1997 ACS National Award Winners

Following are the first set of vignettes of recipients of 1997 awards administered by the American Chemical Society. An article on Mary L. Good, 1997 Priestley Medalist, was published in C&EN, May 13, page 36.

Most winners will receive their awards during the 213th ACS national meeting April 13-17, 1997, in San Francisco. However, the Cope Medalist and the Cope Scholars will receive their awards at the 214th ACS national meeting Sept. 7-11, 1997, in Las Vegas, during the Arthur C. Cope Symposium. In addition, the ACS Award in Fluorine Chemistry is scheduled for presentation at the Winter Fluorine Conference, Jan. 19-24, 1997, in St. Petersburg Beach, Fla., and the Roger Adams Award will be presented at the 35th National Organic Chemistry Symposium, June 22-26, 1997, at Trinity University in San Antonio, Texas.

C&EN will publish vignettes of the remaining awardees in successive January and February 1997 issues.

ACS Award for Nuclear Chemistry

Sponsored by Gordon & Breach Publishing Group

PETER J. ARMBRUSTER, head of the nuclear chemistry department at the Society for Heavy-Ion Research (GSI) in Darmstadt, Germany, "has long been widely admired for his superb mastery of experimental techniques and his innovative, imaginative, and skillful approaches to nuclear research," notes one colleague. He is honored for his leadership in the syntheses of new chemical elements and systematic study of the reactions and decay properties of very heavy nuclei.

Since 1981, Armbruster and coworkers at GSI and other European institutes have created six new elements—elements 107 to 112—by bombarding bismuth or lead targets with high-energy beams of metal atoms. Last February, the multinational team synthesized one atom of element 112—the newest and heaviest of all elements—by fusing lead and zinc atoms.

One of the keys to the GSI team's success has been development of a unique velocity filter, the Separator for Heavy Ion Reaction Products (SHIP). This filter separates the heavier, and therefore slower, products of fusion reactions from the projectiles that pass through the target.

Armbruster received a Ph.D. degree from Munich Technical University in 1961 and worked at the Institute for Neutron Physics in Jülich, Germany, from 1964 to 1970 before moving to GSI in 1971. He has been a professor at Germany's Cologne University since 1968 and at Darmstadt Technical University since 1984. From 1989 to 1992, he was research director at the Laue-Langevin Institute in Grenoble, France.

Armbruster initiated the construction of the fission fragment recoil separators Lohengrin and Josef, which have been operating at the Grenoble institute's high-flux reactor and at Jülich since the early 1970s.

Using these instruments and others, Armbruster has extended and explored the limits of nuclear stability, discovered numerous new nuclides, contributed to the understanding of nucleosyntheses of elements beyond iron in stellar explosions, and generally provided important new insights into nuclear structure and nuclear reaction dynamics.

ACS Award for Distinguished Service in the Advancement of Inorganic Chemistry

Sponsored by Mallinckrodt Baker Inc.

JOHN E. BERCAW'S California license plate identifies his Nissan Maxima as "CP STAR." Although this may not generally make heads turn, it illustrates the affection and enthusiasm of Bercaw's research group. The group gave the CP STAR license plate as a birthday present to Bercaw, a pioneering inorganic and organometallic chemist who has certainly made good use of Cp*—that is, pentamethylcyclopentadienyl—ligands.

Bercaw is a steady achiever who, over the years, has been the recipient of numerous awards, several from the American Chemical Society. The Centennial Professor of Chemistry at California Institute of Technology since 1993, Bercaw has authored and coauthored more than 140 papers and articles in the 25 years of his academic career.

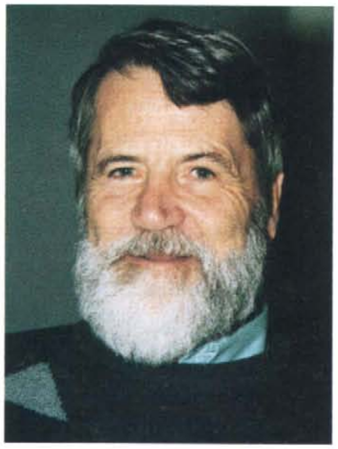
One colleague points out that Bercaw "is making impressive advances in our understanding of the mechanism(s) of Ziegler-Natta olefin polymerization and the origins of the remarkable stereoselectivities for this catalytic process. He has developed two stereochemical probes that have elucidated the precise diastereomic relationships for α-olefin insertion into the Y-H and Y-alkyl bonds of novel chiral catalysts."

