2001 ACS NATIONAL AWARD WINNERS

Recipients are recognized for contributions of major significance to chemistry

Following is the fifth set of vignettes of recipients of the 2001 awards administered by the American Chemical Society. C&EN will publish vignettes of the remaining awardees in February. An article on Fred Basolo, 2001 Priestley Medalist, is scheduled to appear in the April 2 issue.

Most winners will receive their awards during the ACS national meeting in San Diego, April 1–5. The Arthur C. Cope Award and the Arthur C. Cope Scholar Award recipients will receive their awards at the ACS national meeting in Chicago, Aug. 26–30.

Ernest Guenther Award in the Chemistry of Natural Products

Sponsored by Givaudan

YOSHITO KISHI, Morris Loeb Research Professor of Chemistry at Harvard University, has centered his research on the synthesis of a tremendous variety of highly complex natural products that have potent and unique biological activity. His work has had a lasting impact on medicinal chemistry and on the potential for improved drugs for specific therapies.

KISHI has advanced the rules to predict the stereochemical course for reactions on an acyclic system with an allylic group.

A few of the many natural products Kishi and his research group have synthesized include neurotoxins, such as palytoxin, tetrodotoxin, and saxitoxin; polyether antibiotics, such as monensin, lasalocid A, and calcimycin; ansamycin antibiotics (rifamycin S); and antitumor compounds, such as halichondrins and mitomycins. Palytoxin is an extremely complex molecule consisting of a 115-carbon-atom chain richly embossed with functional groups. Given these elements, a huge number—2^{71}—of different stereoisomers are possible, but only one was palytoxin.

In order to carry out extremely complex syntheses, Kishi extensively investigated not only new synthetic strategies, but also new synthetic methods. Through these studies he advanced the rules to predict the stereochemical course for reactions on an acyclic system with an allylic group. To define the conformational characteristics of palytoxin, oligosaccharides, and fatty acids, he recently developed a chemical ruler to measure distances in the 15–50 Å range.

Kishi's group is currently working toward the total synthesis of halichondrins, which are antitumor polyether macrolides isolated from marine sponges. According to one of his colleagues, "Kishi's pioneering work in devising novel synthetic strategies and methodologies and his groundbreaking stereochemical insight are incredibly impressive, especially when taken as a whole."

As an educator, Kishi guided and developed a generation of excellent synthetic chemists. His style, grace, and toughness in the solution of problems have helped the individuals in his research group expand their horizons and uncover strengths within themselves. His group has always consisted of "highly dedicated individuals who intellectually cross-fertilize one another," says one of Kishi's former postdoctoral students. "Clearly, we have all grown in our abilities and willingness to aggressively confront larger molecular targets and to constantly reexamine our notions of how large is too large of a structure for construction and elucidation," he adds.

Kishi earned his Ph.D. degree in chemistry from Japan's Nagoya University in 1966, and he has been a chemistry professor at Harvard since 1972. He was chairman of the chemistry department from 1989 to 1992.

Among Kishi's numerous awards are the ACS Award for Creative Work in Synthetic Organic Chemistry (1980), an Arthur C. Cope Scholar Award (1988), the Javits Neuroscience Investigator Award from the National Institute of Neurological Disorders & Stroke (1988), and the Nagoya Medal of Organic Chemistry (1995). He chairs the advisory board of the Eisai Research Institute of Boston, a pharmaceutical research organization that is owned by Eisai Co. of Tokyo. He has coauthored about 240 chemistry papers.

The award address is to be presented before the Division of Organic Chemistry.—BETTE HILEMAN

ACS Award in Inorganic Chemistry

Sponsored by Aldrich Chemical Co.

Stanford University chemistry professor **EDWARD I. SOLOMON**'s interest in science began at an early age. "I had a telescope, a microscope, and a Gilbert chemistry set in elementary school," he recalls. "These led to a chemistry lab in my garage and eventually to working in a lab at the University of Miami during high school." For his high school research, he was a finalist in the Westinghouse Foundation National Science Talent Search in 1964.

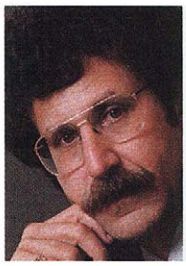
Since then, Solomon has evolved into a preeminent inorganic spectroscopist and physical inorganic chemist, with his research thus far emphasizing the application of a wide variety of spectroscopic methods to experimentally determine the electronic and geometric structures of both natural and synthetic transition-metal complexes.

Solomon's contributions have won him praise from colleagues and peers even though inorganic spectroscopy and theory, as a mature field, has become unfashionable. As one of his peers notes, "It takes an exceptional individual to work within such a field and bring new insights to important problems."

In particular, Solomon has demonstrated how the power of spectroscopy when applied to bioinorganic systems can lead to the determination of structure, descriptions of bonding and electron transfer, and molecular oxygen reactivity. "I think this is an exciting time for inorganic spectroscopy," he says. "Modern spectroscopic methods based on synchrotron radiation, lasers, and superconducting magnets now allow a more rigorous study of metal complexes and generally provide complementary information."

