1999 ACS National Award Winners

Following is the third set of vignettes of recipients of 1999 awards administered by the American Chemical Society. The first and second sets were published in earlier January issues. An article on the 1999 Priestley Medalist is scheduled to appear in the March 22 issue of C&EN. Remaining vignettes will be published in successive January and February issues. Most winners will receive their awards during the ACS national meeting in Anaheim, Calif., March 21-25. However, the Cope Scholars will receive their awards at the ACS national meeting in New Orleans, Aug. 22-26.

Frank H. Field & Joe L. Franklin Award for Outstanding Achievement in Mass Spectrometry

MICHAEL L. GROSS has played a leading role in many of the most exciting developments in mass spectrometry. Furthermore, his unusually broad background in analytical, organic, and physical organic chemistry is reflected in the impressive breadth of his research accomplishments in fundamental ion chemistry.

Gross served as director of the National Science Foundation Midwest Center for Mass Spectrometry at the University of Nebraska, Lincoln—which he helped to establish—from 1978 to 1994. He is now director of the National Institutes of Health's Mass Spectrometry Research Resource at Washington University in St. Louis. He was one of the first scientists to apply ultra-high-resolution MS methods for difficult trace-level organic analysis. For example, in the mid-1970s, at his laboratory in Nebraska, he contributed one of the most noteworthy achievements in environmental analysis—quantitative MS/MS determination of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin at the parts-per-trillion level.

Moreover, his collaborative research with Charles L. Wilkins of the University of California, Riverside, has been cited as a major factor in the successful commercialization of Fourier-transform mass spectrometry by Nicolet Analytical Instrument Corp. "The company decided to go ahead with that [commercialization] project following a visit by a number of their engineers to our laboratory for a demonstration of the working prototype," Wilkins says. "Without Michael's solid understanding of analytical mass spectrometry, that development simply would not have taken place. The analytical FTMS methodology, as well as the conceptually related ion trap methods, have now assumed an important role in analytical mass spectrometry."

A key area of Gross's research is studies probing correlations between condensed-phase neutral and ionic chemistry and ion molecule reaction chemistry. But his work has gone beyond these surface correlations to include dynamical questions and the development of the analytical utility of ion molecule reactions. These studies have provided detailed information on the structure(s) of ion molecule intermediates—the collision complex—and the occurrence of dynamics of isomerization-rearrangement reactions.

Gross has made key contributions to MS methods for molecular structure elucidation. In 1982, for example, to sequence an unknown peptide by MS/MS, he discovered charge-remote fragmentations. He applied these to achieve far more detailed structural characterization of fatty acids and complex lipids. His notable publications on ion molecule reactions include important basic chemistry, writes one colleague, and now reactions for structural characterization.

Gross received a bachelor's degree in chemistry, cum laude, from St. John's University, Collegeville, Minn., and a Ph.D. degree in organic chemistry from the University of Minnesota. Following postdoctoral stints at the University of Pennsylvania (1966-67) and Purdue University, West Lafayette, Ind. (1967-68), he became an assistant professor of chemistry at the University of Nebraska in 1968. He rose through the ranks at Nebraska, becoming professor in 1978 and regents professor in 1988. Since 1994, he has been professor of chemistry and medicine at Washington University.

Among other awards and honors, he received the University of Nebraska Foundation Medal for Distinguished Teaching (1978) and the Commonwealth of Massachusetts Pioneer Award for his work on dioxins in the environment (1987), and he was recognized by *Science Watch* as one of the 50 most cited chemists for the period 1984-91.

Gross is founding editor of the *Journal of the American Society for Mass Spectrometry* and he served as editor of *Mass Spectrometry Reviews* (1982-90).

William Schulz

ACS Award for Computers in Chemical & Pharmaceutical Research

CORWIN H. HANSCH, professor emeritus of chemistry at Pomona College, Claremont, Calif., has spent more than three decades developing model systems to enhance the understanding of structure-activity relationships. "His seminal work in originating and establishing the field of quantitative structure-activity relationships (QSAR) has had a profound influence on the practice of medicinal chemistry with regard to the understanding of structure-activity relationships and the principles and practice of drug design," says a colleague. QSAR has also been used extensively in environmental toxicology.

