

DEPARTMENT OF

Chemistry News



FALL/WINTER 2008 UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



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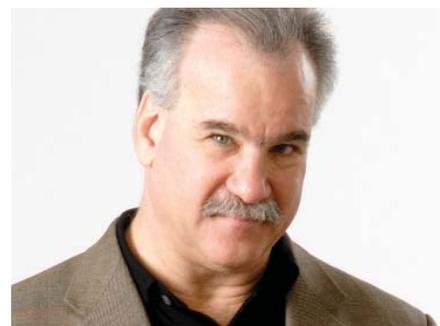
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A Special Appeal from the Department Head



ONE OF THE GREAT JOYS OF BEING DEPARTMENT HEAD IS GETTING TOGETHER with Illinois chemists all across this nation. The most common sentiment they voice is how special our program is—the extraordinary faculty, the state-of-the-art facilities, and the helpful staff. Very often I hear an alumnus say “I really owe much of my success to my time at Illinois.”

We continue to provide that same remarkable experience to today’s students, despite the diminishing support from the State of Illinois (now less than 18 percent of our budget). However, the financial crisis that has gripped the country is threatening us as well, and today I must turn to our good friends and outstanding alumni, many of whom have already partnered with us.

Please help us maintain the considerable momentum we have built in the past few years. I would particularly like to encourage those of you who have not given before, or done so infrequently, to *make an annual gift or a multi-year pledge.* So that your gift will have maximum impact, we have created a new fund called *Chemistry Vision 2020*. With this fund we have set a very ambitious goal of creating a \$20 million endowment by the year 2020. This new fund will replace the Partnership for Chemistry Fund, which has for many years provided current use funds that were vital in meeting our most urgent needs.

Vision 2020 will be endowed. This is a major change that will require some belt tightening in the near term. However, upon reaching our goal, the Vision 2020 Fund will provide an annual income of at least \$1 million and put our department in a very strong position for the future. I provide more details on page 20. I hope you will take a look and consider supporting Vision 2020.

Why is annual giving so important? Some of our alumni tell me that they don’t give because they don’t think it makes a difference, particularly in comparison to the very large gifts that they have read about recently. In fact, large gifts have a large impact, but they are often targeted—to an endowed

chair that enables us to recruit a specific faculty member or to an endowed graduate fellowship fund that provides student stipends. The annual fund allows us to send a student to a national meeting or to purchase a new set of pH meters for the general chemistry laboratories. There are countless other needs where an annual gift will have a direct and distinct impact on our students and programs.

In the last newsletter I wrote about the outstanding faculty and students that we have recruited and the remarkable discoveries that are being made in Roger Adams, Noyes, and the Chemical Life Sciences Laboratories. Much of this has been accomplished with the help of our friends and alumni. If you need some external evidence, I can add the following: In 2007, the *Chronicle of Higher Education* ranked the Department of Chemistry at Illinois as 1st in the nation in scholarly productivity for public institutions. For all institutions, public and private, Chemistry at Illinois ranked 3rd behind only MIT and Harvard. That is the momentum to which I referred.

Many of our alumni are concerned about their own economic future and that is understandable. However, please keep in mind that even small gifts will make a difference because of the power we have in numbers. I hope we can count on you to help make our future as bright as our past. Please do look at the giving section at the back of this newsletter for more details on the *Chemistry Vision 2020* Fund and to see how you can have a direct impact. And feel free to contact me with questions or comments.

Sincerely yours,

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

3M Foundation Gift Supports Organic Teaching Laboratories

THANKS TO A GENEROUS \$300,000 GIFT TO THE SCHOOL OF CHEMICAL Sciences from the 3M Foundation, four organic teaching laboratories on the second floor of Noyes Laboratory are once again state-of-the-art working environments.

In December 2007, the School of Chemical Sciences and the Department of Chemistry held a ceremony to unveil one updated laboratory as the newly renamed "3M Organic Teaching Laboratory." Faculty, staff, students, alumni, and friends of the Department of Chemistry, as well as two representatives from the 3M Foundation, gathered in the second floor hallway of Noyes Laboratory to celebrate and dedicate this newly refurbished facility.

Steven Zimmerman, Head of the Department of Chemistry, provided opening remarks. Noting the prestigious history of Noyes Lab and the Department of Chemistry, Zimmerman introduced Sarah Mangelsdorf, Dean of the College of Liberal Arts and Sciences. Proudly acknowledging the connection the Department of Chemistry and the University share with industry, Mangelsdorf spoke of the role of corporate and academic partnerships, and the vital impact of generous gifts such as the donation from 3M.

Andrew Gewirth, Director of the School of Chemical Sciences, brought special attention to the enduring 3M and Illinois partnership. As an organization, 3M has dedicated itself to education and charitable giving, with donations topping \$42 million in 2007 alone. "This gift reinforces the strong alliance the campus has with 3M," Gewirth said. "This organization is committed to helping students with interests in the chemical sciences develop meaningful careers in many areas."

In his discussion of the role of the organic teaching laboratory, Zimmerman agreed. "These students learn something about the nature of chemicals and their transformations, and how to purify and identify organic compounds," he said. "These are not just chemistry majors ... last fall we had stu-



As a chemist, it is hard to think of a more joyous occasion than the dedication of a new teaching laboratory.

dents representing 34 different majors, from nuclear engineering to ... religious studies. Enhancing chemical literacy broadly is our goal and with this beautiful new lab we can accomplish that more effectively than ever before."

After delivering brief remarks, Dr. Charles Boeder (Ph.D., 1978) and Dr. Peter Grasse (Ph.D., 1983) of 3M were joined by Stanley Smith, professor emeritus, and Dr. Jeffrey Moore for a ribbon-cutting. The event concluded with an open house in the renovated laboratory and a reception.

"As a chemist, it is hard to think of a more joyous occasion than the dedication of a new teaching laboratory," said Zimmerman. "We would not be here today without the long-standing partnership that we have with 3M, and it is their most recent and generous gift that has allowed this module to be built." ■

The Chemistry Learning Center: PLATO IV and a Quiet Revolution in the Teaching of Chemistry

BOOKER T. WASHINGTON ONCE STATED THAT “EXCELLENCE IS TO DO A COMMON thing in an uncommon way.” It’s an apt motto for Dr. Stanley G. Smith and the Chemistry Learning Center. Smith’s novel idea in 1972 was to teach basic chemistry concepts through drill-based tutorials in an entirely new way via computer.

The idea of computer-based instruction took form at Illinois in the 1960s and led to the creation of the PLATO system. In 1967, the National Science Foundation awarded a grant to the University to set up a Computer-based Education Research Laboratory (CERL). The laboratory was guided by Don Bitzer, an electrical engineer and the co-inventor of the plasma screen. With a team of engineers and scientists, Bitzer developed a programming language and touch-sensitive computer terminals that allowed students to work on tutorials developed by instructors.

By 1972 a new system, PLATO IV, was ready for larger scale use. That fall, Smith helped the Chemistry Learning Center (CLC) open its doors for the first time, welcoming in a new generation of students with computer systems that, at the time, were the most cutting-edge on the market. Smith’s vision was to allow chemistry students to work through tutorials at their own pace and in the order of their choosing. The 25 PLATO IV terminals, with their distinctive orange screens, were housed in 313 Chemistry Annex and connected via microwave to a CDC computer mainframe housed in the Engineering Research Lab just a short distance away. Smith created a suite of tutorials on a broad range of topics in chemistry.



“Through his pioneering work in the Learning Center,” said Peter Beak, professor emeritus of Chemistry. “Stan showed the chemistry community how to use computers effectively in teaching. By incorporating judging routines into his lessons, he took computer-assisted instruction from being a page turner for a text book to a newly individualized and interactive way to reach and teach students. His work has been highly influential in chemistry and Stan was decades ahead of his time. In fact, the department still gets many calls from other universities asking about our Learning Center.”

The 1980s saw significant technological advances in hardware that directly affected the quantity and variety of the computer-based educational materials. A grant from IBM provided for a major upgrade of the computer infrastructure. With the new equipment, Illinois developed a prototype microcomputer system that mixed full-motion video from a video disk player with computer graphics generated by an IBM XT computer running at 4.7 MHz with 256K RAM.

The first systems established in the CLC offered students unprecedented technological power at their fingertips—they could carry out experiments on the computer and view the results as video. The expanding technological features of the lab made it readily apparent that the CLC needed to expand physically as well, and soon the CLC was moved to 212 Chemistry Annex, a former wet lab.

