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.

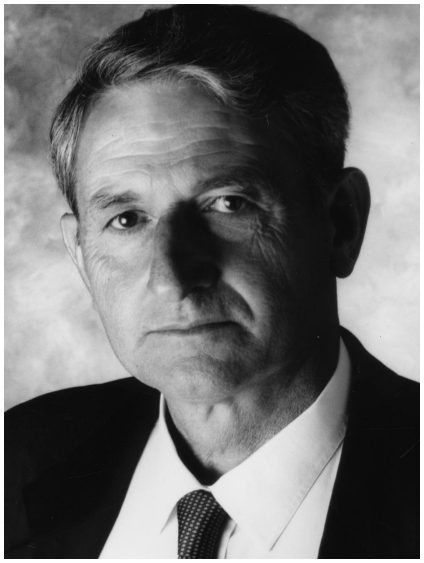
Ralph became professor of physics at Dartmouth in 1991, and, until his retirement in 1999, taught graduate and undergraduate courses, supervised PhD students and research associates, and published papers on the plasma physics of nonideal magnetohydrodynamic steady states in fusion devices and on some 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

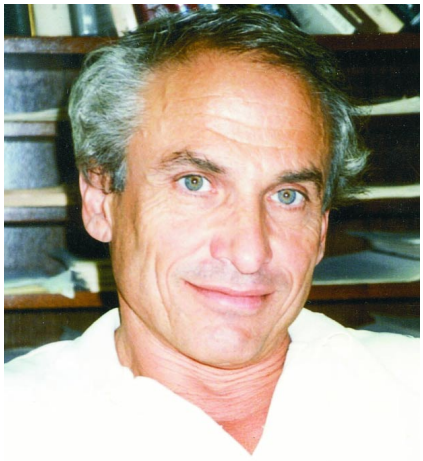
Low, dealt with Regge theory.

In 1973, Adrian moved to the Institute for Advanced Study in Princeton, New Jersey. His entire life as a scientist was characterized by his independence of spirit and unremitting search for truth. This quality was shown at an early stage in his career by his 1974 work on string theory, in which he constructed a bosonic string in noncritical (that is, fewer than 26) dimensions. Although quite prescient, this work perhaps had less impact than it might otherwise have had because "noncritical strings" are technically more complicated than their critical counterparts.

Adrian moved to the University of California, San Diego, in 1975 to take a position as a research associate. In 1977, he became an assistant professor at the University of Arizona, Tucson, where he spent the remainder of his career. As his focus shifted to gauge theories, he worked on classical solutions now called instantons and solitons. From 1977 to 1979, Adrian worked with Eldad Gildener on the contributions of instantons to energy spectra and on the effect of fermions coupled to instantons. Adrian and Gildener published a number of articles that received wide recognition.

At the end of the 1970s, Adrian became intensely concerned about the infrared problems inherent in the semiclassical treatment of instanton gases, both in Yang–Mills theory and its two-dimensional analog, the nonlinear sigma models (classical ferromagnets). His work on these instanton gases with Alain Rouet provided a complete calculation showing that these infrared effects lead to surprising results.

In the early 1980s, Adrian turned to the fundamental question of whether quantum behavior can be understood from something more fundamental. He noted that the assumed equipartition of energy, which in the late 19th century led to the failed attempts to understand blackbody radiation within the classical framework and which led Planck to introduce his quantum hypothesis, was not as well founded as many researchers had believed. Inspired by the seminal study of Enrico Fermi, John Pasta, and Stanislaw Ulam, who were arguably the first to document the failure of equipartition in a nonlinear classical system, Adrian studied a variety of nonlinear systems with potentially infinitely many degrees of freedom and found nonergodic behavior (resulting in violation of equipartition), which, in some cases, led to a



ADRIAN NICOLAE PATRASCIOIU

Planck-like spectrum. Whether his observation actually could lead to a "classical" foundation for quantum behavior remains an intriguing open question.

Adrian's earlier work with Rouet on the problematic aspects of the semiclassical approximation led directly to the main research theme of Adrian's later years, during which he questioned the validity of perturbation theory in asymptotically free field theories (four-dimensional Yang–Mills theory and two-dimensional classical ferromagnets with nonabelian symmetry) and hence of asymptotic freedom itself. He began this enterprise in 1984 and was joined in 1987 by one of us (Seiler). They argued that, despite its widespread acceptance, the presence of asymptotic freedom in models with nonabelian symmetry was an unresolved mathematical question. Because the question was central to particle physics (in particular, quantum chromodynamics) and condensed matter physics (low-dimensional ferromagnets), Adrian considered a mathematically rigorous resolution to be of great importance.

Adrian and Seiler used a multipronged attack, analytical as well as numerical, to back their dissident view that the perturbation theory approach, on which asymptotic freedom rests, is mathematically unjustified in those non-abelian models. In the course of their work, they produced a number of new ideas; one of the more interesting was the reduction of the question in the ferromagnetic case to a percolation problem. The percolation approach has proven quite fruitful and has led to some novel rigorous results. The central problem of asymptotic freedom, however, remains mathematically unsolved, although Adrian and Seiler accumulated a large body of evidence supporting their perspective. At the time of his death, Adrian was actively engaged in a number of new projects related to that research theme.

Although Adrian's devotion to his research was passionate, he pursued other interests with almost equal fervor. He brought to those pursuits many of the same traits that marked his physics research. For example, his love of music was intense but idiosyncratic. He prided himself on finding lesser-known gems, such as Bizet's "other" opera, *The Pearlfishers*. This work has since seen renewed public interest, but Adrian was convinced of its merits long before the popular revival. Adrian's passion for sports was equally intense: He was an avid skier, tennis player, and weightlifter. At the same time, he was a warm and generous person, enriched by an impish, ironic, and often self-deprecating humor. He was a devoted family man, and was especially proud of his daughter and son.

Adrian's life and career revolved around his tenacious search for the ultimate physical laws. His uncompromising personal honesty never allowed him to be satisfied with a theory that he did not find compelling, even if the weight of the entire physics community was behind it. His friends and colleagues will warmly remember Adrian as a physicist of the highest scientific integrity.

DAVID CAMPBELL
Boston University
Boston, Massachusetts
MITCHELL FEIGENBAUM
Rockefeller University
New York, New York
ERHARD SEILER
Max Planck Institute for Physics
Munich, Germany
DANIEL STEIN
University of Arizona
Tucson

Donald Keith Stevens

Donald Keith Stevens, former associate director for basic energy sciences under the Office of Energy Research (now the Office of Science) at the US Department of Energy (DOE), who spent more than 39 years in public service, died on 25 February 2002 in Kensington, Maryland, of natural causes.

Born on 30 July 1922 in Troy, New York, Don earned his bachelor's degree in chemistry at Union College in Schenectady, New York, in 1943.