

MELVIN N. GOUGH

Melvin N. Gough was born in Washington, D. C., in 1906. He received a Bachelor of Engineering degree in Mechanical Engineering from Johns Hopkins University in 1926. In the same year he began a long career with the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics (NACA) in Hampton, Virginia. From 1926 to 1958, Gough was successively an engineer, a test pilot (after being commissioned as a naval aviator in 1929), Chief Test Pilot, and Chief of Flight Research at NACA-Langley.

When NACA became NASA in 1958, Gough transferred to Cape Canaveral to act as Director of NASA Operations at the Atlantic Missile Range for two years. In 1960, he became Director of the Bureau of Safety for the Civil Aeronautics Board and, in 1962, he was Director of Aircraft Development of the Federal Aviation Agency, retiring from government service in 1964. He died on March 6, 1994.

Gough served on the Board of Governors of the Flight Safety Foundation as a charter member of the Society of Air Safety Investigators. He received the Octave Chanute Award for Test Pilots from the Institute of Aeronautical Sciences in 1941 for "outstanding contributions in the field of aeronautics"; the Distinguished Service Award from the Flight Safety Foundation in 1956 for "distinguished service in achieving safer utilization of aircraft"; and the Flight Safety Foundation's Laura Taber Barbour Award in 1960 for championing "through unstinting personal activity the cause of flight safety." For his contributions to aeronautical history, Gough was inducted into the Virginia Aviation Hall of Fame.

The selection of Gough's papers in this case includes photographs of Langley Research Center and contributions to the Manned Spaceflight Safety Program.

SAMUEL HERRICK

Generally recognized as the founder of the field of astrodynamics, Samuel Herrick was born in Madison County, Virginia, in 1911. He received a B. S. in Mathematics from Williams College in 1932 and a Ph.D. in Astronomy from the University of California at Berkeley in 1936. Most of his teaching career was spent at the University of California at Los Angeles (UCLA). He was the Hunsaker Professor of Astronomy at the Massachusetts Institute of Technology during 1961-1962 and was made a professor in the Astronomy and Engineering Departments at UCLA in 1962. Herrick died in 1974.

Herrick's work applied the classic disciplines of celestial mechanics and mathematics (CMM) to the special problems of space trajectory research. His studies of the CMM aspects of space navigation date from 1931, when he received advice and encouragement from R. H. Goddard. As early as 1936, he formulated a development program for the utilization of CMM to help solve space navigation problems destined to become real problems only two decades later. In 1946, Herrick instituted a course in Rocket Navigation, the world's first university course designed specifically for astronautics. In 1957, he founded the Astrodynamics Colloquium at UCLA to facilitate communication among scientists engaged in rocket research.

Herrick's principal contributions to scientific theory are in the areas of orbit determination and ephemeris integration; universal variables; perturbation theory and variation of parameters; differential correction and least squares; space navigation; and sea and air navigation.

In this case, you will find some of Herrick's publications and correspondence.

MARJORIE RHODES TOWNSEND

Born in 1930, Marjorie Rhodes Townsend entered George Washington University (GWU) engineering program at the age of 15. She took classes part time and worked full time, becoming the first woman to earn an engineering degree at GWU, receiving her Bachelor of Electrical Engineering in 1951.

Her career began with eight years of sonar research at the Naval Research Laboratory. From 1959 until 1980, she worked at NASA's Goddard Space Flight Center. Noted for her project management skills, Townsend oversaw three satellite launches from non-US locations. She was project manager for all three Small Astronomy Satellites (1966-1975) and for the Applications Explorer Missions (1975-1976). She was granted a patent for a digital telemetry system that was aboard the NIMBUS satellite. Her last five years at NASA included responsibility for all advanced mission planning for future scientific and applications satellites as well as NOAA's meteorological satellites. After her retirement, Townsend worked for private aerospace companies and provided consulting services to NASA and other aerospace entities. Townsend died in 2015.