The Department of Chemistry has led the nation in integrating new teaching technologies into chemical education, and, for more than 35 years, the Chemistry Learning Center has been at the leading edge of this movement.

The 1990s saw tremendous technological advances, and the Chemistry Learning Center integrated those developments with ease. The entire CLC was rewired for TCP/IP, to allow students full and faster use of the Internet. IBM, a tremendous contributor to the University for years, developed a program entitled 'Photomotion,' which allowed the video disks to be digitized and run directly on the computer. These two technologies combined to allow students in the CLC to utilize digital video, rather than the standard large and unwieldy disks used at the time.

As the 21st century dawned, the Chemistry Learning Center was remodeled in order to provide students more space for studying, a better learning environment, and a new suite of services. Flat panel monitors were added to each of the 70 workstations, and spacious and modern tables were brought in to provide every student with the ideal space for

studying. Today, each computer is housed in its own study cubicle, giving the students privacy and comfort.

A variety of tutoring services are now available to every student, including walk-in tutoring provided by CLC staff and TAs during the week, tutors-for-hire, and one-on-one tutoring sponsored by American Chemical Society student affiliates in the evenings and on weekends. Open seven days a week, with hours extending as late as 10:00 pm on most weekdays, the CLC provides help to every student that walks through the door.

"The Department of Chemistry has led the nation in integrating new teaching technologies into chemical education," Zimmerman noted. "And, for more than 35 years, the Chemistry Learning Center has been at the leading edge of this movement. It is just one part of what makes chemistry at Illinois excellent and unique." ■

In Memoriam:

Ernest Ludwig Eliel

ON THURSDAY, SEPTEMBER 18, 2008, ILLINOIS ALUM ERNEST LUDWIG Eliel passed away at the Carolina Meadows Health Center after a long illness. He was 86 years old.

Eliel was born December 28, 1921, the son of Oskar and Luise Tietz Eliel, and he knew from a very young age that he wished to become a chemist. At age 11, he received his first chemistry set, and by age 15, he knew that chemistry was his passion. When he was 17, his ambitions for chemistry were halted briefly as he fled to Scotland from his German homeland during the Second World War. Only two years later, he was forced once again to relocate when he was sent to a Canadian internment camp after having been dubbed an "enemy alien." Determined to pursue his dreams, however, Ernest did not let this stop him. Once out of the camps, he headed for Cuba, where he achieved an undergraduate degree in chemistry at the University of Havana.

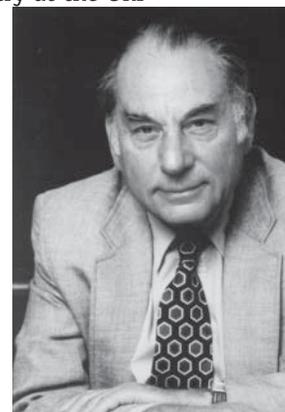
Following this achievement, Eliel moved to the United States and the Department of Chemistry at the University of Illinois. Working with Harold R. Snyder as his advisor, he finished his doctoral studies in only two years, and swiftly began his academic career at the University of Notre Dame. While teaching at Notre Dame, he completed work on what would

become one of the classic textbooks of chemistry, *Stereochemistry of Carbon Compounds*.

After 24 years at the University of Notre Dame, Eliel left to become the W.R. Kenan Jr. Professor of Chemistry at the University of North Carolina at Chapel Hill, where he spent the rest of his chemistry career. A highly honored chemist, Eliel won many awards including the 1996 Priestly Medal, the 1986 North Carolina Award in Science, an honorary doctor of science degree from Duke University in 1983, and an honorary doctor of science degree from Notre Dame in 1990. He also served as president of the American Chemical Society.

He is survived by his wife, Eva Schwarz Eliel; his daughters, Ruth Eliel and Carol Eliel; and his grandsons, Ben and Sam Muller. ■

Adapted from C&E News obituary by Bethany Halford.



Commencement 2008:

Chemistry Grads Look to the Future



Left to right: Andrew Gewirth, Mary Kay Kaufmann, and Steven Zimmerman

THE ANNUAL CHEMISTRY COMMENCEMENT WAS HELD ON MAY 11, 2008, at the Tryon Festival Theater at the Krannert Center of the Performing Arts. Families and friends were joined by 100 students and thirteen professors to celebrate the much-anticipated occasion.

The Champaign Brass performed the processional music and Steven Zimmerman, Head of the Department of Chemistry, welcomed each person and congratulated them on their achievement. "By obtaining a bachelor's or Ph.D. degree from the University of Illinois," he told the graduates, "you have become a member of a very elite group."

Zimmerman announced the awards that were to be given to undergraduates who had distinguished themselves during their years at the University of Illinois. Six awards were given this year to five undergraduates: Joseph Gerdt and Timothy Mui shared the John C. Bailar Award; Mui and David Lador shared the C.S. Marvel Award; Anita Chary received the John David Barnwell Memorial Award; and Lukasz Koscielski was awarded the R.C. Fuson Award.

Mary Kay Kaufmann (B.S., 1980) delivered the commencement address. She focused first on her disbelief that 28 years after her own graduation, she would be on the "other side of the podium," delivering a commencement speech to a new generation of chemists.

Kaufmann urged the graduates to remember important lessons, stressing six pieces of advice ranging from "work hard, play harder" to "choose a positive attitude every day." She encouraged the graduates with wisdom she gained from her years in industry.

"A degree in chemistry can open up all kinds of opportunities," Kaufmann stated. "What your degree in chemistry from a prestigious University says about you today is that you are smart, have great critical thinking skills, very good analytical and deductive skills, that you've got logical problem-solving skills, that you're goal oriented and you've got to be organized to have made it this far. These skills can apply to any number of career paths. Your future is unlimited."

Kaufmann started work with the Nalco Company—which specializes in water treatment and process chemical technologies—in 1980, in the sales department. Quickly promoted due to her talent, training, intelligence, and initiative, she achieved positions within management, marketing, cor-

By obtaining a bachelor's or Ph.D. degree from the University of Illinois you have become a member of a very elite group.

porate strategy, and information technology. She also has served as president of the Industrial & Institutional Services division—a \$1.8 billion area within Nalco. Today, with numerous honors to her name, Mary Kay Kaufmann holds the position of Group Vice President and Chief Marketing Officer for Nalco Company.

Additionally, Kaufmann has committed herself to the community, serving for seven years as a board member of the Naperville, IL, United Way, two of those years as the campaign committee coordinator. She has worked on the start-up of the Naperville Spirit campaign, and the Chicagoland United Way Crusade of Mercy Leadership Giving Women's Initiative. ■

Investitures

Dr. John F. Hartwig



Dr. Jeffrey S. Moore



Dr. Nancy Makri



DR. JOHN F. HARTWIG WAS INVESTED AS THE KENNETH L.

Rinehart Jr. Chair in Natural Products Chemistry in November 2006. Hartwig received a bachelor's degree from Princeton University in 1986 and a Ph.D. from the University of California-Berkeley in 1990. After a postdoctoral fellowship at MIT working on orally active cisplatin analogs, he began an appointment at Yale University in 1992. Hartwig joined the Illinois faculty in 2006. He has won numerous awards, including the 2008 Paul N. Rylander Award of the Organic Reactions Catalysis Society, the 2007 Tetrahedron Young Investigator Award in Organic Synthesis, the 2007 Mukaiyama Award from the Society of Synthetic Organic Chemistry of Japan, and the 2007 Raymond and Beverly Sackler Prize in the Physical Sciences.

Kenneth L. Rinehart Jr. (1929-2005) served as a faculty member at the University of Illinois from 1954 until his retirement in 2000. A lifelong scholar, he earned a bachelor's degree in chemistry from Yale University in 1950 and a doctorate from the University of California-Berkeley in 1954. Between his time attending these schools, he also spent a year of college on a Rotary fellowship at the University of Goettingen, Germany. As a researcher, Rinehart was internationally known for his studies into the isolation of structure determination of bioactive compounds derived from marine organisms. Among the natural products he found was ET743, which has shown great potential as a treatment of certain cancers in humans and is in clinical use.

Marlyn "Corky" Rinehart (née Whitsitt) established the Kenneth L. Rinehart Jr. Chair in tribute to her late husband. Marlyn was born and raised on a farm at Preemption, in Mercer County, Ill. She graduated from Monmouth College in 1957 and attended the University of Illinois for her graduate work. Marlyn has been an outstanding friend and supporter of the Department of Chemistry, and the department is deeply grateful for her exceptional generosity in honoring the remarkable legacy of Ken Rinehart Jr.

