Larry Lake, holder of the W. A. (Tex) Moncrief Centennial Endowed Chair and the chairman of the department of petroleum and geosystems engineering at the University of Texas at Austin.

Margaret A. LeMone, a senior scientist in the mesoscale–microscale meteorology division of the National Center for Atmospheric Research in Boulder, Colorado.

Robert E. McIntosh, a professor of electrical and computer engineering at the University of Massachusetts at Amherst.

Parviz Moin, a professor in the department of mechanical engineering at Stanford University.

Julio Ottino, a professor and chairperson of the department of chemical engineering at Northwestern University.

R. Fabian Pease, a professor of electrical engineering at Stanford University.

Isaac Sanchez, the Cullen Trust Professor of Engineering in the chemical engineering department at the University of Texas at Austin.

Donald R. Scifres, the founder, president and chief executive officer of SDL Inc (formerly Spectra Diode Laboratories) in San Jose, California.

Matthew Tirrell, a professor and head of the department of chemical engineering and materials science at the University of Minnesota.

Theodore Van Duzer, a professor in the graduate school of the department of electrical engineering and computer science at the University of California, Berkeley.

The new foreign associates include **Hans G. Hornung**, the C. L. "Kelly" Johnson Professor of Aeronautics and director of the graduate aeronautical labs at Caltech.

Herbert Kroemer, a professor in the departments of electrical engineering and of materials at the University of California, Santa Barbara.

IN BRIEF

In January, the Woods Hole Oceanographic Institution honored one of its own: **William J. Jenkins**, a senior scientist in Woods Hole's marine chemistry and geochemistry department, was selected to receive the institution's Henry Bryant Bigelow Award in Oceanography, which honors oceanographers around the world. Jenkins was cited, in part, for his "outstanding contributions to the development of the tritium–helium dating technique and its application to problems in ocean physics, biology and geochemistry."

The 1997 Holweck medal and prize has been awarded to **Jean-Pierre Briand**, a professor at the Pierre and Marie Curie University (University of Paris VI) for his work on high-resolution x-ray spectroscopy. This award is given in odd-numbered years by the UK's Institute of Physics to a physicist from France; in even-numbered years, it is given by the French Physical Society to a physicist from the UK.

The 1997 Max Born medal and prize has been given to **Robin Marshall**, a professor of experimental physics at the University of Manchester, for his "outstanding contributions to particle physics, particularly in work concerned with the electroweak interaction." The German Physical Society gives this award to a British physicist in odd-numbered years, and the UK's Institute of Physics gives it to a German physicist in even-numbered years.

At the Pittcon 1997 meeting in Atlanta last month, the Spectroscopy Society presented its 1997 Maurice F. Hasler Award, sponsored by Fisons Instruments, to **Alan G. Marshall**. The citation notes, in part, that Marshall "has developed and nurtured the important technique of Fourier Transform Ion Cyclotron Resonance Mass Spectrometry." Marshall is a professor of chemistry at Florida State University and director of the ion cyclotron resonance program at the National High Magnetic Field Laboratory in Tallahassee.

Quantum Design in San Diego, California, has added four physicists to its product development team in the last year or two. Each one came directly from his degree programs. They are: **Randall Black**, who earned a PhD from the University of Maryland at College Park in 1995; **Jost Diederichs**, who earned a doctorate at Washington University in 1996; **Stefano Spagna**, who got his PhD from the University of California, San Diego, in 1995; and **Kurt Jensen**, who completed his master's degree at Iowa State University in 1995.

OBITUARIES

Charles Palmer Bean

Charles Palmer Bean, an influential solid-state physicist with a unique understanding of science, died of a heart attack on 30 September 1996 while on a business trip to Washington, DC. In his distinguished career, he made seminal contributions to magnetism, superconductivity and biophysics, in addition to helping many colleagues mature into world renown.

Born in Buffalo, New York, in 1923, Charlie graduated from the University of Buffalo in 1947 with a BA in physics and received an MS and a PhD in physics from what is now the University of Illinois at Urbana-Champaign in 1949 and 1952, respectively. His first job was at the General Electric Research Laboratory in Schenectady, New York, and he stayed there until 1986, when he took early retirement and became an institute professor in the school of science at Rensselaer Polytechnic Institute. He became professor emeritus in 1993, when he "retired" for the second time.

