



BILZ

tory materials.

After a period as a research assistant in Freiburg he accepted a chair in theoretical physics in Frankfurt. In doing so, he became one of the few German professors to circumvent the painful ordeal of the *Habilitation* usually required for the occupation of a chair.

In 1972 he moved to Stuttgart where he had been offered a position as department head and director of the newly created Max-Planck-Institut für Festkörperforschung. In his new position, which he held till his death, he was highly instrumental in setting up the policies of this center for solid state research.

Bilz dedicated most of his scientific interests to the theory of lattice dynamics and their interaction with light. He contributed greatly to the development of macroscopic and microscopic theories of lattice vibrations, their anharmonicities and interactions with electronic states. Recently, he had made important contributions to ferroelectricity and to the theory of phase transitions as induced by nonlinear interactions. Much of his work can be found in the monumental volume of the *Handbuch der Physik, Vibrational Spectra of Non-Metals*, which he wrote with D. Straucher and Roland K. Wehner (Springer-Verlag, 1984).

Bilz was responsible for training a large number of theorists, both German and otherwise, who now occupy leading positions in teaching and research. As a theorist he always promoted a strong interaction with experimenters. His office door was open at all times to anyone seeking his help or advice and he was always ready to give it. He exuded optimism and friendliness and was noted for his fairness and conciliatory attitude in handling diffi-

cult matters. He was also a gracious host, for which many of his American colleagues will remember him fondly. With his death we have lost a friend, a colleague, a wonderful human being and a first class scientist in the prime of his work. It will not be easy to replace him.

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John J. Livingood

John J. Livingood died 21 July 1986 at the age of 83. He was one of the pioneer group, centered around E. O. Lawrence, at the Radiation Laboratory at Berkeley who did so much to move nuclear physics from the era of radium sources and ZnS scintillators to the era of cyclotrons and counters. He was born in Cincinnati, Ohio, and got his AB and PhD at Princeton. He stayed at Princeton as an instructor and during this period wrote, with Gaylord Harnwell, the text *Experimental Atomic Physics* (McGraw-Hill). This book was the introduction to modern physics for many of the generation of physicists educated in the thirties and forties. In 1932 he moved to Berkeley and in association with several other people, principally Glenn Seaborg, he found over a dozen new radioactive isotopes. Amazingly enough from their knowledge of nuclear systematics they were also able to find a new stable isotope Te^{120} . The article he wrote with Seaborg (*Reviews of Modern Physics* 12, 30, 1940) was a classic reference in nuclear physics for a decade.

He went to Harvard in 1938 to help in the construction of their first cyclotron, and in 1942 he joined the Radio Research Laboratories that were set up at Harvard during World War II. Here he played a major role in developing the resonatron, a large radio tube used for major jamming. In 1945 he joined the Collins Radio Company where he was in charge of the design and installation of cyclotrons at Argonne and Brookhaven National Laboratories. In 1952 he went to Argonne where he was the leading spirit in the accelerator design project that led to his heading the design and construction of the Zero Gradient Synchrotron, a 12 GeV proton accelerator that made numerous contributions to particle physics until it was shut down in 1979.

In later years he served as consultant to Argonne and others on accelerator matters and wrote two books in this field *Principles of Cyclic Particle Accelerators* (Van Nostrand, 1961) and *The*



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Optics of Dipole Magnets (Academic, 1969).

As a physicist Livingood's outstanding characteristic was his drive to understand. He was not satisfied with easy explanations and was not afraid to question anybody. He was energetic and well-focused, but never overbearing. His good manners, cheerfulness and consideration will be missed by all who knew him.

RON MARTIN
ROY RINGO
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LEE TENG
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William L. Williams

The physics community suffered a tragic loss with the death of William L. Williams as a result of a plane accident on 11 November 1986.

Williams was born in Chickasha, Oklahoma, on 28 May 1937. He received his undergraduate education in physics at Rice University, where he earned the BA in 1959. He then moved to Dartmouth College, where he completed the MA in 1961, and to Yale University, where he was awarded a PhD in 1965.

