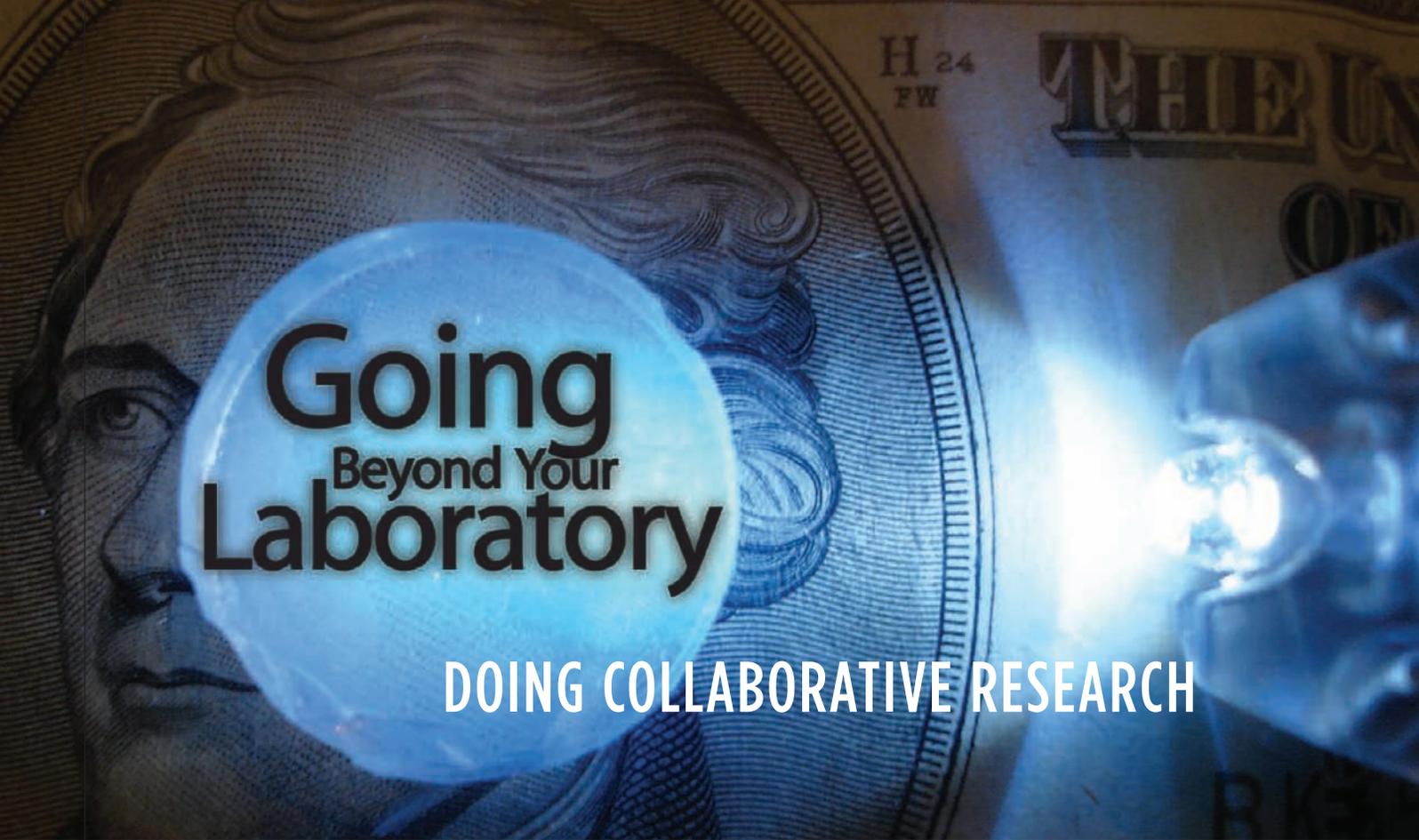
In addition, a local section may already conduct career-related events in which your chapter can participate. “A number of local sections sponsor undergraduate research events, where Student Affiliates are invited to present their research through posters or presentations,” says Lynch. “Others conduct career development workshops with résumé reviews, mock interviews, and more.” Often held in the spring, these events are also opportunities for

Week online resource (<http://chemistry.org/ncw>), and the ACS Office of Community Activities (<http://chemistry.org/oca>).

By connecting and collaborating with local sections and other allies, you can greatly increase the impact of your events and activities ... and improve the personal benefits your chapter members receive. We encourage you to get started today! **IC**



ERIC R. STEWART is a freelance writer and editor based in Arlington, Virginia.



Going Beyond Your Laboratory

DOING COLLABORATIVE RESEARCH

ALEX CAPECELATRO

BY KIMBERLEY A. FREDERICK AND JODI L. WESEMANN

HAVE YOU EVER WANTED TO UNDERSTAND how the material you are learning in your chemistry classes connects to the broader world? Just ask students pursuing research projects, particularly those that involve collaborating with more than one research advisor and group. They can tell you how analytical chemistry and mass spectrometry help solve problems of neuronal development in crustaceans, how infrared spectroscopic analysis might benefit diabetes patients, how manufacturing can be made safer, and how altering synthetic routes can advance materials science.

Such collaborative projects are becoming increasingly common, thanks to more complex and interdisciplinary research questions. They provide some wonderful opportunities — as long as you know what to expect and how to make the most of the multi-investigator environment.

Working with a range of research partners

Collaborators come from many different places: from scientists within your department to those at other academic institutions, government labs, or industrial companies. Regardless of the location of those involved, scientific collaboration involves people with different expertise working on more complex problems than any one researcher could address separately.

One example involves a group of students and two faculty members (one from chemistry and one from biology) at Bowdoin College, Brunswick, ME. This group of scientists is

using mass spectrometry to study a family of neuropeptides called orckinins in order “to construct a phylogenetic tree to describe the evolution of the decapod crustaceans.” As Bowdoin senior Chris Cashman says, “Often, people see a separation between the detail of chemistry and the larger picture described by biology or neuroscience. But a collaborative project allows me to see how things can fit together.”

It is easy to imagine how to conduct your research when you simply need to transport your samples and yourself across the hall or campus to collaborate with partners. But how does it work when the research partners are at an entirely different institution — another college, industrial facility, or government lab?

