

Awards

January 15, 2007
Volume 85, Number 03
pp. 60-66

2007 ACS National Award Winners

Recipients are honored for contributions of major significance to chemistry

FOLLOWING IS THE THIRD set of vignettes of recipients of awards administered by the American Chemical Society for 2007. C&EN will publish the vignettes of the remaining recipients in successive January and February issues. An article on George M. Whitesides, 2007 Priestley Medalist, is scheduled to appear in the March 26 issue of C&EN along with his award address.

Most of the award recipients will be honored at an awards ceremony that will be held on Tuesday, March 27, in conjunction with the 233rd ACS national meeting in Chicago. However, the Arthur C. Cope Scholar awardees will be honored at the 234th ACS national meeting in Boston, Aug. 19-23.

- [ACS Award for Computers in Chemical & Pharmaceutical Research](#)
- [F. Albert Cotton Award in Synthetic Inorganic Chemistry](#)
- [Herbert C. Brown Award for Creative Work in Synthetic Methods](#)
- [ACS Award in Organometallic Chemistry](#)
- [James Bryant Conant Award in High School Chemistry Teaching](#)
- [ACS Award for Team Innovation](#)
- [Glenn T. Seaborg Award in Nuclear Chemistry](#)
- [Earle B. Barnes Award for Leadership in Chemical Research Management](#)

ACS Award for Computers in Chemical & Pharmaceutical Research

[Rick Mullin](#)

Sponsored by Accelrys

Emily Ann Carter is an acknowledged pioneer in the development and application of computational chemistry methods within the fields of surface and materials science. Among her significant contributions to theoretical methodology in computer modeling are the development of tools for sampling rare events in dynamics, the merger of ab initio quantum chemistry with molecular dynamics and kinetic Monte Carlo methods, and quantum-based multiscale materials simulations. She is credited with developing and applying quantum-mechanics-based methods to understanding and controlling the behavior of molecules, metals, ceramics, and semiconductor crystals, surfaces, and interfaces.



Frank Wojciechowski

Carter

Those who know Carter describe her as a chemist, foremost, whose work with computers brings the discipline of chemistry to bear on problems traditionally dealt with by engineers and physicists. With the tools of computational chemistry, Carter's work puts her in the vanguard of multidisciplinary research, a trend impacting both the life sciences and materials science worlds and one in which Carter sees chemistry making a unique contribution.

Carter, 46, graduated with a B.S. in chemistry from the University of California, Berkeley, in 1982 and received her Ph.D. in chemistry from California Institute of Technology in 1987. At Caltech, she studied under William A. Goddard III, the 1988 recipient of the Award for Computers in Chemical & Pharmaceutical Research. After postdoctoral work with James T. (Casey) Hynes at the University of Colorado, Carter joined the faculty at UCLA. There, she rose to the rank of professor of physical chemistry and materials science and director of modeling and simulation at the California Nanosystems Institute at UCLA. Carter is currently a professor of mechanical and aerospace engineering and applied and computational mathematics at Princeton University.

Carter says she was influenced in her decision to pursue theoretical research by Goddard's work. His work in the area of catalysis, she says, showed her a direct, practical connection between theoretical and experimental research. "I saw that one could develop and use computational tools that have the accuracy required to make predictions that not only can explain experimental observations but also help design the next set of measurements," she says.

Pursuing computational applications related to surface chemistry, Carter achieved breakthroughs that include the use of quantum mechanics (coupled with dynamics and kinetics) to elucidate the mechanisms involved in etching and growth of silicon, to connect the atomic-scale nature of cracks in ceramics and metals to their macroscopic mechanical properties, and to provide a new view of the nature of bonding at metal-ceramic interfaces.

This materials research also has a bearing on her earlier work on heterogeneous catalysis. Carter and Emily Jarvis, a research chemist at the National Institute of Standards & Technology and one of her former Ph.D. students at UCLA, have a patent pending on a thermally resistant catalyst technology with automotive catalyst applications.

Goddard says that Carter's background in organometallic research as an undergrad with Robert G. Bergman and Andrew Streitwieser at UC Berkeley equipped her with "a good intuitive grasp of reaction mechanisms in organometallic reactions," which he considers the best systems to learn from. She has applied this know-how to problem-solving via computational methods, which has advanced chemistry in materials research, he says.