ON APRIL 24, 2007, **DR. JEFFREY S. MOORE** WAS INVESTED AS THE Murchison-Mallory Endowed Chair in Chemistry. Moore received his B.S. degree in chemistry in 1984 and his Ph.D. in materials science and engineering in 1989, both from the University of Illinois. Following his graduation, he worked as a National Science Foundation postdoctoral fellow at Caltech, and, in 1990, traveled to the University of Michigan to begin work as

a faculty member. In 1993, he returned to his educational roots, taking a faculty position at Illinois. Moore has received numerous accolades for his work in chemistry, including recently being awarded a fellowship with the American Academy of Arts and Sciences. Additionally, he was recently named to the *Scientific American* "Top Fifty Finest" list. His research into organic materials and polymer chemistry is internationally recognized, and has been featured in *Nature*, *Science*, and *The Economist*. (See related article page 16.)

Meredith Mallory Jr. (B.A., 1941) obtained a medical degree from the Tulane University in 1944, and was commissioned as an officer in the Army Medical Corps. A specialist in the effects of radiation, he served on a medical team that monitored the safety of those exposed to radiation during the bomb tests in the Pacific. In 1954, he left the Medical Corps to work in his family's oil and gas business, where he was an independent gas producer. Mallory shared the naming of the Murchison-Mallory Chair with his late wife, Patricia Murchison.

ON MAY 7, 2008 **DR. NANCY MAKRI** WAS INVESTED AS AN EDWARD William Gutgsell and Jane Marr Gutgsell Endowed Chair in Chemistry. Makri received her B.S. from the University of Athens in 1985 and her Ph.D. from the University of California-Berkeley in 1989. She spent two years as a junior fellow at Harvard before joining the faculty at Illinois in the spring of 1992. She has won numerous awards, including receiving a fellowship to the American Physical Society, the Bodossaki Academic Prize, and being selected as a fellow in the American Association for the Advancement of Science. With numerous publications to her name, her research into theoretical chemistry and quantum mechanics has been groundbreaking, resulting in invitations and requests for presentations worldwide.

Edward and Jane Gutgsell are both graduates of the University of Illinois at Urbana-Champaign. Valuing their relationship with the University highly, they sought to help maintain the standard of excellence for which Illinois has long been known. As longtime donors and genuinely caring alumni, they created the Gutgsell Endowment to "motivate and assist" faculty members in realizing their potential and to enhance their contributions to the University. For more than ten years, the Gutgsell Endowed Chairs have been granting faculty members just this opportunity, to the betterment of campus, the community and the world.

Goings On...



Dr. Robert and Connie Springborn

Dr. Robert Springborn Provides Gift

This fall, Dr. Robert and Carolyn Springborn returned to Urbana for the annual meeting of the University of Illinois Foundation. A highlight of their visit was their meeting with the second class of Springborn Fellows who recently arrived on campus. As described in the last edition of *Chemistry News*, the Springborns donated a total of \$10 million to the department for a high impact student support program. The program is providing nationally visible, highly competitive graduate fellowships to outstanding students. Each fellowship provides a guaranteed

three-year stipend, a tuition and fee waiver, and travel funds to attend two national conferences. That the Springborn Fellowship provides unprecedented freedom to pursue their research and interests in Chemistry has been a key in attracting students to Illinois.

"(The fellowship) played a large role in drawing me toward the wealth of opportunities and resources that the University of Illinois has to offer," says Matthew Luchansky, a recipient of the Fellowship for 2007-2008. "Without the need to be funded as a teaching assistant, this fellowship has provided the resources

that will allow me to focus on research earlier in my graduate student career."

The Springborn Fellows include Karen Brown, Jessica Klinkenberg, Patrick Knerr, Beth Lindquist, Luchansky, and Jacob Stewart. With their research ranging from understanding the dynamics of the Green Fluorescent Protein (GFP) to developing important new synthetic methods, these Springborn Fellows are making full use of the opportunities granted to them by the Springborn Graduate Fellowship.

Fulbright Scholarship awarded to graduate student

Charity Flener of Hartford, Ken., plans to conduct research at Philipps-Universität in Marburg, Germany, thanks to a 2008-09 scholarship from the Fulbright U.S. Student Program.

Flener, a doctoral candidate in chemistry, is studying with professors Gregory Girolami and Thom Dunning. Her Fulbright application was sparked by a June 2007 research visit to Philipps-Universität that was supported by a Central European Summer Research Fellowship. Flener's project involves using quantum mechanical models to study the breaking of carbon-hydrogen bonds, a key step in certain catalytic reactions. In Marburg, she will use advanced modeling techniques to study how

transition metal complexes can break (and form) carbon-hydrogen bonds in hydrocarbons such as methane. Understanding the factors that enable such reactions will lead to better catalysts for energy production.

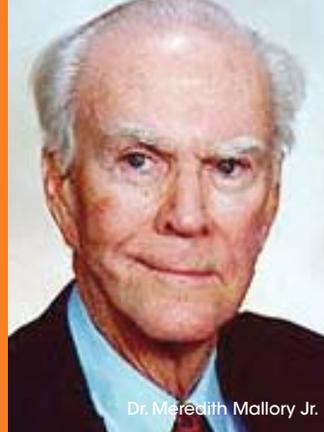
After completing her Fulbright, she hopes to continue her computational work as a college professor.

Department of Chemistry Reception at ACS National Meeting

On August 18, the Department of Chemistry held a reception for alumni and friends at the 236th National Meeting of the American Chemical Society in Philadelphia, Penn. Held at the Pennsylvania Reception Center, the event hosted guests from many parts of the nation and provided a wonderful opportunity for friends and colleagues to reconnect.

Murchison-Mallory Gift Provides for Classroom Renovation

Dr. Meredith Mallory Jr., a 1940 Ph.D. graduate of Illinois, continued his support of the Department of Chemistry with a gift allowing the department to fully renovate a conference room on the third floor of Noyes Lab. Additions to this classroom included completely new furnishings for greater student comfort and



Dr. Meredith Mallory Jr.



William Flygare

learning. Mallory's generous donation also is being used for the renovation of Chemistry Annex, the 77-year-old building that houses general chemistry. This extensive renovation will span several years.

Stoesser Lecture

In February, the Women in Chemistry program hosted the Sylvia M. Stoesser Lecture in Chemistry presented by Dr. Sarah Kelly of Pfizer. Her address was entitled "Research Based Pharmaceuticals: Challenges, Changes and Opportunities."

Sponsored by Dr. Yulan Tong and the Dow Chemical Company, the lecture is designed to give young women in the chemical field a perspective on the world of chemical industry, and has been held annually for more than five years with great success.

Kelly, the vice president of research and science technology in pharmaceutical sciences at Pfizer Global Research and Development, provides global management and leadership for approximately 330 research and science technology colleagues worldwide in Groton, MA.; St. Louis; La Jolla, CA.; and Sandwich, U.K. She manages a global budget of \$100 million. A member of Pfizer since 1986, she has served as a member on a number of teams, including

the Pharmaceuticals Research and Development Line Council. Additionally, she is the Groton/New London Labs product enhancement management team chair.

The next annual Sylvia M. Stoesser Lecture is scheduled for March 5, 2009.

Organic Syntheses Lecture

The Department of Chemistry hosted the 2008 Organic Syntheses Lectureship series, sponsored by Organic Syntheses, Inc., on April 10. The lecture featured Professor Jan-Erling Bäckvall of Stockholm University, Sweden, who spoke on "Recent Advances in the Combination of Metal and Enzyme Catalysis for Asymmetric Synthesis."

A native of Sweden, Bäckvall has had many successes in his career, including membership in the Royal Swedish Academy of Sciences and the Finnish Academy of Science and Letters, serving as president of the Bùrgenstock Conference, and chairman of the editorial board of *Chemistry*, a European journal. He has published more than 300 papers, presented more than 85 plenary and main lectures at international conferences, and has edited the book entitled: *Modern Oxidation Methods*.

Flygare Memorial Lecture

On March 5, Dr. Alexander Pines of the University of California-Berkeley delivered the 2008 Flygare Memorial Lecture on "Novel NMR and MRI: from Nanometers to Meters in Chemistry, Materials, and Biomedicine."

