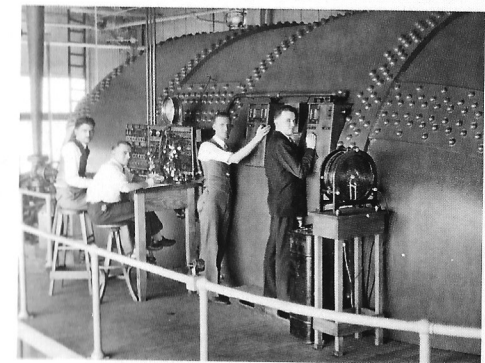


National Aeronautics and
Space Administration



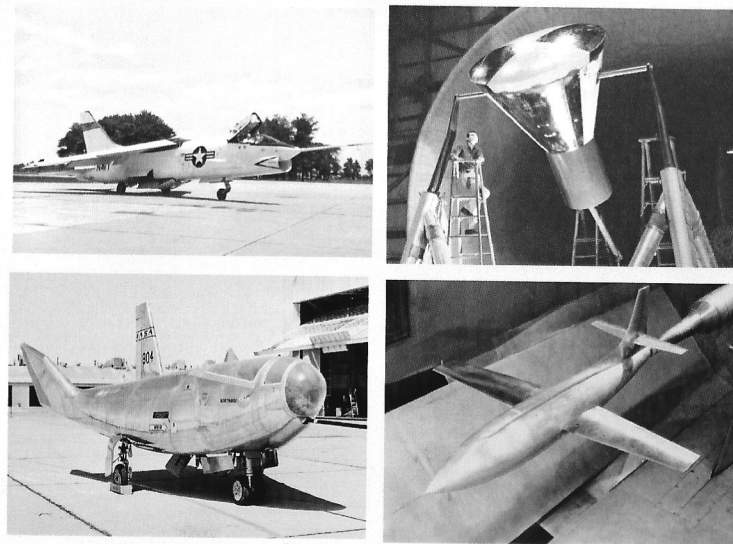
LANGLEY RESEARCH CENTER



NACA *and* NASA HALL *of* HONOR Induction Ceremony

August 13, 2015

H. J. E. Reid Auditorium
NASA Langley Research Center



Welcome
Clayton Turner
Deputy Director, NASA Langley Research Center

Presentation of Colors
Joint Base Langley-Eustis Honor Guard

Singing of National Anthem
Kerry Gough
Systems Engineering & Engineering Methods Branch

Remarks
The Honorable John Miller
Virginia State Senator, 1st District
The Honorable Mamyé BaCote
Virginia General Assembly Delegate, 95th District
The Honorable George Wallace
Mayor, City of Hampton
The Honorable Thomas Shepperd, Jr.
Chair, York County Board of Supervisors
The Honorable Charles "Bud" Southall III
Poquoson City Council
The Honorable Sharon Scott
Newport News City Council

Foundations of Excellence
Joseph Chambers
NASA Langley Retiree, Aerospace History Author

Presentation of 2015
NACA and NASA Hall of Honor
Clayton Turner
Deputy Director, NASA Langley Research Center
Duncan McIver
NACA and NASA Langley Retiree, Chair of Hall of Honor Committee
David Throckmorton
NASA Langley Retiree, Member of Hall of Honor Committee

Reception

Langley Research Center NACA and NASA Hall of Honor

The Langley Research Center NACA and NASA Hall of Honor was conceived by members of the Langley Alumni Association and the NASA Langley Research Center to pay tribute to the those individuals who built exemplary careers at Langley, persevered against the status quo when required, and achieved revolutionary scientific understanding and technological progress on the frontiers of the aerospace sciences.

The Hall of Honor formally recognizes those persons whose contributions have had the most sustained and far-reaching influence on the leadership, direction, mission and capabilities of the NACA Langley Memorial Aeronautical Laboratory and NASA Langley Research Center, or whose work at Langley enabled unprecedented and fundamental advancements in either a scientific or engineering field, and made significant contributions to the United States' aerospace industry for commercial and military aircraft and spacecraft.

The Hall of Honor also provides an opportunity for contemporary Langley employees to reflect on the contributions of these notable individuals – men and women, scientists, engineers and managers – who made profound and enduring impacts on the work of our Center and the technological leadership of our nation.

As 2015 marks the 100th anniversary of the creation of the NACA, for this initial class of inductees, the Hall of Honor Committee specifically looked to those individuals who joined the Langley staff during its days as the NACA Langley Memorial Aeronautical Laboratory. Current plans call for a second Hall of Honor induction ceremony to be a part of Langley's centennial celebration in 2017.



Langley Research Center NACA and NASA Hall of Honor

Initial Class of Honorees

Max M. Munk
Henry J. E. Reid
Pearl I. Young
Fred E. Weick
Eastman N. Jacobs
John Stack
Theodore Theodorsen
Ira H. Abbott
Robert T. Jones
John V. Becker
Samuel Katzoff
Robert R. Gilruth
John P. Reeder
W. Hewitt Phillips
John C. Houbolt
Richard T. Whitcomb
Christopher C. Kraft, Jr.
Maxime A. Faget
Eugene S. Love

Max M. Munk

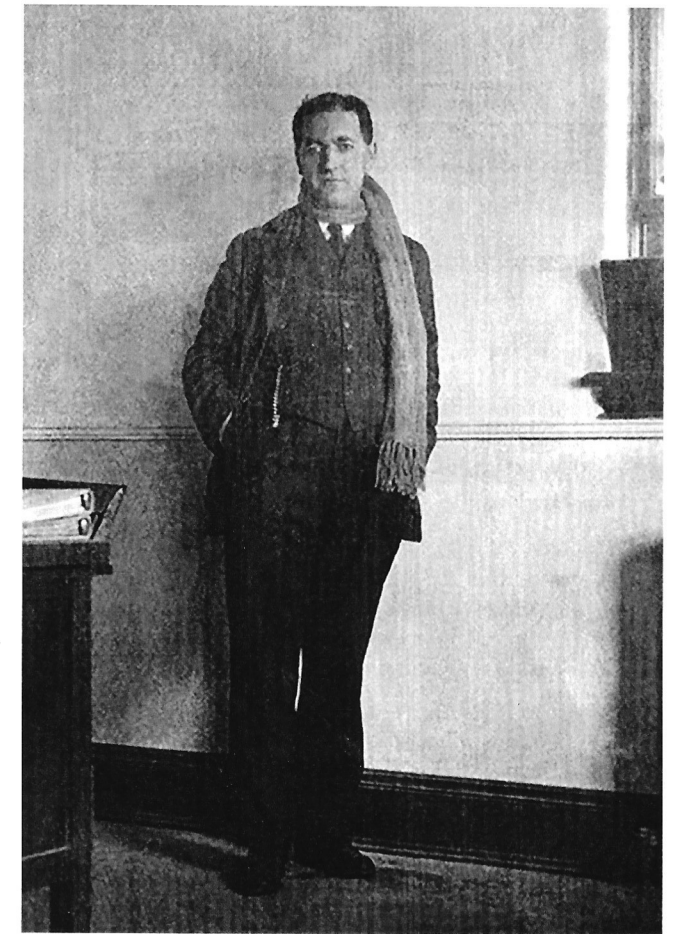
Dr. Max M. Munk (1890–1986) achieved lasting fame by conceiving, developing, and placing into operation the Langley Variable Density Tunnel. This achievement was the most significant accomplishment of the embryonic NACA, and placed the Langley Memorial Aeronautical Laboratory at the forefront of the world's aeronautical leaders.

Munk was born in Hamburg, Germany. He earned an engineering degree at the Hanover Polytechnic School in 1914, and doctorates in physics and engineering from the University of Gottingen in 1917. Munk and other Europeans became targets of the managers of the fledgling NACA, because of their world-wide reputations as leaders in aeronautical sciences. In 1920, he left his native Germany and became a technical advisor to the NACA at its headquarters in Washington, D.C., working on theoretical problems.

One of the major issues facing users of atmospheric tunnels of the day was the influence on test results of the aerodynamic parameter known as "Reynolds number." In 1921, Munk proposed a wind tunnel in which the Reynolds number conditions in the tunnel were directly comparable to those in flight. The key to his remarkable concept was air density. By increasing the pressure in the wind-tunnel test section (and, therefore, the air density), flight conditions could be replicated. Munk's idea became the Langley Variable Density Tunnel (VDT), a wind tunnel contained in a steel tank that could be pressurized. When the VDT went into operation in 1922, it was regarded as revolutionary. Although other nations quickly began building pressurized tunnels, the NACA would lead the world in this area for over a decade.

Munk was also well known for his development of thin-airfoil theory, a means of modeling the aerodynamic characteristics of airfoils by separating their shape factors, such as thickness and camber. Introduced in 1922, his theory remained the primary theoretical technique applied to the design of airfoils, until the development of laminar flow airfoils by Langley's Eastman Jacobs in the 1930s.

In 1926, Munk was transferred from Washington to Langley, to become Chief of the Aerodynamics Division, making him second-in-charge at the laboratory. He resigned from the NACA in 1927. Although he had spent only six years with the Committee, he did more to shape the history of the NACA than any other researcher in a comparable period of time.



"In recognition of development of thin airfoil theory, and the revolutionary Variable Density Wind Tunnel."

Henry J. E. Reid

Dr. Henry J. E. Reid (1895–1968) successfully managed critical research programs, and developed the NACA and NASA culture, as Engineer-in-Charge of the NACA Langley Memorial Aeronautical Laboratory and Director of the NASA Langley Research Center.