Carter sees a mix of scientific disciplines as essential to her research. "People are working on increasingly complex problems," she says. "I think the future will involve many computational tools from a variety of science disciplines—physics, pharma, chemistry, engineering, mathematics, and statistics. As a result, the interpretation and design of experiments in many fields will be empowered more and more by computational chemistry in this broader sense."

The award address will be delivered before the Division of Computers in Chemistry.

F. Albert Cotton Award in Synthetic Inorganic Chemistry

Ron Dagani

Sponsored by the F. Albert Cotton Endowment Fund

Is **Christopher C. (Kit) Cummins**, 40, of Massachusetts Institute of Technology, the most highly regarded chemist of his generation? His colleagues at MIT certainly make a good case for it.



John Curley

Cummins

In 1998, when Cummins was 32, he won both the ACS Award in Pure Chemistry, which recognizes the achievements of outstanding chemists under 35, and the National Science Foundation's Alan T. Waterman Award, which honors exceptional young researchers in any field of science or engineering. At 33, he was named one of Technology Review's 100 top young innovators. Several other prestigious honors soon followed.

So what's all the fuss about? For MIT's Stephen J. Lippard, it's all about Cummins' "extraordinary palette of beautiful chemistry, most of it having little or no precedent in the chemical literature."

Another MIT colleague, Daniel G. Nocera, notes that "Kit revolutionized inorganic chemistry" with the synthesis of three-coordinate metal(III) trisanilide complexes, $M[N(t-Bu)Ar]_3$, where $Ar = 3,5-C_6H_3(CH_3)_2$. These complexes have showcased "some of the most remarkable reactions seen in the field of coordination chemistry in the past two decades," Nocera adds. Included are the activation of N_2 and NO to form $Mo\equiv N$ bonds. In particular, the cleavage of the $N\equiv N$ bond at atmospheric pressure and ambient temperature "led to rapid international acclaim," Nocera points out.

The splitting of the multiple N-N bond of N_2O , as opposed to the N-O bond, was "another remarkable accomplishment, as was his isolation and characterization of the first terminal carbide, $Mo\equiv C$," says Nocera. "Kit soon parlayed this knowledge into a route to prepare a compound containing the first terminal $M\equiv P$ bond and soon thereafter converted the latter into a M-PS compound, thus forming the first $P\equiv S$ complex ever."

In addition to these synthetic achievements, Cummins has shed light on how these reactions occur. Most significantly, he has exploited his tricoordinate molybdenum platform to effect alkyne metathesis.

Another major achievement of the Cummins lab has been its forays into the organometallic chemistry of uranium. For example, the lab has produced remarkable "inverted" uranocene complexes in which two uranium tricoordinate fragments sandwich a cyclooctatetraene ring. "The work is magnificent, pointing to the prominence of δ -bonding in the organometallic chemistry of 4f-block elements," Nocera comments, "and it has ignited a flurry of activity in the community."

When asked what research accomplishments he's proudest of, Cummins mentions the N_2 -splitting work and his group's recently reported discovery of complexes that extrude diphosphorus (P_2) or its synthetic equivalent under mild conditions ([C&EN, Sept. 4, 2006, page 7](#)). The availability of such reactive P_2 species "opens up a huge number of avenues for possible research," Cummins says.

Cummins' interest in organometallic chemistry was sparked as an undergraduate at Middlebury College in Vermont. After getting his B.A. in chemistry under Peter T. Wolczanski at Cornell University, Cummins continued his organometallic studies under Richard R. Schrock at MIT, where he received his Ph.D. in 1993.

Although Cummins interviewed for a position as assistant professor at several universities including MIT, he accepted MIT's offer, becoming the school's first-and so far only-chemistry graduate to be given a faculty position immediately following his MIT studies.

At MIT, Cummins' career has soared, and his work has exhibited "a combination of scholarly depth, intellectual insight, and creative virtuosity that is unmatched by others in his age group," says his colleague Gregory L. Hillhouse of the University of Chicago.

Cummins will deliver his award address before the Division of Inorganic Chemistry.