Pioneering work on metallocene catalysts has been the object of much of Bercaw's research. His work, says the same colleague, "has involved metallocene complexes of the early transition elements, especially scandium, yttrium, titanium, zirconium, hafnium, niobium, tantalum, and tungsten, utilizing . . . Cp* ligands." The petrochemical industry has taken note of Bercaw's work. He was a Shell Distinguished Professor of Chemistry from 1985 to 1990. Since 1979, he has been a consultant to Exxon Chemicals America, a company that has registered many patents related to metallocene catalysts.

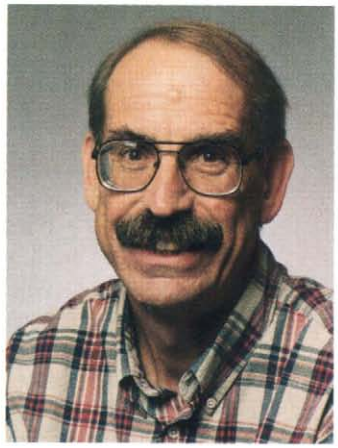
"The novel linked cyclopentadienyl-amide ligand that permitted construction of an active single-component homogeneous olefin polymerization catalyst has not only provided important mechanistic insight into the nature of stereoelectronic control over activity and stereoselectivity, it has proven so potentially powerful that two companies [Exxon and Dow] are developing commercial processes based upon it," a colleague notes.

Bercaw's research has been characterized by "astonishing versatility," this colleague adds. To summarize the main thrust of his efforts, Bercaw explains that his research interests over the past 25 years have concerned "fundamental aspects of catalytic reactions such as the fixation of dinitrogen, the production of synthetic fuels from coal, the conversion of methane to methanol, and the production of polymers from ethylene and propylene."

Bercaw received a B.S. degree in chemistry from North Carolina State University in 1967. He received a Ph.D. de-



Armbruster



Bercaw

Campbell

Collman

gree in inorganic chemistry from the University of Michigan in 1971. He joined Caltech in 1972 as the Arthur A. Noyes Research Fellow in Chemistry. One Caltech colleague notes that Bercaw's excellence in research is matched by his talent as an educator. "Perhaps his most outstanding and visible contribution, though, is the group of first-rate students and postdocs that have emerged from his group to make their own major contributions to inorganic chemistry."

E. B. Hershberg Award for Important Discoveries in Medicinally Active Substances

Sponsored by Schering-Plough Corp.

SIMON F. CAMPBELL, vice president for medicinals discovery at Pfizer Central Research, Sandwich, England, has played a significant role over the past 25 years in transforming this U.K. research group, which has brought several key products to market within the past few years and has a number of other products in the pipeline. He leads by example, as is evidenced by his personal contributions to the discovery of two major drugs, an extensive publication record, and close links with academic colleagues.

In 1995, two of Pfizer's pharmaceutical products—amlodipine, a calcium antagonist for the treatment of angina and hypertension, and doxazosin, an α_1 antagonist for the treatment of hypertension and benign prostatic hyperplasia—contributed almost one-quarter of the company's total pharmaceutical sales.

Campbell was named as inventor and coinventor on the patents covering amlodipine and doxazosin, and he was a key member of the multidisciplinary discovery teams that recommended both compounds for development.

These products, as well as others on the market and in the Pfizer pipeline, demonstrate Campbell's ability to harness innovative medicinal chemistry and new science in the design of novel agents to meet significant medical needs. In addition, he encourages multidisciplinary teamwork, which has been a significant factor in the Sandwich group's success.

Campbell's research is characterized by a drive to understand the basis for drug action at a molecular level, highly developed analytical skills, and inspirational leaps to solve synthetic or medicinal chemical problems. He has been a champion of computational methods in medicinal chemistry, both to rationalize structure-activity relationships and to understand the basis of molecular interactions.

Campbell received a B.Sc. degree in chemistry from the University of Birmingham, England, in 1962, and a Ph.D. degree from the same university in 1965. His doctoral work focused on elimination processes in polyfluorocycloalkanes. He held three postdoctoral positions: at Birmingham; Santa Maria Technical University, Chile; and Stanford University in California. Campbell was a National Science Foundation overseas research fellow and visiting lecturer at the University of São Paulo in Brazil from 1969 until 1972, when he began working at Pfizer in Sandwich. Campbell is a member of the American Chemical Society and the Society for Medicines Research, and he is a fellow of the Royal Society of Chemistry. He received the Royal Society of Chemistry Award for Medicinal Chemistry in 1989 and has authored nearly 100 publications and patents.