At Southwestern College, a community college in Chula Vista, CA, samples of dehydrated and rehydrated cells were either delivered from the medical school at University of California-San Diego (UCSD) or prepared on the Southwestern College campus by UCSD researchers. As a sophomore, Enrique Lopez used FTIR to determine the effectiveness of rehydration techniques being developed to save extremities of diabetes patients. Now a manufacturing process engineer at Cymer, Inc., Lopez says, “It was a win-win situation. The UCSD researchers had their samples analyzed at no cost. I had the opportunity to use sophisticated analytical instrumentation, which is rare at the undergraduate level.”

Another example of diverse partners collaborating on research occurred at Maryville College, TN, where a group collaborated with Denso, an automobile parts manufacturer located down

the street. A team of researchers from the college and the company worked together to model the use and discharge of isopropanol, a chemical used by Denso to clean their electronic boards. In this case, research was done both at the college and on the plant floor.

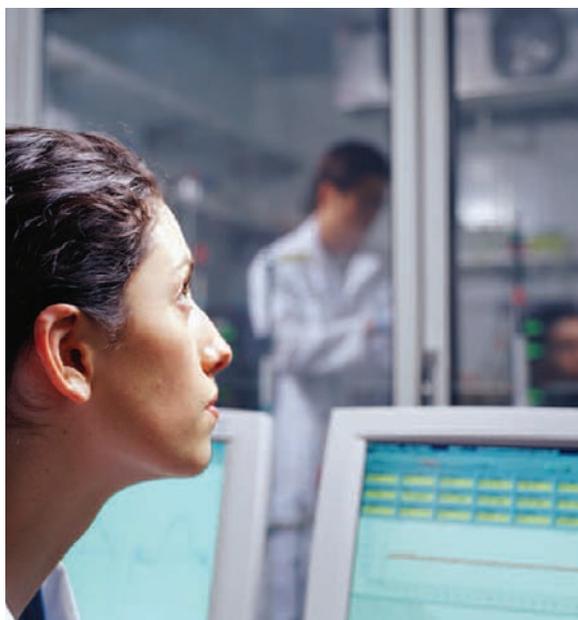
Working with research partners from different departments or disciplines requires some common understanding and the ability to explain your research goals and terms. The contrast between academic and industrial research objectives struck Alice Brank, a senior at Maryville. "Academic research focuses on projects which are new and innovative, while industrial research is more practical. By combining the two, we came up with an interesting way to solve a problem that was also very practical."

At the Naval Research Laboratory (NRL) in Washington, DC, like many national and federal laboratories, collaborative research is ubiquitous. In 2000, Lala Qadir, then a sophomore at Duke University, spent a summer working with researchers at NRL and George Mason University (GMU) in nearby Northern Virginia. Although the experiments were conducted at NRL, Qadir made several visits to GMU, from which she received credit for two summer courses. Now a strategy consultant at Booz Allen Hamilton, she reflects, "I really enjoyed being at the intersection of disciplines, where electrochemistry and materials science converged."

Benefiting from collaborative interactions

Working with research partners and being exposed to bigger scientific pictures, sophisticated instrumentation, different perspectives, and new locations has a number of tangible benefits. For example, students often mentioned that having multiple mentors was one of the best parts of a collaborative project. Because different research advisors can have varying backgrounds and research styles, you can learn much more. "Working in a networked environment allowed me to tap into colleagues with a range of skills and expertise, each of whom helped me develop my research methodology," recalls Qadir. "I refined my sense of the scientific process and how I could contribute to it."

Being part of a collaborative research project also enhances your problem-solving abilities. Amanda Barrow, a junior at Union College who spent a term working as a "Washington Semester" intern at NRL rather than on Capitol Hill, states, "You are exposed to a broader range of science, and learn multiple ways to approach problems." You can also get an



GETTY IMAGES

"I learned the importance of mapping out expectations and milestones, and the steps needed to reach them."

idea of how the chemistry learned in class is linked in other ways. "By seeing how one thing fits into another, the understanding of each is improved, just as the role of a key is not fully appreciated unless the lock is known too," says Cashman.

The abilities to work in teams, communicate, and manage are also developed in collaborative research projects. Barrow notes that at NRL, "everything is done as a team." Qadir echoes this point, stating, "We engaged by building bridges between key players... I learned the importance of mapping out expectations and milestones, and the steps needed to reach them."

Collaborative research projects may also give you an opportunity to interact with graduate students, postdocs, and professors

from other institutions. As Professor David Brown of Southwestern College says, "the opportunity not only gives life to topics in chemistry but also opens doors for the undergraduate student to see into the future. He or she may interact with other researchers and develop insights into what life is like as a graduate student, postdoc, professor, etc., and be better prepared to make life and career decisions."

If you think that a position in the chemical industry might be for you, then a collaborative project can be a great opportunity to get exposure to these types of settings. Brank, whose collaborative project involved an auto parts manufacturer, experienced this benefit. "It was good to learn a different perspective. We couldn't

lock ourselves away in the lab. We had to make sure to balance what all our mentors wanted. Our industrial mentor had totally different approaches and considerations." An additional benefit she mentions is that "we got to work closely with employees, and it was cool to have feedback from people working on the manufacturing plant."

Alex Capecelatro, a freshman at UCLA who also worked at NRL, sums it up this way: "Working on a collaborative project, you get multiple perspectives and a range of ideas. Also, it is just more fun."

Advice from those who have been there

What should you keep in mind if you are already involved in or considering a collaborative research project? Cashman advises, "Collaborative projects require more time. Rather than learning about one specific field, it becomes necessary to learn the background and techniques for two (or more). Of course, once you're over this initial barrier, the

rewards are great!" These sentiments are echoed by Capecelatro, who encourages students to "do a lot of reading," and Barrow, who recommends that students "listen carefully."

Maintaining communications, managing expectations, and keeping focused on milestones will ensure that research progress is made. Qadir reminds students to "stay focused and schedule check-in points." Brank echoes the need to "keep in constant contact with both advisors and other students. You need to consider overall goals so that the project is successful, which means that you have to keep in mind what everyone wants to get done — not just what you think should be done."

Julio de Paula, dean of arts and sciences at Lewis and Clark College, recommends that before embarking on such a project students "talk to other students already participating and find out how [their advisors] handle the collaboration from the students' perspective. It is possible that a student can 'fall through the cracks' between two research groups. Generally, students who are proactive about their education (willing to initiate conversations with other students and faculty, rather than wait for marching orders) fare better in these situations, no matter how nurturing the faculty members may be."