Herbert C. Brown Award for Creative Work in Synthetic Methods

Amanda Yarnell

Sponsored by the Purdue Borane Research Fund and the Herbert C. Brown Award Endowment

"Without **David A. Evans**, the art of synthetic methods development would not only be a far less advanced discipline than it is today, it would have a much less attractive future as well," says Amir H. Hoveyda of Boston College. Evans, a professor of chemistry and chemical biology at Harvard University, has developed a huge armamentarium of invaluable synthetic methods, Hoveyda points out. But Evans' far more lasting contribution, Hoveyda says, is that he "has trained some of the world's most exciting young scientists, many of whom are hailed as being the future leaders in the field of synthetic methodology."



Courtesy of David Evans

Evans

Evans, 65, has built a career on achieving absolute stereocontrol in carbon-carbon bond-forming reactions. Although he has made invaluable contributions to organosilicon and organosulfur chemistry and developed new sigmatropic rearrangements and hydride reduction reactions, Evans remains best known for devising a family of widely used chiral auxiliaries for enantioselective bond construction.

When Evans demonstrated the utility of his now-legendary chiral oxazolidinone auxiliary system in the late 1970s, it was a dramatic departure from the then-widespread reliance on appropriate chiral building blocks to control the target structure's stereochemistry.

Bolstered by their availability and flexibility, Evans' chiral oxazolidinone auxiliaries quickly caught on, and today they are widely used in both industrial and academic laboratories for enantioselective bond constructions. These auxiliaries "served as the springboard for the development of a large array of new stereoselective methods," Hoveyda notes. They have allowed chemists to carry out a wide range of asymmetric reactions, including aldol additions, alkylations, acylations, oxygenations, halogenations, aminations, Diels-Alder cycloadditions, Staudinger reactions, and conjugate additions.

"Evans' chiral oxazolidinones and associated methodology have arguably been used more broadly

than any other asymmetric method in natural product synthesis and pharmaceutical agent discovery," claims Jonathan A. Ellman of the University of California, Berkeley.

Evans later went on to develop chiral bis-oxazoline ligands for enantioselective catalysis. His lab has used their signature copper bis-oxazoline catalysts to drive a wide variety of enantioselective transformations, including olefin cyclopropanation and aziridination, aldol additions of silylketene acetals, and Diels-Alder reactions.

Throughout his career, Evans has demonstrated the power of his asymmetric methods by using them to construct complex natural products. "Evans belongs to that elite group of organic chemists who lead the way in both methods development and complex molecule synthesis," Hoveyda notes. Evans' lab has exploited the asymmetric reactions they have developed to conquer the synthesis of a whopping 50 or so natural products, including the glycosylated antibiotic vancomycin and the anticancer agent bryostatin.

Born in Washington, D.C., Evans received his bachelor's degree from Oberlin College in 1963 and his Ph.D. from California Institute of Technology in 1967. He was a faculty member at UCLA and Caltech before moving to Harvard in 1983. A recipient of numerous honors, including ACS's Arthur C. Cope Award in 2000, Evans is a member of the National Academy of Sciences and the American Academy of Arts & Sciences.

The award address will be presented before the Division of Organic Chemistry.

ACS Award in Organometallic Chemistry

Stephen K. Ritter

Sponsored by the Dow Chemical Co. Foundation

David Milstein of the Weizmann Institute of Science, Rehovot, Israel, has long been recognized by his peers as a powerhouse in the field of organometallic chemistry. He is now being honored for his myriad innovative contributions.



Courtesy of David Milstein

Milstein

Milstein is best known for his pioneering research on metal-mediated activation and functionalization of very strong chemical bonds. He and his coworkers have developed many group 8, 9, and 10 transition-metal complexes with specifically designed ligands that have proven useful to activate strong C-C, C-H, C-F, N-H, and O-H bonds.

"David is one of the most innovative and productive scientists working in the area of organometallic chemistry in the world today," notes Robert G. Bergman, a chemistry professor at the University of California, Berkeley.

"No one has done more than Milstein to elucidate the factors that control these types of demanding chemical processes," adds chemistry professor Harry B. Gray of California Institute of Technology. "All together, his work on the activation of inert substrates represents a landmark in organometallic chemistry."

Milstein, 59, received a Ph.D. in chemistry from Hebrew University of Jerusalem, in Israel. He carried out postdoctoral research in the U.S. at Colorado State University and at the University of Iowa. In 1979, Milstein joined DuPont Central Research & Development in Wilmington, Del., where he became a group leader in the homogeneous catalysis area. In 1987, he took up an academic position at the Weizmann Institute, where he is now director of the Kimmel Center for Molecular Design.

