the early 1960s, he started to work on theoretical plasma physics problems.

Burt made many seminal contributions to the study of plasmas. One of his more influential works was *The Plasma Dispersion Function: The Hilbert Transform of the Gaussian* (Academic Press, 1961), which he coauthored with Samuel Conte. Their book presented an analysis of the *Z*-function, which describes the kinetic linear response of a Maxwellian plasma, including the Landau damping process, and is used widely to study plasma properties ranging from space plasmas to the design of fusion reactors. The study of this function is a required element in graduate plasma courses taught throughout the world.

Burt's research focused on the theoretical understanding of linear and nonlinear waves in plasmas. He contributed extensively to the study of ion acoustic waves in hot plasmas. In their influential research paper in 1961, he and Roy Gould identified the threshold conditions required to trigger the growth of ion oscillations by a population of drifting electrons. That threshold is of fundamental importance in predicting the behavior of laboratory and naturally occurring plasmas in which an electrical current flows. Another theoretical discovery to which Burt made key contributions is what is now known as the Fried–Weibel instability. This important mechanism, which Burt and Eric Weibel first identified in 1959, relates to the relaxation of plasmas having anisotropic temperatures and is of great significance to space plasmas and to energetic particle beams.

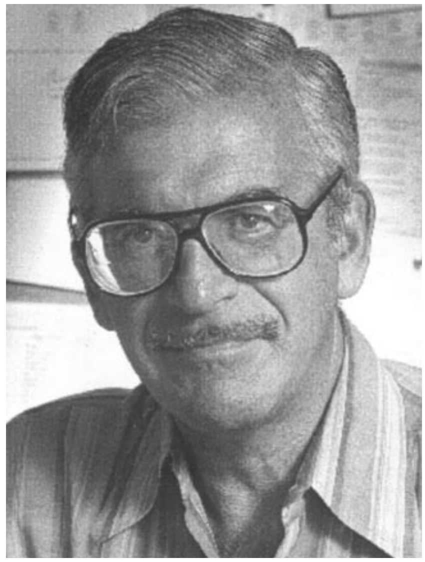
In 1963, the legendary professor Alfredo Baños Jr of UCLA recruited Burt to help him develop a research group in the emerging field of plasma physics. Burt joined the physics faculty of UCLA as a full professor, although he continued to be associated with TRW as a senior staff physicist until 1986. In addition to his creative scientific activities, Burt brought unique capabilities to the UCLA academic environment. He combined an innate ability to identify technical talent with his managerial experience to assemble one of the world's leading plasma research groups. For nearly 30 years, Burt nourished the development of the UCLA plasma group and watched with satisfaction while his protégés grew into accomplished leaders of the field. He retired from UCLA in 1991.

A strong advocate of magnetic fusion as the ultimate energy source for humankind, Burt chaired the American Physical Society's division of plasma physics in 1979 and was the founding editor of the journal *Comments on Plasma and Controlled Fusion*. His activities and influence crossed international boundaries, and over the years he developed close relationships with scientists in Japan and the former Soviet Union. He was one of the first American plasma physicists to travel to Japan and was instrumental in bringing young Japanese scientists to the US. His efforts have evolved into major long-term collaborations in the plasma/fusion area.

Burt was a demanding but fair individual who readily passed along credit to those who deserved it. He was a warm and encouraging mentor, which made him beloved of his students and postdocs. He read widely and had a deep knowledge of music. He enjoyed practicing magic and in his younger days was quite good at it.

George J. Morales
Ferdinand V. Coroniti
University of California, Los Angeles

Walter Ernest Bron



Walter Ernest Bron

Walter Ernest Bron, who made key contributions to condensed matter physics through fundamental and challenging experimental studies, died on 16 November 2002 in Irvine, California.

Walter was born in Berlin, Germany, on 17 January 1930, and his family moved to the US from Amsterdam in 1939 to flee the Holocaust. He received his bachelor of mechanical engineering degree from New York University in 1952 and his MS in metal science in 1953 from Columbia University. He continued at Columbia and earned his PhD in physics in 1959 under the direction of Art Nowick. His thesis explored the bleaching of color centers in alkali halides by x rays. While his thesis studies were under way, he was drafted into the US Army. He served as a research assistant at the Army Research Laboratory in Fort Belvoir, Virginia, from 1954 to 1956.

After leaving the army in 1957, Walter joined IBM Corporation's T. J. Watson Research Center in Yorktown Heights, New York, as a research associate. He was promoted to research physicist in 1958 and remained in that position until 1966. During the 18 years that followed, he served on the physics faculty of Indiana University. He then joined the physics faculty at the University of California, Irvine, in 1986.

