

in metals and of the quantum mechanics of dissipative systems."

## ICTP PRESENTS DIRAC MEDALS

The International Centre for Theoretical Physics in Trieste, Italy, presented the three 1993 Dirac Medals on 8 August. The winners were **Sergio Ferraro**, a member of the senior research staff at CERN and a professor of physics at the University of California, Los Angeles, **Daniel Z. Freedman**, professor of applied mathematics at MIT, and **Peter van Nieuwenhuizen**, Leading Professor of Physics at the Institute for Theoretical Physics of the State University of New York, Stony Brook.

The three were honored for "their discovery of supergravity theory in 1976 and their major contributions in the subsequent developments of the theory." The citation continues, "Their discovery led to an explosion of interest in quantum gravity, and it transformed the subject, playing a significant role in very important developments in string theory as well as Kaluza-Klein theory. Currently any grand unified theory incorporating gravity is based on a supergravity theory coupled to matter in four dimensions, which naturally emerge from the compactifications of the ten-dimensional heterotic string."

## MACARTHUR WINNERS NAMED

Of the 31 individuals who received MacArthur Fellowships, ranging from \$160 000 to \$375 000 over five years, six work in physics or physics-related areas. **Demetrios Christodoulou**, professor of mathematics at Princeton University, works at the boundary between physics and mathematics. The MacArthur announcement stated that "his work is characterized by rigorous mathematical analysis combined with geometric and physics intuition. His approach places him in a unique position to achieve important results in the field of general relativity." **Maria Luisa Crawford**, the William R. Kenan Jr Professor of Geology at Bryn Mawr College in Pennsylvania, was cited by the foundation for "work that involves the reconstruction of past geologic processes in order to study their effect on the Earth's crust and to better understand the Earth's resources." Another recipient of MacArthur largesse is **Stephen Lee**, pro-

fessor of chemistry at the University of Michigan. The citation says that "his research combines theoretical and experimental approaches to solid-state chemistry and electronic structure theory. He... is currently researching such areas as covalent bonds, topology effects on metal-insulator transitions and synthesis of various new materials." **Amory Bloch Lovins**, director of research for the Rocky Mountain Institute in Aspen, Colorado, was given the award for work "to reshape the energy policy of the US and other nations by advancing strategies that focus on nonpolluting and economically competitive sources of energy."

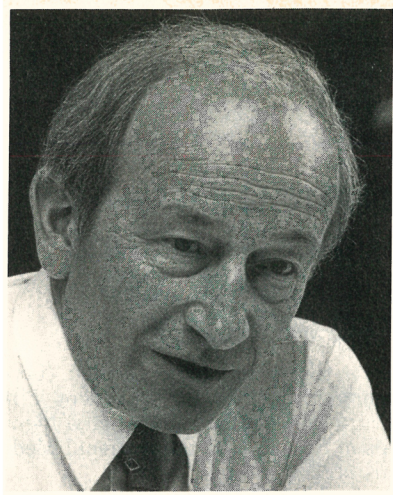
**Frank von Hippel**, professor of public and international affairs at Princeton University, "has made contributions to the study of proliferation-resistant nuclear fuel cycles, cooperative approaches to nuclear disarmament, nuclear test bans and warhead dismantlement, and improvements in automobile efficiency." In September von Hippel was appointed assistant director for national security in the President's Office of Science and Technology Policy. The MacArthur Foundation cited **Robert Williams**, senior research physicist at Princeton University's Center for Energy and Environmental Studies, for work that has "caused energy analysts and policymakers in the US and elsewhere to address the possibilities for decoupling energy consumption and economic growth. Over two decades he has documented the possibilities for cost-effective, environment-sparing, prosperity-enhancing energy futures in industrialized and developing countries based on efficiency improvements and innovative energy supply technologies."

## OBITUARIES

### Solomon J. Buchsbaum

Solomon J. Buchsbaum, who died of complications from multiple myeloma on 8 March 1993, was one of the true statesmen of science—and of technology—in his generation. Known as Sol throughout the US science and technology community, he served his science, his company and his nation in exemplary fashion, and he will be much missed.

Sol was at heart a fighter; he no more gave in to his illness in recent years than he had as a youth to seemingly hopeless situations during World War II. In 1941, two years after the Nazi invasion of Poland,



Solomon J. Buchsbaum

Sol's father, Jacob, together with other businessmen of his home city Stryj, was "removed" and never heard from again. Two years later, just before Sol's 13th birthday, the remaining Jewish residents were assembled for transfer to one of the concentration camps, but in the confusion, Sol's mother persuaded him and his older sister to try to escape; she and his younger sister were killed by the Nazis.

Having reached Warsaw by "jumping" freight trains, Sol managed, because he was blond, to obtain false papers, a Christian name and the opportunity to work in a Christian home. But when his employers discovered that he was Jewish, they turned him out into the streets. He found refuge in a Catholic orphanage, where he eventually was promoted to altar boy! Sol never wanted to talk about these war years, saying simply, "I read, I learned Latin and I survived."

After the war, Sol immigrated to Canada, just two weeks before his 18th birthday, which would have ended his eligibility for the program that sponsored his move. Without prior formal education, he taught himself English and obtained his high school equivalency diploma as well as a scholarship from McGill University—all within a year—while supporting himself by working in a hat factory. After completing his undergraduate study in physics, he remained at McGill one more year to earn a master's degree.

With a scholarship from MIT, Sol then moved to the US, where he became interested in plasma physics and worked with Sandy C. Brown on Project Sherwood—one of the earliest plasma fusion experiments. Interested in the physics of plasma interactions with microwave fields, they