Milstein's important contributions to organometallic chemistry began early in his career. While a postdoc, Milstein and his adviser, John K. Stille, discovered the Stille coupling reaction that is now widely used in the synthesis of pharmaceuticals. It's a useful method for new C-C bond formation that uses a palladium catalyst to couple an organic halide with an organotin compound.

His subsequent pioneering contributions include a 1993 *Nature* paper describing insertion of a rhodium complex into a strong C-C bond using a pincer-type substrate that helps draw the metal center to the hard-to-access C-C bond (*Nature* **1993**, 364, 699). This paper is considered a classic for establishing a general strategy for C-C activation in homogeneous systems.

Another groundbreaking piece of work was Milstein's 1994 *Science* paper on activation of the notoriously inert C-F bond in reactions of fluorinated benzenes with silanes or hydrogen using a rhodium catalyst (*Science* **1994**, 265, 359). Milstein also demonstrated that arranging a metal complex in an ordered monolayer can have remarkable effects on catalysis (*Science* **1997**, 278, 2100).

Milstein has also contributed many pathbreaking papers on N-H and O-H activation, including insertion of iridium complexes into the N-H bond of ammonia and the O-H bond of water. Another example is his recently reported direct conversion of primary alcohols to esters and H₂ using a pincer-type ruthenium catalyst (*J. Am. Chem. Soc.* **2005**, 127, 10840).

His group also pioneered methods for catalytic activation and functionalization of aryl chlorides and of arenes. Other accomplishments, from his work on metal-promoted dearomatization, include synthesis of the first metallaquinone (a quinone in which one of the oxygen atoms has been replaced by ruthenium) and generation and controlled release of biologically active quinone methides. Yet another example was the use of a sulfur ylide instead of a diazo compound as a safer precursor to prepare transition-metal carbene catalysts.

"Milstein's highly impressive achievements and contributions spanning his scientific career have already left an everlasting impact on chemistry," comments Ronny Neumann, a chemistry colleague at Weizmann.

The award address will be presented before the Division of Organic Chemistry.

James Bryant Conant Award in High School Chemistry Teaching

Linda Wang

Sponsored by the ACS General Endowment Fund

Eleanor W. Siegrist made such an impression on Alexander Scheeline during high school that he still remembers her some 40 years later. Not only does he remember his former high school chemistry teacher, but he nominated her for the James Bryant Conant Award in High School Chemistry Teaching.



Charles Siegrist

Siegrist

"Mrs. Siegrist was tough as nails," recalls Scheeline, who is now a professor of chemistry at the University of Illinois, Urbana-Champaign. "She had high standards, and she expected people to meet them."

Siegrist, who taught chemistry between 1966 and 2005 at Hollidaysburg Area Senior High School, in Pennsylvania, challenged not only her students, but also herself. She regularly attended conferences, such as the Conference on Chemical Education, and immersed herself in education literature, one of her favorites being the *Journal of Chemical Education*. During the second half of her career, she became heavily involved in an outreach program called Science in Motion.

Through these efforts, she brought new ideas for science projects to her classroom and kept her material up-to-date. "The most outstanding thing was how hard Mrs. Siegrist worked," says Lara Larson, who took Siegrist's chemistry classes in the mid-1980s and is now an engineer at a northwestern Pennsylvania refinery. "She put a tremendous amount of effort into her lesson plans and homework assignments."

Siegrist, 62, hadn't planned on becoming a chemistry teacher. In fact, she majored in history at Westminster College, New Wilmington, Pa., and minored in chemistry education. After graduating with a B.A. in 1966, Siegrist began looking for a history-related job but instead found a position as a chemistry teacher at Hollidaysburg Area Senior High School. After a couple of months, she realized she had found her calling. She stayed at Hollidaysburg for 39 years, until her retirement in 2005.

Siegrist says her students kept her motivated. "If I can do even a little bit to help them realize the potential and the ability they have and to encourage them to reach and to try, that's a goal that brings me great, great satisfaction," she says.

