



FROM THE CHIEF HISTORIAN

One aspect of my job that continues to amaze and engage me is the sheer variety of the work we do at NASA and in the NASA History Division. As a former colleague used to say, NASA is engaged not just in human spaceflight and aeronautics; its employees engage in virtually every engineering and natural science discipline in some way and often at the cutting edge. This breadth of activities is, of course, reflected in the history we record and preserve. Thus it shouldn't be surprising that our books and monographs cover such a wide range of topics. So to whet your appetite, here's a quick rundown on some upcoming publications.

Currently at the printer we have a fascinating book co-edited by former NASA Chief Historian Steve Dick and Mark Lupisella, *Cosmos and Culture*. The second volume in our Societal Impact subseries, this book examines the three stages of cosmic evolution: physical, biological, and cultural. I'm sure many readers will enjoy it.

In layout we have three publications covering lesser-known topics and facilities. From NASA's Stennis Space Center, we will be publishing a conference proceedings monograph regarding wisdom gained from the testing of Saturn rockets during the Apollo era. From Glenn Research Center, Bob Arrighi has written a full-length book on the Altitude Wind Tunnel. His innovative CD-ROM on this subject already won an award from the Society for History in the Federal Government. Michael Meltzer, whose history of the Galileo

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HOMESPUN HISTORY: DOCUMENTING APOLLO ON THE WEB

By David Woods, editor, *The Apollo Flight Journal*
Bearsden, Scotland

In 1994 I got access to the Internet via a 0.014 Mbps modem through my phone line. As happens with all who access the Web, I immediately gravitated towards the sites that interested me, and in my case, it was astronomy and spaceflight. As soon as I stumbled upon Eric Jones's burgeoning Apollo Lunar Surface Journal (ALSJ), then hosted by the Los Alamos National Laboratory, I almost shook with excitement.

Eric was trying to understand what had been learned about working on the Moon by closely studying the time that 12 Apollo astronauts had spent there. To achieve this, he took dusty, old transcripts of the air-to-ground communication, corrected them, added commentary and, best of all, managed to get most of the men who had explored the surface to sit with him and add their recollections. The result was far too unwieldy for a book but Eric recognized that the Web could give it an excellent home. Almost every day, I looked to see if Eric had added more material. As soon as something became available, I laboriously downloaded it through my painfully slow modem for fear that this goldmine would disappear. I found that reading

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spacecraft project we published several years ago, has written a history of a very engaging topic, planetary protection. (Anybody remember the movie *The Andromeda Strain*?)

In copyediting, Steve Dick has another book in the queue: the proceedings of the conference we held to mark NASA's 50th anniversary. There's also another volume that holds special interest for me: *The Psychology of Space Exploration*. This collected work, edited by Douglas Vakoch of the SETI Institute, covers some often-neglected, most human challenges of long-term exploration.

Several manuscripts have gone through peer review already and their authors are making final revisions. Rob Ferguson is finishing up an excellent overview of aeronautics at NASA since 1958. Bill Clancey has written an ethnographic study of the science team members behind the Mars rovers. The third volume of our aerodynamics documentary history, *The Wind and Beyond*, has been edited by a team that Jim Hansen led.

Of course, we have many more projects that are still in the research and writing phase. These include such staples of the NASA History Series as the fourth and final volume of Boris Chertok's *Rockets and People*, as well as the eighth and final volume of the *Exploring the Unknown* space documentary history series. Readers who are interested in historic preservation or aeronautics will also be pleased to know about Larry Lee's upcoming volume about NASA's wind tunnels. A team led by John Krige of Georgia Tech is completing an analytical survey of NASA's international relations efforts, a particularly challenging task given the vast scope of material on this topic. Michael Meltzer is also writing a history of the Cassini spacecraft project that integrates scientific, engineering, management, and international relations threads of this complex endeavor. There are also 10 other space and Earth science projects that were generously funded by the Science Mission Directorate. Several authors are writing their memoirs and Art Slotkin is working closely with George Mueller to write a history of Mueller's systems engineering management approach for the Apollo program.

This is just a small sampling of the many publications projects we have under way. Please let me know if you have questions about any of these projects. More good things are on the way!

Stephen Garber

Acting Director, NASA History Division

Homespun History (continued)

this work could take me there in my imagination like no other account because of the immense detail with which Eric had endowed it.

