

FROM THE CHIEF HISTORIAN



As mentioned in past newsletters, the year 2008 will be a year of 50th anniversaries for space exploration. On 31 January 1958, following in the wake of Sputnik I and Sputnik II, the United States launched Explorer 1 on the Army's Jupiter-C (Juno) rocket. The Navy's Vanguard followed on 17 March. On 29 July, President Eisenhower signed legislation creating the National Aeronautics and Space Administration (NASA), which became operational on 1 October 1958. During this anniversary year, I will write on each of these events for this newsletter, beginning in this issue with Explorer 1.

One way to approach Explorer 1 is through one of the most iconic images of the Space Age. That image is not the launch itself from Cape Canaveral, spectacular as it was as a nighttime event (10:48 p.m.) and as a new kind of event that was therefore fresh to the American mind. Nor is it the image from Huntsville, home of the Redstone Arsenal, its Army Ballistic Missile Agency, and the von Braun rocket team. Rather, it is the photo snapped a few hours after launch showing William H. Pickering, James Van Allen, and Wernher von Braun holding up a model of the satellite at an early morning news conference in Washington, DC. The image captures the triumph those men, and many others around the United States, felt with the launch of the first American satellite less than four months after Sputnik I had delivered its "shock of the century." Let us contemplate for a few moments the context, the details, and the significance of that photo.

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HISTORY OF THE SCIENTIFIC EXPLORATION OF EARTH AND SPACE CONTRACTS

by Amelia Lancaster

The NASA History Division is very pleased to announce the selection of 12 new projects in the History of the Scientific Exploration of Earth and Space (HSEES) program, funded jointly by the Science Mission Directorate (SMD) and the History Division. SMD assembled an independent review panel to evaluate history proposals that were submitted in response to a broad-ranging solicitation. These selected projects are mostly to produce books or shorter monographs and are mostly three-year projects. The NASA History Division, together with the Science Mission Directorate, will oversee these projects. Synopses of the selected HSEES projects are below.

William Clancey, of Ames Research Center, has been awarded a contract to research the Mars Exploration Rover (MER) scientists, focusing on their professional and personal experience as part of a multiple-year, collaborative mission with a virtual presence on Mars. The monograph is based on personal observations of the MER Spirit and Opportunity science teams at the Jet Propulsion Laboratory (JPL) in 2004 and data gathered by the human-centered computing team led by the principal investigator.

Henry Dethloff has been contracted to research and write a history of scientific ballooning. The work will briefly review balloon flight and will focus

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History of the Scientific Exploration of Earth and Space Contracts (continued)

on the past quarter century of NASA scientific ballooning, which has provided an enhanced understanding of both Earth and planetary environments.

W. Henry Lambright will write a book on the history of NASA's robotic Mars Exploration Program (MEP). Chronicling the history of the MEP program, the book will discuss the Mariner, Viking, and Observer missions of the 20th century, as well as the Mars advocacy coalition.

Chris Impey will write a book on the history and cultural impact of those NASA space science missions that have powerfully shaped popular imagination regarding our place in the universe. Using a wide range of scholarly and popular information, the author aims to reach a wide audience with information about the impacts and achievements of astronomy and planetary science.

Shaida Johnston and Darrel Williams of Goddard Space Flight Center have been contracted to research and write a book on the Landsat satellite missions. The project will document the technical and operational history of the Landsat program and its archive by describing the evolution of the program from a remote sensing system into a global observing system. The book not only will be used as a basic reference document, but also will provide insights and lessons for those entrusted with the planning of future archives and global observing systems.

Susan Neibur has been commissioned to write a book on the 10 missions undertaken since the launch of the Discovery Program. Her work will study how quickly each mission was able to respond to and resolve unforeseen challenges, along with how management at NASA Headquarters responded to those challenges and whether lessons learned have increased the probability of success of later missions. The book intends to inform and inspire general audiences and provide a solid analysis for those involved in the administration, planning, and execution of future missions.

James Acker has been awarded a contract to write a book on the history of NASA's leading role in ocean biological remote sensing, termed "ocean color." Ocean color is the ability of microscopic oceanic plants to appear as different colors because of their chlorophyll concentrations. Visible through satellite imaging, it offers large-scale views of ocean biological dynamics. This history will provide the scientific community and public with insight into the exciting science behind iconic views of the world's oceans.

Roger Launius of the National Air and Space Museum has been commissioned to write a book on the history of robotic planetary exploration. The purpose of this book is to consider, over the 50-year history of the Space Age, what we have learned about the other bodies of the solar system and the process whereby we have learned it. The project seeks to capture, in one place, a set of broad studies of the history of robotic solar system exploration and to open opportunities for greater involvement of social scientists in a topic that has not attracted them heretofore.

Roger Launius also has been granted support to research and create an atlas of space exploration. This work will depict the history of the Space Age through text, photographs, and specially executed cutaway and other types of illustrations, as well as many maps. It will include stupendous images from NASA and other sources. A critical collaborator in this project is Andrew Johnston, a geographer with considerable experience in developing maps and other scientific visualizations for planetary exploration.

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First, the context. Why are Explorer 1's three most important people in Washington, DC? As you might have guessed, it has little to do with technical duties and everything to do with publicity. Having seen the media circus surrounding the failed "4-foot launch" of the Navy's Vanguard the previous month, von Braun, Pickering, and Van Allen were sent to Washington, much to their dismay, for a planned press conference intended to divert some of the attention from the launch site itself. The hours before launch found them in the Pentagon, where they kept track of events via teletype at the Army communications center. After the successful launch, they crossed the Potomac in a chauffeured car on a cold, rainy Washington night and arrived at the National Academy of Sciences building, site of the 1 a.m. press conference. It was now 1 February; the stage was set for the iconic photo.

Let us take a look in more detail at the photo itself. The eye is drawn first to the three men, each the subject of a biography in 2007: Michael J. Neufeld's *Von Braun: Dreamer of Space, Engineer of War* (Alfred A. Knopf, 2007); Abigail Foerstner's *James Van Allen: The First Eight Billion Miles* (University of Iowa Press, 2007); and Douglas J. Mudgway's *William H. Pickering: America's Deep Space Pioneer* (NASA SP-2007-4113, 2007). As von Braun, Van Allen, and Pickering held the model of Explorer 1 aloft in the early morning hours of 1 February 1958, each had come to the moment by diverse personal pathways.

Von Braun was born in 1912, and his path originated in Germany, where he developed the world's first large rocket, the V-2, in the context of Hitler's Nazi Germany. The story of the transfer of 120 Germans to the United States as part of Project Paperclip, their time at Fort Bliss and White Sands testing V-2 rockets, and their arrival and work at the Army's Redstone Arsenal in Huntsville, Alabama, developing a more powerful ballistic missile, is well known. Von Braun and his team provided the Jupiter-C (Juno) first stage that launched Explorer 1. As von Braun had hoped all along, what was once a weapon was turned toward the exploration of outer space.

Pickering (born in 1910) was a New Zealander who was intrigued by radio communication at an early age, came as a student to the California Institute of Technology (Caltech), and joined its faculty in 1936. Both as a graduate student and as a faculty member, he worked with Nobelist Robert Millikan on the new field of cosmic rays, developing instrumentation for determining their directional characteristics using an array of Geiger counters. He also developed lightweight instrument packages for high-altitude balloons, good practice for what was to come. During World War II, Pickering worked on rocket technology for the Army at Caltech's Jet Propulsion Laboratory. He became its Director in 1954 and oversaw the development of its early Corporal and Sergeant rockets. During this time, he met Wernher von Braun. In addition to its role in the Sergeant rockets in the upper stages of the Explorer 1 launch vehicle, Pickering's group would provide the satellite itself. Pickering would remain Director of JPL until 1976, the year before von Braun's death.

Van Allen, born in 1914, was the all-American boy from Iowa. His interest in science was stimulated at Iowa Wesleyan College, where he helped prepare instruments for the second Byrd Antarctic Expedition. He also did work on magnetism with an eye toward geophysical applications. After graduate work at the University of Iowa, as well as wartime work at the Carnegie Institution of Washington's Department of Terrestrial Magnetism and the Johns Hopkins University Applied Physics Laboratory,

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From the Chief Historian (continued)

in 1946 Van Allen became involved in using von Braun's captured V-2 rockets for cosmic-ray research. In 1951, he returned to the University of Iowa as the chairman of its physics department. In furtherance of his cosmic-ray research, he pioneered balloon-launched rocket sondes, and the launch of Sputnik found him on a research ship in the Pacific carrying out his "Rockoon" program. Because of their previous work, Van Allen and his group were well placed to develop a scientific payload for America's first satellite, which was supposed to be the Navy's Vanguard. But Van Allen had hedged his bets by keeping in contact with Ernst Stuhlinger in von Braun's Huntsville group and made sure the payload would also fit on the Army's Jupiter-C rocket. With the launch of Sputnik and the failure of Vanguard, Van Allen's experiments indeed first flew on America's first satellite—Explorer 1.

Each of these three men thus represented a component of Explorer 1's success: the rocket, the satellite, and the science payload. Each represented an institutional underpinning crucial to the fledgling American space program: the Army, the Jet Propulsion Laboratory, and scientific research as represented by the University of Iowa. Each had followed his own path to converge in the singular moment depicted in the triumphal image.

In that image, after the men, the eye is drawn to the object they are holding, the satellite itself. On Pickering's end is the scaled-down fourth-stage Sergeant rocket that he had helped develop. On the right side, over von Braun's head, is the instrumentation section of the satellite. It is made of stainless steel only a fraction of a millimeter thick. The stripes are not for decoration. Rather, they are the passive thermal control system, the alternating eight white stripes allowing the instrument compartment to maintain a temperature between 43 and 104°F. Inside the instrument package are three types of experiments: Van Allen's cosmic-ray experiment (a Geiger counter), two types of micrometeorite detectors, and temperature sensors. Van Allen's experiment was used in conjunction with subsequent satellites to detect and map what became known as the Van Allen radiation belts. The micrometeorite detectors were intended to characterize the space environment for future satellites and to help gauge how they might be endangered by high-velocity small particles in the new, uncharted ocean of space. The third experiment, the temperature sensors, measured temperature around the



Shown here are the three men responsible for the success of Explorer 1, America's first Earth satellite, launched 31 January 1958. At left is Dr. William H. Pickering, Director of JPL, which built and operated the satellite. Dr. James A. Van Allen, center, of the University of Iowa, designed and built the instrument on Explorer that discovered the radiation belts that circle Earth. At right is Dr. Wernher von Braun, leader of the Army's Redstone Arsenal team, which built the first-stage Redstone rocket that launched Explorer 1. (Image Number GPN-2000-000478)

spacecraft. Also important were the wires extending off the satellite; they were used in conjunction with the radio transmitters, which carried the first transistors ever into outer space, to send data to the newly formed Mini-track stations below.

