

DEPARTMENT OF

Chemistry News



SPRING/SUMMER 2011 UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



A Tradition of Innovative Thinking Since 1868

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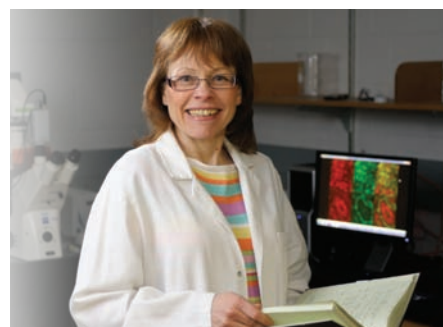
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Letter from the Department Head



FOR THIS NEWSLETTER, I HAVE CHOSEN TO WRITE LESS ABOUT CHEMISTRY AND MORE ABOUT TWO OF MY OTHER PASSIONS: FILM AND PHILANTHROPIC GIVING. As you will read below, the two actually intersect with the Department of Chemistry in several ways.

The story begins with what for my wife, Sharon, and me is an event that has come to be one of the highlights of our year. For the past thirteen years, Urbana-native Roger Ebert has hosted an extraordinary film festival, held in the historic Virginia Theatre in downtown Champaign. Sharon and I have been sponsors since the very first year and regularly attend the festival, which brings actors, directors, and producers to show their films and take part in panel discussions following each showing.

The Roger Ebert Film Festival has also become a favorite of several other chemistry faculty members. Profs. Greg Girolami, Paul Hergenrother, Wilfred van der Donk, and Steve Zumdahl regularly buy festival passes and it is not uncommon to bump into several other chemistry faculty in the lobby or at the concession stand.

This year, we had the privilege of having dinner with filmmaker Jennifer Arnold and her producer/cinematographer Patricia Lee. They had come to screen their beautiful documentary entitled, *A Small Act*. The film centers on Chris Mburu, who grew up in a mud hut in Kenya but had his primary and secondary schooling paid for by a Swedish woman he had never met, named Hilde Back, who gave \$15 a month to a charity that funded the schooling of poor African children. Mburu ultimately graduated from Harvard Law School and became a United Nations Human Rights Commissioner. To show his gratitude to the benefactor he had never met, he started the Hilde Back Foundation to provide scholarships for Kenyan schoolchildren.

The film documents Mburu's attempts to find and thank Hilde Back personally, and the relationship that develops between the two following their eventual meeting. Back, a German Jew whose family perished in the Holocaust after sending her to Sweden as a child, never married and has lived in the same modest apartment for many years. She attended the film festival with Arnold and Lee and delighted the audience with her broad smile and inspiring story.

The title of the film, *A Small Act*, emphasizes the remarkable impact that even a small gift can make. This is a point I try to make to recent graduates of our department. A gift of \$100 can support research that leads to a new drug to treat a patient with a multi-drug resistant bacterial infection; or it might support a student, the first in their family to attend college, who goes on to discover a revolutionary new solar cell. Those are very real possibilities given the outstanding students and faculty here at Illinois.

How can a small gift ever do something that significant? Because the Department of Chemistry has over 3000 living alumni. The cumulative impact of our support is substantial. Our annual fund drive currently yields nearly one hundred thousand dollars to the Vision 2020 fund. So I ask that you consider how a small act can have a major impact and give to Chemistry at Illinois, or to the charity of your choice.

Sincerely yours,

Steven C. Zimmerman
Head and Roger Adams Professor
Department of Chemistry

Instructional Technology in the Department of Chemistry

By DOUG MILLS, DIRECTOR OF INSTRUCTIONAL TECHNOLOGY

MANY WILL KNOW THAT THE LATE DR. STAN SMITH (1931-2010) WAS A PIONEER IN THE USE OF COMPUTERS FOR CHEMISTRY EDUCATION AT THE UNIVERSITY OF ILLINOIS.

Stan joined the UIUC faculty in 1960 as a physical organic chemist, but by 1970 was already interested in instructional technologies, publishing that same year in the *Journal of Chemical Education* a groundbreaking paper entitled "Use of Computers in the Teaching of Organic Chemistry." This began a nearly 40-year effort to integrate computer based technologies into the instruction of general and organic chemistry.

With gratitude for his vision and accomplishments, the Department continues to move forward with the exploration and implementation of emerging technologies to support and engage students learning chemistry. This article presents a high level overview of some of the projects underway and in place.

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Chemistry at Illinois utilizes Lon-Capa and ACE Organic as two course management systems with powerful features ideally suited to online learning in Chemistry. Although neither of these products was developed at Illinois, they provide stable foundations for online instructional innovation in introductory General Chemistry courses and introductory Organic courses respectively. In addition to taking full advantage of the capabilities of these two learning platforms, instructors in both areas, Dr. Christine Yerkes in General Chemistry and Drs. Jeffrey Moore and Nicholas Llewellyn in Organic Chemistry in particular are active in helping shape the ongoing development of these systems as they push the programs to their limits and provide valuable feedback to the development teams of each product.

In the case of Lon-Capa and General Chemistry courses, instructors like Dr. Yerkes and Gretchen Adams have been able to build on the functionalities in a number of ways. Dr. Yerkes' idea of developing and incorporating interactive visual widgets, for example, allows freshmen students preparing for an in-lab experiment to read temperatures from an actual scale "virtual thermometer" and estimate tenths of a degree as they will have to do in the lab rather than simply reading the temperature in the text along the lines of "you are given a solution with an initial temperature of 39.3° C," or to perform a virtual titration where they control the flow of the titrant by opening and closing the stopcock of a "virtual burette" and use their "experimental" starting and ending values to perform their calculations rather than simply being given those values. In a basic introductory course, Gretchen Adams was able to extend the hints functionality of Lon-Capa problems by incorporating video she created on her computer. Students stuck on a homework problem are now able to click a link to view a personable, friendly video clip helping them think through key points and strategies to successfully work the problem.

In a more extensive undertaking, Drs. Yerkes and Christian Ray in General Chemistry have begun development of an online interactive multimedia electronic text (e-text). Currently this project is also being hosted within the Lon-Capa course management system, an arrangement which, among other things, allows incorporation of the powerful Lon-Capa homework problems directly into the e-text. This project is still in relatively early stages but is coinciding well with other revisions underway in the General Chemistry curriculum. The e-text is being developed in HTML5 and CSS3, emerging standards on the web which, together with

JavaScript, allow for new levels of functionality and compatibility with popular mobile devices and tablets as well as current web browsers on desktop and laptop computers.

In fact, being mobile- and tablet-friendly underlies many of the instructional technology initiatives underway in the Department. Student use of smartphones and tablets is on the rise and cannot be ignored. A pre-lab video, developed by Dr. Don DeCoste of General Chemistry, for freshmen lab courses produced in the SABIC IP Multimedia Studio (see inset) is being delivered in a mobile- and tablet-friendly fashion. An initial look at the weblogs for the videos for Chemistry 103, a course which utilizes the pre-lab videos, indicate about 13% of the hits on the site have come from iPods, iPads and iPhones, and that percentage can be expected to increase.

Although some new content is being designed to be accessible on mobile and tablet devices as well as laptop and desktop computers, other content is being designed specifically for mobile devices or tablets. For example, after consulting with General Chemistry Instructor Dr. Kelly Marville, instructional technology staff developed a flashcard template implemented using HTML5, CSS3 and JavaScript which can be accessed



SABIC IP Multimedia Studio Opens

The Department of Chemistry is delighted to announce that the SABIC Innovative Plastics Multimedia Studio has opened and is assisting faculty and instructors in incorporating technology into their classrooms. The SABIC IP Multimedia Studio is a professional grade video studio available for the development of instructional multimedia resources for faculty in the Department of Chemistry.

This facility fills the need for high-end video production and complements the already growing use of desktop video for instructional purposes. Doug Mills, Director of Instructional Technology for the Department of Chemistry commented on the project saying, "The completion of the SABIC Innovative Plastics Multimedia Studio could not have come at a better time." He continued, "The opportunity and need for instructional video in chemistry was already growing as evidenced by a steady increase in the number of instructors making use of desktop video production to provide online content to their students, and the new use of informal video capture in seminar courses for students to review their presentation."

The studio is staffed by Alejandro 'Alex' Ibarra, an Instructional Technologist with a strong background in video production. Since it's opening in October 2010, projects produced in the studio include prelab multimedia for freshman to prepare for general chemistry labs and lab technique primers available on demand via mounted iPads. In addition, Ibarra has been working on a project with Chemistry Professor Alexander Scheeline that allows students to view, via video, advanced analytical instrumentation that they would otherwise not have access to. The videos will also be made available to students studying chemistry in Vietnam.