Another motivating factor was Science in Motion, which Siegrist credits for revitalizing the second half of her career. The program, which began as a partnership between Juniata College, Huntingdon, Pa., and local high schools and has spread throughout Pennsylvania, allowed Siegrist to share ideas with other high school teachers, bring sophisticated instruments into her labs, and through the program's workshops, learn how to use the instruments.

Donald J. Mitchell, a professor of chemistry at Juniata College and a founder of Science in Motion, says Siegrist was a driving force behind the program and probably used its resources more than anyone else.

Through the program, Siegrist was able to bring pH meters, top-loading and analytical balances, a gas chromatograph, infrared spectrometers, and high-performance liquid chromatography instruments into her classroom. Siegrist says she took great pride in giving her students a college-level experience.

Siegrist also inspired young chemistry teachers. She motivated a fellow teacher to get a master's in education, and to show her support, Siegrist joined her in pursuing the degree. In 1998, Siegrist received a master's degree in curriculum and instruction, with a minor in science education, from Pennsylvania State University.

Siegrist's low-key nature belies her intensity. "When you first talk to her, you don't realize the drive and purpose behind her because she's so quiet. But she really got things done, and she was very

determined," Mitchell says.

Since retiring, Siegrist has been volunteering with the First Baptist Church of Hollidaysburg and is serving as an associate interim pastor.

The award address will be presented before the Division of Chemical Education.

ACS Award for Team Innovation

Arlene Goldberg-Gist

Sponsored by Corporation Associates

More and more during the past quarter-century, the emergence of highly resistant strains of *Streptococcus pneumoniae*, *Enterococcus faecium*, and *Staphylococcus aureus* has laid the groundwork for a medical crisis, especially among hospital patients. These bacteria cause pneumonia, bloodstream infections, and soft-tissue infections. But the teamwork of four former Upjohn Co. researchers who epitomize the definition of "collaborators" has led to "the first member of any entirely new class of antibacterial agents to reach the market in 35 years," according to Martin Mackay, senior vice president of Pfizer Global Research & Development.



Amy Wiseman/Pfizer Michigan Labs

Barbachyn



Esta Freeman

Brickner



Brian D. Ende/Abbott Laboratories

Hutchinson



Kara M. Manninen

Manninen

The organic chemists who will share the award include **Michael R. Barbachyn**, **Steven J. Brickner**, and **Douglas K. Hutchinson**, the three coinventors of linezolid (Zyvox)-the first member of the oxazolidinone class of antibiotics to be approved for the treatment of serious gram-positive nosocomial (meaning originating or taking place in a hospital) infection. The fourth awardee is **Peter R. Manninen**, who is recognized for his identification of a breakthrough in the synthesis of optically active oxazolidinones.

Brickner, 52, who has been a research fellow in antibacterials chemistry at Pfizer in Groton, Conn., since 2001, initiated the synthetic chemistry program leading to Zyvox as a spare-time project while working at Upjohn from 1982 to 1996. He says that when his lab was joined by Hutchinson's lab and then by Barbachyn's, they developed "a different operating model-one that came to engender a strong, effective team spirit with extensive sharing, not only of chemical intermediates but also ideas and strategies for prioritizing and prosecuting them as rapidly as possible." This approach led the team to select its first drug candidates, eperzolid and linezolid.

Barbachyn, 50, currently director of antibacterials chemistry at Pfizer in Ann Arbor, Mich., says that he "can't emphasize enough that this method of operating, something that we take for granted now, was truly an innovation back in the early 1990s."

Hutchinson, 51, is currently a research investigator with Abbott Laboratories. His scientific interests continue to lie in synthetic organic chemistry that is related to biologically active compounds, especially antiviral agents, oxazolidinone antibacterial agents, peptidomimetics, and organometallic chemistry. He says the team's approach that led to its focus on the piperazinyl oxazolidinones, "efforts which eventually segued into linezolid," is not universal in how things are done in the pharmaceutical industry. However, he says, "such an approach certainly allows everyone to have more fun with the chemistry and, perhaps ironically, makes a successful outcome for the project more likely. Certainly, trying to apply as many chemical resources to a project as possible to solve a clinical problem whose solution is never, ever obvious remains a motivating factor for me to this day."

"A second innovative approach instituted by our team," Brickner says, "was to prosecute our medicinal chemistry strategy based on obtaining, early on, safety information derived from monthlong toxicology studies and using this information to complement the normal correlation of structure with potency, efficacy, and pharmacokinetic properties."