Having advisors who can help with administrative challenges is also important. As Lopez experienced, when collaborative projects are funded by grants, getting funds for supplies and equipment takes negotiation. Obtaining support for presenting

results at conferences also takes negotiation, notes Capecelatro. Qadir navigated the process of gaining government clearance and transferring credits from one academic institution to another.

As with any other activity, what you get out of working on a collaborative research project will reflect what you put into it. Qadir encourages students to "live the partnership." By taking the initiative and embracing the many opportunities to learn, you can advance science and develop professionally, gaining transferable skills and acquiring valuable insights that will shape your career. **FC**



KIMBERLEY A. FREDERICK is an associate professor of chemistry at the College of the Holy Cross, Worcester, MA. She and her students do research in capillary electrophoresis, microfluidics, and Raman spectroscopy. They have benefited from collaborations with researchers at Whittier College, Louisiana State University, Rensselaer

Polytechnic Institute, and the National Institute of Standards and Technology. **JODI L. WESEMANN** is the assistant director for higher education at the American Chemical Society. She was involved in collaborative research projects while a chemistry professor at Saint Mary's College of California. Both Frederick and Wesemann are chemistry councilors for the Council on Undergraduate Research.

2007 Mid-Atlantic Regional Meeting Ursinus College May 16-18, 2007

Interested in networking with other students and colleges?
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The Role of INTERNATIONAL SCIENTIFIC *[in the 21st Century and Beyond]* COLLABORATIONS

BY EDWARD M. OLANO

THERE IS NO DOUBT THAT INTERNATIONAL exchange of scientific ideas during the last century has been an important aspect of global scientific achievement. For example, the International Space Station is a joint research project of five space agencies: the National Aeronautics and Space Administration, the Russian Federal Space Agency, the Japan Aerospace Exploration Agency, the Canadian Space Agency, and the European Space Agency. In the field of nanotechnology, the International Nanotechnology and Society Network (INSN) was created to foster international scientific collaborations. The INSN comprises the U.S., Brazil, Mexico, Japan, Australia, the United Kingdom, and Germany.

In today's world, some of the globe's most pressing problems necessitate international research partnerships. Thus, it is important for the public, especially students, to understand that international collaborations are essential in advancing science to the next level, where some of the critical issues facing mankind today — such as global climate change, disease control (e.g., SARS, AIDS, cancer) and energy production — will perhaps be resolved.

Asia, Latin America and Europe have experienced the largest increase in international collaborations over the last five years. Scientists in these parts of the world have realized the advantages of collaborations that stretch across continents.

Dr. Derek Cunningham, a Scottish-born material scientist, is an example of a researcher who recognized the importance of international collaborations nearly a decade ago. Cunningham earned both his B.S. in chemistry and his Ph.D. in material science from the University of Strathclyde in Glasgow, Scotland. Cunningham is currently CEO of Scientific Observer, an online scientific publishing company based in San Jose, California.

SACNAS News talked with Cunningham about the current and future importance of international scientific collaborations and what he recommends to science and engineering students as they begin their journey toward a professional science career.

SACNAS News: Tell us about the positions you have held since earning your Ph.D.

Derek Cunningham: My first job was at the Osaka National Research Institute in Japan. It was an exciting experience and I was the first-ever foreign member of the staff. After spending eight years in Japan, I was approached by Bayer AG to work in their Central Research Department based in Dormagen and Leverkusen, Germany. I worked there for two years developing novel catalytic systems and designing Bayer's first automated catalytic research facility. I then worked for a small startup company named Avantium Technologies in Amsterdam, the Netherlands. After a few years, I finally moved to the U.S.

SN: You have experienced science in many different countries. Why do you think scientists and students should explore international collaborations?

"Students who plan to pursue a career in science need to realize that the future will be more than just doing experiments and developing new theories; it will be one of international teamwork."

DC: International collaborations are crucial because of the different ways in which scientific research is done. For example, in Germany, emphasis is placed on the logical development of an experiment with strong reliance on theory. In the United Kingdom, there is a strong reliance on approach. In Japan, the emphasis is more on individual research. Any major discoveries made are addressed rapidly by industry through systematic and complete experimentation. I think that in order for scientists to grow, they must be exposed to the different ways in which science is done.

SN: What do you think is the biggest obstacle for international collaborations?

DC: In a single word: language. There is a widespread misconception among scientists that most large-scale journals publish in English, and therefore all scientists know and speak English fluently. In fact, international collaborations are simple and straightforward for only those exceptional individuals who are comfortable with speaking a foreign language. It's a sad fact that most native English speakers

choose to only participate in an international collaboration with a foreign-based scientist if that scientist shows a very good, if not outstanding, command of the English language. For the 80 percent of scientists who do not fit this category, any thought of starting an international collaboration with a U.S.-based team is simply a dream.



Derek Cunningham is not only a noted international scientist, but a dad too!

Students who plan to pursue a career in science need to realize that the future will be more than just doing experiments and developing new theories; it will be one of international teamwork.

SN: *Twenty years from now, how important do you think international collaborations will be?*

DC: In the next 20 years, I think collaborations will become very important. I see some problems, however. Patent applications have recently increased in number at an unbelievable rate, and by law it is necessary for patent officials to check all public information, even when it is published in foreign text. This may force some international collaborators to publish in English, but it may also cause others to actively choose to publish their results in a foreign language, to help protect commercial data. For example, many Japanese firms now choose to publish only in Japanese to hinder uptake of their ideas by fast-acting U.S. and European firms.

SN: *What final words do you have for science and engineering students?*

DC: There is no doubt that international scientific collaborations will become very important in the future. The ability to work with scientists from different countries will be another skill that all scientists must possess. We invite the students of science and engineering to rise to the challenge and play an active role in this for the future. **EC**



EDWARD M. OLANO earned his B.S. in chemistry from the University of California, San Diego, and his M.S. in physical chemistry and combustion engineering from the University of Texas at Austin. He is currently an undergraduate research counselor for the Undergraduate Research Opportunities Program at the University of California,

Irvine. He also serves on the board of directors for Scientific Observer, as well as other scientific organizations and companies.

**234th ACS National Meeting
Boston, MA
August 19-23, 2007**

International Research Participant Call For Papers

Have you pursued an international research experience?

