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Harold Ralph Lewis FREE

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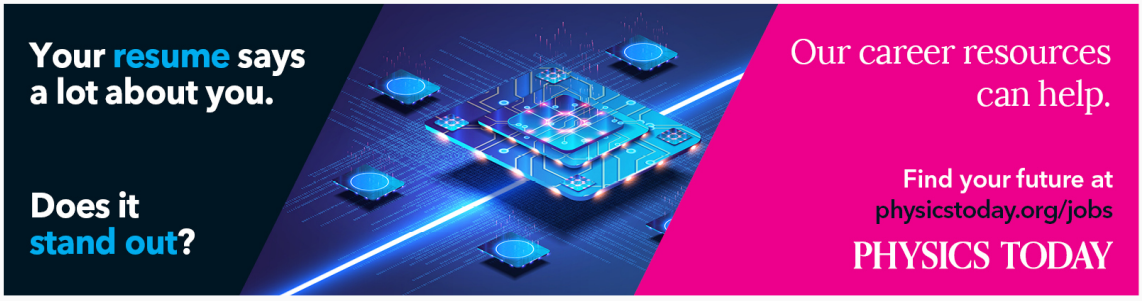

energy loss than if the ion had entered the crystal in a random direction. Further development of this ion channeling technique led to the discovery of resonant coherent excitation for multicharged ions with one and two electrons. In this process, an incoming channeled ion is quickly elevated to an excited state when a harmonic of the ion's perturbation frequency, given by the ion velocity and the spacing of atoms in the crystal, matches the frequency for electronic excitation. Excited ions thus produced are rapidly ionized inside the crystal. One could study the coherent excitation processes inside a crystal by studying the ions' charge state fraction versus the ions' velocity.

From 1976 to 1981, Sheldon led the atomic and molecular collisions group and heterogeneous catalysis group in the chemistry division. From 1979 to 1991, Sheldon and collaborators from Stanford University and Lawrence Livermore National Laboratory explored a related but different periodic perturbation effect. They channeled high-velocity electrons and positrons through a crystal to produce channeling radiation—that is, the release of strong, forward-directed x-ray radiation.

In the late 1970s, Sheldon and his ORNL coworkers first measured the dielectronic recombination for ions by merging a multiply-charged ion beam with an electron beam. This method provided cross sections that were needed for modeling energy-loss processes in hydrogen fusion-oriented plasmas. In 1981, Sheldon was named head of the atomic physics group of ORNL's physics division.

His continued innovations led him, along with coworkers, to conduct experiments using heavy-ion beams at CERN during the early 1990s. The interaction of these ultrarelativistic energy ions in gold foils illuminated, at extraordinary high-collision energy, atomic physics aspects such as ion charge state change and electron–positron pair production. The experimental measurements of the cross sections for charge capture and loss in high-Z collision systems provided the first test of existing theoretical calculations. Because a large capture cross section could lead to reduced storage lifetimes in colliders, it became important to establish design parameters of CERN's Large Hadron Collider and also of Brookhaven National Laboratory's Relativistic Heavy Ion Collider, which, at that time, was under construction.

More recently, while heavy-ion storage rings, such as the CRYRING in Stockholm, Sweden, were being built in Europe, Sheldon realized an idea. In those rings, a molecular ion beam is merged with a beam of electrons so that the collision of the electrons with the ions removes energy from the ions. The result is that each ion's random motion is reduced (that is, cooled). This technique allows the study of collisions at very low energies that earlier had not been possible. Sheldon and his collaborators used this method to study dissociative recombination at near-zero collision energy. The use of heavy-ion storage rings has contributed greatly to an improved understanding of processes in low-temperature plasmas, astrochemistry, and aeronomy.

For his work, Sheldon received numerous honors. In 2000, he received the Enrico Fermi Award, the highest award given by the US Department of Energy, with cowinners Sidney Drell and Herbert York. In 1998, he received the American Physical Society's Davisson–Germer Prize in Atomic Physics. Sheldon also was a fellow of the American Association for the Advancement of Science.

Those of us who worry how the loss of this giant scientist will affect the progress of collision physics should recall a saying of Sheldon's. When explaining an approach to a solution he had obviously conceptualized thoroughly but was still mulling over the details, he would say, with gestures for emphasis, "Not to worry." That will be difficult for many of us to do.