QSAR—a method to describe, in mathematical terms, the relationship between the structure of chemicals and the way they affect biological systems—enables scientists to visualize, as well as predict, interactions from new, spatial perspectives. Hansch has put his QSAR methodology to productive use in diverse areas of medicinal chemistry, including central nervous system agents, anti-infective agents, antitumor agents, mutagenesis, carcinogenesis, protein-ligand binding, and metabolism.

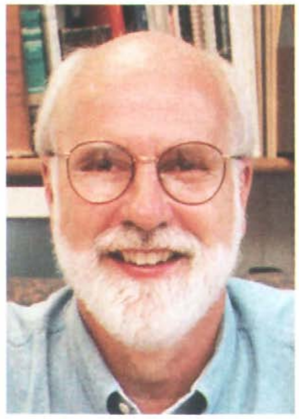
In short, says a colleague, "His pioneering work in the development of the QSAR paradigm has revolutionized the thinking of most medicinal chemists and laid the foundation for the development of modern quantitative molecular design."

Hansch's approach was soon established as an essential research tool, valuable in numerous aspects of pharmaceutical research. QSAR paved the way for subsequent innovations that include three-dimensional QSAR, "a direct offshoot of Hansch's work that has generated tremendous energy and success in drug design," according to another colleague.

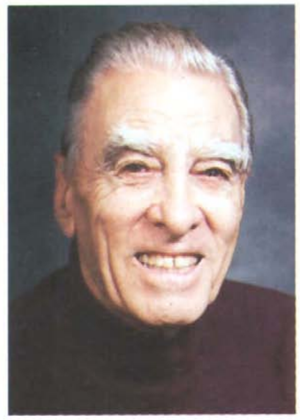
Hansch received a B.S. degree in chemistry in 1940 from the University of Illinois, Urbana-Champaign, and a Ph.D. degree in organic chemistry in 1944 from New York University. Following a brief stint as a research chemist and group leader for DuPont, Hansch accepted a professorship in the Pomona College chemistry department in 1944, where he remained until his retirement in 1988. He is currently a partner in BioByte, a Claremont, Calif.-based computer software and database company.

Hansch has authored or coauthored more than 325 technical papers and is the recipient of numerous accolades including the ACS Award for Research at an Undergraduate Institution (1986, first recipient) and the Smissman-Bristol-Myers-Squibb Award from the ACS Division of Medicinal Chemistry (1975, first recipient).

Kevin MacDermott



Gross



Hansch

Henderson

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

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

DOUGLAS J. HENDERSON, professor of chemistry at Brigham Young University, Provo, Utah, is an international leader in the theory of liquids. His pioneering work and breakthroughs during the past 30 years have defined areas of research for liquids, solutions, and electrolytes.

"Doug has contributed in a significant way to other areas of statistical mechanics, including intermolecular forces, phase changes, the statistical mechanics of surfaces and interfaces, and the structure and electronic properties of amorphous solids," writes one colleague.

Henderson's first major contribution, in 1967 with Australian researcher John Barker, concerned the perturbation theory of fluids. Henderson and Barker showed that with judicious division of intermolecular energy into reference and perturbation terms, and a systematic definition of the diameter of the reference hard spheres, perturbation theory could be successful. The theory continues to be a topic of investigation and an important tool for chemists and chemical engineers.

A second major contribution was an integral equation for liquid-solid interfaces. Henderson and collaborators extended this approach to include nonuniform integral equations and fluid-surface phenomena including adsorption, colloids, and electrode surfaces.

Henderson is also well known for his international collaborative efforts. He has worked not only with other scientists in the U.S., but also with scientists in Europe, Latin America, Asia, and Australia. "For Doug, science is truly an international affair," writes a colleague who was among those who organized a meeting in his honor in October 1994 in Mexico City.

Born in Canada, Henderson received a bachelor's degree in mathematics in 1956 from the University of British Columbia, Vancouver. He received a Ph.D. degree in physics in 1961 at the University of Utah, Salt Lake City. Henderson became a naturalized U.S. citizen in 1995. He is author of more than 300 papers and 38 major reviews in the field of statistical mechanics. He is coauthor with Henry Eyring and Betsy Stover of a major textbook, "Statistical Mechanics," and coedited with Eyring and Wilhelm Jost the 15-volume "Treatise on Physical Chemistry."