Response to the studio and its projects has been overwhelmingly positive. Over 85% of student polled in Chemistry 103, an introductory lab course with fall enrollment of over 350 students, rated the videos as helpful or very helpful in a recent survey.

The multimedia studio comes as a result of the generosity of SABIC Innovative Plastics, a world leader in providing engineering thermoplastic material solutions. "SABIC hopes that the funding helps to facilitate quality learning for the students and provides new tools for the faculty to be even more creative in how they teach students" said Bimal Patel (Ph.D. 1996, Suslick) Global Color Technology Manager at SABIC Innovative Plastics. Dr. Patel continued by saying: "We have a number of successful graduates from the University of Illinois School of Chemical Sciences working at SABIC (formerly General Electric Plastics), and we would like students and faculty to know that we are still here - just under a new name that may not be so familiar."

Support for the studio was also provided in part by the Camille and Henry Dreyfus Foundation Special Grant Program in the Chemical Sciences.



on a desktop computer but is really optimized for smartphones. With content that simply has to be memorized, it's useful to be able to study on the go—to be able to pull out your phone and review while riding a bus or standing in line for the cafeteria. Facilitating this functionality on devices such as iPod Touches is the off-line storage feature making this website function like an application stored on the device itself, even without a network connection.

For an example of a project designed specifically for tablets, the lab technique video project for the Chemistry 237 organic lab, also mentioned in the inset article, is being delivered primarily via three iPads mounted in the 237 lab space. Mounted securely on columns in the lab, the iPads function like touchscreen video kiosks you might see in a state of the art museum display to deliver helpful reviews of important techniques to an audience of two or three students at a time. A similar project in the works for the Chemistry 233 lab calls for iPads mounted in each bay of the lab to be the touchpad and brain delivering video to large-screen monitors viewable by the whole class at one time in the lab space. These two courses are also used for the first time this semester an online lab report template which helps students standardize their lab report submissions, which in turn streamlines TA review of the reports.

Chemistry is a large, energetic, creative department and I know there are many great uses of instructional technology going on which I have yet to learn of, despite my position as “Director of Instructional Technology.” (For example, I learned just this past week that Chemistry 332, taught by Professor Jeffrey Moore, is using an online ticketing system developed by graduate student Michael Evans they developed which allows students who did well on a particular exam question to connect with a student who wants help with that question as s/he works on exam corrections.) Chemistry continues to be an exciting place to work in the area of instructional technology. I think Stan Smith would be pleased. ■



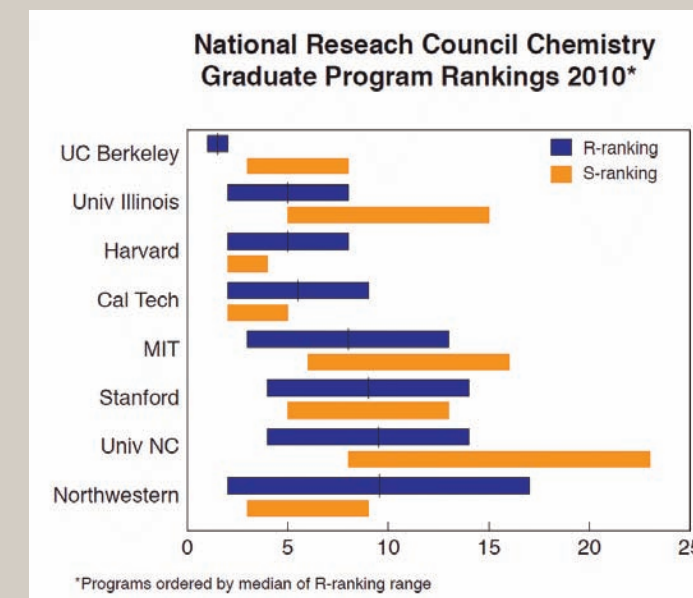
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Chemistry at Illinois Places High in National Research Council and Research & Development Spending Rankings

THE DEPARTMENT OF CHEMISTRY AT THE UNIVERSITY OF ILLINOIS WAS RATED ONE OF THE BEST IN THE NATION IN TWO RECENTLY PUBLISHED REPORTS. Last fall, The U. S. National Research Council (NRC) released its long awaited “Data-Based Assessment of Research-Doctorate Programs in the United States”. The NRC is the working arm of the National Academy of Sciences (NAS) and their last authoritative rankings were published in 1995. The current analysis is based on twenty different measures and resulted in two overall rankings -- with different methodologies/weightings -- each calculated as ranges that represent 90 percent confidence limits (5th to 95th percentile). The analysis covers 5,000 programs in 62 fields at 212 universities.

Though each ranking is based on slightly different methodologies, both place Chemistry at Illinois in the top six programs in the U.S., with the median of the one range placing the Department second behind University of California Berkeley, tied with Harvard University.

In addition to the NRC Rankings, Chemistry at Illinois topped *Chemical and Engineering News* most recent list on Academic R&D spending, placing above peer schools including Berkeley, Harvard, and Massachusetts Institute of Technology. The Department of Chemistry also had the largest percentage increase in the top three schools, increasing 4.6% between 1998 and 2008. ■



Please join us!

Fall 2011 Alumni and Friends Reception

in conjunction with the
American Chemical Society
Fall National Meeting

Monday, August 29, 2011

The Curtis Hotel
Denver, Colorado

For more information visit:
chemistry.illinois.edu/news/2011_FallAlumniReception.html

or contact:
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Faculty Awards

Ryan Bailey is the recipient of a **2011 Sloan Research Fellowship** from the Alfred P. Sloan Foundation. The Sloan fellowship program awards fellows \$50,000 to pursue their choice of research topics and allows them flexibility in applying funds toward their research.

Scott Denmark is the recipient of the **ISHC Senior Award in Heterocyclic Chemistry**. This award, sponsored by Pfizer Inc. is presented at the biannual International Society of Heterocyclic Chemistry congress. Professor Denmark will receive the award at the 23rd International Congress on Heterocyclic Chemistry in July in Glasgow, Scotland.

Ben McCall was designated as a **2011-2012 Helen Corley Petit Scholar** by the College of Liberal Arts and Science at the University of Illinois. This scholarship is in recognition of Professor McCall's outstanding research and teaching accomplishments. Candidates for the Petit Scholarship are not nominated but rather selected on the basis of an extraordinarily strong tenure and promotion package.

Cathy Murphy was ranked #10 in materials science and #32 overall in the Thomson Reuters list of the 100 top chemists ranked by citations per article or review published between Jan 2000 and Oct 2010. **Professor Murphy** will also receive the **2011 Inorganic Nanoscience Award**, given by the ACS Division of Inorganic Chemistry. The award is given to a mid-career scientist who has shown sustained excellence, dedication, and perseverance in research in the area of inorganic nanoscience

Ralph Nuzzo has received the **Research Award of the Alexander von Humboldt Foundation**. The 60,000 Euro Humboldt Research Award is granted to researchers whose fundamental discoveries, inventions or novel theories have influenced essentially their fields of research and who are expected to continue being top researchers in the future. The award winners are enabled to work on research projects of their choice in Germany together with a native colleague for a period of up to one year.

Eric Oldfield is the recipient of the **2011 Avanti Award in Lipids** for his pioneering research using NMR methods to investigate lipid membrane structure and for his work in drug discovery, targeting lipid biosynthesis. This award is given annually by the Biophysical Society to an investigator that has made "outstanding contributions to our understanding of lipid biophysics." The winner receives an honorarium.

Scott Silverman is the recipient of the **Campus Award for Excellence in Guiding Undergraduate Research**. For more information about Professor Silverman and undergraduate research in the department, please see the article on page 10.

Investitures



On October 28, 2010, **Dr. Catherine Murphy** was invested as the Peter C. and Gretchen Miller Markunas Professor of Chemistry. Murphy graduated magna cum laude (Bronze Tablet) with two B.S. degrees, one in

chemistry and one in biochemistry, from the University of Illinois in 1986. She received her Ph.D. from the University of Wisconsin in 1990 and served as a NSF and then a NIH postdoctoral fellow at the California Institute of Technology from 1990-1993. From 1993-2009 Murphy was a faculty member in the Department of Chemistry and Biochemistry at the University of South Carolina. In August 2009 she joined the faculty of the Department of Chemistry at the University of Illinois. Her research focuses on developing inorganic nanomaterials for biological and energy-related applications and understanding the chemical interactions of these nanomaterials with their surroundings. She is the recipient of numerous research and teaching awards.

