
Robert M. (Bob) Walker, Ph.D., passed away on February 12, 2004 in Brussels, Belgium, at the age of 75, after a 20-month long fight with stomach cancer. The first McDonnell Professor of Physics at Washington University, Bob was one of the great visionaries in the space sciences, and his imagination, sense of scientific rigor, and passion for the microscopic world and its use as a window to the Cosmos has been imprinted on several generations of physicists, space scientists, and cosmochemists. Bob’s scientific interests covered a remarkable range and included fundamental contributions to particle physics, nuclear physics (the discovery of nuclear particle tracks and the invention of fission track dating), cosmic ray physics, and the study of extraterrestrial materials.

Bob was born in Philadelphia, Pennsylvania, in 1929 and grew up partly in New York City and partly in upstate New York. Knowing from an early age that he wanted to be a scientist, he attended the Bronx High School of Science and subsequently obtained his B.S. in Physics from Union College. Bob’s professional career began at Yale University, where he received his Ph.D. in 1954 in particle physics, performing work that led to the discovery that strange particles are produced in pairs (Walker et al. 1955). He subsequently joined the General Electric Laboratory in Schenectady, where his research focused on investigating radiation effects in solids, including work on the behavior of copper exposed to electrons (Corbett et al. 1959a, b) that even today is regarded as the definitive work on this topic. In 1962, he discovered that particle tracks in insulators could be revealed by chemical etching (Price and Walker 1962) and used this information to develop a new geochronometer based on fission tracks (Price and Walker 1963). He subsequently applied this technique to diverse problems in meteoritics, neutron dosimetry and cosmic rays, as well as archaeology and anthropology. His discovery of tracks from nuclei heavier than iron in meteorites (Fleischer et al. 1967a) and his pioneering use of plastics to detect such nuclei in cosmic ray balloon flights (Fleischer et al. 1967b) opened a new frontier in cosmic ray physics.

With his move to Washington University in 1966 and the subsequent establishment of the Laboratory for Space Sciences, he turned his research interests increasingly to space physics and cosmochemistry. Bob played a key role in planning for the return of lunar samples from the Apollo flights, and his laboratory was involved in the analysis of the first lunar rocks returned, providing important information on the history of solar radiation and cosmic rays (e.g., Crozaz et al. 1970; Walker and Zimmerman 1972; Walker and Yuhás 1973). Bob’s interests were wide-ranging and sometimes led to activities that exceeded the confines of his space-related scientific work. For example, the application of thermoluminescence led to the authentification of an ancient Greek bronze horse (e.g., Zimmerman et al. 1974; Walker et al. 1976), which in turn led to Bob’s involvement in the preservation of artwork and, for several years, people worked on the restoration of sculptures in the middle of research on meteorites and lunar samples.

During the 1970s, Bob also devoted substantial time and effort to strengthening the Physics Department of Washington University and revitalizing the Geology Department (now the Department of Earth and Planetary Sciences) through the appointment of key faculty members such as Charles Hohenberg, Ray Arvidson, Ghislaine Crozaz, Frank Podosek, and Larry Haskin. His efforts to bring a first-class space physics program to Washington University culminated in the establishment of the McDonnell Center for the Space Sciences in 1974. The McDonnell Center today consists of some 80 professors, research scientists, and students working in meteoritics, lunar science, planetary imaging and geophysics, theoretical and observational astrophysics, high
energy astrophysics, general relativity, extraterrestrial materials science and cosmic rays, and provides endowed faculty positions, graduate student fellowships and visiting scientist support in space-related fields.

His Laboratory at Washington University assumed its modern form in the early 1980s, with the purchase of one of the earliest ion microprobes used for the study of extraterrestrial materials. His early recognition of the potential importance of the ion microprobe for making isotopic measurements on microscopic samples directly led to numerous spectacular results, including the identification and characterization of stellar condensates in meteorites, and their use in constraining models of stellar nucleosynthesis. Similarly, he seized upon the study of interplanetary dust particles as an important research direction for learning about early solar system materials. His visionary emphasis on applying multiple microanalytical techniques to the same small sample has led to discoveries ranging from the identification of deuterium anomalies in interplanetary dust particles (Zinner et al. 1983) to the analysis of circumstellar oxide grains from oxygen-rich red giants (Nittler et al. 1994), and the identification of complex aromatic molecules in interplanetary dust particles (Clemett et al. 1993) and presolar graphite (Messenger et al. 1998). Always in pursuit of newer ways of analyzing small amounts of material, Bob devoted the last years of his life to the implementation and application of nanoscale secondary ion mass spectrometry (NanoSIMS) for the study of individual submicrometer presolar grains. This led to the recent discovery of presolar silicate grains in interplanetary dust particles (Messenger et al. 2003), a discovery he had been anticipating for a number of years.

Bob was an internationally recognized scientist. He was elected to the United States National Academy of Sciences in 1973 and received numerous awards and recognitions, including the E. O. Lawrence Memorial Award of the US Atomic Energy Commission, the J. Lawrence Smith Medal of the National Academy of Sciences, and the Leonard Medal of the Meteoritical Society. He was also awarded an honorary doctorate by Union College in 1967 and was named Docteur Honoris Causa by the University of Clermont-Ferrand, France in 1975. He posthumously received an honorary doctoral degree from Washington University in 2004. As part of his continuing interest in the study of meteorites, he was a member of the 1984–1985 and 1990–1991 NSF-sponsored ANSMET expeditions to collect meteorites in Antarctica and received the Antarctic Service Medal in 1985. Yet, despite the numerous recognitions that came his way, Bob was always concerned, first and foremost, with the pursuit of science for its own sake, rather than for his own glory. He was a tireless spokesperson and lobbyist for science and served on many scientific committees. He was also one of the founders and first president of VITA (Volunteers in Technical Assistance), an organization that provides technological expertise to third world countries.

In the Laboratory for Space Sciences (the “fourth floor” as it has become known in the community), Bob generated a wealth of stimulating ideas and freely imparted his knowledge and skill to numerous students and postdocs, many of whom have gone on to outstanding careers. The fourth floor was an exciting place to work and also to have fun (the ping pong matches are legendary), and countless former students and postdocs have fond memories of the days they spent as part of the “fourth floor family.” Bob’s scientific leadership and inspiration, and the wide-ranging influence he had on space science, were celebrated at the Robert M. Walker Symposium, held in his honor at Washington University in March 2003 and in a special issue of Geochimica et Cosmochimica Acta published in December 2003. But more importantly, the Symposium was a testament to how universally loved and respected Bob was.

Bob is survived by his wife and soul mate, Ghislaine Crozaz; his sons, Eric and Mark Walker; his mother, Dorothy Potter; and three grandchildren. Yet, in a larger sense, he was also a father and mentor to much of the current community of meteoriticists and cosmochemists. He will be deeply missed.

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REFERENCES

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