In addition to his many awards and honors, Henderson has twice received an Alfred P. Sloan Foundation Fellowship (1964 and 1966) and has received an IBM Outstanding Research Contribution Award (1973), an IBM Outstanding Innovation Award (1987), and a John Guggenheim Fellowship (1997).

William Schulz

James Bryant Conant Award in High School Chemistry Teaching

Sponsored by Albemarle Corp.

"To be a good teacher you have to teach to your personality. There are myriad excellent teachers out there and they each have a different personality and they each take their own special approach." So says **JOHN L. IHDE,** chemistry teacher at Wausau West High School, Wausau, Wis.

One of Ihde's colleagues says, "John Ihde loves to teach and loves chemistry, and considers both to be intricately entwined in all aspects of life. His dedication is contagious and motivating to those of us who have the good fortune to work with him daily. While others who have been teaching for [more than] 30 years are thinking of retirement, John is searching for new challenges, confronting issues, and implementing new approaches to education."

Another colleague says that Ihde is an excellent classroom teacher. "The best testimony to support that claim that I can offer is that my two sons studied high school chemistry under John and both of them, now Ph.D.s in science fields, consider him one of the best teachers they ever had."

But the 57-year-old Ihde, who has been teaching since 1964, does not stop at the classroom. He has published a number of articles on chemistry teaching; written a monthly column about education, science, and society for the *Wausau Daily*; presented demonstration programs at local elementary schools; run summer science camps for sixth- and seventh-grade students; and developed a course—called Kaleidoscope—with local art teacher Lee Michlein that is designed to show the connections that exist between chemistry and art. This course was awarded a $10,000 Toyota Tapestry grant for innovative science projects from the National Science Teachers Association. He has also been involved in curriculum development and teacher training.

Ihde, who received a B.S. degree in natural science with a concentration in chemistry in 1964 from the University of Wisconsin, Madison, and a master's of arts and

Ihde

Knowles

teaching in 1973 from Duke University, is no stranger to awards. Besides the Toyota Tapestry grant, Ihde has received the Outstanding Teacher Award from the Herb Kohl Educational Foundation, the ACS Great Lakes Regional Award in High School Chemistry Teaching, the Tandy Technology Scholar Award, the ACS Polymer Division's Achievement Award for Excellence in Polymer Education, the Wausau School District Teacher of the Year, and the Chemistry Teacher of the Year from the ACS Central Wisconsin Section.

He says of receiving the Conant Award: "This award brings back some fond memories for me. I was able, along with my wife and [then] young children, to see my father, Aaron J. Ihde, receive the Dexter Award from the ACS History of Chemistry Division in 1966. My father was a great influence on my choice of career and definitely influenced many of the things I do in the classroom."

Ihde says the Conant Award is doubly rewarding "because it involves receiving recognition for something I truly love to do—teach chemistry."

William Storck

The Nakanishi Prize

Harvard University Dean of the Faculty of Arts & Sciences **JEREMY R. KNOWLES** has the responsibility for some 10,000 students and a budget of $600 million. But in the world of chemistry, he has achieved his greatest influence through more than 30 years spent probing questions in bioorganic chemistry and guiding and inspiring hundreds of students and coworkers.

After serving as a pilot officer in Britain's Royal Air Force, Knowles studied chemistry at the University of Oxford, in England, where he received bachelor's (1959), master's, and Ph.D. degrees (1961). He spent a postdoctoral stint at California Institute of Technology before returning to Oxford in 1962. He joined the chemistry faculty at Harvard in 1974 and was appointed dean in 1991.

Knowles's research has applied the techniques and approaches of chemistry to the solution of biochemical problems, primarily the study of how enzymes accelerate reactions with such astonishing efficiency and specificity. As one colleague writes, Knowles has "gone further than anybody else in bridging the gap between classical organic chemistry and classical enzymology."