Peter C. and Gretchen Miller Markunas

Peter Markunas (1911-2001) worked with Professors Bailar and Reedy while at the University of Illinois and received his M.S. (1937) and Ph.D. (1940) from the Department. He worked in the chemical research department of National Distillers of Cincinnati and performed research on penicillin for U.S. Troops during World War II. From 1952-1972, he led the analytical chemical research department at R.J. Reynolds Tobacco Co. in Winston-Salem, NC. After his retirement from R. J. Reynolds, he became involved in farmland and soybean research in Springfield, IL. He was an emeritus member of the American Chemical Society, American Association for the Advancement of Science, and Sigma Xi's Research Society.

Gretchen Markunas (1912-2005) graduated from Springfield High School and earned her teaching certification from Illinois State Normal University in 1932. She went on to serve as a teacher for nine years and was a longtime member of the West Side Christian Church as well the President's Council of the University of Illinois.



On October 28, 2010 **Dr. Yi Lu** was invested as the Jay and Ann Schenck Professor of Chemistry. Lu received his Ph.D. degree from UCLA in 1992 under Dr. Joan S. Valentine. After two years of postdoctoral research in Dr. Harry B. Gray group at the

Caltech, Lu began his own independent career in the Department of Chemistry at the University of Illinois at Urbana Champaign in 1994. He is now HHMI Professor and Alumni Scholar in the Departments of Chemistry, Biochemistry, Materials Science and Engineering and Bioengineering. He is also a member of the Center for Biophysics and Computational Biology and Beckman Institute for Advanced Science and Technology. His research interests lie at the interface between inorganic and analytical chemistry and biology, with a particular focus on developing sensors and novel biological catalysts, especially for environmental applications. Professor Lu has published over 160 journal articles and holds four US patents with several more pending.

Jay R. and Ann Schenck

Jay Schenck (1915-2006) obtained his bachelors and masters degree from the Department of Chemistry at Illinois working under Professor Ralph Shriner. He worked at Abbott Laboratories, retiring after a forty-two year career as a research chemist. He was a member of the American Chemical Society, the American Society for Biological Chemistry, and Sigma Xi, a scientific research society. In addition to being an avid University of Illinois supporter, he was a snow skier, enjoyed sailboat racing, and was a member of the U.S. Power Squadron where he taught navigation.

Ann Schenck (1918-2008) was a homemaker, volunteer, and enthusiastic bird watcher. She volunteered for the Red Cross during World War II and continued volunteering for numerous organizations throughout her life, including a local elementary school where she helped second graders with reading.

Virginia Bartow Chemistry at Illinois' First Female Faculty Member

BY GREGORY S. GIROLAMI, PROFESSOR OF CHEMISTRY



PROFESSOR VIRGINIA BARTOW (1896-1980) TAUGHT CHEMISTRY AT THE UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN FOR 37 YEARS AND PLAYED AN IMPORTANT ROLE AT THE NATIONAL LEVEL IN THE AMERICAN CHEMICAL SOCIETY AND THE WOMEN'S CHEMISTRY HONOR SOCIETY IOTA SIGMA PI.

Her interests extended from science to the arts, and she served as an inspiring mentor to many young chemists.

Virginia Bartow was born on December 20, 1896, in Rochester, New Hampshire, the daughter of Edward and Alice Abbott Bartow. Her father, a well-known professor of chemistry who moved to the University of Illinois at Urbana-Champaign in 1905, was the first director of the Illinois State Water Survey and served as president of the American Chemical Society in 1936. After finishing high school, Bartow enrolled in Vassar, obtaining her A. B. degree in 1918. After Vassar, she taught chemistry at Goucher College in Baltimore from 1918-1920 and then began graduate work at the University of Illinois. She earned an M.A. degree in 1921 and a Ph.D. degree in 1923, both under Professor William Albert Noyes, Head of the Chemistry Department at Illinois and one of the most distinguished chemists of the time. Her Ph.D. thesis was entitled "An Attempt to Prepare an Aliphatic B-Diazo Compound."

After obtaining her Ph.D. degree, Bartow taught at Rockford College in Illinois from 1923-1924 and then at the University of Iowa 1924-1925 before returning to Urbana in 1925 as an instructor. She was promoted to an associate in 1932, to an assistant professor in 1939, and to an associate professor in 1955, the highest rank a female faculty member had risen to at the time. In that era, women faculty members were not permitted to live alone, and were required to reside with an approved female roommate, usually another faculty member. On Sunday afternoons, Professor Bartow and her roommate would often entertain guests with tea and conversation.

Professor Bartow initially taught chemistry for students majoring in home economics, but was better known for her classes on the literature and history of chemistry. The course on the literature of chemistry, the first such course in America, had been started by the chemistry department librarian Marion Sparks in 1913. After the unexpected death of Miss Sparks in 1929, Professor Bartow took over the course and taught it for the next 33 years. The courses benefited from her personal acquaintance, in part through her father, with many of the leading chemists worldwide. One of the students in these courses said, "Bartow had a clear idea that systematic exposure to the literature and history of the science added something useful and long term to one's education. Among other ways, she prepared displays using postage stamps and her own chart of academic genealogy as painless ways to learn history." Even today, Alumni regularly remark on how much Professor Bartow's class in chemical literature meant to them, how valuable her counsel had been, and what a remarkable teacher she was. For one student's recollection, please side the side bar.

One of the results of the history of chemistry course was her 'chemical genealogy,' in which she traced the doctoral lineages of Illinois faculty members back to the 1700s. Each person was linked to their scientific mentor, and then to their mentor's mentor, etc., to form an academic analog of a family tree. Professor Bartow's publication of her pioneering chemical genealogy in 1939 has inspired similar efforts at many other universities worldwide. Such a genealogy for the current chemistry faculty was created by Dr. Vera Mainz and Prof. Greg Girolami and can be found in the School of Chemical Sciences Library.

Professor Bartow was always especially interested in the professional development of women students in chemistry and other sciences. Each year, for example, she hosted a dinner for them. From 1925 until 1962, Professor Bartow served as the advisor to the local section

of Iota Sigma Pi, the honorary society for women in chemistry. She was the society's national vice president in 1940 and chair of the society's national fellowship board in 1948-1950 and 1962-1963. Through these efforts and many others, Professor Bartow offered special help and inspiration to young women entering the field of chemistry. One woman later wrote "Times are changing, of course, but the female chemistry student, particularly the graduate student, sometimes gets the feeling that it's a man's world. Miss Bartow's interest in us, in class and out, and her obvious belief that we were just as able as anybody else to carve out careers made a lot of difference sometimes.... I'm sure her humanity hasn't been confined to just the women in the department, but it probably has meant more to us."

Professor Bartow was chair of the History of Chemistry division of the American Chemical Society in 1952-4, and chair of the local section of the ACS in 1952-3. She was the editor of three comprehensive decennial reports of the Chemistry Department at Illinois, in 1941, 1951, and 1961. She retired in 1962. For her achievements, in 1976 she was awarded an honorary membership in Sigma Delta Epsilon, the professional society for graduate women in science.

Professor Bartow enjoyed musical concerts and collecting stamps. She made several gifts to the university's museums: a gift of two rare flint glass tumblers in 1978 and a gift of a number of couturier gowns to the University's historic costume collection. She died on July 7, 1980 in Douglas, Michigan, where she had a summer home, and is buried in Fishkill, New York. ■

Generations of us learned about the culture of chemistry—its literature and its history—from Dr. Bartow. Her long connection with Illinois gave her insight not only into the larger world of chemistry, but into the immediate world of UIUC. She had personally experienced much of the department's history up to that point. Her own Ph.D. was with William Albert Noyes, and her father was on the committee that recruited him. Her stories were legendary.

Her approach to the chemical literature was comprehensive and unforgiving. I learned to use Beilstein by learning the Beilstein classification system, not by learning to use the indices. I learned about how one interleaved searches of the early literature between Chemical Abstracts and Chemisches Zentralblatt. They were amazingly demanding courses.

She was a lonely figure—one of two women in the Chemistry Department. She was also an historian/bibliophile among a large cadre of experimental scientists. But she made her mark on so many of us.