Pines, a pioneer in the development of nuclear magnetic resonance (NMR) spectroscopy, has received many prestigious honors during his career, including the Langmuir Award of the American Chemical Society, the Faraday Medal of the Royal Society of Chemistry, and the Wolf Prize. He is a member of the U.S. National Academy of Sciences and a foreign member of the Royal Society (London).

Since joining the faculty of the University of California-Berkeley, Pines has held multiple lectureships, including Loeb lecturer at Harvard University, Lord lecturer at MIT, Roberts lecturer at Caltech, Tetelman fellow at Yale University, Harkins lecturer at the University of Chicago, Max Born lecturer at the Hebrew University of Jerusalem, Lord Todd professor at Cambridge University, Hinshelwood professor at Oxford University, and Professeur Joliot-Curie at the Ecole Supérieure de Physique et Chimie in Paris.

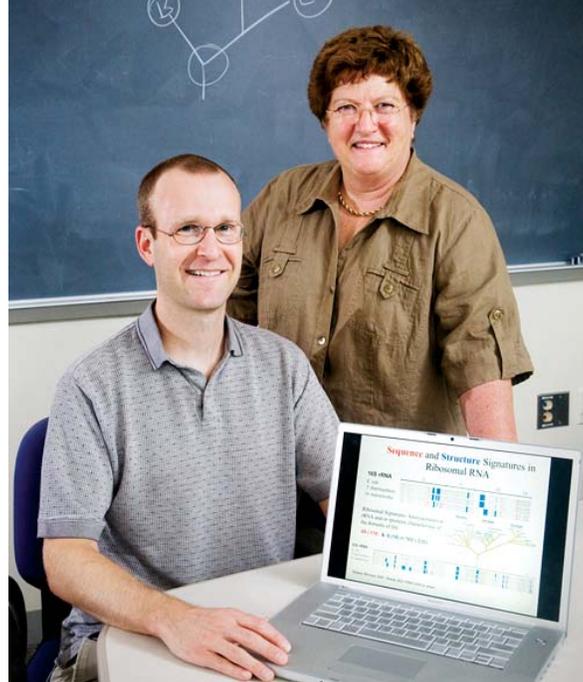
Next year's Flygare Memorial Lecture will be held on May 6, 2009.

ACS Landmark Textbook Lecture

The American Chemical Society (ACS) held a series of lectures celebrating the proud heritage of chemistry at Illinois on March 27.

"Landmark Chemistry Books of the 20th Century: Authors from the University of Illinois at Urbana-Champaign" was held at the Chicago ACS National Meeting, and featured speakers such as Dr. James Lisy and Dr. Scott Denmark of Illinois, as well as numerous other alumni and esteemed professors. Books covered included numerous organic chemistry books by Dr. R.C. Fuson; *Chemistry of Coordination Compounds*, by Dr. J.C. Bailar Jr.; *Chemical Literature and Its Use*, by Marion Sparks; and *Inorganic Chemistry: An Advanced Text Book*, by Dr. T. Moeller. Additionally, Dr. Lisy delivered a speech entitled: "Molecular Structure and Dynamics: Legacy of Willis H. Flygare."

Illinois Researchers Uncover a Major Step in Understanding the Evolution of Life



Portrait by L. Brian Stauffer, UIUC News Bureau

A NEW STUDY OF THE RIBOSOME, THE CELL'S PROTEIN-BUILDING MACHINERY, sheds light on the oldest branches of the evolutionary tree of life and suggests that differences in ribosomal structure among the three main branches of that tree are "molecular fossils" of the early evolution of protein synthesis.

The new analysis, from researchers at Illinois, reveals that key regions of the ribosome differ between bacteria and archaea, microbes that the researchers say are genetically closer to eukarya, the domain of life that includes humans. The study appears in the *Proceedings of the National Academy of Sciences*.

The findings confirm and extend the early work of Illinois microbiology professor Carl Woese, an author on the study. Woese was the first to look for signs of evolution in the ribosome, where genetic information is translated into proteins. In the mid-1970s, he and his colleagues found consistent differences in the sequence of nucleotides that spell out the RNA of the ribosome in bacteria and archaea. These "molecular signatures" were so pronounced that Woese concluded that the archaea comprised a separate domain of life, distinct from bacteria and eukarya (animals, plants, fungi, and protists). His classification system is now widely accepted.

"Carl Woese and his colleagues years ago established that protein translation had to be well developed when the evolution of modern cells started," said Illinois chemistry professor Zaida Luthey-Schulten, an author on the new study. "So the evolution of cells and the evolution of translation are really linked to one another."

The ribosome has two subunits, each made up of RNA and proteins. It interacts with a host of other molecules to guide the assembly of new proteins.

The researchers analyzed the sequence of nucleotides (the building blocks of RNA) and amino acids (the building blocks of proteins) that make up the ribosome.

They also looked at the three-dimensional structures of the ribosomal RNA and proteins and their proximity to each other.

Graduate student Elijah Roberts, lead author on the study, developed computer programs to analyze the ribosomal sequences of different organisms. Whenever he found a ribosomal RNA or protein sequence that differed between bacteria and archaea, he screened the database to determine whether a sequence was unique to a given domain.

"To be a molecular signature, a sequence has to be common to all members of a single domain of life, but not another," Luthey-Schulten said.

Using the three-dimensional structures available for some bacterial and archaeal ribosomes, the researchers were also able to determine where in the ribosome these molecular signatures occurred.

"Until the 2000s, when these structures became available, you weren't able to correlate where these signatures were with what was touching them in 3-D space," Roberts said.

To learn more about Dr. Luthey-Schulten's research, visit chemistry.illinois.edu/faculty/Zaida_Luthey_Schulten.html

"So nobody had ever done this sort of analysis before."

The researchers found that 50 percent of the signatures distinguishing the archaeal and bacterial ribosomes is located in 5 percent of the ribosomal RNA sequence. Most of these molecular signatures occur in regions that are critical to ribosomal function.

They also found correlations between some ribosomal protein and RNA signatures, which they say is evidence that the ribosomal RNA and proteins co-evolved.

“The ramifications of this work are it gives you a much better way to probe how this universal machinery changes from one organism to another,” Luthey-Schulten said.

“In that the ribosome constitutes the core of the cellular translation mechanism, which is the *sine qua non* of gene expression, which is the essence of life as we know it, these findings constitute a major step in understanding the evolution of life, which is still a journey of a thousand miles,” Woese said.

The new findings also have implications for human health, Luthey-Schulten said. Because the signatures that differenti-

ate bacteria from other organisms often occur in regions that are essential to ribosomal functioning, they will likely be targets for the development of new antibiotic drugs, she said.

Woese and Luthey-Schulten are affiliates of the Institute for Genomic Biology. Luthey-Schulten is also an affiliate of the Beckman Institute for Advanced Science and Technology and of the Center for Biophysics and Computational Biology. ■

by Diana Yates, life sciences editor, University of Illinois News Bureau

Van der Donk Selected as HHMI Investigator



THIS YEAR, 1,070 APPLICATIONS WERE RECEIVED for the Howard Hughes Medical Institute (HHMI) Investigators program. Fifty-six Investigators were chosen, with only two selected from the University of Illinois: Dr. Phillip Newmark, and the Richard E. Heckert Chair in Chemistry, Dr. Wilfred A. van der Donk.

“Although he’s intensely focused on this fundamental research, which he calls an arms race with the microbes, van der Donk is equally committed to inspiring students—in both the classroom and the

laboratory—to become excited about science,” HHMI officials wrote in announcing the award.

As a researcher, Dr. van der Donk is no stranger to undertaking large and cutting-edge research. Last year, he was a co-recipient of a five-year, \$7-million grant from the National Institutes of Health to discover, develop, and produce antibiotic agents.

“Wilfred van der Donk is one of the country’s leading chemical biologists,” said Steven Zimmerman, Head of the Department of Chemistry. “He combines a sharp eye for critical problems with a deeply analytical and creative mind that produces unique solutions. The HHMI award will give him the freedom to tackle some very important and challenging problems already underway in his laboratory, such as developing new antibiotics to treat drug-resistant infections.”

“He will also be able to initiate new projects in the area of cell biology, with one project potentially offering new insights into the malaria life cycle in human cells,” Zimmerman continued. “Wilfred is all around an outstanding teacher, scholar,

and colleague—always ready to help and with outstanding judgment and standards.”

