

Cohen Is APS Vice President for 2003

On 1 January, **Marvin Cohen** will take office as vice president of the American Physical Society, succeeding **Helen Quinn**. He will become president-elect in 2004 and president in 2005. APS's president for 2003 is **Myriam Sarachik**.

Cohen graduated from the University of California, Berkeley, in 1957 with a bachelor's degree in physics. He pursued his graduate studies at the



COHEN

University of Chicago, where he received an MS in physics in 1958 and a PhD in physics in 1964. After holding a postdoctoral position at Bell Laboratories in Murray Hill, New Jersey, Cohen returned to UC Berkeley in 1964 to become an assistant professor of physics.

He joined the Lawrence Berkeley National Laboratory science staff in 1965, and has been affiliated with UC Berkeley ever since. He currently is a University Professor there and a senior scientist in the lab's materials sciences division. Cohen's research interests include theoretical condensed matter physics, nanoscience, superconductivity, and semiconductors.

Cohen says he has been "thinking about physics every day for the last 50 years. I hope that, when working with the APS over the next four years, I can help promote the support of physics and help to increase its popularity. I believe physics is the 'central science.' I do advocate collaborative efforts with other disciplines, and I think physics can provide the rigor in these collaborations." As far as physics education goes, Cohen plans to work hard on "getting more women and underrepresented minorities involved in physics—especially at the pre-college level."

In other APS election results, also taking office on 1 January will be the new chair-elect of the APS nominating committee, **John Peoples** (Fermilab). The two new members of the APS general council are **Janet Conrad** (Columbia University) and **Laura Smoliar** (Lightwave Electronics in Mountain View, California).

IN BRIEF

At its inaugural American Conference on Neutron Scattering held in Knoxville, Tennessee, in June, the Neutron Scattering Society of America announced the establishment of the Clifford G. Shull Prize in Neutron Science, which carries a purse of \$5000. Shull, who died in March 2001 (see PHYSICS TODAY, October 2001, page 86), shared the 1994 Nobel Prize in Physics with Bertram Brockhouse. Beginning in 2004, the NSSA will award the prize every two years to an individual who has made outstanding contributions to neutron science.

During a ceremony last month in Leiden, the Netherlands, the Royal Netherlands Academy of Arts and Sciences awarded the Lorentz Medal to **Frank Wilczek**, Herman Feshbach Professor of Physics at MIT and editor-in-chief of *Annals of Physics*. He was honored for his "pioneering work in particle physics, including his research on particles that can only move in a two-dimensional plane, as well as his involvement in the discovery of the phenomenon known as 'asymptotic freedom.'"

In August, Pennsylvania State University added three individuals to its physics faculty. **Bernd Brügmann**, formerly a research staff

member at the Max Planck Institute for Gravitational Physics in Potsdam, Germany, is now an associate professor of physics in the Center for Gravitational Physics and Geometry. **Doug Cowen** is an associate professor of physics and of astronomy and astrophysics. He previously was an assistant professor of physics at the University of Pennsylvania. Also joining the department as an assistant professor of physics is **Benjamin J. Owen**, formerly a research associate in the Center for Gravitation and Cosmology at the University of Wisconsin-Milwaukee.

At a ceremony last April in Washington, DC, the government of France awarded **Harold P. Smith Jr** the rank of Commander in the Legion of Honor. Smith, Distinguished Visiting Scholar and professor in the Richard & Rhoda Goldman School of Public Policy at the University of California, Berkeley, was recognized for his work while serving as the assistant to the secretary of defense (nuclear, chemical, and biological defense programs) in the Clinton administration from 1993 to 1998.

Kirsten Tollefson has joined the physics faculty of Michigan State University as an assistant professor of experimental high-energy physics. She previously was a research associate at the University of Rochester.

OBITUARIES

Sheldon Datz

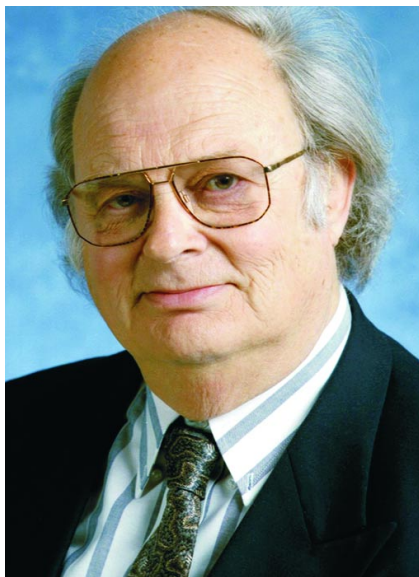
Sheldon Datz, who helped introduce a new field of research, molecular-beam studies of chemical dynamics, died on 15 August 2001 in Oak Ridge, Tennessee, of pneumonia brought on by progressive pulmonary fibrosis.