Townsend was awarded the NASA Exceptional Service Medal in 1971 and the NASA Outstanding Leadership Medal in 1980. She was also named Knight of the Italian Republic Order in 1972. She was a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and served as a chair of the Washington chapter.

This case contains materials from Townsend's work on the Small Astronomy Satellite (SAS) Program and her involvement at NASA. Clippings also celebrate her many achievements and accomplishments.

JAMES DEAN

Born in Fall River, Massachusetts, James Dean attended the Swain School of Design in nearby New Bedford, before eventually playing a key role in the creation of the NASA art program. He became the NASA director of films, publications and television, then founding director of the Fine Arts Program at NASA from 1961-1974, after which serving as the Curator of Art at the National Air and Space Museum.

Additionally, Dean illustrated astronaut Michael Collins' book *Liftoff: The Story of America's Adventure in Space*.

Here, you will find a selection of illustrations by Dean during his time at NASA alongside his reference photos. Dean created some of the most iconic depictions of the Space Station and Space Shuttle, some of which you can see here. Also in this case is an unpublished manuscript of Dean's *The Artist and the Space Shuttle*. Many more of Dean's illustrations and reference materials can be found in Special Collections and University Archives on the first floor.



APOLLO-SOYUZ RADIO COMMUNICATIONS TRANSCRIPTS

DATE
1975

APOLLO-SOYUZ PAMPHLET NO. 2: X-RAYS, GAMMA-RAYS

DATE
1977

MIKE COOPER

Mike Cooper, an ABC News employee in the late 1960s, kept a collection of materials relating to NASA's Apollo Missions. This collection provides a unique perspective of behind-the-scenes news coverage.

Displayed here is an assortment of materials collected by Cooper, including postcards and other launch memorabilia, photos, and NASA publications.



RECORD OF INVENTION FOR AN "AUTOMATIC AILERON TRIM CONTROL DEVICE FOR AIRPLANES"

DATE
1955

COOPER LETTER

DATE
n.d.

DESCRIPTION

In this letter to his parents, Cooper includes 9 photographs of the Apollo 11 launch from the ABC News on-site broadcasting site.

PROMOTIONAL MATERIALS

DATE
1994, 1997

NASA PRINTED MATERIALS

DATE
1989, 1991, n.d.

WILLIAM HEWITT PHILLIPS

William Hewitt Phillips, known familiarly as Hewitt, was born in Merseyside, England, in 1918, moving with his parents at age two to the United States. He studied aeronautical engineering at the Massachusetts Institute of Technology (MIT), obtaining a Bachelor of Science degree in 1939 and a Master of Science in 1940. During his childhood, he developed an interest in model aircraft, and he maintained an active interest in the hobby throughout his life.

In July 1940, Phillips commenced service with the National Advisory Committee for Aeronautics (NACA) in the Flight Research Division at Langley Research Center in Hampton, Virginia, specializing in the study of aircraft flying qualities and stability. Within this broader assignment, Phillips' task involved the improvement of World War II military aircraft flying qualities. Following the war, Phillips researched the development of jet-powered fighter airplanes, supersonic airplanes, stability augmentation and its effect on pilot control, automatic control, and gust alleviation.

As the U. S. space programs commenced, Phillips became chief of the Space Mechanics Division, supervising research in the areas of space rendezvous, navigation, and lunar landing and developing flight simulators for the Gemini and Apollo programs. To train astronauts for lunar landings, Phillips developed the Lunar Landing Facility. He later served as an analyst and consultant in the development of the space shuttle. Phillips died in 2009.

A selection of Phillips' papers on display showcases his notable achievements and contributions.