Alfred Bader Award in Bioinorganic or Bioorganic Chemistry

JAMES P. COLLMAN, George A. & Hilda M. Daubert Professor of Chemistry at Stanford University, has created models of biological chemicals that have led to greater understanding of the biochemical world.

The most impressive model created a turning point in the study of oxygen binding to hemoproteins. He invented functional analogs of the oxygen carriers hemoglobin and myoglobin and of the oxygen activating site in cytochrome c oxidase, the enzyme that metabolizes oxygen during respiration and is the cell's "powerhouse." Collman's picket-fencelike porphyrins were the first artificial systems that bound oxygen reversibly—by preventing the formation of dimers—allowing the study of binding and crystal structures.

"Bioinorganic chemistry depends upon models, and models often require elaborate construction in order to be useful," says a colleague. "The construction tool is organic chemistry. It is here that Collman has played a seminal role in the development of the field."

His early work elucidated the role of transition-metal ions in hydrolysis of ester and amide bonds. Collman invented a functional model for carboxypeptidase, a hydrolytic enzyme containing zinc that catalyzes hydrolysis of amide bonds in peptides and proteins.

"Collman has had a major impact on our understanding of the chemistry of biological systems by his invention and synthesis of functional models that mimic their properties and reactions," says another colleague. "His work on models for oxygen binding, [cytochrome] P-450, cytochrome c oxidase, and hydrolytic enzymes has provided a strong basis for what we know about the reactions of each of these systems.

"Because of the often unique nature of the biological reactions," this colleague continues, "these biomimetic systems provide incredible insight into the ways in which natural systems work."

Collman received B.S. and M.S. degrees in chemistry from the University of Nebraska, Lincoln, in 1954 and 1956. In 1958, he received a Ph.D. degree in chemistry from the University of Illinois, Urbana-Champaign. Collman served on the faculty of the University of North Carolina, becoming a full professor of organic and inorganic chemistry in 1966. A year later, he moved to Stanford University.

Collman has been a member of the National Academy of Sciences and the American Academy of Arts & Sciences since 1975. In addition to authoring nearly 300 journal publications and holding two patents, Collman has been a prolific lecturer. "But to his great credit," says yet another colleague, "Collman keeps moving into new territory and refuses to rest on his laurels."

ACS Award in Analytical Chemistry

Sponsored by Fisher Scientific Co.

Granting this prestigious award to **R. GRAHAM COOKS** is "a great recognition for the field of mass spectrometry as well as to its most productive member," writes a colleague. Cooks is Henry Bohn Hass Distinguished Professor of Chemistry at Purdue University, West Lafayette, Ind.

Cooks devoted the early stages of his career to developing tandem mass spectrometry as a tool for analyzing complex mixtures, building a variety of mass spectrometers, and exploring various ionization and activation methods. Subsequently, he made major contributions to the evolution of mass spectrometry as an increasingly sophisticated analytical tool. For example:

- He developed a method for dissociating ions via surface collisions. This method, known as surface-induced dissociation, is an alternative to gas-phase collision-activated ion dissociation in tandem mass spectrometry. Collisions between low-energy ions and well-characterized surfaces also were found to produce chemical reactions at the interface. Fluorine atoms and alkyl groups, among other atoms and groups, can be transferred from surfaces and be carried away by the impinging ion. These observations represent a new method of surface modification and analysis.
- He equipped mass spectrometers with membrane interfaces for on-line analysis of aqueous solutions. This analytical tool, called MIMS, is being used for environmental trace monitoring and bioreactor monitoring.
- He developed a "kinetic method" for measuring a compound's thermochemical properties based on the kinetics of dissociation of its cluster ions. The method is uniquely applicable to biological compounds and increasingly is being used to study them.
- He made major contributions toward developing the quadrupole ion-trap mass spectrometer as a high-performance instrument. Among other innovations, he and his coworkers reported the first MS/MS experiments, extended the mass range by 10^3, and injected ions from external sources.

Cooks holds several patents for his work in mass spectrometry. He is the author of 560 technical papers and several books. Among awards he has received are a Fullbright Senior Fellowship (1981), the Thompson Medal for Mass Spectrometry (1985), and the ACS Frank H. Field & Joe L. Franklin Award for Outstanding Achievement in Mass Spectrometry (1991). He was research adviser to 60 Ph.D. degree graduates, a number of whom hold academic appointments. And while he was head of the analytical chemistry department at Purdue (1986-95), Cooks had administrative responsibility for 115 graduate students working toward Ph.D. degrees in analytical chemistry.