He spent his academic career at the University of Michigan, where he arrived as instructor in 1965. He advanced rapidly to professor in 1976. He served as associate chairman of the department of physics and was the associate dean of research for his college at the University of Michigan. His *Doktorfamilie* contains 11 doctoral students, and the list of students whom he influenced in his teaching career numbers in the thousands.

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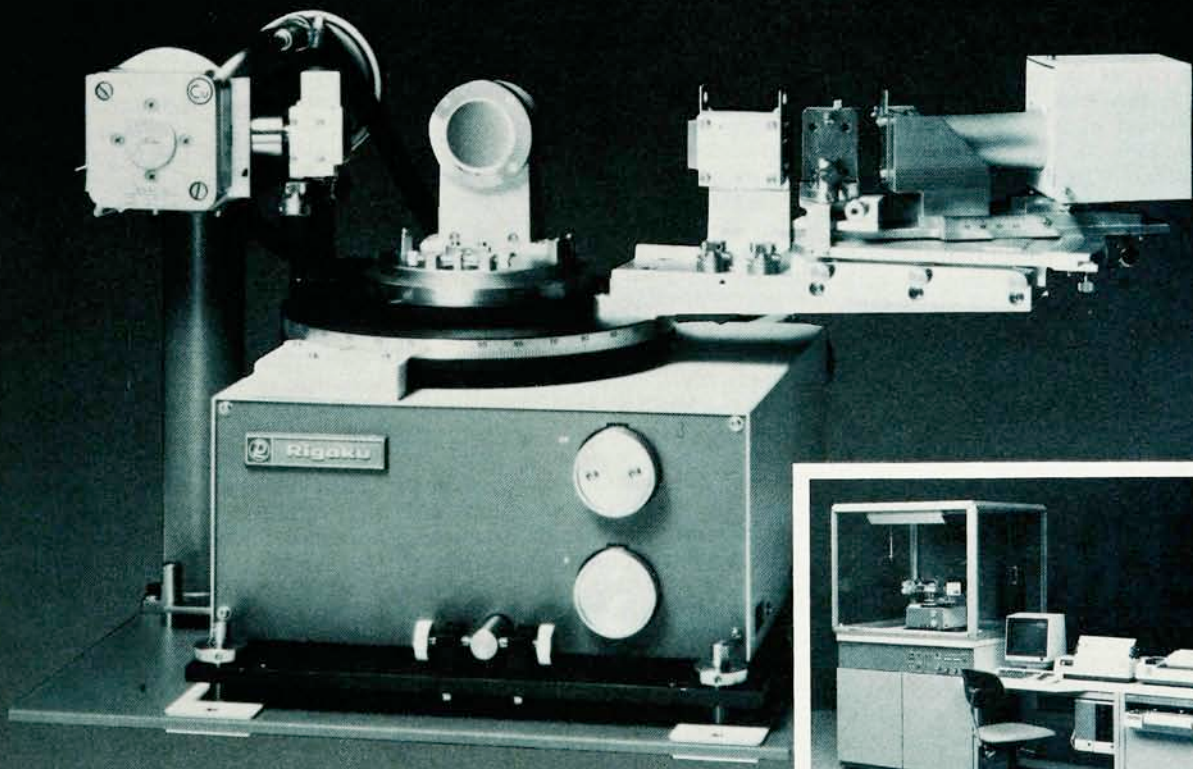
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WILLIAMS

His career as an experimenter began as an undergraduate at Rice in nuclear physics, and continued in solid state physics at Dartmouth. He was attracted to fundamental problems in atomic physics as a doctoral candidate at Yale, with Venon W. Hughes, with whom he performed sensitive nmr experiments that set new limits on the anisotropy of inertial mass. At Michigan, he worked on a number of experiments with hydrogen and helium beams, especially a precision measurement of the $2S_{1/2}-2P_{3/2}$ interval in hydrogen with Richard T. Robiscoe. This was followed by a series of measurements with Arthur Rich in which the circular polarization of light from white dwarfs and other galactic objects was measured. His most ambitious challenge was the search for weak interactions in hydrogen, which he pioneered with Robert R. Lewis. This work yielded the best existing tests of inversion symmetries in the hydrogen atom. At the time of his death, he was collaborating on a particle physics experiment to measure the muon g -factor anomaly.