"Having heard fragmentary information that DuPont—the original discoverer of the antibacterial oxazolidinones—had abandoned its oxazolidinone program (presumably because of toxicity), we went on to demonstrate the necessity of conducting these labor-intensive safety evaluations in order to identify those series with the best safety profiles. This represents arguably one of the first programs within the industry to successfully deliver to the market a first-in-class drug based on this then-uncommon strategy of running multiple, early preclinical toxicological evaluations to drive compound selection for development."

Barbachyn notes another "innovation that should be highlighted is the finding that incorporation of one or two strategically positioned fluorine atoms on the phenyl ring of our best oxazolidinones, including linezolid, confers advantageous properties to the oxazolidinone pharmacophore. In some cases, a potency advantage was realized; in others, there were observations of improved oral efficacy and pharmacokinetic performance. Perhaps most important was the finding that the monofluoro congeners

usually exhibit improved water solubility, a critically important observation and innovation that enabled the realization of intravenously administered oxazolidinones, including linezolid."

Brickner, Barbachyn, and Hutchinson all point to the role played by Manninen, who was Brickner's laboratory associate, for his independent finding of a critical modification—that is, the use of a lithium base in the oxazolidinone cyclization. This new "Manninen reaction" provided an improved process that allowed the researchers "to synthesize oxazolidinones in very high optical purity and on a large scale," Brickner adds.

Manninen, 44, who is now a senior associate organic chemist with Eli Lilly & Co., says it was early in his career when he worked on the discovery of Zyvox, and he feels fortunate to have had the three other award winners as mentors: "For me, it is an honor to be included with them as a recipient of this award and very humbling at the same time, knowing that it takes far more than a few people to discover and develop a marketable drug to provide to patients in need. Drug discovery to help those who are suffering is the goal, but working through the science to accomplish that goal is a passion. I think every medicinal chemist out there has that passion or they wouldn't be doing drug discovery."

Speaking for the group, Brickner says: "With the knowledge that Zyvox has now been used for over 1 million patients, many of whom were very seriously ill, it is extremely gratifying to know that our collective work with very many other colleagues has delivered a lifesaving drug to those in need. Without the excellent scientific insights of our colleagues, particularly those in the disciplines of biology, drug metabolism, and toxicology, this project would never have progressed beyond its early stage as a breeder project."

The award address will be presented before the Division of Medicinal Chemistry.

Glenn T. Seaborg Award in Nuclear Chemistry

Alex Tullo

Sponsored by the ACS Division of Nuclear Chemistry & Technology

Norbert G. Trautmann, 67, had the benefit of professional contact with Glenn T. Seaborg and Otto Hahn at formative stages in his career. While working for his Ph.D. in nuclear chemistry at Johannes Gutenberg University, Mainz, in Germany, Trautmann was part of a group that discovered the heaviest isotopes of protactinium. Hahn, who discovered protactinium with Lise Meitner, took an interest in this work when he occasionally visited his partner in splitting the atom, Fritz Strassmann, still at Mainz in the 1960s. "He also dropped in on my lab and asked what was going on with protactinium," Trautmann recalls.



Foto Rimbach Mainz

Trautmann

After receiving his Ph.D., Trautmann initiated work on fast chemical separation methods, mainly based on solvent extractions. The methods had to separate a single element from a mixture of 30 or more elements in fission product mixtures and perform the separation quickly enough to accommodate the sometimes subsecond half-lives of the isotopes of the isolated elements.

In 1970, Seaborg became interested in the fast-separation techniques that Trautmann was developing

and invited him to come to Lawrence Berkeley National Laboratory (LBNL), where he worked in 1970 and 1971 under Seaborg and Albert Ghiorso. Trautmann recalls Seaborg fondly. "At that time, you could ask him more or less anything about the heaviest elements," Trautmann says. "I admired him very much."

Gerhart Friedlander, a retired senior chemist with Brookhaven National Laboratory, says Seaborg himself would be impressed by Trautmann's body of work, noting that "Trautmann coauthored several publications with him and has contributed significantly to the field closest to Seaborg's heart: production and properties of the heaviest elements."