Add those tools to modern quantum

chemistry theory and today's computing power and high-level calculations on complex metal sites become possible, he says. "The payoff is new insight into metalloenzyme catalysis, the properties of inorganic materials, and potentially into organometallic structure-reactivity correlations."



SOLOMON uses a wide variety of spectroscopic methods to study bioinorganic systems.

Solomon's work includes investigations of photoactive excited states, surface interactions of small molecules on metal oxides in catalytic systems, determination of the covalency of metal-ligand bonds, peroxide-metal binding and its contribution to oxygen activation, and new spectroscopic methodologies.

The latter includes variable energy photoelectron spectroscopy using synchrotron radiation to define metal-ligand covalency and the change in electronic structure upon ionization. Another technique Solomon has developed is variable temperature/variable field magnetic circular dichroism spectroscopy, a method especially useful for high-spin iron(II) complexes.

One of his interests has been the physicochemical elucidation of the "blue copper" proteins. Another contribution he has made has been to help unravel the complex electronic structure of rubredoxin, a small iron-containing redox protein. Other important work includes the study of hemerythrins and hemocyanins, which along with hemoglobins are three classes of metalloproteins capable of reversible binding of oxygen. He also has developed molecular mechanisms of oxygen activation by tyrosinase and the four-electron reduction of oxygen to water by the multicopper oxidases.

Solomon received a B.S. degree in chemistry in 1968 from Rensselaer Polytechnic Institute and an M.A. degree in chemistry in 1970 and a Ph.D. degree in chemistry in 1972, both from Princeton University. He then was a postdoctoral fellow at the H. C. Ørsted Institute, in Copenhagen (1973–74), and at California Institute of Technology (1974–75).

Solomon began his academic career at Massachusetts Institute of Technology as an assistant professor of chemistry in 1975, and he reached the rank of full professor in 1981. He moved to Stanford in 1982, and became Monroe E. Spaght Professor in 1991.

Among numerous invited lectureships and awards, Solomon has received the Remsen Award from the ACS Maryland Section and the G. W. Wheland Medal from the University of Chicago and has been elected a fellow of the American Association for the Advancement of Science and a fellow of the American Academy of Arts & Sciences.

He currently is an associate editor of *Inorganic Chemistry* and is on the editorial board of several journals, including *Chemical Reviews, Chemistry & Biology,* and *Coordination Chemistry Reviews.* He also was coeditor with chemistry research professor Barry Lever of York University, Toronto, of the two-volume set "Inorganic Electronic Structure and Spectroscopy" (Wiley, 1999), a comprehensive review of the methodology and applications of spectroscopic techniques and theoretical models used in inorganic chemistry to elucidate electronic structure.

The award address is to be presented before the Division of Inorganic Chemistry.—STEVE RITTER

Francis P. Garvan-John M. Olin Medal

Sponsored by Olin Corp. Charitable Trust

Serendipity has played more than a minor role in the professional life of this year's recipient, **SUSAN S. TAYLOR**, Howard Hughes Medical Institute investigator and professor in the department of chemistry and biochemistry at the University of California, San Diego.

Taylor is now a well-known biochemist, highly recognized for her work on protein kinases, particularly the different forms of the key regulatory enzyme, cyclic adenosine monophosphate (cAMP)-dependent kinase (PKA). As one colleague puts it, "If one had to choose the single most fundamental breakthrough of the last decade in our understanding of protein kinases, it probably would be the solution of the crystal structure of the catalytic subunit of cAMP-dependent protein kinase," work done by Taylor and her colleagues in 1991.

"To a significant extent," notes another close observer of her work, "PKA became the prototypic enzyme among the hundreds of protein kinases now known to exist largely because of Taylor's research. This occurred because of the depth to which she pursued her studies and the broad range of techniques she and her collaborators employ in their research. Knowledge of protein kinases has been of great value in the design of drugs to regulate the control of these enzymes and to understand their function."

But when she entered the University of Wisconsin as an undergraduate in 1960, Taylor wasn't planning on a career or even a major in chemistry. Her aim was to be a medical doctor, albeit one who did research. But an honors chemistry course her freshman year—specifically, its "wonderful teacher," Charles Sorum—led her to major in chemistry.

Marriage and her husband's new position at the National Institutes of Health brought Taylor to Washington, D.C., but she hadn't applied to any medical school in the area and there wasn't time to do so. However, there was time to apply to graduate school. That led her to a Ph.D. degree in physiological chemistry from Johns Hopkins University in 1968, where she worked under Edward Heath, "who gave me my rigorous training in science." She then followed her husband to Cambridge, England, where she obtained a postdoctoral fellowship at the Medical Research Council Laboratory of Molecular Biology, working under Brian Hartley.

