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Fleming, Long Join Chemistry Department Faculty

ACS honors Fleming with Debye Award in Physical Chemistry

Professor Graham Fleming just joined the Berkeley faculty this summer, but he has already won an award. The American Chemical Society officially announced on September 8 that he is this year's recipient of the Peter Debye Award, one of the most distinguished awards in the field of physical chemistry. "It was a good way to end my first week here at Berkeley," said Fleming.

This award, consisting of $5,000 and a certificate, is sponsored by DuPont and honors outstanding research of a theoretical or experimental nature in physical chemistry. "It is always nice to have the recognition of your peers," he said.

Fleming says he was lured to Berkeley because he felt it was time to "have a shake up, be on trial again" in his research. He had been teaching at the University of Chicago for the past 18 years and was ready for the "stimulation of new colleagues, new ideas, and the facilities at the Lawrence Berkeley National Laboratory."

He became hooked on science early. While growing up in his native England, he leaned toward studying biology. A book that he read in high school, incorporating lectures by physicist Richard Feynman and chemist Linus Pauling, attracted him to the realm of physical chemistry. After his bachelor's degree, he was intrigued by research on flash photolysis done by Nobel laureate George Porter at the Royal Institution in London, and he asked him if he would become his Ph.D. advisor.

Fleming received his doctorate in 1974 and did postdoctoral research at the University of Melbourne, Australia, and at the Royal Institution in the UK. Since then he has won many honors and awards, including election as a fellow of the Royal Society of London and of the American Academy of Arts and Sciences, a Guggenheim Fellowship, the Inter-American Photochemical Society Award, and now the Debye Award.

His research focuses on the motion and dynamics of molecules in solution. Specifically, he looks at molecules in the condensed phase, for example, liquids, solutions, glasses and proteins.

In molecules, activity can occur in times as short as a few tens of femtoseconds (a femtosecond is 10-15 seconds).

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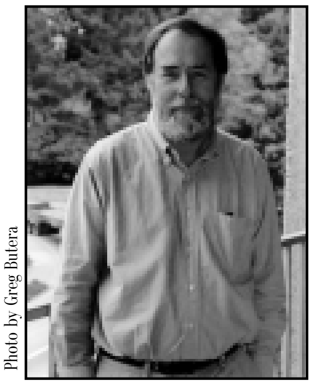

Photo by Greg Bulera

Graham Fleming

Pines Wins ACS Award for Chemical Physics

Our second ACS award winner is chemistry professor Alexander Pines, who has been awarded the 1998 Langmuir Award, the premier award in chemical physics given by the American Chemical Society. The award, cosponsored by the American Physical Society, which presents it in odd numbered years, recognizes and encourages outstanding interdisciplinary research in chemistry and physics, in the spirit of Nobel prize-winning chemist Irving Langmuir.

The secret to his explorations across chemistry and physics, Pines says, has been his research group. "This award is another tribute to my exceptional students and postdocs. They're in the lab doing the thinking and the experiments; most of the ideas and interpretations and much of the excitement and effervescence are theirs," he said. He also credits his success to close collaborations with colleagues in chemistry and physics.

Pines' path to physical chemistry began with a love and pursuit of physics and mathematics. He recalls his under-

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King wins ACS award for Separations Chemistry

Also winning a top ACS award is chemical engineering professor and UC Provost and Senior Vice President C. Judson King, who was recently recognized by the American Chemical Society with its award in Separations Science and Technology. The award was given "for outstanding individual research contributions in the areas of spray drying and separations based on chemical complexation, and for outstanding contributions in defining research needs and setting the directions for separations science and technology research on the national and international scene." He said he was most pleased about this award because it means "being recognized from the world of chemistry" as a chemical engineer, and because separations science is such a broad-based field.

It is easy to see how King's research may affect our lives someday. His work involves the separation of chemicals from water, by removing either the water or the chemicals. His separations research group is working to improve the removal of polar organic molecules (molecules formed with carbon which have a dipole moment) from water, so they can be reused, or simply to reduce their levels in industrial waste streams. Polar organic compounds are separated from their solutions using chemical complexing and other mass-separating agents, a process not unlike using a chemical "magnet" to adsorb and extract the organic compounds.