Cooks received B.S. and Ph.D. degrees in chemistry from the University of Natal, South Africa, in 1961 and 1965, respectively, and a Ph.D. degree in organic chemistry from Cambridge University, England, in 1967. Following postdoctoral work at Cambridge, he joined the chemistry department of Kansas State University, Manhattan, as an assistant professor in 1968. He moved to Purdue in 1971.

Claude S. Hudson Award in Carbohydrate Chemistry

Sponsored by National Starch & Chemical Co.

SAMUEL J. DANISHEFSKY, director of the Laboratory for Bioorganic Chemistry at Memorial Sloan-Kettering Cancer Center, New York City, and professor of chemistry at Columbia University, has achievements in carbohydrate chemistry and biochemistry that stand "as a notable tour de force, combining synthetic expertise with mechanistic insight and a keen awareness of biological relevance," according to one colleague. Danishefsky, he adds, has helped change "the way organic chemists now carry out the synthesis of carbohydrates."

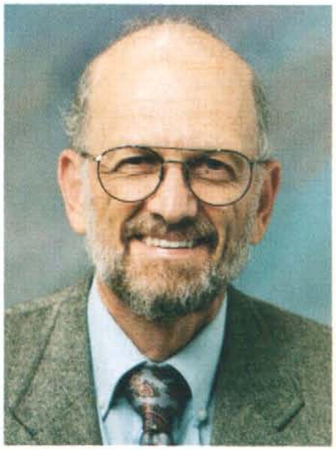
Recent major contributions by Danishefsky's research group include a practical approach to the solid-phase synthesis of glycopeptides and the first use of polymer-supported synthesis to construct a complex branched blood-group determinant—the Lewis Y antigen—which is associated with colon cancer. In addition, Danishefsky and coworkers recently reported the first total synthesis of a human breast-tumor-associated antigen and its conjugation to a carrier protein—work that could aid development of a tumor vaccine. Clinical trials on this project are to begin soon. Another recent synthesis performed by his group is that of epothilone A, a bacterial natural product that has potential as an anticancer drug.

Danishefsky's interest in carbohydrate chemistry arose from his studies of organic synthesis. For example, his work on cyclocondensation reactions led to syntheses of pyranosides and higher order monosaccharides such as tunicamycin and neuraminic acid. "These syntheses," writes a colleague, "resulted in the elaboration of polyoxygenated structures bearing as many as eight contiguous heterosubstituted stereogenic centers in a few steps." Danishefsky also used the cyclocondensation strategy to synthesize zincophorin, an antibiotic, and 6-deoxyerythronolide B, the parent compound of the antibiotic erythromycin.

In the past few years, Danishefsky's major focus has been on the use of glycals as glycosyl donors and acceptors in the synthesis of complex oligosaccharides and glycoconjugates. The glycal technique has provided the basis for the syntheses of a chitinase inhibitor (allosanadin), a phosphodiesterase inhibitor (KS-501), the saccharide portion of the antibiotic vancomycin, and the saccharide domain of the principal enediyne antibiotics, among other structures.

Danishefsky's group has also used glycals to produce oligosaccharides such as the cell-adhesion ligand sialyl Lewis X, as well as nucleosides, gangliosides, and glycopeptides. Glycal technology opens a complete route to synthetic oligosaccharides and associated structures.

Danishefsky received a B.S. degree in chemistry from Yeshiva University in 1956 and a Ph.D. degree in chemistry from Harvard University in 1962.


Cooks


Danishefsky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Ellis

Earle B. Barnes Award for Leadership in Chemical Research Management

Sponsored by Dow Chemical Co.

Proactive leadership has been the hallmark of the career of **DAVID A. DUKE** at Corning Inc. Recently retired as vice chairman and chief technical officer, he has played a significant role in the company's R&D efforts and business activities over the past 34 years.

The world technical community recognizes Duke as a "leader, businessman, and scientist of the highest character," says one colleague. Duke is author of the Corning Innovation Process, which has been described as "a highly effective, planned approach to invention and project management." This approach, applied throughout Corning, has generated interest from other industrial labs as a research management benchmark.

Duke's research management abilities have been recognized formally by the Washington, D.C.-based Industrial Research Institute. This organization, whose members are Duke's peers in industrial R&D management, designated Corning a model for its success in integrating business and technical planning. While under his guidance, the company was awarded the National Medal of Technology in 1994.