Marion O'Leary (B.S. 1963)





Engaging Undergraduates in Independent Research

WHETHER GOING ON TO GRADUATE SCHOOL OR PURSUING A CAREER IN THE FIELD, UNDERGRADUATE RESEARCH IS CONSISTENTLY RANKED AS ONE OF THE MOST IMPORTANT AND REWARDING EXPERIENCES A STUDENT CAN HAVE WHILE PURSUING THEIR BACHELOR'S DEGREE. Chemistry at Illinois has long been committed to offering a wide range of undergraduate research opportunities, including summer opportunities and research support and awards.

Recently, Professor Scott Silverman received the UIUC Campus Award for Excellence in Guiding Undergraduate Research. This is a highly competitive teaching award with several evaluation criteria, including having exhibited sustained activity in involving and guiding undergraduate students in research projects and having a positive impact on student scholarship or intellectual development. Chemistry News spoke with Professor Silverman and one of his undergraduate students, senior Emily Allen, about undergraduate research and its impact on students and professors.

Professor Scott Silverman

Chemistry News: Why is it important for undergraduate students to have research experience?

Professor Silverman: Undergraduate research is often the first exposure that anyone has to “real” scientific research. The opportunity to join a laboratory, participate in a research project, and in general become part of the scientific enterprise can make a real difference in helping an undergraduate student to choose a research-oriented career.

Chemistry News: What unique benefits and challenges are there when mentoring undergraduate researchers?

Silverman: Graduate students take and teach classes in their first year or two, but beyond that they focus solely on research. Postdocs usually have only their research. In contrast, undergraduate students are continuously balancing classes, research, and everything else about college. It's sometimes a challenge to help them manage all of the competing draws on their time and energy while making research progress and hopefully not getting burned out. It's also a challenge to coordinate mentorship of undergraduates by the lab's graduate students and postdocs, without whom undergraduate research would be impossible. The benefit of bringing undergraduates into research for potentially their entire careers makes facing these challenges worthwhile.

Chemistry News: What was your experience performing undergraduate research? Did your experience inform the way you work with students today?

Silverman: I was an undergraduate student at UCLA, where I did research for two years. Like Illinois, UCLA is a large state university. Thinking of my own experience, I feel compelled to provide some of the same opportunities that were given to me. As an undergraduate I had my own research projects. To the greatest possible extent, I try to provide the undergraduates in my own lab with research projects they too can call their own.

Chemistry News: You recently received the UIUC Campus Award for Excellence in Guiding Undergraduate Research. What is your proudest accomplishment(s) as an undergraduate research advisor?

Silverman: Many of the undergraduate students in my lab have authored peer-reviewed research manuscripts, including several as first authors in top journals such as JACS, Biochemistry, and Organic Letters. It's difficult to deny pride in that, because such outcomes don't happen accidentally (and, I should note, require just as much mentorship from graduate students and postdocs in the lab as from me). More important than any published papers is the fact that many of my undergraduate students have gone on to do well as graduate students in chemistry or related disciplines.

Chemistry News : What is your advice for undergraduate students who may be interested in pursuing research?

Silverman: Start relatively early (don't wait until your senior year!). Ensure that your weekly schedule allows sufficient time to have a meaningful research experience, while also recognizing that some weeks you simply won't have a lot of time for the lab. Try to prepare yourself for the inevitable ups and downs of real-life research. Take a moment every now and then to recognize how great it is to be discovering things that until this moment, nobody ever knew before.

THE OPPORTUNITY TO JOIN A LABORATORY, PARTICIPATE IN A RESEARCH PROJECT, AND IN GENERAL BECOME PART OF THE SCIENTIFIC ENTERPRISE CAN MAKE A REAL DIFFERENCE IN HELPING AN UNDERGRADUATE STUDENT TO CHOOSE A RESEARCH-ORIENTED CAREER.

Professor Scott Silverman

Emily Allen

Chemistry News: Could you tell us a little about yourself and background?

Emily Allen: I am a senior studying Molecular and Cellular Biology (MCB) and Chemistry. One of my favorite courses at the University of Illinois has been Chem 332: Elementary Organic Chemistry and so I applied to become a supplemental instruction (SI) leader for the class. I have been an SI leader for the past four semesters. I joined the Silverman lab in January 2010.

Chemistry News: You are a member of Dr. Scott Silverman's research group. Could you describe the work you do in lab?

Allen: My first project was aimed at increasing the zinc tolerance of deoxyribozymes that hydrolyze phosphodiester bonds. I performed a reselection of the deoxyribozyme 10MD5 in order to find similar enzymes that are tolerant to more zinc concentrations. After the selection process I was able to sequence and assay several deoxyribozymes that are active over an order of magnitude of zinc concentrations. This work contributed to our lab's recent publication in Chemical Communications. (“Merely Two Mutations Switch a DNA-Hydrolyzing Deoxyribozyme from Heterobimetallic (Zn²⁺/Mn²⁺) to Monometallic (Zn²⁺-only) Behavior”, Y. Xiao, E. C. Allen, and S. K. Silverman, *Chem. Commun.* **2011**, 47, 1749)

I am currently in the beginning stages of a new research project that will culminate in my undergraduate thesis. In this project, I hope to identify the optimal length for the catalytic region of deoxyribozymes for phosphodiester bond hydrolysis. I am performing selections of DNA molecules having catalytic region lengths between 20 and 60 nucleotides. After characterizing the enzymes that are identified from this process, I will be able to determine which size enzyme gives the best activity, both in overall yield and reaction rate.

Chemistry News: How did you get involved in undergraduate research?

Allen: During my sophomore year I became interested in pursuing research and continuing on to graduate school. I decided to get involved in undergraduate research to prepare myself for graduate school. I wanted to join a research group that would allow me to combine my interests in molecular biology and organic chemistry. Dr. Scott Silverman's group appealed to me because it uses biological molecules in novel ways to catalyze reactions.

Chemistry News: In summer 2010 you received the Gieseking scholarship which allowed you to perform summer research in Dr. Silverman's lab. How did receiving a research award affect you and your research?

Allen: I received the Gieseking Scholarship in the summer of 2010 which provided me with funding to pursue research full time during the summer. This allowed me to perform more intensive research that I would not have been able to do while classes were in session. During this time I performed a cloning procedure which allowed me to study each enzyme individually and subsequently sequence the enzymes and perform kinetics assays. It was great to experience what it is like to work in a lab full time and strengthened my interest in continuing to graduate school.

Chemistry News: You're graduating this year. What's next for you?

Allen: After graduation I will be moving to California where I plan to work as a lab technician for a year before applying to Immunology Ph.D. programs.



A Moment with: Deborah Leckband

PURSUE WHAT YOU LOVE. THERE ARE MANY CHALLENGES TODAY IN HEALTH, SUSTAINABILITY, THE ENVIRONMENT, AND ENERGY WHERE CHEMISTS ARE PLAYING CRITICAL ROLES. THERE ARE MANY WAYS THAT YOU CAN MAKE A DIFFERENCE AND HAVE FUN DOING IT.

Professor Deborah Leckband

A MEMBER OF THE UNIVERSITY OF ILLINOIS FACULTY SINCE 1995, PROFESSOR DEBORAH LECKBAND'S RESEARCH USES SURFACE PHYSICAL CHEMICAL APPROACHES TO UNDERSTAND THE BIOLOGY-MATERIAL INTERFACE AND TO ENGINEER THAT INTERFACE BY DESIGNING MATERIAL COMPOSITION AND ARCHITECTURE. In addition to her ground-breaking surface research, Professor Leckband has been the recipient of numerous professional awards, including being named a Fellow of the American Chemical Society, the American Institute for Medical and Biological Engineering, and the American Association for the Advancement of Science. *Chemistry News* sat down with Professor Leckband to discuss her research, students, and life in the Department of Chemistry at University of Illinois.

Chemistry News: When did you first become interested in chemistry?

Professor Leckband: I was always interested in biology, but I fell in love with chemistry as an undergraduate. My favorite subjects were physical chemistry and biochemistry, but I also loved organic chemistry. I had a terrific high school chemistry instructor, but it wasn't until college that it all really clicked.

Chemistry News: You did your undergraduate and postdoctoral work in California and received your Ph.D. from Cornell. What attracted you to University of Illinois?

Professor Leckband: The University of Illinois has a strong

tradition in chemical sciences, and I was particularly drawn by the fact that Chemical Engineering also had a strong tradition in both fundamental research and in applied research. Chemistry is an overall incredibly strong department. Beyond Chemical Sciences, there are no barriers to collaborative, interdisciplinary research, which is where I find the most exciting scientific challenges. Many University of Illinois faculty have affiliations with different departments, and that is also true in Chemistry. Another very strong draw was the extraordinary array of facilities here on campus. These enable you to do much more than you could if you had to work through collaborations or build the infrastructure in your own lab, as faculty often do at other institutions.