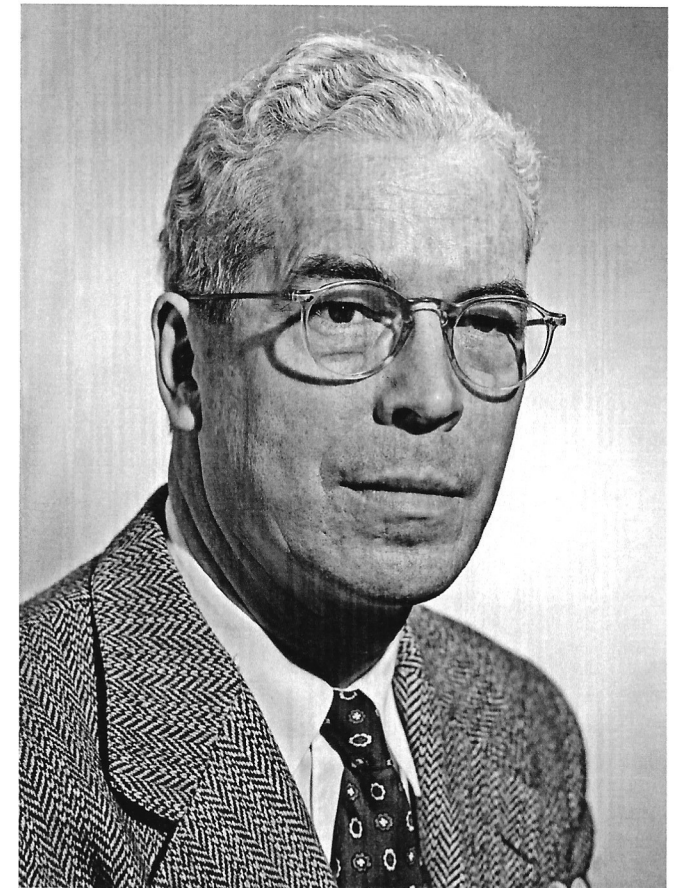
Dr. Reid was born in Springfield, Massachusetts; and graduated from Worcester Polytechnic Institute in 1919, with a bachelor of science degree in electrical engineering. He worked briefly in private industry before beginning his career at Langley, accepting a position as a junior engineer at the Langley Memorial Aeronautical Laboratory (LMAL) in 1921. He initially worked in the Instrumentation Division designing and improving basic instruments for flight research.

Dr. Reid was an enthusiastic researcher, and expert in his field. In 1930, he teamed with one of his staff members to invent and develop an instrument known as the NACA V-G Recorder, which has been used extensively throughout the world since that time to yield critical data on speed and inertial loads during aircraft operations.

In January 1926, he was appointed Engineer-in-Charge (Director) of Langley. From this leadership position, he managed the rapid growth that accompanied the development of the LMAL as a leading aeronautical and space research facility; and became the well-known and respected face of Langley.

Langley won its first Collier Trophy (in 1929) during the early years of his management. During World War II, his management of Langley focused on providing the specialized research required to assure Allied air supremacy. When the war ended, President Truman awarded the Medal for Merit to Dr. Reid, in his capacity as Langley Director, for "Exceptionally meritorious conduct in the performance of outstanding services to the United States during the war."

H. J. E. Reid retired from NASA in 1961. During his 34 years of leadership at Langley, he oversaw the Center's growth from a staff of only 40 persons to 3200; and from an institution comprised of only one small wind tunnel and flight hangar, to one with over 40 major research facilities. He had directed Langley for all but about 10 of the 44 years of its existence; and the Center had grown, through peace and war, to become one of the world's leading aeronautical and space research organizations.



"In recognition of development of the NACA V-G Recorder, and exemplary leadership during a storied career as Engineer-in-Charge of the NACA Langley Memorial Aeronautical Laboratory and Director of the NASA Langley Research Center."

Pearl I. Young

Hired in 1922, Pearl I. Young (1895–1968) was the NACA's first female professional. Educated as a physicist, she was initially assigned to the Instrument Research Division, which designed, constructed, calibrated, and repaired virtually all instrumentation carried on aircraft. During her first few years on the job, Young assembled and calibrated instrumentation used to measure pressures on aircraft surfaces in flight.

During her early years at Langley, Young observed that the young, inexperienced engineers had poor technical writing skills, and that systems were needed to both help teach them the mechanics of writing, and to improve the quality of publications coming from the laboratory. In 1929, H. J. E. Reid, Langley's Engineer-in-Charge, appointed her Langley's first Chief Technical Editor. She established a new office and hired qualified staff. She personally conceived and implemented a highly successful technical writing system that ensured the quality of the documents which communicated the extraordinary technical accomplishments of the Langley staff. Her oversight of the technical report program was always exacting.

In 1943, she published a document entitled "Style Manual for Engineering Authors," which served as the guiding document for authors at Langley and other NACA laboratories. NACA publications were renowned for their thoroughness and accuracy, and became the rock upon which NACA built its reputation as one of the preeminent aeronautical research institutions in the world. Pearl Young helped define the public image of the NACA, and influenced the way aeronautical engineers throughout the NACA communicated their ideas and results. The basic approach inspired by her efforts continues to be used today.

Pearl Young left Langley in 1943 to work at NACA's new Aircraft Engine Research Laboratory (now NASA Glenn Research Center) in Cleveland, Ohio. She resigned from the NACA in 1947 to become an Assistant Professor, teaching Physics, at the Pennsylvania State College - Pottsville Center; but, returned to the NACA's Cleveland facility in 1957, and was named the lab's Technical Literature Analyst.

Pearl Young retired from NASA in 1961. In recognition of her extraordinary contributions to the NACA and NASA, Langley's Pearl Young Theater is named in her honor.



"In recognition of enduring contributions to the NACA and NASA resulting from her personal establishment of systems that ensured the accuracy, thoroughness, and quality of technical publications."

Fred E. Weick

Fred E. Weick (1899–1993) contributed major innovations in aircraft design that significantly enhanced the performance, handling qualities, and safety of civil and military aircraft. His genius touched virtually every technical discipline of importance to the science of flight.

Fred Weick was born in Berwyn, Illinois, a suburb of Chicago. He graduated from the University of Illinois in 1922 with a bachelor of science degree in mechanical engineering. Following brief jobs with the U.S. Air Mail Service and the Yackey Aircraft Company, Weick went to work for the Navy's Bureau of Aeronautics, in Washington, D.C., where he became its first civilian assistant for propeller research.

While with the Navy, Weick recommended to the NACA that a special wind tunnel be constructed for testing full-scale propellers. He then joined the Langley Memorial Aeronautical Laboratory in 1925, and proceeded to work with Dr. Max Munk to design the Langley Propeller Research Tunnel (PRT), the first wind tunnel devoted to full-scale propeller research. He was head of the PRT from 1925–1929.

After initial testing in the PRT verified its technical value, Weick led the development of low-drag engine cowlings for the air-cooled radial engines of the day. The resulting technology significantly enhanced aircraft performance, while ensuring adequate engine cooling. This contribution was one of the most important advances in aviation history and, in 1929, earned the NACA its first Collier Trophy.

Weick left the NACA in 1929 to become chief engineer at the Hamilton Aero Manufacturing Company, only to return to Langley in 1930 as the Assistant Chief of the Aerodynamics Division. He focused his subsequent research on aircraft stability and control, with specific emphasis on spin avoidance, at a time when spins had become a major problem causing a large number of fatal accidents.

In 1936, Weick left the NACA to join the Engineering and Research Corporation (ERCO), as its chief designer. His Ercoupe airplane design demonstrated Weick's passion for safety. He simplified turning the airplane by combining the controls for the rudder and ailerons into a single-steering, interconnected device that was easy for amateur pilots to use. The Ercoupe was the first private owner airplane to be certified as spin-proof. Based on the innovations reflected in his Ercoupe design, Weick received the 1945 Sylvanus A. Reed Award.



"In recognition of pioneering full-scale propeller research, development of the low-drag NACA engine cowling, and spin-resistant aircraft design."

Eastman N. Jacobs

Eastman N. "Jake" Jacobs (1902–1987) joined the Langley Memorial Aeronautical Laboratory in 1925 after earning a mechanical engineering degree at the University of California, Berkley. He was a brilliant aerodynamicist and engineer, who contributed to major advances in the design and applications of airfoils and wind tunnels.

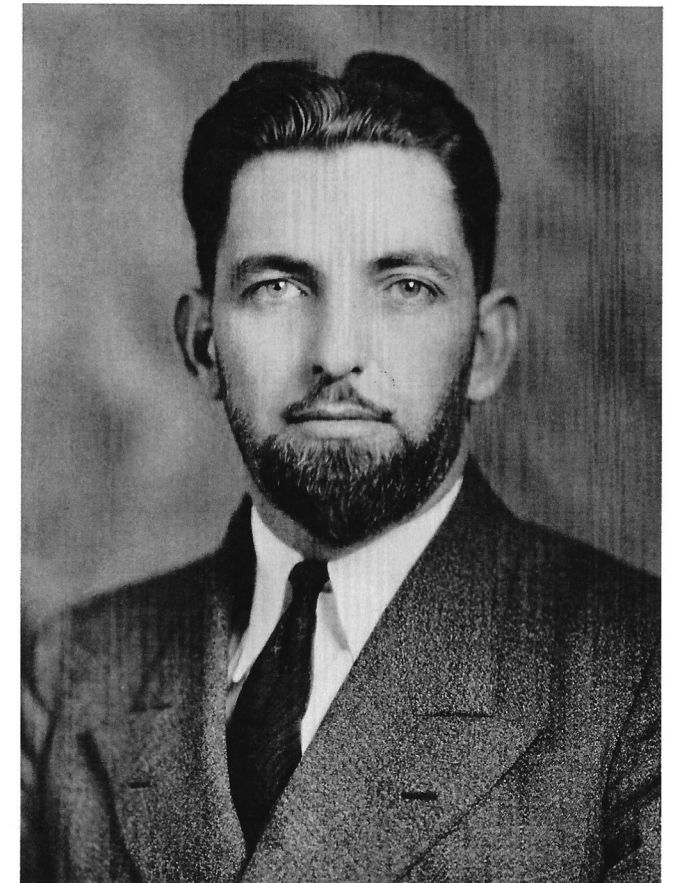
Jacobs was assigned to the research group at the revolutionary Variable Density Tunnel (VDT) and, in 1928, became the head of the tunnel. He pioneered the systematic definition of airfoil profiles (the NACA series); and oversaw extensive testing of those airfoil shapes, providing designers with unprecedented data for their selection for new airplanes. Jacobs personally focused on airfoil shaping to modify boundary-layer flows, reducing drag and increasing the lift-to-drag ratio of airfoils.