It was there, Taylor says, "that I learned protein chemistry surrounded by crystallographers and molecular biologists. So I had not only the details of protein chemistry, but also the broader context of how it could be used. Once I got there, I never thought about doing anything else than working with proteins. It was an extraordinary environment—one I've spent the rest of my life trying to mimic."

TAYLOR advises young people to be flexible and to take advantage of every opportunity that comes along.

The next and final stop on the road for Taylor and her husband was UCSD, where he had accepted a faculty position and she undertook an extra year of postdoctoral work under Nathan Kaplan, who one day put a paper on her desk, saying, "You ought to look into this." The paper was on protein kinase and the rest, as they say, is history.

Drawing on her experience, Taylor says, "my message to young people now is, 'Take advantage of the opportunities that come

your way. Don't plan so carefully.' I find the most important events in your life are often the ones that you don't plan. Flexibility is a critical factor for all of us."

Her work has given Taylor an insight into chemistry as well. "It's a science," she says, "that puts you at the interface. You can use it for high-resolution analysis. You can use it for intense computational work. You can use it to try and understand how things work in a cell. It's at the interface of physics, computation, and biology. That, I think, is the most exciting thing. It's really served me well over the years." Taylor, who served as president of the American Society for Biochemistry & Molecular Biology in 1997, was elected to the National Academy of Sciences and the Institute of Medicine in 1996.

The award address will be presented before the Division of Biological Chemistry at the ACS National Meeting in Chicago, Aug. 26–30.—JANICE LONG

ACS Award in Polymer Chemistry

Sponsored by ExxonMobil Chemical Co.

Merging the precision of biological polymerizations with the versatility of traditional polymer chemistry is one of the major themes of research in **DAVID A. TIRRELL**'s laboratory at California Institute of Technology.

Tirrell, who is chairman of Caltech's division of chemistry and chemical engineering, has made major contributions in numerous areas of polymer chemistry. It is at the interface of polymer science and biology—specifically the creation of artificial proteins with virtually absolute control of chain length, sequence, and stereochemical purity—that Tirrell has, in the words of Caltech colleague Robert H. Grubbs, "pointed the way to a genuinely new approach to polymer synthesis."

"There are fundamental and practical reasons for pursuing this research," Tirrell says. "On the fundamental side, there has always been a split between those who study natural and synthetic polymers. Communication between the two is not common. I want to help merge the two areas in a way that is useful—there are important intellectual challenges involved in that effort."

"There is also a practical side," Tirrell continues. "It is not in the traditional strengths of polymer science, which has done a great job in designing mechanical and barrier properties into polymers. Rather, it is where protein properties pay off—in membranes, films, and surface structures. This is a natural point of merger, where biomaterials consisting of protein arrays can have biological properties integrated directly into them."

No matter how carefully controlled, conventional polymerization reactions produce mixtures of macromolecules characterized by relatively broad distributions of molecular weight, composition, sequence, and stereochemical structure. Tirrell and his coworkers have synthesized artificial genes that encode synthetic polypeptide chains of essentially absolutely uniform structure. By careful selection of the amino acid monomers making up the polypeptides, the Tirrell group has created materials that crystalize into unique and predictable structures. They have also succeeded in incorporating nonnatural amino acids into the polypeptides, developing strategies for producing fluorinated, electroactive, and alkene- and alkyne-functionalized polymers.

TIRRELL's research pushes the frontiers of the interface of polymer science and biology.

Robert W. Lenz, former editor of *Macromolecules* and professor emeritus of polymer science and engineering at University of Massachusetts, Amherst, where Tirrell was a professor for 15 years before moving to Caltech, says of the research: "It is no exaggeration to say this development represents one of the most significant new approaches to macromolecular synthesis to have appeared in the last several decades."

Tirrell's focus on the connections between polymer and biological science has led to numerous other accomplishments. In the areas of membrane chemistry and drug delivery systems, Tirrell and coworkers re-created, in synthetic membranes, the essential signal transduction characteristics of natural membranes of cells and organelles. According to Grubbs, "Dave's unique approach to membrane design offers the promise of important applications in drug delivery, in imaging, and in chemical sensing, and it is currently under development in other academic and industrial laboratories."

More recently, Tirrell introduced a new way to create nanometer-scale polymer gels, wires, and patterns. In the method, long nanotubes drawn from biomembranes are used to create templates for photochemical polymerization into solid-phase conduits and networks. The researchers can control the dimensions of the tube precisely in the range of 20 to 200 nm.

Tirrell has authored or coauthored more than 200 refereed research papers, edited three books, and served as the editor of the *Journal of Polymer Science, Part A: Polymer Chemistry* for the past 10 years. He is an elected fellow of the American Institute of Medical & Biological Engineering, a Rothschild Fellow of the Institute Curie, and a winner of the Harrison Howe Award (ACS Rochester Section). He was also the recipient of four outstanding teacher awards at the University of Massachusetts.