On the table in front of this scene is a model of the launch vehicle, reminding us of the intense rivalry between the Navy's Vanguard and the Army Ballistic Missile Agency rocket built in Huntsville. Its first stage is a Juno rocket, a modified Jupiter-C from the Redstone Arsenal, with a V-2 pedigree going back to World War II. The second stage is a ring of 11 modified Sergeant solid-propellant motors, with three more for the third stage. These upper stages include the cylindrical "spinning tub," started 10 minutes before launch and revolving at 750 revolutions per minute (rpm) during launch, to help even out the thrust of the clustered motors and provide gyroscopic stability. The fourth stage is that single scaled-back Sergeant rocket. The first-stage engine delivered 83,000 pounds of thrust; each Sergeant rocket, 16,500 pounds. All of this to launch a payload of 31.5 pounds, including the attached burned-out fourth stage, $\frac{1}{20}$ of 1 percent of the initial mass. It was awesomely wonderful and awesomely inefficient at the same time—a problem still with us today, even with much larger engines.

Many elements thus came together to compose this iconic image—the setting, the people, the technology, the politics, and the media itself, present in the knowledge that the event was bound to be of historic proportions. No one knew quite how historic. All things have a beginning, and for the United States' presence in space, this was it, eight months before NASA even became operational. Out of small beginnings grew great things. One could hardly have known what this singular event would set off during the next 50 years. For some visionaries, it has been a disappointment; for others, an inspiration; for yet others, a diversion of resources better used on Earthly problems. But like the railroad and the airplane, spaceflight has impacted society in ways that even the visionaries could not have foreseen and that we cannot fully fathom even today.

Steve Dick

History of the Scientific Exploration of Earth and Space Contracts (continued)

David DeVorkin has been granted support for a project that is to examine how arrangements between academic research institutions and government patrons have stimulated pure research. As an example, DeVorkin studies the transformation of the Smithsonian Astrophysical Observatory and the Harvard College Observatory into the Harvard-Smithsonian Center for Astrophysics. In doing so, he shows how deeply NASA influenced what became a true transformation in scope and direction for the combined Center for Astrophysics.

Neil Maher has been contracted to write *Ground Control: An Environmental History of NASA and the Space Race*. The book will examine the changing relationship between nature and American science and culture. It will bring attention to the historic significance of NASA science and the way in which the space race and nature's unexplored role within it shaped the politics and culture of post-World War II America.

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History of the Scientific Exploration of Earth and Space Contracts (continued)

Christine Beckman has been awarded a contract to explore how managers and organizations successfully manage innovation in the face of uncertainty. The study explores the formal and informal structures that give shape to emerging ideas, the way in which technical and scientific uncertainty interact with financial and political uncertainty, and the way in which new structures emerge to deal with uncertainty during projects of long duration. The study examines the Spitzer Space Telescope program as well as the social and technical changes that arose during its inception.

NEWS FROM HEADQUARTERS AND THE CENTERS

Headquarters

Headquarters Historical Reference Collection

Jane Odom continues to evaluate and acquire new material for the Historical Reference Collection. She appraises material and directs the subsequent processing of collections. Jane continues to answer reference requests and facilitates the entry of international visitors into the building. She and other members of the archival staff are still working with the information technology (IT) staff on a modification to the database that will allow thousands of Portable Document Format (PDF) files in the database to be published to an external Web site accessible to all.

Colin Fries and John Hargenrader have completed the scanning of the Administrator's speeches. They are now working their way through the Deputy Administrator's speeches, scanning and adding them to our database. A project John and Colin began a year ago has finally come to fruition—the processing of the National Advisory Committee for Aeronautics (NACA) Collection, 1915–58. Those interested in using this collection will find subject files, biographical files, photographs, patent files, reunion files, and oral history interviews.

Colin, John, and Liz Suckow shared in fact-checking a number of forthcoming publications—a new art book by Bert Ulrich, a dictionary of the Space Age by Paul Dickson, and a revision of our monograph on U.S. human spaceflight. Additionally, all three share reference duties such as answering inquiries sent to the public e-mail account on the History Division Web site and assisting walk-in researchers. Everyone from the History Division attended sessions at the “Remembering the Space Age: 50th Anniversary Conference” held 22–23 October 2007 in Washington.

Individually, Liz completed the processing of two life sciences collections, one dated 1991–2002 and the other a collection of source materials, 1958–77, for an unpublished book on the topic by Mae Mills Link. In November, Liz began appraising several dozen boxes of Viking Program History files recalled from the Federal Records Center. She is copying historically significant items from those boxes and adding them to the Historical Reference Collection. In addition, she began processing a collection of Equal Employment Opportunity (EEO) files.

Colin completed the reorganization of the History Division book series Web page and added a section describing our flagship publications. He continues to find and correct errors on the History Web site. John is currently processing a collection of source files

collected by Dill Hunley for his recently published book on propulsion technology development for U.S. space-launch vehicles.

Welcome to Amelia Lancaster

The NASA History Division welcomed Amelia Lancaster as a new intern in January. Amelia is from Northern California and is a student at the University of California, Davis. She is a junior majoring in political science and economics.

Ames Research Center (ARC)

To celebrate NASA's 50th anniversary, the NASA Ames Contractor Council prepared its 2008 calendar to honor the 12 inductees in the Ames Hall of Fame. It sold rapidly. Preparations are under way at Ames to select a new class of honorees.

April Gage remains busy with a tremendous variety of acquisitions. Throughout 2007, she acquired and inventoried 19 donations to the History Office archives, which included 61 cubic feet of records, books, and small- to medium-sized artifacts, as well as 85 linear feet of framed items and large artifacts. Of these acquisitions, 18 were accessioned and 10 were fully processed, totaling 34.5 cubic feet and 5.5 linear feet. Items of note include artifacts from the Pioneer Project era, such as a full-scale model of Pioneer 6–9 spacecraft and several original paintings depicting artist's conceptions of planetary encounters by various Pioneers. A wooden, full-scale mockup of the interior components of the Galileo descent probe and a wind tunnel model of the probe also stand out among spacecraft models acquired in 2007. Remarkably, a complete Hycon HR-732 9-by-18-inch-frame reconnaissance camera for the U-2 aircraft, one of several aerial cameras used in the airborne science program when it was based at Ames, was rescued from disposal for placement in the History Office artifact collection. Additionally, a cache of documents on Ames-based Earth system science, mission analysis, and computer systems and research was donated by Robert Slye, a gifted and versatile scientist who has been continuously employed by the Center since 1958.

April also brought a renewed focus on preservation to the Ames archive. She reviewed actual storage conditions in the N207 high bay and drafted a requirements plan anticipating a proposed relocation of the archive in 2008. She identified ways to implement basic, broad preservation measures to improve the storage conditions across all the collections. Further, she relocated, cleaned, rehoused, and performed other preservation measures to 36 cubic feet of material, including artifacts, records, books, and photographs from multiple acquisitions dating from 2004 to 2006; furthermore, she either created or updated finding aids for the items.

Working with NASA Ames Historic Preservation Officer Keith Venter, April completed a major redesign of the Ames historic preservation Web site (<http://historicproperties.arc.nasa.gov>). An encyclopedic compilation of documents relating to the history of Ames facilities, it is proving an excellent resource for historical researchers.

The History Office would like to extend a hearty thank-you to its emeritus archivist, Leilani Marshall. Much to the office's good fortune, Leilani has generously donated abundant amounts of her time to archives projects here. Of note was her completion of the conversion of the last several cubic feet of legacy material, including records, scrapbooks, audiovisual media, and books, into the Archives Reference Collection

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News from Headquarters and the Centers (continued)

(AFS1070.8A), a large collection that she designed. Leilani has provided valuable advice, appeared when needed, and magically helped make piles of work disappear.

Allison Sundaram, a senior at Santa Clara University, will join the History Office as an intern for the spring semester. To further her interest in museum studies, she will catalog artwork in the archives and prepare some small exhibits. Ruth Dasso Marlaire, on detail to the History Office, has been researching and writing a biography of space scientist James Pollack.

Jack Boyd has prepared a complete new presentation for NASA's 50th anniversary from the perspective of the NASA Ames Research Center and has been using it for his many outreach efforts. He and Glenn Bugos are writing up a version of it for presentation at the American Institute of Aeronautics and Astronautics (AIAA) "Space 2008" conference.

Glenn Research Center (GRC)

The Plum Brook Reactor's Decommissioning Project's Annual Community Information Session was held on 17 October at Sandusky High School. The event was very well attended by local citizens hoping to learn more about the reactor and the progress of the decommissioning. Glenn's History Officers Kevin Coleman and Anne Power, as well as archivist Bob Arrighi (RSIS), were on hand to answer questions about the reactor's history. Additionally, the reactor documentary *Of Ashes and Atoms* was shown on Toledo's local Public Broadcasting Service (PBS) station in December.

Archivist Bob Arrighi and Records Specialist Deb Demaline (RSIS) are working with Galen Wilson and Scott Forsythe of the National Archives and Records Administration (NARA) in identifying original architectural drawings to be transferred to the NARA Regional Archives in Chicago. It was decided to retain

all drawings from the initial 1941–45 construction period; those documenting the overall structure and major changes to each building; and all original, significant operational, and major modification drawings for each major test facility.

Contract archivist Nora Blackman has resigned her position in the GRC History Program Archives effective 11 January 2008 and is now an archivist in the Special Collections Department at Case Western Reserve University Libraries in Cleveland, Ohio. In her new role, Nora will continue to work with primary sources in the history of science and technology. She will be missed!

In early fall 2007, Scott Marabito, a Glenn maintenance worker, discovered the original groundbreaking tools used to mark the beginning of construction of the Center in 1941. The special nickel-plated pick and



Recently discovered in an old storage building at GRC, the original pick and shovel used to break ground at the NACA Aircraft Engine Research Laboratory on 23 January 1941 in Cleveland Ohio, is now prominently on display in the Dr. Edward R. Sharp Employee Services building.

shovel were also later used at the groundbreaking for Plum Brook Station in Sandusky. The tools had previously been thought to be lost. On 23 January, the 67th anniversary of the groundbreaking, a ceremony was held to commemorate the event and to unveil a new permanent display of the groundbreaking tools in the Edward R. Sharp Employee Center.