Chemistry News: Who or what inspires you as a chemist?

Professor Leckband: Discovering something for the first time that is both new and important.

Chemistry News: Your research is at the interface between biology and surface chemistry. What drew you to this area?

Professor Leckband: So many important processes in biology and in our everyday lives are result of encounters between biological molecules or cells and the surfaces of either natural or manmade (abiotic) materials. For example, contact lenses initially had to be changed every day, because of the buildup of proteins, lipids, and bacteria that would adsorb to the contact lens materials. Reformulating contact lenses from materials with surface chemistries that more effectively repel biological components, allow your eyelids to slide over the materials more easily, and remain hydrated led to our current extended wear lenses. Even some of the most fundamental processes in biology such as the organization of embryonic cells into tissues during development result from the actions of specialized adhesion proteins on cell surfaces. Many aspects of these problems cannot be understood or solved with knowledge of surface chemistry or biochemistry alone, but instead require an integrated, multidisciplinary perspective. In many ways, the research is more demanding because you are expected to be an expert in both disciplines. At the same time, I like to the challenge.

Chemistry News: Are there any awards or honors that you have received that hold special meaning to you?

Professor Leckband: For me, a special honor is to be invited by graduate students at another university to give a seminar in their department. This tells me that my research inspired young scientists without them ever having met me personally. This is unlike awards for which you apply and are awarded by your scientific peers.

Chemistry News: What advice do you have for students considering pursuing chemistry today?

Professor Leckband: Pursue what you love. There are many challenges today in health, sustainability, the environment, and

energy where chemists are playing critical roles. There are many ways that you can make a difference and have fun doing it. If laboratory research isn't for you, many professions need people with technical training to inform and educate businesses, politicians, and the public, in order to help them understand and appreciate the positive contributions of chemists and scientists to our society.

Chemistry News: What is your favorite aspect of working at University of Illinois?

Professor Leckband: Having so many talented students, postdocs and colleagues to work with, and seeing fresh graduate students grow into independent, successful scientists.

For more information about Professor Leckband and her research, please visit chemistry.illinois.edu/faculty/Deborah_Leckband.html

CHEMISTRY IS AN OVERALL INCREDIBLY STRONG DEPARTMENT. BEYOND CHEMICAL SCIENCES, THERE ARE NO BARRIERS TO COLLABORATIVE, INTERDISCIPLINARY RESEARCH, WHICH IS WHERE I FIND THE MOST EXCITING SCIENTIFIC CHALLENGES.

Share Our Vision

AS OUR SUPPORT FROM THE STATE OF ILLINOIS CONTINUES TO DROP, THE DEPARTMENT OF CHEMISTRY IS BECOMING INCREASING DEPENDENT ON PRIVATE GIVING. Unfortunately, only 7% of living alumni give to Illinois Chemistry. Every gift counts because there is strength in numbers! For example, the majority of the gifts to our annual campaign are in the range of \$100 to \$1000 and these total nearly \$100,000 per year.

Reasons for Giving

Your gift has a very real, very direct impact on the people at our school, who in turn, are improving society through their discoveries and by educating the next generation of scientific leaders. Our faculty and students are working to address some of the most pressing global challenges, from developing new anti-cancer therapies and drugs that treat multi-drug resistant bacteria to creating synthetic methods for more sustainable industrial processes and new more efficient sources of energy.

The Vision 2020 Fund

With a lead gift from Mr. Mark Pytosh, the Vision 2020 Fund was created in 2008 to provide a lasting source of funding to the department through an endowed fund. By establishing an endowment we have created a permanent funding source which provides an annual income which will allow us to meet the Department's most critical needs including recruiting and supporting top faculty and students, maintaining and upgrading facilities and equipment, and creating educational support programs for deserving students.

Vision 2020 recently received its largest gift to date—a million dollar gift by Dr. Peixin He and Mrs. Xiaoming Chen. This gift also created the “Larry R. Faulkner Professorship in Chemistry”, a chaired position for a faculty member in honor of Dr. Larry Faulkner, a former professor in the Department and Dr. He's mentor. Named positions are a critical tool for recruitment and retention of top faculty, providing flexible funds that encourage innovation and excellence in research and teaching.

In addition to Faulkner Professorship, income from Vision 2020 is also being earmarked for student support. Awards and scholarships are critical to recruiting and retaining top students at both the graduate and undergraduate level and the Department of Chemistry is committed to providing meaningful support to its students.

Documented Impact and Stewardship

Beginning in 2012, every donor to the Vision 2020 Fund will receive an annual letter and report detailing market value, growth, and income from the fund. The report will also detail any present or future projects supported by the fund's income so that the impact of every gift is seen.

Donor Recognition

Each donor to the Vision 2020 Fund will be acknowledged in the annual report and in the giving section of the Spring/Summer edition of Chemistry News, the Department of Chemistry's semiannual newsletter. Major gifts and pledges, donors will be furthered recognized in Noyes Laboratory. See “Special Recognition” below for more details.

At a donor's request, gifts can be made anonymously.

Giving in Honor of Another

A gift may be given in honor of a friend, family member, or an Illinois great. Acknowledge the impact of a research advisor or honor the memory of a loved one. The donor's gift will be listed as given in “honor of” or in “memory of”.

Special Recognition

For an annual gift to Vision 2020 of \$10,000 or a pledge of \$2,000 per year for five years, an engraved nameplate will be permanently installed on a seat G.L. Clark Hall (formerly 100 Noyes Laboratory). For cumulative gifts above \$20,000 over a five year period, the donor will be further recognized on a permanent plaque in the main hallway of Noyes Laboratory.

Other Opportunities for Major Gifts

Major gifts allow you to leave a lasting legacy as well as provide vital support to the department. Named opportunities are available in the following areas:

- Graduate Fellowships
- Faculty Chairs and Professorships
- Undergraduate Scholarships and Awards
- Classrooms

Other opportunities are also available. Please see our giving page (chemistry.illinois.edu/giving) for more information or feel free to contact me via email (sczimmer@illinois.edu) or by phone (217-333-5071).

With Illinois Pride,



Steve Zimmerman

Donors

The Department of Chemistry wishes to thank these, and all, donors for their continued and generous support of our teaching and mission.

The list of donors includes individuals whose gifts to the Department of Chemistry were dated between July 1, 2009 and December 31, 2010, regardless of processing date.

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Giving Stories:

The Springborn Fellowship

IN THE FOUR YEARS SINCE DR. ROBERT AND MRS. CAROLYN SPRINGBORN DECIDED TO LEAVE THEIR LEGACY BY DONATING TEN MILLION DOLLARS TO SUPPORT GRADUATE STUDENTS, 19 STUDENTS HAVE RECEIVED THE SPRINGBORN FELLOWSHIP.

The fellowship, which provides a stipend as well as a tuition and fee waiver, also supports travel to outside conferences and labs to promote research.

When their gift was made in 2007, Dr. Springborn commented, “I give for two reasons. I value the education I received and I want to ensure our country can compete scientifically in the future; Illinois is the best place to invest to achieve both goals. I owe my success to my education.” Today, with state appropriations being cut, gifts like the Springborn’s are even more critical. As we work to maintain the tradition of excellence in teaching and research, support for students is one of the keys to our success.

The Springborn Fellowship is highly competitive, with hundreds of applicants each year. Unlike other fellowships given at Illinois, the Springborn Program requires an on campus interview. With regard to support, the fellowship is highly attractive, matching or surpassing the most elite programs in the U.S., including that of the National Science Foundation. As a result, the students recruited to Illinois usually have offers from multiple top-ten programs and many also receive an NSF Fellowship, which can be held consecutively with the Springborn Fellowship.

Chemistry News sat down with Springborn Fellow Patrick Knerr to talk about the impact of the fellowship.

“The Springborn Fellowship has played a pivotal role both in my deciding to come to UIUC and during my time here.” said Knerr, “After I graduated from the University of Delaware in 2008, I was accepted into the Department of Chemistry here at UIUC and joined

OVERALL, THE FELLOWSHIP HAS GREATLY HELPED TO EASE MANY OF THE BURDENS OF GRADUATE SCHOOL, AND I’M VERY GRATEFUL TO HAVE HAD THE OPPORTUNITY TO MEET THE SPRINGBORNS AND LOOK FORWARD TO THEIR NEXT VISIT.

