

well-balanced vision of the work and had great instincts about what was possible. Some of us still remember his "Salut, les copains" ("Hello, buddies") resonating at the beginning of potentially delicate meetings. His rigor, efficiency, and honesty were well recognized.

Falk-Vairant left CERN in 1981 to join the French National Institute for Particle and Nuclear Physics (IN2P3) as deputy director for particle physics, a position he held until his retirement in 1987. During his time at IN2P3, French groups made significant contributions to the proton-antiproton collider work at CERN in the UA1 and UA2 experiments, the preparation of the major French experimental effort at the LEP, and the beginning of underground experiments, particularly the Fréjus tunnel. Falk-Vairant had the foresight to realize that a lack of computer resources could hinder progress in the use of the LEP. To avoid a bottleneck, he directed the construction of a computing center in Lyon for the different research groups of the IN2P3. Through his leadership, he positively influenced the necessary transition of particle physics research to the very large international groups that constructed and used large detectors at CERN.

Falk-Vairant enjoyed yachting and modern art. He was a man of impeccable character who often came to his decisions during solitary walks in a small Parisian park close to the IN2P3 head office, after collecting opinions directly from those people involved. He then presented his decisions in a passionate and almost theatrical manner. His wisdom and personal style will long be remembered. A modest man, Falk-Vairant was very happy to have been in key positions during a glorious era in particle physics.

MAURICE JACOB
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Geneva, Switzerland

Peter Mazur

Peter Mazur, one of the founders of nonequilibrium thermodynamics, died on 15 August 2001 following a short illness. Born on 11 December 1922 in Vienna, Austria, he died in Switzerland, where he had lived after his retirement. During World War II, Mazur had to go into hiding for about three years in various farms in the Dutch countryside. He then began studying chemistry at Utrecht University in the Netherlands.

In 1951, Mazur obtained his doc-

C. W. J. BEENAKKER



PETER MAZUR

torate under the direction of Sybren de Groot with a thesis entitled, "Thermodynamics of Transport Phenomena in Liquid Helium-2." The results were in good agreement with experiments done at the Kamerlingh Onnes Laboratory in Leiden, the Netherlands.

After many futile attempts to obtain a theoretical foundation for experimentally established reciprocal relations, Lars Onsager finally (in 1931) showed that such relations were a general consequence of the invariance of the microscopic equations of motion under time reversal. Josef Meixner in 1941 and, independently, Ilya Prigogine in 1947 set up a consistent phenomenological theory of irreversible processes, incorporating both Onsager's reciprocity theorem and the explicit calculation for some systems of the so-called entropy source strength. Shortly thereafter, Mazur and de Groot joined this group as founding fathers of the new field of nonequilibrium thermodynamics.

After a period as a postdoctoral fellow at the University of Maryland, College Park, Mazur became an associate professor at Leiden University in 1954. He and de Groot, who had also moved to Leiden, founded, in 1955, the Lorentz Institute for Theoretical Physics at Leiden University. In 1961, Mazur became a full professor, and when de Groot left in 1963, he became director of the institute. He filled this position in his own distinctive way for 25 years until he became emeritus in 1988. Under the direction of de Groot and Mazur, the institute grew substantially and eventually established the Lorentz Chair, a prestigious special professorship.

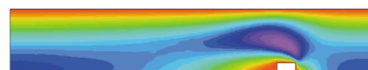
In his first years at Leiden University, Mazur studied the classical

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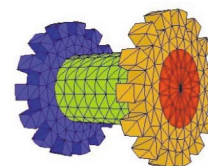
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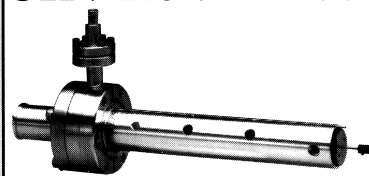


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and quantum molecular foundations of nonequilibrium thermodynamics. Significant results included the derivation of the Langevin equation with one of us (Oppenheim) and the classic paper on harmonic oscillator systems by George Ford, Mark Kac, and Mazur, which was published in the *Journal of Mathematical Physics* (in 1965). Mazur's work in the 1950s and 1960s culminated in the publication of *Nonequilibrium Thermodynamics* (North-Holland and Interscience, 1962), written by de Groot and Mazur. This book, translated into several languages, became a classic in the field and was later republished as a series of classic monographs.

Mazur's work in subsequent years addressed a variety of problems in statistical mechanics. He had a good nose for problems ripe to be investigated. To describe diffusion of large particles in fluids, he introduced, together with one of us (Bedeaux), the concept of induced forces in 1974. This concept was used to derive generalizations of Faxen's theorem and to develop a theory for the viscosity of a suspension. In 1976, Mazur, with Bedeaux and Alfonso Albano, gave the first systematic formulation of nonequilibrium thermodynamics for surfaces. This formulation opened a new field, which is still in active development. And Mazur, Wim van Saarloos, and Carlo Beenakker developed an algebraic method around 1982 to successfully describe hydrodynamic interactions between arbitrary numbers of particles using induced forces. This was a breakthrough in the field.