Tirrell was born in 1953 in Easton, Pa. He received his B.S. degree in chemistry from Massachusetts Institute of Technology in 1974 and his M.S. and Ph.D. degrees in polymer science and engineering from the University of Massachusetts in 1976 and 1978, respectively. He joined the faculty of Carnegie Mellon University in 1978 as an assistant professor of chemistry and moved to Massachusetts in 1984 as an associate professor of polymer science and engineering. He joined the Caltech faculty in 1998 as Ross McCollum/William H. Corcoran Professor and professor of chemistry and chemical engineering.

The award address is to be presented before the Division of Polymer Chemistry.—RUDY BAUM

Ralph F. Hirschmann Award in Peptide Chemistry

Sponsored by Merck Research Laboratories

DANIEL F. VEBER has been associated with some of the most important developments in peptide chemistry over the past 30 years. His work has included fundamental contributions to the synthesis, purification, and conformational analysis of complex peptides. He has also made pioneering discoveries relating to the design of peptide analogs and derivatives having improved biological activities, the design of peptidomimetics, and the discovery of nonpeptide structures that interact with the receptors at which peptides express their biological activity.

"In short, Veber is an internationally recognized leader in peptide chemistry who has an enviable record of sustained productivity," a colleague says. Noted for both the quantity and quality of his publications,

Veber has more than 200 to his name and is an inventor on more than 60 patents. "His research has had an exceptionally broad impact on the direction of peptide research," the colleague continues.

Trained as an organic chemist with his bachelor's (1961), master's (1962), and doctoral (1964) degrees from Yale University, Veber began his career at Merck Sharp & Dohme Research Laboratories, Rahway, N.J., and retired from Merck in 1993 after 29 years with the company. During his career there, he moved from the role of research chemist to eventually become a senior director in Merck's medicinal chemistry department at West Point, Pa. Since 1993, he has been a director in the medicinal chemistry department at SmithKline Beecham Pharmaceuticals in King of Prussia, Pa.

VEBER is an internationally recognized leader in peptide chemistry who has an enviable record of sustained productivity.

At Merck, he was part of the team that in 1968 achieved the first solution-phase chemical synthesis of an enzyme—ribonuclease-S. His extensive studies to optimize the use of protecting groups and the formation of 3-cysteine bridges were critical to the overall successful synthesis. He and coworkers also have synthesized atrial natriuretic factor, a heart muscle hormone; echistatin, the anticlotting agent from snake venom; and the aspartic protease from HIV-1. These peptides, ranging in size from 28 to 99 amino acids, were synthesized in amounts needed to support detailed biological studies.

In addition to peptide synthesis, Veber is also distinguished for his leadership of the chemical part of the somatostatin program at Merck. The determination of bioactive conformations led to the development of smaller, less peptidelike molecules that could replicate the biological activity of complex peptides. For example, Veber and coworkers designed and synthesized a cyclic hexapeptide that contained only two of the 14 amino acids found in the somatostatin hormone, but which was nevertheless 50 to 100 times more potent.

Veber's design and synthesis of conformationally constrained peptide analogs has become the standard strategy in peptide hormone research. His approach to the discovery of small conformationally restricted peptide agonists and antagonists continues to play a role in the discovery of small, nonpeptide drug leads.

Veber is known for his contributions to the development of enzyme inhibitors as well. More specifically, his work on renin inhibitors—published jointly with Daniel H. Rich, professor of medical and organic chemistry at the University of Wisconsin, Madison—has helped establish the principles for inhibition of aspartic proteases on which the HIV protease inhibitors are based. Recently, his work has focused on cysteine protease inhibitors that inhibit cathepsin K, which is implicated in osteoporosis.

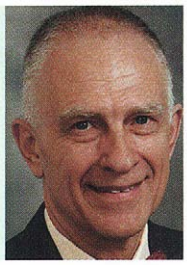
"There is no question about the tremendous impact he and his science have made to the field of peptide chemistry and its exploitation in the design, discovery, and development of peptide-based drugs," another colleague says. "Veber's creativity and extraordinary breadth of understanding of many of the fundamental issues related to peptide chemistry is what I find to be most compelling about his many contributions."

The award address is to be presented before the Division of Medicinal Chemistry.—ANN THAYER

ACS Award for Nuclear Chemistry

Sponsored by Gordon & Breach Publishing Group

WALTERS has helped develop ways to find trace elements in a wide variety of samples, including archaeological specimens.



WILLIAM B. WALTERS, professor of chemistry at the University of Maryland, has spent his career peering into atomic nuclei with clever and innovative techniques. The results of these techniques have not only been important in determining why nuclei behave the way they do, but they have also been useful in other fields.

For example, Walters recently coauthored a paper with graduate student Jo Ressler and others on a half-life measurement of ^{80}Zr, a neutron-deficient isotope that is thought to be made in X-ray bursts. Walters' work reduced the believed half-life of ^{80}Zr, simplifying models of how X-ray bursts create a number of different elements. During his career, he also helped develop ways to find trace elements in a wide variety of samples, including archaeological specimens.