For example, Knowles synthesized chiral phosphate groups to study the stereochemistry of phosphate ester transfer. He and his coworkers devised two independent methods for determining the absolute configuration of phosphates labeled with the three stable isotopes of oxygen, ^{16}O, ^{17}O, and ^{18}O. Knowing whether the transfer occurs with inversion or retention of configuration of phosphorus greatly aided evaluation of how enzymes catalyze the transfer.

In another intellectual milestone, Knowles and Oxford colleague W. John Albery recognized that triosephosphate isomerase had achieved "perfection" in catalysis. After determining the complete free-energy profile for the enzyme-catalyzed reaction, they concluded that the enzyme could not improve any further: The reaction as facilitated by the enzyme proceeds at a rate controlled only by diffusion.

Since then, many other enzymes have been recognized as having reached the end of the evolutionary pathway in the sense that they cannot further accelerate reactions they catalyze. In separate work, Knowles has used the techniques of molecular biology to study evolution at the molecular level, attempting to understand the relationship between amino acid sequence and catalytic competence.

Knowles has tackled many other significant biochemical questions, including the mechanism of bacterial resistance to β-lactam antibiotics. Yet the fruits of his career as a researcher and teacher extend beyond the new knowledge obtained in his laboratory to a cadre of coworkers exposed to his exceptionally productive yet positive approach to science. The scientific environment he created, one former postdoctoral fellow notes, was "one that focused on scientific rigor and investigation while minimizing personal antagonisms and maximizing scientific understanding. Jeremy has an extraordinary ability to induce people to think and to do their research synergistically."

Among his many honors, Knowles has received the Alfred Bader Award in Bioinorganic or Bioorganic Chemistry and an Arthur C. Cope Scholar Award, both from the American Chemical Society; the Davy Medal from the Royal Society of Chemistry; and the Robert A. Welch Award from the Welch Foundation. He is a fellow of the Royal Society of Chemistry, a foreign associate of the National Academy of Sciences, and a member of the American Philosophical Society.

Pamela Zurer

ACS Award for Nuclear Chemistry

Sponsored by Gordon & Breach Publishing Group

KARL-LUDWIG KRATZ, a professor at the Institute for Nuclear Chemistry (Institut für Kernchemie) at Johannes Gutenberg-University of Mainz, Germany, has been cited by his colleagues as a pioneer in the study of neutron-rich nuclides whose structures and radioactive decay are important for understanding the astrophysical r-process—the rapid neutron-capture mechanism described for nucleosynthesis of the heavy elements beyond iron.

In his early career, Kratz worked on fast-chemical separation of fission products and performed a vast number of experiments to determine β-strength functions and decay properties of neutron-rich unstable isotopes. In all, he has led or participated in studies of more than 40 new isotopes at research reactors and experimental facilities around the world.

Kratz also is acknowledged for making strong contributions in the use of β, γ, and neutron spectroscopy on nuclides separated chemically, with laser ion source isotope online mass separators, and with projectile fragmentation. His work on developing neutron spectroscopy in particular is recognized as elevating that technique to a valuable high-resolution method.

One of his most notable theoretical contributions has been to develop the concept of "shell quenching," which has provided evidence for the notion that nuclear shell structures evolve and dramatically change as the neutron-proton ratio of a nuclide increases. One of Kratz's celebrated studies is that of the r-process "waiting-point" nuclides $^{130}Cd_{82}$ and $^{80}Zn_{50}$, which has allowed a direct connection between the original parent nuclides in the r-process pathway and the stable final decay products.

A key experiment he carried out on this subject last year to determine the half-life of ^{129}Ag (far from stable ^{107}Ag and ^{109}Ag) led to the conclusion that the "quenching" of the strength of the $N = 82$ closed neutron shell for nuclei with proton numbers less than 50 determines the r-process abundance pattern in the 130 mass region.

In other work, Kratz has applied for the first time an internally consistent microscopic nuclear physics input to describe thorium and uranium production needed for galactic age determinations. With these new calculations and with observations made by others from ground-based observatories and the Hubble Space Telescope, Kratz and his coworkers have been able to show that the relative r-abundances beyond barium have not changed during the history of the galaxy.