JAMES J. AVITABILE

James J. Avitabile, an air force officer from East Haven, Connecticut, graduated from the University of Connecticut and obtained an MBA from Western New England College. He entered the United States Air Force in 1959. During his career, Lieutenant Colonel Avitabile served as an Atlas E operations launch officer and as an astronaut mission operations instructor at NASA's spacecraft simulator complex responsible for astronaut mission flight training at Cape Canaveral/Kennedy from 1965 to 1967. He also served in the Air Force's Manned Orbiting Laboratory (MOL) Program Office; as airborne test director for the E-3A Airborne Warnings and Control Systems (AWACS) Aircraft; and as activation director for the AWACS Operating Base. He was a member of the Cadre Office at NATO, responsible for the fielding of the NATO AWACS system and was a program director responsible for the acquisition of Air Force Command and Control Systems. Upon retiring from the Air Force, Lt. Col. Avitabile worked for General Electric, where he directed military and commercial space programs.

In this case, you will find some of Avitabile's papers from NASA, such as educational briefs and communications.



SUMMARY OF REVIEW OF APOLLO LUNAR MODULE STABILIZATION
AND CONTROL DURING LANDING AND ASCENT

DATE
1969

DONALD K. “DEKE” SLAYTON

One of the first seven American astronauts, Donald Kent "Deke" Slayton was born on March 1, 1924, in Sparta, Wisconsin. He was a senior at Sparta High School when the Japanese government attacked Pearl Harbor, which caused him to join the U. S. Army Air Forces. During World War II, he flew for the 340th Bombardment Group in Europe and the Pacific. Slayton earned a B.S. in aeronautical engineering from the University of Minnesota in 1949. He then worked for Boeing before joining the United States Air Force, serving with the 36th Fighter Day Wing and as a test pilot.

In 1959, Slayton was selected for the Mercury program, NASA's first class of astronauts but was disqualified upon discovery of a heart condition. He continued to work in several positions for NASA. After a reevaluation of his medical status, he was certified for space flight, and in July 1975, Slayton was the docking module pilot for the Apollo-Soyuz Test Project, resulting in a joint docking and experiments with Soviet cosmonauts. Slayton retired from NASA in 1982. He later founded Space Services Inc., of Houston, to develop rockets for commercial endeavors.

Displayed here are some of Slayton's Apollo-Soyuz Program files.



MARS AIRPLANE DIAGRAMS

DATE
1978

DESCRIPTION

These diagrams accompany the “Final Report of the Ad Hoc Mars Airplane Science Working Group” at the Jet Propulsion Laboratory under NASA contract.

SHOOTING FOR THE STARS

A SURVEY OF THE ARCHIVES OF AMERICAN AEROSPACE EXPLORATION

This exhibit contains a selection of materials from the Archives of American Aerospace Exploration (AAAE) at Virginia Tech.

In 1986, the University Libraries at Virginia Tech established the AAAE as one of the core collecting areas for Special Collections and University Archives. Its purpose is to preserve and provide access to published and unpublished materials that document American aeronautical and space history, as well as related sciences. The AAAE includes books, articles, notes, photographs, reminiscences, memorabilia, oral histories, patents, drawings, and schematics. Current holdings comprise more than three dozen collections of papers from pilots, astronauts, physicists, chemists, engineers, NACA (National Advisory Committee for Aeronautics) and NASA (National Aeronautics and Space Administration) administrators and project managers, writers, illustrators, and researchers in industry and academia.

In this exhibit, you will find materials from just eight of these collections, providing a small glimpse into the many materials available for research. The collections on display were selected for their unique perspectives on the subject. From artists to news technicians to the founder of astrodynamics, you will find many interesting documents, illustrations and photographs to start your journey of discovery into American space and aviation history.

COLLECTIONS

James J. Avitabile
Papers, Ms2001-057

Mike Cooper ABC
Apollo Collection,
Acc2019-127

James Dean Collection,
Ms2003-061

Melvin N. Gough
Papers, Ms1987-057

Samuel Herrick Papers,
Ms1978-002

William Hewitt Phillips
Papers, Ms2005-019

Donald K. "Deke"
Slayton Collection,
Ms2023-058

Marjorie Rhodes
Townsend Papers,
Ms1986-003



CLIPPINGS AND ARTICLES ABOUT TOWNSEND'S ACHIEVEMENTS

DATE

1973, 1980, n.d.

