

IN BRIEF

Richard Webb is leaving the IBM T. J. Watson Research Center in Yorktown Heights, New York, to become the Alford S. Ward Chaired Professor of Semiconductor Physics at the University of Maryland and a member of the university's Center for Superconductivity Research.

In October **James Stith** moved from the physics department at the US Military Academy in West Point, New York, to the physics education group in the department of physics at Ohio State University, Columbus. Stith will work with Kenneth G. Wilson on two programs, Project Discovery and Physics by Inquiry.

Lawrence Krauss is now the Ambrose Swasey Professor of Physics and chair of the physics department at Case Western Reserve University. Until last July Krauss was an associate professor in the departments of physics and astronomy at Yale University.

C. Grant Wilson has been named the Rashid Professor of Chemical Engineering and the Collie Welsh Fellow of Chemistry and Biochemistry at the University of Texas, Austin. Wilson formerly worked at the IBM Almaden Research Center in San Jose, California.

The Packard Foundation has announced the names of 20 young scientists and engineers who will receive five-year fellowships worth \$500 000 apiece. The winners include **Raymond Ashoori**, assistant professor of physics at MIT, who has measured the change in electrical charge resulting from the addition of individual electrons to a single quantum dot; **John Badding**, assistant professor of chemistry at Pennsylvania State University, who studies the changes that occur in elements under high pressure; **Jean M. Carlson**, assistant professor of physics at the University of California, Santa Barbara, who is developing a new approach to understanding self-organized criticality and applying it to a range of phenomena; **Bradley F. Chmelka**, assistant professor of chemical and nuclear engineering at the University of California, Santa Barbara, whose research concerns the fabrication and behavior on a molecular level of synthetic materials used in new optical devices and semiconductors; **Norbert F. Scherer**, assistant professor of chemistry at the

University of Pennsylvania, who has elucidated several fundamental chemical and materials problems; **Tycho Sleator**, assistant professor of physics at New York University, who works in atom optics; **Herman L. Verlinde**, assistant professor of physics at Princeton University, who applies sophisticated mathematical techniques to problems of quantum gravity; and **Alan E. Willner**, assistant professor of electrical engineering at the University of Southern California, who is conducting research in optical fiber communications.

Priscilla W. Laws of Dickinson College and **Ronald K. Thorton** of Tufts University have jointly won a \$50 000 Charles A. Dana Award for Pioneering Achievement in Education for "developing an innovative approach to teaching the fundamentals of physics." Their program, called Workshop Physics, "engage[s] students in discovery, abandoning the traditional lecture and laboratory-based approach to physics instruction."

Arthur Ashkin and **Joseph M. Dziedzic**, both retired from AT&T Bell Labs in Holmdel, New Jersey, were awarded the Rank Prize at the Royal Society of Medicine in London on 30 November for creating "optical tweezers . . . which use focused laser light to trap and manipulate virus particles, living cells and other biological entities whilst allowing them to maintain viability."

The 1993 Mishima Award of the American Nuclear Society was given to **K. Linga Murty**, a professor in the departments of nuclear engineering and of materials science and engineering at North Carolina State University. He was cited for his outstanding contributions to the understanding of zirconium, titanium and magnesium and their alloys, the prediction of in-reactor cladding performance, and the understanding of radiation effects on alloys and of radiation-induced defects and impurities.

Fernando Flores won the first Iberdrola Science and Technology Prize, which is given by the Iberdrola Electric Power Utility, Spain, to acknowledge the achievements of Spanish researchers. Flores, a professor at the Madrid Autonomous University and director of the Nicolás Cabrera Institute of Material Science, was cited for contributions to "semiconductor interfaces, tunnel microscopy, surface states, liquid metals and the interaction between charges and solids."

The Nuclear and Plasma Sciences Society of the Institute of Electrical and Electronics Engineers has awarded its 1993 Merit Award to **Akira Hirose** for "pioneering contributions to the understanding of linear waves, instabilities and turbulent heating in plasmas and confinement studies of tokamaks." Hirose is a professor in the department of physics and engineering physics at the University of Saskatchewan in Canada.

OBITUARIES

Bernard T. Feld

Bernard T. Feld, emeritus professor of physics at MIT, died on 19 February 1993, after a few weeks of acute illness, in the city of Brooklyn, not far from where he was born. His entire career is entwined both in symbol and in substance with this half-century's fateful choice between catastrophic war and uneasy peace.

With an undergraduate degree in physics from the City College of New York, Bernie had all the talent and ambition (but none of the money) to enter graduate study at Columbia. The versatile, city-wise student came there to earn his way in part by assisting a brand-new physics professor who had arrived in New York only three weeks or so earlier. The new man was Enrico Fermi, fresh from Rome via the Nobel awards ceremony at Stockholm; the new year was 1939, with a world war in the offing; the new challenge was the fission of uranium, recognized worldwide in mid-January to imply an inordinate release of energy.

To no physicist was the discovery



Bernard T. Feld

more vivid than to Leo Szilard and Fermi, old friends in Europe, now partners and to a degree rivals around Columbia. Graduate student Feld walked step by step along the long path to the bomb. He was one of the very few who shared in those key early experiments on fission. When in 1942 the mushrooming project came under Army direction, he moved with Fermi and Szilard to Chicago, where he was one among the 40-odd people who helped to build and watched succeed the first of all neutron chain reactions. He worked there and at Oak Ridge, and as the war neared its end, he went on to Los Alamos to help wire the test bomb itself, that night when the desert sun would rise twice.