Eric proved to be a friendly, supportive, and tactful editor of the ALSJ. When this inexperienced Apollo fan from another continent sent him lists of minor typos I had found, he responded to my e-mails in his easy, courteous manner. This was a project I felt I could be involved with and when I offered to scan out-of-print NASA history books for him, he encouraged my enthusiasm by passing me over to the NASA history people. Me? Work for NASA? The idea of this small-time guy in Scotland doing work for people who had enchanted me as a kid with their mastery of spaceflight seemed little short of being told I could go to the Moon myself.

Scanning books was great fun—I'm good at that kind of grunt work. But after a while I wanted to go deeper into the complexities of Apollo than scanning books would allow, and an idea had come into my head. Film documentaries on Apollo sometimes included recordings of the air-ground communication where mission control would read long lists of numbers to the crew. The director invariably wanted to give an impression of the technical, mathematical, dehumanised nature of spaceflight by including a soundtrack of impenetrable numbers. I, however, wanted to know what the numbers meant. A way to do that might be to extend Eric's work to cover an entire Apollo flight. I would leave the parts that included the surface exploration to the master, but I would try to achieve a similar result by presenting the flight portions of the transcript on the Web. I would correct the transcript where I could and add commentary.

What was I thinking? Just add commentary? What did I know about Apollo? But that was the power behind the idea. To write commentary, I would have to research the very depths of the spacecraft, its technology, and its operational procedures. I would also need to learn about how mission control worked with the crew and how ground staff across the world applied many varied techniques to make a flight successful. I put my idea past Eric who gave it his effervescent thumbs-up and the Apollo Flight Journal (AFJ) was born.

One important suggestion from Eric was to bring Frank O'Brien on board. Frank is a New Jersey computer guru who had studied the deeper technical aspects of Apollo's computers (and hence large chunks of the mission they were involved with). Initially Frank was a little skeptical of the AFJ's value and felt it would consist of little more than the crew regularly realigning their guidance platform. However, over time, we learned how much more there was to these missions and just how difficult Apollo was to fly. My contact at NASA's History Division, Stephen Garber, offered to host the AFJ on NASA's servers, seeing as how the ALSJ was now residing there. I was off and running.

Various aspects of the task became apparent. The ALSJ is a "living document" so that, unlike books, it can easily be corrected and added to as more information becomes available. This meant I didn't have to worry about having to know absolutely everything before getting started. I could just get the core text in place and comment as I learned. But what mission to cover? Apollo 11 was obvious, given its historical importance. However, it was a simpler mission operationally and I wondered if I might only have the energy to cover one flight before the fun faded. I preferred to cover an advanced mission and the magnificent Apollo 15 flight seemed like a good bet. Also I had noticed how its commander, David Scott, had

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Homespun History (continued)

bought into the idea of the ALSJ and he seemed keen to help out with the first draft of Apollo's historical record. So with Frank O'Brien to keep me honest, Eric Jones's enthusiasm, the wisdom of David Scott and others, and with backing from Stephen Garber and NASA's History Division with its resources, the Apollo 15 Flight Journal began to appear in 1998.

The beauty of the Apollo journals is that they provide context to historical material because they have a chronological core text around which other types of data could be hung. Since I first saw the ALSJ in 1994, rich seams of information on the missions had been opened up. For example, after a trail was blazed by another Apollo enthusiast, Kipp Teague, great chunks of the Apollo photographic record were scanned and placed online. The detailed research that goes into the transcripts make it possible to identify when most of the photographs were taken and what their subjects are. More recently the audio recordings of the Apollo 11 mission were digitized by John Stoll at Johnson Space Center who then contributed them to the AFJ. The audio was then chopped up and made available in the transcript so that readers could both hear and read what was being said on this historic flight.

Growing the AFJ has not been quick. Though a number of enthusiasts have come in to help with the work, we all have day jobs and other interests. Nevertheless, the AFJ has gradually blossomed and covers seven missions to varying degrees. Slowly and continuously the document has grown, like a moderated wiki site. It would be true to say that the AFJ is far from being a perfect resource. It seems in a state of permanent incompleteness. But it has the energy of a team of people from around the world that has made it an accurate and trusted document of the Apollo journeys to the Moon.

