

**MEMORIAL RESOLUTION OF THE FACULTY
OF THE UNIVERSITY OF WISCONSIN-MADISON**

ON THE DEATH OF PROFESSOR EMERITUS FRANCESCO CERRINA

Professor Emeritus Francesco (Franco) Cerrina, age 62, died unexpectedly in his laboratory at Boston University on July 12, 2010. He had left the UW Department of Electrical and Computer Engineering (ECE) in 2008 to become the chair of ECE at Boston University.

Franco was born on February 11, 1948 in Moncalvo, Italy. He moved to Rome and became a laboratory technician, made the rare transition to graduate school, and achieved a PhD in physics from the University of Rome "La Sapienza" in 1974. Because of his outstanding technical skills in electronics, sophisticated instrumentation, and physics, he was encouraged to go to Montana State at Bozeman to work with Professor G. J. Lapeyre on photoelectron spectroscopy (PES). In 1980-84, he came to Madison, encouraged by Professors Giorgio Margaritondo (physics) and James W. Taylor (chemistry) as a research associate/associate scientist in chemistry. Here he helped to develop new instruments to utilize the monochromatic radiation produced by the UW Synchrotron Radiation Center to study the chemistry/physics of surfaces, catalytic materials, and molecular structure using PES. His work was so outstanding and productive that he was hired as an assistant professor in ECE in 1984. He rose to associate professor in 1987 and professor in 1990. He received numerous honors for his efforts: fellow of the American Association for the Advancement of Science; fellow of the Institute of Electronic and Electrical Engineering; the McFarland-John Bascom chair in 2001; and the Lynn H. Matthias chair in 2005-2008.

Franco had an outstanding ability to create a vision for where organizations could prosper and new companies could flower from the results of basic research. He became director of the Center for X-ray Lithography in 1986 that was originally created by professors Henry Guckel (ECE), John Wiley (ECE), and James Taylor, and drove it to receive substantial funding from industry, the Semiconductor Research Corporation, SEMATECH, DARPA, and other federal agencies. The goal was to employ synchrotron radiation for the creation of smaller line width and higher resolution electronic circuits and other nanoscale devices. In this endeavor, the capability of synchrotron radiation to yield finer feature sizes than could be easily obtained with standard optical techniques led to the creation of the Center for Nano-Technology (CNTech) in 1998 with Franco as its director until 2008. In this effort, Franco enlisted the participation and cooperation of other university and industry participants to explore the creation of electronic circuits, the materials components necessary for reliable and functioning electronic circuits, and extensive modeling of the materials and device performances of various combinations and configurations. At UW-Madison, professors James Taylor, Roxann L. Engelstad (mechanical engineering), and chemical engineering professors Paul Nealy and Juan DePablo were involved in the various activities and were supported by the joint funding that the collaborative efforts created. In partial recognition of these efforts, the Semiconductor Research Corporation awarded Franco the Aristotle Award for excellence in teaching in 1998. During this period, there were many students who completed their MS and PhD degrees with Franco, most of whom found positions in the semiconductor industry, and several became leaders at various academic institutions and synchrotron radiation facilities across the world. He generated over 210 additional publications from his work in the semiconductor and X-ray radiation areas. He and his collaborators were awarded 13 patents through the Wisconsin Alumni Research Foundation.

Franco's research career also involved a specific emphasis on synchrotron radiation and its applications. He developed the SHADOW code, which is universally used for the design of X-ray beamlines. He is also considered as one of the founding fathers of photoemission spectromicroscopy thanks to its MAXIMUM and SUPERMAXIMUM systems, both implemented at the UW Synchrotron Radiation Center.

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Franco's ability to determine where scientific research could generate important new technologies is apparent from his involvement in the creation of new companies. NimbleGen Systems was co-founded with UW Biochemistry Professor Michael R. Sussman, Genetics Professor Fred Blattner and support from Robert J. Palay, Thomas M. Palay, and Roland Green in November 1999 to commercialize a new instrument (the maskless array synthesizer, or MAS), that they had invented based on the digital micromirror device just developed by Texas Instruments. The company focused on manufacturing DNA microarrays and providing genomic services. This company, based in Madison, employed 40 staff with Franco as the president and chief technical officer. In 2007, NimbleGen was sold to Hoffman-LaRoche and remains in Madison. Genetic Assemblies, Inc. was co-founded here in 2003 with professors Michael R. Sussman and Peter Belshaw (chemistry) to market custom-made double-stranded DNA sequences. This company was merged with Codon Devices, Inc. in 2006. Biolitho, Inc. was established in 2008 in Chicago for the purpose of innovative engineering solutions to biological and genetic problems. Gen9, Inc. was established in 2009 in Cambridge, Massachusetts with Franco, Joseph Jacobson (MIT), George Church (Harvard), and Drew Endy (Stanford) as co-founders for the purpose of DNA synthesis and synthetic biology. It is a reflection of Franco's creative capabilities, his thirst for knowledge, and his abilities to work closely with others in fields very dissimilar to his own that this period of research activity with his collaborators in the biological and chemical sciences became very fruitful and produced numerous new multimillion dollar research grants for UW from agencies such as NIH and DARPA.

Franco's teaching in ECE was primarily in the areas of optics, solid-state physics, physics of electronic devices, micro-and nanofabrication, semiconductor processing, and lithography at the undergraduate and graduate levels. Because of his strong interest in the use of computers in the classroom, he developed the ECE 543 course "Computer Simulation of Semiconductor Devices and Processing" as well as ECE 602 "Introduction to NanoLithography." Both these courses were also taught at national conferences sponsored by the Society of Photo-Imaging Engineers (SPIE).

Franco left UW in 2008 to become the chair of ECE at Boston University. There he started the Nano-DNA laboratory to develop novel nanotechnology fabrication techniques for integrating bio-molecules like DNA, RNA, and proteins into existing nanotechnology. It was primarily involved in photolithographic synthesis of DNA using the Maskless Array Synthesizer and in designing DNA nanostructures that could be utilized to immobilize the proteins accurately on a surface at specific locations. These techniques, along with atomic force microscopy, enabled the group to study these nanostructures at subatomic resolution.

During his tenure at the UW-Madison and again at Boston University, Franco brought his unique style of professional charm and friendly engagement to research and teaching. His was to listen to the opinions of others and then gently, sometimes reluctantly, voice his opinion. Boston University President Robert Brown is quoted on the BU web site of ECE as saying that Franco had already distinguished himself by his intellect, leadership, and warmth to all who had the chance to know him. Engineering Dean Kenneth R. Lutchen added that he left his mark on the college as a department chairman, teacher, researcher, colleague, and friend. All of his colleagues at Madison share those sentiments. We will miss him greatly.

Franco was married to Jean Gendreau for 20 years and is survived by his three daughters, Saima Akhtar, Michaela Cerrina, and Magdalena Cerrina. His death is a great loss to creative science, good friendship, quality research, innovation, and scientific leadership.

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