Duke joined Corning in 1962 as a senior scientist. His research work, and that of the groups he has led, has focused on glass, ceramics, and advanced materials. These research efforts have contributed to developments in the areas of optics and fiber-optic applications, automotive catalytic converters, and liquid-crystal displays. He also has managed a range of Corning businesses from automotive ceramics and industrial products to telecommunications.

From 1985 through 1988, Duke was senior vice president of the company's R&D division before being named Corning vice chairman. Since 1987, his energies have been directed toward the worldwide Corning research, development, and engineering laboratories with responsibility for research centers in the U.S., France, and Japan. He has actively promoted international technological interactions and cooperative programs among businesses, academic institutions, and other research organizations.

Duke received an undergraduate degree in geology from the University of Utah, Salt Lake City, in 1957. He then received M.S. and Ph.D. degrees in geological engineering and ceramics from Utah in 1959 and 1962, respectively. He is a member of the National Academy of Engineering and a fellow of the American Ceramic Society.

George C. Pimentel Award in Chemical Education

Sponsored by Union Carbide Corp.

ARTHUR B. ELLIS, Meloche-Bascom Professor of Chemistry at the University of Wisconsin, Madison, is "changing the teaching of chemistry," according to one enthusiastic supporter.

These changes have taken place not only in his own classroom, but also through myriad educational and professional programs behind which he is a driving force. Ellis' emphasis has been to include materials science in the teaching of general chemistry.

To this end, Ellis brought together about two dozen scientists, engineers, and teachers to produce a new, comprehensive curriculum that incorporates solid-state and materials science into science and engineering courses. One result was the book "Teaching General Chemistry: A Materials Science Companion" written by Ellis and four coauthors. In addition, several demonstration kits—distributed by the Institute for Chemical Education, also at the University of Wisconsin—are giving teachers new instructional tools.

Ellis is "inventing new ways of teaching chemistry that prepare students for the technically sophisticated world in which we live," says a colleague, "showing that we can change the way in which students see science courses by developing new techniques and new materials that make the courses accessible, friendly, and relevant."

Ellis has brought his ideas to colleagues through several hundred lectures and workshops, and as cochair of the first Gordon Research Conference on chemical education in 1994. He currently leads a team studying introductory college science courses for the National Science Foundation-sponsored National Institute of Science Education. Beyond his work in education, he has served on many professional committees and advisory boards. Much recognition has followed for his teaching and professional work, including a Guggenheim Fellowship in 1989.

Simultaneously, Ellis has supervised the work of 40 doctoral students. Since 1977, he has been at the University of Wisconsin, where he currently chairs the chemistry department's inorganic division. In 1973, he received a B.S. degree in chemistry from California Institute of Technology, followed by a Ph.D. degree in inorganic chemistry from Massachusetts Institute of Technology in 1977.


Friedman


Goodman


Murray


Bawendi

Joel Henry Hildebrand Award in the Theoretical & Experimental Chemistry of Liquids

Sponsored by Exxon Research & Engineering Co. and Exxon Chemical Co.

HAROLD L. FRIEDMAN, professor emeritus in the department of chemistry at the State University of New York, Stony Brook, has accumulated a unique record of major theoretical contributions to the understanding of experimentally observable chemical phenomena in electrolyte solutions. It is his focus on experimental observables and what they have to tell about their molecular underpinnings that have characterized his research. Friedman's pioneering contributions have approached solution chemistry from many points of view: thermodynamics, transport processes, spectroscopy, dynamics, and chemical kinetics.

His main focus is on interpreting the properties of solutions in terms of the interactions among the solution's constituent molecules and ions. His efforts have used microscopic analytical formulations of the problems of the coupling of solvent dynamical response to solute charge redistribution—an issue widely recognized as lying at the heart of many examples of chemical reaction dynamics in solution.

Initially, his explorations emphasized bulk ionic solutions, work that dispelled then-current beliefs about the structural integrity of solvation spheres and the corresponding influence on observed properties. Later, his work on a wide range of solutes yielded some of the earliest molecular-level information about the character of the hydrophobic interactions among nonpolar molecular solutes. Friedman and his coworkers extended their theories to mixed electrolytes, leading to the only current theory of electrolyte mixing rules and to the discovery of mixture-limiting laws.

Friedman was the first to develop the application of nonequilibrium statistical mechanics to calculate isothermal mass transport coefficients of ions in electrolyte solutions. He also showed that the solvent-averaged forces between certain ions in mixed electrolyte solutions can be probed by nuclear magnetic resonance, leading to a surprising conclusion that even strongly hydrated cations in aqueous solutions readily form close cation-cation pairs.

