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rents and other natural and manmade hazards. (Stromboli's volcano erupted 14 times during his circumnavigation of that island, for example.) And of course, he gave no thought to the comfort of using insulating grease or a wet suit, or to the precaution of having a support boat along.

His sudden death was caused by an undiagnosed mitral valve condition revealed, tragically, by the final exertions of his seventh swim round the island of Sark in the English Channel, a feat that he was the first to accomplish—at the age of 49.

Lighthill died as he lived—boldly, enthusiastically and very much larger than life.

DAVID CRIGHTON

*University of Cambridge
Cambridge, England*

Ernst Ising

Ernst Ising, originator of the widely applied model that bears his name and an emeritus professor of physics at Bradley University, died at his home in Peoria, Illinois, on 11 May 1998, the day after his 98th birthday.

Born in Cologne, Germany, Ernst began studying mathematics and physics at the University of Göttingen in 1919. He continued his studies at the University of Bonn and then at the University of Hamburg, where his teacher, Wilhelm Lenz, suggested that he turn to theoretical physics—in particular, to a model of ferromagnetism that Lenz had introduced in 1920.

In studying for his doctoral degree, which he received at Hamburg in 1924, Ernst focused on the special case of a linear chain of magnetic moments that can adopt only two positions, up and down, and that are coupled by interactions between nearest neighbors.

It was probably through the publication, in 1936, of a paper by Rudolf Peierls entitled "On Ising's Model of Ferromagnetism" that this famous model acquired the "Ising" epithet. In the hands of others, notably Hendrik Kramers, Gregory Wannier and Lars Onsager, the model proved strikingly successful in the search for the phase transition between the ferromagnetic and the paramagnetic state.

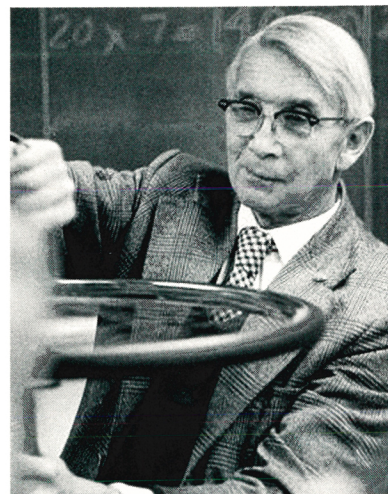
Ernst, however, knew nothing of his model's success at that time. After earning his PhD, he taught at public high schools in Germany, but was dismissed soon after Adolf Hitler came into power in 1933. From 1934 to 1938, he was a teacher and headmaster of a Jewish boarding school in Caputh near Potsdam, Germany. In Caputh, Ernst and his wife Jane found themselves neighbors to Albert Einstein, who had a summer home there. Ernst enjoyed

telling how he took his daily baths in Einstein's bathtub because he and Jane did not have a bathroom in their home.

In November 1938, the school at Caputh was destroyed by the Nazis and Ernst and Jane were forced to leave Germany the following year. They fled to Luxembourg with plans to emigrate to the US as soon as possible. When the Germans invaded Luxembourg in 1940 and rounded up most Jews a year later, Ernst and other men who were married to non-Jews were forced to dismantle the Maginot Line railroad in Lorraine. For the next four years, Ernst and Jane worked at menial jobs, struggling to survive.

They finally got to the US in 1947, and Ernst taught physics and mathematics at the State Teachers College in Minot, North Dakota. A year later, he came to Peoria and Bradley University, where he taught in the physics department until his retirement in 1976.

Ernst's life was forever changed by World War II. He never returned to his early research. In fact, it was not until 1949 that he found out from the scientific literature that his model had



ERNST ISING

become widely known. Today, the Ising model is a widely used standard model of statistical physics. Each year, about 800 papers are published that use the model to address problems in such diverse fields as neural networks, protein folding, biological membranes and social behavior.

In the postwar years, Ernst's great passion was for teaching, at which he excelled. His students will never forget his elaborate classroom demonstrations.

Ernst was a sensitive, artistic man who loved travel and the arts. He had a keen mind and sharp sense of humor, but was a gentle, quiet individual who always seemed a little shy when questioned about his famous model.