Sheldon was born in New York City on 21 July 1927. His brilliant career may have been foretold when, at the age of 16, as a student at the city's Stuyvesant High School, he was involved in research alongside Ellison Taylor at Columbia University's Synthetic Alloy Materials Laboratory. There, he and Taylor investigated the properties of "tube alloy," a code name for uranium. At the time, Sheldon was unaware that he was working with uranium. The study later became part of the Manhattan Project.

At age 17, Sheldon joined the US Navy and saw combat in the South Pacific. After World War II ended, while still in the navy, he witnessed

nuclear testing in the Bikini Atoll. He then began his studies in chemistry at Columbia, receiving his BS in 1950. Ten years later, he earned his PhD in chemistry from the University of Tennessee at Knoxville. His thesis, entitled "Molecular Association in Alkali Halide Vapors," was prepared under the guidance of Richard D. Present.

In 1951, Sheldon joined the chemistry division of the Atomic Energy Commission's Oak Ridge National Laboratory as a research chemist, and again had an opportunity to work with Taylor, who joined ORNL that same year. Sheldon undertook the first of his more than 300 refereed publications in 1955, when he and Taylor wrote an article on chemical reaction mechanisms using molecular beams. The first demonstration of this technique was acknowledged by the 1986 Nobel Prize in Chemistry to Dudley R. Herschbach, Yuan T. Lee, and John C. Polanyi. A year after this initial semi-



SHELDON DATZ

nal work, a seemingly modest pair of experimental technique papers written by Sheldon and Taylor were published in the *Journal of Chemical Physics*. Those papers described the first quantitative study of surface ionization detection, a method that was originally used by I. I. Rabi and his students in atomic and molecular beam research. The method remains the mother lode for an entire industry of beam studies carried out to this day. Further development of the technique led to Sheldon's inventing the differential surface ionization detector that allowed him to identify chemical reaction products.

In 1962–63, Sheldon, on a Fulbright fellowship, worked at the Institute for Atomic and Molecular Physics in Amsterdam. In 1964, he and a colleague discovered that a low-velocity argon ion would scatter from a single copper atom residing on a solid surface. Laboratories worldwide later adapted this technique to analyze the elemental composition and structure of surfaces. During his stay in Amsterdam, Sheldon became interested in ion channeling, in which an ion could be directed to pass cleanly through a crystal so that the researcher could measure the change in the ion's energy and trajectory to reveal the crystal's electronic and structural characteristics.

In 1965, Sheldon became an assistant director of ORNL's chemistry division, a position he held until 1974. He and his ORNL colleagues demonstrated in 1965 that an atomic ion traveling in the interstitial regions of a crystal, between rows and planes of crystal atoms, undergoes much less



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energy loss than if the ion had entered the crystal in a random direction. Further development of this ion channeling technique led to the discovery of resonant coherent excitation for multicharged ions with one and two electrons. In this process, an incoming channeled ion is quickly elevated to an excited state when a harmonic of the ion's perturbation frequency, given by the ion velocity and the spacing of atoms in the crystal, matches the frequency for electronic excitation. Excited ions thus produced are rapidly ionized inside the crystal. One could study the coherent excitation processes inside a crystal by studying the ions' charge state fraction versus the ions' velocity.

From 1976 to 1981, Sheldon led the atomic and molecular collisions group and heterogeneous catalysis group in the chemistry division. From 1979 to 1991, Sheldon and collaborators from Stanford University and Lawrence Livermore National Laboratory explored a related but different periodic perturbation effect. They channeled high-velocity electrons and positrons through a crystal to produce channeling radiation—that is, the release of strong, forward-directed x-ray radiation.

In the late 1970s, Sheldon and his ORNL coworkers first measured the dielectronic recombination for ions by merging a multiply-charged ion beam with an electron beam. This method provided cross sections that were needed for modeling energy-loss processes in hydrogen fusion-oriented plasmas. In 1981, Sheldon was named head of the atomic physics group of ORNL's physics division.