"Bill Walters' passion has been the structure of the nucleus," one colleague says. "What combinations of protons and neutrons achieve a stable nuclear configuration? How are these nuclei produced?"

More recently, he has probed a fundamental question that underlies the entire field of chemistry: How are heavy chemical elements made in exploding stars?

Walters says he got a big break early in his career. He received his B.S. degree in chemistry from Kansas State University, Manhattan, in 1960 and his Ph.D. degree in physical chemistry from the University of Illinois, Urbana-Champaign, in 1964.

As he arrived as a postdoctoral student at Massachusetts Institute of Technology in 1964, the research team he was assigned to acquired a germanium gamma-ray detector from a team of nuclear engineers that was making gamma-ray detectors down the hall. The resolution of the device was 100 times greater than anything the chemists had used before. The team quickly put it to use and pioneered a number of experimental techniques, many of which are still used today. Walters has taken advantage of this factor of 100 in capacity to measure gamma rays and radioactive decay nearly his entire career.

Walters has also helped develop other methods. He has been working with the ISOLDE (Isotope Separator On-Line De Europa) collaboration at CERN in Geneva to develop a technique that uses resonance ionization laser sources for selective separation of isotopes of different elements. The team working at CERN has recently used the technique on the heaviest known isotopes of tin: ^{135}Sn, ^{136}Sn, and ^{137}Sn. Tin is important to understanding nuclear structure because it has a closed proton shell. The team intends to look at ^{138}Sn and ^{139}Sn soon.

Walters has also been working with a team at Argonne National Laboratory that uses double-sided silicon strip detectors. This technology allows scientists to examine the proton emissions of some 1,600 events at once, instead of waiting for the events to occur one at a time.

Walters has also been busy outside of the laboratory. In 1986, he was the chairman of the ACS Division of Nuclear Chemistry & Technology, and he was a

recent chair of the University of Maryland campus senate, where he was instrumental in the university's adoption of plus and minus letter grades. Walters has also been a John Simon Guggenheim Memorial Foundation Fellow at Oxford University and the recipient of the University of Maryland, College Park's, Sigma Xi award for research in 1998. He is currently teaching a graduate-level course in radiochemistry. He is an elder in the Riverdale Presbyterian church and director of international affairs of the College Park Rotary Club. In the latter capacity, he has hosted two Rotary scholars from Germany and sponsored two students who received Rotary fellowships to study in France and Israel.

The award address is to be presented before the Division of Nuclear Chemistry & Technology.—ALEX TULLO

Arthur W. Adamson Award for Distinguished Service in the Advancement of Surface Chemistry

Sponsored by Occidental Petroleum Corp.

With a résumé and list of publications that look and feel like a big-city phonebook, University of Texas, Austin, chemistry professor **J. M. WHITE**—"Mike" to those who know him—could spend hours talking about his research accomplishments. But he doesn't. He'd rather have you know about his love for teaching.

"I'm proud of the 60 or so Ph.D.s that I've graduated over the years," he tells C&EN. "My goal has always been to see them flourish." And indeed they have. Many of White's former students hold prestigious positions at major universities, industrial laboratories, and government institutions.

WHITE's love for teaching remains strong even after 35 years as a professor at the University of Texas.

But it's not just graduate students who are helped by White. "I still love the classroom," he says. Thirty-five years after coming to the University of Texas, White insists that he still enjoys teaching freshman chemistry and interacting with the students—and clearly the young adults are drawn to the veteran chemist. For example, after completing their first chemistry class with White last semester, a dozen students came to him for guidance on undergraduate research projects. And in a remarkable show of support, a freshman chemistry section of some 400 students nominated White for a prestigious campus-wide award, making White the 1998 recipient of UT's Jean Holloway Award for Teaching Excellence.

In the laboratory, White long ago established a reputation as a highly productive researcher. Originally, White studied gas-phase chemistry focusing on hot atom reactions. By the early 1970s, he had developed a research program in surface chemistry and had investigated oxidation of carbon on nickel surfaces. White was among the first to measure concentrations of carbon monoxide and oxygen during steady-state oxidation of carbon monoxide on transition-metal surfaces.

White is particularly well known for his pioneering photochemistry studies of molecules adsorbed on metals. Contrary to conventional wisdom at the time of the experiments, the Texas researcher demonstrated that unique photochemical processes can occur on metal surfaces. The prevailing assumption was that would-be chemical reactions would be halted by a metal's ability to rapidly quench electronic excitations that could otherwise lead to reactions. White's surface photochemistry studies extended to many types of adsorbed molecules including alkyl halides, ammonia, sulfur dioxide, and fluorinated compounds as well as several surfaces such as platinum, silver, alumina, gallium arsenide, and silicon.

In addition to advancing photochemical methods for surface investigations, White is credited with developing a technique known as static secondary-ion mass spectrometry (SIMS) for monitoring surface species during reactions. In SIMS experiments, an energetic ion beam impinges upon an adsorbate-covered surface, causing atoms and molecules in the topmost layers to recoil toward a mass spectrometer.