If so, the American Chemical Society's Committee on International Activities invites you to present your research at the Undergraduate Research Poster Sessions sponsored by the Division of Chemical Education during the 234th ACS National Meeting this fall.

Students presenting posters based on international collaborations will be recognized by the Committee during the sessions. Please designate yourself as an international research participant when submitting your abstract and e-mail Beth Rudd at b_rudd@acs.org to confirm your participation.



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PASSPORT TO SCIENCE

Once outnumbered by humanities majors, science students are now studying abroad in force

BY LINDA WANG

IN MAY, KATIE LOMBERK graduated from Arcadia University, Glenside, Pa., with a bachelor's degree in chemistry and mathematics. She got her degree in just three years and still found time to study abroad, in London. Add to that Ireland, Greece, Turkey, Mexico, China, and Egypt.

Lomberk's globe-trotting adventure is not typical among chemistry students, but she is no longer the exception. As study-abroad programs grow in popularity, science students are finding ways to make it work for them.

Nonscience majors have traditionally consisted of the largest percentage of students who study abroad. According to a 2005 "Open Doors" report on study abroad published by the Institute of International Education, physical sciences, engineering, and health sciences accounted for only 13.4% of the majors studying abroad in the 2003-04 academic year.

"Most science students are afraid to study abroad. They think they can't do

it," says Tomas Baer, a chemistry professor at the University of North Carolina, Chapel Hill (UNC-CH), and coordinator of the Trans-Atlantic Science Student Exchange Program (TASSEP), a large science exchange program in North America and Europe. He explains that many science students are worried they'll get behind in their coursework if they go abroad. "Our job as faculty members is to tell them, 'You can do it.'"

Studying abroad has clear advantages for science students. Overseas, they are exposed to different approaches to teaching and learning, they gain professional contacts, and they learn to solve problems on the fly. "A global experience is very important for budding scientists to have because they come back and think about what they are learning and how they're learning science in a very different way," says Preetha Ram, assistant



Gardner (back row) poses with schoolchildren in Ecuador after teaching them biodiversity games.

COURTESY OF BRODINE GARDNER



dean for science at Emory University. "They're more accepting of the fact that they are going to be interacting with international colleagues and that the whole landscape of science is changing."

Robert G. Cluss, professor of chemistry and biochemistry and dean of curriculum at Middlebury College, in Vermont, says students who have gone abroad come back more grounded, more confident, and with a better perspective of the world.

Still, with their heavy course loads, and because of the sequential nature of these

fit in a semester or year abroad. Arcadia University does something similar, in addition to making sequential courses such as chemistry 101 and 102 available in the fall, spring, and summer.

The effort is paying off. At Emory University, only 7% of science students studied abroad in 1997. Now 20% do. At Middlebury, a quarter of chemistry and biochemistry majors study abroad every year. And at Harvey Mudd, the number of science students who go abroad has been growing every year.

Once a student decides to study abroad, there are many things to consider. For one, students must find out whether they can receive credit for the courses they plan on taking abroad. Arcadia addresses this by keeping a list of "approved" foreign universities. Arcadia faculty are stationed at each

conduct research in labs in foreign countries. The Fulbright Program (us.fulbrightonline.org) also provides grants for students to do research abroad. And the National Science Foundation offers a variety of fellowships for a similar purpose.

A strong study-abroad program is one way some universities are distinguishing themselves. In fact, Arcadia University is so well-known for study abroad that students choose the school for that very reason. "We were looking for something that would be very distinctive and that would make our university unique, truly different, and truly forward looking, and I think we've found it," Mikulski says.

Several dozen U.S., European, and Canadian universities have joined together under TASSEP to offer a structured study-abroad experience for science students. Unlike at many universities where science students take nonscience courses abroad, students participating in TASSEP take predominantly science courses.

TASSEP allows science students to be abroad for a year and still make progress toward their degrees, says Lani Stone, an academic adviser and coordinator of the TASSEP program for the University of Washington,



COURTESY OF KATIE LOMBERK

courses, science majors can feel apprehensive about being away for a semester or a year. All of the students *C&EN* interviewed, however, say that going abroad was one of the best experiences of their lives and that they were able to fit it in and still graduate on time. The key to making it work, they say, is to plan ahead.

Many chemistry faculty are helping students plan ahead by introducing them to the idea of studying abroad during their freshman year. "You cannot begin thinking and planning too early," says Cluss, who helps students interested in studying abroad plan a course of study.

Gregory C. Tucci, assistant director of undergraduate studies for Harvard University's department of chemistry and chemical biology and a concentration adviser, says that in the past several years, he has been asking every freshman concentrating in chemistry whether he or she plans on studying abroad. If so, he offers the student advice on how to structure the course work to be able to fit it in.

Some colleges, like Harvey Mudd College, Claremont, Calif., have created road maps that list the sequence of courses science students need to take to

Lomberk (left in photo at top) and two friends emerge from the Boho Caves in Northern Ireland, where they observed stalagmites and stalactites; (photo below) students from Emory University watch a demonstration on glassblowing in Murano, a coastal island near Venice famous for its handblown glass.

of these institutions to help students select courses that will transfer. "We don't want them just studying anywhere," says Chester M. Mikulski, professor and chair of the department of chemistry and physics at Arcadia. "We want them to study at a quality university."

Another consideration is cost. Studying abroad would seem expensive, but students who have done it say that it often does not cost any more than tuition in the U.S. Financial aid and scholarships are also available to help. At Harvard, Tucci says, many science students take advantage of Herchel Smith Harvard Undergraduate Research Fellowships to



COURTESY OF PREETHA RAM

Seattle. She adds that faculty science advisers are available at each of the participating universities to help students choose appropriate courses that will transfer.

Another unique aspect is that the program requires students to have language proficiency, and they will often take their courses in a foreign language. Jason Bischof, a senior at UNC-CH and a

chemistry and biology double major, took chemistry and biology courses in French when he studied abroad in Grenoble, France, in his junior year. He said it took him several days to get over the initial shock of a completely different environment. Matthew Van Wingerden, a senior at the University of Washington, took physical chemistry, analytical chemistry, biochemistry, and genetics in Spanish when he studied in Madrid in his junior year. "Even with different teaching styles, chemistry is just chemistry no matter where you go," he says.