NEWS FROM HEADQUARTERS AND THE CENTERS

Headquarters

As Jane Odom continues to evaluate and acquire new material for the Historical Reference Collection (HRC) she also appraises items for historical value, directs the subsequent processing of collections, and answers reference requests. Jane is publishing speeches of key officials in NASA's history and also press releases from 1963–1976 to the Internet at <https://mira.hq.nasa.gov/history/>. Collectively, Colin Fries, John Hargenrader, and Liz Suckow share reference duties, answering inquiries received by e-mail, assisting walk-in researchers, and helping Jane with Freedom of Information Act (FOIA) requests. They are also working to further preserve our hardcopy collection by photocopying deteriorating news clippings, replacing worn folders, and updating abstracts of folder contents. Their preservation work is currently focusing on earth science, international cooperation, and space program impact files. They also recently reviewed the introduction and cover for the reprint of *Apollo Expeditions to the Moon*.

Colin recently processed a collection of former Deputy Administrator Shana Dale's presentations given at Future Forums and CEO Days during 2007 and 2008. He finished organizing a set of NASA HQ news releases in PDF format, dated 1975–1984 in the database. He has also completed the evaluation of a collection of mainly NASA/

government-only documents to determine disposition. Colin and Liz continue to appraise a collection of administrators' chronological correspondence files, ca. 1963-1978, copying historically significant items to add to existing subject files in the HRC. In addition, Colin continues to assist in maintaining the History Division Web pages.

Liz Suckow continues to appraise a 53-box collection borrowed from the Federal Records Center. The collection contains life sciences history sources, papers of Langley Research Center engineer/HQ official T.L.K. Smull, and chronological correspondence from a number of Headquarters offices. Liz is updating the HQ oral history inventory available at <http://history.nasa.gov/oralhistory/ohcatalog.htm> and is entering descriptive information about our oral histories into the database. Liz completed the processing of two small collections recently: the NASA Advisory Council Task Force on International Relations and the Office of External Relations files on Space Station Freedom.

John completed the processing of the Charles King collection that consists primarily of Apollo Program propulsion and engineering troubleshooting materials. King is a retired HQ engineer. John is also verifying photo dates in the Great Images in NASA (GRIN) database to ensure they conform as closely as possible to the dates the photos were taken after some errors were discovered in GRIN.

Ames Research Center (ARC)

On 20 December 2009, ARC celebrated its 70th anniversary—and the Ames community has already started its celebration. Recent events included an Ames family portrait on the tarmac near Hangar 1, a series of historical exhibits in downtown



ARC staff gathered on the tarmac near historic Hangar One to take a photograph that has become an ARC anniversary tradition.

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News From Headquarters and the Centers (continued)

Mountain View and Sunnyvale, a meeting of Deputy Center Directors emeritus, and a Directors Forum where former Directors give their insights on Ames's legacy and what it means for the Center's future. On 23 January, the Center celebrates with a gala dinner at Santa Clara University.

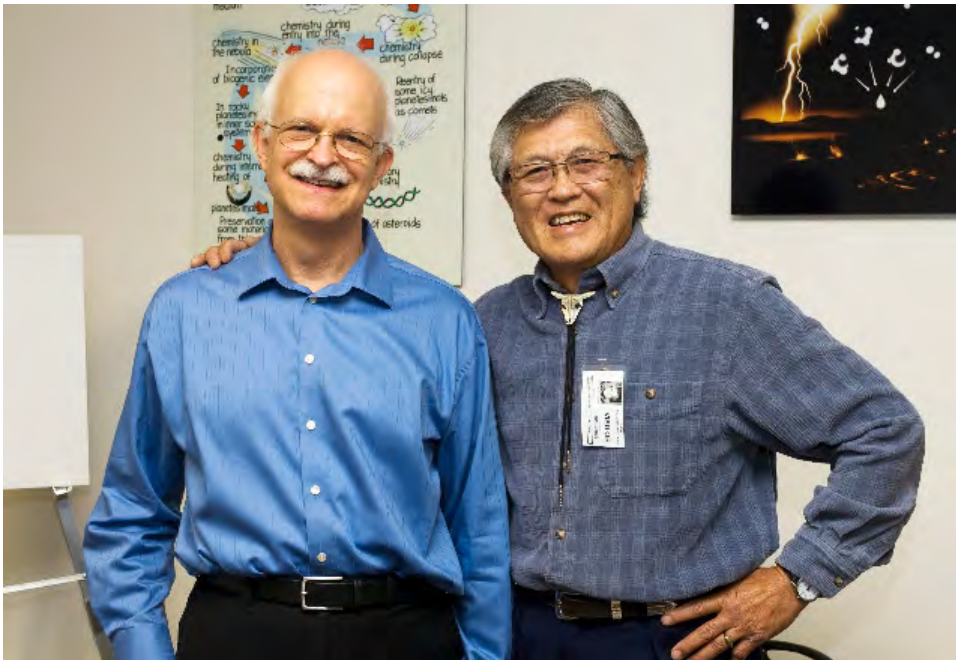
Glenn Bugos circulated a complete draft of his history of ARC, since 1958 and updated for the 70th anniversary, and it is being prepared for publication.