Recently, White has directed interdisciplinary research focusing on chemical issues related to growing, synthesizing, and analyzing electronic materials. In addition to overseeing a research center that brings together a dozen faculty members and some 30 graduate students and postdoctoral researchers, White's research group also has made contributions in this area, having investigated chemical vapor deposition reactions related to preparing thin films of silicon, gallium nitride, titanium nitride, and other materials.

Preeminent surface scientists offer all manner of praise for White's intellect, scientific rigor, and leadership skills. But above and beyond the science, White will always be known for his human nature. As a close colleague puts it, "Mike is such a great guy."

White was born in Danville, Ill., in 1938. He studied chemistry at Harding University and graduated with a bachelor's degree in science in 1960. After attending graduate school at the University of Illinois, Urbana-Champaign, and completing a Ph.D. in physical chemistry in 1966, he took a position at the University of Texas, Austin, as assistant professor of chemistry. He was promoted to associate professor in 1970, and in 1976 he was named professor of chemistry.

White served as UT's chemistry department chair from 1979 to 1984 and held the Norman Hackerman Professorship in chemistry from 1985 to 2000. Last fall, he became Robert A. Welch Chair in the chemistry department. And since 1991, White has directed the University of Texas Science & Technology Center for Synthesis, Growth, & Analysis of Electronic Materials, which is sponsored by the National Science Foundation.

White has served on the editorial boards of *Chemical Physics Letters, Surface Science, Applied Surface Science,* and *Accounts of Chemical Research.* He directed a Gordon Research Conference in 1993 and has been a trustee of the American Vacuum Society. From 1989 to 1992, White was a member of the ACS Committee on Professional Training, and he currently serves on the advisory committee for the Chemical Sciences & Technology Division of Los Alamos National Laboratory.

The award address is to be presented before the Division of Colloid & Surface Chemistry.—MITCH JACOBY

George A. Olah Award in Hydrocarbon or Petroleum Chemistry

It takes years for some people to figure out what they want to do in their life, but **FRANCISCO ZAERA** had no trouble making up his mind. "As far back as I can remember, I was curious about the way things worked," says Zaera, now a chemistry professor at the University of California, Riverside. "I always wanted to be a scientist. In fact, I never really conceived of doing anything other than science."

Thinking back to his high school years in Venezuela, Zaera says he really enjoyed mathematics but was motivated to go into chemistry because of his country's large petroleum industry. Eventually Zaera came to specialize in heterogeneous catalysis and surface science—subjects closely tied to petrochemistry.

Zaera's work for the past two decades has focused on hydrocarbon chemistry on transition-metal surfaces and in particular on the mechanisms of catalytic hydrogenation and dehydrogenation. The UC Riverside researcher has shown how small variations in relative rates of competing reactions can account for vast differences in selectivity among platinum, palladium, nickel, and other metals.

ZAERA enriches the surface chemistry field with his investigations of surface reactions and dynamics.

Zaera is credited with advancing the notion that catalytic hydrocarbon reactions occur on surfaces that are coated with carbonaceous layers—not on pristine metal surfaces. To elucidate the function of the carbon layers, Zaera devised experiments based on isotope labeling, surface vibrational spectroscopy, and molecular-beam methods. A general conclusion of that work is that carbonaceous deposits play indirect roles in hydrogenation-dehydrogenation reactions by passivating reactive surfaces and storing hydrogen.

One of the keys to success in surface reaction mechanism studies is coming up with procedures for preparing reproducible test specimens. Zaera's alkyl halide methods for preparing surfaces with films of alkyl fragments proved useful to Zaera and to other researchers who introduced his procedures in their laboratories. Through these methods, Zaera was able to show that the main conversion pathways for alkyl fragments on transition metals are β-hydride- and reductive-elimination steps. These studies, which were conducted early in Zaera's career, explained observations made in hydrogenation experiments and hydrogen-deuterium exchange processes.

More recently, Zaera showed that diiodoalkanes can undergo thermal decomposition, leading to metallocyclic reaction intermediates, and he probed differences in selectivity exhibited by various catalytic metals. As one researcher summarizes, "Zaera's determination of α-dehydrogenation on nickel versus γ-hydride elimination on platinum may very well explain the unique performance of platinum in hydrocarbon reforming."

Of Zaera's wide and varied scientific accomplishments, one expert identifies as Zaera's "most significant contribution" his development of near-edge extended X-ray absorption fine-structure spectroscopy and its application to surface species—particularly under atmospheric pressure conditions. "Extension of the technique into this pressure regime offers a new approach to study many problems in surface chemistry."

With roughly 150 publications to his credit, Zaera is well known and highly regarded by his peers. As one colleague puts it, "Zaera is a first-rate scholar who continues to enrich the field of surface chemistry with his investigations of surface reactions and dynamics." A noted surface scientist remarks that Zaera's research "consistently demonstrates the highest standards of scholarship and scientific excellence," adding that Zaera's work "opens new intellectual frontiers for others in the field."