A dry recital of his accomplishments fails to convey the vitality and enthusiasm with which he lived. Williams was an unusually vigorous person, rising early, working hard and lamenting the time spent in sleep. He conveyed a keen sense of joy in his work and stimulated those around him to share his intense activity. The range of his interests included travel, sailing, hiking, canoeing and, especially, flying. He was an accomplished linguist and an enthusiastic musician. His concern for people led him to involvement in political questions; for example, he was a member of an arms control seminar at the University of Michigan, and he signed the statement pledging not to

perform research funded by the Strategic Defense Initiative. He will long be remembered as a positive force in the lives of many people.

ROBERT R. LEWIS
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Harald Zingl

Harald Zingl, a leading figure in few-body physics and an important contributor to the evolution of Austrian physics, died on 27 January 1987, at the age of 59.

Zingl was born in 1927 in the Steiermark, in Austria. The completion of his education was delayed by the war, and so he studied at the University of Graz only in the early 1950s. He soon excelled in his studies of physics and was awarded the Erzherzog Johann Prize (1959) and the Theodor Korner Prize twice (1960, 1962). The latter is given by the President of Austria to encourage promising, talented young scientists.

From 1974 he was professor at the Institute of Theoretical Physics at the University of Graz, where Paul Urban has been the driving force for many years. Zingl was responsible for building up a systematic teaching program as well as a group of excellent younger research collaborators in the area of few-body nuclear and particle physics. Zingl made also an important contribution, especially at its early stages, to the organization of the Schlading series of winter schools, which has become one of the foremost such series in the world. He was also the organizer of the 1978 Conference on the Few-Body Problem, a periodic international meeting.

Zingl's main research interest was within the few-body area. Toward the beginning of his career he worked with Urban on weak interaction problems and on relativistic electromagnetic scattering. Later he became interested also in strong interaction problems. Gathering around him a sizable group of younger physicists, many of whom have by now embarked on careers of their own, Zingl published important papers on electron-deuteron scattering and the form factor problem, on the deuteron wave function, on separable potentials in the two-nucleon interaction (one of which is named the "Graz potential") and on the interplay of the Coulomb and the strong interaction parts in various few-nucleon reactions.

This group of researchers also evolved an intensive network of inter-



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national collaborations, with Paris, Bielefeld, Karlsruhe, the Naval Research Laboratory in Washington, DC, and many other institutions.

Zingl was a board member of the European Physical Society's nuclear physics division. He will be remembered both as a noted researcher and as an important contributor to the building of new opportunities for future generations of Austrian physicists. He will also be remembered by his friends and colleagues as a kind and congenial human being.

MICHAEL J. MORAVCSIK
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William W. Beeman

William W. Beeman, professor emeritus of physics and biophysics at the University of Wisconsin in Madison, died in Madison on 7 February 1987 at the age of 75.

Born in Detroit, Michigan, Beeman received a BS in mathematics from the University of Michigan in 1937 and a PhD in physics from Johns Hopkins University in 1940. After a year at the General Motors Research Laboratory he joined the faculty of the University of Wisconsin. He became a professor in 1952 and helped found the University of Wisconsin Biophysics Laboratory in 1962, serving as its chairman from 1962 to 1970. He retired in 1981.

Beeman worked at Johns Hopkins with Joyce A. Bearden. His PhD thesis concerned x-ray absorption edges of dissolved substances, and he continued to use x rays to study the structure of matter. He used x-ray absorption and emission spectra to study chemical binding in complex solids. In the