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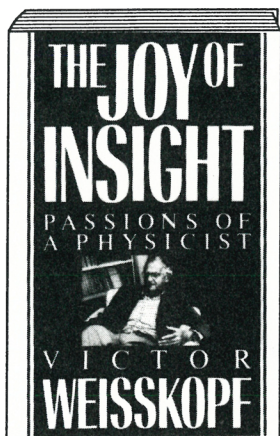
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**Charlotte Moore Sitterly**

In the 1920s she worked with Russell and others to update the solar-spectrum wavelengths, and she also assisted Russell in using the solar line strengths to make the first major determination of the Sun's chemical composition. After earning a PhD from the University of California in 1931, Moore returned to Princeton, where she worked on energy-level analyses of several complex atomic spectra. With Russell, she coauthored the monograph *The Masses of the Stars* in 1940, and in 1945 she completed her extensive compilation, the *Multiplet Table of Astrophysical Interest*.

In 1945 Moore joined W. F. Meggers's spectroscopy section at the National Bureau of Standards (now the National Institute of Standards and Technology), where she was put in charge of an atomic energy levels program.

She did indeed take charge. Far from regarding the job as simply one of gathering published data, she drew on her wide knowledge of the research of many atomic spectroscopists to obtain extensive unpublished material. She critically examined the data for each spectrum. When she noticed important gaps or dubious analyses, she persuaded the best qualified spectroscopists to carry out new observations and analyses. The resulting three volumes of *Atomic Energy Levels* (1949-58) included data for 485 atomic species that were organized in a uniform, clear format with standardized notation.

In October 1946, Richard Tousey's group at the Naval Research Laboratory used a V-2 rocket to obtain ultraviolet spectra of the Sun extending down to 2200 Å. In the early 1950s Moore began working with Tousey on analyses of ultraviolet

solar spectra that his group had been collecting with these rockets. Their collaboration continued until her death. After officially retiring from NBS in 1968, Moore joined Tousey's group at the Naval Research Laboratory in 1971 and also continued her work at NBS.

Moore's service to the scientific community would not have been possible without her persuasiveness, discretion and firmness when required. The great amount of unpublished material she obtained from many spectroscopists is evidence of their confidence in her handling of data. Her genial and helpful nature stimulated a continuous flow of requests for data from a large and international group of scientists, all of whom received prompt and authoritative responses. She frequently welcomed astronomers who were visiting Washington as guests in her home. Her many friends and colleagues will remember her with affection and esteem.

WILLIAM C. MARTIN  
National Institute of Standards  
and Technology  
Gaithersburg, Maryland

## Kent M. Terwilliger

Kent Melville Terwilliger, the associate chairman of the University of Michigan physics department, died on 23 February 1989, after an illness of about six months. He was 64 years old.

Terwilliger was a member of the small group of midwestern physicists that made many innovations in accelerator physics during the 1950s. In 1955, with Donald W. Kerst and other physicists at the Midwestern Universities Research Association (MURA), he coauthored one of the first articles proposing colliding beams as a means of achieving very high center-of-mass energies. His 1956 experiments with the Michigan fixed-field, alternating-gradient electron accelerator model were the first to demonstrate the manipulations of rf phase space necessary to achieve practical luminosities with hadron colliders.

While on a fellowship at CERN, Terwilliger developed an idea for increasing the luminosity of the CERN Intersecting Storage Rings by superposing equilibrium orbits of different momenta at the beam-crossing azimuths. The magnets developed for this purpose came to be called "Terwilliger quadrupoles."

During the 1960s and early 1970s Terwilliger collaborated in a program of spark-chamber experiments to

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study pion-proton scattering at the Zero Gradient Synchrotron at Argonne National Laboratory. In the mid-1970s he joined the Michigan polarized beam group and played a major role in the pioneering 12-GeV ZGS experiments, in which the group discovered large spin effects in large-angle proton-proton elastic scattering. In the 1980s Terwilliger was an important figure in the acceleration of polarized protons in the 30-GeV Alternating Gradient Synchrotron at Brookhaven, and he developed the phenomenological "Terwilliger model" to understand the strengths of the many depolarizing resonances that had to be overcome at the AGS. More recently Terwilliger played a major role in the search for ways to accelerate polarized protons to much higher energies. At the time of his death he was actively working on ways to maintain polarized beams in the Superconducting Super Collider.

Terwilliger received his BS from Caltech in 1949 and his PhD in physics from the University of California at Berkeley in 1952. He joined Michigan's physics department in the fall of 1952 and remained there throughout his career.

At Michigan, Terwilliger was highly esteemed as a teacher and collaborator. He had a deep love and respect for the physical world and possessed the rare ability to pinpoint the crux of a complex research problem. Although quiet and self-effacing, Terwilliger was daring as a scientist. His rigorous scientific honesty and careful research provided a standard that inspired many scientists around the world.

L. W. JONES  
A. D. KRISCH

*University of Michigan  
Ann Arbor, Michigan*

## Ernest Coleman

Ernest Coleman, a senior physicist in the office of high-energy and nuclear physics of the US Department of Energy, died on 17 January 1990 at the age of 48.

Coleman received his doctorate in physics from the University of Michigan in 1966 and completed a one-year postdoctoral fellowship at DESY in Hamburg. He then became an associate professor of physics at the University of Minnesota, before joining the Federal government in 1974.

Coleman's research contributions were in the area of nucleon interactions at high energies. In experiments conducted primarily at the Cosmotron at Brookhaven and the



**Ernest Coleman**

Zero Gradient Synchrotron at Argonne, he studied scattering of protons and mesons from hydrogen and deuterium targets. In his earlier studies to test the one-nucleon exchange model, Coleman's work led to a multiple-scattering correction to Roy Glauber's theory. At DESY, Coleman made important contributions to experiments led by Samuel Ting to examine the photoproduction and leptonic decays of vector mesons.

In 1974 Coleman became head of the central laboratory research section in the Atomic Energy Commission's division of physical research. He remained with the organization as it became first the Energy Research and Development Administration and then the Department of Energy. At DOE in 1980, he developed a unique and valuable paradigm based on extensive historical data to assist high-energy physics laboratories project escalation costs associated with inflation.

Coleman's interest in education was evidenced in his successful leadership of SLAC's Summer Science Program, which he directed from 1971-84. The program nurtures the scientific research capabilities of talented high school students who aspire to be scientists. Many of the participants were members of minority groups sought out by Coleman.

Coleman responded graciously to requests to address professional groups interested in affirmative action. His concern for improving opportunities for members of minority communities and his willingness to assist with these matters made him a valuable role model, especially for young people.

J. V. MARTINEZ  
*US Department of Energy  
Washington, DC* ■