King's most recent success is with his research focusing on spray drying. In an industrial spray dryer, a liquid or slurry is sprayed down a tall chamber, sometimes as many as four stories high, at temperatures hot enough so that particles dry in the few seconds before they hit the bottom. This process can be used in a number of industries, but the one most easily understood is the food industry. His research group studies techniques for drying solutions, like coffee or natural flavorings, to improve the retention of volatile compounds that produce aroma and flavor.

To remove all the water from a droplet, one must expose it to a great deal of heat. And this can seriously affect the flavor of a solution like coffee. As a droplet dries, it undergoes changes in its shape, size and appearance, readily causing loss of volatile flavor substances. Bubbles, due to boiling temperatures, form in the surface of the droplet. Different substances change shape in various ways. In coffee, the bubbles create frothy arms that spread out as the bubble breaks; in sucrose, the bubble pops and simply collapses. His focus is on how these differences affect aroma and flavor retention.

King recently developed an experimental technique with graduate student John Hecht in which drops of aqueous solution are constantly monitored throughout the process of drying. This new technology is providing far more information than ever expected. King commented, "This is, I think, one of the great satisfactions of research. We did not even have in mind going into this that we would develop a technique that is an order of magnitude more capable." Their technology allows continuous observation of the evolution of trace volatile components in a droplet (such as aroma and flavor), temperature, moisture levels, and the amount of energy needed for drying.

King enjoys being an experimentalist, trying out new things and discovering new phenomena, gaining more understanding about old ones, or maybe assembling odd

What does this research mean to you and me?

1) Less expensive biodegradable plastics. King works to recover biochemicals from the processes of fermentation, such as those used in producing chemical products from cane sugar or cornstarch. One such product is lactic acid, which is the raw material used to create biodegradable plastics. Reducing costs to produce it could lead to greater use of degradable packaging, and less plastic in our landfills.

2) Less pollution in the water. King focuses mainly on polar organics that have oxygen in their molecular structure. Glycerol and sugars are examples. The waste stream from an industrial food plant can have a large sugar load. His research could make sugar recovery more affordable, reduce the load on municipal water treatment plants, and provide a product for reuse or sale.

3) Reuse of petrochemicals. King has also been studying the recovery of petrochemicals that are made in aqueous solution, such as ethylene glycol (antifreeze) and propylene glycol (a compound with many industrial uses), to permit reuse or sale.

4) **Less energy consumed in industrial production.** An industry that can benefit from King's research may also be able to reduce energy use in the manufacture of its products.

pieces of a puzzle into a unifying concept. That is one reason why he still makes time to keep up with his research at Berkeley, even while he is an administrator at the system-wide level. "I've found a great deal of satisfaction working with the high caliber students that come to Berkeley. The one-on-one relationship is very intellectually rewarding, for both grad student and research advisor challenge each other equally." He feels that it is useful for administrators to continue with their research, in order to stay connected to faculty issues.

During King's tenure at UC, he has supervised nearly 80 graduate students and worked on the national and international scene to develop and define the direction of research, while taking on increasing administrative duties. He began 30 years ago as vice-chair of the Chemical Engineering department, moving up to Chairman, Dean of the College of Chemistry, Provost for Professional Schools and Colleges at Berkeley, and finally to his current position at the UC Office of the President.

C. Judson King

King has also had a significant role in shaping the national research agenda as a director of the American Institute of Chemical Engineers, and as chairman or member of a number of committees of the National Academy of Engineering, National Research Council, and American Society for Engineering Education. He has also served on numerous advisory committees for government agencies, other universities and technical journals. He says it is satisfying to help balance the need for basic science and what is good for the United States.

Now that he is located in Oakland, he can't use a free block of time to drop into the lab. Instead, he must juggle his tight schedule to work on his research. E-mail is his savior. "Thank God the electronic age came along when it did," he said. When he finds a free minute away from his desk or the lab, King is an avid hiker and outdoorsman. He spent 11 years as Scoutmaster of a Boy Scout troop in Kensington, and he still enjoys time at his mountain getaway in the Sierras. Says King, "I'll hike until my knees wear out."

Pines

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graduate days, when he read Linus Pauling's book "*The Nature of the Chemical Bond*," and subsequently attended a four-hour seminar by Harvard chemistry professor Robert Woodward on the quantum mechanics of stereoselective molecular arrangements. He was struck by the excitement hovering around the boundary between chemistry and physics.