As an HHMI Investigator, van der Donk plans to research new classes of compounds that potentially could be used as antibiotics. These compounds and microbial agents, which previously have not been used for therapeutic purposes in humans, could give rise to a new generation of antibiotics.

Two alumni from the Department of Chemistry previously have been selected as HHMI Investigators. In 1993, Stephen J. Elledge (B.S., 1978) was chosen and in 2005, Milan Mrksich (B.S., 1989) became an HHMI investigator. Both studied as undergraduates at Illinois, with Mrksich’s research occurring in the lab of the current head of the department, Dr. Steven Zimmerman.

Three other current faculty members from Illinois have received HHMI awards, two of whom are associated with the Chemistry Department. Chemistry professor Yi Lu was chosen as an HHMI Professor in 2002, and chemistry affiliate and physics professor Taekjip Ha was chosen as an HHMI Investigator in 2005.

Selection as a Howard Hughes Medical Investigator means many things, not the least of which is the opportunity to pursue ambitious, risky, and long-term research plans that the researchers may not have been able to tackle with other sources of funding. This year alone, the Howard Hughes Medical Institute has pledged more than \$600 million to support the new researchers during their first term of appointment. ■

To learn more about Dr. van der Donk’s research, visit chemistry.illinois.edu/faculty/Wilfred_van_der_Donk.html



Dr. Scott Denmark: Recipient of the Prelog Medal

IN 2007, DR. SCOTT DENMARK TRAVELED TO ZÜRICH, SWITZERLAND, to receive an award of special importance, not only for its significance in chemistry, but also for him personally: the Vladimir Prelog Medal, awarded by the Organic Chemistry Laboratory of the Swiss Federal Institute of Technology (ETH-Zürich). For more than 20 years, the Prelog Medal has stood as a distinguished achievement in the chemical world, recognizing not only excellence in chemistry, but also an individual who has made fundamental contributions to the field of stereochemistry. Heralded as an original and innovative thinker in stereochemistry, Denmark was a clear choice for the award due to his pioneering work in the invention and study of new, stereoselective, synthetic reactions.

The award was meaningful for Denmark, however, not only because of its prestige, but because of the personal connection that he had with the individual for whom the award was named. A graduate of the ETH, Denmark had known Prelog and had many memorable encounters with this legendary chemist. During his graduate years, Denmark spent his Sundays in the ETH Bibliothek, reading not only the current literature, but also the work of the giants of organic chemistry who had laid the foundations of the field. Of particular interest were those scientists, especially Prelog, Ruzicka, Wilstätter, and Kuhn who had spent much of their careers at the ETH. Indeed, in his speech accepting the medal, Denmark identified Prelog as one of his chemical heroes.

Although Prelog made seminal contributions to many areas of chemistry, including the structure and synthesis of alkaloids and antibiotics, it was his work in stereochemistry that was recognized by the Nobel Foundation in 1975. Prelog discovered early on the many stereochemical consequences of organic structures and transformation, and devoted himself to determining, manipulating, and understanding those phenomena. His work led to the development of the Cahn-Ingold-Prelog system, as well as the creation of "Prelog's Rules," a method for determining the absolute configuration of secondary alcohols.

To learn more about Dr. Denmark's research, visit chemistry.illinois.edu/faculty/Scott_Denmark.html



Dr. Heidi Wunderli-Allenspach with Dr. Scott Denmark.

The intellectual departure from the established norm only came about as a consequence of the creativity and innovation that typifies Denmark's research program.

– Erick Carreira

Stereochemistry suffuses the many different areas of research investigated by Denmark during his 28-year career at Illinois. From his early reports on the Nazarov cyclization—which were termed groundbreaking by his contemporaries—to his more recent work in emphasizing the chemistry of Lewis bases, which has led to the identification of new opportunities for catalysis, Denmark's many discoveries have opened doors in exciting and pioneering new ways. Leading scientists such as Erick Carreira have lauded his recent research in Lewis base catalysis, saying that, "A combination of creativity and mechanistic insight has produced a substantive new addition to the field of asymmetric synthesis... The intellectual departure from the established norm only came about as a consequence of the creativity and innovation that typifies Denmark's research program. The development of this concept required a new class of reagents, i.e. trichlorosilyl enolates, and catalysts, particularly chiral phosphoramides. The success of these transformations constitutes a remarkable *tour de force* ..."

The long list of awards that Denmark has received pays tribute to the lasting impact that he has left on the world of chemistry. With honors including the Yamada-Koga Prize of the Japan Research Foundation for Optically Active Compounds; the Pedler Medal from the Royal Society of Chemistry;

the A.C. Cope Scholar award from the American Chemical Society (ACS); and the ACS Award for Creative Work in Synthetic Organic Chemistry, Denmark's recognitions abound. Yet, despite this surfeit of accolades, his enthusiasm and creativity have not diminished. In recent years he has embarked upon new adventures in research, exploring uncharted areas in chemistry and stereochemistry, for example in systematic examination of the characteristics of phase transfer catalysts and the implementation of organosilicon compounds in cross-coupling processes.

Through it all, however, Denmark has maintained a perspective that both pays tribute to and echoes that of Vladimir Prelog. Prelog (a Croatia by birth) recognized how fortunate he was to have been given the opportunity to be a professor at the ETH-Zürich. He maintained that it was a privilege to interact with outstanding colleagues and students and he was always grateful for the assistance and guidance he received from his colleagues and co-workers. Most importantly, Prelog generously acknowledged the contributions made by his predecessors, without whom many of his own discoveries would not have been possible.

"If I have seen further than others," Denmark said in his acceptance speech, quoting Isaac Newton, "it is by standing upon the shoulders of giants." ■

Honoring the Dream of Dr. King

Adapted from the article "Retired Chemist Heard King's 'Dream' and Lives It," by John Liberty, *Kalamazoo Gazette*



Photo by Mark Bugnaski of the Kalamazoo Gazette

RETIRED CHEMIST AND UNIVERSITY OF ILLINOIS CHEMISTRY GRADUATE Harvey Myers has many of the memories frequently held in life: marriage, family, a long and successful career, in his case at the UpJohn Company. But in addition to these, he has some special and less common ones—the memories of his own role in the Civil Rights movement and of meeting the Reverend Martin Luther King, Jr.

In the 1960s, Harvey Myers was a high school student living in Tampa, Fla., during the height of the Civil Rights era. His local theater insisted that it would not admit black patrons, and refused to change its policy. "We decided enough was enough," said Myers many years later in an interview with the *Kalamazoo, Michigan, Gazette*. Joining with other residents of the area and members of the NAACP, Myers stood outside the theater, demanding that the policies change.

Three days later, they did.

By this time, Myers was already familiar with the Civil Rights movement. He had, after all, been present at one of the most momentous days. On August 28, 1963, he sat close to the Lincoln Memorial and listened to the Rev. Martin Luther King Jr. as he delivered his groundbreaking "I Have a Dream" speech. He didn't realize, he told the *Gazette*, the historic nature of the speech at the time.

Years later, Myers followed in King's footsteps, attending Morehouse College in Atlanta and joining the Alpha Phi Alpha fraternity. As a student at Morehouse, he had the opportunity to see King again, this time by attending a sermon delivered by the famous pastor. He recounted later that he didn't remember much of the sermon, but he shook King's hand when it was over. Only a few short years after the meeting, Myers heard the news that King had been assassinated.

"It was a very terrible time on our campus," Myers recalled.

"We suspended classes, and we came together in the auditorium and talked about what we would do in honor of our most illustrious graduate."

As the years passed, Myers lived up to the goal of honoring King, fulfilling the words of "I Have a Dream." After Morehouse, he joined the graduate program in chemistry at the University of Illinois. He worked with John Katzenellenbogen, who said, "Harvey was a student who combined commitment, diligence, and persistence in the laboratory with a kind demeanor and a sense of humanity. He did great work and was uniformly liked and respected."

After obtaining his Ph.D. degree, Myers worked with Dr. Stanley Smith to learn computer-assisted instruction. He then took a job at the UpJohn Company at a time when UpJohn only employed six blacks with doctoral degrees. Not deterred by the situation, Myers undertook the task of traveling to historically black colleges, seeking to encourage the students there to work at UpJohn.

In recent years, Myers says that though the industry has gotten away from this manner of recruitment, he recalls that during his time at UpJohn he worked in a hospitable environment. He states that while "I know it (racism) was around me ... I don't remember any incidents that angered me or set me off. I did not work in a hostile environment."