Jacobs advocated construction of more capable wind tunnels; and designed both the Two-Dimensional (2-D) Low-Turbulence Tunnel (operational in 1938) and, subsequently, the more advanced 2-D Low-Turbulence Pressure Tunnel (LTPT) in 1941. In these facilities, Jacobs developed one of most important breakthroughs in aeronautics—the laminar flow airfoil, which achieves low drag by maintaining laminar flow conditions over much of its surface. Combining the promise of low drag with a significant delay in the onset of compressibility effects at high speeds, these airfoils revolutionized the design of U.S. aircraft in World War II, such as the P-51 Mustang and P-63 King Cobra.

In recognition of his outstanding contributions and superior research on airfoil aerodynamics, Jacobs was the recipient of the coveted Wright Brothers Award in 1933, and the Sylvanus Albert Reed Award in 1937.

Jacobs also had an interest in high-speed wind tunnels and led design efforts for Langley wind tunnels including: the 11-Inch High-Speed Tunnel (1928), the 24-Inch High-Speed Tunnel (1934), and the concept for the 8-foot High-Speed Tunnel (1936). Jacobs was the first person to observe a shock wave in tunnel testing using Schlieren photography. He also led the effort to construct the 9-Inch Supersonic Tunnel (1942), one of the first supersonic tunnels in the United States.

In 1944, Jacobs left Langley and spent a few months at the NACA Aircraft Engine Research Laboratory (today the NASA Glenn Research Center) in Cleveland, OH. He subsequently retired from the NACA at the early age of 42, after a brief career of only 19 years.



"In recognition of pioneering development of the NACA series of airfoils — especially the laminar flow series — and design of important Langley wind-tunnel facilities."

John Stack

John Stack (1906–1972) is widely regarded as one of the world's most important aeronautical engineers. As a pioneer and specialist in the field of high-speed aerodynamics, he personally conceived, advocated, and conducted some of the most productive aviation projects ever undertaken by the United States

Stack was born in Lowell, Massachusetts. In 1928, he received a degree in aeronautical engineering from the Massachusetts Institute of Technology and joined the Langley Memorial Aeronautical Laboratory staff as a junior aeronautical engineer. He was initially assigned to the Variable Density Tunnel, and worked there for 11 years.

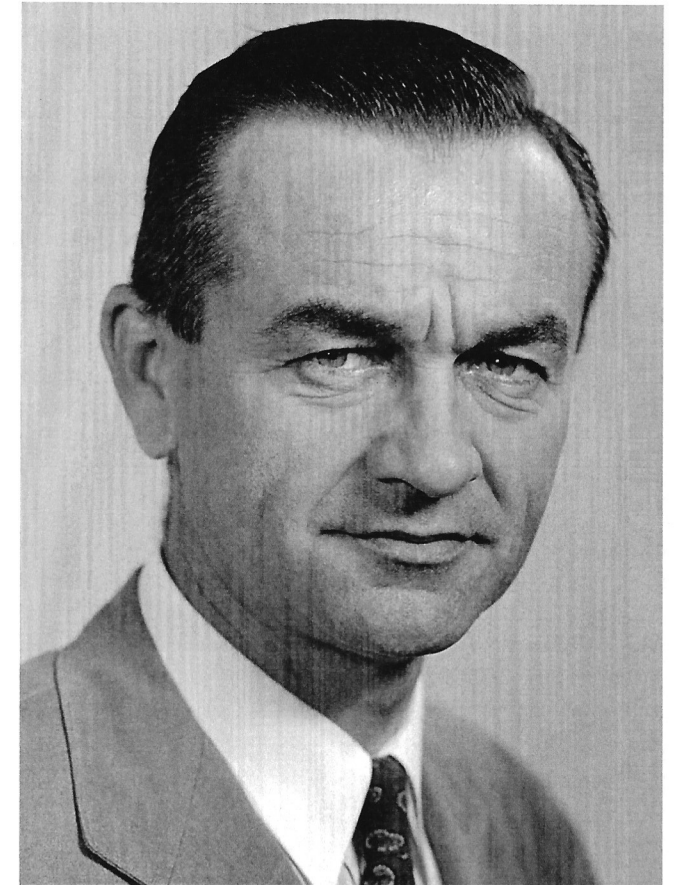
Stack contributed to the design and development of the NACA's early high-speed tunnels that pioneered the acquisition of supersonic data in the 1930s. His contributions included analyses of aerodynamic data and development of specialized flow visualization equipment that permitted researchers to visualize shock waves emanating from aircraft at supersonic speeds. In 1944, Stack was the first Langley staff member to be chosen to deliver the prestigious Wright Brothers Lecture, sponsored by the Institute of Aeronautical Sciences.

Stack is most renowned for his strong-willed advocacy and leadership of two of the most important projects ever undertaken by the NACA. His contributions to the Bell X-1, rocket-powered research airplane project were critical to its success. The X-1 was the first aircraft to exceed the speed of sound in level flight—a milestone in aviation history. In recognition of this extraordinary achievement, he was a member of the 3-person team awarded the Collier Trophy in 1947.

That achievement was followed by his enthusiastic support for development of slotted walls in wind tunnels to enable testing at transonic speeds. In 1951, he won the Collier Trophy again, for the conception and practical application of the slotted-wall wind tunnel.

In 1952, he received the Sylvanus Albert Reed Award; and in 1962, was awarded the Wright Brothers Memorial Trophy of the National Aeronautic Association.

During his career, he served as Langley's Assistant Chief of Research and as Assistant Director of the Center. Stack retired from NASA in 1962, after serving a year as Director of Aeronautical Research at NASA Headquarters in Washington, DC.



"In recognition of pioneering research and leadership related to the challenges of supersonic flight, including leadership of the X-1 Program, and contributions to development of the slotted-wall wind tunnel."

Theodore Theodorsen

Dr. Theodore Theodorsen (1897–1978) was a theorist and applied mathematician, who contributed superior fundamental research in the fields of flutter, vibration, and theoretical aerodynamics.

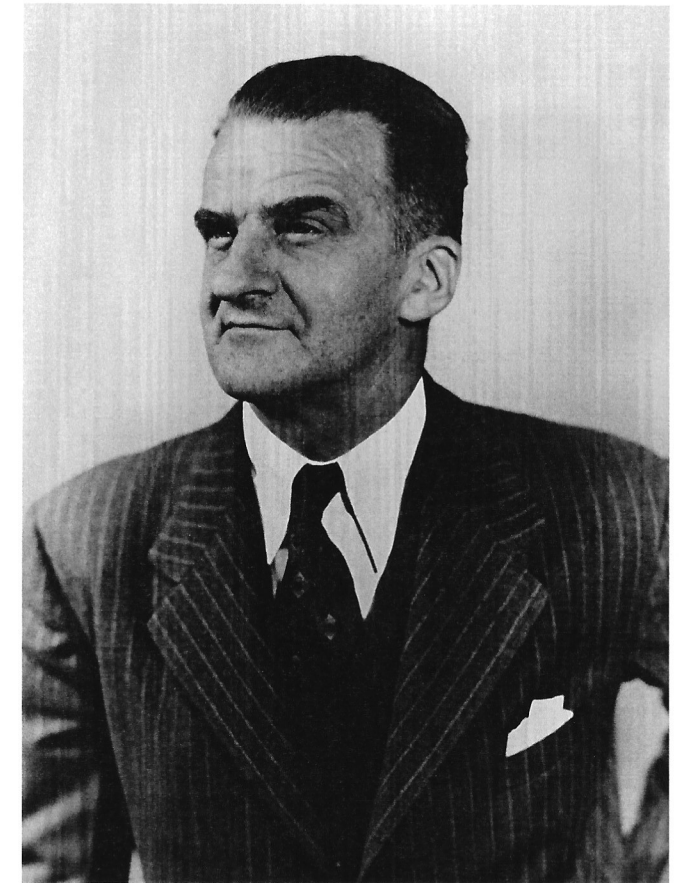
Dr. Theodorsen was born in Sandefjord, Norway. He attended the Norwegian Institute of Technology in Trondheim, graduating in 1922 with a master's degree in mechanical engineering. In 1924, he emigrated to the United States, and accepted a position as an instructor in mechanical engineering at Johns Hopkins University. He taught there for five years, and earned his doctorate degree in physics. In 1929, Theodorsen was hired by the NACA as an associate physicist at the Langley Memorial Aeronautical Laboratory.

One of Theodorsen's first assignments was to develop an instrument to detect buried metals—desired because of NACA concerns during construction of the first Langley towing tank, as the construction site was formerly a bombing range used by the Army Air Service. On its first use, Theodorsen's device detected a live bomb.

During his career at Langley, he performed or managed fundamental research related to a multitude of topics important to the development of aeronautical technology. He became Head of the Physical Research Division, and made critical contributions to the theoretical study of open, closed, and partially open wind-tunnel test sections; pressure distributions on airfoils; and made some of the first measurements of skin friction at transonic and supersonic speeds.

His most outstanding work was in the field of flutter, in which he was widely acknowledged to be the country's expert. He developed the use of Freon as a test medium, which enabled experimental aeroelastic testing to be performed with reduced facility horsepower requirements. He proposed and managed a pressurized wind tunnel for flutter testing that employed a mixture of air and Freon for testing aeroelastic models. Langley's current day Transonic Dynamics Tunnel was designed based on the principles pioneered by Theodorsen.

Theodorsen left the NACA in 1946 to organize the Instituto Tecnológico de Aeronáutica (Aeronautical Institute of Technology) in Brazil. Upon his return to the United States in 1950, he served as Chief Scientist for the U.S. Air Force, and Chief of Research for the Republic Aviation Corporation; retiring in 1962.



"In recognition of groundbreaking research on the phenomenon of aircraft flutter, and development of the use of Freon in wind tunnels to enable aeroelastic testing in simulated flight-like environments."