Students who find it impossible to be away for a year, or even a semester, can find opportunities over the summer to study abroad. Since 2004, chemistry faculty at Emory have been taking 15 to 20 chemistry students to Siena, Italy, for five weeks over the summer. As part of their course work, students visit art museums to learn about art restoration and the chemistry of paints and pigments; they visit vineyards to study the fermentation process; they tour gold, alabaster, and glass factories to watch chemical transformations unfold; and they test for minerals in water samples at a nearby Tuscan town.

"It's important to tie in what they study with what they're seeing around them," says Ram, who has led several of the trips. "The classroom then becomes a place to discuss their experiences."

Jolyn Taylor, who went on the Siena trip in 2004, says the experience made chemistry come alive for her. "Everything we studied, we saw," she says. She notes that she also got to see how passionate her professors were about chemistry. "That kind of enthusiasm from professors is contagious," she says. "You can't often get that in a class of 200."

Regardless of how much time a student spends abroad, whether it's just a summer or an entire year, the experience makes a big difference. Scott Wallace, a graduate student in inorganic chemistry at Indiana University, Bloomington, studied in Italy as an undergraduate at Lebanon Valley College, in Annville, Pa. He says the experience has made him more sensitive to the struggles of international students. And of the international students in his own lab at Indiana, he says: "I'm sympathetic, and I'm patient. I know what it's like."

"Even with different teaching styles, chemistry is just chemistry no matter where you go."

Van Wingerden came to a similar conclusion when studying in Madrid. "In American universities, there are so many foreign students that we just think it's normal; they should be able to survive on their own," he says. "But for each one, it's still difficult. I really learned to appreciate that."

Studying abroad influenced Shelly Krebs's decision to pursue a career in international public health. Krebs, who studied in Scotland and graduated with a bachelor's in chemistry and biochemistry from Bradley University, Peoria, Ill., in 2000, is now a graduate student in molecular and cellular biology at Dartmouth Medical School. She says studying abroad "changed her life."

For Brooke Gardner, studying abroad reaffirmed her love for biochemistry. Gardner, who graduated from Middlebury in May with a bachelor's in biochemistry, studied comparative ecology in Ecuador during the second semester of her junior year and got to visit a rainforest, the Amazon River, and the Galapagos Islands. Although she enjoyed what she was studying, she says there was never a doubt that her first love is for biochemistry.

The experiences students bring back have led to curriculum changes in some chemistry departments. Kurt W. Field, chair of the department of chemistry and biochemistry at Bradley, says chemistry students who study in Europe often return with oral and written communications skills that are better than those of their peers. As a result, the department now requires that all seniors pass an oral exam to graduate.

International experience can make a student more attractive to graduate schools, medical schools, and potential employers, says Washington's Stone.

While students may get the most out of a study-abroad experience during their undergraduate years, Jay S. Siegel, director of the Institute of Organic Chemistry at the University of Zurich, in Switzerland, encourages students to consider doing their graduate work abroad. Siegel himself went abroad as a graduate student on a Fulbright scholarship and ended up doing a postdoc abroad. He says students who do their Ph.D. abroad will come back more aware of what's going on in the world.

Many graduate students, however, say they don't recommend pursuing a Ph.D. abroad because of the time commitment involved. They say doing a master's or a postdoc abroad would be more practical. "There's a lot of pressure on a Ph.D. student to get stuff done," says Arif Karim, a grad student who moved to Zurich from San Diego several years ago with Siegel's group. "If you get caught up in the culture shock, that's definitely something that absorbs your time."

Still, some students, like Lindsay Merte, are up for the challenge. Merte graduated from the University of Washington this year and studied abroad in Vienna; he's planning on doing his Ph.D. in surface chemistry at the University of Aarhus, in Denmark. The opportunity resulted from a contact he made in Vienna. Although he is concerned about being disconnected from the U.S. job market while abroad, he's "not worried enough to not do it."

Going abroad can be addictive. Emory's Taylor went on to study for a semester in Bolivia, where she helped to bring hand sanitizers to a rural hospital. And Lomberk plans to spend the next two years in Australia, where she will work on a master's in chemistry. But before she goes, she is taking a few months off to do something she hasn't done in a long time: spend a summer in the U.S. **IC**



LINDA WANG is an associate editor at C&EN. She has a MS in science and technology journalism from Texas A&M University-College Station and BS in biochemistry from University of Wisconsin-Madison.

A GLOBAL DECISION

Is studying abroad worth your time?

BY ELIZABETH H. RUDD

IF YOU HAVE EVER BROWSED THE Web for information on study abroad opportunities, you have probably been inundated with messages supporting international study. Often-cited reasons to study abroad include: experiencing a new culture, learning a language, traveling, increasing your self confidence, and the clincher: building your résumé.

According to the "Open Doors 2005 Report on International Educational Exchange," published by the Institute of International Education, the number of undergraduates studying abroad has more than doubled over the past 10 years. However, the report also notes that students in the physical sciences have averaged just 7% of total participants.

While all students face the challenges of finding the right program, preparing for the trip, and funding it, students in the sciences face strictly organized curricula that often make study abroad seem more like a luxury than a priority. As you begin to identify your professional or academic career goals, you face the question: is study abroad worth my time?

To help you answer this question, your author asked chemistry students and university professors about their experiences, and contacted the ACS Office of Career Management and Development for information on how study abroad alumni are viewed by employers. Here is what they had to say.



INGRAM DIGITAL IMAGES

The student perspective

Matthew Van Wingerden is a senior chemistry student at the University of Washington who recently returned from a year in Madrid. Like many students, Van Wingerden was originally planning to join a research group in his junior year and continue his research as a senior, with the goal of getting published before applying to graduate school.

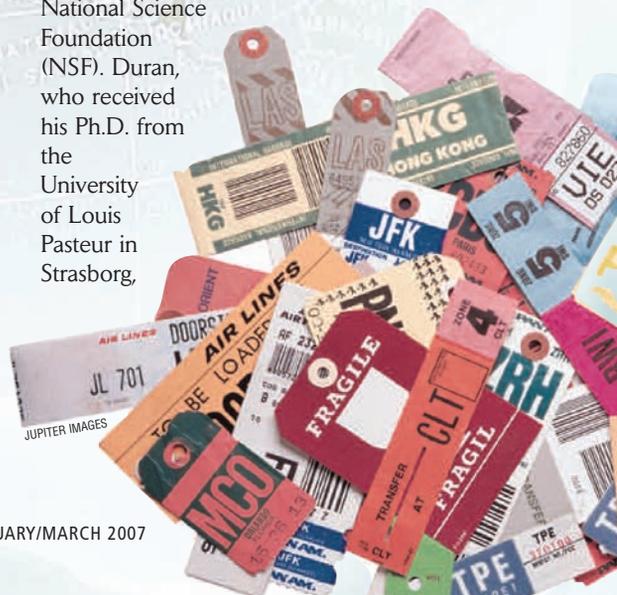
According to Van Wingerden, "I knew that going to Spain would disrupt my plans for an in-depth research project in my university, but I still decided to go. There was a potential cost, but there were also guaranteed benefits. I knew that it would be a great experience:

I would achieve fluency in Spanish, and be forced to adjust in ways I had never thought of before."