Pines' research focuses primarily on the development and applications of Nuclear Magnetic Resonance (NMR) spectroscopy. Molecules are composed of atoms, atoms have nuclei, and some nuclei have a property called spin. The spin gives rise to magnetic moments that "precess," or oscillate at characteristic frequencies when exposed to a magnetic field. These oscillations and their mutual correlations, measured by multidimensional versions of NMR, represent a "signature" for the structure and dynamics of the molecule. According to Pines, NMR allows us to deduce the structures of molecules, such as proteins in solution, where single crystal x-ray techniques are inapplicable. Similarly, it is possible to obtain pictures of materials and of the human body (as used in medicine), by encoding the NMR frequencies with spatial coordinates by means of magnetic field gradients, a technique called magnetic resonance imaging (MRI).

The Pinenuts (as the more than 150 students and postdocs who have passed through his research group have dubbed themselves) have striven to devise and implement new techniques for high-resolution NMR, especially for the study of solids. It used to be that NMR was used almost exclusively for liquid solutions. However, recent advances in concepts and methodology, many pioneered by the Pinenuts and their collaborators, have permitted the development of new solid-state methods.

One recent research highlight, in collaboration with Tel-Aviv University's Gil Navon, a biophysical chemist currently in residence as Visiting Miller Professor at Berkeley, together with chemical engineering colleague Jeffrey Reimer and physics colleague Erwin Hahn, uses optically pumped Xenon to "light up" selectively the NMR of molecules in solution and on polymer surfaces. Optical pumping employs a laser beam, together with alkali metal atoms,

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New Faculty

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During this time, parts of the molecule move, electrons shift energy levels, and bonds break and form. To observe molecules in action, Fleming uses femtosecond spectroscopy based on laser systems, which is capable of generating light flashes of a few femtoseconds duration. The light pulses initiate and probe the molecular dynamics during the course of reactions and other chemical phenomena.

At its simplest level, the optical spectrum of a molecule in solution, a glassy matrix or a protein host for example, is remarkably uninformative. Fleming has worked to develop new techniques that allow the experimenter to remove the influences which broaden spectra until their information content is lost. His techniques are based on the idea of a photon echo, similar in concept to the spin echo used in nuclear magnetic resonance (NMR).

With Postdoc Andrei Tokmakoff, Fleming performed the first two-dimensional femtosecond Raman experiment, which, he says, “opens up a whole new area of study of complex systems that previous spectroscopy systems were unable to analyze.” He says it used to be “impossible to determine whether the behavior of a molecular system was identical from one place to another or whether it was relatively simple in individual locations, but different, so when you add them all together it appears very complex.” This is the first kind of measurement that can distinguish between those two possibilities. Before this procedure was developed, any observation of the behavior of a complex system would generate data that was an average of activity across the spectrum. Five distinct femtosecond light pulses are used to generate the desired signal, and the optical paths between all five must be synchronized.

“If we can observe molecules on the time scale in which they are doing something, you have the potential to make them do something different, to change from being a voyeur to a participant,” said Fleming.

One possible application for this research could be improvements n the way we harness solar energy. Some of his research deals with photosynthesis and chlorophyll. One experiment uses multiple pulses of light focused on an elaborate photosynthetic structure, a ring of molecules designed to funnel energy to the molecule he is observing, sitting in the center. This is done at such a high speed that there is very little energy lost in the process. If one tries to recreate a photosynthetic system in the lab, the overall efficiency is low. The energy transfer becomes wasted heat. "So, if we understand how photosynthesis works, we can use that to help us design artificial photosynthetic systems," he said. Fleming does not think any one piece of his research is more important than another. "We can look on the real molecular time scale" to see biological processes occurring. He continues, "we can defeat the mask of spectral broadening and congestion which has meant that spectroscopy in condensed phases has been limited until now."

When asked what impact his research may have on the field of chemistry, he quoted Faraday, who had responded to the same question with, “I don’t know, but I am sure the government will find a way to tax it.” Fleming adds, "In response to a similar question on a different occasion, Faraday remarked, ‘What use is a newborn baby?’ This is really basic science,” said Fleming.

When not in the laboratory, Fleming likes to spend time outdoors with his nine-year-old son. He also likes to climb mountains, and he used to be an avid rock climber.

Jeffrey Long: New Inorganic Chemist

Last year Jeffrey Long was an NSF postdoctoral fellow here at Berkeley, but now he is a new assistant professor, and one who loves the subtle beauty of inorganic structures. His father, also a chemist, tried to discourage him from chemistry, but from a young age Long has loved the “certain primitive attraction” of the inorganic materials he studies. “I liked going to museums to look at the geological displays, and the colors and shapes of crystals. Now, we grow crystals in the lab,” he said. He intended to major in math, but his first chemistry class hooked him. Now he spends his time playing with molecules, hoping to develop rational approaches for the design of inorganic compounds.