Kratz received a diploma in chemistry in 1966 from the University of Mainz and completed his thesis at the Institute for Nuclear Chemistry in 1967. He received a Ph.D. degree summa cum laude in 1972 from Mainz and began his career at the Institute for Nuclear Chemistry—first as a scientific assistant and then as an assistant professor of chemistry. In 1979, Kratz completed his habilitation and became professor in the department of chemistry and pharmacy at Mainz.

Kratz is the author of more than 180 research papers and has presented some 120 seminars and talks on nuclear chemistry, physics, and astrophysics. He currently is a member of the scientific committee of the On-Line Isotope Mass Separator (ISOLDE) at the European Laboratory for Particle Physics (CERN).

Stephen Ritter

ACS Award in Polymer Chemistry

Sponsored by Mobil Chemical Co.

If there is one idea that has driven **ROBERT S. LANGER** in his life's work, it is that chemistry can "solve all kinds of problems that will change and improve people's lives." Indeed, Langer's revolutionary discoveries in the area of polymeric controlled-release systems and the synthesis of new polymers for drug delivery have extended the lives of people suffering from a form of brain cancer called glioblastoma multiforme, one of the most rapidly progressive and universally fatal of all cancers.

Kratz

Langer

MacDiarmid

Langer is Kenneth J. Germeshausen Professor of Chemical & Biomedical Engineering at Massachusetts Institute of Technology, where he directs a laboratory of 40 to 45 graduate students, postdocs, and visiting scientists and about 25 undergraduate students. "I believe almost anything can be done," he says. "Many times, someone says you can't do it, but I find that that is rarely true, and that's what I tell my students." In each of three major areas, Langer and his colleagues have made seminal discoveries: controlled release of macromolecules, synthesis of new biomaterials, and polymers for cell transplantation (tissue engineering).

Langer received a B.S. degree in chemical engineering in 1970 from Cornell University and a Ph.D. degree in chemical engineering in 1974 from MIT. He decided that he wanted to find novel ways to apply chemical engineering to medicine. Thus, he began working as a postdoc in the Harvard Medical School laboratory of Judah Folkman, where he, Folkman, and their team isolated the first substance that could inhibit capillary growth.

It was in that same laboratory that Langer began working on the controlled delivery of high molecular weight molecules through polymers. At that time, it was thought that polymers could not be used to slowly release high molecular weight drugs because of low permeation rates. He defied conventional wisdom and designed polymer matrices that delivered the molecules through a winding, porous internal path. Langer also developed novel approaches to polymer synthesis that provided a rational framework for medical polymer design by integrating engineering, chemistry, and biology.

Langer subsequently worked with Henry Brem, a professor at Johns Hopkins University School of Medicine, and with chemists, chemical engineers, materials scientists, and biologists to design the Gliadel system to treat glioblastoma multiforme. The treatment utilizes a biodegradable polymer wafer implanted at the time of surgery to slowly deliver a highly toxic drug directly to the tumor site. The wafer has dramatically improved the survival rate of victims of this dreaded cancer.

Langer's list of firsts is extensive. In addition to new biopolymers, he developed the first approach to create synthetic polymer systems to deliver mammalian cells to form specific tissue structures. This research has provided the scientific foundation for the creation of new cartilage, bone, urological structures, and the first FDA-approved artificial skin based on synthetic polymers. Most recently, he and a team developed a solid-state silicon microchip that can provide controlled release of single or multiple chemical substances on demand—perhaps the precursor to a "pharmacy-on-a-chip." The release mechanism is based on the electrochemical dissolution of thin anode membranes covering microreservoirs filled with chemicals in solid, liquid, or gel form.