Goddard Space Flight Center (GSFC)

Barbara Thompson has agreed to serve as the history point of contact at Goddard Space Flight Center; she will be replacing Jane Riddle, who has retired. Barbara graduated from the University of Pennsylvania in Philadelphia with degrees in physics and mathematics. She worked as a research assistant doing theoretical modeling of auroral activity and magnetic storms, and she completed her doctoral thesis on auroral particle acceleration in 1996.

She began work at GSFC after graduate school and served as a research scientist on the recently launched Solar and Heliospheric Observatory (SOHO). She worked primarily on the Extreme Ultraviolet (EUV) Imaging Telescope (EIT) and the Large Angle Spectrometric Coronagraph (LASCO) instruments, serving as operations and research scientist.

She has authored or coauthored over 150 scientific papers, primarily concerning coronal mass ejections, the solar wind, and space weather. She currently serves as an astrophysicist with the Solar Physics Branch at Goddard, working on the Solar Dynamics Observatory and Solar TERrestrial RELations Observatory (STEREO) missions, as well as the International Heliophysical Year (IHY).

Barbara is now setting up a History Committee at GSFC in preparation for their 50th-anniversary activities. The new History Committee is meeting on a monthly basis to determine history needs and serve as a point of contact for historical efforts. There are approximately 20 members, and GSFC is close to achieving a good balance of participants through all of the Center's directorates. We have established liaisons with the American Geophysical Union History Committee, the GSFC Public Affairs Office, and the Goddard Retirees and Alumni Association.

The members of the GSFC History Committee are already very active, particularly since 2009 will be Goddard's 50th anniversary. The History Committee is joining efforts with the Public Affairs Office to support the activities celebrating the anniversary. Other activities include the planning the 50th anniversaries of the Explorer and Vanguard programs, arranging a Yuri's Night celebration of the flight of Yuri Gagarin, organizing historical speakers at GSFC, and supporting efforts such as those of the GSFC library.

The History Committee is already busy with many requests from individuals and programs requiring information on GSFC's activities and successes. We hope that the interest will continue and that this effort will be fruitful.

Marshall Space Flight Center (MSFC)

A full-scale, newly restored Saturn V rocket at the U.S. Space & Rocket Center (USSRC) in Huntsville is now housed in the new 68,200-square-foot Davidson Center for Space Exploration.

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News from Headquarters and the Centers (continued)

The restoration of the Saturn V and the opening of the Davidson Center represent the first stage in a USSRC plan to better showcase NASA and MSFC contributions to historical, current, and future space exploration.

The Davidson Center will also serve as a new front door for the USSRC complex, housing its visitor ticketing area and a 350-seat auditorium, along with the Saturn V rocket.

The USSRC, NASA's first visitor center, opened in 1970 and has served over 12 million visitors to date. As the Official Visitor Information Center for Marshall, the USSRC educates the public and students who attend Space Camp about the work being done at MSFC, particularly in the area of propulsion, where MSFC has made significant contributions to the Apollo and Shuttle programs and is again on the forefront with the Ares rockets.

Dorothy Davidson, a Huntsville businesswoman who is a member of the Saturn V Restoration Executive Committee, secured the naming opportunity for the building with her leadership gift. Through this naming opportunity, Mrs. Davidson is recognizing the contributions of her husband, Dr. Julian Davidson, and other Alabama engineers who worked in the early days of missile and rocket development in Huntsville, many of whom joined Dr. Wernher von Braun's team to create the rocket that transported human beings to the Moon.

Stennis Space Center (SSC)

Rebecca Strecker, History Office point of contact at SSC, will be moving to Kennedy Space Center to take a new position in strategic communications. We wish her well. Linda Theobald will be replacing her as the new History Office point of contact at SSC.

NEW NASA HISTORY PUBLICATIONS

New Books

Wind and Beyond: A Documentary Journey into the History of Aerodynamics in America, Volume II: Reinventing the Airplane (NASA SP-2007-4409), edited by James R. Hansen with Jeremy Kinney, D. Bryan Taylor, Molly Prickett, and J. Lawrence Lee. Following up on volume 1's account of the invention of the airplane and the creation of the original aeronautical research establishment in the United States, volume 2 explores the airplane design revolution of the 1920s and 1930s and the quest for improved airfoils. To order this book, please contact the NASA Center for AeroSpace Information, 7121 Standard Drive, Hanover, MD 21076, 301-621-0390, help@sti.nasa.gov; online order form: <https://www.sti.nasa.gov/legi-bin/ordersti.pl>. The price code is EA7 (within the U.S., \$35 plus \$2 shipping and handling; outside the U.S., \$70 plus \$17 shipping and handling).

William H. Pickering: America's Deep Space Pioneer (NASA SP-2007-4113), by Douglas J. Mudgway. A thoroughly researched, insightful biography of William Pickering, a pioneer of U.S. robotic spaceflight and a significant actor in the Explorer 1 project. To order this book, please contact the NASA Center for AeroSpace Information, 7121 Standard Drive, Hanover, MD 21076, 301-621-

0390, help@sti.nasa.gov; online order form: <https://www.sti.nasa.gov/cgi-bin/ordersti.pl>. The price code is EA5 (within the U.S., \$25 plus \$2 shipping and handling; outside the U.S., \$50 plus \$17 shipping and handling).

Facing the Heat Barrier: A History of Hypersonics (NASA SP-2007-4232), by T. A. Heppenheimer. Hypersonics is a study relating to supersonics that has enabled thermal protection during atmospheric reentry and advanced high-speed propulsion. *Facing the Heat Barrier* examines this science and its importance in the fields of aeronautics and spaceflight. To order this book, please contact the NASA Center for AeroSpace Information, 7121 Standard Drive, Hanover, MD 21076, 301-621-0390, help@sti.nasa.gov; online order form: <https://www.sti.nasa.gov/cgi-bin/ordersti.pl>. The price code is EA4 (within the U.S., \$20 plus \$2 shipping and handling; outside the U.S., \$40 plus \$17 shipping and handling).

U.S. Human Spaceflight: A Record of Achievement, 1961–2006 (NASA SP-2007-4541), compiled by Judith A. Rumerman and updated by Chris Gamble and Gabriel Okolski. Interested readers may obtain a free copy of this monograph by sending a self-addressed, stamped 9-by-12-inch envelope (\$2.84 domestic first-class postage for 13 ounces) to the NASA Information Center, NASA Headquarters, Washington, DC 20546, or by coming in person to the NASA History Division in room CO72 of NASA Headquarters. We expect to post a PDF version of this monograph soon.

The Societal Impact of Spaceflight (NASA SP-2007-4801), edited by Steven J. Dick and Roger D. Launius. The first in a new subseries for societal impact studies, this large volume contains the edited papers from a conference that was held in September 2006. The essays cover a wide range of topics including ideology, turning points in history, and applications satellites, as well as social, cultural, and economic impacts. To order this book, please contact the NASA Center for AeroSpace Information, 7121 Standard Drive, Hanover, MD 21076, 301-621-0390, help@sti.nasa.gov; online order form: <https://www.sti.nasa.gov/cgi-bin/ordersti.pl>. The price code is EA5 (within the U.S., \$25 plus \$2 shipping and handling; outside the U.S., \$50 plus \$17 shipping and handling).

OTHER NEW AEROSPACE HISTORY PUBLICATIONS

Compiled by Chris Gamble

The History of German Space Policy: Ideas, Influences, and Interdependence, 1923–2002, by Niklas Reinke, translated by Barry Smerin and Barbara Wilson (Paris: Beauchesne Editeur, January 2008). Niklas Reinke's book describes, for the first time, the concepts, the influencing factors, and the interdependencies that had an impact on Germany's postwar program in space. The book provides an in-depth look into the different phases of space activities in Germany over the years (and, to a large extent, also those elsewhere in Europe), at the personalities involved, and at the numerous projects carried out within the national program or as bilateral programs with the U.S. and France.

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Other New Aerospace History Publications (continued)

The Skylark Rocket: British Space Science and the European Space Research Organisation, 1957–1972, by Matthew Godwin (Paris: Beauchesne Editeur, January 2008). By the time the last Skylark rocket was launched in 2005, nearly 450 launches had been carried out from sites in Europe, Australia, and South America in the nearly 50-year lifetime of the program. The Skylark is a largely unsung hero of the U.K. space program—in fact, its use went far beyond the U.K.; it also was used by NASA, the European Space Research Organisation (ESRO), and German and Swedish space organizations. The book charts the first 15 years of the development of the Skylark program, from its genesis to its extensive use by ESRO.

To the End of the Solar System: The Story of the Nuclear Rocket, 2nd edition, by James A. Dewar (Apogee Books Space Series/Collector's Guide Publishing, Inc., January 2008). Jargon-free and ideal for scientists and laypersons alike, this study is a comprehensive history and analysis of nuclear rocket propulsion systems. Detailing a two-decade period—spanning the 1950s through part of the 1970s—by profiling the U.S. government's Rover and Nuclear Engine for Rocket Vehicle Application (NERVA) programs, the book provides a complete history of the development of nuclear propulsion capabilities for space exploration. Eyeing future possibilities, this reference identifies the technological requirements necessary to perform the deep space missions now being planned by NASA and presents a discussion on the political and social issues surrounding nuclear rocket development.

The Space Economy at a Glance 2007, published by the Organisation for Economic Co-operation and Development (OECD) (Paris: OECD Publishing, 2007). The space industry itself is relatively small compared to other manufacturing sectors, but its technological dynamism and strategic significance mean that it plays an ever more critical role in modern society. This book provides a compilation of statistics on the space sector and its contributions to economic activity.

50 Years of Space: A Global Perspective, edited by P. V. Manoranjan Rao (Universities Press, 2007). To commemorate the 50th anniversary of the launch of Sputnik I, *50 Years of Space* gathers, in a single volume, brief histories of all of the major space agencies of the world written by top space program officials. The essays illustrate the means by which each space agency has explored outer space, showcased its technological advancements, and solved social problems. They also depict advances in international cooperation with predictions for the future.