The City of Mountain View invited ARC, in honor of its 70th anniversary, to display artifacts, photographs, and banners in windows along downtown Castro Street. At a ribbon cutting ceremony are ARC historian Jack Boyd, Mountain View Mayor Margaret Abe-Koga, ARC Deputy Center Director Lew Braxton, and Julie Smiley of the Mountain View Central Business Association.



As part of its 70th anniversary celebration, the Ames Exchange Council hosted a Visionary Forum. Young staffers, including historian Alex Macdonald, speculated on what the Center and space exploration might look like 70 years in the future.



David Des Marais and Sherwood Chang at the dedication of the Sherwood Chang Conference Room.

The ARC directorate for space science dedicated its conference room in building N239—the site of many key meetings in the history of exobiology—in honor of Sherwood Chang. David Des Marais led a rousing review of Chang’s work and friendships. The citation reads “Dr. Sherwood Chang played a keystone role in Exobiology and Space Sciences during his career at NASA Ames Research Center from 1967 to 1998. He was first Exobiology team leader and then Chief of the Exobiology Branch from the early 1970’s until 1998. His distinguished research accomplishments include discoveries about carbon and other life-related elements and compounds in lunar regolith, meteorites, prebiotic environments and the cosmos. As a physical organic chemist, Sherwood was among the leading intellectual figures who united cosmochemistry, origins of life research and molecular biology to create the field of astrobiology that ultimately emerged at the dawn of the twenty-first century. This conference room is dedicated to perpetuate the historic dialog that Sherwood Chang maintained for more than a quarter of a century along these hallways and in the broader NASA community.”

April Gage completed a self-guided tour of primary research facilities at ARC for the Historic Preservation Office Web site. The tour includes interactive image maps with rollovers showing photographs and descriptions of more than 50 facilities as well as a downloadable companion brochure.



Archivist April Gage, shown here with Deputy Center Director Lewis Braxton, was awarded a Certificate of Excellence from the ARC Contractor Council. Nominated by her site lead Arshad Mian of Intrinsyx Technologies, April was cited for her work in student mentoring.

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News From Headquarters and the Centers (continued)

The History Office continues to acquire and process material, more than 55 cubic feet and 18 linear feet of records and artifacts so far in 2009. Notable arrivals include 21 cubic feet of records documenting the construction, operation, and maintenance of the recently demolished Propulsion Simulator Calibration Laboratory and its predecessor, the one-by three-foot wind tunnel. Both wind tunnels were located in N207, the building that now houses the History Office.

Dorothy Leung and Laura Williams, graduate students in the San Jose State University School of Library and Information Science, completed their fall semester internships in the History Office. Dorothy processed the Donald E. Wilson Earth Resources Survey Program Papers, 1972-1983, which document remote sensing applications and technology transfer to establish Landsat data analysis capabilities in the Pacific Northwest. Laura processed the Robert E. Slye Papers, 1961-2001, which relate to Slye's work for NASA's Mission Analysis Division and his research in ecosystem science, remote sensing, and computational image analysis. Dorothy's and Laura's EAD-encoded finding aids for the collections are now available in the Online Archive of California.

Dryden Flight Research Center (DFRC)

Peter Merlin published *Ikhana Unmanned Aircraft System Western States Fire Missions*, (Monographs in Aerospace History, NASA SP-2009-4544) in October 2009. Individuals interested in receiving a copy should send a self-addressed, stamped Priority Mail envelope (\$4.95 postage) to: History Office, NASA Dryden Flight Research Center, Bldg. 4839, 4800 Lilly Drive, Edwards, CA, 93523, and request the monograph by title.

The American Institute of Aeronautics and Astronautics will issue a second printing of Peter's *From Archangel to Senior Crown: Design and Development of the Blackbird* (AIAA, 2008, Library of Flight Series) in 2010.

Curtis Peebles completed the manuscript of his Hyper-X project history. The book examines Hyper-X in the larger context of hypersonic research and the development of scramjet engines. He has started research on his next project, "The Forgotten X-Planes," which is a reassessment of formative post war years of flight.

