



Joseph A. B. [unclear]

SEYMOUR M. BOGDONOFF

1921–2005

Elected in 1977

“For contributions to gas dynamics and mechanics of viscous fluids, especially in hypersonic flow and shock boundary layer interaction.”

BY RICHARD B. MILES, ALEXANDER SMITS, AND SAU-HAI LAM

SEYMOUR MOSES BOGDONOFF, Robert Porter Patterson Professor of Aeronautical Engineering Emeritus, died on January 10, 2005, his 84th birthday, at Helene Fuld Hospital, in Trenton, New Jersey, of injuries sustained in a fall in his home in Princeton.

Professor Bogdonoff, known to many simply as “Boggy,” was born in New York City in 1921. He studied at Rensselaer Polytechnic Institute and received his bachelor of aeronautical engineering (BAE) degree in 1942. He chaired Princeton University’s Department of Mechanical and Aerospace Engineering from 1974 to 1983.

Boggy started his career as an aeronautical engineer at the National Advisory Committee on Aeronautics (NACA, the predecessor to NASA) at Langley Field, where he met and married Harriet, a mathematician. Both worked for Arthur Kantrowitz. When Lester Lees joined the faculty of Princeton University’s very young aeronautics department in 1946, he brought Boggy with him as his assistant. Boggy enrolled in the Princeton graduate program, earned his master’s degree in 1948, and was immediately appointed an assistant professor. The department was only six years old in 1948 and growing very rapidly—first under the leadership of Dan Sayre and later Court Perkins. In addition to Boggy, Sayre and Perkins

recruited many creative and talented faculty members, all with strong credentials in high-speed flight and rocketry.

The Princeton department was fully involved with the exciting aerospace problems of those days. Boggy's interests were in supersonic and hypersonic aerodynamics—high-speed flights that involve enormous mechanical and heat transfer loads on the vehicles and complex interactions with strong shock waves. Boggy pioneered this world and spent a lifetime exploring its challenges. His work was instrumental in developing the nation's space program and was crucial to solving the problems of safe reentry. Examples of his work include his investigations of shock-wave boundary-layer interactions at compression corners, his study of the reattaching shear layer problem, and his innovation of the air spike for drag reduction. His development of testing facilities and wind tunnels for these flow conditions was highly influential. He was nationally and internationally renowned for his work, and he was especially well known in Europe and the Soviet Union, where he was widely recognized for his contributions as an experimentalist.

At Princeton, Boggy was promoted to associate professor in 1952 and full professor in 1957. He was a skilled and demanding teacher, and his students went on to dominate all aspects of the field of gas dynamics. He was named the Robert Porter Patterson Professor of Aeronautical Engineering in 1964 and was elected to the National Academy of Engineering in 1977. He became department chairman in 1974 and served nine years. He recognized the importance of numerical computations very early and was instrumental in the establishment of Princeton's Program in Applied and Computational Mathematics in the early 1980s.

Boggy's skills as a consultant were widely sought by industry and government, and he had enormous influence on shaping research activities and research policies in aerospace engineering. He was an advisor to the National Science Foundation, the Office of Science and Technology Policy, the Defense Science Board, and the National Aeronautics and Space Administration. From 1963 to 1986 he served on the

Air Force Scientific Advisory Board, which helps guide the US Air Force's research and development plans. He was a key advisor to NATO through his activities in the Advisory Group for Aerodynamics Research and Development, and he helped found and nurture European efforts in high-speed aerodynamics and space. For this work he was recognized with numerous honors, including membership in the French Academy of Air and Space. At the same time he maintained close contacts with Soviet scientists, helping to maintain vital scientific links at a time when governments were engaging in Cold War brinkmanship.

But Boggy was much more than a very good scientist and engineer. Above all else, he was committed to his family, enjoying his children and grandchildren. He had many interests, including traveling the world, playing his Senegalese drum, and building furniture. He was an active member of the community, a mentor to the Boy Scouts, and one of the founders of the Jewish Center of Princeton, serving as one of its early presidents. He skied, played squash, and found time to tinker in his garage.

From his early days, Boggy loved cars, and they were a passion throughout his life. He was a superb mechanic and an expert driver, honing his skills with his Porsche at Watkins Glen. He challenged the New Jersey Motor Vehicle Commission by bringing down from the back woods of Maine a vintage orange Citroën Deux Chevaux, a car that failed to meet almost all US safety standards, and he overcame all bureaucratic nightmares to drive it triumphantly to work. In his later years he worked to establish a driver education program for senior citizens.

Boggy was a born leader. After Lester Lees left Princeton for Caltech in 1953, Boggy took over the Princeton Gas Dynamics Lab, and under his direction it became a national powerhouse in aeronautical research. He surrounded himself with a team of outstanding faculty colleagues, including Wallace D. Hayes and Sin I. Cheng. At its peak the laboratory had seven faculty members, about 10 postdoctoral and upper-level research associates and technicians, and dozens of graduate students.

Their work was supported by a wide range of helium, nitrogen, and air wind tunnels designed and built by Boggy, often aided by his close associate Irwin Vas. From that research flowed a torrent of papers and reports that helped shape our understanding of high-speed flight. But more than that, an entire generation of students and researchers went out from the lab to support the national programs in supersonic flight and the race to the moon. These students and researchers went on to dominate virtually all aspects of gas dynamics research and engineering. That legacy continues today, with the earlier researchers and students in turn training second, third, and fourth generations of aeronautical engineers. One can still go to such places as the Air Force Research Lab in Dayton, Ohio, or the von Karman Institute in Brussels, or DLR in Göttingen, and find wind tunnels that are copies of those designed by Boggy, run by people who were trained by him.

In 1954, Boggy and Antonio Ferri coauthored the first general description of the design and operation of intermittent supersonic wind tunnels, an enormously influential guide to experimental work for the burgeoning interest in high-speed flows. It was published as *AGARDograph* No. 1, literally and figuratively at the start of a new age.

Boggy was a man who held strong opinions, and he defended them passionately. He was renowned as a severe critic and as a man of action. He got the job done. If you disagreed with him, you had better come prepared and be as tough as Boggy himself. As a number of people have said, he was a force of nature. Natalie Crawford of the RAND Corporation, who served with him on the Air Force Scientific Advisory Board, called him the grain of sand that makes the pearl in the oyster. He challenged those around him to be better and stronger, and although it may not always have been pleasant at the time, it was an excellent education. Many students remember his help and guidance, often warmly. At heart he was a generous, charming, and kind man. He did many things for many people, even for those with whom he disagreed, and those who knew him well remember him fondly.

He is survived by his wife, Harriet; three children—Sondra Bogdonoff (of Portland, Maine), Zelda Bogdonoff (of Bethlehem, Pennsylvania), and Alan Bogdonoff (of New London, Connecticut); and five grandchildren.