History of Rocketry and Astronautics, Volume 28, edited by Frank H. Winter, American Astronomical Society History Series (IAA History Symposia, volume 19, 2007). This volume contains the proceedings of the Thirty-Third History Symposium of International Academy of Astronautics in Amsterdam, The Netherlands, 1999.

History of Rocketry and Astronautics, Volume 27, edited by Kerrie Dougherty and Donald C. Elder, American Astronomical Society History Series (IAA History Symposia, volume 18, 2007). This volume contains the proceedings of the Thirty-Second History Symposium of International Academy of Astronautics in Melbourne, Australia, 1998.

State of the Universe 2008: Images, Discoveries, and Events, by Martin Ratcliffe (Praxis, December 2007). This annual provides a yearly astronomy review suit-

able for the popular science level, covering all major astronomical news on topics beyond the solar system and placing them in the context of the longer term goals of astronomers and astrophysicists around the world. It also includes Web links for all major news stories, providing a bridge between the public news stories and the actual research Web sites. The set of appendices at the end of the book includes a list of launches of major astronomical observatories/satellites during the past year, a list of planned future astronomical satellites, and basic data on all astronomical observatories currently in operation, with Web links for the reader who wishes to find out more.

How Apollo Flew to the Moon, by W. David Woods (Praxis, December 2007). Out of the technological battlefield of World War II came a team of gifted German engineers and designers who developed the vengeance weapon, the V-2, which evolved into the powerful Saturn V rocket that would take men to the Moon. David Woods tells this exciting story, starting from America's postwar aeronautical research facilities that used the V-2 for the development of the robust, resilient, and reliable Saturn V launcher. He describes the initial launches through piloted orbital spaceflights, comprehensively detailing each step in this massive technical accomplishment, including computer configuration, the role of ground control, trajectory planning, orbiting the Moon, the separation of the lander, walking and working on the Moon, retrieving the lunar astronauts, and returning to Earth.

The Far Side of the Moon: A Photographic Guide, by Charles J. Byrne (Springer, December 2007). The far side of the Moon, also called the "dark side of the Moon," was unknown to humanity until the Luna and Lunar Orbiter pictures were returned to Earth. Until now, the farside Lunar Orbiter photos have been available only with strong reconstruction lines, but they appear here for the first time as complete photographs, unmarred by imaging and processing artifacts. The book also explains in detail how the far side was deeply covered by ejecta from the Near Side Megabasin and modified by later impacts.

Robots in Space: Technology, Evolution, and Interplanetary Travel, by Roger D. Launius and Howard E. McCurdy, New Series in NASA History (Baltimore: Johns Hopkins University Press, December 2007). Given the near-incomprehensible enormity of the universe, it appears almost inevitable that humankind will one day find a planet that appears to be much like Earth. This discovery will no doubt reignite the lure of interplanetary travel. Will we be up to the task? And, given our limited resources, biological constraints, and the general hostility of space, what shape should we expect such expeditions to take? In *Robots in Space*, Roger Launius and Howard McCurdy tackle these seemingly fanciful questions with rigorous scholarship and disciplined imagination, jumping comfortably among the worlds of rocketry, engineering, public policy, and science fantasy to expound upon the possibilities and improbabilities involved in trekking across the Milky Way and beyond. They survey the literature (fictional as well as academic studies); outline the progress of space programs in the United States and other nations; and assess the current state of affairs to offer a conclusion startling only to those who have not spent time with Asimov, Heinlein, and Clarke: to traverse the cosmos, humans must embrace advanced robotic technologies.

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Other New Aerospace History Publications (continued)

Apollo Moon Missions: The Unsung Heroes, by Billy Watkins (author) and Fred Haise (foreword) (Bison Books, December 2007). In 1961, President John F. Kennedy challenged the United States to land an astronaut on the Moon and return him safely to Earth before the end of the decade. It seemed like an impossible mission and one that the Soviets—who had launched the first satellite and put the first man into Earth orbit—would surely achieve before the Americans. However, the ingenuity, passion, and sacrifice of thousands of ordinary people from all walks of life enabled the space program to meet this extraordinary goal. This is the story of 14 of those men and women who worked behind the scenes, without fanfare or recognition, to make the Apollo missions successful.

James Van Allen: The First Eight Billion Miles, by Abigail Foerstner (Iowa City: University of Iowa Press, 15 November 2007). Astrophysicist and space pioneer James Van Allen (1914–2006), for whom the Van Allen radiation belts were named, was among the principal scientific investigators for 24 space missions, including Explorer 1 in 1958, the first successful U.S. satellite; Mariner 2's 1962 flyby of Venus, the first successful mission to another planet; and the 1970s Pioneer 10 and Pioneer 11 missions, which surveyed Jupiter and Saturn. Although he retired as a University of Iowa professor of physics and astronomy in 1985, he remained an active researcher, using his campus office to monitor data from Pioneer 10—on course to reach the edge of the solar system when its signal was lost in 2003—until a short time before his death at the age of 91. Now Abigail Foerstner blends space science drama, military agendas, Cold War politics, and the events of Van Allen's lengthy career to create the first biography of this highly influential physicist.

We Came in Peace for All Mankind: The Untold Story of the Apollo 11 Silicon Disc, by Tahir Rahman (Leathers Publishing, November 2007). Next to the first boot prints left by Neil Armstrong and Buzz Aldrin is a package containing a silicon disc with messages from 73 world leaders. This vividly illustrated and inspiring book reveals the story of those messages as well as the historic lunar plaque and U.S. flag that were left on the Moon.

Our Changing Planet: The View from Space, edited by Michael D. King, Claire L. Parkinson, Kim C. Partington, and Robin G. Williams (Cambridge: Cambridge University Press, November 2007). Since their launch in the 1960s, satellites have been used to observe Earth on local, regional, and global scales. These observations have given us unique insights into the often detrimental effects that human activity is having on the planet. Led by a team of editors from the NASA Goddard Space Flight Center, the world's top remote sensing scientists showcase spectacular satellite imagery combined with an accessibly written text that explains the science behind these images. This is a stunningly attractive and informative volume for anyone interested in environmental issues and the magnificence of our Earth. It also provides inspiration for students, teachers, environmentalists, and scientists.

The Lunar Exploration Scrapbook, by Robert Godwin (Burlington, Ontario: Apogee Books/Collector's Guide Publishing, Inc., November 2007). From single-seat landers to rocket backpacks and lunar bulldozers, this study takes readers into the imagination of the world's top aerospace engineers by presenting NASA's lunar spacecraft research. A unique blend of history and imagination, this resource not only covers the actual exploration of the Moon conducted during the Apollo program of the 1960s and 1970s, but also includes a presentation of dozens of spacecraft that were

never built. Vivid, colorful renderings of the conceptual craft—many of which are not available anywhere else—are also included, providing a visual progression of NASA's technological advancements.

Apollo Training, by Robert Godwin (Burlington, Ontario: Apogee Books/Collector's Guide Publishing, Inc., November 2007). This 168-page book was originally compiled for astronauts and NASA internal staff in 1968. It includes 166 pages of diagrams of Apollo systems, trajectories, and basic procedural information. This extremely rare black-and-white collectible with a full-color cover is now available in its entirety for the first time since 1968.

NEW ONLINE RESOURCES

NASA History Web Sites

Thor Hogan's *Mars Wars: The Rise and Fall of the Space Exploration Initiative* (NASA SP-2007-4410) is now available at <http://history.nasa.gov/sp4410.pdf> online. The book is about the Space Exploration Initiative, an ambitious project that sought to return humans to the Moon as well as complete a mission to Mars. It was unsuccessful due to budgetary and, the author argues, decision-making constraints.

Other New Electronic Resources

Retro Space Images provides high-resolution versions of historic NASA imagery in an easy-to-use format. To obtain a CD or DVD-R containing pictures, visit their Web site at <http://retrospaceimages.com>. Questions or comments about Retro Space Images titles or material can be addressed to J. L. Pickering at Roverpick@aol.com.

The Web site <http://www.TodayinSpaceHistory.com> publishes important and interesting information about space history, especially space exploration, in relation to the date on which the event occurred.

The Society for the History of Technology (SHOT) has moved its online database for the History of Science, Technology and Medicine to <http://firstsearch.oclc.org/>. The database contains citations for journal articles, conference proceedings, books, book reviews, and dissertations in the history of science, technology, medicine, and allied historical fields.

The Society for History in the Federal Government is pleased to announce the establishment of H-FedHist, which promotes the study and discussion of the history of the United States Federal Government by scholars, teachers, researchers, and other interested parties. It also supports the exchange of ideas and information between scholars on related H-Net networks. To join H-FedHist, please send a message from the account where you wish to receive mail to listserv@h-net.msu.edu (with no signatures or styled text, word wrap off for long lines) and only this text: sub H-FedHist <firstname>, <lastname>, <institution>. Example: sub H-FedHist Leslie Jones, Pacific State U. Alternatively, you may go to <http://www.h-net.org/lists/subscribe.cgi> to perform the same function as noted above. Follow the instructions you receive by return mail. If you have questions or experience difficulties in attempting to subscribe, please send a message to help@mail.h-net.msu.edu.

NASA HISTORY FELLOWSHIPS

The NASA History Division is pleased to announce two new fellowships in the history of space science and technology. The History Division continues to sponsor the American Historical Association Fellowship in Aerospace History. Please see <http://www.historians.org/prizes/NASA.htm> for more details. The deadline for applications is 1 March 2008.

The new NASA History of Science Society Fellowship in the History of Space Science funds a nine-month research project that is related to any aspect of the history of space science, from the earliest human interest in space to the present. The program is broadly conceived and includes the social, cultural, institutional, and personal context of space science history. Proposals of advanced research in history related to all aspects of the history of space science are eligible. Space science and sciences affected by data and concepts developed in connection with space exploration include astronomy, Earth science, optics, meteorology, oceanography, and physiology. The fellowship is open to applicants who hold a doctoral degree in history or a closely related field, or students who have completed all requirements except the dissertation for a Ph.D. in the history of science or a related field. The stipend is \$17,000; the fellowship term is nine months and must fall within the period of 1 July 2008 to 30 June 2009. Please see <http://www.hssonline.org/profession/support/detail.lasso?-Search=Action&Table=Events%20web&Database=hssguides&KeyValue=3504> for more details. The deadline for applications is 3 March 2008.