Springborn Fellow Patrick Knerr

lab of Wilfred van der Donk, where my research involves the synthesis of a family of antibiotic natural products called lantibiotics. I was initially drawn to UIUC when applying to graduate schools due to the high reputation of its faculty and its emphasis on my subdiscipline, chemical biology, but I was hesitant to move so far from the East Coast knowing my wife would not be able to move with me for the first year. Thankfully, the Springborn Fellowship provided me the opportunity to travel home to see her several times during that year apart. “

The Springborn fellowship is unique in the Department of Chemistry for a number of reasons, including the additional support it offers and the chance for students to meet and directly interact with the donors of the fun. Knerr said, “A unique aspect of this fellowship is that fellows get a yearly opportunity to meet with the benefactors, Dr. and Mrs. Springborn. These visits involve both informal research discussions over lunch as well as a dinner hosted in their honor, and I always enjoy the chance to chat with such charming people. The fellowship also provides a travel stipend to attend a national conference, which I used to travel to the American Chemical Society’s National Meeting in Anaheim, CA at the end of March. Overall, the fellowship has greatly helped to ease many of the burdens of graduate school, and I’m very grateful to have had the opportunity to meet the Springborns and look forward to their next visit.” ■



Giving News:

Peixin He and Xiaoming Chen

CHEMISTRY AT ILLINOIS IS DELIGHTED TO ANNOUNCE OUR LARGEST GIFT TO DATE TO THE VISION 2020 FUND—A MILLION DOLLAR GIFT BY DR. PEIXIN HE AND MRS. XIAOMING CHEN.

Dr. He was born in Shanghai China and received his Bachelor’s and Master’s degree from Fudan University. In 1980, he traveled to the University of Illinois as an exchange scholar but registered as a non-degree student, joining Professor Larry Faulkner’s research group in analytical chemistry. After returning to Fudan University for one year, he formally enrolled in the Ph.D. program at University of Illinois. Before graduating in 1985, He authored seven original journal articles with Faulkner in the area of electrochemistry.

Mrs. Chen also attended Fudan University, earning her Bachelor’s and Master’s degrees in 1977 and 1979, reflectively. She served as a faculty member at Fudan University and a visiting research scientist at the University of Illinois, working with Dr. Faulkner. Before founding a company, CH Instruments, with her husband, Mrs. Chen also worked at Purdue University and as a chemist in Bioanalytical Systems.

In 1994, Dr. He and Mrs. Chen founded CH Instruments, which has become a highly successful company specializing in electrochemical instrumentation. Together with Larry Faulkner and James Avery, Dr. He is the inventor of the cybernetic potentiostat, a revolutionary piece of commercial analytical equipment.

Income from Dr. He and Mrs. Chen’s gift will be used initially to support a faculty position that will honor Dr. He’s advisor and colleague Dr. Larry Faulkner. Drs. He and Faulkner met at the University of Illinois, where Dr. Faulkner served on faculty from 1973-1983 and 1984-1998, as well as holding the positions of Department Head, Dean of the College of Liberal Arts and Sciences, and Provost and Vice Chancellor for Academic Affairs. For more information about the Faulkner Chair, please keep an eye out for announcements and an interview with the recipient in a future issue of *Chemistry News*.

Unrestricted gifts like Dr. He and Mrs. Chen’s are instrumental in providing flexible funds to address departmental needs. For more information on giving to the Vision 2020 fund, please see Share Our Vision on page 14. ■



INCOME FROM DR. HE AND MS. CHEN’S GIFT WILL BE USED INITIALLY TO SUPPORT A FACULTY POSITION THAT WILL HONOR DR. HE’S ADVISOR AND COLLEAGUE DR. LARRY FAULKNER.

Alumni Notes



Remembering

David Y. Gin

THE DEPARTMENT OF CHEMISTRY AT ILLINOIS IS SADDENED TO ANNOUNCE THE DEATH OF DAVID Y. GIN, A FORMER COLLEAGUE AND FRIEND OF THE DEPARTMENT.

David Y. Gin was born on May 16, 1967 and raised in Ashcroft, British Columbia. He received his BSc in Chemistry at the University of British Columbia in 1989, where he performed summer undergraduate research under the direction of Professor Tom Money. In 1989, he began his graduate studies in synthetic organic chemistry at the California Institute of Technology under the direction of Professor Andrew Meyers. Professor Jeffrey Moore, a postdoctoral researcher at Caltech while Dave was a student there, recalled their first interactions, saying, “My first memories of him are as an eager student, full of life and an amazing love for chemistry.”

After earning his PhD in 1994, he held a two-year Natural Sciences and Engineering Research Council of Canada (NSERC) postdoctoral appointment at Harvard under the guidance of Professor E.J. Corey (Illinois faculty 1951-1959), Dave began his independent academic career in 1996 at the University of Illinois at Urbana-Champaign, where he remained for 10 years in the Chemistry Department, establishing a research program in the synthesis of natural products and the development of new synthetic methodology.

Professor Peter Beak remarked that Dave was a remarkable scientist, bright, hard working, productive, a leader in his field, an excellent mentor for his students and a generous colleague. He added, “Above all else Dave was dedicated to his family. I remember early on at Illinois when we were flying out of Champaign together I asked how he was doing. With a huge smile he said, “Wonderful, I am heading to Cal Tech to see Mary.””

In 2006, Dave left the University of Illinois to join Sloan-Kettering Institute’s Molecular Pharmacology and Chemistry Program. His work was at the nexus of synthetic chemistry, clinical trials, and research to develop new, safer, and more-potent immunological and therapeutic agents for cancer and infectious diseases. Professor Wilfred van der Donk, who began at Illinois one year after Dave did, spoke of Dave’s research saying, “He was a brilliant synthetic chemist that devised ingenious routes to complex natural products,

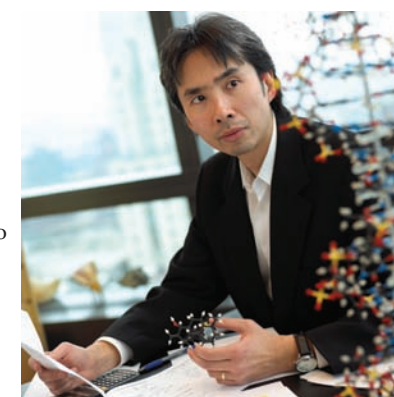
**MOST IMPORTANTLY,
HE WAS A GREAT
FRIEND, COLLEAGUE,
AND FAMILY-MAN**

Steven C. Zimmerman

including molecules that are currently under development for anti-cancer vaccine therapy. Considering his remarkable scientific accomplishments he was truly humble and modest and did not seek the attention that his accomplishments warranted. He let his science speak for itself.”

Dave’s research was recognized a number of times and he was the recipient of numerous professional awards, including most recently the Hoffmann-La Roche Excellence in Organic Chemistry Award. Additionally, his dedication to teaching the next generation of chemists was recognized with awards such as the Camille Dreyfus Teacher-Scholar Award and the School of Chemical Sciences Teaching Excellence Award during his time at University of Illinois. Many of the faculty still use Powerpoint slides that are derived from those initially developed by Dave during his time at Illinois. “He was absolutely one of our most committed and gifted teachers,” noted Steve Zimmerman, “But as much as he enjoyed teaching, Dave was passionate about his research, and particularly the opportunity to develop his synthetic oligosaccharides and glycoconjugates for anti-cancer and anti-viral vaccine therapies. Most importantly, he was a great friend, colleague, and family-man.”

Dave was preceded in death by his father, Eugene, and daughter Suzanne. He is survived by his mother, Gigi; brother, Doug; daughter, Laura; son, Duncan; and wife Mary who served on the University of Illinois, Department of Chemistry faculty from 2000 to 2006. ■



Basudeb DasSarma (Postdoc, 1953-55) recently published a book, *Journey of a Lifetime: Memoir of an Indian Chemist*, which features a chapter about his time at University of Illinois. Dr. DasSarma, who views himself as a preacher of the beauty and flavor of “common sense chemistry,” worked under Dr. John Bailar from 1953-55 and described his time in the Department of Chemistry saying, “My twenty-one months at Illinois were probably the most enjoyable and creative periods in my life. I was free of family commitments, social obligations, definite hours, programs, or interests outside the lab.”

Elaine Fuchs (B.S. 1972) recently received the Madison Medal from Princeton University. Named for James Madison, Princeton’s first graduate alumnus, the Madison Medal was established in 1973 by the Association of Princeton Graduate Alumni (APGA). Upon the recommendation of the APGA Committee on Nominations and Awards and the Madison Medal Selection Committee, this honor is conferred each year on an alumnus or alumna of the Graduate School who has had a distinguished career, advanced the cause of graduate education or achieved a record of outstanding public service.