While he doesn't yet know how graduate schools will view his decision, Van Wingerden does know that "the fact that so few chemistry students study abroad makes it something special. I find that people are very interested when they hear I studied chemistry in a foreign country in a foreign language, and I think in the long term it might help more than whatever else I could have done in the same time."

The university perspective

Randy Duran, an associate professor of chemistry at the University of Florida (UF), manages one of the International Research Experience for Undergraduates (IREU) programs supported by the National Science Foundation (NSF). Duran, who received his Ph.D. from the University of Louis Pasteur in Strasborg,



France, now oversees a summer research exchange program that brings French students to Florida and American students to three universities in France.

"Students returning from a research experience abroad are more sophisticated consumers of science," states Duran. "They stand out in labs and are able to make strong connections with both French faculty and visiting international faculty."

Past participants in the UF program have also been very successful after graduation, receiving Rhodes, Goldwater, NSF, and Department of Defense scholarships.

According to Duran, "Experiences in overseas labs help students make more informed graduate school selections. Upon their return to the U.S., these students find that all doors open to them."

The employer perspective

David Harwell, assistant director of ACS Career Management and Development, notes, "While we don't have the data to say that study abroad will positively impact your chances for employment, all the data that we are seeing about the chemical industry show a trend toward multinational collaborations, global supply chains, and interdependencies on foreign markets. Having first-hand knowledge of how things are done in another country will give you insights into other cultures and practices that would be difficult for U.S. students and postdocs to gain."

Additionally, ACS regularly conducts a salary survey of members, including recent graduates, who are asked about employment status, GPA, continuing education, participation in study abroad, and more. The average starting salary of recent graduates with a study abroad experience was \$30,770, compared to \$28,392 for students with similar attributes who had not studied abroad – a difference of 8.37%.

Chemistry students who want to study abroad will always face challenges, but those who choose to make study abroad a priority also stand to receive great career benefits. Students, universities, and employers agree: going overseas to study chemistry, learn a language, or conduct research will set you apart, increase your knowledge of the global marketplace, and maybe, help get the job you want. 



Study Abroad Resources for Chemistry Students

Experiential Programs in Chemistry (EPiC)

The ACS EPiC activity promotes internships, co-ops, study/work abroad, and service-learning as important components of undergraduate chemical education. Check out EPiC's Directory of Experience Opportunities. (<http://www.chemistry.org/education/epic>)

ACS Study Abroad Webpage

This recently updated collection contains helpful articles, links, and study abroad information meant specifically for students of the chemical sciences. (<http://www.chemistry.org/education/student/studyabroad.html>)

TransAtlantic Science Student Exchange Program (TASSEP)

TASSEP is a consortium of member universities from the European Union, Canada, and the United States. The key feature in TASSEP is strong academic advising by science faculty, who work in close cooperation with their study abroad offices. (<http://studyabroad.unc.edu/tassep/>)

Research Internships in Science and Engineering

Biology, chemistry, engineering, geology, and physics students spend a summer working with German doctoral students on serious research projects. The doctoral students help integrate undergraduates directly into lab work and act as personal and professional mentors. (<http://www.daad.de/rise/en/>)

Research Experiences for Undergraduates (REU)

The REU program supports active research participation by undergraduate students in any areas of research funded by NSF. REU projects involve students in ongoing research programs in the U.S. and overseas. (http://www.nsf.gov/crssprgm/reu/reu_search.cfm)

IIEPassport

The Institute of International Education (IIE) has compiled a database of study abroad programs worldwide. Use IIEPassport to search for study abroad programs in your area of study. (<http://www.iiepassport.org/>)

NSF Central Europe Summer Research Institute (CESRI)

Sponsored by the NSF and managed by IIE, CESRI is a fellowship opportunity for U.S. graduate students in science and engineering who are seeking an international research experience in Austria, the Czech Republic, Germany, Hungary, Poland, or Slovakia. (<http://www.iie.org/Content/NavigationMenu/Programs7/CESRI/CESRI.htm>)

National Security Education Program (NSEP)

NSEP provides a unique funding opportunity for U.S. students to study in world regions critical to U.S. interests, including Africa, Asia, Central and Eastern Europe, Eurasia, Latin America and the Caribbean, and the Middle East. (<http://www.iie.org/programs/nsep/default.htm>)



ELIZABETH H. RUDD is an international fellow in the ACS Office of International Activities. She spent a semester at the University of Bath in the U.K. and conducted graduate research in Vietnam.

AS A STUDENT, YOU PROBABLY hear a lot about teamwork — on the sports field, in group projects, and in your extracurricular activities. But you may think that outside of your college or university, teamwork stops. After all, in the “real world,” you’ll have a boss and coworkers who are more senior than you. Does teamwork apply in situations with such defined hierarchies?

Yes! Maybe more than ever, teamwork

employees assigned to cover the tasks in the lab. But rather than working as four individuals, the group functions as a close-knit team.

“It is crucial that the four team members work closely together,” Hinkle says. “Each person is cross-trained for all tasks, and they rotate through each position on a weekly basis.” If anything goes wrong in the lab — such as equipment failures, power outages, or delays in tests that

Many perspectives, one goal

Quenzer explains how scientists with different areas of expertise work together at Pfizer. Her group’s goal is to determine crystal structures for structure-based drug design. The team is made up of analytical chemists, crystallographers, molecular biologists, computational chemists, and other specialists.

Teamwork Is Everywhere

How collaborative skills learned today can help your career

BY ALLISON BYRUM PROFFITT

is essential in today’s workplace. Crossing lines of seniority and experience, successful work environments rely on a teamwork approach. This is great news for today’s graduates. Teamwork means an expansion of your skill sets and invaluable experience working diplomatically with others.