The new NASA Fellowship in the History of Space Technology will be administered by the Society for the History of Technology (SHOT). This \$17,000 fellowship will fund one predoctoral or postdoctoral Fellow, for up to one academic year, to undertake a research project related to the history of space technology. This fellowship may support advanced research related to any or all aspects of space history and should lead to publications on such topics as the history of space technology broadly considered, including cultural and intellectual history; institutional history; economic history; the history of law and public policy; and the history of science, engineering, and management. The fellowship's stipend will be paid quarterly; funds may not be used to support tuition or fees. Applicants must possess a doctorate degree in the history of technology or in a closely related field, or be enrolled as a student in a doctoral degree program and have completed all requirements except the dissertation for a Ph.D. in the history of technology or a related field. Eligibility is not limited to U.S. citizens or residents. Application forms and further information will be available soon from <http://www.historyoftechnology.org/> online; meanwhile, questions may go to SHOT secretary Amy Bix at shot@iastate.edu. The deadline for applications is 1 March 2008.

NEW CONTRACTS

NASA Aeronautics Research Mission Directorate

NASA's Aeronautics Research Mission Directorate (ARMD) is developing a series of case studies to help foster the transfer of lessons learned from real-world aerospace programs to the future aerospace workforce. ARMD is looking for manuscripts suitable for a higher education audience on topics related to aeronautics research and technology development. Manuscripts should be about 50,000 words and should be accompanied by any relevant supporting materials such as photos, tables, or other graphics. There is an ongoing selection process with varying amounts awarded to those selected. Please contact Lynn Bondurant with Paragon Tec at 216-361-5555, ext. 213, or neslynn@paragon-tec.com for more information or to submit proposals

NASA HISTORIC PRESERVATION

By Tina Norwood

While NASA's historic accomplishments in aeronautical research, science, and space exploration are well documented, less is known about the buildings and structures that supported and enabled these accomplishments. This article is the second in a series that provides a brief review of the real property assets that NASA owns and operates across the country. Of the many assets that are listed or eligible for listing on the National Register of Historic Places (NRHP), 20 are National Historic Landmarks (NHLs).

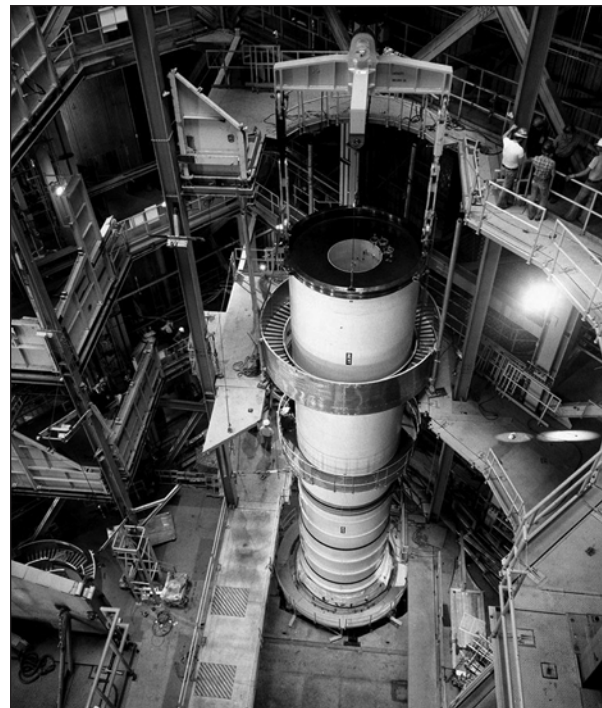
The National Park Service (NPS) manages the NRHP. The NRHP contains approximately 2,500 NHLs: the buildings, districts, structures, and objects that are significant to America's history nationally. This series provides an overview of NASA's 20 NHLs. This issue features NASA's Dynamic Test Stand, one of four NHLs at Marshall Space Flight Center (MSFC) in Alabama.

NASA Dynamic Test Stand

Marshall Space Flight Center, Alabama

By Ralph H. Allen
Marshall Space Flight Center
Historic Preservation Officer (HPO)

Strap an engine or vehicle into most of NASA's test stands and you get smoke, fire, and thunder. Yet at one major test stand, you get silence. Marshall Space Flight Center's Dynamic Test Stand is designed to determine



The left side of the solid rocket booster (SRB) is stacked in the Dynamic Test Stand at Marshall Space Flight Center. The SRB was attached to the external tank (ET) and, later, to the orbiter for the Mated Vertical Ground Vibration Test (MVGVT), which resumed in October 1978. The purpose of the MVGVT was to verify that the Space Shuttle would perform as predicted during launch.

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NASA Historic Preservation (continued)

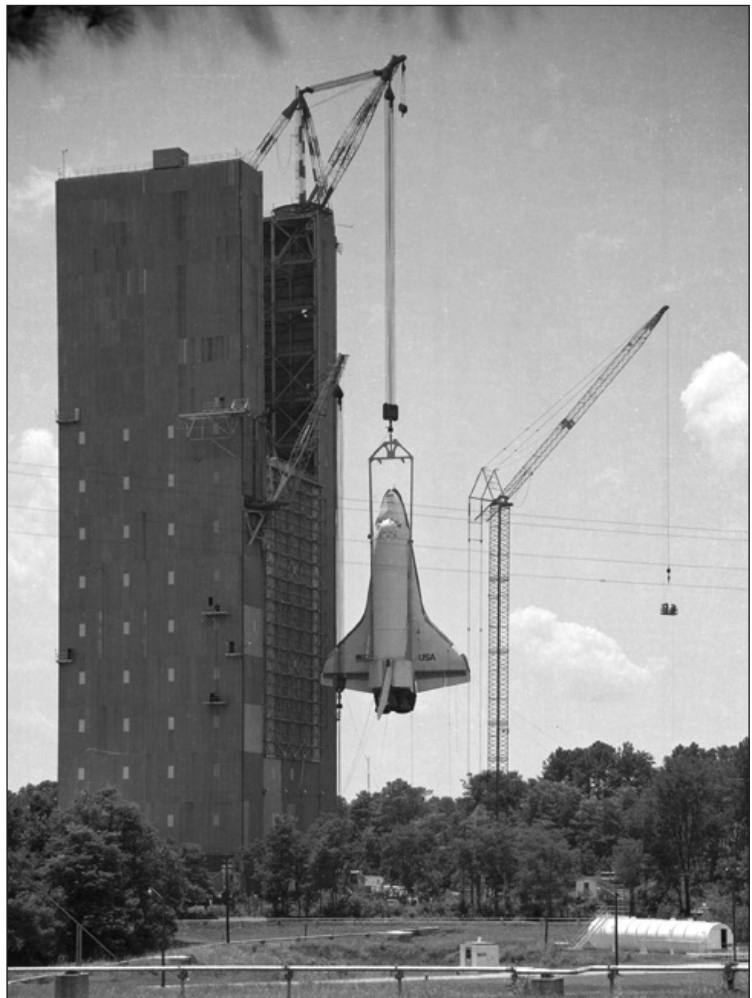
how various stages and configurations of launch vehicles bend and vibrate in flight. These tests require hundreds of accelerometers to measure vibration induced by dynamic shakers at various locations on the test article.

The 424-foot-tall test stand (counting the upper derrick crane) is currently being modified for testing of the new Ares I, and the first time that the Ares I will be fully assembled and mated with all major components will be at this stand for tests in 2011. A few years later, the Ares V will also see time in this stand before it is certified for flight.

Previously known as the Saturn V Dynamic Test Stand, the stand was constructed from 1963 to 1965 to test the fully assembled Saturn V rocket. It is one of NASA's 20 National Historic Landmark structures nominated under the 1984 *Man-in-Space* Theme Study. Modifications such as those required to change the stand from the Space Shuttle testing configuration to a new Ares I configuration must follow the steps required by Section 106 of the National Historic Preservation Act (NHPA) of 1966. The implementing regulations of this federal statute require federal agencies to consult with the State Historic Preservation Officer (SHPO). That means that NASA must take into account the historic nature of the structure when making changes, allow the Alabama SHPO to comment on the planned work, and take those comments into consideration.

Because the Dynamic Test Stand is a unique historic structure and major interior changes will be required to reconfigure the platforms that permit access to the vehicle being tested, a team from the Historic American Engineering Record (HAER) was brought in to survey, document, and interpret the stand and its history. This documentation was the mitigation action proposed in Marshall's Section 106 submittal to the Alabama SHPO.

HAER and its sister organization, the Historic American Building Survey (HABS), are programs of the National Park



Orbiter *Enterprise* being lifted by crane into the Structural Dynamic Test Facility in 1978. (Image Number NASA MSFC-7890776)

Service that have been recording America's significant historic structures since the 1930s. Their documentation is considered the highest level of recordation available for historic and industrial structures, and the drawings, photos, and history that they produce are placed in the Library of Congress and are made available online at <http://memory.loc.gov>.

NASA's program and facility managers recognize that HABS and HAER provide permanent recordation of NASA's unique buildings and structures before major modifications are made. The MSFC Historic Preservation Officer was able to initiate Section 106 consultation even before Constellation Program managers had exact definitions of the alterations to the Dynamic Test Stand that would be needed to support Ares. In accordance with the programmatic agreement governing NASA's 20 NHLs, the Secretary of the Interior, National Park Service, was also consulted in the Section 106 process.

The HAER team assembled to document the Dynamic Test Stand at Marshall Space Flight Center in 2007. Architectural historians worked on-site through the summer to measure, analyze, interpret, and draw the stand. Their drawings, history, and photos will give NASA and the country a permanent record of the stand and define its significant place in the testing and development of the Saturn V and Space Shuttle vehicles. This proactive approach to recording the Dynamic Test Stand was critical to completing the Section 106 process with the Alabama SHPO to support the proposed alterations.