Zaera graduated in 1979 with a combined bachelor's and master's degree (licentiate) in chemistry from Simón Bolívar University, Caracas, Venezuela. His master's degree work focused on theoretical physical chemistry and kinetics. Zaera continued his chemistry education in the U.S. and completed a Ph.D. degree in 1984, studying surface science and catalysis at the University of California, Berkeley, under the direction of chemistry professor Gabor A. Somorjai.

After completing his graduate studies, Zaera conducted postdoctoral research at Brookhaven National Laboratory. He took a position in 1987 as assistant professor of chemistry at UC Riverside and was promoted to associate professor in 1991. Zaera became professor of chemistry in 1995.

Since 1998, Zaera has served as an editor for the *Journal of Molecular Catalysis A,* a guest editor of the *Journal of Physical Chemistry,* and an associate editor for the "Encyclopedia of Chemical Physics & Physical Chemistry." Zaera was a member of *Langmuir*'s editorial board and served as treasurer for the ACS Division of Colloid & Surface Chemistry.

The award address is to be presented before the Division of Physical Chemistry.—MITCH JACOBY

Charles Lathrop Parsons Award

The name **RICHARD N. ZARE** turns up frequently on lists of ACS award winners. His cutting-edge research in laser chemistry, experimental and theoretical studies of molecular collision processes, and analytical spectroscopy is well known and well recognized. This latest award, however, recognizes his outstanding public service as an ACS member.

Marguerite Blake Wilbur Professor of Natural Science in the department of chemistry at Stanford University, Zare has long been involved with the public sector at the national level. In the 1980s, he served on the American Physical Society's Directed Energy Weapons study panel, which examined the scientific basis of the once-again-prominent Strategic Defense Initiative. As chairman of the National Academy of Sciences (NAS) panel on Basic Science & Technology Centers, he helped develop the guidelines used by the National Science Foundation in setting up and evaluating the centers. A longtime advocate of interdisciplinary studies, Zare championed the idea that individual investigator support was not the only useful modality for fostering research in chemistry and other fields of science.

Zare stepped up the pace of his public commitments in the '90s. He was a member of the NAS Government-University-Industry Research Roundtable; chaired the National Research Council's Commission on Physical Sciences, Mathematics & Applications; and served on the NAS Council. In addition, he is a fellow of the California Council on Science & Technology and served as chairman of the President's National Medal of Science Selection Committee.

ZARE is known for his chemistry research as well as his involvement with the public sector at the national level.

Zare was appointed to the National Science Board in 1992 by President George Bush and chaired it during 1996–98. NSB is NSF's governing body, but its congressional charter also gives the board a role to play, if it so chooses, in setting overall federal science and technology policy. For many years it wasn't a role NSB chose to

play. Zare, however, saw a research and development system under stress and out of balance and in need of help in setting priorities. This was a role NSB could and should undertake, Zare thought, so he went to work.

For his work, Zare received NSB's Distinguished Service Award. In presenting the award, his successor, Eamon Kelly, an economist and past president of Tulane University, described Zare's tenure as a time of "seeing an opportunity, thinking outside the envelope, knowing when it's important to be cautious and when it is time to be bold—all [qualities] required to lead the board in a period when our members saw a need to be more outspoken on issues affecting the health of our scientific enterprise."

Kelly continued: "Your generosity of spirit, wisdom, and forbearance, softened by your always ready humor, have driven us to do more and to find a way to move forward together when it would have been easier to simply agree to disagree."

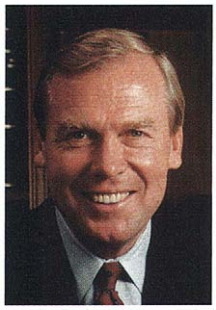
As Rita Colwell, who officially took up the duties of NSF director in August 1998, put it: "Whether you are talking about the politics of chemistry or the chemistry of politics, it's never a good idea to bet against Dick Zare—and it's always a good idea to count him as a friend and colleague."

Born 61 years ago in Cleveland, Ohio, Zare earned a B.A. degree in chemistry and physics in 1961 and a Ph.D. degree in chemical physics in 1964, both from Harvard University. After a short stint as an assistant professor of chemistry at Massachusetts Institute of Technology, Zare became an assistant professor of physics and astrophysics at the University of Colorado. In 1969, his career path took him to Columbia University as a professor of chemistry. He made his final move to Stanford in 1977. He is the author or coauthor of more than 625 papers and is the recipient of numerous awards and honorary degrees, including the National Medal of Science in 1983 and the Welch Award in Chemistry from the Welch Foundation of Houston in 1999.

