

RONALD GREELEY

Planetary pioneer

Space missions over the past few decades have revolutionized our understanding of the Solar System and our own planet. Instruments on and orbiting Mars have provided a wealth of information on the red planet's past and present conditions. Many of these missions — including the Viking, Mars Pathfinder, Mars Global Surveyor, Mars Exploration Rovers and the European Mars Express missions — were indebted to the commitment of Ronald Greeley, a Regents' Professor at Arizona State University, who died on 27 October 2011 at the age of 72.

Greeley's interest in the similarities and differences of far-flung landscapes arose as he and his family moved around frequently — his father was a military serviceman. His PhD research took him to Mississippi's Barrier Islands, where he combined the study of modern organisms with investigations of their fossil records. This marked the start of a career utilizing modern processes on Earth to understand our planet's past, as well as the surfaces of other planets and satellites.

In 1967 Greeley was assigned to NASA's Ames Research Center to work on questions arising from the Apollo programme. Greeley had been hired by Don Gault to work on lunar cratering, but he was given relatively free rein to investigate a range of topics within planetary research. His interests led him to lava tubes and channels on Earth, which he used as analogues for lunar features. The resultant series of papers comparing lunar and terrestrial features included a 1971 *Science* paper in which he interpreted Hadley Rille as a lava channel, prior to its visit by Apollo 15 astronauts later that same year. Inspired by Mariner 9 images of Mars, he used wind tunnels to simulate how aeolian processes might operate on the red planet. Through observation, theory and carefully designed experiments, his work refined the physics of aeolian processes on the planets, including Earth.



Greeley began teaching at Arizona State University in 1977. It was there that I first came to work with him in 1986. As I began my graduate studies, he reminded me of the old adage: 'A journey of 1,000 miles begins with a single step'. During the many steps that followed, Greeley equipped me with the tools and opportunities to propel me towards a successful career. As a teacher and mentor he was always gracious with his time and advice. His thorough red-ink markups of manuscripts are notorious among those of us fortunate enough to have been his student. Greeley was a gentleman and a quiet leader, able to guide either an individual graduate student or a large committee towards an achievable goal. Through the past decade, I continued to work with Greeley in his chairmanship role on studies of missions to Europa. Now leading these studies myself, I regularly ask myself in some situation: "What would Ron Greeley do?"

His role in the planetary community was broad. Greeley was involved in nearly

every major spacecraft mission that explored the Solar System since the Apollo Moon landing. In addition to the numerous martian expeditions, Greeley also contributed to the Galileo mission to Jupiter, the Magellan mission to Venus, and the Shuttle Imaging Radar that observed our own planet with new eyes. He also chaired many NASA and National Research Council panels.

A network of former students located throughout the universities and research institutes of the United States provides testimony to Ron Greeley's influence on the field of planetary geology. His legacy will live on through a scholarship fund set up in his honour for planetary geology students at Arizona State University.

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