

and geography, and fostered international cooperation between scientists.

For decades, Leonid's research addressed key issues and shaped the agenda in environmental acoustics, nonlinear wave interaction in the ocean, and acoustic oceanography. Among the numerous books Leonid wrote, a special place belongs to *Waves in Layered Media*. First published in Moscow in 1956, the book was translated into English and Chinese and had five editions by 1980. It has since become a classic reference and textbook for several generations of researchers around the world. Many physicists who never met Leonid consider themselves his students, having learned wave propagation theory from his book.

Leonid received many honors and awards, including the Lenin Prize in 1970 and the Rayleigh Gold Medal of the UK Institute of Acoustics in 1977, and was elected to the USSR Academy of Sciences and the US National Academy of Sciences. Leonid used to say that he was fortunate to live the dream of his youth—to combine theoretical physics with traveling around the world. He enjoyed running, skiing, and practicing yoga. His firmness of purpose, vision, wisdom, uncompromising integrity, modesty, and

kindness were a great example for all who knew him.

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Katherine Austin Lathrop

Katherine Austin Lathrop, pioneer research scientist in nuclear medicine and professor emeritus in the department of radiology at the University of Chicago, died of complications of advanced dementia in Las Cruces, New Mexico, on 10 March 2005.

Born in Lawton, Oklahoma, on 16 June 1915, Katherine was drawn at an early age to the sciences. Initially, she majored in home economics, which introduced her to textile chemistry and to weaving, one of her many lifelong in-



Katherine Austin Lathrop

terests. An exceptional scholar, Katherine earned BS degrees in biology (1936) and physics (1939) and an MS in chemistry (1939) from Oklahoma State University. Katherine married Clarence Lathrop in 1938; they moved to Chicago with two children in 1944.

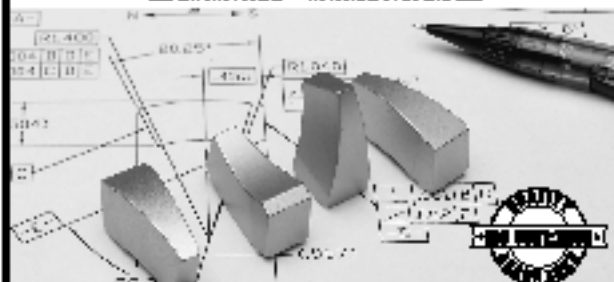
To help cover expenses, Katherine took a position in 1945 as a junior chemist at the metallurgical laboratory of the Manhattan Project on the University of Chicago (U of C) campus. There she carried out quantitative

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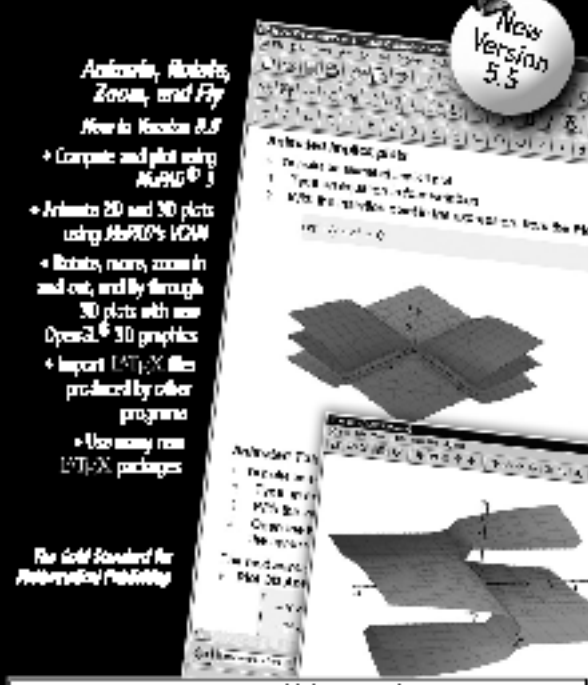
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Randolph A. Nanna, Publisher

studies of the dose distribution of radiation absorbed from radioactive materials (primarily radium and fission products) administered to laboratory animals. From 1947 to 1954, Katherine was an associate biochemist at Argonne National Laboratory (ANL) in Lemont, Illinois, and a chemist at the U of C.

After her fifth child was born in 1952, Katherine found the commute to ANL burdensome, and in 1954 she joined the research team of surgeon Paul V. Harper at the Argonne Cancer Research Hospital on the U of C campus. Part of the Atoms for Peace program of the US Atomic Energy Commission, ACRH opened in 1953 with the mission of exploring uses of radioactive materials and radiation beams in the diagnosis and treatment of cancer. Katherine's broad background in the sciences enabled her to make major contributions to this mission during the subsequent 40 years of her close working relationship with Harper.

Together, Katherine and Harper developed intraoperative radiation therapy procedures including iodine-131 "afterloaded" to fine polyethylene tubing threaded through cancerous pancreas tissue; yttrium-90 pellets implanted in the pituitary gland using a transsphenoidal approach; and strontium-90 delivered on the tip of a long, removable needle, also using the transsphenoidal approach. For all such procedures, Katherine performed meticulous measurements and calculations to determine the absorbed radiation dose distribution. As a possible alternative to ¹³¹I in some applications, Katherine and Harper developed a method for producing ¹²⁵I by freezing xenon-124 in a zirconium capsule and then irradiating it in the reactor at ANL. Now widely used in countless radioimmunoassay procedures, ¹²⁵I is currently produced commercially by essentially the same method.

On the basis of her contributions to quantitative radiation dosimetry, Katherine became chair of the medical radiation dose committee of the Society of Nuclear Medicine, a member of the American National Standards Institute Committee N44.3 on Nuclear Medicine, and a member of the advisory panel on radioactive pharmaceuticals for the United States Pharmacopoeia.

While therapy with radioisotopes remained an important part of its research, the ACRH nuclear medicine team is best known for the clinical introduction of metastable technetium-99 for detecting brain tumors and for a great variety of other diagnostic imaging applications. Annually, ^{99m}Tc is

used in approximately 35 million such procedures worldwide.

Katherine always found time to discuss research issues with students and trainees, and in the graduate program of medical physics she gave lucid and well-received lectures on nuclear physics, interactions of radiation with matter, dosimetry, radiochemistry, and radiopharmaceutical science. Those who knew Katherine will remember her with affection, admiration, and respect.

Robert N. Beck
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Gen Shirane

Gen Shirane, one of the world's foremost authorities on using neutron scattering as a probe of solids, and who for more than half a century was a leader in developing techniques by which high-flux nuclear research reactors were transformed into premier tools for studying condensed matter physics, died of a stroke at his home in Bellport, New York, on 16 January 2005.

Born in Nishinomiya, Japan, on 15 May 1924, Gen received a bachelor's degree in engineering physics from the University of Tokyo in 1947 and worked briefly at the Tokyo Institute of Technology. In the evolving society of post-World War II Japan, he was impatient with the old hierarchical ways of Japanese science; even before receiving his PhD in science from the University of Tokyo in 1954, he set off for Pennsylvania State University, where he worked from 1952 to 1957. His early experiments at Penn State and Tokyo used x-ray scattering, and his scientific interests were in sym-



Gen Shirane