At Pfizer, teamwork has recently been the focus of several changes in the organization, says Terri Quenzer, an analytical chemist with Pfizer Global R&D. “The company put explicit expectations [to encourage teamwork] in each individual’s goal,” she says. “The group that I work in is very open and collaborative.”

With teamwork becoming such an important part of how businesses are run, there are a variety of ways for teams to be used in the workplace.

Nonstop collaboration

Amber Hinkle, quality lead at Bayer Material Science, describes what teamwork looks like in her lab. “In my laboratory, we operate 24 hours a day, 7 days a week ... performing testing to support manufacturing and provide quality assurance.” During each shift, there are four

need to be run on deadline — the team must work together quickly and efficiently. “The team must decide who is going to do what, when, and how,” Hinkle adds. “It is the responsibility of the team to continue to provide full support in all circumstances and that won’t be possible if each team member only ‘minds their own business.’”

Better solutions

Teamwork is crucial to addressing more unique workplace problems as well. John Barrett, senior technical associate at Eli Lilly, describes his lab’s reaction to the recent shortage in workplace helium.

Rather than simply implementing a mandated plan, representatives from engineering and maintenance partnered with lab analysts to “identify the issues, design a strategy, and implement the fixes in a very short time,” Barrett says. “In this instance, the whole was greater than the sum of the parts, due to cooperation and having the right people involved. We accomplished much more together than all of us working as individuals could ever have realized.”



JUPITER IMAGES

“We start with a protein that the molecular biologists make,” she says. “They’ll take it to the crystallographers to get a crystal structure; I’ll analyze it with mass spectroscopy; and the computational people will work on computer modeling. The process involves the entire department.”

In Quenzer’s experience, communication is key to successful partnerships. To collaborate effectively, “[we] have to be open to each other’s needs. If I need to work with purified protein, it’s not going to help me if [my coworker] gives me protein in a mixture,” she says. “You can optimize the whole process if you know what everyone’s needs are. That way, when you hand stuff off it’s in the right form.”

Factors for success

In all of these examples, the strength of the team lies in the combined contribution of the members. However, not all teams work together so smoothly. Successful teams have common traits,

and the basis of strong teams lies in communication, mutual respect, and professionalism. Once those traits are firmly established, success relies on a few other characteristics:

- **Focus.** Having focus, Barrett says, is key to a strong and effective team. Teams should clearly define their goals, identify boundaries, and remain on topic. If teams come up with issues that are out of their scope, they should set them aside to address later.
- **The Right Players.** "Diversity in perspective, expertise, ability, and personality can go far in the success of a team," says Barrett. "Getting the right people in the right roles and assignments is invaluable."
- **Commitment and Camaraderie.** Team members should be committed to the success of the venture and the positive outcome, regardless of setbacks or obstacles. Members of successful teams "agree to help each other out when needed," Hinkle observes. "They share ideas and information; they develop a bond."
- **Sense of Humor.** "Keeping the interaction light can defuse tense situations, and help address conflict within the team," Barrett says.

Though the goals for each team are different, whether it be a special focus group called together to address a specific issue, or a team of employees working together daily, the foundations of successful partnerships are the same.

Learning the skills

Achieving the right mix of each of these components, however, isn't always simple. Working well on a team is a learned skill. Hinkle says her team member training happened on the job, and her experiences include both the good and bad varieties. "It is important to learn how things work well, and to learn not to do those things that you see don't work well," she says.

Barrett agrees. "I have been a member of a variety of teams throughout my career," he says. "Some have had major challenges and successes, while others never really got off the ground."

Quenzer, Barrett, and Hinkle encourage undergraduates to actively work to build their team member skills, and to look for opportunities to be a part of successful teams. Even as undergraduates, notes Barrett, "there are many examples of teamwork, ranging from family activities and chores, to sports or club activities, etc. Two or more people working toward a common goal is the basic definition of a team."

"To gain experience," Hinkle says, "look for opportunities to participate in a variety of roles on different teams." Barrett suggests volunteering as a great opportunity to work on diverse teams. "Volunteering for charitable work like Habitat for Humanity or a local soup kitchen can often serve as a positive team-building experience," he says.

Quenzer suggests choosing classes that require team projects. "Really embrace [those assignments] and take them as opportunities to learn how to be a team player." She also strongly suggests using internships to get a real taste of teamwork in a scientific work environment.

"[Often] scientists like to work independently," she notes, but as more research becomes interdisciplinary, teamwork is of

More about Teaming

<http://www.une.edu.au/gamanual/staff.htm>

This University of New England Web site hosts a ten-session, self-paced tutorial to provide the basics of teaching and learning teamwork.

<http://oldlearn.lincoln.ac.nz/tls//groupwork/>

This Lincoln University Web site includes downloadable questionnaires to evaluate your team and assess your progress.

<http://www.workteams.unt.edu/old/reports/andrews.html>

Published by the Center for the Study of Work Teams, this article highlights the factors that affect multi-cultural teams' successes.

<http://www.workteams.unt.edu/old/reports/smiddltn.htm>

Also from the Center for the Study of Work Teams, this article summarizes different methods and approaches to decision making and problem solving at both the individual and group levels.

<http://www.workteams.unt.edu/old/edu/cases1.htm>

This compilation highlights 20 companies that are using teamwork to excel in their businesses. The profiled companies include Pfizer, Eastman Chemical, Sterling Winthrop (an Australian pharmaceutical company), and Texas Instruments Malaysia.

<http://home.pacifier.com/~axis/T11myths.html>

Excerpted from a speech given by consultant Darcy Hitchcock at a General Motors conference, this article breaks down six myths about teams, and explains not only why teams are essential to business success, but how they call for a change in organization structure.

greater importance. "You have to be able to communicate with scientists in other fields, because we aren't all trained in each other's disciplines," she says. "It's a group effort."

Hinkle also reminds undergraduates that in the business world, while the end goal of the team's work is important, your individual contributions to the team will be evaluated too. "Focus on the team aspects of team projects in addition to the technical outcome," she says. "Critique yourselves on how well you did as a team. Learn from these experiences."

To build on your skills, Barrett encourages students to reflect on positive examples of teamwork from their pasts. Realize that on a strong team, everyone brings something to the table.