The following is an excerpt from the HAER package, which is currently being finalized by historian Sara E. Wermiel:

The Saturn V Dynamic Test Stand represents an important element in the program of research and development that created the enormous Saturn V/Apollo space vehicle that in July 1969 allowed humans to make the first landing on the Moon (Apollo 11). The stand also is significant as an engineering landmark, because it used a novel means to create free flight conditions for the 363-foot tall, 6.2 million-pound Saturn V/Apollo. The facility was built to determine how various stages and configurations of this multi-stage launch vehicle would bend and vibrate in flight. Engineers needed this information in order to design the vehicle's flight control system and confirm the overall integrity of the structure. Dynamic tests had been used in the development of missiles and aircraft, but creating test facilities and testing procedures became increasingly challenging as the size and complexity of space vehicles grew. In 1960–61, Marshall Space Flight Center staff and contractors built the first tall (204-foot) steel-skeleton dynamic test stand; this was used for dynamic testing of the Saturn I launch vehicle and its payload. In that case, the vehicle was suspended, using cables attached to springs, and shaken to simulate its dynamic characteristics in flight. For the taller and heavier Saturn V, a new stand and different kind of support system were needed. Marshall Center engineers invented special hydraulic supports that went under the frame of the vehicle. Each of the four supports consisted of an ingenious, virtually frictionless bearing on a vertically floating piston in a cylinder. Oil forced into the base of the piston pushed up a float, which in turn increased pressure on nitrogen gas in the piston, forcing the bearing, and thus the Saturn,

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NASA Historic Preservation (continued)

to rise a few inches. In its “free-free” test condition, the vehicle could move in all directions when it was vibrated by shakers. Tests were conducted on a model vehicle, the SA-500D, built especially for dynamic testing. Both the test vehicle and the Saturn V Dynamic Test Stand are National Historic Landmarks (nominated in 1986). The results of dynamic tests at this stand helped engineers make the Saturn V a successful launch vehicle. The stand was modified in the mid-1970s so it could be used for vibration testing of the Space Shuttle vehicle.

For Centers with significant structures, consideration should be given to having HAER documentation done for those that are of national importance. By working directly with the National Park Service, HAER Office, MSFC now has permanent HAER recordation of all four of their NHLs.

Kennedy Space Center Names New Historic Preservation Officer

By Tina Norwood

In October 2007, Barbara Naylor was designated as the Historic Preservation Officer (HPO) for Kennedy Space Center (KSC), Florida. She replaces Mario Busacca, who joined NASA in 1984 and served as KSC’s first HPO. Barbara has been a NASA employee at KSC since 1973 and has supported Cultural Resources Management (CRM) issues for the past three years in the Environmental Program Branch. Barbara has been involved in the recent KSC and Agency-wide Space Shuttle Program Historic Property Surveys and the removal of the Shuttle Cargo Integration Test Equipment Stands and the Apollo Test Mount Clean Room in the Operations and Checkout Building/High Bay, as well as the demolition activities at Launch Complex 34/Engineering Support Building. She will oversee the CRM requirements involving the removal of the Launch Control Center Sun louvers and windows and the proposed demolition of the Mission Control Center. She has worked in several organizations throughout her career, including the Space Shuttle Program Office, the Space Station Project Control Office, the Resources Management Office, the Executive Staff to the Center Director, the Design Engineering Directorate, and the Biomedical Office. Barbara has been working in the Special Projects and Planning group within the Environmental Program Branch since 1994.

The NASA historic preservation community welcomes Barbara to NASA’s team of 13 HPOs. She states, “I look forward to working more closely with Barbara and appreciate the tremendous job Mario Busacca has done in managing Kennedy’s historic resources.” HPOs oversee CRM compliance activities in support of NASA’s mission. More information on NASA’s CRM program can be found at <http://www.hq.nasa.gov/office/oim/oi/alemdlcrm.html>.

For more information, please contact Ralph Allen, MSFC HPO, at Ralph.H.Allen@nasa.gov or Tina Borghild Norwood, NASA Federal Preservation Officer, at tnorwood@hq.nasa.gov.

OTHER HISTORY NEWS

News from the National Air and Space Museum

Michael Neufeld (Space History Division) has been promoting his new biography, *Von Braun: Dreamer of Space, Engineer of War* (New York: Alfred A. Knopf, 2007), including giving public talks and radio appearances. The book was reviewed by, among other publications, the *New York Times*, the *Los Angeles Times*, the *Boston Globe*, the *Washington Post*, the *New Yorker*, and the *New York Review of Books*. He also gave a paper in November at the workshop “Who Is Making Science? Scientists as Makers of Science Policy” at the Universitat Pompeu Fabra, Barcelona, Spain, entitled “Wernher von Braun, Science, Technology and Defense Policy in Germany and the United States, 1932–1977.” Allan Needell of Space History also presented a paper on Lloyd V. Berkner at this conference.

Roger Launius (Space History) participated as a featured speaker in the Council on Foreign Relations event “The Legacy of Sputnik” on 15 October 2007. The event took place at the Council’s New York facilities and involved, in addition to Launius, Garrick Utley, formerly of *ABC News* and currently president of the Neil D. Levin Graduate Institute of International Relations and Commerce, and Matthew Brzezinski, former Moscow correspondent of the *Wall Street Journal* and author of *Red Moon Rising: Sputnik and the Hidden Rivalries That Ignited the Space Age*.

Additionally, Roger Launius has published “Viewpoint: A Significant Moment for the Space Age,” *Space Policy* 23 (August 2007): 141–143. Abstract: Anniversaries offer not only opportunities to celebrate and commemorate a significant event, but also to reflect on larger meanings and consider the place of the events and their actors in the larger fabric of modern society. On 4 October 2007, the world will commemorate the 50th anniversary of the launch of Sputnik I, the first spacecraft placed in orbit. What has this 50-year history brought us? This essay reflects on this event and its meaning. It suggests that humanity may appropriately conclude that this Earth is not a cage and that humanity may venture beyond it. It also invokes the possibilities both of living more fully on this small and precious world we call home and of leaving it behind for other planets beyond.

Roger Launius has also been named a Fellow of the American Association for the Advancement of Science (AAAS). This rank is awarded in recognition of an individual’s efforts toward advancing science applications that are deemed scientifically or socially distinguished. The AAAS said that this elevation was “for distinguished scholarship and leadership in the field of space history, and for demonstrating the relevance of history to public policy.” He will be formally inducted as an AAAS Fellow on Saturday, 16 February, at the Fellows Forum during the 2008 AAAS Annual Meeting in Boston.

At the American Historical Association (AHA) convention in Washington, DC, in January, David H. DeVorkin (Space History) received the 2008 Herbert Feis Award

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Other History News (continued)

recognizing distinguished contributions to public history during the previous 10 years. This award, created with an initial endowment from the Rockefeller Foundation and offered by the AHA, is named in memory of Herbert Feis (1893–1972), public servant and historian of recent American foreign policy. Previous scholars recognized by this award have included Victoria A. Hardin, Rachel P. Maines, Pete Daniel, Robert Hughes, and Larry E. Tise.

Also in January, at the American Astronomical Society (AAS) conference in San Antonio, the Historical Astronomy Division of the AAS awarded David DeVorkin the sixth LeRoy E. Doggett Prize for Historical Astronomy. This prize was given for “his seminal work in illuminating the origins and development of modern astrophysics and the origins of the space sciences during the twentieth century.” His citation reads: “Dr. DeVorkin’s many research papers, books, and monographs have provided a detailed, scholarly and yet interesting history of twentieth century space science and astrophysics and the roles of the military, religion, government, the world wars and the power brokers in the development of these fields. His 2000 biography of Henry Norris Russell was critically acclaimed and resulted in two major exhibitions as well as several smaller ones. Based upon a wide variety of well documented sources, including archival correspondence and oral histories, this landmark biography illuminated much of the history of astrophysics in the first half of the 20th century. His popular historical articles have engaged the public, and through his curatorial role at the Smithsonian Institution’s National Air and Space Museum he has made astronomy come alive for millions of interested museum visitors.”

Martin Collins (Space History) is succeeding John Krige as the editor of *History and Technology*, an international journal that aims at integrating technology into the broader field of historical inquiry. Research on aviation and spaceflight fits squarely into the journal’s portfolio. For more on the journal, including submission guidelines, see <http://www.tandf.co.uk/journals/titles/07341512.asp>.

Richard Hallion (Aeronautics Division) has been elected to the grade of Fellow of the American Institute of Aeronautics and Astronautics, one of 30 Fellows and 3 Honorary Fellows elected for 2008. AIAA Fellows are selected for “notable and valuable contributions to the arts, science, or technology of aeronautics or astronautics.” Dr. Hallion currently serves as the 2007–08 Alfred Verville Fellow at the National Air and Space Museum, where he is studying the role of NACA Technical Representative John Jay Ide in air intelligence and the transfer of technical information between Europe and America.

News from the American Astronautical Society’s (AAS) History Committee

The AAS History Committee (HistComm) has many tasks and publications for 2008. They include the following:

- Work with Univelt to publish three volumes in the *AAS History Series*, plus an index of IAA History Series papers, 1967–2000, which was prepared by the IAA History Study Group.

- Complete editorial work on ABC-CLIO encyclopedia effort.
- Select the recipient of the 2007 Emme Award for Astronautical Literature.
- Assess the HistComm charter and implement recommendations of the Doyle Working Group.
- Produce three editions of *Explorer*.
- Provide *Space Times* with four book reviews.
- Add two new members to the HistComm (nominations welcomed).
- Support activities to celebrate the 50th anniversary of NASA.
- Initiate compilation of college space history courses and programs available nationally, eventually to include sample syllabi and other information.
- Expand the AAS awards program to include an annual award for the best published article on astronautics or spaceflight history.
- Support the efforts of *Space Times* by encouraging members to provide articles to *Space Times* for publication.

The AAS History Committee publishes its *Explorer* newsletter quarterly. To receive *Explorer* via e-mail, send a message to michael.l.ciancone@nasa.gov. You will receive confirmation that your e-mail address has been added to the AAS History Committee's e-mail list for the newsletter.

AWARDS AND RECOGNITION

The History Division is pleased to announce that Douglas Mudgway, author of *William H. Pickering: America's Deep Space Pioneer*, has been awarded the American Institute of Aeronautics and Astronautics 2008 History Manuscript Award. The book is a biography of William Pickering, an instrumental figure in the Explorer 1 Program and a pioneer in the field of space exploration. As Director of the Jet Propulsion Laboratory, Pickering's decision to affiliate with the newly formed NASA brought about NASA's ambitious program for the exploration of the solar system. With his guidance, missions to explore Venus, Mars, and the Moon came to actualization. Explorer 1, America's first satellite, became another iconic mission under his direction. The book's publication date is significant because it coincides with the 50th anniversary of the Explorer 1 program. The book is now available for public sale.

CALL FOR SUMMER INTERNS

The NASA History Division sponsors internships for undergraduate and graduate students year-round. We are currently looking for interns for summer 2008. The deadline for applications is 14 March 2008. Our internships are quite substantive and are opportunities for students to learn and contribute significantly.