His continued innovations led him, along with coworkers, to conduct experiments using heavy-ion beams at CERN during the early 1990s. The interaction of these ultrarelativistic energy ions in gold foils illuminated, at extraordinary high-collision energy, atomic physics aspects such as ion charge state change and electron-positron pair production. The experimental measurements of the cross sections for charge capture and loss in high- Z collision systems provided the first test of existing theoretical calculations. Because a large capture cross section could lead to reduced storage lifetimes in colliders, it became important to establish design parameters of CERN's Large Hadron Collider and also of Brookhaven National Laboratory's Relativistic Heavy Ion Collider, which, at that time, was under construction.

More recently, while heavy-ion

storage rings, such as the CRYRING in Stockholm, Sweden, were being built in Europe, Sheldon realized an idea. In those rings, a molecular ion beam is merged with a beam of electrons so that the collision of the electrons with the ions removes energy from the ions. The result is that each ion's random motion is reduced (that is, cooled). This technique allows the study of collisions at very low energies that earlier had not been possible. Sheldon and his collaborators used this method to study dissociative recombination at near-zero collision energy. The use of heavy-ion storage rings has contributed greatly to an improved understanding of processes in low-temperature plasmas, astrochemistry, and aeronomy.

For his work, Sheldon received numerous honors. In 2000, he received the Enrico Fermi Award, the highest award given by the US Department of Energy, with cowinners Sidney Drell and Herbert York. In 1998, he received the American Physical Society's Davisson-Germer Prize in Atomic Physics. Sheldon also was a fellow of the American Association for the Advancement of Science.

Those of us who worry how the loss of this giant scientist will affect the progress of collision physics should recall a saying of Sheldon's. When explaining an approach to a solution he had obviously conceptualized thoroughly but was still mulling over the details, he would say, with gestures for emphasis, "Not to worry." That will be difficult for many of us to do.

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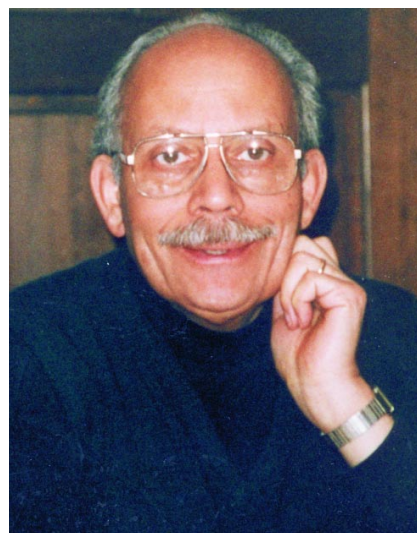
BEN BEDERSON

*New York University
New York City*

Harold Ralph Lewis

Harold Ralph Lewis, an emeritus professor of physics at Dartmouth College, died at his home in Hanover, New Hampshire, on 25 March 2002, following a courageous battle with multiple myeloma.

Ralph was born on 7 June 1931 in Chicago, Illinois. He received AB and SB degrees in physics from the University of Chicago. He earned his MS (1955) and PhD (1958) degrees, both in physics, from the University of Illinois. His doctoral research, "A Method for Measuring Magnetic Fields in Super-



HAROLD RALPH LEWIS

conductors," was carried out under the direction of Hans Frauenfelder. Ralph was reportedly an outstanding and cooperative student, with a knowledge and skill in theoretical physics that were remarkable for an experimentalist. Much of his later work was in theoretical physics. He was a postdoctoral research associate at the University of Heidelberg in Germany from 1958 to 1960 and an instructor in the physics department at Princeton University from 1960 to 1963.

In 1963, Ralph became a staff scientist on Project Sherwood (later to become the controlled thermonuclear division) at Los Alamos National Laboratory, where he remained for 28 years. He spent those years working primarily on the controlled thermonuclear fusion project. During part of that time, he served as deputy group leader and associate group leader of the magnetic fusion theory group and earned distinction as an LANL fellow. He was equally adept in analytical and numerical methods. He focused much of his effort on the application of computers to plasma physics, an area in which he made numerous contributions. He developed Hamiltonian methods and applied them to models, such as the Vlasov fluid model, for treating plasma equilibrium and stability, and to a method of solving linear equations with time-dependent coefficients.

During the academic year 1975–76, Ralph took leave from LANL to accept a visiting professorship offer at the University of Wisconsin–Madison. There, he suggested a research topic for, and participated in the advising of, a graduate student, James Schwarzmeier. The thesis involved the simulation of Bernstein-