More recently, Friedman has worked on developing new methods for calculating structural and dynamical dielectric properties of polar liquids represented by interaction site models—the models most often used in simulation studies. His other interests include structural, energetic, and dynamic aspects of solution behavior, including solutions that don't conduct electricity.

Friedman was born in New York City in 1923 and served in the Office of Strategic Services during World War II. He completed a B.S. degree in chemistry in 1945 at the University of Chicago and was elected Phi Beta Kappa in 1946. He continued on at Chicago to receive a Ph.D. degree in chemistry in 1949.

Early in his career, Friedman served as a faculty member in the chemistry department at the University of Southern California (1949-59) and then as a staff member at IBM Research Center in Yorktown Heights, N.Y. (1959-65). He joined the chemistry faculty at SUNY, Stony Brook, as a full professor in 1965.

Friedman has received many honors over the years: Guggenheim Fellow at the Free University of Brussels (1957-58); Sackler Distinguished Lecturer in Chemistry at Tel-Aviv University, Israel (1988); and recipient of the Robinson Medal by the Faraday Division of Britain's Royal Society of Chemistry for his work on hydration of cation-cation and anion-anion pairs (1988). He also has been elected a fellow of the American Physical Society (1988).

During his career, Friedman has served on the editorial boards of the *Journal of Solution Chemistry,* the *Journal of Chemical Physics,* the *Journal of Physical Chemistry,* and *Faraday Transactions.* In addition, he has served as a member of the executive committee of the American Chemical Society's Division of Physical Chemistry and as a member of the National Science Foundation's Chemistry Advisory Committee.

Ralph F. Hirschmann Award in Peptide Chemistry

Sponsored by Merck Research Laboratories

MURRAY GOODMAN, professor of chemistry since 1970 at the University of California, San Diego, has been making extraordinary contributions to the field of peptide chemistry for more than 30 years. His integrated approach—combining organic synthesis, spectroscopy, computer modeling, and bioassays—has "profoundly changed and influenced peptide chemistry," according to an admiring colleague.

Most of Goodman's work aims to create potent and selective peptides that can be used for drug discovery. He and his students synthesize enantioselective building blocks that can be incorporated into constrained peptide analogs and peptidomimetics. These target molecules are then analyzed by spectroscopy, X-ray diffraction, and computer simulations. Using information from these studies and from bioassays, the chemists have been able to propose structure-bioactivity relationships for novel hormones, opioids, antibiotics, and neurotransmitters.

Recently, Goodman and his colleagues have developed a promising general approach to peptide synthesis based on urethane-protected α-amino acid *N*-carboxy anhydrides. They also have developed new routes for the synthesis of orthogonally protected lanthionines for novel drug design and new cyclization strategies on solid supports. These reactions are being developed as routes to peptide libraries.

Goodman's group has just published papers on the role of templates and peptidomimetics in the formation of collagen-like triple helices. His research group also has investigated the molecular basis for sweet and bitter tastes of peptidelike molecules with constrained geometries. They have developed a model to relate the stereochemistry of preferred conformations to their taste properties.

Goodman was the founder, and for 30 years the editor, of *Biopolymers*, a leading journal in protein, nucleic acid, polypeptide, and polynucleotide chemistry.

Nobel Laureate Signature Award for Graduate Education in Chemistry

Sponsored by Mallinckrodt Baker Inc.

It's rare for a graduate student working on a Ph.D. research project to make a major contribution to a field of science, and rarer still for such a student to achieve two major milestones. But that's what **CHRISTOPHER B. MURRAY** did while working in the laboratory of his thesis adviser, **MOUNGI G. BAWENDI**, at Massachusetts Institute of Technology. According to colleagues, Murray and Bawendi's work on the growth and self-organization of nanocrystals has had a profound impact on the field of nanocrystalline chemistry, opening a promising new branch of materials science.

Prior to Murray's dissertation research, much of the work in this area was performed by physicists and chemists interested almost exclusively in how the size of the crystallite affects the electronic properties and stability of the bulk material. In studying nanocrystalline materials, these researchers often were forced to make their measurements on poorly crystallized phases containing crystallites of widely varying sizes. These problems hampered progress in the field, which was sorely in need of general strategies for creating well-defined nanocrystals of any material.