The award address is to be presented on May 3 at the National Press Club in Washington, D.C.—JANICE LONG

Huntsman To Receive Petrochemical Heritage Award

NOTED ENTREPRENEUR AND PHILANthropist Jon M. Huntsman has been selected as the fifth recipient of the Petrochemical Heritage Award. The Chemical Heritage Foundation and the Founders Club established this award in 1997 to recognize outstanding contributions to the petrochemical community and to encourage emulation, inspire achievement, and promote public understanding of modern science, industries, and economies. The award will be presented at a symposium, "Innovation & Entrepreneurship," to be held on Sunday, April 1, in San Antonio, Texas, as part of the International Petrochemical Conference.



HUNTSMAN

The founder of Huntsman Corp., Huntsman built from scratch what is now an $8 billion corporation with leading positions in the chemical, plastics, and packaging industries. A director of the American Chemistry Council and founding director of the American Plastics Council, he is known for his efforts to increase public understanding and the competitiveness of the U.S. chemical industry.

Huntsman is widely recognized for his involvement in humanitarian endeavors and charitable causes, in such diverse areas as cancer research, famine relief, higher education, and care of the homeless. He has established the Huntsman Cancer Institute at the University of Utah, the Huntsman Award for Excellence in Education, and the Huntsman World Senior Games. And he has received numerous awards including the Medal of Honor of Armenia (1988), the National Caring Award (1996), and the Kavaler Award for Chief Executive Excellence (1997).

A University of Pennsylvania alumnus, Huntsman and his family recently presented the university with a $10 million gift to endow a new undergraduate program in international studies and business at Penn, which will be renamed the Huntsman Program in International Studies & Business.

Japan Prize Goes to Goodenough

JOHN B. GOODENOUGH, PROFESSOR OF engineering in the department of materials science and engineering at the University of Texas, Austin, will receive the Japan Prize for his discoveries of the materials critical to the development of lightweight rechargeable batteries. The prize is administered by the Science & Technology Foundation of Japan and honors scientists from around the world who have made original and outstanding achievements in science and technology. Honored in the category of "Science & Technology of Environment Conscious Materials," Goodenough will receive the award—which consists of a certificate of merit, a commemorative medal, and a cash award of 50 million yen or approximately $450,000—in Tokyo in April.

Goodenough's discoveries of lithium manganese oxide and lithium cobalt oxide have been critical to the development of lightweight and high-energy density rechargeable batteries that power various portable or mobile instruments. The lithium battery, which is environmentally benign, is replacing rechargeable batteries that use lead and cadmium. The increasing use of lithium batteries in hybrid and electric-powered cars should make a significant contribution to the environment by reducing the total level of carbon dioxide emissions from gasoline-powered vehicles.

Goodenough has received numerous honors for his research, including last year's Olin Palladium Award from the Electro-

chemical Society. He also is a member of the National Academy of Engineering.

Kessler Chosen for Public Welfare Medal

THE NATIONAL ACADEMY OF Sciences (NAS) has selected David A. Kessler, dean of the Yale University School of Medicine, to receive its most prestigious award, the Public Welfare Medal. Kessler served as commissioner of the Food & Drug Administration from 1990 to 1997. The academy chose Kessler for his bold leadership in controversial public health matters, such as the drug approval process and the regulation of tobacco products. Established in 1914, the Public Welfare Medal is presented annually to honor extraordinary use of science for the public good. The award will be presented in April.

PHOTO BY DAVID HANSON

KESSLER

"Kessler's visionary and practical leadership has had a profound effect on our society," said University of Chicago chemistry professor R. Stephen Berry, NAS home secretary and chair of the selection committee. "He has been a tireless fighter for improving this nation's public health."

With a background in clinical medicine, education, research, administration, and law, Kessler was tapped in 1990 by President George Bush to be FDA commissioner. He was reappointed by President Bill Clinton and served until February 1997. The most noted and widely recognized accomplishment during Kessler's tenure at FDA is the campaign he waged against the tobacco industry. He supported the identification of nicotine as the principal addictive agent in cigarettes and the claim that manufacturers were manipulating the nicotine content of tobacco products. Manufacturers denied this claim, leading Kessler to begin a comprehensive investigation into the tobacco industry. He developed irrefutable evidence from memoranda and patents, which strengthened the case for the regulation of tobacco and impaired the industry's ability to promote tobacco use in the U.S.

Kessler also focused his efforts on ways to speed up the agency's process for approving drugs. When he was appointed commissioner, FDA was under heavy criticism for the prolonged length of its drug approval process, especially for medications and combination drug therapies to treat AIDS patients. With support from Congress, Kessler implemented a program of user fees levied on drug manufacturers. This allowed FDA to hire additional researchers, dramatically reducing approval time from 33 months to 19 months without increasing the agency's budget.

Kessler graduated magna cum laude with a bachelor's degree from Amherst College in 1973. He received his J.D. from the University of Chicago Law School in 1978 and his M.D. from Harvard University Medical School a year later. Kessler then went on to receive an advanced professional certificate in business from the New York University Graduate School of Business Administration in 1986. ■