A recent retiree, Myers still works to honor the dream, even 40 years later. An active volunteer with Community Advocates for Parents and Students (CAPS), a local Kalamazoo organization that tutors students ranging from kindergarten to high school, he also remains a member of his local chapter of the NAACP.

"Stay in school," he tells the kids he works with. "Get as much education as you can. No one can take that away from you." ■

Interview With Harvey Myers

What prompted you to choose the Department of Chemistry at the University of Illinois as your graduate school?

The short answer is that the University of Illinois is a great school. One of my Morehouse College professors, Dr. Charles Merideth (B.S. Morehouse College, Ph.D. University of California-Berkeley) recommended it. Illinois was, and still is, ranked in the top ten chemistry Ph.D.-granting universities in the country.

The long answer: In freshman chemistry at Morehouse College, my chemistry professor and chair of the department, Dr. Henry C. McBay (B.S. Wiley College, Ph.D. University of Chicago) stated that Morehouse College graduates had earned Ph.D.s in chemistry from every major university in the country except Harvard and University of Illinois. My classmate, John Hall turned to me and said, "I am going to Harvard and you should go to University of Illinois." John earned his degree from Harvard in 1974 and I earned my degree from Illinois in the same year.

Were you aware at that time of the Department of Chemistry's history as the first institution to award a Ph.D. degree to an African-American chemist, St. Elmo Brady, in 1916?

I was aware of St. Elmo Brady earning his degree from Illinois. I have several books on black scientists in America. Aside from my undergraduate chemistry professor, Dr. Henry McBay,

and my graduate advisor, Dr. John Katzenellenbogen, my most influential chemist was Dr. Percy Julian. I read about Dr. Julian while I was still a student in high school trying to decide what major I wanted to choose once I got to college. I also visited Dr. Julian's laboratory in Chicago and I own the video "Percy Julian: Forgotten Genius"

How would you describe your experience at the Department of Chemistry?

I had a very rewarding, enjoyable, enlightening, yet scientifically challenging, experience at the University of Illinois.

Are there any memories that stand out to you from your time here?

I recall several interesting times, some hilarious, some proud, some were humbling, and some frightening.

When I first walked into Biochemistry 350 at Illinois and there were more than 100 students from many of the major colleges in the United States, I thought that I had made a mistake. Since I had just graduated from Morehouse College where during my senior year I had, at most, ten students in my largest class, I called my mother and told her that I would be home at the end of the week.

I was inspired each time I was chosen as a co-author on a scientific publication. I am proud to say that I have authored numerous scientific and/or technical reports since leaving the University of Illinois.

I was proud to have only needed to take seven cumulative exams. In the group of cumulative exams, each graduate student had to pass six exams before they failed six. I only failed one.

I was humbled, yet proud, when I was notified that I was a candidate for induction into Phi Lambda Upsilon Honorary Chemical Society.

I recall waiting for the elevator in Roger Adams Laboratory along with Dr. Adams. When the elevator door opened, he said "after you" and I said "no, after you." We both missed the elevator.

I was frustrated when I synthesized 6-diazo-estradiol, yet because of its thermal instability, I was unable to isolate it to physically characterize it. I worked weeks, to no avail, to isolate this compound.

Has your experience at Illinois impacted you later in your career? If yes, how so?

Yes. Whenever, I encounter a difficult scientific problem, or any major problem for that matter, I always tell myself that I had attended school with and learned from the best at Illinois and Morehouse. I can solve this one.

What advice do you have for future chemists considering Illinois?

Illinois is a great school and you get to interact, study, and learn with the best in the world. You can succeed at Illinois, and you can succeed anywhere.



Photos courtesy of the National Archives.

Moore and Researchers

Develop Self-Healing Materials



IMAGINE A MACHINE THAT, WHEN damaged, can heal itself. This may seem like a discovery of the distant future, or a work of science fiction, but as Dr. Jeffrey Moore of the Department of Chemistry at Illinois is showing, that innovation of the future is possible today.

When a machine endures high stress for prolonged periods of time, that stress can produce microcracks which, if left unchecked, would eventually result in hazards to safety or large-scale damage. For example, if such fractures occurred in the blades of wind turbines or the fuselage of modern airplanes, serious accidents could

result in injuries or death. Up to now, each of these materials has been constructed of epoxies and composites, but, because of Moore's discovery, a further component is added.

Microcapsules of a chemical called "dicyclopentadiene" are embedded in the composite material. When a microcrack occurs, the capsules located near the damage are broken as well, releasing their contents into the fissure. The dicyclopentadiene molecules fill the gap, linking to one another and forming another type of plastic that holds the crack closed and eventually—after only minutes, in fact—effectively heals the damage.

The creation of these materials has been so revolutionary that scientific and non-scientific journals alike have featured the research. What's more, the discovery earned Moore and his research colleagues a coveted place on the *Scientific American's* "Top Fifty Finest" list, which recognizes outstanding

technological leadership by 50 individuals, teams, or companies in research, business, or policymaking each year.

This innovative discovery was not a one-step process. Moore and his colleagues have been hard at work perfecting their design to not only be practical, but also environmentally safe and economically feasible for industry. Early versions of the solution featured ruthenium-based catalysts which, while effective, were deemed impractical after further examination. A catalyst-free system was then developed to replace the ruthenium-based catalyst; however, the chlorobenzene used in this chemistry proved troublesome, owing to the potentially environmentally hazardous nature of that solvent.

Any difficulty with finding a preferred solvent did not slow Moore and graduate student Mary Caruso. They recently discovered another solution, one that not only removes any potential hazards but that also restored all of the material's original toughness. While chlorobenzene could only repair a

To learn more about Dr. Moore's research, visit chemistry.illinois.edu/faculty/Jeffrey_Moore.html

damaged epoxy to 80 percent of its original hardness, this new solution can restore it all.

"Although we demonstrated the self-healing concept with a ruthenium-based catalyst, the cost of the catalyst made our original approach too expensive and impractical," said Moore. "Our new self-healing system is simple, very economical, and potentially robust."

Details are still forthcoming regarding the nature of Moore's newest solution, and testing is still being done. What is clear, however, is that once Moore is finished and his discovery is released, no one will ever look at a mechanical fracture in quite the same way. ■

Heckert Endows Chair and Harold R. Snyder Graduate Fellowship



RECENTLY, THE DEPARTMENT OF CHEMISTRY RECEIVED A GIFT FROM ONE OF its most accomplished, yet humble alums: Dr. Richard E. Heckert. This endowed gift allowed the department to establish a distinguished chair as well as a graduate fellowship.

Born in Oxford, Ohio, in 1924, Heckert spent the years following World War II studying organic chemistry at Illinois with Dr. Harold R. Snyder, his graduate advisor. Snyder had a profound influence on the lives and careers of his students. Indeed, Heckert attributes his success to his mentor. In 1937, Snyder had taken an academic position at the University of Illinois, returning to his educational roots—he graduated with a B.S. from Illinois in 1931—after spending one year in industry. Though he was new on the scene, Snyder quickly excelled in his role as an educator and researcher. He, Roger Adams, Carl “Speed” Marvel, and R.C. Fuson, became known as the “Big Four” at Illinois.

The endowed chair is named the Richard E. Heckert Chair in Chemistry and an endowed graduate fellowship honors Snyder. Modest and unpretentious, at first Heckert, who graduated from Illinois with a A.M./M.A. degree in 1947 and a Ph.D. in 1949, did not wish to have the chair named after himself, preferring instead that it be named after Snyder, acknowledging his debt of gratitude to his mentor. With the urging of senior officials in the Foundation, and the request of the Department of Chemistry, Heckert agreed to allow the chair to be in his name. “Dick’s extraordinary generosity is already having an enormously positive impact on our faculty and students,” noted Steven Zimmerman, Head of the Department of Chemistry. “It is wonderful that such a great friend to our department could honor an Illinois great like Harold Snyder, while at the same time allowing us to recognize one of our most successful alums.”

Heckert has established himself as a leader in his own chosen arena: the DuPont Company. Beginning as a research

scientist in the experimental station laboratories in the central research department, Heckert quickly moved through the ranks, holding multiple positions in his time with the DuPont Company, including supervisor of the film department in the Cellophane Research and Development Laboratory; plant manager of the Circleville, Ohio, Mylar Plant; director, senior vice president and member of the executive committee; president and chief operating officer of DuPont Operations; vice chairman and chief operating officer; and finally as chairman and chief executive officer. At every step Heckert’s accomplishments were matched by his desire to lead an already successful company to newer and better heights.

