



*Alexander H. Foy*

# ALEXANDER H. FLAX

1921–2014

Elected in 1967

*“Solid and fluid mechanics and aerodynamics.”*

BY EARL DOWELL

ALEXANDER HENRY FLAX passed away June 30, 2014, at age 93 after a long and distinguished career as an engineer and scientist, a leader in government and industry, and a valued advisor. He was NAE home secretary from 1984 to 1992.

Al was born to David and Etta Flax on January 18, 1921, in Brooklyn, New York. A high school teacher inspired his interest in mathematics and, after he graduated at age 16, he went on to receive his BS in aeronautical engineering from New York University and PhD in physics from the University of Buffalo.

His career was largely in the world of aerospace, aviation, and defense, beginning with employment at Curtiss-Wright Corporation, Piasecki Helicopter Corporation (later acquired by Boeing), and Cornell Aeronautical Laboratory (now Calspan Corporation).

At Curtiss-Wright (1940–44) he introduced analytical methods for developing and using ground and flight instrumentation in aircraft design, development, and flight testing, applying these methods to problems in vibration, flutter, and structural loads for flight dynamics. He spearheaded the development and adoption of electric strain gauges in aeronautical instrumentation and provided insights to address “the compressibility effect” (excessive vibration) in aircraft at high speeds.

In his work at Piasecki (1944–46) he headed a group of engineers who developed twin-rotor tandem helicopters, which are still in use (the Boeing CH-47 Chinook). He also led the technical effort that yielded aerodynamic structures testing and weight control, including the development of methods of design analysis and testing.

At Cornell Aeronautical Laboratory (1946–59 and 1961–63) his analytical and flight test correlations contributed to flight stability and helicopter blade design. He led research in supersonic aerodynamics, flight control, and ram-jet propulsion, and significantly enhanced wind tunnel capacity for supersonic and hypersonic testing.

He served as chief scientist of the Air Force (1959–61) and then assistant secretary of the Air Force for Research and Development (1963–69) under Presidents John Kennedy and Lyndon Johnson. He was the third director of the National Reconnaissance Office (NRO) at a time when the second generation of imaging systems became operational and important in US intelligence during the Cold War. He advocated major growth in NRO funding and personnel, oversaw the production of signals intelligence collectors from space, and promoted the development of an electro-optical imaging system for US reconnaissance satellites. From there he became president of the Institute for Defense Analyses (IDA; 1969–83).

In addition, he was a long-time consultant to the Defense Science Board (DSB; 1974–87) and President's Foreign Intelligence Advisory Board (1982–87).

He was a member of numerous government and university advisory boards, committees, and panels. He served on the Air Force Scientific Advisory Board, DSB, and Federal Emergency Management Agency advisory board, and chaired the Defense Intelligence Agency (DIA) advisory committee.

He was also active in the work of the NAE and National Research Council, as a member of the Panel on the Impact of National Security Controls on International Technology Transfer (1985–87), Committee on a Commercially Developed Space Facility (1988–89), and Committee on NASA Scientific and Technological Program Reviews (1981–93), among others.

He was repeatedly honored, starting early in his career with the Lawrence Sperry Award (1949) from the Institute of Aeronautical Sciences (now the American Institute of Aeronautics and Astronautics, AIAA); distinguished service medals from the Air Force (1961, 1969), NASA (1968), DIA (1974), and Department of Defense (1983); the General Thomas D. White US Air Force Space Trophy (1966); the von Kármán Medal (1978) from the Advisory Group for Aerospace Research and Development (AGARD-NATO); and the Clifford Furnas Award (1986) from SUNY Buffalo. He was a Wright Brothers Lecturer for AIAA and a Wilbur and Orville Wright Memorial Lecturer for the British Royal Aeronautical Society.

He was selected to receive the 2007 Guggenheim Medal of the American Society of Mechanical Engineers (ASME), AIAA, American Helicopter Society (AHS), and Society of Automotive Engineers (SAE) “for outstanding contributions to aerospace engineering in aeroelasticity, unsteady aerodynamics, and flight mechanics, and for exceptional leadership of engineering organizations including service to the US Department of Defense.”

In addition to his NAE membership, he was an honorary fellow of AIAA, was named Elder Statesman of Aviation by the National Aeronautic Association, and was inducted into the Niagara Frontier Aviation Hall of Fame.

Dr. Flax was a genius at repairing old hardware. He also enjoyed a “hobby” of writing out long differential and integral equations on any paper available, including the margins in the *TV Guide* and scraps of cardboard.

He was preceded in death by his wife of 60 years, Ida Leane Warren Flax, an Army cryptanalyst during World War II and a mathematician who worked on pioneering aircraft at the Piasecki Helicopter Company in the 1940s. She died in 2011. They are survived by their daughter Laurel Flax and many nieces and nephews.

Al is warmly remembered by his colleagues and the many who benefited from his wise advice and counsel. He was truly one of the giants of the aerospace and defense world.