Feld came to MIT after finishing his Columbia PhD, begun before the war under Willis Lamb. It was not at all on fission, but on nuclear magnetic resonance in the presence of a nuclear quadrupole moment. Both experimenter and theorist, Feld extended his interests, first to neutron physics, then to particle physics, always staying close to the experimenters at the MIT Laboratory of Nuclear Studies (where he served for five years as director) until his retirement. His admirable text on early models of the elementary particles and their interaction (*Models of Elementary Particles*, Blaisdell, 1969) and his editing of the collected scientific papers of Szilard (*The Collected Works of Leo Szilard: Scientific Papers*, MIT Press, 1972) remain clear and direct, as was everything he did. He always was a prized teacher, with a flair for reducing complications to essential simplicity.

But all that is only his academic shadow. What quiet, steady Feld shared with quicksilver Szilard, who was for decades his friend and mentor, was an enduring and passionate sense of responsibility for ending the nuclear threat. His informed work and his wry opinions, both blunt and sharp, are found everywhere in that worldwide effort. The organizations he worked for (and often led) began in postwar Washington even before the founding of the Federation of Atomic Scientists. He served as first president of the Council for a Livable World, founded by Szilard in the late 1950s. Feld took part in almost every one of the international Pugwash Conferences, across the continents. For a few years he was on leave from MIT as executive head of Pugwash in London. The reference shelves hold many conference volumes he organized and edited on the technical and political issues of four

decades. His signature and his clarifying work appear in a myriad of documents. For some years during the 1980s he was editor of the *Bulletin of the Atomic Scientists*. The list is long; the lifelong statement is crystalline.

There were bad years, too, some of the trouble a sign of seriously failing health in the last decade. He published a volume bleakly entitled "A Voice Crying in the Wilderness" (Pergamon Press, 1979). But it is satisfying to report that in many conversations over the few years since *glasnost* came, Bernie welcomed as surprising but genuine the many signs that catastrophe is receding in the face of worldwide opposition to the waging of nuclear war.

There is one memorial Bernie Feld would most welcome: the determination of his colleagues—all of us—to ensure that the faint rosy glow where once nuclear darkness ruled the horizon is not another false dawn, like the first sunrise at Trinity long ago.

PHILIP MORRISON

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Bernard Peters

Bernard Peters, for more than four decades a world leader in probing cosmic rays, died at the age of 82 on 2 February 1993 in Copenhagen. Born in Posen (now Poznan in Poland), he grew up in academic circles in Germany between the wars. His bold early anti-Nazi activity as an engineering student in Munich brought him briefly to Dachau, but he soon found his way to the US, in 1934. A few years later, while a dockworker in San Francisco, he met Robert Oppenheimer through mutual friends, and soon he became one among Oppie's students. Peters took a PhD at Berkeley in 1942, then spent the war years working on the magnetic separation of ^{235}U .

Off to the University of Rochester at war's end, Peters formed a high-flying collaboration with another young group from the University of Minnesota. In 1948 they flew a package up to the last few grams/cm² of the air in a balloon. The package contained both a small cloud chamber for the Minnesotans and a large stack of photographic plates for Peters and Helmut Bradt, a colleague from Rochester who died, sadly, in 1950. The abundant heavy tracks confirmed for the first time that incoming cosmic rays are a mix of nuclei—starstuff like ourselves, somewhere and somehow smoothly accelerated to relativistic

energies, but not a primordial mystery of creation.

Soon the McCarthyite cold war chilled American campuses. Peters, although in no danger of a second concentration camp, nevertheless had real troubles to avoid and the high geomagnetic field at the equator still to exploit. Was there any antimatter in those cosmic rays? He was welcomed by Homi Bhabha to the Tata Institute of Fundamental Research in Bombay. There they promptly set a limit on antimatter, less than one antiproton among 1000. Soon Peters conceived another interest in the cosmic beam: It left radioactive tracers everywhere. Once you could ferret out a few dozen specific atoms from tons of meltwater you could study the mutual history of the rays and of the Earth.

Peters stayed in Bombay for eight busy years, happily engaged in such novel tasks as learning chemistry and a little Tamil, processing unprecedentedly large sheets of unbacked photographic emulsion, searching out downed balloons among suspicious, unlettered villagers and hauling heavy ion-exchange columns on horseback high into the Kashmir snows. The TIFR graduate students became devoted to this professor who worked harder than they did, would try out anything he could understand, earnestly explained everything he knew and through it all kept a helpful eye on them as his warm friends. His style is honored today in more than one successful Indian lab.

Peters left the tropics in 1958 to work at the Bohr Institute in Copenhagen. As Peters could improvise in the rickety Indian infrastructure, so he would innovate in the high-technology European context. If a gas at high pressure was a standard but cumbersome medium for Cherenkov detectors aloft, Peters had a better idea: Why not an artificial "gas," submicron hollow spheres of silica, custom-pressed to the density and refractive index of choice?

After a few years at the Bohr Institute Peters became director of the new Danish Space Research Institute, where his ingenuity and leadership informed many a productive space payload, even for the much larger agency, NASA. He retired in 1979, still able to challenge the experts with good new ideas about cosmic-ray origins. His personal glow as a cosmopolitan "teacher supreme," both through his pungent precepts and his reasoned if stubborn example, warms and illumines many who follow his path, fascinated as he was