Following his fellowship at LBNL, Trautmann returned to Mainz, where he became the deputy manager of the Research Reactor TRIGA Mainz at the Institute for Nuclear Chemistry (INC). He became the manager of the research reactor in 1991, a position he gave up only a few months ago.

Friedlander recalls, from visits to INC, Trautmann's boundless energy. "He really seems to be the one who keeps all the wheels in the institute turning," he says. "His nonstop work habits are legendary. Time and time again, I have seen experiments and projects on the verge of foundering until Trautmann came to the rescue and led them to success."

Trautmann's work at the research reactor was also seminal. Guenter F. Herrmann, his thesis adviser at Mainz, rates Trautmann's development of rapid chemical separation techniques and resonance ionization mass spectrometry (RIMS) of actinide elements as major accomplishments. "Trautmann was the first to master complicated separation schemes involving several steps on a time scale of seconds," Hermann says. "This made numerous new nuclides in the complex fission product mixture accessible for study."

Trautmann says these methods enabled measurements of the fission properties of short-lived isotopes. Using a centrifuge system developed with international partners, Trautmann then focused on chemical properties of transactinide elements with atomic numbers of 104 or greater.

RIMS was used by Trautmann and coworkers to determine the first ionization potential of the elements americium through einsteinium for the first time and for the ultratrace analysis of transuranium elements, particularly plutonium.

Trautmann has authored or coauthored more than 300 papers. He won the Fritz-Strassmann Award of the German Chemical Society in 1984, the Helmholtz Award of the Physikalisch-Technische Bundesanstalt Braunschweig in 1990, and the Otto Hahn Award of the City of Frankfurt in 1998.

The award address will be presented before the Division of Nuclear Chemistry & Technology.

Earle B. Barnes Award for Leadership in Chemical Research Management

Kimberly Dunham

Sponsored by Dow Chemical

When asked to define his management style, **Frank J. Williams**, now retired from General Electric Global Research, in Schenectady, N.Y., says: "Hire great people, spend time mentoring and developing those hires, listen to people, and never be afraid to make changes when needed."



Courtesy of Frank J. Williams

Williams

Mentoring was certainly significant for Williams, 62, during his own career. At the urging of a "great high school chemistry teacher," Williams applied for a National Science Foundation fellowship that took him to Bucknell University for six weeks after his junior year. "That was my introduction to Bucknell, organic chemistry, and a wonderful professor: Harold W. Heine," he says. After high school, Williams attended Bucknell and took organic chemistry during his freshman year from Heine. "I was hooked," he says.

After receiving a bachelor's degree in chemistry in 1966, Williams went on to get a Ph.D. in organic chemistry in 1970 at Ohio State University. There, he worked with former ACS president Paul G. Gassman, to whom he was introduced by Heine.

Gassman led Williams to GE, where he was hired in 1971 by Joe Wirth to work at what was then GE's Corporate R&D Center. During his initial years at GE, Williams was a top technical contributor on a team that invented, developed, and helped commercialize GE's high-performance polymer Ultem polyetherimide. The time spent gaining a sound technical footing, Williams says, was important for his eventual role in management, because "that reputation helps establish credibility with your technical teams, which is critical to success."

In 1978, Williams began his first managerial assignment and continued in management until his retirement in February 2005 as a global technology leader. He attributes his career longevity to the "wonderful people and tremendous diversity of projects" he experienced at GE. As a manager, Williams says, he always tried to understand the positions of others, and he credits himself with an ability to anticipate and respond to change.

Williams' former colleagues agree. Scott C. Donnelly, president and chief executive officer of GE Aviation, says, "His unceasing curiosity, passion for innovation, ability to thrive on change, and courage in taking risks are qualities that I point to when I'm explaining to others how to lead an organization."

Ultimately, Williams says, he has seen people become successful with many different types of management styles. He says he was never afraid to be himself, and encourages others to do the same. "You have to be able to live with that person you see in the mirror every morning," he adds.

Williams' ability to adapt to change is serving him well in his retirement. Although it has taken some adjustment, he says, he is enjoying his time. He is working on making a dent in reading his book collection and improving his golf game. In fact, he received news of his award on his cell phone as he was walking off the golf course.

Williams is currently working with kids at a local Boys & Girls Club to inspire interest in math and science, and he is planning to use his prize to support recognition awards for science students at Schenectady High School.

The award address will be presented before the Division of Polymer Chemistry.