

the statistical behavior of fluctuating cross sections, which had been predicted by Torlief Ericson. In his early data from Rutgers, he found the first firm confirmation of the theory for many degrees of freedom. Among nuclear physicists, however, he is probably best known for his work on isobaric analog resonances. These studies led to the Barshay–Temmer theorem, a fundamental symmetry relation in nuclear reactions.

Temmer was a strong advocate of cross-disciplinary collaboration between scientists, clearly manifest in the fruitful cooperation between Rutgers University and AT&T Bell Laboratories. Together with Bell Labs scientists, Temmer initiated some of the first experiments in the channeling of nuclei through crystals. These experiments led to the measurement of lifetimes of compound nuclei around 10^{-18} s.

Toward the end of his career, Temmer became an active participant in activities opposing the nuclear arms race, nuclear testing and the Strategic Defense Initiative. He served as vice chairman of education for the Coalition for Peace Action in Princeton, New Jersey. He lectured widely in the US, USSR and Western Europe.

Temmer was a “universal” physicist. He consistently supported developments on the interface between nuclear physics and atomic and condensed matter physics and always was a strong advocate for inclusion of theorists in experimental groups. He cultivated relationships with scientists from all over the world. His laboratory was always a beehive of activity, where long-standing collaborations were formed, all languages were spoken and many aspects of physics beyond nuclear physics were explored. He was one of the first official scientific visitors from the US to the USSR, and also to China, where he spent a sabbatical leave in 1972.

Georges Temmer’s broad knowledge, his flair for physics and his immense curiosity provided intellectual stimulation to all around him. His enjoyment of life as a physicist was contagious. His friends and colleagues will miss him.

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Viktor Yakovlevich Frenkel

Viktor Yakovlevich Frenkel, one of the most prolific historians of Russian and Soviet science and technology,

died suddenly of a stroke on 8 February 1997 in St. Petersburg, Russia. He was the author, coauthor, editor and compiler of 40 books and some 300 papers concerning the history of physics.

Frenkel was born in Leningrad on 22 February 1930, the son of Yakov Ilich Frenkel, the long-time head of the theoretical physics department at the A. F. Ioffe Leningrad Physical-Technical Institute. As a young boy, Viktor Frenkel experienced some of the most difficult trials of Soviet life: the ruthless purges ordered by Stalin in the 1930s, the German invasion of the USSR in June 1941, and the blockade of Leningrad.

The Frenkel family survived the war by moving to Kazan, on the Volga River, along with other members of the scientific elite. Upon returning to Leningrad, Viktor Frenkel completed high school and entered the Leningrad Polytechnical Institute, writing his senior thesis on meson theory. His excitement over his impending graduation in 1953 was tempered by the death of his father and a growing climate of ideological repression directed against Jews and of damaging attacks on genetics, relativity theory and quantum mechanics. After a year of unemployment, Frenkel began work at a radio tube factory, work that led to his candidate of science degree in 1960 from Leningrad Polytechnical Institute. In 1959, he transferred to the Ioffe Institute, where he remained until his death. There, he worked on mathematical and plasma physics through 1973, and then devoted himself to the history of physics. He became a senior scientist and the institute’s deputy scientific secretary (1973–86).

As a historian of physics, Frenkel preferred to write biographies and based all of his works on extensive archival research. His last major work was a biography of his father: *Yakov Ilich Frenkel* (Basel, Birkhäuser Verlag, 1996), an extensive revision of the 1966 Russian version. He wrote or cowrote biographies of Paul Ehrenfest, Alexander Friedmann (with Artur Chemin and Eduard Tropp) and Igor Kurchatov (with A. P. Grinberg). He coauthored books about two of his father’s colleagues, Matvei Petrovich Bronshtein (with Gennady Gorelik) (Moscow, Nauka, 1990; in English, Basel, Birkhäuser Verlag, 1994) and Vsevolod Konstantinovich Frederiks (with Anatolin Sonin) (Moscow, Nauka, 1995), both of whom had been among the dozens of his father’s physics colleagues who perished in the purges or the gulag system.

Frenkel also assembled a series of books of documents, letters and pre-

viously published articles on leading physicists that serve as crucial primary sources for the study of Soviet science, for example the Ehrenfest–Ioffe correspondence and reminiscences of Abram Alikhanov and Boris Konstantinov. Recently, he published articles on George Gamow and Fritz Houtermans, who had been *personae non gratae* in the USSR for imaginary crimes against the state.

Frenkel believed that science was international. He wrote about the relationships that Wolfgang Pauli and Niels Bohr each had with Soviet scientists. His publication record clearly reveals a physicist and historian dedicated to opening the history of Soviet science to examination of its social, political and philosophical aspects, always grounded in a thorough mastery of the science itself.

