MICHEL BOUDART

1924–2012

Elected in 1979

“For contributions to structure, catalysis and chemical reactions surfaces.”

BY ANDREW MYERS

Printed with the permission of the
Stanford University School of Engineering
SUBMITTED BY THE NAE HOME SECRETARY

MICHEL BOUDART, a professor emeritus of chemical engineering at Stanford University and for five decades one of the world’s leading experts in catalysis, died May 2, 2012, at an assisted living center in Palo Alto of multiple organ failure. He was 87.

Boudart played a crucial role in establishing the reputation of Stanford’s Chemical Engineering Department. The central theme of his research was the catalytic properties of metals, particularly small metal particles. Catalysis is the study of chemical processes by which one substance, the catalyst, promotes a reaction among other substances without itself changing. Boudart essentially brought catalysis, as a science, to chemical engineering in the United States and was an international ambassador for the field throughout his career.

“Michel Boudart was a world-renowned and influential expert in the field of catalysis who brought Stanford University chemical engineering to prominence and trained several decades of students,” said Andreas Acrivos, a fellow professor at Stanford and now professor emeritus at Stanford and City College of the City University of New York. “He left a legacy that would be difficult to replicate.”
As a professor, Boudart supervised what was consistently one of the larger groups of PhD candidates in the department, eventually guiding more than 70 doctoral candidates to their degrees and mentoring over 100 postdoctoral researchers and visiting scientists. The diaspora of his former students went on to lead and shape the field.

Top Student and World Traveler
Boudart was born June 18, 1924, in Brussels, Belgium. He was 16 when Hitler’s Panzer divisions attacked his homeland in 1940. He had been accepted to the University of Louvain, but the university was closed because of the war. To avoid being drafted or sent to German factories, he worked as a volunteer stretcher-bearer for the Red Cross.

During the war Boudart had private tutoring to prepare for Louvain. When the university reopened, he graduated in three years at the top of every class, save mathematics, where he was outdone only by his dear friend, the late Professor René de Vogelaere of the University of California, Berkeley. He earned his bachelor’s degree in 1944 and his master of science in 1947. He then left Belgium to attend Princeton University, where he took his PhD in chemistry in 1950.

Boudart held faculty positions at Princeton until 1961 and, for three years, at Berkeley before joining the Stanford faculty in 1964. He chaired Stanford’s Department of Chemical Engineering from 1975 to 1978 and also held visiting professorships at universities in Louvain, Rio de Janeiro, Tokyo, and Paris. He became professor emeritus in 1994.

An avid international traveler, Boudart and his wife, Marina, boasted friends across the world. His office sported Japanese shoji screens, abstract prints, overstuffed sofas and—occupying one entire wall—an immense periodic table of the elements printed in Russian, which he read with ease. He was described as a “gentleman scientist.”

He cited as his personal philosophy a quote from French literary theorist Roland Barthes that loosely translates as “No power, a little knowledge, a little wisdom, and as much flavor as possible.”
Guiding Force

In the post–World War II era, the United States became the acknowledged leader in catalysis, mostly owing to advances flowing from American academia and industry. Boudart was at the center of it all. In a published interview, he laid out his case: Without catalysis, he said, “Our satellites could not be maneuvered, our autos would pour out all the noxious chemicals we’ve spent years guarding against, our telephone links with the rest of the world would be seriously impeded.”

In 1974, in the wake of the first oil crisis, Boudart and two associates founded Catalytica in Santa Clara, California. The company worked on highly complex catalytic problems for petrochemical, chemical, and pharmaceutical firms as well as government agencies. “[Catalytica] started in the catalysis consulting field, a service made clearly necessary by the oil crisis,” Boudart said at the time. “One of the critical areas was in synthetic fuels.” The company grew over the following three decades into a number of subsidiaries.

Prolific Author

Boudart authored or coauthored more than 280 journal articles and served on the editorial boards of at least 10 journals. His book Kinetics of Chemical Processes (1991) is a standard reference and was translated into Japanese, Spanish, and French, and Kinetics of Heterogeneous Catalytic Processes (prepared with contributor Gérald Djéga-Mariadassou) was published in French in 1982 and translated to English in 1984. He was coeditor in chief of Catalysis Science and Technology, a series of 11 volumes. He held four patents.

Recognized Leader

Accolades and awards were showered on Boudart throughout his life, but particularly in the later years of his career, when the scale of his impact became clear. In 1985 the University of Utah hosted a 5-day symposium on catalysis in his honor. In 2005 the Journal of Physical Chemistry dedicated an entire issue to his legacy. And in 2006 the Danish company Haldor Topsøe sponsored the Michel Boudart Award for the Advancement
of Catalysis, which is administered jointly by the North American Catalysis Society and the European Federation of Catalysis Societies.

His election to both the National Academy of Sciences and the National Academy of Engineering reflected his leadership and scientific merit. He was also a fellow of the American Association for the Advancement of Science, the American Academy of Arts and Sciences, and the California Academy of Sciences, and a foreign member of the Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique and its Royal Belgian Academy Council for Applied Sciences.

He received honorary doctorates from the University of Liège, the University of Notre Dame, the University of Ghent, and the Institut National Polytechnique de Lorraine.

Boudart is survived by a daughter, Iris Harris, of Whittier; three sons: Marc of Aptos, Baudouin of Atherton, and Philip of Palo Alto; and grandchildren Marina and Clint Harris and Jesse, Louise, and Noella Boudart. His wife, Marina d’Haese Boudart, died in 2009. A second daughter, Dominique, died in childhood.