Ira H. Abbott

Ira H. Abbott (1906–1988) made enduring contributions as a researcher in the field of applied aerodynamics and as a manager of critical national programs in aeronautics and space technology.

Abbott was born in Wolfeboro, New Hampshire. In 1929, he received a bachelor of science degree in aeronautical engineering from the Massachusetts Institute of Technology, and joined the staff of the NACA Langley Memorial Aeronautical Laboratory as a junior aeronautical engineer.

Abbott's first assignment was at the Variable Density Tunnel, under the supervision of Eastman Jacobs. The first decade of his career was focused on airfoil research, including studies of pressure distributions, expanding the family of NACA airfoils, and documenting airfoil characteristics in technical reports. His classic 1945 NACA Report, Summary of Airfoil Data, co-authored with Albert E. von Doenhoff and Louis E. Stivers, Jr., was one of the most important reports ever written by the NACA, and is still used by airplane designers today.

In addition to his contributions to advanced airfoil technology, he participated in the design and operation of several important Langley wind tunnels, including: the 24-Inch High-Speed Tunnel; the Two-Dimensional Low-Turbulence Tunnel; and the more advanced Two-Dimensional Low-Turbulence Pressure Tunnel.

Abbott left Jacobs' organization in 1943 to join the Full Scale Research Division, and later became Assistant Chief of Langley's Research Department.

In 1948, Abbott transferred to NACA Headquarters and, subsequently, became the Assistant Director of Research (Aerodynamics). In 1959, he was appointed NASA's Deputy Director of Aeronautical and Space Research, responsible for research programs in basic fluid mechanics; applied aerodynamics for aircraft, missiles, and spacecraft; and guidance, navigation, and controls. Abbott's last assignment was as Director, Advanced Research and Technology. In that important managerial position, he supervised the X-15 research airplane program, NASA's contributions to the U.S. supersonic transport program, and the nuclear rocket and advanced reentry technology programs.

Abbott retired from NASA in 1962, after more than 32 years of government service.



"In recognition of outstanding contributions to the development of the NACA-series of airfoils, and exemplary leadership of NACA and NASA programs of critical national importance."

Robert T. Jones

Robert T. "R. T." Jones (1910–1999) independently identified the benefits of swept-back wings for high-speed aircraft, regarded as one of the most important discoveries in the history of aerodynamics.

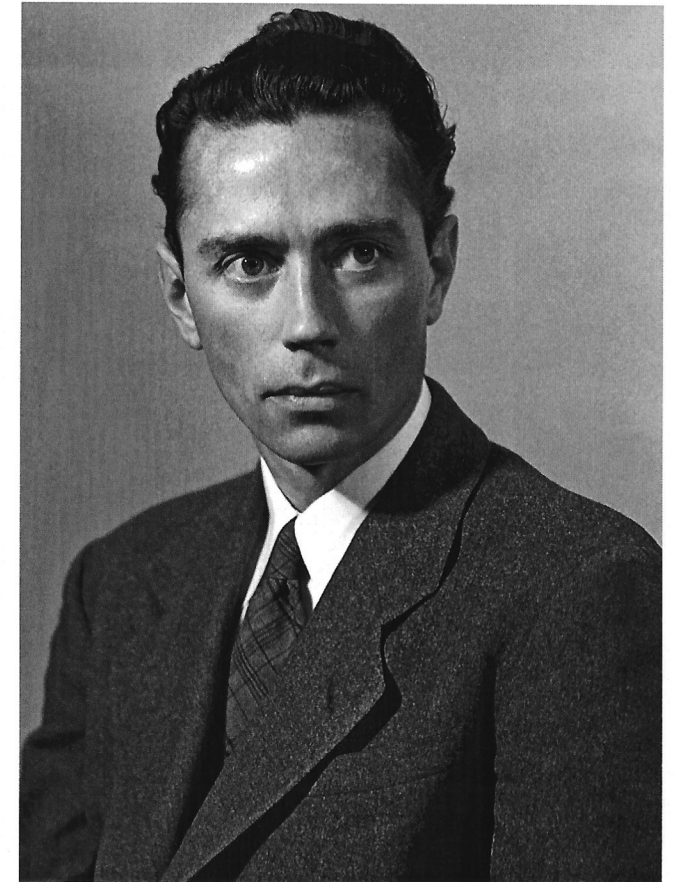
R. T. Jones was born in Macon, Missouri. He briefly attended the University of Missouri; but quit after a year to join a locally based flying circus. Later, while working as an elevator operator in the House Office Building in Washington, D.C., he attended night-time undergraduate courses in aeronautical engineering at Catholic University, taught by noted aerodynamicist Max Munk; but he never completed his degree.

When the Public Works Administration created some temporary jobs at the Langley Memorial Aeronautical Laboratory in 1934, Jones secured a nine-month temporary position. A permanent professional position required passing a standard civil-service exam, which in turn required a bachelor's degree. A special exam was composed for him and, in 1936, Jones became a junior engineer.

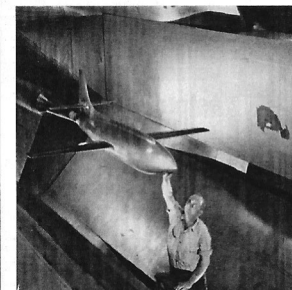
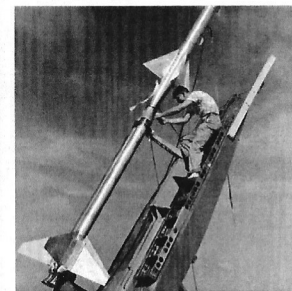
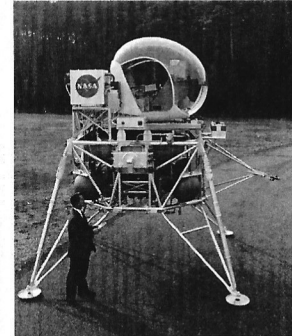
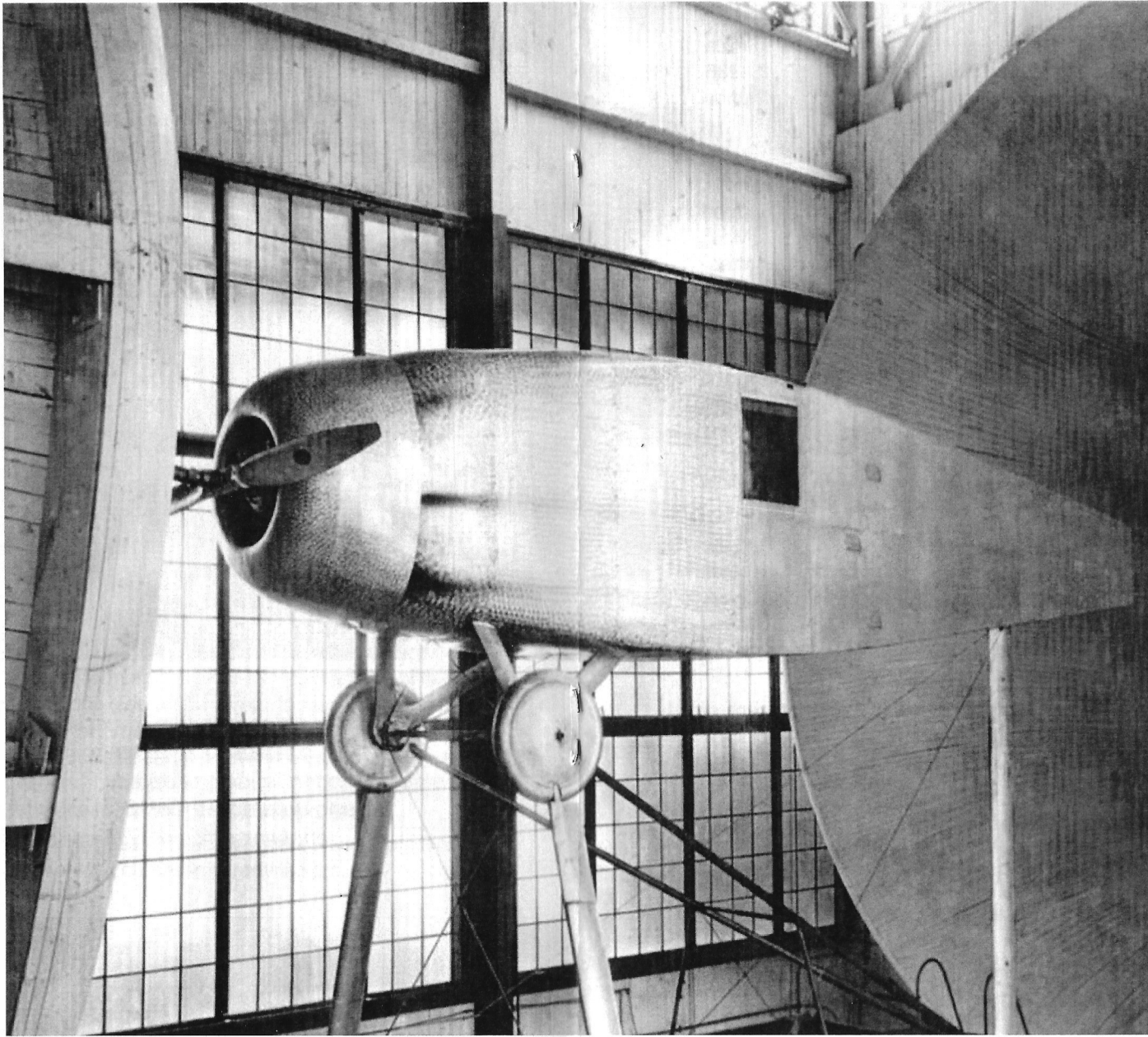
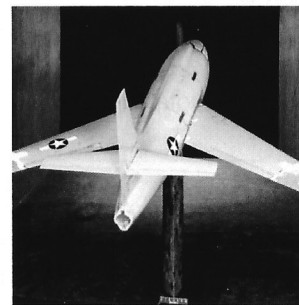
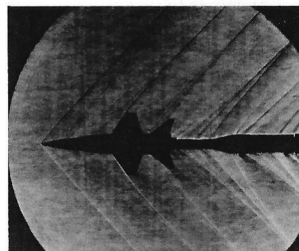
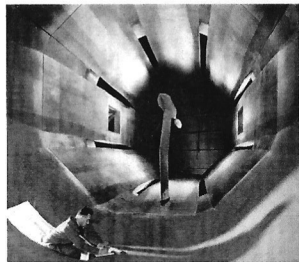
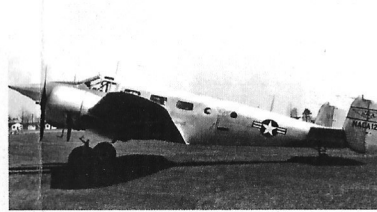
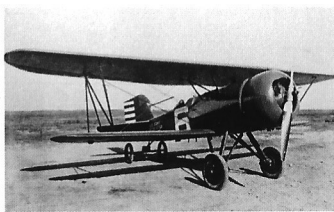
By the beginning of World War II, Jones had become well known in aeronautical circles, especially as an expert on dynamic stability and control. But, Jones' most important contribution to the science of flight was his theoretical development, in 1945, of the concept of the swept-back wing. Jones observed that, by sweeping the wing's leading edge behind the Mach cone generated by an aircraft in supersonic flight, the flow at the leading edge of the wing was subsonic, thereby minimizing wave drag. In 1946, he was awarded the Sylvanus Albert Reed Award by the Institute of the Aeronautical Sciences.

