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.

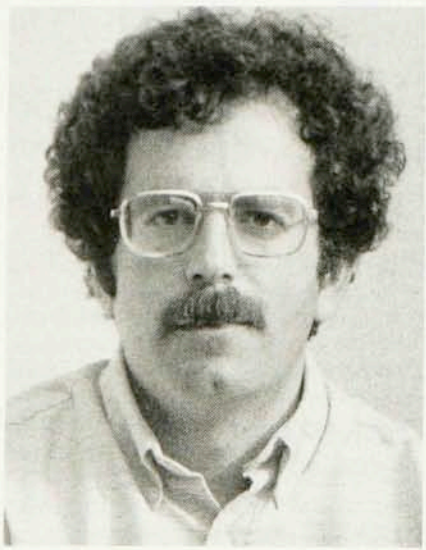
Aaronson was born in Los Angeles, California, on 24 August 1950. He grew up in Los Angeles and stayed on in Pasadena, where he got his BS in astronomy from Caltech in 1972. He obtained his PhD from Harvard in 1977. His doctoral work concerned infrared photometry of galaxies; he worked with Jay Frogel (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-

lems in correcting for internal extinction in galaxies and for differences in the stellar populations of galaxies. Aaronson, Huchra and Jeremy Mould (Caltech) realized that these problems could be minimized by observing galaxies in the near infrared. In 1979 they confirmed the higher value of the Hubble constant suggested by the work of Gerard de Vaucouleurs (University of Texas, Austin) and of Tully and Fisher. Aaronson then formed and led a collaboration that measured velocity-independent distances to over 700 galaxies. His work produced the first detailed and direct measurement of the infall of galaxies into the Virgo Cluster, the core of the Local Supercluster, and the first direct measurements of the Hubble constant at redshifts greater than 5000 km/sec. At the time of his death, he was leading a team of astronomers who are proposing to measure galaxy distances with the Hubble Space Telescope.

Aaronson also made several other important contributions to stellar population studies. He and Mould discovered carbon stars in the Magellanic Cloud globular clusters, a finding that explained the peculiar colors of these clusters. He and other collaborators, including his postdoctoral fellow Ed Olszewski, discovered carbon stars in several of the dwarf galaxies in the local group; this discovery established the existence of a significant population of intermediate-age stars in these galaxies. Aaronson also made the first accurate measurements of the internal velocity dispersions in the dwarf galaxies. He recognized that carbon stars, even though they are extremely faint at the distances of the dwarf galaxies, have exceptionally strong spectral features. With his accurate measurements of stellar velocities, he found that the masses of the dwarves were almost ten times larger than expected. That result indicated that massive dark halos surround even dwarf galaxies.

Marc Aaronson



Aaronson was just reaching the peak of his career. He had an incredible passion for astronomy and drove himself relentlessly to set high standards in research. He won the 1984 Newton Lacy Pierce Prize of the American Astronomical Society for outstanding astronomers under the age of 35. In 1986 he was elected a councilor of AAS. Astronomy has suffered a truly great loss.

JOHN HUCHRA
Harvard–Smithsonian Center for Astrophysics
Cambridge, Massachusetts

Antoinette de Vaucouleurs

Antoinette de Vaucouleurs died on 29 August 1987. She had established an international reputation for her work in astronomy at a time when few women worked in that field. Born on 14 November 1921 in Paris, France, she studied mathematics, physics and astronomy at the Sorbonne. She married Gérard de Vaucouleurs on 31 October 1944 and began a lifelong partnership in marriage and astronomical research. She first worked in spectroscopy at the Institut d'Astrophysique in Paris and then took part in the parallax program at the University of London's Mill Hill Observatory. After moving to Australia in 1951, she worked at the Commonwealth Observatory, Mount Stromlo, near Canberra. The de Vaucouleurs moved to the United States in 1957 at the invitation of the Lowell Observatory in Flagstaff, Arizona, and in 1958 they moved to the Harvard Observatory in Cambridge, Massachusetts. Antoinette became a naturalized citizen in 1962, after the couple had moved to Texas. She accepted a position as research scientist associate at the University of Texas, Austin, which she held for more than 25 years. After 1980 she was also a member of the Chancellor's Council for the University of Texas system.

Working together, the de Vaucouleurs made lasting contributions to astronomy. Antoinette shared wholeheartedly in Gérard's research in the early exploration of the Local Supercluster, the determination of the supergalactic coordinate system and the discovery of the supergalactic anisotropy of redshifts of nearby galaxies. She was meticulous in her work and developed a knack for discovering and correcting misprints, misidentifications and the assorted mistakes that mar so many astronomical papers. These special talents were invaluable in the 15-year task of revising and supplementing the *Shapley–Ames Catalogue of Bright Galaxies*, which was published in 1964 as the *Reference Catalogue of Bright Galaxies* (U. of Texas P., Austin). Twelve years later, in 1976, the de Vaucouleurs published the *Second Reference Catalogue* with Harold Corwin Jr. A much expanded *Third Reference Catalogue* is now under way, supported by the National Science Foundation.

Antoinette's early work in Paris led to the discovery of new doublets and perturbations in the secondary series of the infrared spectrum of potassium. In Australia she worked first on Greenwich-style spectrophotometric gradients in the continua of southern bright stars and of the planet Mars. Later she produced the first quantitative spectral and luminosity classification of 366 B, A and F stars in the Morgan–Keenan systems. These are still among the best available classifications for MK types of southern stars. She was a full partner in the first quantitative analysis of the spectral composition of the bar of the Large Magellanic Cloud, which showed that the qualitative visual impression of a Morgan A-type spectrum is misleading; the line strengths could only be explained by a mixture of B- and K-type supergiants. This work was continued by many others. Antoinette was the first to notice (in 1958) that the magnitudes of the central parts of several Seyfert galaxies differed perceptibly over a one-month interval, and her suspicions were verified ten years later when variations of Seyfert nuclei were firmly established. During her 25 years at the University of Texas she participated in nearly all of the extra-Galactic research undertaken by her husband, particularly the radial velocity surveys done at the McDonald Observatory between 1960 and 1978, and the photoelectric observations of bright galaxies that formed the basis of our knowledge of total magnitudes of galaxies in the UBV system. Among her last publications is a general catalog of photoelectric magnitudes and colors in the UBV system of 3578 galaxies brighter than 16th V-magnitude. A similar catalog of infrared magnitudes is in press.

FRANK BASH
HARLAN J. SMITH
J. CRAIG WHEELER
University of Texas, Austin ■