Dr. Fuchs, a world leader in skin biology and its human genetic disorders who is widely credited for bringing dermatology into the molecular biology era, has also been selected as the 2011 Passano Laureate. The Passano Foundation supports scientific research and makes an annual award to recognize outstanding research done in the United States.

Lastly, Dr. Fuchs has also received the 11th annual Albany Medical Center Prize in Medicine and Biomedical Research. The award is given to scientists “whose pioneering work in isolating human stem cells holds great promise for the future of medicine” and is the largest monetary award in medicine and science in the United States.

Michael Harmata (Ph.D. 1985, *Denmark*), Norman Rabjohn Distinguished Professor of Chemistry at the University of Missouri-Columbia, has received a number of appointments, awards, and honors over the last year. Dr. Harmata was appointed an adjunct faculty member at the International Institute of Nano and Molecular Medicine at the University of Missouri. The institute is a research center dedicated to the discovery and application of fundamental and translational medical science based upon previously unexplored chemistry combined with nanotechnology and the biosciences.

Additionally, Dr. Harmata has received the Liebig Professorship award from the Justus-Liebig University in Giessen, Germany. The appointment directly connects him to one of the greatest organic chemists in the 19th century, Justus von Liebig, who is often considered the founder of the chemistry curriculum used today in many universities. Harmata worked in Germany in 1998 - 1999 and 2008, and his work with students there earned him the award, much like Harmata’s students at the University of Missouri. “To have my work recognized, as well as to have the University of Missouri acknowledged internationally, is one of the highest recognitions my work can achieve,” Harmata said. “The students that graduate are pushing innovation, and ultimately, that’s an extension of me, just as I am related to Professor von Liebig through a number of generations of outstanding organic chemists.”

Dr. Harmata also received a PROSE Award honorable mention for his editing of the book *Silver in Organic Chemistry*, published by John Wiley & Sons, Inc.

Jim Thean (B.S. 1966) was highlighted in a fall issue of the *Walton Sun*, a Florida newspaper. Dr. Thean retired to Panama City after a career that included research for Florida State University, teaching for Florida A&M University, lab work in Atlanta, and a position in Florida Department of Agriculture. Since retirement, Dr. Thean has used his knowledge for pompano fishing, and was named as one of Florida’s top 10 pompano experts by the *Miami Herald*.

In Memoriam

Jane C. Benjamin passed away on Tuesday, Feb. 22, 2011. She was born on Feb. 28, 1927, in Macomb, Ill., to Augustus F. and Iva Randolph Cover. She married Kenneth E. Benjamin on June 1, 1947, in Toulon. She was a University of Illinois graduate, having majored in chemistry. Following college she worked at the Northern Regional Research Laboratory. Jane was a member of First Federated Church, serving in many leadership positions including vice moderator, chairman of pastoral search committee, finance committee and deaconess. She also was on the board of Peoria Forest Park Foundation. She was very active for more than 50 years in the Service League of Methodist Medical Center, serving as president, shop chairman and bookkeeper in the gift shop. Most recently she was the chairman of the Service League flower shop. She helped establish Wildlife Prairie Park Shops and served as president and treasurer for several years. She also served as Wildlife Prairie Park business manager from 1986-1991.

Doretha Helene Holcomb Burgess passed away on February 16, 2011. She was predeceased by her husband, John H. Burgess, of Lake City. She earned a B.S. Degree from Florida A and M University and played tennis and basketball for the Rattlers. Subsequently, she earned a Master's degree from Tuskegee institute and completed post graduate studies in chemistry at the University of Illinois. Mrs. Burgess began teaching in White Springs, Florida at Carver High School

where she also coached the girls' basketball team. The remainder of her educational career was served in Columbia County. She was a beloved teacher, coach, mentor and friend. She won the Star Teacher Award and the Florida Outstanding Chemistry Teacher Award while teaching at Columbia High School. Her science students continually received academic acclaim for their projects each year. She served as pianist for the Trinity United Methodist Church youth gospel chorus and the Union AME Church. She was a member of Alpha Kappa Alpha Sorority, Inc. and served honorably in numerous church, civic and social organizations.

Robert E. Carnahan passed away on February 3, 2011. Carnahan earned a B.S. at the University of Wisconsin, Madison, and an M.S. in organic chemistry at the University of Illinois, Urbana-Champaign, where he also earned a Ph.D. in organic chemistry in 1950. He began his career as a chemist with Charles Pfizer in Groton, Conn., before moving to the company's patent department in Brooklyn in 1955. In 1960, he joined Mead Johnson in Evansville, Ind., working as a patent liaison representative; in 1963, he became the company's director of patents. Beginning in 1981, Carnahan became director of patents at Bristol-Myers Squibb, working in Syracuse; Wallingford, Conn.; and Evansville, before retiring earlier this year. He was an emeritus member of ACS, joining in 1948. He was an active member of the Evansville Historical Society and a supporter of the Evansville

Philharmonic and the University of Evansville music program. He enjoyed traveling, playing golf, and listening to opera.

Charles Harold (Hap) Fisher died Friday, May 13, 2011. He was born November 20, 1906, in Hiawatha, W.Va., and was a chemist, technologist, author and philanthropist. He earned a bachelor of science degree in chemistry from Roanoke College in 1928, master of science in chemistry in 1929 from the University of Illinois, and a Ph.D. in organic chemistry in 1932, also from the University of Illinois. Dr. Fisher led a long and distinguished career that included playing tenor banjo in a dance band, teaching chemistry at the University of Illinois, conducting industrial chemical research at Pennsylvania Coal Products Co., teaching organic chemistry at Harvard, investigating production of liquid fuels and chemicals with the U.S. Bureau of Mines, was a research leader at the USDA Eastern Regional Research Center in Philadelphia, was the Director of the USDA Southern Regional Research Center in New Orleans for 22 years and finally returning to Roanoke College in 1972 as an Adjunct Research Professor. He was a U.S. delegate to the 17th Conference of the International Union of Pure and Applied Chemistry at Stockholm and Uppsala, Sweden, and was awarded honorary doctoral degrees by both Tulane College and Roanoke College. He was a recipient of the Herty Medal, the Southern Chemist Award, and named Chemical Pioneer by the

American Institute of Chemists, named a Pioneer in Polymer Science by Polymer News, received the USDA's Superior Services Award, the Presidential Citation of Merit by the American Institute of Chemists and the Roanoke College Medal. Dr. Fisher's record also includes more than 200 publications and 72 patents. His biography is included in Who's Who in America, Who's Who in the World, England's Outstanding Scientist of the 21st Century, the International Who's Who of Intellectuals and England's Outstanding Scientists.

Harriet Harlin, age 86, formerly of Mt. Prospect, IL passed on Oct. 30, 2010. A longtime supporter and friend of the Department of Chemistry at the University of Illinois, Ms. Harlin was a teacher for the Chicago School District and taught chemistry at Taft High School. She enjoyed participating in bridge groups, photography and travelled extensively through Europe. A full obituary and reflection on Ms. Harlin's life and legacy will be featured in Fall/Winter 2011 issue of Chemistry News.

Julius E. Johnson passed away on November 29, 2010. Julius was raised in Colorado and received an A.B. degree in chemistry from the University of Colorado, Boulder. He received his Ph.D. at the University of Illinois under Dr. William Rose, participating in some of the original discoveries of essential amino acids in the human diet. In 1943 he was employed as a research chemist by The Dow Chemical Co. During wartime he developed a program testing Dow

compounds for possible use as anti-malarial and anti-infective drugs. Afterward he worked in the areas of animal nutrition and disease control. He became the director of research for Agricultural Chemicals and later was appointed manager of the Agricultural Chemicals Department. In 1968 he was elected to the board of directors and appointed the director of research and development for the company. In 1971 he became general manager of the Life Sciences Department, retaining his corporate responsibilities as director of research and vice president. He was also chairman of the company's Ecology Council, a primary focus later in his career. Julius participated in the National Agricultural Chemicals Association, chaired the American Chemical Society-Midland, served on committees of Academy of Sciences, National Research Council, EPA Science Advisory Board, Midland School Board, Chemical Bank, Rotary Club, and was an advisor to the Neogen Corporation Board.