Corporate and industrial competition for DuPont Company was exceptionally fierce in the 1980s, fueled by rising energy and raw material costs and an increasing number of competing organizations. Stepping into the role of CEO at the height of this competition in 1986, Heckert brought his customer-centered approach to bear on the difficulties plaguing DuPont. Placing emphasis on marketing efforts, building successful areas while trimming back weaker sectors, and consolidating and reorganizing departments to better serve customers, Heckert helped DuPont maintain its position as an industry leader despite the competition.

Several years ago *Fortune* magazine described Heckert as a “gregarious, relaxed, and unflappable... 6-foot-3, friendly bear of a boss,” but Heckert has not let his success in industry consume all his attention. Throughout his life, he has been a committed philanthropist and volunteer. He has held positions such as president of the United Way of Delaware; trustee and chairman of the board of the Carnegie Institute of Washington; president of Longwood Gardens in Kennett Square, Penn.; member of the Advisory Commission for Trade Negotiations; chairman of the National Association of Manufacturers; and trustee of the Delaware Council on Economic Education. ■

Classroom Dedicated in Honor of Dr. Howard P. Hetzner



Dr. Steven Zimmerman, Dr. Peter V. Hetzner, Mrs. Martha Hetzner-Nilson, and Dr. Andrew Gewirth outside the newly dedicated Hetzner classroom.

ON APRIL 18, 2008, MEMBERS OF THE DEPARTMENT OF CHEMISTRY gathered to celebrate the legacy of Dr. Howard P. Hetzner with an inspiring event: the dedication of the Howard P. Hetzner classroom in Noyes Laboratory. Part of a years long renovation project of Noyes Laboratory, the Hetzner classroom showcases state-of-the-art technology, beautiful and spacious seating, new furnishings, and a completely remodeled interior.

This wonderful new classroom would not have been possible without the foresight, generosity, and determination of Hetzner and his family.

A native of Illinois, Hetzner was born on April 15, 1916, almost 92 years to the day from the classroom dedication. As a graduate of Illinois, he earned a bachelor's degree in chemistry in 1936 and went on to study at the University of Michigan, obtaining his Ph.D. in 1939. Following graduation, he went to work for Standard Oil of California as a research chemist, staying with that company until 1942. At that time, and until 1944, he served his country as a petroleum specialist for the Petroleum Administration for War in Washington, D.C. After the war, he returned to industry, working in many high-level positions until his retirement in 1977.

Throughout his years in industry, Hetzner never forgot his alma mater, and worked hard to make certain that other students benefited from the same quality education that he had received. In 1996, he established the C.S. Marvel Fellowship, in honor of his undergraduate research mentor, Dr. Carl "Speed" Marvel. As a part of his contribution, Hetzner committed himself to fully support three graduate students annually, ensuring that they would be funded as they grow as scholars and researchers during their time at Illinois.

On October 30, 2004, Hetzner passed away. Before his death, he set in motion the process to contribute funds for the renovation of Noyes Laboratory. Following his death, Hetzner's children, Dr. Peter V. Hetzner and Mrs. Martha Hetzner Nilsen, along with the Department of Chemistry, could think of no greater tribute to the man who had given so much to Illinois than to use these funds in part to dedicate a classroom in his name. In recognition of this generous contribution, a plaque honoring and celebrating a person who gave much, achieved much, and will never be forgotten now hangs on the wall outside the Howard P. Hetzner classroom located at 165 Noyes Lab. ■

Never Forgetting a Mentor: Buhrke Honors G.L. Clark



Dr. Victor and Janet Buhrke

WHEN ASKED ABOUT EVENTS that lead to a particular path in life, some point to the impact of a single individual. For Dr. Victor Buhrke, an Illinois graduate in chemistry whose education and talent has lead him to high-level positions within the DuPont Company, RCA, and Picker X-Ray, that person was none other than his graduate advisor, Dr. George Lindenberg Clark.

Buhrke obtained his B.S. in chemistry in 1950, and was accepted into the graduate program that same year, where he started working with G.F. Smith. In 1952 he transferred to Dr. George Lindenberg Clark's group. Known as "G.L." to his students, Clark became a faculty member in chemistry in 1927. An established leader in the chemical field, he created the first analytical x-ray laboratory in the United States at the University. According to the American Chemical Society (ACS), he studied and became an expert in the "application of x-rays in science, industry and medicine" while at Illinois. Utilizing x-rays, he undertook stress analyses to discover whether certain metals were defective. The ACS also notes that in 1945 he undertook the development of an x-ray tube that, in extremes, could withstand the heat created by exposure to more than 50,000 volts of electricity. Using this tube, Clark could take x-ray pictures in mere seconds, rather than in minutes, as had previously been required.

Following in Clark's footsteps, Buhrke made numerous advances in the field of x-ray fluorescence and x-ray diffrac-

tion, most significantly in the areas of research, engineering, applications, training, consulting, and management. He served as chief editor for landmark texts, the chief engineer and manager of the Picker Analytical and Nuclear Division, and started his own company. He co-edited the book *A Practical Guide for the Preparation of Specimens for X-Ray Fluorescence and X-Ray Diffraction Analysis*, which is considered a landmark in the field. For his numerous contributions, he received the prestigious Jenkins Award in 2005.

Throughout his many successes, however, Buhrke never forgot the difference that his graduate advisor had made in his life, from offering leadership and insight during his academic years at Illinois, to providing a key recommendation that helped Buhrke secure a job at RCA in the early portion of his career.

To honor Clark, and to memorialize his legacy in Illinois chemistry for years to come, Buhrke and his wife, Janet, chose to commemorate their friend with a gift that rededicated the main lecture hall, 100 Noyes Laboratory, as G. L. Clark Hall. Refurbished and redesigned, G.L. Clark Hall now is providing space for the education of thousands of students each year with state-of-the-art technology, new seating and equipment, and other innovative features that will aid in teaching many facets of chemical knowledge.

"We gain immense satisfaction in knowing that G.L. will be memorialized with his name and image appearing in perpetuity at the entrance and within 100 Noyes," said Buhrke. "We hope that all students who have the privilege of hearing lectures in Clark Auditorium will honor his memory with us." ■





Share our Vision

Brilliant Futures

The Department of Chemistry at Illinois, with its extraordinary history and outstanding students and faculty, is widely recognized as a major force in chemical research and education. Our goal is to continue to compete with the most elite departments in the country, many of which are private and benefit from very large endowments. As can be seen in the chart on the next page, a very small percentage of our budget comes from the State of Illinois and increasingly we are relying on the generosity of our alumni.

As you know, the University of Illinois has initiated a major \$2.25 billion fund raising campaign known as Brilliant Futures. The Department of Chemistry has set its own ambitious goal of raising \$60 million. Thanks to the remarkable generosity of our alumni and friends, and corporate and foundation donors, we have already reached 72 percent of our goal. However, we still have a long way to go. Last year of our more than 6,400 living alumni, 435 made a gift to the department. This is less than 7 percent, a percent giving value that is about half that of our peer institutions. We know we can count on more of our alumni to step up to the plate. Please consider giving this year to our new Vision 2020 Fund, which is described below.

The Vision 2020 Fund

In creating the Vision 2020 fund, our goal is to secure the future of our department by creating an endowed fund, the annual income of which will allow us to meet our most critical needs, such as recruiting and retaining the best faculty and students, purchasing equipment for the teaching laboratories, and

creating educational programs (e.g., travel awards) for deserving students. This fund will not reduce the support currently provided by the campus because our State budget is more than 85 percent dedicated to salaries and generally set by formula.

Documented Impact and Stewardship. A publically disseminated annual report will be generated to show the market value, growth, and income of the Vision 2020 fund. Most importantly, we will detail how the fund's income was used in the previous year so that the impact of every gift will be seen.

Donor Recognition. Each donor to Vision 2020 will be acknowledged in the annual report and in the Department of Chemistry News. At a donor's request, gifts can be made anonymously. For major annual giving and annual pledge levels, donors will be permanently recognized in Noyes Laboratory (see below for details).

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 brass nameplate will be permanently installed on a seat in G. L. Clark Hall (formerly 100 Noyes). For cumulative gifts above the \$20,000 level over a five-year period, the donor will be further recognized on a permanent plaque in the main hallway of Noyes Laboratory.

