

topes from astatine to plutonium. But he also explored the mechanism of high-energy reactions with both chemical and physical techniques, did nuclear fission studies and performed alpha spectroscopy on 50 new, short-lived isotopes produced by heavy-ion reactions at Berkeley's High-Energy Linear Accelerator. Earl also took part in the earliest studies of fragmentation of nuclei by high-energy protons at the Bevatron.

Before Earl became increasingly involved in the management of LBNL, he was also a prolific writer. Not only did he write scientific papers, but he was the coauthor (with Isadore Perlman and Seaborg) of the first two volumes and the sole author of the third volume (on fission phenomena) of a three-volume treatise entitled *The Nuclear Properties of the Heavy Elements* (Prentice Hall, 1964), which is now considered a classic in the field. In 1987, he wrote with Darleane Hoffman and Oswald Keller Jr a history and analysis of the discovery of elements 104 and 105 (*Radiochimica Acta*, volume 42, page 57).

Earl was an official US delegate to the first Geneva conference on the peaceful uses of atomic energy in 1955 and also to the 1958 conference.

Earl's ease in dealing with people, his ability to calm roiling waters, his unfailing good humor and his genuine interest in other people and in their research problems were recognized by Seaborg, who, in 1970, offered Earl the job of deputy head of LBNL's nuclear chemistry division, a new position. Earl was also appreciated by Andrew Sessler, who became the third director of LBNL in 1973. At Earl's memorial service, Sessler recalled: "[When] I moved into the front office, I knew whom I would like to have join with me in the very large tasks that faced us. Of all the people in the laboratory, I chose Earl to be the [first] laboratory deputy director." And when David Shirley followed Sessler as laboratory director in 1980, he, too, asked Earl to stay on as his deputy, which Earl did through 1984. Earl retired one year later, having spent that year as the acting head of the nuclear science division and an associate director at large.

In addition to his devotion to his family, LBNL and his work, Earl had a great many interests, among them, history and literature. He was a very fine photographer, particularly of the forests and mountains in which he loved to hike. He had a passion for music—especially chamber and opera—and dancing, and would sometimes call square dances at parties at his home. He was a founding member

and an enthusiastic participant in the Strawberry Canyon Aquatic Masters swimming club team at the university. He will be greatly missed by a wide range of people, whose common bond was their friendship with this wonderfully humane man.

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Jürgen H. Rahe

Jürgen H. Rahe, the science program director for solar system exploration in NASA's Office of Space Science, was killed in Potomac, Maryland, on 18 June 1997, when a large tree fell on his car as he was driving home from work in a severe storm. His career was one of exceptional service to the planetary science community and outstanding leadership in promoting international cooperation in space science.

Born in Melle, Germany, on 30 June 1939, Jürgen earned his first degree in mathematics and physics and, in 1966, a PhD in astronomy—both at the



JÜRGEN H. RAHE

University of Hamburg. After receiving his *Habilitation* from the Technical University of Berlin in 1971, he became a professor of astronomy at the University of Erlangen-Nürnberg. From 1978 to 1985, he was director of the Remeis Observatory in Bamberg.

After several short visits to the US, he moved there permanently in 1985. His first position was at the Jet Propulsion Laboratory, where he served as coordinator of the International Halley Watch and as coinvestigator of the European Space Agency's Giotto mission to comet Halley. At the same time, he also taught planetary astronomy at Caltech.

In 1989, Jürgen started work at

NASA Headquarters. He advanced rapidly from chief scientist for planetary astronomy to chief scientist for solar system exploration, then to director for solar system exploration, and finally to program science director for solar system exploration.

At NASA, he oversaw the general management, budget and strategic planning of the agency's Galileo mission to Jupiter, the Cassini mission to Saturn and several missions to Mars, including Mars Global Surveyor and the highly successful Mars Pathfinder. As program scientist for the Ballistic Mission Defense Organization's Clementine mission to the Moon, he successfully integrated the NASA science team into BMDO's engineering and mission operations.

Jürgen also helped to initiate NASA's Discovery program of "cheaper, better, faster" missions. For one such mission, Near Earth Asteroid Rendezvous, which returned the spectacular images of large craters on asteroid Mathilde, he served as its first program scientist. He was also program scientist of Rosetta, an international comet-rendezvous mission to be launched in 2003.

In the late 1980s, he fostered the search for and characterization of planetary systems surrounding other stars. He also established and managed NASA's role in the Keck Observatory's twin 10-meter telescopes in Hawaii.

Recognizing the lack of tenured positions in planetary science, Jürgen initiated and negotiated agreements with universities to establish new tenure-track positions in planetary science for which NASA provided three-year startup funding.

Not just an outstanding administrator, he published over 100 papers—mostly relating to comets—edited books and conference proceedings, was president of the International Astronomical Union Commission 15 (Study of Comets, Minor Planets, and Meteorites) and editor of *Astrophysics and Space Science*.

Jürgen was a colleague and friend who valued personal relationships. Meetings with him, which I would look forward to with pleasure, were relaxed—even when we were tackling difficult agenda items. Despite his heavy managerial burdens, he still found time to help his colleagues and actively participate in civic organizations. As we try to implement his visions for Solar System exploration, we shall miss his vigor and enthusiasm. And his kindness and humanity make losing him especially painful.

WALTER F. HUEBNER

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