Murray succeeded in developing a synthetic strategy for making nanoparticles of so-called II-VI semiconductors such as cadmium selenide with narrow size distributions. The key to the method is rapid creation of the particles, followed by a longer growth period. In Murray's procedure, chemical precursors to the semiconductor are quickly pyrolyzed at temperatures greater than 300 °C in a strongly coordinating solvent. Over the course of a few hours, nanocrystallites of the semiconductor grow in the reaction mixture until they are removed. "By controlling the temperature of the pyrolysis and the timing of material removal from the solvent, Murray was able to obtain a narrow size distribution that could be further sharpened by centrifugation," notes a colleague. "The final result was a distribution honed to ±1 atomic layer, an unprecedented accomplishment. These general methods were rapidly adopted by several leading research groups, raising the standards for II-VI nanocrystal studies, and were adapted to provide the first synthetic routes to high-quality III-V [semiconductor] nanocrystals."

Murray followed up on "his remarkable achievement" with yet another feat that is considered to be of "holy grail" quality, says this colleague. He developed procedures for creating highly ordered three-dimensional superlattices in which each nanocrystallite occupies one lattice site—that is, each nanocrystallite can be thought of as a "unit cell" of the larger supercrystal. The spacing between the nanocrystallites can be varied by changing the nature of the organic molecules coordinating to them. Moreover, the superlattices can be made to deposit as films over large areas of silicon, glass, or other substrates.

Many important potential applications require that nanocrystalline materials exist in the form of mechanically stable, ordered arrays of nanocrystals. Murray's breakthrough is "a major milestone along the route to accomplishing this goal," says a chemist familiar with the research.

Murray's work under Bawendi, a professor of chemistry at MIT, has been "an amazingly productive collaboration," comments another colleague. Murray was one of Bawendi's first generation of graduate students, and he received a doctoral degree in September 1995. The Canadian-born Murray is currently a member of the research staff at IBM's T. J. Watson Research Center in Yorktown Heights, N.Y.◀

Huchital receives North Jersey education award

The ACS North Jersey Section has awarded Daniel H. Huchital, a professor of chemistry at Seton Hall University, South Orange, N.J., its 1996 Excellence in Education Award funded by Hoffmann-LaRoche Co. The annual award, which consists of a plaque and $500, was presented at the general meeting of the section in May.

The award honors an educator who has aroused the curiosity of students and inspired them to pursue chemistry careers in which they later excelled. New Jersey educators are nominated for the award by past students who have been successful.

Huchital joined Seton Hall University in 1966 and is chairman of the department of chemistry and an associate dean of the College of Arts & Sciences. In 1992, he was honored with the university's Teacher of the Year Award. His former students include W. Rorer Murphy and Richard D. Sheardy, both Seton Hall professors of chemistry, and Jerry A. Hirsch, who is the current dean of the College of Arts & Sciences at Seton Hall. Other nominators were Dennis Jamiolkowski, a department head at Ethicon Inc., Somerville, N.J., and Maureen Dunn at Merck Research Institute, Rahway, N.J.

Huchital received a B.S. degree in chemistry in 1961 from the City College of New York, and a Ph.D. degree in chemistry from Stanford University in 1965.◀

Nominations solicited for Patterson-Crane Award

The ACS Dayton and Columbus Sections have issued a call for nominations for the 1997 Patterson-Crane Award. The biennial award consists of a $2,000 honorarium and a personalized commendation. Deadline for receipt of nominations is Jan. 31, 1997.

The award acknowledges contributions to the field of chemical literature, especially chemistry documentation; chemical information storage and retrieval; and design, development, production, or management of chemical information or services. It is given in honor of Austin M. Patterson and E. J. Crane, who were previous editors of *Chemical Abstracts.*

Nominations for the award must be in writing and should illuminate the nominee's contributions to the field as well as evaluate the person's accomplishments. Nominations must include a biography, bibliography of publications and presentations, and seconding letters. Resubmission of previous nominations with updated information will be considered. The award will be presented May 13, 1997, in Dayton, Ohio.

One copy of nomination materials should be sent to Margaret Roach, Patterson-Crane Award Committee Chair, c/o ACS Dayton Section, 140 East Monument Ave., Dayton, Ohio 45402-1267. For more information about the award, call (937) 224-8513 or (937) 255-3005.◀

Polymer chemistry student awards

The Polymer Education Committee of the ACS Divisions of Polymeric Materials: Science & Engineering (PMSE) and of Polymer Chemistry has issued a call for applications for the 1997 ICI Student Award in Applied Polymer Science. Current graduate students and students who received a degree within the past year are eligible for the award, which consists of $750 and a plaque. Applications must be submitted by March 1, 1997.