Charlie had a major influence on the development of the GE lab in the late 1950s and early 1960s, at a time when industrial laboratories still engaged vigorously in basic research. He was one of the main reasons the laboratory became so prominent in the world, not only because of the excellence of his research, but also because he was a constant source of unbounded enthusiasm, inspiration and construc-

CHARLES PALMER BEAN

tive criticism. What he liked best was to work with other people, to prod and challenge his colleagues to do their very best. At that time, during a visit to Schenectady, Nevill Mott was asked to give his impression of the GE lab: "I am surprised," he replied, "that a second-rate place can do so much first-rate work!"

Charlie's research in magnetism started in 1951. His many pioneering contributions to this field included work on exchange anisotropy, rotational hysteresis, fine particle magnets, AC losses in transformer steel, nucleation of magnetic domains and the phenomenon of superparamagnetism (a term he coined). When ferromagnetic particles are sufficiently

fine, the direction of magnetization is influenced by thermal fluctuation, and the resulting superparamagnetic behavior is of importance in several technical and scientific fields, including magnetic recording and magnetotactic bacteria.

In the early 1960s, Charlie became interested in superconductivity. He developed the relationship between the magnetization and current-carrying properties of type II superconductors, now widely know as the Bean model. This model describes the spatial variation of the magnetic field and current within these important technological materials. It was first applied to metallic superconductors and found a second life when high-temperature ceramic superconductors were developed in the late 1980s. At a recent conference a young scientist asked Charlie if he was related to the person who had developed the Bean model. Without missing a beat, Charlie joked: "Yes, he was my father!" because it had been so long ago.

In the 1970s, Charlie's interests turned to biophysics. He became interested in membranes and, taking advantage of Nuclepore membranes developed at GE, wrote a seminal paper on the theory of porous membranes. Experimentally, he used the membranes, but now with only one pore, as a virus counter, a variation of the well-known Coulter counter. He later turned to electrophoresis and contributed to the understanding of how DNA snakes through a gel under both AC and DC electric fields. He spent some summers at Woods Hole Marine Biological Laboratory, where he became interested in and made contributions to the study of the swimming of sea urchin sperm and the behavior of magnetotactic bacteria.

When Charlie went to Rensselaer in 1986, he became intrigued by undergraduate teaching. A particularly popular course of his was one he called Light and Color in the Open Air. Because of his deep understanding of science, he had the ability to explain complex phenomena in a simple language, always encouraging and challenging the listeners. He also loved to do research with undergraduates in the laboratory, carrying out simple but very elegant and instructive experiments.

In my own career, which would not have been the same without Charlie as a good friend, I have had the opportunity to meet and interact with many world-famous scientists. I can truly say that Charles P. Bean measured up to the very best.

Ivar Giaever
Rensselaer Polytechnic Institute
Troy, New York

Gottfried Karl Wehner

Gottfried Karl Wehner, a professor emeritus of electrical engineering at the University of Minnesota, died on 13 June 1996 in Munich, Germany. Wehner was known as a pioneer of research in sputtering.

He was born on 23 September 1910 in Dresden, Germany, and studied physics at the Technische Hochschule, now the Technical University of Munich, where he received his PhD in 1939. He worked at the Institute of Electron Physics in Munich throughout World War II.

In 1947, Wehner moved to the US to work at Wright-Patterson Air Force Base near Dayton, Ohio. From 1955 until his return to Germany in 1991, he worked in Minneapolis, first at General Mills, then as a director of the applied science division of Litton Industries starting in 1963 and then, after 1968, as a professor in the department of electrical engineering of the University of Minnesota.

Wehner's interest in sputtering dates back to 1937, but his many contributions stem from the 1950s and 1960s. Recognizing the need for controlled measurements by modern techniques of vacuum physics, he and his colleagues performed systematic measurements of erosion rates for numerous materials. Those measurements still form the prime basis for thin film deposition and other applications of sputtering. Wehner set research standards that reached far beyond the experimental study of sputter processes. For example, he took meticulous care in reporting experimental data. The relevant quantity is the number of sputtered atoms per incident ion; Wehner measured the former, but had only an approximate measure of the latter, and noted that shortcoming in every curve that he published for many years.

In 1955, he reported the observation of what are now known as Wehner spots (or "Venus spots" when translated back from the Russian, as he loved to tell his friends). Wehner spots are observed when a single crystal is inserted as a cathode in a gas discharge. Wehner's observations of a strong directionality in sputter emission led him to conclude that sputtering was the result of a sequence of atomic collisions. (Until then, evaporation models played a major role, and they still do, but nobody has questioned the fundamental significance of his observation.)

Exposing a single crystal to particle bombardment was a major step forward that required courage. Metal crystals were rare and expensive, and