



ROSE

In 1958, the year he became an American citizen, Rose joined the newly formed department of nuclear engineering at MIT and developed the department's teaching and research programs in controlled nuclear-fusion science and technology. His pioneering text *Plasmas and Controlled Fusion*, written with Melville Clark Jr, set the context for fusion-reactor studies that continues to this day. Many of the world's current leaders in plasma and controlled-fusion research were trained in Rose's laboratory and by his lectures.

In 1969 Rose's energetic and effective leadership was channeled in a new direction. While on leave from MIT for two years, he became founder and first director of the Office of Long Range Planning at Oak Ridge National Laboratory and began his work on ecological and environmental questions and their relation to energy systems. He established the pioneering program that led to the laboratory's internationally renowned research in energy conservation and environmental sciences.

On his return to MIT in 1971, Rose formulated and taught the first academic courses on environmental problems and energy systems. In the early 1970s he became a recognized authority on nuclear-waste disposal, and he subsequently made contributions to the study of acid rain due to fossil-fuel combustion and of the relationships between world energy options and the global climate, focusing on strategies for reducing the accumulation of carbon dioxide in the atmosphere. A dynamic, witty and highly effective teacher, Rose consistently attracted to his classes large numbers of students from a wide variety of disciplines and departments. Shortly before his death, he completed a textbook, *Learning About Energy*, scheduled to be published in 1986 by Plenum.

In 1978 Rose became a member of the

World Council of Churches' Working Party on the theological and ethical issues underlying the search for a just, participatory and sustainable society. His enthusiasm and drive led to MIT's becoming the host of the council's conference on "Faith, science and the future," held 12-24 July 1979.

In 1979 Rose was selected by his MIT colleagues to receive the 1979-80 James R. Killian Jr Faculty Achievement Award and to deliver the Killian lecture that year.

From 1981 on, Rose was a senior research fellow at the East-West Center in Honolulu and divided his time between Cambridge and Hawaii. In Honolulu he worked on cooperative programs among the nations of the Asian Pacific area for the development of economical and environmentally acceptable electricity supplies for the region's developing nations.

Rose's professional life spanned three distinguished careers: that of scientist and engineer, that of technology and policy analyst and that of communicator between scientists and theologians. He wrote and lectured widely on all of these areas. In addition to his professional accomplishments, Rose was a man of acknowledged personal charm and humor, and of open, witty and delightful relations with associates and friends.

WILLIAM P. ALLIS

ELIAS P. GYFTOPOULOS

RICHARD K. LESTER

Massachusetts Institute of Technology
Cambridge, Massachusetts

Laura Eisenstein

Laura Eisenstein died tragically on 14 August 1985 at the age of 41 in Champaign, Illinois.

Eisenstein was a graduate of Barnard College (AB in physics, 1963), Columbia University (AM in physics, 1964) and Harvard University (PhD in physics, 1969). With her husband Bob, she joined the physics department of the University of Illinois in 1969. In 1971 she became a research assistant professor, in 1974 a research associate professor, and in 1980 a permanent member of the staff as an associate professor.

Eisenstein served the physics community in all ways: through her research, through her guidance and education of her graduate students, through her dedicated service on many university and professional committees, as an elected officer of The American Physical Society and through her stimulating lectures at colloquia and conferences. In all of these roles she established her reputation as a dedicated physicist, a congenial and gracious colleague, a hardworking and

reliable collaborator and a lucid speaker.

Eisenstein's first area of research was high-energy physics. As a member of the Illinois group she participated in a number of studies, among them the exploration of the K^+p reaction. The inevitable conflict between the relentless demands of experimental high-energy physics and the unceasing requirements of bringing up children led her to look for an equally challenging field that could be pursued in a small laboratory. She found this field in biomolecular physics and from 1972 on she concentrated her energies on the exploration of proteins. To deepen her knowledge of the field, she spent the academic year 1973-74 as a NATO postdoctoral fellow at the Institut de Biologie Physico-Chimique in Paris, where she worked with Pierre Douzou. After her return to Urbana she continued her collaboration with Hans Frauenfelder (in physics) and Irwin Clyde Gunsalus (in biochemistry) in exploring the dynamics of proteins over a wide range of temperatures. This work led to a deeper understanding of protein motions and to the realization that even phenomena such as quantum-mechanical tunneling can be investigated successfully in proteins. Striking out on her own, she concentrated on two remarkable systems, bacteriorhodopsin and rhodopsin. Using Fourier-transform infrared-difference spectroscopy, she and her students provided essential contributions to the understanding of the important photo-cycles in these systems. It was typical of Eisenstein's approach that nearly all of this work involved interdisciplinary collaborations with scientists in many different institutions, for instance Tom Ebrey (University of Illinois), Koiji Nakanishi (Columbia), Julian Sturtevant (Yale) and members of the Biophysics Institute of the Hungarian Aca-

EISENSTEIN



American Institute of Physics Conference Proceedings 135.
Proceedings of a conference held at the Congressional Office
of Technology Assessment in Washington, D.C., April 1985.

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demy of Sciences in Szeged.

Eisenstein served for five years on the APS Committee on the Status of Women, serving as chair for 1983-84. She was a member of the editorial board of the Biophysical Society (1982-85), and was elected to the nominating committee of the AAAS physics section and to the executive committee of the APS biological-physics section. She was also a member of the NIH study section on biophysics and biophysical chemistry.

In her honor the department of physics of the University of Illinois at Urbana-Champaign, together with the APS Committee on the Status of Women, has instituted the Laura Eisenstein Award to encourage women students in the pursuit of a degree in physics.

HANS FRAUENFELDER

PETER G. DEBRUNNER

University of Illinois
at Urbana-Champaign

James Daniel Hardy

James Daniel Hardy, Professor Emeritus at Yale University and Director Emeritus of the John B. Pierce Foundation, died 6 September 1985 at the age of 81. Hardy received his bachelor's (1924) and master's (1925) degrees from the University of Mississippi. He obtained his PhD in physics from The Johns Hopkins University in 1930, where he worked with A. H. Pfund on problems in infrared spectroscopy.

In 1932 Hardy became a research fellow at the Russell Sage Institute of Pathology at the Cornell University Medical School, where he applied his knowledge of physics and instrumentation to problems in physiology. His work led to the first quantitative assessment of pain and to the seminal book *Pain Sensations and Reactions*, written with Harold A. Wolff and Helen Goodell. His development of the Hardy radiometer was important to his analyses of energy balance in human thermoregulation, a subject that interested him all of his life and to which he made fundamental contributions.

In 1940 Hardy joined the Navy as a physicist, working on mine-detection techniques and then, characteristically, applying these techniques while serving as an officer on mine sweepers in the Mediterranean. He served as director of the Naval Reserve Officers' School in Philadelphia in 1953 and retired from the Naval Reserve with the rank of Rear Admiral in 1964. He was awarded the Purple Heart and the Medal of the Legion of Merit.

While professor and director of graduate studies in physiology at the University of Pennsylvania, Hardy acted also as scientific director of the Naval Medical Research (human centrifuge)