After retiring in 1988, Mazur remained active. In 1991, he derived, with Bedeaux, the Langevin equation for a Brownian particle using only causality and time-reversal invariance. From 1994 to 2000, Mazur, together with J. Miguel Rubi, used the method of internal degrees of freedom to describe fluctuations in the context of nonequilibrium thermodynamics. In 2001, he and Bedeaux developed nonequilibrium thermodynamics for quantum systems.

Many of Mazur's colleagues and students have good memories of his flamboyant lecture style and the often heated discussions in front of the blackboard. He insisted on a crystal-clear introduction followed by a detailed derivation of the results. And he thoroughly disliked sentences such as, "It can be easily shown that. . . ." It was great to work with him.

Mazur served on the boards of the International Union of Pure and Applied Physics (1966–84) and the

Dutch Foundation for Fundamental Research of Matter (1970–85). In 1987, Queen Beatrix made Mazur a Knight of the Order of the Netherlands Lion.

Mazur was an excellent scientist, and superb teacher and colleague, whose knowledge and interests encompassed not only science, but almost all fields of intellectual endeavor. A great man, he was devoted to his family, friends, and colleagues. We will miss him dearly.

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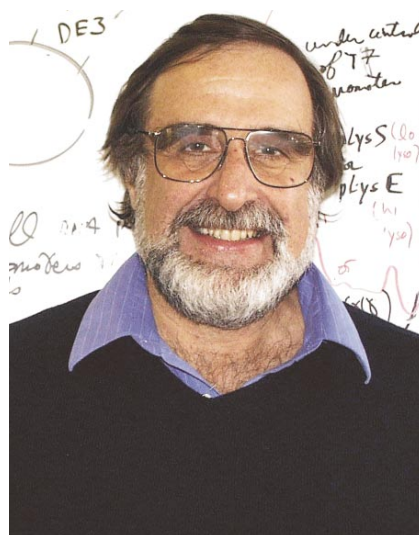
Robert Alexander Mendelson Jr

Robert Alexander Mendelson Jr was among a wave of physicists who sensed the changes in biology in the 1960s and went on to define molecular biophysics and structural biology during the latter half of the 20th century. He died in San Francisco, California, on 5 August 2001 of lung cancer.

Born in Los Angeles on 24 January 1941, Bob earned an AB in physics in 1962 from Occidental College in Los Angeles. He received his PhD in physics from the University of Iowa in 1967 under the direction of his thesis adviser Raymond T. Carpenter. For his thesis, Bob studied the excited states of nuclei.

Bob moved in 1968 to pursue postdoctoral research in nuclear physics at the University of California, Berkeley. During his period as a postdoc, he decided to bring the precise experimental and theoretical approaches of nuclear physics to the study of biological processes. Perhaps he sensed that biophysics was about to flourish in an unprecedented way.

In 1970, he moved across the Bay and joined Manuel Morales's group at the University of California, San Francisco. Morales, one of the leaders studying the molecular physiology of muscle contraction, had the vision to see the power of physical methodologies. Bob established nanosecond techniques for following fluorescence in muscle proteins. His was probably the second nanosecond rig to work on biological macromolecules. He expanded his research to include the measurement of fluorescence in different time domains and the use of fluorescence to measure the structure



ROBERT ALEXANDER MENDELSON JR

and orientation of organized biological systems. Bob later (1984) attained the rank of professor of biophysics.

During the late 1970s, Bob started what was to become his major research focus: the use of small-angle solution scattering techniques to study the structure, dynamics, and organization of biological macromolecules. Initially, scientists in his laboratory used small-angle x-ray scattering to study the muscle motor protein myosin. They were among the earliest users of the synchrotron facility at the Stanford Synchrotron Radiation Laboratory. Bob then pioneered, in 1984, the application of small-angle neutron scattering to the study of complexes of muscle proteins and how the structures of the individual proteins change while executing their function. These structural studies, together with other work, form the basis for our current understanding of how protein molecular motors generate force and are regulated.

Bob loved experiments and had a passion for developing new instrumentation. He was a hands-on experimentalist until his death. As a physicist, he coupled his experimental prowess with a deep theoretical understanding, analyzing each experimental result with a battery of theoretical and computational techniques. His last work was a tour de force on determining the molecular basis for the regulation of muscle contraction by the troponin system of proteins. The work has all the hallmarks of Bob's style of science: exquisite biochemistry, state-of-the-art neutron measurements, and computationally intense analysis. He worried about all aspects of an experiment. His laboratory worked via dialectical principles,