

stimulating. He is missed by his many friends scattered throughout the world.

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Richard Guy Helmer

Richard Guy Helmer, an internationally recognized gamma-ray spectroscopist, died on 16 January 2005 in Idaho Falls, Idaho, of complications arising from colon cancer.

Dick was born on 19 February 1934 in Homer, Michigan, and grew up in Ypsilanti, about 8 miles southeast of Ann Arbor. He obtained his BS (1956) and MS (1957), both in physics, from the University of Michigan, Ann Arbor, and his PhD in nuclear physics there in 1961. Dick's thesis research, on the decay properties of several rare-earth nuclides, was carried out at Argonne National Laboratory under the direction of S. Bradley Burson. On receiving his doctorate, Dick joined Russell Heath's gamma-ray spectroscopy group at the National Reactor Testing Station (now the Idaho National Laboratory), where he spent the rest of his career.

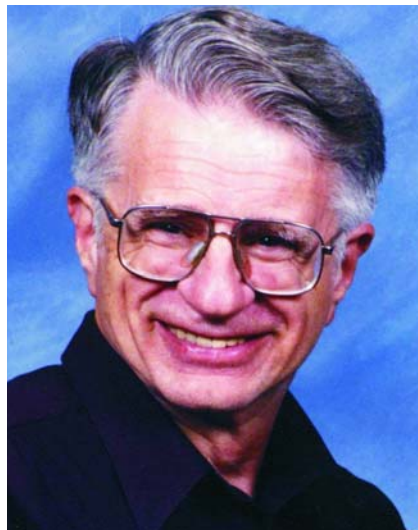
In the 1970s Dick, in collaboration with Reginald Greenwood and others at the Idaho laboratory, began work on germanium-detector-based gamma-ray spectroscopy, primarily in the measurement of gamma-ray energies and the precise calibration of germanium detector efficiencies. Throughout his career, Dick made seminal contributions to that field.

That work led to Dick's involvement with a number of collaborators, both national and international. With Pieter Van Assche of the nuclear research center SCK/CEN in Belgium and Cor van der Leun of the R. J. Van de Graaff Laboratorium of Utrecht University in the Netherlands, for example, Dick presented a set of well-documented and precisely determined gamma-ray energy standards for calibrating Ge-detector energies. Dick and van der Leun subsequently updated the standards, and after van der Leun's death in 1998, Dick completed the update and published the standards in 2000 in *Nuclear Instruments and Methods in Physics Research A*.

A large body of published work on the precise measurement of gamma-ray emission probabilities resulted

from Dick's work on the measurement of Ge-detector efficiencies. For example, he and Klaus Debertin of the Physikalisch-Technische Bundesanstalt, the national metrology institute in Brunswick, Germany, cowrote the book *Gamma- and X-Ray Spectrometry with Semiconductor Detectors* (North-Holland, 1988), a standard reference for many practicing gamma-ray spectrometrists. From the mid-1970s to 1990, his work also influenced many areas of science and technology. Examples include coordinated research programs, conducted under the auspices of the International Atomic Energy Agency (IAEA), on the measurement of actinide-nuclide decay data (1977–85), x-ray and gamma-ray standards for detector calibration (1986–90), and an update and extension of those standards—an effort that is still in progress.

Beginning in the late 1990s, Dick and John Hardy of Texas A&M Uni-



Richard Guy Helmer

versity used both careful measurements and Monte Carlo calculations to precisely calibrate the efficiency of a high-purity Ge detector. Their work resulted in the HPGe detector's being, as far as presently known, the most precisely calibrated detector in the world.

Dick was also committed to efforts to evaluate nuclear data. Beginning in 1984, he became involved in the international Nuclear Structure and Decay Data Evaluation Network, an international group of nuclear physicists, coordinated by the IAEA, that is charged with producing the Evaluated Nuclear Structure Data File from which the Nuclear Data Sheets are produced. From 1998 to 2002, Dick chaired the network's Nuclear

Structure and Decay Data Working Group.

In 1991 Dick began discussions with members of radiation standards laboratories in Germany and France to establish an international collaboration that would provide carefully documented evaluations of decay data for applications in science and technology. As a result, the Decay Data Evaluation Project was formed four years later and held its first meeting. The group's participants today include evaluators from national radioactivity standards laboratories in Brazil, France, Germany, and Russia, as well as national laboratories in the UK and the US.

Dick's achievements, though, were not restricted to standards and evaluations. He contributed significantly to fundamental nuclear physics. In 1968 he and one of us (Reich) reported the discovery of a second isomeric state in hafnium-178. The unique combination of properties—long half-life (31 years), high spin (16+), and high energy (2.45 MeV)—of this four-quasiparticle state continues to attract a lively interest and even some notoriety (see *PHYSICS TODAY*, May 2004, page 21). And those two researchers discovered in 1990 that the first excited state of thorium-229 must lie within a few electron volts of the ground state. Following that discovery, Dick carried out an extensive set of energy measurements with sub-eV precision on several gamma rays from the alpha decay of uranium-233, from which the value 3.5 eV was obtained for the ²²⁹Th energy level. That finding has led to numerous experimental and theoretical studies and continued interest in the topic.

Dick's accomplishments were rewarded well. At the 2001 Annual Winter Meeting of the American Nuclear Society, he was honored at a special session and received the society's Radiation Science and Technology Award. In 1991 he was elected a member of the International Committee on Radionuclide Metrology, the only US member of that committee not associated with NIST.

