In Remembrance

Eric R. Cosman '63 (XVIII), PhD '66, professor emeritus of physics, dies at 75

Nuclear physicist whose early career focused on nuclear reactors, isobaric analog and shape-isometric nuclear states, transitioned to biomedical physics in his later career.

MIT Professor of Physics Emeritus Eric R. Cosman, Sr., of Belmont, MA, passed away July 17, 2017. He received a bachelor's degree in mathematics (1963) and a doctoral degree in physics (1966), both from MIT. His early research career focused on nuclear physics including nuclear reactions, isobaric analog and shape-isomeric nuclear states. Later, his research transitioned to biomedical physics.

Eric and Helga Cosman at the Physics Department's Pappalardo Lecture Dinner, October 2009.

Cosman supervised the Bachelors, Masters, and PhD theses of numerous students at MIT during his active years as professor from 1966 until 1991. From 1969 until 1991 he was also Scientific Director of Radionics, Inc. In 1991 he became Professor Emeritus, and in the same year succeeded his father, Bernard Cosman, as President and CEO of Radionics. In the year 2000, he sold Radionics to Tyco, Inc. Throughout these years, Cosman was the world's leading authority on radiofrequency (RF) generation in medicine, intracranial pressure sensors and models, stereotactic methods, and radiosurgery. He invented and developed numerous techniques and instruments in these fields, including dozens of models of RF generators and electrodes for neurosurgery, pain therapy, and tumor ablation; the Cosman-Roberts-Wells (CRW) frame, which was the world's leading stereotactic frame in neurosurgery; and pioneering mechanical and software applications in stereotactic radiosurgery and image guided navigation. In 2004, he founded Cosman Medical to advance radiofrequency technology in pain management

and neurosurgery, and he continued to publish scientific articles in that field. In 2011, he was succeeded as CEO of Cosman Medical by his son, Eric R. Cosman, Jr. In the year 2016, Cosman Medical was sold to Boston Scientific. Cosman was the author of over 100 scientific publications in *Nuclear Physics and Biomedical Physics*, and the author of over 150 U.S. and foreign patents and patent applications.

Cosman was born in Boston, MA, on May 9, 1942, to Bernard J. Cosman and Lillian A. (Spracklin) Cosman. He grew up in Arlington, MA, with siblings Lillian S. Cosman, Ann (Cosman) Walter, Walter Cosman (died 1946), and Hope (Cosman) Alminana. He attended the Bishop elementary school, Junior High East, and High School in Arlington. He was a brother of the Phi Beta Epsilon fraternity at MIT. He and his wife Helga H. (Just) Cosman raised a family in Belmont, MA, and lived there for over 40 years. He is survived by Helga; their four children, Eric R. Cosman, Jr., Christina M. Cosman O'Sullivan, Niels J. Cosman, and Sonia H. Cosman; and five grandchildren, Tadhg E. O'Sullivan, Eden E. O'Sullivan, Matilda M. O'Sullivan, Bjorn B. S. Cosman, and Isla G. H. Cosman.

Courtesy of Brown & Hickey, Belmont, MA; and Cosman Medical, Inc., Burlington, MA

Stanislaw Olbert, professor emeritus of physics and a pioneering theorist of the space age, dies at 94

Olbert researched measurements of solar wind with instruments on several NASA space missions, including the Voyager probes.

by Sandi Miller for the Department of Physics

Stanislaw "Stan" Olbert PhD '53, professor emeritus of physics and a distinguished researcher with MIT's Space Plasma Group, died from a heart attack on September 23, 2017. He was 94.

Olbert fought with the Polish underground during World War II, later came to MIT on a scholarship to earn his doctorate, and as a member of MIT's Space Plasma Group was one of the pioneer theorists of the space age. He specialized in the understanding of the solar wind, the streams of atomic particles flowing outward from the sun. Olbert participated in, and brought insight to, the measurements of the solar wind with instruments on several NASA space missions, including the Voyager missions to the outer planets and interstellar space.

Born in 1923, Olbert was raised by his widowed mother in a small village in eastern Poland. He showed early academic promise, and during the Russian occupation of 1939 to 1941, he concentrated in math and physics under Russian teachers. Under the subsequent German occupation of 1941, however, his studies were interrupted. He was forced to work as a mason, and later, because he spoke German, as a bookkeeper on a German-run farm. He secretly shared information about German-bound food shipments for later interception by the Polish underground.

In 1944, he fought in the Warsaw uprising and at the surrender was taken prisoner by the Germans. At the war's end, Olbert was declared a "displaced person" and enrolled at the University of Munich to resume his studies in math and physics. He earned a scholarship to the doctoral program of MIT's

Department of Physics in 1949. With the Cosmic Ray Group led by Professor Bruno Rossi, he earned his doctorate in 1953, became an assistant professor in 1957, and full professor in 1967; he retired in 1988.

Following his thesis research, Olbert studied the properties of high-energy nuclear interactions and the extensive air showers—large cascades of atomic particles propagating through the atmosphere—that are produced by those interactions. This provided the first theoretical framework in which the implications of various assumptions about the basic cascade processes could be worked out for comparison with observed shower phenomena.

Olbert's research in the field of space plasmas began with a study of the origins of cosmic rays in our galaxy. This work, performed in collaboration with Rossi and Professor Philip Morrison, led Olbert into fundamental investigations of individual and collective behavior of charged particles in the interplanetary environment.

The results of these investigations became the basis of two MIT graduate courses. One of these, taught in collaboration with Rossi, led to the publication of a textbook on the subject, *Introduction to the Physics of Space* (McGraw-Hill, 1970).

"Professor Olbert was the theoretical backbone of MIT's Space Plasma Group," said his colleague Hale Bradt, professor emeritus of physics. The group flew instruments in numerous space missions to study the solar wind, beginning with its first *in situ* measurement with Explorer 10 in 1961, and including the 1977 launches of Voyager I and Voyager II. Even today, the Voyagers continue to send data from in and beyond the heliosphere. Among other contributions, Olbert engaged in theoretical studies of a variety of mechanisms that could be responsible for the generation of stellar winds.

From 1979 to 1986, Olbert undertook two major research projects: the self-consistent solution of the problem of solar wind dynamics, and theoretical studies of radiation generated by solid conductors moving through a magnetized plasma. Olbert maintained contact with many graduate and undergraduate students who have since become well-known in the field of space research.

"He gave me private lessons on the physics of space plasmas, which had not been covered in my coursework," said Olbert's last doctoral student, Alan Barnett PhD '83. "His cheerful and optimistic outlook was infectious."

In the 1980s, Olbert was a frequent visitor to the University of Rome and the Arcetri Observatory in Florence and in 1991 at the Institute for Cosmic Studies in Warsaw, Poland. He collaborated abroad and at home with former students and associates on various projects. One of these papers, in 2003, provided methods for the visualization of the motion of electromagnetic fields

that have been used in the teaching of freshman physics both at MIT and around the world. His last first-author paper was published in 2012, at the age of 89. Until late in his life, Olbert kept up with current events with regular reading of newspapers in German, Italian, Polish, and English.

Olbert is survived by his wife, Norma (DeVivo), and their two children, Thomas of Cambridge, MA, and Elizabeth of Farmington, Maine.

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