Opportunities for Major Gifts

The Strategic Plan developed by the Chemical Sciences Leadership Council and updated by the Department of Chemistry in 2005 identified several areas where major gifts are most needed.

Named Graduate Fellowships. The Provost's matching program provides a match of the annual income on endowed gifts of \$250,000 or more designated for a Graduate Fellowship. The Named Fellowship, which honors the donor or an individual designated by the donor, provides full support for a graduate student. It serves to recognize the most promising leaders of tomorrow, while at the same time helping us to recruit and retain outstanding students and faculty.

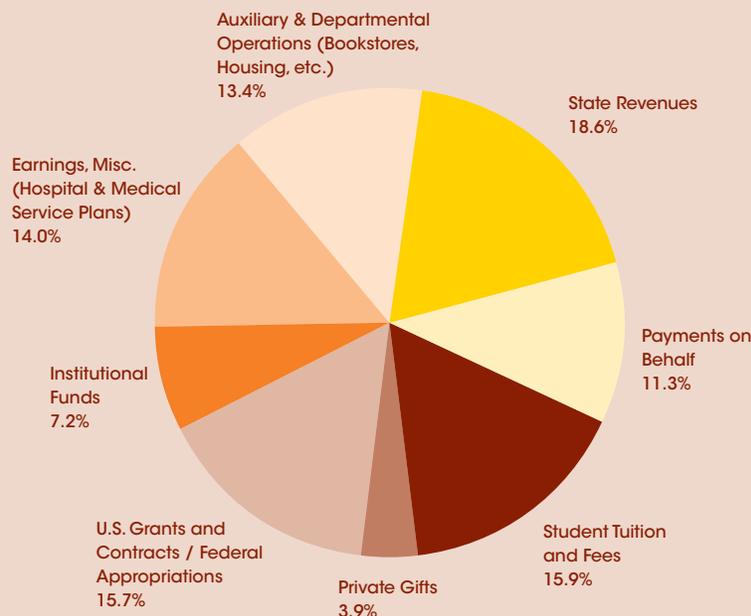
Named Chairs and Professorships. Chairs and professorships are critical for recruiting and retaining top faculty. Such appointments provide flexible funds for faculty to explore new areas, purchase vital new equipment and instrumentation, or support undergraduate and graduate students. A gift of at least \$3 million will endow a named chair that will support the most accomplished faculty. A gift of \$1.5 million will endow a named professorship used for emerging leaders in chemistry.

Other Opportunities. There are many other needs, from remodeling funds for Noyes Laboratory and the Chemistry Annex to outreach and global programs, as well as programs supporting research. Please see our Web site (chemistry.illinois.edu) for more information or feel free to call me at (217) 333-5071 or send me an e-mail (sczimmer@illinois.edu). I welcome your comments and hope that you help us maintain our tradition of excellence.

With Illinois pride,



Steve Zimmerman



Did You Know?

Only 18 percent of the Illinois budget comes from the State of Illinois.

The Department of Chemistry has nearly 10,000 total alumni.

Half of the Nobel Laureates among Illinois' alumni and faculty have been associated with the Department of Chemistry.

- Paul C. Lauterbur – 2003, Physiology or Medicine
- Martin Rodbell – 1994, Physiology or Medicine
- Phillip A. Sharp – 1993, Physiology or Medicine
- Rudy Marcus – 1992, Physiology or Medicine
- E. J. Corey – 1990, Chemistry
- Robert W. Holley – 1968, Physiology or Medicine
- Vincent du Vigneaud – 1955, Chemistry
- Wendell M. Stanley – 1946, Chemistry
- Edward A. Doisy – 1943, Physiology or Medicine

How to Give

Online at chemistry.illinois.edu/giving

By mail:
 Department of Chemistry
 University of Illinois
 107 Noyes Laboratory
 505 South Mathews Avenue
 Urbana, IL 61801

Please make checks payable to the University of Illinois Foundation, and designate Chemistry on your check.

Questions? Please contact us via phone at 217-333-5071 or email at chemdept@scs.uiuc.edu.

DONORS

Members of the William Albert Noyes and Roger Adams Club

Recognizing individuals who have made major gifts to the Department of Chemistry.

James R. Beck
Eugene P. Bertin
Lucile A. Brink
Victor and Janet Buhrke
Lester E. and Kathleen A. Coleman
Chia-chen Chu and Chi Lung Kang
Joyce Eiszner
John E. and Flossie Y. Gieseking
Melvin J. Gortatowski
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John and Margaret Witt
Michael and Louise Witte

Gifts Received During 2007

Flagship Society \$1,000,000 +

Eugene P. Bertin
Victor and Janet Buhrke
Richard E. Heckert
Robert and Carolyn Springborn

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Alumni Notes

James E. House, Ph.D. 1970, *Bailar*, is the author of *Inorganic Chemistry*, which was released by Academic Press in August 2008. Since becoming an emeritus professor at Illinois State University in Normal, Ill., he has served on several occasions as an adjunct professor at Illinois Wesleyan University and is teaching there again this academic year.

Ikram M. Said, Ph.D., 1977, *Robert M. Coates*, has only visited the Illinois campus once since his 1977 graduation. He says that readers may find it interesting to note that in Malaysia the mandatory retiring age for professors is 56 (has since been revised to 58 last month). He is still employed as a professor of chemistry (professors are allowed to continue until 65, on a contract basis) doing research in natural products. He states that being one of the few graduates from the United States at his university has been an added value to his career, as he reached the post of deputy vice chancellor before he retired.

Sander (Sandy) Mills, Ph.D. 1983, *Beak*, was recently promoted to the high-level position of vice president of basic research at Merck & Co., Inc.

Michael Bradley, Ph.D. 1985, *Jiri Jonas*, was deeply involved in developing the five new products just released by Thermo's FT-IR group: a

QA/QC spectrometer, an imaging microscope and three software packages. He traveled internationally (Spain, China, Japan, Israel, Sweden, Norway and more) for the launches. He is currently involved with international customer support and product development and taught for 15 years at The University of Connecticut and Valparaiso University, and worked in the product development division of Abbott Laboratories.

Kira G. Kruglikova, M.S. *Inorganic*, 1986, left the U.S. Embassy in Tallinn, Estonia, and has been seconded from the U.S. Foreign Service to the United Nations Office in Geneva, where she works in its Conference Services Division.

David Huffman, Ph.D. 1994, *Suslick*, received tenure at Western Michigan University in the summer of 2007. He was on sabbatical at the University of Florence 2007-08. Last May, he and his wife Ruthann celebrated their 25th wedding anniversary in Florence and then took a trip to Austria. His daughter Rachel is 16 and son Randy is 20. Randy is studying graphic design.

Mike Wong, Ph.D., 1996, *Suslick*, has moved to Newport Beach, Calif., to be closer to his family. He previously lived and worked in New Jersey for 10 years and now works for Henkel, a consumer product company with brands such as Dial, Renuzit, Soft Scrub, go2b, and Purex. He is the director of R&D in charge of hair care.



We'd like to hear from you. Submit your alumni note. Visit chemistry.illinois.edu/alumni/chem_alum_news.html

In Memoriam

David Webb Herlocker, M.A. 1964, Ph.D. 1966. Former chair of the Chemistry Department of McDaniel College, Herlocker, died recently of heart failure at age 67. Born in Chicago and raised in Peoria, Ill., Herlocker attended Knox College, where he achieved a bachelor's degree in chemistry in 1967. At the University of Illinois, he obtained a master's degree and a Ph.D. in inorganic chemistry. In 1966, Herlocker took a position teaching at Western Maryland College, where he later became department chair and founder of the college chapter of the chemistry honor society, Gamma Sigma Epsilon. He is survived by his son, David; daughter, Caryn; his brother, William; his sister, Linda; and two grandchildren.

James Wesley Berry, Ph.D. 1953. Berry died at age 82 at Mountain View Care Center in Tucson, Ariz. Born March 23, 1926, in Rankin, Ill., Berry served with distinction in the U.S. Army in 1944-1945. Following World War II, he achieved a Ph.D. degree in organic chemistry from the University of Illinois. In 1956, he left to pursue an academic career as a professor of chemistry at the University of Arizona. There, he received the William V. Cruess Award for Teaching. He is survived by five sons, Michael, John, Peter, Thomas, and Steve, as well as numerous grandchildren and great-grandchildren. His wife, Alice, preceded him in death in 1998.

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