Jones transferred to the NACA Ames Aeronautical Laboratory in 1946. He later pursued work on a radical airplane configuration known as the oblique-wing concept, in which an entire straight wing pivots about a single point on the fuselage, forming a scissor-like appearance with a swept-back wing panel on one side and a swept-forward wing panel on the other side. Jones' interest and advocacy for oblique-wing applications to high-speed military and civil designs led to numerous wind-tunnel tests, free-flight model evaluations, industry system studies, and flight tests of the NASA AD-1 research airplane.

Jones retired from Ames in 1981, and became a consulting professor at Stanford University, teaching courses in aerodynamics.



"In recognition of extraordinary contributions to the fundamental understanding of aerodynamic principles and development of the swept-back wing enabling efficient high-speed flight."



John V. Becker

John V. Becker (1913–) contributed critical concepts and leadership in high-speed aerodynamics programs for the NACA and NASA, including efforts that culminated in the X-15 research aircraft program.

John Becker was born in Albany, New York. He graduated from New York University with a bachelor of science degree in mechanical engineering in 1935; and earned a master of science degree in 1936. He subsequently joined the staff of the Langley Memorial Aeronautical Laboratory, and was assigned to the 8-Foot High-Speed Tunnel.

Early in his career, Becker performed aerodynamic studies of World War II aircraft, high-speed propellers, engine cowlings, and airfoils. He developed test techniques and facility hardware, such as support stings, to enable acquisition of valid wind-tunnel data up to a Mach number of about 0.96. He contributed to development of the slotted-wall wind-tunnel concept, and the X-1 rocket-powered research aircraft.

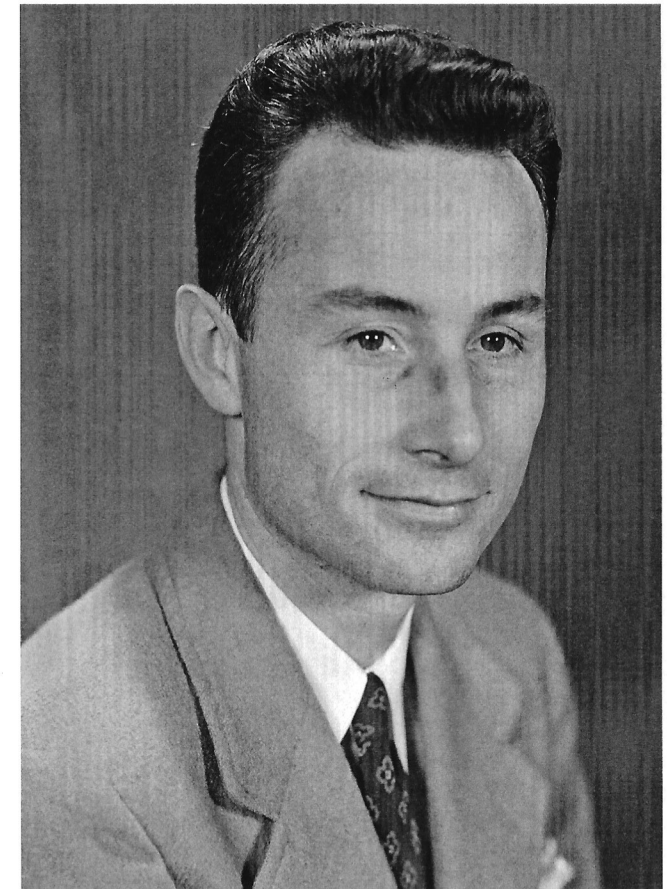
Becker's most important contributions were to the development and application of hypersonic technology in the U.S. He conceived the design for the Langley 11-Inch Hypersonic Tunnel, first operational in 1947, which became the workhorse for U.S. hypersonic studies. He then provided technical supervision of the research activities in the tunnel that provided initial understanding of hypersonic-flow phenomena and the requirements imposed by aerodynamic heating.

In advancing the state-of-the-art of hypersonic technology, he stimulated and led support for flight tests of a hypersonic research vehicle. He served as the leader of a study group that, in 1954, established the technical justification for such a vehicle, and proposed an effort that led to the X-15 research airplane project—for which he supplied the preliminary performance specifications.

As Chief of the Aero-Physics Division, he led the development of additional, advanced high-speed facilities at Langley, including hypersonic wind tunnels, arc-jets, and shock tubes covering the speed range from Mach 1.5 to Mach 20.

In recognition of his contributions to advancements of the technologies of hypersonic flight, in 1961, he was awarded the Sylvanus A. Reed Award of the Institute of the Aeronautical Sciences.

John Becker retired from NASA in 1974.



"In recognition of pioneering contributions to the technology of hypersonic flight, including design of the 11-Inch Hypersonic Tunnel and visionary leadership that culminated in the X-15 research aircraft."

Samuel Katzoff

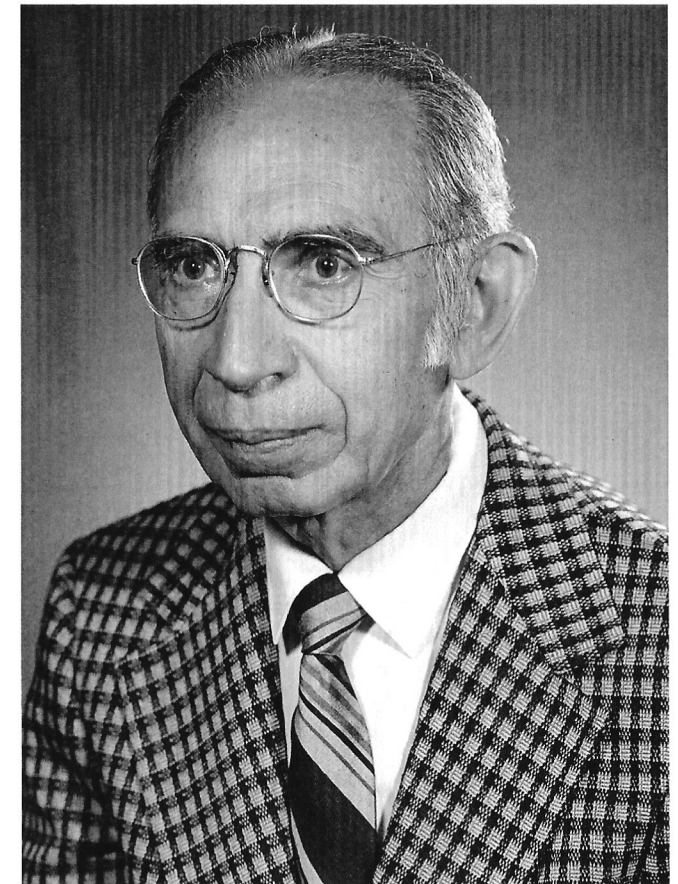
Dr. Samuel "Dr. Sam" Katzoff (1909–2010) overcame a lack of formal education in aeronautics to become one of the leaders of theoretical and analytical studies for the NACA and NASA. After earning bachelor of science and doctorate degrees in chemistry, in 1936 Katzoff was hired by the Langley Memorial Aeronautical Laboratory as a junior physicist. Recalling his lack of training in aeronautics, he said "I didn't know what made a plane fly; but I knew how to study, and I learned."

His first assignment at Langley was to perform theoretical analyses in support of the wind-tunnel staff at the Langley Full Scale Tunnel. Most of the projects at the wind tunnel were focused on experimental results, which needed comparisons with theoretical predictions for better understanding. The breadth of his studies included prediction of phenomena such as: maximum lift, downwash in flow fields at the tail location, effects of propeller slipstream on stability and control, air flow through cooling ducts, drag by momentum considerations, wind-tunnel wall interference effects on experimental aerodynamic data, and conversion of waste heat from engines into useful power.

In 1943, Katzoff became head of a newly created group at the Full Scale Tunnel that was specifically devoted to analytical studies. In 1946, he was promoted to Assistant Chief of the Full-Scale Research Division, while retaining leadership of the analysis group. After NASA was formed, he served as the Assistant Chief of the Applied Materials and Physics Division and became deeply involved in space-related research, including leading an influential study team during early planning for the Lunar Orbiter Project. In 1965, Director Floyd Thompson appointed Katzoff to the highly respected position of Langley Senior Staff Scientist.