NASA NOTEBOOK

DATE

Oct. 1975 - May 1976

ILLUSTRATIONS OF GEMINI MODULE

DATE

n.d.

THE SMALL ASTRONOMY SATELLITE (SAS) PROGRAM

DATE

ca. 1967

DESCRIPTION

Written by Townsend during her time as Project Manager, this report describes the SAS Program and its suitability for specific astronomy experiments.

SAS-A AND SAS-B 1/20 SCALE MODELS & SAS-C MEMORABILIA

NOTES AND MATERIALS RELATED TO THE ORGANIZATION OF NASA

DATE

1958, 1959

CORRESPONDENCE WITH PHYSICIST R.H. GODDARD

DATE

1932

SUBJECT FILES

DATE

1960, 1962, 1963

DESCRIPTION

Herrick collected a large number of subject files throughout his research and collaboration with others, like these on artificial satellites and atmospheres.

ROCKET NAVIGATION

DATE

1950

DESCRIPTION

In addition to creating the first university course in rocket navigation specifically designed for astronautics, Herrick published multiple articles on the subject.

SPACE SHUTTLE CLIP ART AND SKETCHES

DATE

1982, 1986

SPACE STATION ILLUSTRATION

DATE

n.d.

DESCRIPTION

This illustration is the featured image on a NASA poster about the Space Station. It depicts “astronauts assembling EASE/ACCESS components—showing how Space Station will be assembled.”

POSTCARDS OF APOLLO LANDING
AND APOLLO MEMORABILIA

DATE
n.d.

APOLLO-SOYUZ TEST PROJECT FLIGHT MENU AND FOOD LIST

DATE
1974

ASTRONAUT PHOTOGRAPHS

DATE

n.d.

DESCRIPTION

Signed photographs of astronauts Edwin E. "Buzz" Aldrin, Jr. (Apollo 11, Gemini 12) and James A. Lovell, Jr. (Apollo 8, Apollo 13, Gemini 7, Gemini 12)

NASA PRESS BADGES AND JFK SPACE CENTER NEWS MEDIA DEPENDENTS TOUR BADGES

DATE

Nov. 1969

ROSTER OF MILITARY PERSONNEL AT NASA

DATE

1966

APOLLO-SOYUZ PAMPHLET NO. 5: THE EARTH FROM ORBIT

DATE

1977

LANGLEY RESEARCH CENTER PHOTOGRAPHS

DATE

ca. 1954

SAFETY CORRESPONDENCE

DATE

1953, 1968

DESCRIPTION

Gough was heavily involved in safety and accident prevention, participating in panels and acting as a consultant. Some of his files (right) demonstrate his commitment to aviation safety.

APOLLO-SOYUZ TEST PROJECT PHOTOGRAPHS

DATE

1975

SPACE STATION ILLUSTRATION

SOURCE

James Dean Collection, Ms2003-061

DATE

n.d.

DESCRIPTION

This illustration is the featured image on a NASA poster about the Space Station. It depicts “astronauts assembling EASE/ACCESS components—showing how Space Station will be assembled.”

DR. MAXIME A. FAGET

DATE

n.d.

DESCRIPTION

A sketch of Dr. Maxime A. Faget, President and Chief Executive Officer of Space Industries, Inc., alongside reference photos.

SPACE STATION SKETCH

DATE

n.d.

NASA EDUCATIONAL BRIEFS

DATE

n.d.

NASA FACTS PUBLICATIONS

DATE

1967

GOUGH PUBLICATION ON AIRPLANE DESIGN AND ITS
AERODYNAMIC EFFECTS

DATE
1938

ASTRODYNAMICS

DATE

1971-1972

DESCRIPTION

One of Herrick's many publications, *Astrodynamics* is the culmination of his research, a comprehensive two-volume work published by Van Nostrand.