His home was always open to foreign guests, no matter the period of Soviet history. Even before the breakup of the Soviet Union, he helped western scholars gain access to previously closed Soviet archives and generously secured photographs as book illustrations.

In his last years the economic hardships that beset Russia began to tell upon Frenkel’s health, requiring him both to continue his writing at a feverish pace and to endure the sheer physical challenges of living in a large city whose transportation and consumer goods infrastructure had crumbled. But that did not interfere with his miraculous productivity or his hospitality.

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Albert Moscowitz

Albert Moscowitz, an international authority on the spectra of chiral molecules, died of cancer in Minneapolis on 25 September 1996, at the age of 67.

Moscowitz was born in Manchester, New Hampshire. He did his undergraduate studies at the City College of New York and obtained his PhD in chemical physics from Harvard University in 1957. Following two years as a postdoctoral fellow at Washington University, he joined the University of Minnesota’s chemistry faculty in 1959, where he remained for the rest of his career.

In his thesis, Moscowitz recognized that the Kronig–Kramers relations have their counterparts in relations between optical rotation and circular dichroism spectra. He used this insight to replace the direct calculation of rotational strengths from circular dichroism spectra, which were then

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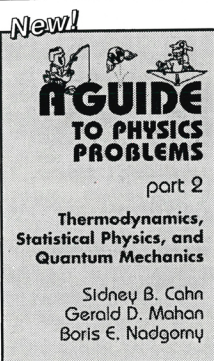
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Through his own work and in important collaborations in the early 1960s with Carl Djerassi, Kurt M. Mislow and Robert B. Woodward, Moscovitz made major contributions to our understanding of the relation between the rotational strengths of electronic transitions and the structure of chiral molecules. A chromophore (the molecular group responsible for the transition) was classified either as chiral in its own right or as achiral, but chirally perturbed. In the latter case it proved possible to formulate a simple procedure, called the octant rule, for estimating the contribution of each part of the molecule to the rotational strength.

Together with his students and associates, Moscovitz calculated the rotational strengths required to test these ideas on a wide variety of molecules. He extended his calculations to magnetically induced circular dichroism, which can occur even in achiral species. In collaboration with John Overend, he developed a charge flow model of vibrational contributions to optical activity in the infrared region.

Although primarily a theorist, Moscovitz often worked with experimental colleagues, both in this country and abroad. Many of these collaborations were in biomedical areas. An example is his work on the structure of bile pigments, a joint project with David A. Lightner and the research group of Cecil J. Watson.

Albert Moscovitz was widely admired and respected by his many students, colleagues and friends for his altruism, integrity and humor, as well as for his extraordinary courage and endurance in the face of his final long-term illness. He retained his zest for science to the end; his last paper appeared only a month before his death.

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Joseph John Loferski

Joseph John Loferski, noted for his pioneering work on the development of modern solar cells, died of cancer at 71 in Providence, Rhode Island, on 20 January 1997.

Born in Hudson, Pennsylvania, Loferski earned a BS in physics from the University of Scranton in 1948 and received his MS (1949) and PhD (1953) in physics from the University of Penn-

sylvania. From 1953 to 1960, he was on the technical staff of RCA Laboratories in Princeton, New Jersey, where he worked on p-n junction photovoltaic cells with Paul Rappaport. The early work of Loferski and other researchers on solar cells demonstrated that semiconductor devices might one day produce commercially competitive, pollution-free electricity.

In 1961, Loferski was appointed professor of engineering at Brown University, where he remained for the rest of his career. He served as chairman of the division of engineering from 1968 to 1974 and associate dean of the graduate school from 1980 to 1983. He was codirector of the Rhode Island Center for Thin Film and Interface Research, established in 1988, and became professor of engineering emeritus in 1990. At Brown, Loferski was a popular teacher and was deeply involved in the education reform processes.

Having been an exchange fellow at the Institute for Nuclear Research in Warsaw, Poland, from 1974 to 1975, Loferski served as science counsellor at the US embassy in Warsaw, from 1985 to 1987. In 1988, he was appointed one of four US members of the US-Poland Joint Commission on Cooperation in Science and Technology. At other times in his career, he served as a consultant to NASA, to other Federal agencies and also to the private sector.

Some of Loferski's papers have become classics. They cover such topics as calculations of limiting efficiencies for solar cells made from various semiconductors and include some of the earliest papers on spectral responses of cells, radiation damage and radiation hardening to gallium arsenide cells, tandem structure cells and the utilization of new semiconductor materials. Today, Loferski's steadfast faith that energy from the Sun would eventually play an important role in meeting our energy needs may be vindicated by the growing energy and environmental crisis.

Loferski was a man of many talents and wide interests who will be remembered with great affection. He treated his students generously, and his graduate students became his extended family. As the pastor said at his funeral, "Joseph Loferski was a man who acted justly, loved tenderly and worked humbly."

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