This summer, we unfortunately will be unable to pay interns directly. However, we encourage students to apply for stipends or other funding through the national network of state space grant consortia (http://calspace.ucsd.edu/spacegrant/contacts/directors/dir_directors.html), their home educational institutions, or other corporate or nonprofit sources. Students will need to exercise initiative to find out about the different application criteria, procedures, and deadlines from these various organizations. In any event, interested students should follow the NASA History Division's application procedures and deadlines, as outlined on <http://history.nasa.gov/linterncall.htm>.

KENNEDY SPACE CENTER LAB WORKS WITH CUSTOMERS TO DELIVER NEW TECHNOLOGIES

By Svetlana Shkolyar, Student Intern

Although the main mission of Kennedy Space Center's Applied Physics Laboratory (APL) may be to deliver gadgets to support launch operations, it is the verdict of the end users of these technologies that dictate which ones make it into the field.

For example, the Water Extraction Tool (WET), a vacuum system for drying multiple orbiter tiles, "is a case where hardware is needed for contingencies," said Dr. Robert Youngquist, physicist at the APL. The tool was designed to remove water from orbiter tiles after a 2001 mission, when the orbiter was subjected to rain after its landing. WET was developed as a five-times-faster method than that used for *Atlantis*, drying by heating. WET works by sucking water out through the waterproofing holes in each tile.

The Thermal Protection System team liked the tool, but when lab personnel delivered it, they "kindly asked us to keep our hardware," said Youngquist, because Shuttles are rarely rained upon. Four years later, *Discovery* landed in California and was also rained upon. A request for the tool was sent to the lab, and within two weeks, WET was being used in the field.

The Gaseous Oxygen Vent Alignment Tool, which is positioned on the External Tank spike, came to be used also because the end user, engineer Jorge Rivera, accepted it for use in the field despite management's concern that it needed additional capabilities. Jorge recognized that it would meet the need as it was and accepted it for use.

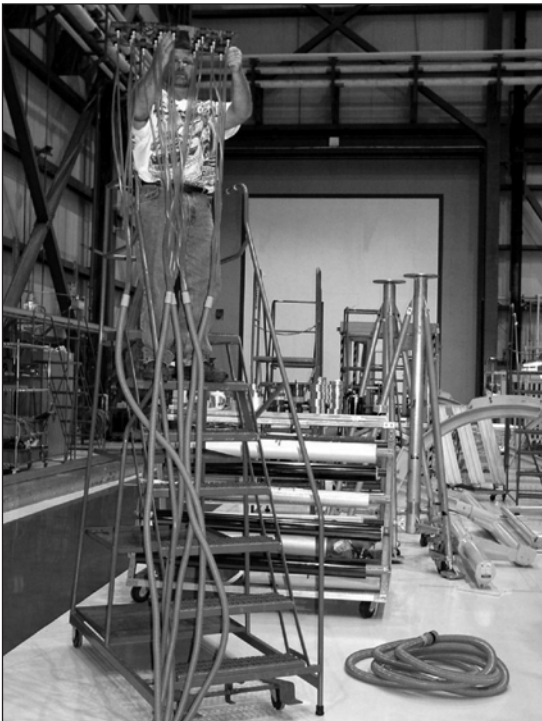
Other APL technologies that would not have made it into the field without the end user's active involvement include the Reaction Control System (RCS) nozzle inspec-

tion tools for checking the RCS chambers for defects, as well as the Surface Light Optimizing Tool (SLOT) for inspecting the orbiter windows for hazardous defects by light reflection using a prism.

According to Youngquist, “The best case is when the end user wants to work with you and develops a vested interest.” Just like NASA Orbiter Maneuvering System engineer John Peters, who “took a hands-on interest” in the RCS project, lead window inspector Robin Floyd took a similar interest in developing the SLOT. Floyd conceived the idea for SLOT independently but had no means of fabricating a field version of it; he and the APL jointly produced the tool when a “meeting of the minds occurred,” said Youngquist.

The SLOT will soon be adapted for use by the International Space Station (ISS) and the Constellation project. The tools allow work to be completed in much less time than that required by previous methods. Three RCS tools are used today at four sites, including the White Sands Test Facility, which refurbishes thrusters.

“Technology is a function of how ardent the customer is on getting the product; it is need and personality driven,” said Youngquist. This may be the secret to how innovation impacts the Shuttle Program here at KSC.



Technician Steve Parks of Arctic Slope Regional Corporation (ASRC) is testing the vacuum through the system for the WET tool. This Plexiglas sheet has holes drilled into it to simulate the waterproofing holes on the Shuttle tiles.



Quality assurance inspector James Allen Atwell is using the RCS fuel hole inspection device to look into a nozzle in bay 2 of the Orbiter Processing Facility.

CALLS FOR PAPERS

2008 Annual Conference of the Society for the History of Technology

The Society for the History of Technology will hold its annual meeting in Lisbon, Portugal, 11–14 October, to continue the celebration of the 50th anniversary of the founding of the Society. This year’s theme will be “SHOT@50: Looking Beyond.” The Program Committee seeks papers or session proposals for the 2008 meeting that concern the history of technology as it may or ought to be practiced in the future. The Committee also appreciates papers or panels reaching out beyond SHOT’s current disciplinary boundaries, as well as papers of high quality on any aspect of the history of technology, broadly defined.

The Committee welcomes proposals for individual papers or sessions, as well as works in progress from researchers. Proposals for individual papers must include a one-page abstract (maximum 600 words) and a one-page curriculum vitae, including current postal and e-mail addresses. Proposals for complete sessions must include a description of the session that explains how individual papers contribute to an overall theme; the names and paper titles of the presenters; a one-page summary of each paper’s topic, argument(s), and evidence used for each presenter; and a one-page curriculum vitae for the commentator, chair, and each presenter. The deadline for submission is 14 March 2008.

Quest: The History of Spaceflight Quarterly

David Arnold, editor of *Quest: The History of Spaceflight Quarterly*, is seeking articles for publication. For more about the journal, see <http://www.spacebusiness.com/quest/>. Dr. Arnold sent a note to the editorial board indicating that he has a terrific issue coming together for the 50th anniversary of the Space Age but is looking for additional items relative both to the anniversary and to other non-anniversary-related topics for upcoming issues. If you have possible articles for publication or know of people who might have articles for publication, please contact Dr. Arnold at historyofspace@aol.com.

International Test and Evaluation Association Journal

The *Journal of the International Test and Evaluation Association* (ITEA) is looking for history articles. Each quarter, there is a column entitled “Historical Perspectives” involving short historical sketches of up to 1,200 words, with three or four photographs to accompany them. Longer historical pieces have also been published in the main part of the journal about subjects of special interest to the association.

The subject matter for these columns has been intentionally broad. The editors are appealing to a wide range of test and evaluation (T&E) practitioners—not so much professional historians—so it is important to publish subjects that are varied and novel to keep the readers interested. The journal has done one article about an incident involving flight testing during World War I, another on truck fairing tests designed to increase fuel economy during the energy crisis of the 1970s, and a third

on the human factors—not just the machinery—involved in the near-fatal crash of a pilot of one of the NASA lifting bodies. All have endnotes and, although short, offer good scholarship to pique further reading and fresh perspectives.

All periods of history are open, and T&E is defined liberally: in the modern sense of complex, computerized experiments, but also the much less complex T&E as understood in earlier periods. For example, articles can be about specific aircraft (or subsystem) tests, influential individuals in the field of testing, technological turning points, or unique supporting subjects (for instance, the T&E of airline food!). It can also be a first-person account. Moreover, submissions need not be dominated solely by test and evaluation; ideally, they will feature T&E in some broader context.

Finally, the journal is informal in its editorial process. The journal gives the historical editor wide latitude to find submissions, so once he makes contact with a potential author and hashes out a subject, it is very likely that it will indeed be published. For more information, please contact Michael Gorn, Ph.D., NASA Dryden Flight Research Center, at michael.gorn@dfrc.nasa.gov.

Space Times

Space Times, the bimonthly article of the American Astronautical Society (AAS), is in search of articles for publication. Articles may cover virtually any topic involving space science, technology, exploration, law, or policy. Articles that touch on issues relevant to the civil, commercial, military, and intelligence space sectors alike are also welcomed. Articles should be written for a well-educated audience that has a great interest in space topics but may not necessarily be familiar with the author's specific topic. They should therefore be written in active voice, with a clear explanation of technical concepts provided. Submission of photos or other visual support is encouraged, but not required, and must be provided in high resolution (at least 300 dpi) and in JPG, TIF, or GIF format. Please provide proof of permission from the owner of any photos or visuals; if permission has not already been obtained, provide contact information for the owner. For more information, visit <http://www.astronautical.org>.

UPCOMING MEETINGS

5–6 March 2008, the annual Goddard Memorial Symposium, sponsored by the American Astronautical Society, will be held in Greenbelt, Maryland. Please see <http://www.astronautical.org> for more information.

13 March 2008, the Society for History in the Federal Government (SHFG) annual meeting will be held at the National Archives and Records Administration (NARA) in College Park, Maryland. For more information, please see <http://www.shfg.org> or e-mail shfgannualconference@yahoo.com.

29 March–1 April 2008, the next Mutual Concerns of Air and Space Museums Conference will be held in Washington, DC. The meeting will be held at the L'Enfant Plaza Hotel, with a day of sessions at the National Air and Space Museum's Steven F. Udvar-Hazy Center. For more information, please see <http://www.nasm.si.edu/getinvolved/mutualconcerns/>.

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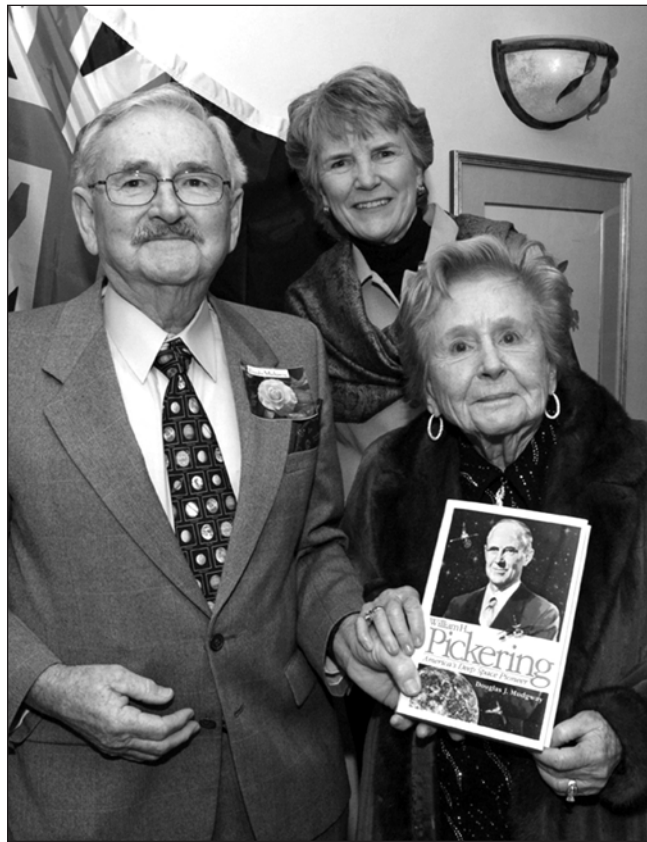
Upcoming Meetings (continued)

10–13 April 2008, the National Council on Public History will hold its annual meeting in Louisville, Kentucky. Please see <http://www.ncph.org/Conferences/2008/tabid/301/Default.aspx> for more information.