Long graduated with honors in chemistry and mathematics from Cornell in 1991. While an undergraduate, he held several summer internships, including one with NASA’s Lewis Research Center in Cleveland, Ohio, synthesizing organic compounds that were precursors for heat-resistant materials used on the Space Shuttle. During his junior year, he became excited about experimenting with inorganic metal compounds, and he was further encouraged by a successful internship with DuPont the following summer.

As a senior, he was introduced to the theoretical side of inorganic chemistry by Nobelist Roald Hoffman, whose creative approach to research and appreciation for the aesthetic value of basic science had a tremendous impact on him. “Inorganic chemistry is an enormous, young field, and it permits you to perform basic science right off the bat,” which, Long explains, can be quite exciting for a student.

He earned his Ph.D. from Harvard in four years, during which time he published eight papers. His postdoctoral work included a year at Harvard as well as last year’s fellowship with the Alivisatos group at UC.

Photo by Greg Butera

Long, at work in new lab facilities in Tan Hall.

Long says he was drawn to Berkeley by the high caliber of graduate students. “I think this is the very best place for beginning faculty. You have access to a large pool of extremely competent students, many of them willing to take a chance on an unknown, young professor.”

He is looking forward to beginning teaching in the spring. “It sounds somewhat backwards, but teaching is a great way to come up with research ideas,” he said. Long believes teaching is the best way to ensure that you are current with chemistry. “You think about your research from a new perspective, that of a student. Without students to prompt questions, you become stagnant.” And, he says, students can help you develop whole new fields to study. “That is part of the process that is almost addictive. You’re just experimenting in the lab, making compounds. Something unexpected happens, and suddenly you’re faced with a challenging new puzzle to solve.”

Inorganic and materials chemistry exist today with little structure, according to Long. Unlike the well-studied field of organic chemistry, “there are really very few well-reasoned synthetic approaches” for making new inorganic compounds. “An organic chemist has volumes of reactions that he can use to create a complex molecule. There are not many examples of general reactions that you can use to take a solid structure and manipulate it,” Long said. He hopes to change this by developing systems to understand how compounds are formed and rational approaches to synthesize inorganic structures.

Long’s research has the potential to influence the production of new solid materials with all sorts of properties, including semiconductors, superconductors, magnets, optical materials and even drugs used in medical X-ray imaging. In some medical cases, doctors need to inject compounds incorporating iodine into a patient to help absorb x-ray transmissions and aid in diagnoses. This procedure can be quite uncomfortable or even painful for the patient. Long’s research in heavy cluster synthesis shows some promising improvements that would mean lower doses and more accurate diagnoses for doctors.

His advice for a new graduate student would be to choose the area that catches your interest the most. If you love what you are studying, he explains, then you will be the most effective chemist possible. Too many students specialize in a certain field just because they think they will land a job, says Long.

Long spends his time outside the lab with his wife, Jennifer, exploring California, and occasionally playing darts, but he says that “embarrassingly enough, chemistry is my hobby.”

Graduate Affairs Committee

The Graduate Affairs Committee (GAC) promotes and communicates graduate student interests to the faculty and staff in the College of Chemistry. Reconvened a year ago under the guidance of professors John Arnold and Paul Alivisatos, it deals with issues such as student recruitment, GSI training, coursework, seminars, and social events.
This year, the GAC sponsored the open house for incoming students. The organization has also established a forum, using open slots in the Thursday Graduate Research Colloquium series, for exiting graduate students to give formal talks about their research. The GAC meets with faculty two or three times a semester, and puts out a newsletter several times a year. Any graduate student is welcome to join or to voice concerns. Contact Marcel Bruchez ‹bruchez@holmium.cchem.berkeley.edu›, Ellen Kick ‹kick@uclink.berkeley.edu›, Seth Cohen ‹upto11@uclink2.berkeley.edu› or Sara Mullins ‹smullins@uclink4.berkeley.edu› for more information.