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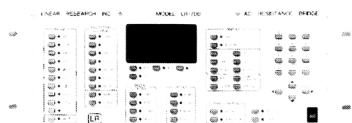
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Ernst will be missed by his family, his physics department colleagues, by the Peoria community and by the students whose lives he enriched through his teaching.

CONLEY STUTZ
BEVERLY WILLIAMS

Bradley University
Peoria, Illinois

Chris Ernie Earl Kuyatt

Chris Ernie Earl Kuyatt, an inspiring scientist and manager at the National Institute of Standards and Technology (NIST), died in Washington, DC, on 12 September 1998 following a brief illness.

Born on 30 November 1930 in Grand Island, Nebraska, Kuyatt earned BS, MS and PhD degrees in physics from the University of Nebraska in 1952, 1953 and 1960, respectively.

In 1960, he joined NIST's forerunner, the National Bureau of Standards, as a physicist in the electron physics section. There, he worked with J. Arol Simpson, who was developing an electron monochromator-analyzer. Not long after, at Westinghouse Electric Corp, George Schulz observed a resonant decrease in the elastic scattering of 19.3 eV electrons in helium. Kuyatt became intrigued by this new discovery, and he and Simpson modified their electron monochromator-analyzer by adding a gas scattering cell. They soon found sharp resonances in the transmitted current. At the same time, similar resonances were seen in photoabsorption spectra taken at the NBS synchrotron by Keith Codling and Robert Madden. Ugo Fano, who was then at NBS, explained these resonances as being due to the creation of multielectron autoionizing states. Soon observed later in many other gases, such resonances became a fertile and exciting area of research.

Kuyatt and Simpson continued their collaboration to improve electron monochromators and analyzers. Later, Kuyatt also focused on the optical properties of electron lenses. Kuyatt and Simpson's 1967 paper in the *Review of Scientific Instruments* on the principles of monochromator design was a landmark in the development of these systems. Kuyatt further described his design philosophy for monochromators and analyzers in a set of unpublished lecture notes that were circulated widely and used by many scientists as the basis for their own designs.

As the discipline of surface science emerged in the 1960s, Kuyatt began to study and develop specialized elec-

tron optical systems for such applications as measuring energy distributions of field-emitted and photoemitted electrons and delivering polarized electrons produced in the gallium arsenide source. These electron-optical systems, with their combination of high energy resolution and transmission, made possible a host of key observations of new phenomena on clean, adsorbate-covered and magnetic surfaces.

Beginning in the late 1960s, Kuyatt turned his attention to scientific management and rose through a series of managerial positions at NIST. He served as acting chief of the electron physics section (1969-70), chief of the electron and optical physics section (1970-73), chief of the surface and electron physics section (1973-78), chief of the radiation physics division (1978-79) and director of NIST's Center for Radiation Research (1979-91).

As radiation research director, Kuyatt led NIST's efforts in the areas of atomic, nuclear and accelerator physics, optical radiometry, ionizing radiation and dosimetry. Most recently, his interests were directed toward science policy and international cooperation. He worked with the NIST visiting committee on advanced technology and participated in negotiations to develop internationally accepted guidelines for evaluating and expressing uncertainties in physical measurements.

Kuyatt was a wonderful person to have as a colleague. Excited by scientific questions that arose in papers or discussions, he probed relentlessly to identify the key phenomena or issues. His infectious enthusiasm for science was equaled by his love of music. He was a member of the Rockville Concert Band from 1960—first as clarinet player and later as a concert master and associate director. In his early years, Chris, who stood about 2 meters tall, must have been an impressive figure leading the University of Nebraska's marching band in his 0.5-meter-tall drum major's hat!

He will be sorely missed by his many colleagues at NIST and throughout the world.

ROBERT J. CELOTTA
J. WILLIAM GADZUK
CEDRIC J. POWELL

National Institute of Standards
and Technology
Gaithersburg, Maryland

Samuel Bradley Burson

Samuel Bradley Burson, a retired physicist at the Nuclear Regulatory Commission, died of a stroke on 24