While Katzoff's technical work focused on theoretical studies, "Dr. Sam" became legendary for his extraordinary technical writing skills. In 1955, he authored a 25-page guide for NACA technical writers, entitled "Clarity in Technical Reporting." While he did not set out to compose a publication, the demand from would-be authors virtually forced it into print. For years prior to and after printing of the document, Dr. Sam acted as a counselor to young engineers coming to work at Langley, guiding inexperienced authors in the art of writing technical reports that measured up to Langley's exacting standards.

Katzoff retired from NASA Langley in 1974.



"In recognition of pioneering contributions to the theoretical understanding of fundamental aerodynamic phenomena, and leadership to ensure the quality of NACA and NASA research publications."

Robert R. Gilruth

Dr. Robert R. "Bob" Gilruth (1913–2000) conceived and managed pioneering research programs in aeronautics, and is considered the father of the U. S. manned space program.

Gilruth was born in Nashwauk, Minnesota. He attended the University of Minnesota, where he earned a bachelor of science degree in aerospace engineering, as well as a master's degree. He began his career at the Langley Memorial Aeronautical Laboratory in 1937.

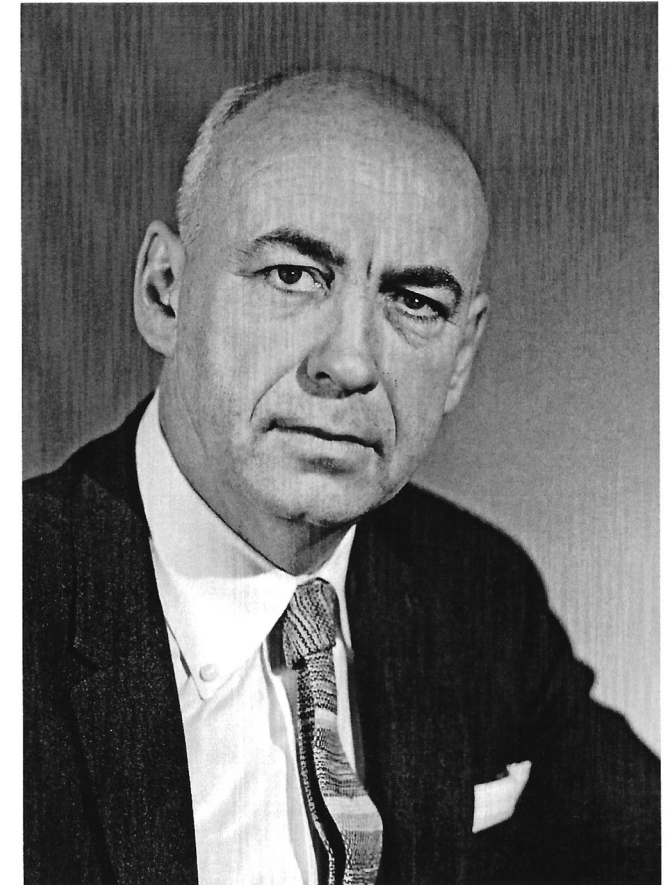
Gilruth was assigned to a new project called "flying and handling qualities of airplanes," with the objective of deriving quantitative terms to describe what pilots deemed "good" or "bad" flying characteristics. His ground-breaking research led to early identification of aircraft handling quality problems, and the development of definitive criteria for satisfactory aircraft flying qualities.

In 1943, Gilruth became Head of Flight Research Engineering, responsible for all Langley flight-research activities. He personally conceived flight-test methods for obtaining transonic data that could not be obtained in wind tunnels—a free-falling-body approach that used telemetry-equipped models dropped from an aircraft flying at high altitude, and the approach of using a P-51 aircraft in a dive with small models attached to its wing. Gilruth also conceived and demonstrated the use of an all-moveable horizontal tail, which minimized pilot control forces at high speeds, a design feature of virtually all modern high-performance aircraft.

Under Gilruth's leadership, Langley formed the Pilotless Aircraft Research Division (PARD) and initiated testing at Wallops Island, VA, conducting free-flight experiments with rocket-powered models—activities that proved critical to the transition from NACA to NASA.

In October 1958, Gilruth was selected to be Director of the Space Task Group, the organization responsible for the design, development and flight operations of Project Mercury and became Director of the new Manned Spacecraft Center (MSC) in 1961. Under his leadership at MSC, NASA performed 25 manned space flights, including Alan Shepard's first Mercury flight, the first lunar landing, the dramatic rescue of Apollo 13, and the Apollo 15 mission in July 1971.

Gilruth retired from NASA in 1973. His list of honors is long and distinguished, including induction in the National Space Hall of Fame.



"In recognition of pioneering contributions to the quantitative understanding of aircraft handling qualities, concepts for flight testing in lieu of wind-tunnel testing, and leadership of America's manned spaceflight program."

John P. Reeder

John P. "Jack" Reeder (1916–1999) exemplified the ultimate engineering test pilot, possessing an extraordinary ability to analyze the most complex flying characteristics of aerospace vehicles.

Reeder was born in Houghton, Michigan; and attended the University of Michigan, graduating with a degree in aeronautical engineering. He joined the staff of the Langley Memorial Aeronautical Laboratory as a junior aeronautical engineer in 1938, and was assigned to the Full Scale Tunnel. He worked there for four years, in the areas of applied aerodynamics, stability and control, engine cooling, and drag reduction. He earned his private pilot's license, and purchased a plane.

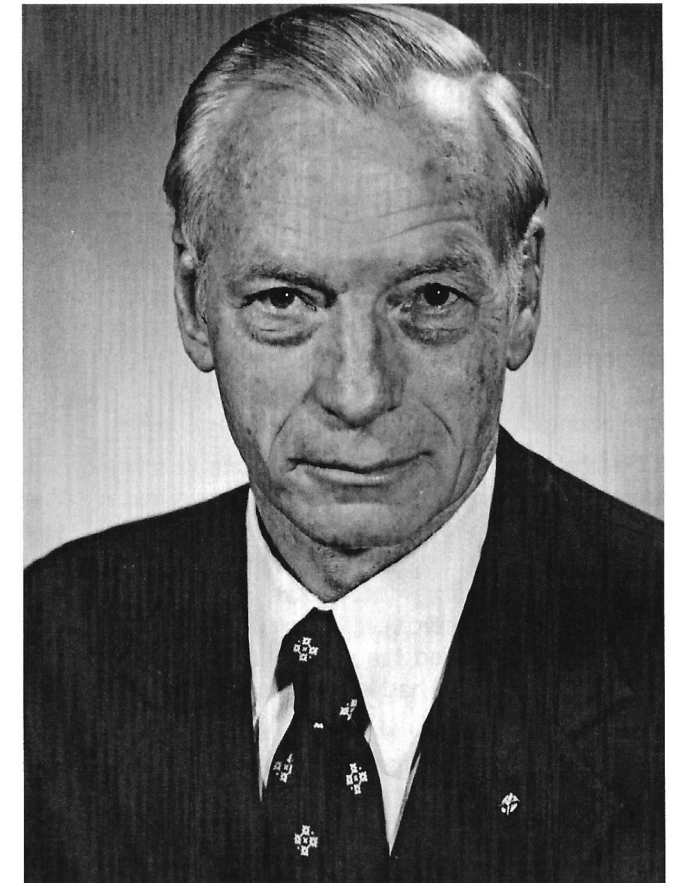
In 1942, Reeder's aspiration to become a flight-research pilot was realized. During World War II, he performed high-priority flight evaluations of prototype and production aircraft. He flew over 35 different single- and multi-engine Army and Navy aircraft, including trainers, fighters, and bombers, identifying potential problems and providing recommendations for improvements.

In 1946, Reeder was chosen to be the first civilian pilot to fly the X-1 rocket-powered research aircraft. Personal considerations, however, forced him to turn down that opportunity. In 1951, he became Head of Flight Operations and Langley's Chief Test Pilot.

In 1960, NASA tasked Langley to lead the Agency's research activities associated with rotorcraft and V/STOL (Vertical/Short Takeoff and Landing) aircraft. Reeder had qualified as NACA's first helicopter pilot in 1944; and became internationally renowned for his expertise and contributions to the understanding of helicopter and V/STOL handling qualities.

In 1970, Reeder became the Chief of the Research Aircraft Flight Division, and developed an intense interest in advanced cockpit technology for safer, more efficient operations in the terminal area near airports. He advocated for a new program, known as the Terminal Configured Vehicle Program, which brought the prototype Boeing 737 to Langley, where it was to become a world-class research platform used for over 20 years to develop breakthrough technologies.

Reeder retired from NASA in December 1980. Apollo astronaut Neil Armstrong called Reeder "the best test pilot I ever knew." He is a member of both the Virginia and Michigan Aviation Halls of Fame.



"In recognition of an exemplary career as NACA and NASA's preeminent test pilot and his critical role in the development and implementation of the Terminal Configured Vehicle Program."

W. Hewitt Phillips

W. Hewitt Phillips (1918–2009) was a major contributor to advances in the aeronautical and space programs of the NACA and NASA. Exceptionally broad in his knowledge and expertise, he personally conducted or led highly successful research efforts on vehicles ranging from propeller-driven airplanes to manned space vehicles.

Phillips was born in Port Sunlight, England. He studied aeronautical engineering at the Massachusetts Institute of Technology, earning both bachelor's and master's degrees; and joined the staff of the Langley Memorial Aeronautical Laboratory in 1940. He was assigned to the Flight Research Division, and was immediately involved in assessing the stability, control, and flying qualities of U. S. military aircraft. He also conducted flying-quality evaluations of the first captured Japanese Mitsubishi Zero, results of which provided critical guidance on how to counter the aircraft in air-to-air engagements.

One of Phillips' most significant contributions was his identification and analysis of a potentially dangerous flight phenomenon called "roll coupling." He first noted the phenomenon during free-fall tests of a model of the X-1, when the model exhibited violent oscillations in pitch during rolling maneuvers. Phillips derived the relevant equations to describe and predict the problem, which became known as "inertial coupling." He also studied the causes and cures of pilot-induced oscillations, some of which had led to catastrophic failures of aircraft.

