

tron, Schmidt and his students made early studies of correlations between the polarization and the emission direction of beta particles. His interest in nuclear alignment and polarization led to a productive series of experiments on angular correlations between particles and photons emitted in nuclear reactions and on the probability of projectile spin flip.

Later Fred's interests turned to accelerator mass spectrometry using the university's tandem facility. The sensitivities achieved as a result of his improvements of the transmission and stability of the accelerator enabled him and his colleagues to measure, for example, the variation of carbon-14 concentrations within a single annual tree ring and to extend their ^{14}C researches into a wide range of problems in environmental science.

In the early 1970s Fred developed a strong concern about energy issues. Largely because of what he believed to be its environmental advantages, he became a vigorous proponent of nuclear power. He spoke and wrote extensively on energy issues, including coauthoring the 1976 book *The Energy Controversy: The Fight Over Nuclear Power*.

Fred had wide-ranging interests and often found intriguing examples of physics in them, especially in his favorite sports, skiing, climbing and swimming. In addition, as his friends came to expect, he kept careful records of his exploits and could quote dates, weather conditions, altitudes and other details. He was ever eager to teach what he had learned, whether from these activities or his research. His students in first-year physics remember him on his skis in the lecture hall, illustrating angular momentum conservation.

Fred Schmidt was a vibrant, intense person with exceptionally high standards for precision in thought and deed. Withal, however, he was a warm, thoughtful human being who often would chuckle at his own foibles. For 45 years he was a forceful and enterprising member of our department. His colleagues, students and friends everywhere remember him with fondness and respect.

DAVID BODANSKY
RONALD GEBALLE
ISAAC HALPERN

University of Washington, Seattle

Constantine Neugebauer

Constantine A. Neugebauer, a physical chemist at General Electric Research and Development Center, died

at his Schenectady home on 1 February 1992, after a long illness. He was 61 years old.

Born in Dessau, Germany, Connie moved to the US in 1945 and settled in Schenectady in 1950. He received a bachelor's degree in chemistry from Union College in 1953 and was awarded a doctorate in physical chemistry from the University of Wisconsin in 1957. He then joined GE, where he worked for 34 years.

Connie is credited with inventing the direct-bond copper process, now used worldwide. He was considered an expert in superconductivity, kinetics, integrated circuit technology, and the structures and properties of thin films. He also did extensive research on large-scale memory and logic arrays for application in information and communication systems.

Connie founded and served as chairman of the thin film division of the American Vacuum Society, was American editor for the *Journal of Electrocomponent Science and Technology* and was an editorial board member of the *Journal of Solid Thin Films*. In 1976 he was named manager of the semiconductor packaging program at the GE R&D Center. He was also active on committees of a number of professional societies.

Connie was known internationally as well as personally revered by people at the GE R&D Center. He was widely recognized for his comprehensive knowledge of all aspects of semiconductor packaging and materials technology and was frequently in demand as an invited technical speaker. An extremely warm and generous person, he served as a mentor to many, both at GE and elsewhere in industry. His legacy lives on through the people he taught and inspired.

JIM BURGESS
HOMER GLASCOCK
General Electric

Schenectady, New York

Jan Popielawski

Jan Maria Popielawski, an outstanding physical chemist and director of the Institute of Physical Chemistry of the Polish Academy of Sciences, passed away suddenly on 9 February 1992. He was 52 years old.

Popielawski was educated at Warsaw University. His work covered a wide range of topics in physical chemistry, such as irreversible processes in adsorbed phases (the subject of his PhD dissertation, completed in 1966 and obtained from the Polish Academy of Sciences), electronic properties in disordered systems (a subject he

researched in 1967 during his postdoctoral stay with Stuart A. Rice at the James Franck Institute at the University of Chicago) and kinetic theory of chemical reactions in the gas phase as well as in dense media. His contributions were recognized internationally. In particular, his work in the last ten years of his life on the deviation from the Maxwellian distribution in chemical reactions under nonequilibrium constraints stimulated new developments and international collaborations. The work has potentially important repercussions for the microscopic foundations of chemical kinetics.

In addition to his research, Popielawski stimulated various scientific activities in Poland as head of the postgraduate school in the Institute of Physical Chemistry of the Polish Academy of Sciences from 1974 to 1981, through his activities in the Polish Chemical Society and by organizing domestic and international meetings on timely subjects in the broad areas of statistical mechanics and physical chemistry. Elected associate professor of chemistry in 1972 and professor of chemistry in 1986, he held various offices with the Institute of Physical Chemistry before being elected its director in April 1990, following the end of the Communist regime.

Jan was an accomplished and devoted scientist. We both remember his pragmatic and straightforward approach to research, which was already apparent during his postdoctoral year in Chicago. After a preliminary discussion he would disappear into the library for several weeks, work in isolation by trial and error, and finally come up with a personal, almost definitive solution. In his everyday relations he will be remembered as a low-key but intense person full of generosity, courtesy and care for his colleagues and his coworkers. He guided several young chemists to productive research careers. His sudden death, at the height of his capabilities and his career, is a great loss for Polish chemistry and for his numerous friends all over the world.

GREGOIRE NICOLIS
University of Brussels
STUART A. RICE
University of Chicago

Lawrence E. Nielsen

Lawrence E. Nielsen, noted for his research in polymer rheology and the mechanical behavior of polymers, died in Bend, Oregon, on 15 February 1992.

Born on a ranch in central Oregon, Nielsen received his early education

WE HEAR THAT

in the Pacific Northwest, earning a BS from Pacific University and an MS from Washington State University before he earned his PhD at Cornell University in 1945. He spent his entire professional career at Monsanto Co, first in Springfield, Massachusetts, and then in St. Louis, Missouri, from 1963 until his retirement in 1977. He became senior scientist in 1955.

The late 1940s and early 1950s were an important time in polymer science, during which the effect of crystallinity on the mechanical behavior of polymers began to be recognized. Nielsen's pioneering research during that period—some of it performed on a home-built torsion pendulum that could clearly distinguish between different types of thermodynamic transitions—provided much of the inspiration for a broader research program at Monsanto's plastics division. That program, which lasted into the 1960s, was devoted to the elucidation of relations between the physical and chemical structures of polymers and their mechanical and rheological behavior.

In addition to pursuing his own research at Monsanto, Nielsen also served as an internal consultant until his retirement. He participated in a government-sponsored Monsanto-Washington University joint research program on polymer composites as advanced materials, and he served as an affiliate professor at Washington University from 1965 to 1976.

Nielsen authored the books *Mechanical Properties of Polymers* (1962), *Mechanical Properties of Polymers and Composites* (1974) and *Predicting Properties of Mixtures* (1978).

While in Springfield, Larry began to combine his love of the out-of-doors with his professional interest in rheology. Over the years he led several expeditions to Alaska, where he studied the flow properties of glaciers. He accomplished the first ascents of several major mountain peaks, which he was then allowed to name.

Following his retirement, Nielsen and his wife, Deanne, took up tracing the trails followed by early pioneers in Oregon, and together they collaborated on the books *Pioneer Roads in Central Oregon*, *In the Ruts of Wagon Wheels* and *Roads of Yesterday*.

To the end of his life, Larry pursued his diverse interests in science and nature and shared his enthusiasm with his friends and visitors.

WILLIAM P. COX
Advanced Microdevices
Sunnyvale, California

PAUL EHRLICH
University of Massachusetts, Amherst ■

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