JOSEPH MARTINEZ
US Department of Energy
Washington, DC
HERBERT KRAUSE
Oak Ridge National Laboratory
Oak Ridge, Tennessee
BEN BEDERSON
New York University
New York City

Harold Ralph Lewis

Harold Ralph Lewis, an emeritus professor of physics at Dartmouth College, died at his home in Hanover, New Hampshire, on 25 March 2002, following a courageous battle with multiple myeloma.

Ralph was born on 7 June 1931 in Chicago, Illinois. He received AB and SB degrees in physics from the University of Chicago. He earned his MS (1955) and PhD (1958) degrees, both in physics, from the University of Illinois. His doctoral research, "A Method for Measuring Magnetic Fields in Superconductors," was carried out under the direction of Hans Frauenfelder. Ralph was reportedly an outstanding and cooperative student, with a knowledge and skill in theoretical physics that were remarkable for an experimentalist. Much of his later work was in theoretical physics. He was a postdoctoral research associate at the University of Heidelberg in Germany from 1958 to 1960 and an instructor in the physics department at Princeton University from 1960 to 1963.

HAROLD RALPH LEWIS

In 1963, Ralph became a staff scientist on Project Sherwood (later to become the controlled thermonuclear division) at Los Alamos National Laboratory, where he remained for 28 years. He spent those years working primarily on the controlled thermonuclear fusion project. During part of that time, he served as deputy group leader and associate group leader of the magnetic fusion theory group and earned distinction as an LANL fellow. He was equally adept in analytical and numerical methods. He focused much of his effort on the application of computers to plasma physics, an area in which he made numerous contributions. He developed Hamiltonian methods and applied them to models, such as the Vlasov fluid model, for treating plasma equilibrium and stability, and to a method of solving linear equations with time-dependent coefficients.

During the academic year 1975–76, Ralph took leave from LANL to accept a visiting professorship offer at the University of Wisconsin–Madison. There, he suggested a research topic for, and participated in the advising of, a graduate student, James Schwarzmeier. The thesis involved the simulation of Bernstein-

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Green-Kruskal (BGK) waves in plasmas and a comparison of the results with calculations using an analytic method developed by Ralph for the analysis of inhomogeneous equilibria.

Over a period of about 25 years, Ralph also held visiting faculty positions at Pennsylvania State University, the University of the Witwatersrand in South Africa, Culham Laboratory in the UK, and the Atomic Energy Commission (CEA) and National Center for Scientific Research (CNRS) in France. He tutored in the undergraduate and graduate programs at St. John's College in Santa Fe, New Mexico. And, from 1988 to 1990, he worked on administrative assignment at the US Department of Energy's Office of Fusion Energy. Fluent in German, Ralph collaborated on *Pauli Lectures on Physics* (MIT Press, 1973), a six-volume translation of the lecture notes of Wolfgang Pauli into English.

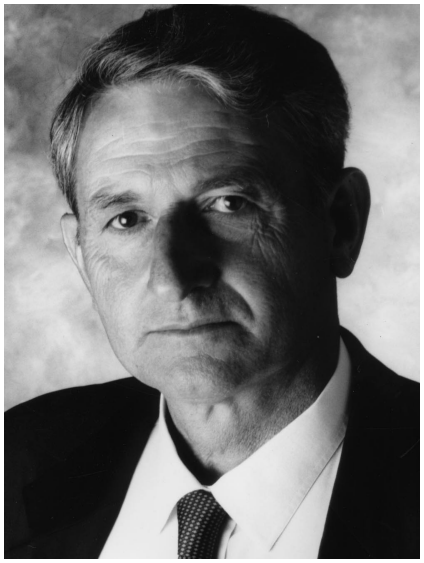
Ralph became professor of physics at Dartmouth in 1991, and, until his retirement in 1999, taught graduate and undergraduate courses, supervised PhD students and research associates, and published papers on the plasma physics of nonideal magnetohydrodynamic steady states in fusion devices and on some nonlinear mechanics problems that had interested him at a much younger age.