When NASA was created to advance the nation's capabilities in space technology, he focused his efforts on the challenges of manned space flight. During his career, he led efforts in the design and application of aerospace simulators used to train pilots and astronauts, as well as to conduct fundamental research for aerospace vehicles. He personally conceived and successfully advocated for the Langley Lunar Landing Facility used for astronaut training prior to the first moon landing.

Langley's Differential Maneuvering Simulator was also conceived and implemented under his leadership. This facility enabled studies of the flight dynamics and control of aircraft during air combat; and was used extensively during the developments of the F-14 and F-15 fighters.

Phillips received numerous awards during his career, including the Institute of the Aeronautical Sciences' Lawrence Sperry Award in 1944. Phillips retired from NASA in 1979.



"In recognition of pioneering research in aircraft flight dynamics and development of multiple, unique simulation technologies at Langley—specifically, the Lunar Landing and Differential Maneuvering Simulator Facilities."

John C. Houbolt

Dr. John C Houbolt (1919–2014) successfully advocated, almost single-handedly, for the lunar-orbit-rendezvous concept that proved to be enabling for the nation's effort to place men on the moon.

Houbolt was born in Altoona, Iowa. He earned both bachelor's and master's degrees in civil engineering from the University of Illinois; and, in 1942, joined the Langley Memorial Aeronautical Laboratory staff as an assistant civil engineer.

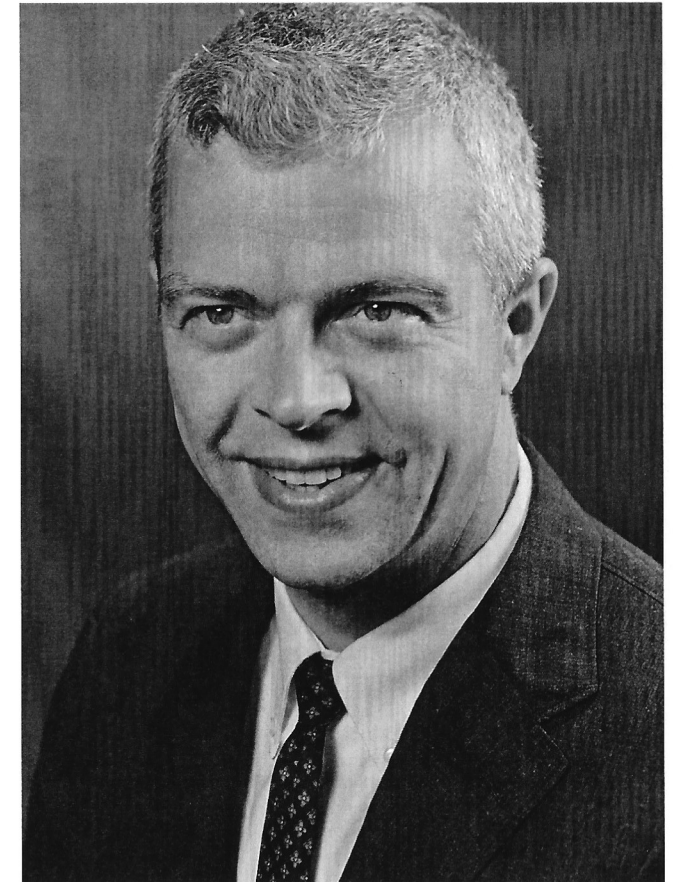
Houbolt's technical career was extremely diversified, including studies of dynamic loads and aeroelasticity of aircraft, and the unique problems of space flight. He contributed significantly to the theoretical analyses of the phenomenon known as propeller whirl flutter, which had caused the catastrophic crashes of early models of the Lockheed Electra civil transport in the early 1960s.

Dr. Houbolt is most widely recognized for his tenacious advocacy of the lunar-orbit-rendezvous (LOR) approach for carrying men to the surface of the moon. In the LOR approach, a spacecraft would be inserted into orbit around the moon, and a smaller lander dispersed to land on the surface, followed by a rendezvous with the orbiting craft for the return trip to Earth. The competitor concept, referred to as "direct ascent," required construction of a mega-sized launch vehicle called Nova—the concept initially favored by Werner von Braun.

Houbolt was convinced that the LOR approach was the only technique that could enable the goal set by President Kennedy of landing a man on the moon before the end of the 1960s. He risked his reputation and career by aggressively promoting the LOR concept. He took on the bureaucracy; and after significant controversy, the LOR approach was adopted. His personal persistence resulted in the critical decision that ultimately ensured the success of the Apollo Program.

Shortly after the LOR technique was adopted, Houbolt left NASA to enter private industry. He returned to Langley in 1976 as its Chief Aeronautical Scientist. He retired from NASA in 1985.

Houbolt was awarded the NASA Exceptional Scientific Achievement Medal for his work on the LOR concept. He was the first recipient of the American Institute of Aeronautics and Astronautics' Structures, Structural Dynamics, and Materials Award; and, in 1990, was elected to the National Academy of Engineering.



"In recognition of single-handed, unwavering advocacy of the lunar-orbit-rendezvous concept that enabled accomplishment of President Kennedy's objective of a manned mission to the moon and back, during the decade of the 1960s."

Richard T. Whitcomb

Richard T. "Dick" Whitcomb (1921–2009) conceived three revolutionary aerodynamic concepts that forever changed airplane design, by enabling aircraft to fly faster and farther, and with less fuel.

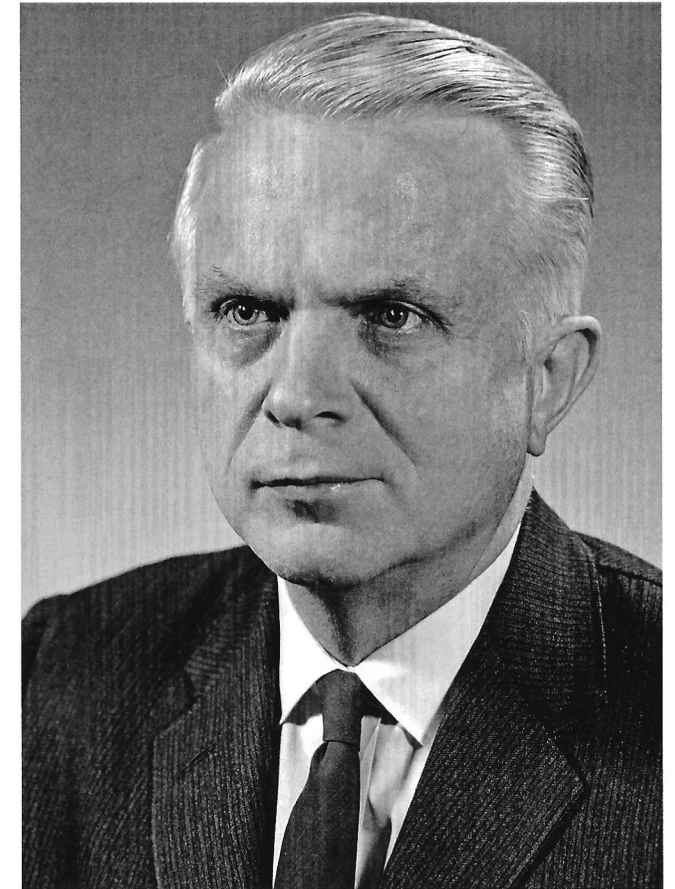
Whitcomb was born in Evanston, Illinois. He earned a bachelor's degree in mechanical engineering, with a concentration in aeronautics, from the Worcester Polytechnic Institute. In 1943, he joined the staff of the Langley Memorial Aeronautical Laboratory as a junior engineer. He was assigned to the 8-Foot High-Speed Tunnel and performed wind-tunnel testing of high-priority military aircraft for the war effort. After the war, Whitcomb turned his attention to more basic research, specifically, reducing the tremendous increase in aerodynamic drag that was noted for aircraft flying near the speed of sound.

In 1951, a flash of inspiration resulted in one of the most important discoveries in the history of aeronautics. Whitcomb theorized that, to minimize transonic drag, the cross-sectional area distribution along the length of an airplane should be similar to that of a smooth body. His concept was quickly verified by testing simple wing-body models in the 8-Foot High-Speed Tunnel. The "area rule" was a milestone discovery. Its application to the F-102 fighter improved that aircraft's speed capability by an estimated 25 percent. It has been incorporated in the design of virtually every high-performance military aircraft to this day.

In 1969, Whitcomb designed an airfoil shape that dramatically delayed the onset of drag of aircraft flying at high subsonic speeds. Incorporating a blunt leading edge, flat top, bulging underside, and thin trailing edge, the benefits of his "supercritical wing" were quickly verified in full-scale flight-tests. Wings based on the principles of his concepts are used in almost every commercial airliner flying today.

Whitcomb's third breakthrough was inspired by the airflow at the wing tips of soaring birds. Years before, wing-tip end-plates had been used in efforts to reduce drag; but, Whitcomb's ingenious analysis led to special tailoring of such devices, which proved to significantly reduce drag at cruising speeds. He called his invention "winglets;" they are now commonly seen on aircraft at major airports throughout the world.

Whitcomb retired from NASA in 1980. Included among his myriad honors are the 1954 Collier Trophy for the area rule, the Wright Brothers Memorial Trophy, and the National Medal of Science.



"In recognition of revolutionary contributions to the science of aerospace—the area rule, supercritical wing, and winglets—that enabled supersonic flight of military aircraft, and energy-efficient flight of commercial aircraft."

Christopher C. Kraft, Jr.

Christopher C. "Chris" Kraft, Jr. (1924–) created the concept, and developed the organization, operational procedures, and culture of NASA's Mission Control, which was a critical element of the success of the nation's manned spaceflight programs.

Kraft was born in Phoebus, Virginia. He attended the Virginia Polytechnic Institute and graduated with one of the first aeronautical engineering degrees awarded by the Institute. In 1945, he joined the staff of the Langley Memorial Aeronautical Laboratory, assigned to the Flight Research Division under the leadership of Robert Gilruth.

He made significant contributions to many critical NACA programs, including free-fall model testing to measure transonic and supersonic aerodynamics, and evaluations of aircraft flying qualities. He conducted analytical work on gust alleviation, and directed a pioneering study of wake turbulence resulting from trailing vortices.