Jack A. Kampmeier passed away on March 26, 2011 at the age of 75. Born June 11, 1935 in Cedar Rapids, Iowa, his family soon moved to Wyncote, Pennsylvania where he met the love of his life Anne, in fifth grade. After graduating in 1953 from Cheltenham High School, he attended Amherst College, graduating cum laude in 1957. After marrying Anne in 1958, he completed a Ph.D. in Organic Chemistry at the University of Illinois, Champaign-Urbana in 1960. Jack spent 45 years at

the University of Rochester and served the university and his students as an assistant, associate, and full professor, department chair, assistant dean, and Dean of the College before becoming Professor Emeritus of Chemistry in 2005. Since 1995, Jack derived great joy and satisfaction from his involvement with Peer-Led Team Learning at the University of Rochester and throughout the United States. Jack believed in the transformative power of education and to his final days worked to make the world a better place through teaching, learning, and understanding.

Robert E. Putnam passed away March 27, 2011. He was born Oct. 18, 1927, in Northampton, Mass., the son of Ervin and Mary Connelly Putnam. From 1945 to 1946, he served in the U.S.N.R. and then received a bachelor of science in chemistry from the University of Massachusetts in 1950, and a PhD in organic chemistry from the University of Illinois in 1953. Bob held various research positions for E.I. DuPont de Nemours in Wilmington, Del., and Parkersburg until his retirement as a research manager in 1985. Dr. Putnam served as adjunct faculty of Washington State Community College in Marietta; Alumni Advisory Council, Department of Chemistry, University of Mass., Amherst, 1975-78; instructor of chemistry at Marietta College, and served on the advisory council of the Institute For Learning in Retirement. He contributed 20 articles to professional journals and held many patents on polymer

chemistry as well as being a NSF fellow, University of Illinois, 1952-53; Fellow AAAS; member of the American Chemical Society, and Research Society of America.

Delos Edison Pypes, Jr. passed away on February 7, 2011. Born September 28, 1927, Delos served in the Army Signal Corp in WWII Occupied Japan 1945-47, earned a B.S. in Chemistry at University of Illinois Champaign-Urbana 1950 and was a member of Alpha Chi Sigma fraternity. He studied at Princeton Theological Seminary 1950-53. He worked as a chemist and inventor at Sunflower Ordinance, Armco Steel, Paniplus, and Colgate-Palmolive. He was an active member of Westport Presbyterian Church and a Royals fan who liked to fish and camp.

Albert Smith passed away, March 9, 2011, after a long and meaningful life. Dr. Smith was born on June 16, 1913 in Mulhull, Oklahoma. He began his college education at Oklahoma A & M (now Oklahoma State University) and completed his BS degree in chemical engineering as class valedictorian at the age of 18. Albert Smith then pursued an advanced degree in chemistry from the University of Illinois and successfully attained his PhD at the age of 22. Dr. Smith's professional career spanned over 30 years with leading industry giant E.I. DuPont De Nemours & Company in Wilmington, Delaware as Director of the Carothers Research Laboratory. There his contributions included but were not limited to the invention, development, production, and improvements of synthetic fibers. He held 17

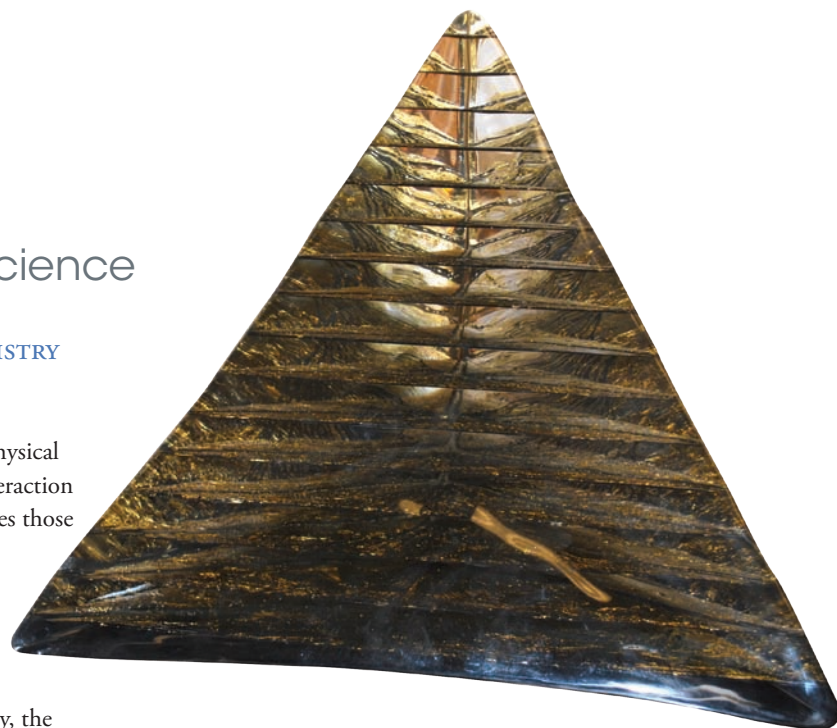
patents notably for work in the development of base tire cord (rayon) used during World War II for aircraft tires, as well as, toothbrush bristles, fire retardant materials and numerous and substantial other items. Dr. Smith was listed in "American Men and Women of Science" and "Who's Who in American Politics."

William H. ("Bill") Taylor, Jr. passed away on March 21, 2011. Bill was born on May 4, 1915 in Wausau, Wisconsin, son of the late William H. Taylor, Sr. and Mary Loretta (Ford) Taylor. He obtained a B.S. in Chemistry with honors from the University of Wisconsin in 1937 and a Ph.D. in Analytical Chemistry from the University of Illinois in June 1941. He worked for the Naval Research Laboratory in Washington, D.C. during World War II helping to develop clothing to protect soldiers from the effects of poison gas. Bill received a Meritorious Civil Service Award for outstanding service to the Navy to recognize his achievements and advances in this chemical warfare defense research. After the war, Bill moved to Wilmington, DE to work for the E. I. DuPont de Nemours Company in the research department at the Experimental Station. It was there that he met his wife of 49 years, Janice S. Taylor. After 32 years of service for the DuPont Company, Bill retired in 1978 but continued to find ways to contribute his services to the Wilmington community through many church, school, and volunteer organizations.

Terry Balle: At the Interface of Art and Science

GRADUATES FROM THE DEPARTMENT OF CHEMISTRY CAN BE FOUND IN A NUMBER OF FIELDS AND DISCIPLINES, FROM RESEARCH TO ACADEMIA TO MARKETING. Alumni Terry Balle received his Ph.D. in Physical Chemistry and turned his research into the study of the interaction of light and matter into a career as a sculpture artist who uses those principles to create his art.

Recently, Terry created a piece in honor of his advisor, Dr. Willis Flygare. The piece, which was purchased by Ruth Flygare, is the sister piece to a sculpture that Terry created (see image) which will be auctioned in the fall to support the Department of Chemistry and, more specifically, the Flygare Lecture Series. Read below for an excerpt of Terry's reflection on his art and his piece dedicated to Dr. Flygare.



The Golden Tetrahedron

A Sculpture Dedicated to Bill Flygare
Terry Balle, Ph.D. ; March 2011

I am especially happy to have the opportunity to dedicate a sculpture to the memory of Professor Bill Flygare. I attended the U of I Department of Chemistry from 1975 to 1980 and worked with Bill to invent and patent our Fabrey-Perot Cavity, Pulsed Fourier Transform Molecular Beam Microwave Spectrometer. This project was a labor of love and I honor the memory of Flygare's guidance and support.

After eight years in corporate America as a scientist, I founded a Sculpture and Design studio in Boston. I have dedicated my work to the interplay of Art, Science, and Psychology. My sculptures reflect my on-going study into how a sculptural work of art can incorporate the disciplines of optics with symbolic shape and geometry as embodied in my hand carved optical system. My work is informed by the use of mixed organic dyes or metal leaf to create a sequence of interactive color planes which are unified with the principals of symbolic design and qualitative number theory.

I believe science can supply an objective criteria to guide the creation of sculpture, whereby art gives beauty to science and science gives new meaning to art.

Symbols are important in art as well as life because they point to the undefinable. Like reality itself, a symbol is beyond complete description, one cannot put it in a box. Symbols exist simultaneously on many levels of meaning. In my work as a sculptor, I use the symbols of sacred geometry as reflected in this sculpture, "The Golden Tetrahedron."

For more information about Balle's piece for the Department of Chemistry, to be auctioned in Fall 2011, please visit our website at chemistry.illinois.edu/giving/SculptureAuction.html. ■



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