Pines

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to excite the nuclear spins of noble gas isotopes like helium-3 or xenon-129, orienting the spins in the same direction, either "up" or "down." When admitted to solutions or surfaces, the dramatically enhanced nuclear magnetization of the xenon-129 atoms tends to polarize the spins of accessible atoms in the solution or surface molecules. Such experiments should make it possible to study molecular properties in exposed, accessible regions of molecules and surfaces of materials.

Developments from his laboratory are already used widely in academia and industry, but Pines is reluctant to predict how his present research may impact chemistry in the future. "It is not the expected advances, but rather the surprises that are most interesting," says Pines. "What is exciting is what the young scientists, like those in my groups and in other groups, are going to do."

Pines, (third from right, back row) and his Pinenuts, in a 1996 photo.

When pressed about how current and future NMR research will affect you and me, he anticipates that one day elephants or other large creatures will be studied with earth's-field imaging using giant superconducting (SQUID) detectors. Rather than try to predict the benefits, his preference is "to cultivate intellectual curiosity and original research, the benefits deriving later, often in unexpected ways." As an example he cites MRI, an important outgrowth of NMR: "No one in their right mind 30 years ago would have guessed that we'd be looking at such exquisite images using NMR techniques; it was unpredictable, a serendipitous discovery deriving from fundamental research."

Pines, a recipient of several distinguished teaching awards, has been teaching freshman chemistry for the last 10 years, and the experience still energizes him. After all, Pines says, "Most important ideas and achievements ultimately make their way into the freshman textbooks. They deal with fundamental questions at the very core of chemistry, a healthy balance to the inevitable specialization of advanced research." He encourages students to question accepted wisdom and to maintain broad interests, "to avoid ending up so narrow and specialized that their research, to use a well-known quote, fills a much-needed vacuum."

Pines is a scientist, a world leader in physical chemistry, but he is also a fan of chess, music, art and literature. "I might be tempted to give it up, all 25 years of science, if I could write one line of Mozart or Shakespeare," he chuckles. But he cannot really imagine a more stimulating way of life than to do science, surrounded by his beloved Pinenuts who continue to define and further NMR in chemistry.

Professor Jon Ellman Frequently Cited Author

According to an article in *Science Watch* , Professor **Jonathan Ellman** was one of the most frequently cited chemistry authors in the past three years. The study, which analyzed the 200 most cited papers from 1994-1996, found that five of Ellman's papers have had a significant impact on chemistry research.

"Combinatorial chemistry is a new and rapidly emerging field that has impact on many areas of science," said Ellman, "particularly in the pharmaceutical industry." In the procedure, various molecules are combined in a complex pattern, which allows the creation of thousands of compounds in a very short time. From that group of new compounds, the most effective one can be selected. This means that researchers may be able to develop better drugs faster.

Ellman was enthusiastic about what other scientists were referencing. "Not only was a general review article cited," he said, which is understandable in dealing with a new process in chemistry, "but several papers focusing on different aspects of chemistry" were highly cited as well.

The *NEWSLETTER OF THE COLLEGE OF CHEMISTRY* at Berkeley is published three times each year to support the College's mission of providing excellent teaching, research, and public service in the fields of Chemistry and Chemical Engineering.

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Entering Students, Fall 1997

	Undergraduate		Graduate	
	Chem	ChemE	Chem	ChemE
Enrolled	89	97	84	18
% Male	64	64	76	72
% Female	36	36	24	28

Note: The graduate chemical engineering program was oversubscribed last year, and therefore, a smaller class was admitted this fall.

Noteworthy News

Effective July 1, promotions to associate professor and tenure were given to **Jonathan Ellman**, **Martin Head-Gordon**, and **Evan Williams** in chemistry and **Susan Muller** in chemical engineering. Muller is the first tenured woman on the chemical engineering faculty.

John Arnold and **K. Birgitta Whaley** in chemistry and **Arup Chakraborty** and **David Graves** in chemical engineering were promoted to full professor.

The following students won Outstanding Graduate Student Instructor Awards in Chemical Engineering for 1996-97: **Andrew Chun-Pong Lau** (for ChE 160 with Fred Vorhis); **Caidian Luo** (for ChE 162 with Jay Keasling); **Mark Jeremy Rice** (for ChE 162 with Jay Keasling); and **Thara Srinivasan** (for ChE 230 with Morton Denn). All awards were for fall semester, 1996.

Chemical engineering students **Daniel Chinn** (for ChE 141 with Roya Maboudian, Fall 1996); and **Michael Ming Chang Sun** (for ChE 140 with Clayton Radke, Fall 1996) were the recipients of the Dow Prize for Excellence in Teaching for 1996-97. This $5,000 award is for outstanding graduate student instructors.