In 1958, the NASA Space Task Group was born, and Kraft became one of its original 35 members, with responsibilities that immersed him in mission procedures and challenging operational issues. As NASA's first Flight Director, he personally invented the mission planning and control processes required to enable successful manned spaceflight missions. He was a key participant in planning for NASA's new Manned Spacecraft Center in Houston, Texas; and moved there, in 1962, along with other members of the Space Task Group.

Kraft served as Flight Director for spaceflight missions that included the historic first U. S. human sub-orbital and orbital flights, the first spacewalk, and first rendezvous in space. During the Apollo program, Kraft became Director of Flight Operations, responsible for overall manned spaceflight mission planning, training, and execution. In 1972, he became Director of the Johnson Space Center (JSC), playing a vital role in the successes of the final Apollo missions, the first manned space station (Skylab), the first international space docking (Apollo-Soyuz Test Project), and the first flights of the Space Shuttle. Kraft served as Center Director until his retirement in 1982.

Kraft received numerous honors during his career, including the 1979 Goddard Memorial Trophy. In 2011, Johnson Space Center Building 30, the Mission Control Center which has operated for 50 years in support of manned space missions, was named in his honor.



"In recognition of early research in aircraft handling qualities and subsequent creation of the concepts and processes for the planning, execution, and control of manned spaceflight missions."

Maxime A. Faget

Dr. Maxime “Max” A. Faget (1921–2004) received a bachelor of science degree in mechanical engineering from Louisiana State University in 1943; and following service as a submariner during World War II, joined the Langley staff as a research scientist in 1946. He was an engineering genius.

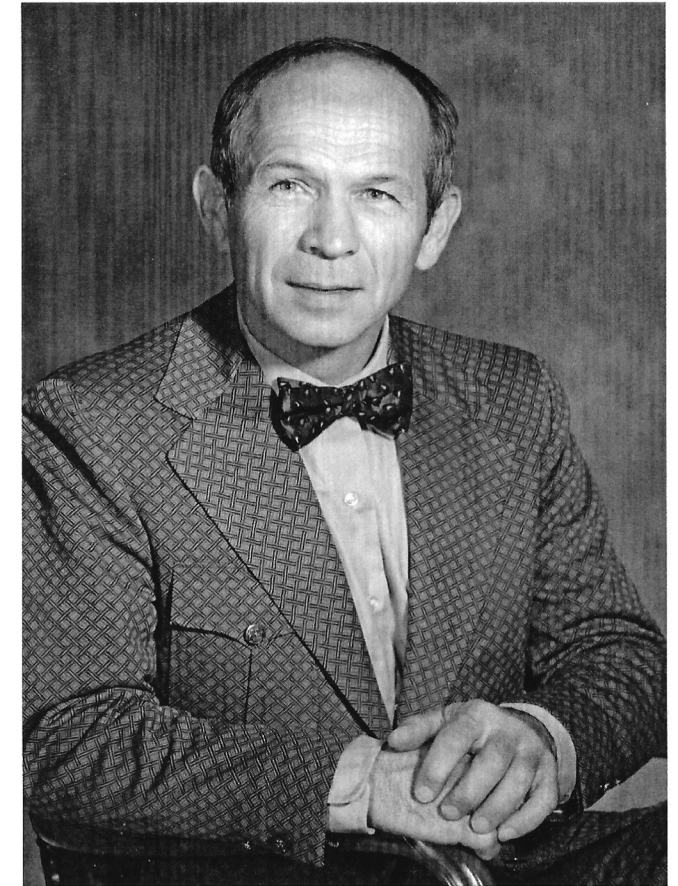
Faget’s first assignment was in the newly-formed Pilotless Aircraft Research Division (PARC) headed by Robert Gilruth, conducting research studies of ramjets and the development of Mach meters for flight. In 1954, he became engaged in studies for the X-15 research airplane, and began to grapple with the challenges of hypersonic flight. Building upon the work of H. Julian “Harvey” Allen at the Ames Research Laboratory, Faget conceived configurations for a blunt-ended, capsule-type spacecraft for manned space missions, work which laid the cornerstone for design of the capsule for Project Mercury.

Faget was one of the original group of 35 persons assigned by Langley Director Floyd Thompson to form the nucleus of the Space Task Group to carry out Project Mercury. His accomplishments include the capsule design and operational plan for Project Mercury. One of his most important contributions was his concept of a launch-escape tower. Faget’s escape-tower concept was used for all follow-on NASA capsule configurations—with the exception of Gemini.

In 1962, Faget became Director of Engineering and Development at NASA’s new Manned Spacecraft Center in Houston, Texas, and immersed himself in the technical challenges of the Gemini and Apollo programs. He was a significant contributor to the design-evolution of the Space Shuttle, including his proposal of a straight-winged configuration as a candidate for the orbiter.

Among his many accolades, he was awarded the prestigious Guggenheim International Aeronautical Award in 1973. He was inducted into the National Space Hall of Fame in 1969, and the National Inventors Hall of Fame in 2003.

Faget retired from NASA in 1981, following the second Space Shuttle mission. Upon his death in 2004, his good friend and peer, Christopher Kraft, paid him this tribute: “He was a true icon of the space program. There is no one in spaceflight history, in this or any other country, who has had a larger impact on man’s quest in space exploration.”



“In recognition of extraordinary engineering insights and innovation that enabled Project Mercury, and technical leadership of development of NASA’s manned space systems, from Mercury to the Space Shuttle.”

Eugene S. Love

Eugene S. "Gene" Love (1920–2001) made significant contributions to U. S. access-to-space capabilities through the development of specialized facilities and his leadership as an expert in the fields of hypersonic aerodynamics and reentry from space.

Love was born in Elizabeth City, North Carolina. He received his bachelor of science degree in aeronautical engineering from the Georgia Institute of Technology, and joined the Langley Memorial Aeronautical Laboratory as a research scientist in 1947.

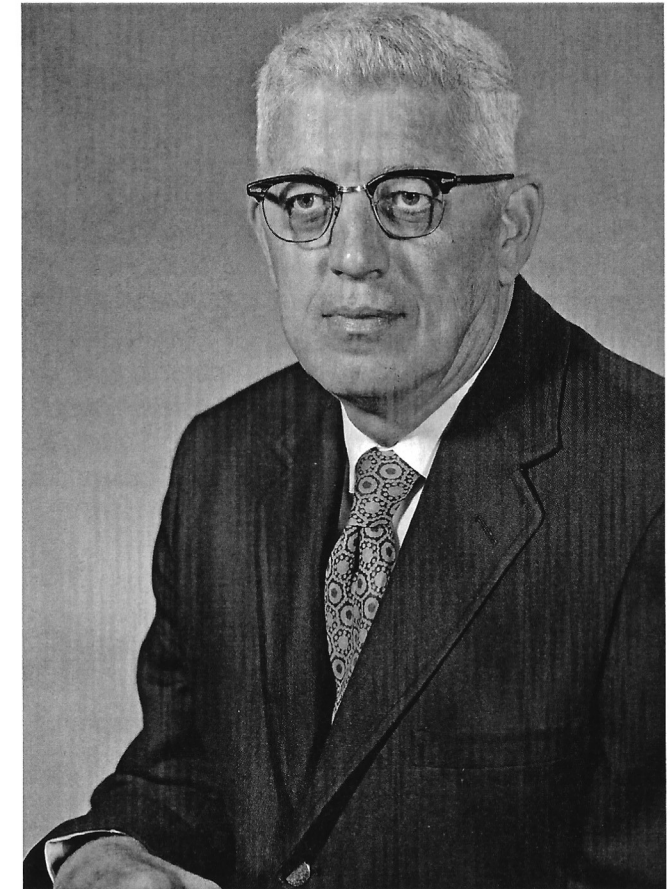
Love conducted research on basic and applied aerodynamics of supersonic aircraft. He participated in the design of the Langley 20-Inch Hypersonic Tunnel; and, in 1956, was named Head of the Hypersonic Branch of the Aero-Physics Division, responsible for all hypersonic research within the division.

Love was a critic of the ballistic capsule design used for Project Mercury, believing that a "lifting-body" configuration, having a controllable cross-range capability, would be a more effective concept for return-from-space missions. He personally designed the HL-10 lifting-body research vehicle, which provided significant information on the performance, handling qualities, and mission capabilities of such concepts, and helped form the basis for design of the Space Shuttle. The HL-10 was the most successful vehicle of NASA's lifting-body program, performing 37 test flights from 1966 to 1970.

As Langley's representative on the Space Shuttle Executive Steering Committee, Love significantly influenced the evolution of the Space Shuttle Program during its early planning stages. In 1970, he became Chief of a new Space Systems Division, created to provide a focus for Langley's support of the Space Shuttle and Space Station programs.

In 1972, he became Director for Space, responsible for all Langley research associated with hypersonic and reentry systems, space systems, and space-radiation protection. He also initiated Langley's atmospheric sciences program. Love retired from Langley in 1975.

Notable among his many honors, in 1981, Love was awarded the NASA Exceptional Service Medal, "For outstanding leadership in definition of the shuttle design and systems characteristics during its formative stages, and for major contributions to the technological base which made the successful flight of STS-1 possible."



"In recognition of pioneering contributions to the technology of lifting bodies for controlled entry from space—especially the HL-10—and leadership of Langley's critical roles in development of the Space Shuttle."

Acknowledgment

The Hall of Honor Committee wishes to acknowledge all those who have pursued their research and applied their technical and management skills to enable NACA and NASA Langley to achieve its goals. All contributions, both great and small, have contributed in significant ways to the overall preeminence of Langley, NASA and the United States in the relentless and ever-challenging quest for knowledge of our world and worlds beyond.

Special acknowledgement to Joseph Chambers for his research and authorship of the honorees' biographies.

Special thanks to the Langley Alumni Association for the mementos for the families and the reception.

Visit the Hall of Honor Web-site at:
<http://www.nasa.gov/langley/hall-of-honor>

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