A colleague says that Langer's research "provides perhaps the best example in history in which polymer chemistry and the synthesis of new polymeric materials have been so closely linked to improving human health and saving human life." For such achievements, he has received many honors: At age 50, he is the only person to hold active elective membership in the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Among his 70 major awards and honors, he received the prestigious Gairdner Foundation International Award in 1996. In 1998, he received the $500,000 Lemelson-MIT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Madeleine Jacobs

ACS Award in the Chemistry of Materials

Sponsored by DuPont

Not every scientist can claim to have opened up an important new field of research like the University of Pennsylvania's **ALAN G. MacDIARMID** can. In 1977, MacDiarmid, in collaboration with Hideki Shirakawa, then a postdoctoral associate of his from Tokyo Institute of Technology, and physicist Alan J. Heeger (then at Penn), demonstrated that an organic polymer—polyacetylene, to be exact—can be doped with bromine or iodine vapor so that it becomes metallic. No one had expected this to be the case. With this discovery was born the field of conducting polymers, also known as synthetic metals, and it has led to an ever-expanding torrent of research by chemists, physicists, and materials scientists.

The impact of MacDiarmid's work is clearly evidenced by the fact that since the announcement of doped polyacetylene's metallic behavior more than 3,000 papers have been published on this polymer, according to one source. In addition, about a dozen other conducting polymers have since been discovered. Among them is an analytically pure form of polyaniline that MacDiarmid's group synthesized and converted to the metallic state by protonic acid doping—an entirely new doping concept. "Since Alan's seminal paper on the doping of polyaniline in 1986," notes one of his colleagues, "1,500 papers and patents have appeared on this conducting polymer alone!"

MacDiarmid, Blanchard Professor of Chemistry at Penn, has focused his studies during the past decade primarily on polyaniline, in collaboration with physics professor Arthur J. Epstein of Ohio State University, Columbus. According to one colleague, MacDiarmid's most important recent studies have clearly shown, for the first time in any conducting polymer, that conductivity is highly dependent on the molecular conformation of the polymer chain. Thus, polyaniline's conductivity can be increased about a 1,000-fold by straightening out the molecule from a "tight coil" to an "expanded coil" conformation.

Other recent collaborative studies, this colleague continues, have revealed "an exciting, unexpected phenomenon" whereby the properties of light-emitting polymer diodes are greatly improved by incorporating a layer of polyaniline between the light-emitting polymer and the adjacent electrode.

MacDiarmid's work also has had a significant impact on industry. The past six years have seen "an explosion of technological activity" associated with polyaniline and also with light-emitting diodes (LEDs) based on electronic polymers. Potential areas of application of these polymers include rechargeable batteries, electromagnetic interference shielding, antistatic materials, corrosion inhibition, LED displays, and flexible "plastic" transistors and electrodes.

MacDiarmid was born in New Zealand 71 years ago. After obtaining his higher education (including two Ph.D. degrees in chemistry) at the University of New Zealand; the University of Wisconsin, Madison; and the University of Cambridge, in England, he joined the Penn faculty in 1955. He is the author or coauthor of some 600 research papers and 20 patents, and has received numerous awards and honorary degrees.

Ron Dagani

Francis P. Garvin-John M. Olin Medal

Sponsored by Olin Corp. Charitable Trust

"I want to be known as a chemist first," **CYNTHIA MARYANOFF** asserted during an interview when she received the 1997 Tribute to Women and Industry Award from the YMCA. The Garvin-Olin Medal now also recognizes Maryanoff's creativity in scientific endeavors, demonstrated leadership in research management, and national service to the chemistry community.

Maryanoff is senior director of new product research at Johnson & Johnson's R. W. Johnson Pharmaceutical Research Institute in Spring House, Pa. Her group is noted for the discovery and development of innovative, practical chemical routes to complex enantiomeric heterocyclic molecules, retinoids, and peptides/proteins.

Maryanoff

McCormack

She heads all of the basic development functions required to move a new chemical entity rapidly from discovery to human trials, and she is responsible for chemical production within R. W. Johnson, ensuring a supply of chemicals for clinical trials and eventual market supply.

Maryanoff's outstanding scientific and leadership skills are amply demonstrated by her approach to process research. Says one colleague: "She has developed many efficient syntheses for a wide variety of organic compounds that had to be prepared on multikilogram scales. Her energy and ability have been an inspiration to her coworkers. Her excellence in recognizing useful details that can be valuable to the chemical community has resulted in the publication of several methodology papers."

A personal and professional priority for Maryanoff is educating and developing future chemists. She and her husband, Bruce, have set up an endowment of $50,000 to fund a scholarship for an undergraduate chemistry major doing undergraduate research.