Michelle Claffey was awarded the Eli Lilly Corporation's Graduate Fellowship in Chemistry for 1997-98. The $15,000 award is presented to an outstanding student in Organic Chemistry.

Chemical engineering professor **Enrique Iglesia** was the first recipient of the Eminent Visitor Award from the Catalysis Society of South Africa. The award is given for excellence in fundamental research in catalysis. Iglesia spent a week in August giving lectures at the main catalysis research centers in South Africa.

Jaqueline Kiplinger, a postdoctoral researcher in professor **Robert Bergman's** group, is the 1998 recipient of the Nobel Laureate Signature Award for Graduate Education in Chemistry. The award recognizes work done as a graduate student, and consists of $3,000 and a plaque containing the signatures of Nobel laureates. Kiplinger was honored with her Ph.D. advisor, Thomas Richmond, at the University of Utah, where she received her doctorate. She will receive the award at the American Chemical Society annual meeting in Dallas on March 31, 1998.

Chemistry professor **Alex Pines** was one of 17 distinguished faculty named to a UC Berkeley Chancellor's Professorship. This program provides $20,000 a year for three years to be used for research and scholarship to faculty whose achievements in research, teaching and service are judged to be outstanding. Nominations are made by department chairs and reviewed by deans and the Budget Committee. Final selections are made by the chancellor and the vice chancellor and provost.

Chemistry professor **Gabor Somorjai** was awarded the 1997 MRS Von Hippel Award by the Materials Research Society for his work studying materials surfaces. The award includes $10,000 and a ruby laser crystal representing the many faceted nature of materials research. In addition, he was asked to present the prestigious Schuit Lecture on September 18 at the University of Eindhoven, the premier institution working in catalysis research in the Netherlands.

The College of Chemistry presented Distinguished Service Awards for the 1996-97 academic year to nine individuals and four teams for exemplary service and outstanding contributions.

Recognized for outstanding individual effort were **Cheryn Gliebe**, **Alice Kaneshige**, and **Maria Panuco** from the Department of Chemistry; **Vonis Moore** and **Judith Powers** from the Department of Chemical Engineering; and **Gloria Orozco**, **Eric Granlund**, **Susan Slavick** and **Norman Tom** from the College of Chemistry.

Pictured left to right, Read, Valrey, Dyer, Murphy, Pope.

Pictured left to right, Dreger and Pedersen, and from University EH&S, Bangay and Franaszek.

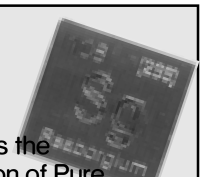
Pictured left to right, Lamey, Willis, Bogart, Harris, Jefferson, Simms, Murphy, Wilson.

Photos by Jane Scheiber

Pictured left to right, Gliebe, Kaneshige, Orozco, Panuco, Powers, and Moore.

Team awards were given to **Materiel Services** (Marcia Bogart, Barbara Harris, Michael Murphy, Brenda Jefferson, Sylvester Simms, Carl Lamey, Lirmar Willis, and Emery Wilson); **Chemistry Graduate Unit** (Theodosia Valrey, Rebecca Pauling, and Elizabeth Murphy); **College Relations** (Camille Olufson, Patricia Dyer, Dorothy Read, and Sharron Pope); and the **EH&S Team** (Kurt Dreger, Brigitte Bankay, Stephen Franaszek, Phil Kruse, and Professor Steve Pedersen).

"Seaborgium" Approved for Element 106



"Seaborgium" has been officially confirmed as the name of element 106 by the International Union of Pure and Applied Chemistry (IUPAC), approved on August 30 and adopted at the meeting of the American Chemical Society (ACS) in Las Vegas on September 7. They also confirmed the names for the other elements from 101 – 109. Glenn Seaborg (Ph.D. '37), Nobel laureate and UC professor emeritus, became the first living scientist bestowed with such an honor. Seaborg was greatly responsible for discovering several of the transuranium elements. Ken Hulet (Ph.D., '53) of Lawrence Livermore National Laboratory and Albert Ghioso of Lawrence Berkeley National Laboratory discovered element 106 in 1974. The process for naming these elements involved some controversy, including several disputes over which research team discovered an element, and in this case, whether to approve the name of a living scientist.