Applicants should submit a research paper for presentation at the fall 1997 ACS national meeting in Las Vegas. The paper must conform to the preprint format of the PMSE Division and be commensurate with the regulations and customs of papers presented at PMSE programs.

As many as six finalists will be selected to receive $600 in travel expenses to present papers at the ICI Award Symposium at the fall 1997 ACS national meeting. All finalists will also receive a one-year membership in PMSE. The actual award will be presented at the spring 1998 ACS national meeting in Dallas.

To apply, contact Elsa Reichmanis, Chair, ICI Award Committee, Bell Laboratories, Lucent Technologies, Room 1D-260, 600 Mountain Ave., Murray Hill, N.J. 07974; phone (908) 582-2504.◀

Call for nominations for Baekeland Award

The ACS North Jersey Section has issued a call for nominations for the 1997 Leo Hendrick Baekeland Award sponsored by Union Carbide Corp. The award consists of a gold-plated medal and an honorarium of $5,000. Nominations must be submitted by Jan. 15, 1997.

The Baekeland Award recognizes accomplishments in pure or industrial chemistry. American chemists who have not reached their 40th birthday by Jan. 1, 1997, are eligible for the award. The North Jersey Section presents the Baekeland Award biennially to commemorate the achievements of Leo Hendrick Baekeland and to encourage younger chemists to follow his example.

Nominations should include a letter defining the nominee's achievements, a brief biography, and a list of the nominee's publications. Renominations are encouraged. Five copies of the nominating letter and attachments should be sent to James E. Hanson, Baekeland Award Committee Chair, Seton Hall University, Department of Chemistry, 400 South Orange Ave., South Orange, N.J. 07079-2694; e-mail: hansonja@lanmail.shu.edu.◀

Applications invited for Ullyot scholarship

The Chemical Heritage Foundation (CHF) invites applications for the Glenn E. & Barbara Hodsdon Ullyot Scholarship for the summer of 1997. The purpose of the scholarship is to advance public understanding of the importance of the chemical sciences to public welfare. Applications must be submitted by Feb. 28, 1997.

The scholarship consists of a $2,000 stipend and supports a minimum of four weeks of research on the heritage of the chemical sciences utilizing CHF's Othmer Library of Chemical History in Philadelphia, other area libraries, and associated resources. The Othmer library houses primary sources from the 16th century through the mid-20th century as well as reference volumes and secondary literature on chemical history.

Applicants should send four copies of their curriculum vitae, a one-page research proposal that notes how the Othmer library's resources are relevant to the research, and the telephone numbers of two references. Send applications to Laurel Adelman, CHF, 315 Chestnut St., Philadelphia, Pa. 19106; phone (215) 925-2222, fax (215) 925-1954.◀

Nominations sought for Linus Pauling Award

The ACS Puget Sound, Oregon, and Portland Sections are soliciting nominations for the 1997 Linus Pauling Award. The award, which consists of a gold medal, is named for the two-time Nobel Laureate and honors those who have made contributions to chemistry that have received national and international recognition. It honors work for which the nominee has not already received the Nobel Prize. Nominations must be submitted by Feb. 28, 1997.

Nomination materials should include the nominee's résumé, a narrative summary of his or her scientific achievements, including explanations of the importance of the person's work, and supporting letters. Renominations will be accepted.

Send seven collated copies of all materials to Carl C. Wamser, Pauling Medal Award Chair, Portland State University, Department of Chemistry, Portland, Ore. 97207-0751; phone (503) 725-4261, e-mail: wamserc@pdx.edu.◀

Nominees sought for Catalyst Awards

The Chemical Manufacturers Association (CMA) is accepting nominations for its 1997 Catalyst Awards Program. Educators at all levels are eligible for the regional and national awards. National Catalyst Awards consist of $5,000, a medal, and a citation; regional awards consist of $2,500, a medal, and a citation. Nominations must be received at CMA by Jan. 10, 1997.

The annual awards are presented to as many as 24 teachers who, through dedication, knowledge, and innovative teaching methods, have inspired students toward careers in chemistry and science-related fields. National award nominees must have at least 10 years of teaching experience; there are no years-of-teaching requirements for regional nominees.

For more information, contact Hope Bonito at (703) 741-5826. To receive nomination forms and guidelines, contact Toni Benton, c/o Prolist, 17904 Georgia Ave., Suite 100, Olney, Md. 20832.◀