Maryanoff has a keen interest in chemistry, especially as applied to process research, and has shown considerable innovation in her thinking and application. She couples this with leadership in that she is an effective leader of young chemists who work with her. She is an active promoter of career advancement of women and minority chemists and has played a strong role in that capacity within the R. W. Johnson Pharmaceutical Research Institute, which is reflected in the numerous awards she has received from the institute.

Maryanoff's concern for encouraging a strong liaison between academia and industry is evident in her activities as a member of the executive committee of the ACS Division of Organic Chemistry since 1988, the C&EN Advisory Board (1990–92), and a National Institutes of Health study section, to name a few. She was the 1997 chair of the ACS Division of Organic Chemistry, and has pioneered a number of important projects for that division, including undergraduate travel awards to ACS national meetings.

She is the author of more than 66 publications and holds 22 patents. She has chaired more than 16 symposia at ACS national meetings, Gordon Research Conferences, and other meetings.

Maryanoff received a B.S. degree in chemistry in 1972 from Drexel University, Philadelphia. During her time at Drexel, she did research in organic chemistry with Robert O. Hutchins, who says: "I perceived that she possessed exceptional motivation and dedication toward chemistry and was able to obtain an undergraduate fellowship for her for 1970 and 1971. This perception was, I believe, quite correct. Over the next three years, she really astounded me with her devotion, intelligence, hard work, and experimental competence."

Maryanoff received a Ph.D. degree in chemistry from Princeton University in 1976, working with stereochemist Kurt Mislow. She did postdoctoral work there in 1978–79 with Edward C. Taylor.

Rita Johnson

Charles Lathrop Parsons Award

Science literacy—in many forms and for many audiences—has been a driving force in the life of **MIKE McCORMACK,** who is being recognized by this award for outstanding public service as an ACS member. McCormack is best known as a U.S. House of Representatives member from Washington State during 1970–80 and as chairman of the House Science & Technology's Subcommittee on Energy. He was one of a handful of representatives who provided "strong, rational leadership on science issues," say ACS members recommending him for the award.

"Listen to scientists and engineers and be guided by their recommendations," McCormack said, when asked how politicians should weigh issues related to science.

In the past decade, McCormack has focused on enhancing the level of science literacy throughout society through programs of the Institute for Science & Society, which he founded in 1990 and of which he is director.

Eight hundred teachers have completed the institute's science literacy courses. The core program is a 40-hour course that starts with an introduction to astronomy and progresses through an overview of basic physical laws, chemistry, and simple math. The course includes lab visits, geology field trips, guest lecturers, and the gift of a minilibrary of a dozen basic science texts—all free for teachers.

"Today, most Washington teachers are state certified with virtually no training in science and mathematics," he says in explaining the genesis of the institute.

His concern about science education has carried over to his gubernatorial appointment to the Washington State Higher Education Coordinating Board in 1994. There, he has pressed the legislature to require that elementary-school teachers are tested and certified in the basic subjects they will teach to students. McCormack has also taken science literacy to a very personal level and volunteers as an elementary-school science teacher for fourth graders in his hometown of Ellensburg, Wash.

After earning B.S. and M.S. degrees in physical chemistry in 1948 and 1949 at Washington State University, Pullman, and a year of teaching chemistry at the University of Puget Sound, Tacoma, McCormack was hired in 1950 as a research scientist at the Atomic Energy Commission's Hanford facility in Richland, Wash., where he remained until 1970. For 14 years of this time, he served in the state legislature.

Asked about key science issues of the next century, McCormack singles out energy, particularly the dwindling supply of oil and natural gas. He warns that as supplies drop over the next 20 years, the developed world's great dependence on oil will lead to "traumatic changes in energy consumption and lifestyles."

"Early in the 21st century, we must provide new nonpolluting fuels for automobiles," he says. "We must also choose between further polluting the atmosphere by burning still more coal or build more nuclear power plants. Otherwise, we must reduce our standard of living. There is no other option."

McCormack has developed those views into papers that have recently been presented at international meetings of the American Geological Society, American Association for the Advancement of Science, and the American Chemical Society.

Jeff Johnson