An exceptionally kind and caring person, Dick was actively involved in his community and the world. He served for six years as a trustee of the Idaho Falls school board, in lay leadership positions in his church, and on the advisory board of the Good Samaritan Nursing Center in Idaho Falls. He helped establish kindergartens for low-income children in his community; engaged in church missions to Brazil, Chile, and Nicaragua;

and worked on Habitat for Humanity projects. Perhaps the best description of him is found in Micah 6:8:

He has showed you, O man,
what is good.

And what does the Lord require
of you?

To act justly and to love mercy
and to walk humbly with your
God.

He is greatly missed.

Charles W. Reich
Boise, Idaho

Robert J. Gehrke
Idaho Falls, Idaho

Daniel Joseph Zaffarano

Daniel Joseph Zaffarano died peacefully in Ames, Iowa, on 3 December 2004 of pneumonia. He was a talented, productive physicist and administrator at Iowa State University, and he had a congenial, outgoing, and caring personality. His love of music made him equally comfortable in the music and physics departments. He was very proud of his son and five daughters; they and his wife, Suzanne, were by his side during his last days.

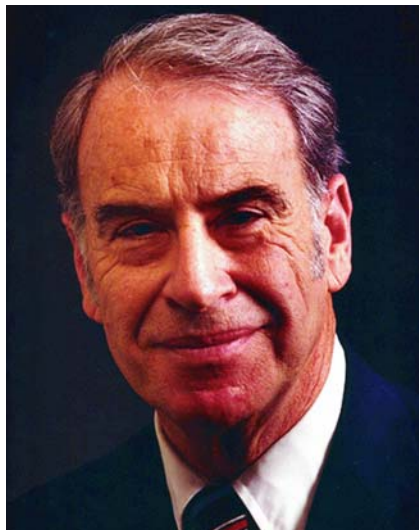
Dan was born in Cleveland, Ohio, on 16 December 1917. In 1939 he received his BS in physics from the Case Institute of Applied Science (now Case Western Reserve University). He then joined the National Carbon Co (a part of Union Carbide and Carbon Corp, now Union Carbide Corp) in Cleveland, where he became involved in the development and application of the battery used in proximity fuzes during World War II.

After the war, a fuze project colleague of Dan's, A. C. G. Mitchell, who was on leave from Indiana University, persuaded Dan to join him at Indiana for graduate work. Shortly after August 1946, he started that work; he completed his MS in physics two years later. For his doctoral work, he participated in the design, construction, and use of a state-of-the-art beta-ray spectrometer. Four papers in which he described data taken with that instrument were the basis of his 1949 dissertation.

He subsequently joined Iowa State as a research associate professor in the physics department and in the Ames Laboratory of the US Atomic Energy Commission (USAEC, now

the US Department of Energy). The director of the lab, Frank Spedding, had ordered a 70-MeV synchrotron from General Electric Co in 1947; for the next 22 years, Dan oversaw the use of that facility. He also helped plan and staff a 5-MW heavy-water research reactor later installed by the USAEC near the synchrotron.

Dan spent an enjoyable 16 months in England during the mid-1950s, when he was the Office of Naval Research liaison scientist in Europe. In 1961, he became chair of Iowa State's physics department and chief of the Ames Lab physics division. The fruits of his leadership included the recruiting of new faculty, growth in the number of graduate students, and a heightened level of sociability and interaction in the department. Dan's foresight and efforts resulted in the



Daniel Joseph Zaffarano

construction of a physics building addition in the mid-1960s. The enormous positive impact of that facility on the department is arguably his major legacy to Iowa State. In winter 2004, the building was designated the Daniel J. Zaffarano Physics Addition. He also supervised PhD programs and regularly taught introductory courses. In 1967 the university honored him as a Distinguished Professor in Sciences and Humanities.

Four years later Dan was named vice president for research and dean of Iowa State's graduate college. He was highly popular and respected in those positions, and carried out his work with an enthusiasm that continued until his retirement. In 1977 Dan convinced Iowa State to host a well-attended international conference on the potential use of icebergs as a source of fresh water. He strongly sup-

ported the establishment of a university-wide biotechnology program, for which initial state funding was provided in 1986. That program is thriving today.

After his retirement in 1988, the university established the Zaffarano Prize, given annually to the PhD recipient with the best publication record. Questions about the publication of research results were a standard part of the exit interview Dan conducted with each student. In 2002, on the occasion of his 85th birthday, colleagues and alumni celebrated his Iowa State career at a festival in his honor.

Dan's efforts during his career were not limited to Iowa State, however. In 1974, he directed a \$3 million state project to explore the environmentally friendly strip mining of Iowa coal and the use of physical methods to reduce its high sulfur content. He was active with numerous groups, including the Argonne Universities Association, the Universities Research Association for Fermilab, and the Council of Graduate Schools in the US.

Dan actively participated in community musical organizations. He enjoyed singing and was founder and first president of the Ames Choral Society. He and his wife, Suzy, provided leadership for the Ames Town and Gown Chamber Music Association, the Ames International Orchestra Festival Association, and the Friends of Music of Iowa State's music department. One of his last public appearances was at the department's scholarship musicale in the fall of 2004. We miss him.

Clayton A. Swenson
John R. Clem

*Iowa State University
Ames ■*

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