"Pay attention to what's going on around you and look for ways to help," Quenzer says. "When you see a way your specialty can help solve a problem, be aware and be willing to offer it up."

Learning to be a team player — and becoming a good one — takes time and practice, but it's a crucial skill for today's

chemists. "You have to be aware," Quenzer says, "that reaching your goals is dependent on not just you, but others." 



ALLISON BYRUM PROFFITT is a freelance writer and editor based in Cambridge, Massachusetts.



CHICAGO DEPARTMENT OF TOURISM

Undergraduate Program

233rd ACS National Meeting, Chicago, IL

March 25 – 29, 2007

The Society Committee on Education's Task Force on Undergraduate Programming invites you to join us for the 233rd ACS national meeting in Chicago. As you can see below, we have put together a terrific program that will offer you the opportunity to present research, learn about new research, and network with chemists from around the country. You won't want to miss the Eminent Scientist Lecture, the Undergraduate Social, or the annual SAACS Chapter Awards Ceremony. Don't miss out! I look forward to seeing you in Chicago!

Sincerely,
Mark Benvenuto
2007 Chicago Program Chair
Task Force on Undergraduate Programming

SUNDAY, MARCH 25

8:00 a.m. – 5:00 p.m.

Undergraduate Hospitality Center

8:00 – 9:00 a.m.

Making the Most of Your First ACS Meeting

9:00 – 10:30 a.m.

Writing the SAACS Chapter Report

9:00 – 10:30 a.m.

Graduate School Reality Check

10:30 a.m. – noon

Graduate School Recruiting Tea

10:30 a.m. – noon

Chem Demo Exchange Using Household Chemicals

12:30 – 1:30 p.m.

ACS Community Outreach Programs – You Can Make a Difference

2:00 – 3:00 p.m.

Automotive Chemistry I: More Than Just the Tail Pipe

3:00 – 4:00 p.m.

Chemical Survival Guide: Reducing the Frustration of Learning and Teaching Chemistry

3:00 – 4:00 p.m.

Dress For Success Workshop

4:00 – 5:00 p.m.

Kids & Chemistry Workshop

7:00 – 8:30 p.m.

Student Affiliates Chapter Awards Ceremony

8:30 – 11:30 p.m.

Undergraduate Social

MONDAY, MARCH 26

8:00 a.m. – 5:00 p.m.

Undergraduate Hospitality Center

8:00 – 10:00 a.m.

Graduate School Recruiting Breakfast

9:00 – 10:00 a.m.

Sustainability and Chemistry: Tomorrow's Challenge for Today's Students

10:00 – 11:00 a.m.

Automotive Chemistry II: More Than Just the Tail Pipe

11:00 a.m. – 1:00 p.m.

Undergraduate Research Poster Session I

2:00 – 4:00 p.m.

Undergraduate Research Poster Session II

5:00 – 6:00 p.m.

Eminent Scientist Lecture featuring Professor Omar Yaghi: Pores Without Walls for Clean Energy

6:00 – 7:30 p.m.

Up Close and Personal: ACS Corporation Associates Reception for Undergraduates

8:00 – 10:00 p.m.

Sci-Mix / Successful Student Affiliates Chapter Poster Session

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

UNDERGRADUATE

CALL FOR PAPERS

**Undergraduate
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Scheduled for
August 19–20, 2007!**

**Abstract Deadline:
April 2, 2007**

More than 12,000 chemical
science and engineering
professionals will gather in
Boston, MA.

How about you?

**Join the American Chemical Society
for its 234th
national meeting from
August 19–23, 2007**

to present a research or chapter poster,
prepare yourself for a career in the
chemical sciences, network with other
chemists, and have a good time!

How to Submit Your Abstract

To be considered for a presentation, submit an abstract via the ACS website, chemistry.org, by April 2, 2007. Just log on to chemistry.org/meetings, select the OASYS icon, and click on CHED. Select the appropriate discipline for undergraduate research posters (URPS) or SAACS for chapter posters. Submit your research abstract under one of these URPS categories:

- Analytical Chemistry ■ Biochemistry
- Chemical Education ■ Computational Chemistry
- Environmental Chemistry
- Geochemistry ■ Inorganic Chemistry
- Medicinal Chemistry ■ Nanotechnology
- Organic Chemistry ■ Physical Chemistry
- Polymer Chemistry

There are no faculty presentations, and no late submissions will be accepted. Active Student Affiliates chapters may apply for travel grants to assist with registration fees. For more information, e-mail saprogram@acs.org, or visit chemistry.org/education/saprogram.html.



2007 ACS Regional Meetings

Get to know your region!

If you can't get to a national meeting, but would like to present your research findings, learn more about future career options, and network with professionals – then an ACS Regional Meeting is for you! In 2006, seven regional meetings held undergraduate-specific programming. From chocolate symposiums to hands-on nanotechnology workshops, undergraduates from Frankenmuth, MI to Phoenix, AZ explored what their ACS regions had to offer. In 2007, be sure to take advantage of a meeting near you!

Consult Web sites for additional information.

39th Middle Atlantic Regional Meeting (MARM)

May 16–18
Collegeville, PA
<http://www.marmacs.org>

An undergraduate program will be hosted by the Temple University Student Affiliates Chapter. Poster sessions, a graduate school workshop, and several keynote speakers are scheduled.

39th Central Regional Meeting (CRM)

May 20–23
Covington, KY
<http://www.cermacs2007.org>

An undergraduate program will be hosted by the Northern Kentucky University Student Affiliates Chapter. An ice cream social, career symposium, and SAACS workshop are planned.

62nd Northwest Regional Meeting (NORM)

June 17–20
Boise, ID
http://northwestchemistry.org/Norm_2007/index.htm

An undergraduate program will be hosted by the Eastern Oregon University Student Affiliates Chapter. A tour of Micron, an Eminent Scientist Lecture, and an undergraduate poster session are scheduled.

20th Rocky Mountain Regional Meeting (RMRM)

August 30–September 1
Denver, CO

41st Western Regional Meeting

October 10–13
San Diego, CA
<http://www.wrsmacs.org>

59th Southeastern Regional Meeting (SERMACS)

October 24–27
Greenville, SC
<http://www.sermacs2007.org>

62nd Southwestern Regional Meeting (SWRM)

November 4–7
Lubbock, TX

42nd Midwest Regional Meeting (MWRM)

November 7–10
Kansas City, MO