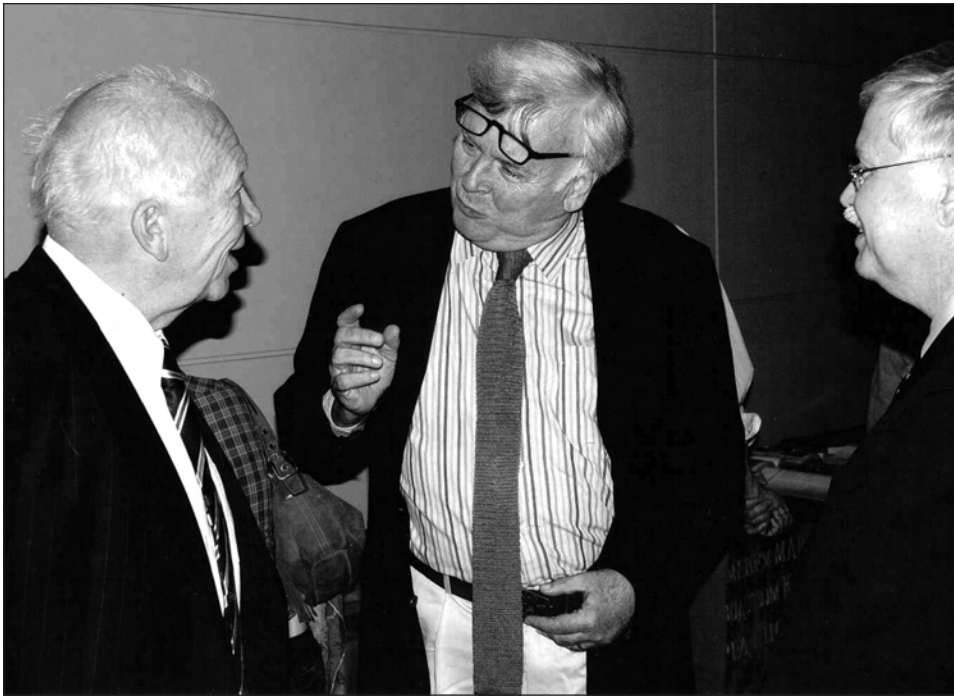
8–10 May 2008, a conference is being planned in Dayton, Ohio, at Wright State University, for the centennial of the Wright brothers' international flight demonstrations. Conference organizers are seeking paper and panel proposals focusing broadly on the international nature of the history and development of flight from 1908 to 2008. The conference will be held throughout the day, with guided tours of the National Museum of the U.S. Air Force and trips to Dayton Aviation Heritage National Historic Park, Carillon Park, and Hawthorne Hill. For more information, please e-mail Francois Le Roy, Chair, Program Committee, at Leroy@nku.edu.

The National Academy of Sciences and National Research Council's Space Studies Board (SSB) is sponsoring an international public seminar series through 2007 and 2008 to commemorate the 50th anniversary of the International Geophysical Year and the establishment of the SSB. Please see http://www7.nationalacademies.org/ssb/International_Public_Seminar_Series.html for more information.

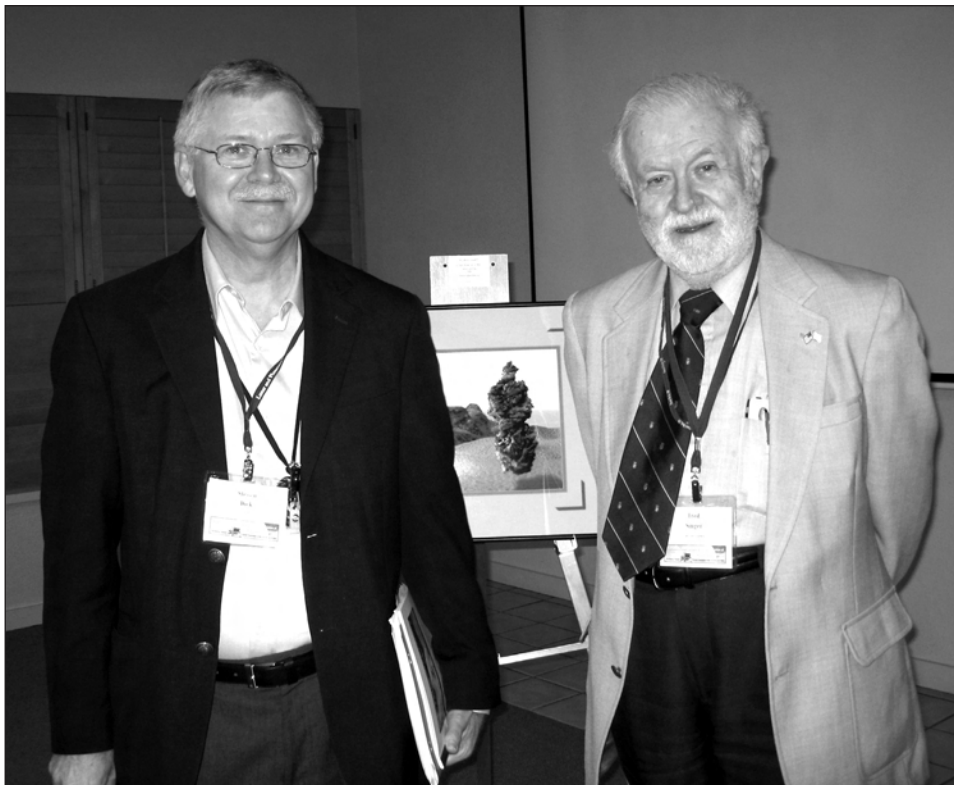
RECENT IMAGES



Clockwise from left are Douglas Mudgway, author of the recently published biography of William Pickering; Beth Pickering Mezitt, daughter of Pickering; and Inez Chapman-Pickering, Pickering's widow. This image was taken at the 28 January 2008 dinner in Flintridge, California, that marked the publication of the biography and kicked off the week celebrating the 50th anniversary of the launch of the Explorer 1 spacecraft.

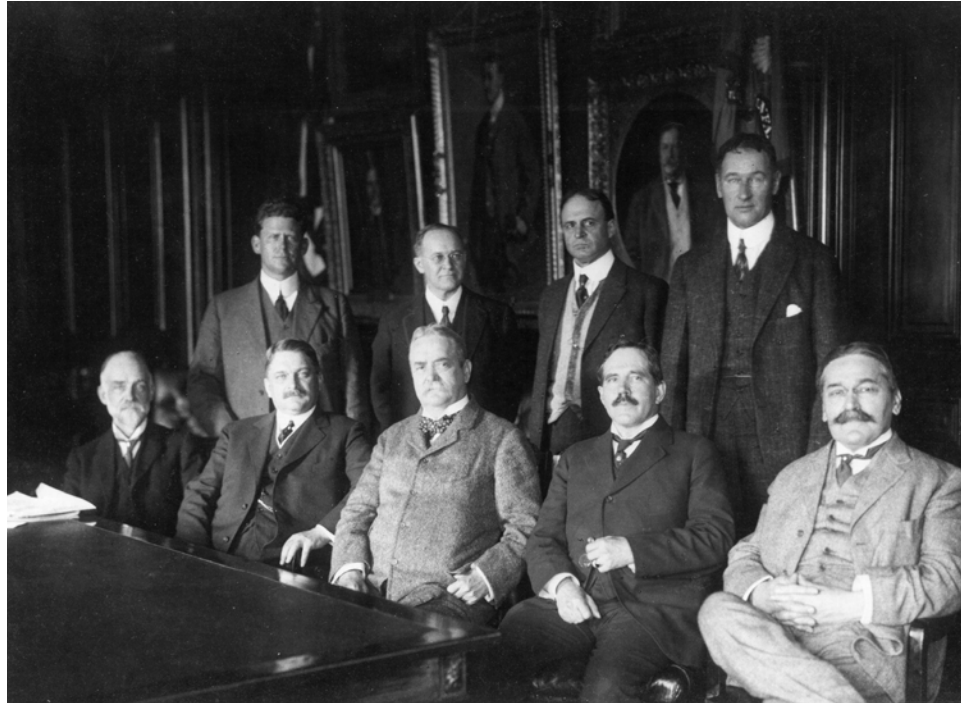


Sergei Khrushchev, Paul Dickson, and Steve Dick converse at an event commemorating the 50th anniversary of the launch of Sputnik I.



Steve Dick and Fred Singer at the First International Conference on the Exploration of Phobos and Deimos. Phobos and Deimos are the two moons of Mars, which were discovered in 1877.

IMAGE IN AEROSPACE HISTORY



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The first meeting of the National Advisory Committee for Aeronautics (NACA) in the Office of the Secretary of War, 23 April 1915. Pictured seated from left to right are Dr. William Durand, Stanford University; Dr. S. W. Stratton, Director, Bureau of Standards; Brigadier General George P. Scriven, Chief Signal Officer, War Department; Dr. C. F. Marvin, Chief, United States Weather Bureau; and Dr. Michael I. Pupin, Columbia University. Standing, left to right, are Holden C. Richardson, naval instructor; Dr. John F. Hayford, Northwestern University; Captain Mark L. Bristol, Director of Naval Aeronautics; and Lieutenant Colonel Samuel Reber, Signal Corps. George P. Scriven was elected temporary Chairman of the NACA.

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We also welcome comments about the content and format of this newsletter. Please send comments to Steve Garber, newsletter editor, at stephen.j.garber@nasa.gov.

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