um extraction for the Manhattan Project. In 1951 Seaborg and Edwin M. McMillan received the Nobel Prize in Chemistry for their studies of the chemistry of the transuranium elements.

As a member of the President's Science Advisory Committee (1959–61) Seaborg prepared a report, "Scientific Progress, the Universities, and the Federal Government," that called for an "integrated" approach to basic research and graduate education. Seaborg was chairman of the Atomic Energy Commission from 1961 until 1971, and he played an important role in negotiations on the Limited Test Ban Treaty of 1963 and the Nonproliferation Treaty of 1969. He returned to Berkeley in 1971 as University Professor in the chemistry department; he also serves as chairman of the Lawrence Hall of Science. He has written *Kennedy, Khrushchev and the Test Ban* (U. of Calif. P., 1981) and *Stemming the Tide: Arms Control in the Johnson Years* (Lexington Books, 1987).

Glenn T. Seaborg

HEWLETT–PACKARD PRIZE TO BEDNORZ AND MÜLLER

J. Georg Bednorz and K. Alex Müller (both of the IBM Zurich Research Laboratory) received the 1988 Hewlett–Packard Europhysics Prize at a conference held in Budapest in April. Given for their discovery of high-T_c superconductivity, the prize consists of 20 000 Swiss francs, donated by Hewlett–Packard.

In the spring of 1986 Bednorz and Müller discovered superconductivity at temperatures above 30 K in a mixed-phase oxide of lanthanum, barium and copper. They received the 1987 Nobel Prize in Physics for their work. (See PHYSICS TODAY, December 1987, page 17.) Bednorz has been at IBM since receiving his doctorate from the Eidgenossiche Technische Hochschule (Zurich) in 1982; he became an IBM Fellow in the fall of 1987. Müller received his doctorate from ETH in 1958, and was a project manager at the Batelle Institute in Geneva from 1959 to 1963. He was appointed a lecturer at the University of Zurich in 1962, and was named Titular Professor in 1970 and a full professor in 1987. Müller has been a staff member at IBM since 1963; he managed the lab's physics department from 1972 to 1985 and became an IBM Fellow in 1982.

IN BRIEF

Geoffrey P. Summers, a research physicist at the Naval Research Laboratory, has been appointed chairman of the physics department at the University of Maryland in Baltimore.

William J. Skocpol, formerly a member of the technical staff at AT&T Bell Labs (Holmdel, New Jersey), has become a professor of physics at Boston University.

Steven M. Girvin, formerly a staff research physicist at the National Bureau of Standards, and **Allan H. MacDonald,** formerly a staff research physicist with the National Research Council of Canada in Ottawa, have become professors of physics at Indiana University, Bloomington. **David Baxter** has become an assistant professor in the same department, and **John Carini** will become an assistant professor there in fall 1988.

OBITUARIES

Arthur Henry Benade

Arthur H. Benade, a longtime member of the physics faculty at Case Western Reserve University and a pioneering thinker, researcher and teacher in the field of musical acoustics, died on 4 August 1987 after an extended struggle with cancer. He was 62 years old.

Although his career began in nuclear physics, Benade's interest in musical acoustics soon turned into a full-time occupation, and his accomplishments in this field were numerous. One thinks first of his work in connection with wind instruments, including the theory of wave propagation in flared "horns," the role of the tone hole lattice in determining a "cutoff frequency" at which the propagation properties of the air column undergo a radical change; the nonlinear interaction between the air column and the reed, which determines the "oscillation regime" that the instrument establishes; and the effects of the upstream air tract (the oral, laryngeal and sublaryngeal cavities of the player) upon the generated tones. In fact, Benade's contributions went far beyond this area, encompassing not only other musical instruments but also the perceptual aspects of musical tones, especially as they are affected by room acoustics.

Yet none of these specific accomplishments were as important in establishing Benade's professional reptutation as the brilliant way in which, by spanning the whole spectrum from the most theoretical to the most practical, he set an example of applied physics at its very best. He was comfortable with the most abstruse mathematical techniques whenever he found a use for them, and he could also build and modify musical instruments on a par with the most skillful professional instrument builders. What's more, he had the ability to connect those two activities so that they became one. If he improved the performance of a clarinet by shaving a thousandth of an inch of wood out of one of the tone holes, it was because he had considered in his mind the propagating and nonpropagating modes of the air column, their relative mixing and dissipation, and their effect on the instrument's driving-point impedence and the consequent interaction with the reed and the player's lips. Conversely, if he developed the necessary mathematical functions to describe the Bernoulli effect of the air flow between the reed and the lay of the mouthpiece, it was by referring to his own experience with the "feel" of an instrument before and after he had made some small change in the mouthpiece structure. There could be no theoretical hypothesis for which he did not immediately seek a direct and practical test, and no perceptual experience for which he did not immediately pursue a sophisticated theoretical explanation; and he was generally successful in both.

Benade was the recipient of the Silver Medal of the Acoustical Society of America in 1984, and this year, posthumously, of the Gold Medal, its highest award. Yet by far the greatest recognition of his abilities is to be found in the way he served as teacher and example to a generation of scientists who have been consistently fascinated and inspired by his ability to break interdisciplinary barriers and thus command the respect and admiration of intelligent people wherever they may reside on the theory–practice axis. Those of us who continue in his chosen field are left with a great void that cannot be filled, but also with a model that will keep us busy and fruitful for a long time to come.

Gabriel Weinreich
University of Michigan
Ann Arbor, Michigan

Marc Aaronson

Marc Aaronson, professor of astronomy at the University of Arizona, died in a tragic accident on the night of 30 April 1987 at the Kitt Peak Mayall Telescope. He was 36 years old.

Aaronson was born in Los Angeles, California, on 24 August 1950. He grew up in Los Angeles and stayed on in Pasadena, where he got his BS in astronomy from Caltech in 1972. He obtained his PhD from Harvard in 1977. His doctoral work concerned infrared photometry of galaxies; he worked with Jay Frogel (now at Kitt Peak) and Eric Persson (now at the Mount Wilson and Las Campanas Observatories) to develop new instrumentation for large-aperture photometry and then used that instrumentation to study the cool stellar populations of galaxies. This work was extremely important for understanding the stellar populations of galaxies because the peak of their integrated stellar energy distributions occurs in the near infrared. While at Harvard, Aaronson also worked with a number of other astronomers, including Christopher McKee, John Danziger and John Huchra, on projects that ranged from studies of absorption line systems in quasars to star formation in extra-Galactic H II regions.

After finishing at Harvard, Aaronson went to Steward Observatory at the University of Arizona as a postdoctoral fellow. There he began work on a series of important problems. In the mid-1970s Brent Tully (University of Hawaii, Manoa) and Richard Fisher (NRAO) developed a new technique for determining distances to galaxies, based on the correlation of the absolute luminosity of a spiral galaxy with its rotation velocity. When they introduced their method, they obtained a value for the Hubble constant that disagreed significantly with the then-accepted value. Their technique was attacked on the grounds that there were major prob-