Ralph had a lifelong and intense interest in classical and jazz music, and was an accomplished clarinetist. He and his wife, Renate, were involved for many years with support activities at the Santa Fe Opera, Santa Fe Chamber Music Festival, and Los Alamos Concert Association. Ralph was an avid skier and hiker, always happy to be outdoors in the varied terrains of New Mexico and New Hampshire. He will be greatly missed by all who knew him.

HARRY DREICER
Los Alamos National Laboratory
Los Alamos, New Mexico
DAVID C. MONTGOMERY
Dartmouth College
Hanover, New Hampshire
KEITH R. SYMON
University of Wisconsin–Madison
LEAF TURNER
Los Alamos National Laboratory
Los Alamos, New Mexico

Charles Maisonnier

Charles Maisonnier, a respected fusion researcher and leader of the International Thermonuclear Experimental Reactor (ITER) program, died on 27 July 2001 in Brussels, Belgium, following complications from cancer.



CHARLES MAISONNIER

Charles was born on 8 October 1931 in Lyon, France. He attended school in the French system of elite "Grandes Ecoles": at the Ecole Centrale Lyonnaise (1951) and Ecole Supérieure des Télécommunications in Paris (1956).

Charles started his international career in physics in 1956 as a visiting student at the University of California, Berkeley, and at Brookhaven National Laboratory. He also worked at Saclay (1957–58) and at CERN (1958–60) on the design of new particle accelerators. In 1966, he defended his doctoral thesis at Lyon University. His thesis, a study of the dynamic tubular pinch, was done under the guidance of J. L. Descroix.

In 1960, Charles applied to work at a EURATOM association. He was appointed that same year to the Frascati Center on Fusion Research, near Rome, where he remained until 1978. Those were the golden years of plasma physics research. Charles's international scientific reputation rests with the 1MJ plasma focus project—which studied the acceleration of a hydrogen plasma to high velocity and its compression to high density and temperature—that he conceived and realized as laboratory director at Frascati. For this success, he received the Thibaud Prize for young physicists from the Academie des Sciences, Belles Lettres et Arts de Lyon, in 1968.

In 1978, Charles joined the Brussels EURATOM headquarters of the European Fusion Programme, becoming the director eight years later. He served as director for nearly 10 years. The European Fusion Programme benefited greatly from Charles's forceful efforts at maintaining a "single voice" in fusion policy matters within the complexities and diversities of the European Union, and from his capabilities in managing major crises.

The ITER venture, which was rooted in summit meetings during the mid-1980s and involved the joint efforts of the European Union, Russia, Japan, and later the US, was—and still is—a great challenge for the worldwide fusion community. Charles played an important role with ITER. He was the most active European delegate to the negotiations, which were resolved through the ITER Engineering Design Activities Agreement in July 1992. He then became a permanent member of the ITER Council until his retirement in 1996. During retirement, he continued to care about ITER and fusion, a world he never left.

Charles was afflicted in 1995 by cancer, which he met stoically. During his illness, he was surrounded by his large beloved family and the many friends he liked to receive so generously at his home until the end.

Charles seemed to possess the secret of friendship: He was charming and entertaining. But he was incapable of hiding his nature: dedicated, determined, exigent, and responsible. Therefore, it was no surprise that he was a leader, recognized and appreciated in the circles in which he participated.

ROBERT AYMAR
ITER Garching
Garching, Germany
ERNESTO CANOBBIO
Brussels, Belgium

Adrian Nicolae Patrascioiu

Adrian Nicolae Patrascioiu, a gifted theoretical physicist whose work spanned particle physics, statistical mechanics, and chaos theory, died on 2 March 2002 in Phoenix, Arizona, after a brief battle with a rare form of T-cell lymphoma.

Adrian was born on 11 December 1940 in Bucharest, Romania. While he was still in his late teens, he graduated from the Polytechnic Institute of Bucharest with a degree in electrical engineering, but soon realized that his passion was physics. In Romania in those days, one did not get second chances, so Adrian immigrated to the US in 1965 after a daring escape that involved swimming across the Adriatic Sea to Italy from what was then Yugoslavia. He obtained his PhD in physics from MIT in 1972. His thesis, written under the direction of Francis

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