Characteristic of his research were experiments that explored novel phenomena and introduced new methodologies and techniques. Many of those experiments constituted a tour de force of experimental technique. During the mid-1960s, he detected the first paraelectric resonance signals associated with the tunneling motions of small ions present as impurities in alkali halide crystals. He introduced methods to both generate and subsequently detect very high-frequency phonons in solids, with frequencies in the THz range, far above the frequency domain accessible to conventional ultrasonic technology. One means by which he generated such very high-frequency phonons was using superconducting junctions both as generators and as detectors of phonon pulses.

Using another approach, resonant pumping of vanadium impurities in aluminum oxide with an infrared laser, he created a population inversion and then stimulated emission of phonons with frequencies in the THz range. That work provided insights into the physics of very-high-frequency phonons. In 1982, Walter and his student J. M. O'Conner observed for the first time a quasi-diffusive form of phonon transport that had been predicted by Soviet theorists D. V. Kazakovtsev and Y. B. Levinson.

During the early 1980s, Walter turned his attention to using picosecond laser pulses to study diverse phenomena in the solid state in real time, through pioneering pulse-probe experiments. After his move to Irvine, he established a femtosecond laser laboratory that continued and extended those studies. During this period, he measured the nonlinear optical susceptibility tensors of semiconducting materials and completed direct studies of the decay in time of coherently generated optical phonons, polaritons, and coupled phonon–plasmon modes of doped semiconductors.

In 1993, Walter conducted an ingenious experiment that verified a theoretical prediction discussed actively during the late 1960s. The prediction was that, in the semiconducting material gallium phosphide, an acoustic phonon at the boundary of the Brillouin zone should have an anomalously long lifetime. Walter was justly proud of his experiment, which verified this long-standing prediction.

Among his professional honors, Walter received a Guggenheim Fellowship in 1966 from the John Simon Guggenheim Memorial Foundation. In 1973, he received the Senior Scientist Award from the Alexander von Humboldt Foundation in Germany.

Walter and his wife enjoyed a warm marriage of 50 years. He has two daughters and two granddaughters who will miss him as we will.

Douglas L. Mills
Alexei A. Maradudin
University of California, Irvine

Kenneth Melvin Evenson


NIST

Kenneth Melvin Evenson

Kenneth Melvin Evenson, NIST fellow and distinguished laser metrologist, died at his home in Sunshine Canyon, Colorado, on 29 January 2002 after a two-year battle with Lou Gehrig's disease. He was an inventor and experimentalist par excellence in the fields of laser metrology and spectroscopy.

Ken was born on 5 June 1932 in Waukesha, Wisconsin, but grew up in Montana. He received a BS in physics from Montana State College in 1955. That year, he married his classmate Vera Stucky, a microbiology major, and they left for a year of studies on Fulbright scholarships at the University of Tübingen. In 1963, he received a PhD in physics from Oregon State University. His research, done under the guidance of David Burch, was on the gas phase recombination of nitrogen atoms using electron paramagnetic resonance.

After graduation, Ken took a job at NIST in Boulder with a group that was studying electrical discharges. His long career at NIST was characterized by a remarkable series of inventions and developments, more than 300 publications, and highly productive collaborations with scientists worldwide. One of his first projects, done in 1964 with Herb Broida and Fred Fehsenfeld, was to test and develop microwave discharge cavities. Ken's design for a compact, quarter-wave cavity powered by a 2450-MHz magnetron was an immediate success. Their 1965 paper (published in *Review of Scientific Instruments*), which included engineering drawings, remains one of the most requested and cited NIST publications. Ken's device is still used in laboratories to generate emission spectra, atoms, radicals, metastables, and ions, and is commercially marketed as the "Evenson cavity."

Another collaboration with Broida led to the development of microwave–optical double resonance, a powerful spectroscopic technique. In their experiments, fine structure transitions in cyanogen (CN) radicals were optically detected using modulated microwave pumping. This early 1960s study foreshadowed generations of double-resonance experiments, which have evolved into the myriad of two-photon spectroscopic techniques in use today.

Much of Ken's research involved measurements in the far-infrared region. He was a pioneer in the development and discovery of many new FIR lasers powered by electrical discharges or IR pumping. In 1968, he led a team that developed laser magnetic resonance (LMR), a sensitive spectroscopic method for detecting paramagnetic species using the Zeeman effect and a fixed frequency FIR or IR laser oscillator. The method has been exploited around the world to study the spectra of transient species, including ions, atoms, and radicals. The excellent sensitivity of LMR has led to its application by chemists as a