Christian Gelzer has completed his truck fairing monograph and is making edits before sending it out for peer review. He has had several speaking engagements recently, including one at Auburn University in celebration of the 40th anniversary of the Apollo 11 Moon landing.

Betty Love continues sorting archival files moving from R. Dale Reed's papers to Walter "Whitey" Whiteside's material, a man whose life often redefined the term colorful. In October, Betty was among four individuals honored as 2009 Eagles by the Flight Test Historical Foundation during the group's annual Gathering of Eagles. The foundation supports operation and improvements to the Air Force Flight Test Center Museum at Edwards Air Force Base. Each year it inducts a select few new Eagles into its fold in recognition of their contributions to flight research. Current and past Eagles include Scott Crossfield, Joe Engle, Bob White, and many other luminaries in the field. Betty takes her proper place among them.

Glenn Research Center (GRC)

The Glenn History Program and the Glenn Imaging Technology Center are pleased to announce the new, interactive Web feature on the history of NASA's past and present aircraft, "Lessons of A Widowmaker (and Other Aircraft)." The page can be viewed at <http://www.grc.nasa.gov/WWW/portallflash/aerol>. This creatively arranged portal allows users to select different NASA aircraft and learn about its history, specifications, and view images. Visitors to the page can also view video, listen to audio programming, and play educational games. This site was made possible by the hard work and talent of RSIS employees Emery Adanich, Bob Arrighi, Bill Fletcher, Eric Mindek, and Gary Nolan.

Work is also underway on another interactive Web site detailing the history of the recently razed Propulsion Systems Labs 1 & 2. It will include a history of the facility and research conducted there and a wide variety of multi-media materials. The site will be similar to the award-winning Altitude Wind Tunnel interactive history that can be seen at <http://awt.grc.nasa.gov/interactive.aspx>.

Langley Research Center (LaRC)

LaRC's Full Scale Tunnel closed its doors on September 30 and is set for demolition in 2010. Also known as the 30- by 60-Ft Tunnel, it began operation in 1931. NACA notables Smith DeFrance, Abe Silverstein, Harry Goett, and Clinton Dearborn designed the tunnel. During World War II, three shifts worked seven days a week conducting drag reduction studies on full-size production military aircraft. In later years Mercury spacecraft, blended wing body, and many other models were also tested.

The Full Scale Tunnel was designated a National Historic Landmark in 1985. However, due to high maintenance costs, NASA closed the tunnel in 1995. A few years later, an agreement was signed with Old Dominion University who used the tunnel until its closure to train future engineers. LaRC's Historic Preservation group has created a Web site with details and photos of the tunnel at <http://gis.larc.nasa.gov/documents/643/historic/WebApp.html>.

The Full Scale Tunnel played a role in the 2009 movie *The Box* starring Cameron Diaz and James Marsden. Set designers added Hollywood glam with visual effects, lighting and black consoles, but the tunnel's distinctive fan blades and upper operating booth are recognizable to those who worked in the tunnel to advance understanding of America's aircraft and spacecraft. The film's director and screenwriter, Richard Kelly, is the son of Lane Kelly who worked at LaRC on the Viking mission to Mars in the 1970s. See http://www.nasa.gov/centers/langley/news/researchernews/rn_boxstars.html for a photo and details of the Full Scale Tunnel's role in the movie.

In October, the Center celebrated the people who worked in the tunnel with a reception and tours attended by retirees, community leaders, and employees. LaRC retiree and author Joseph Chambers, a former Full Scale Tunnel branch head, presented an overview of the work performed at the tunnel. Some former tunnel employees brought in their written memories, which are now being compiled into a book. A videographer and interviewer were on hand at the celebration to record memories also. Mr. Chambers's presentation, the video memories, and a historic photographic montage are being compiled into a history of the tunnel that will be

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available on DVD. See http://www.nasa.gov/topics/aeronautics/features/fst_ceremony.html for details of the celebration.

The city of Hampton, Virginia, home to LaRC, is planning its 400th anniversary in 2010. Langley will be participating in the Hunt for Hampton History, a daylong history celebration in March 2010. NASA employees were interviewed for a possible local television history program and DVD that will include other aspects of Hampton's history. Dr. Joel Levine was interviewed about Viking and other LaRC contributions to Mars exploration, Mr. Roy Harris was interviewed about aeronautics history, Ms. Kathy Barnstorff was interviewed about Langley's Collier Trophies, Dr. Bruce Wielicki was interviewed about atmospheric science history, Mr. Marshall Smith was interviewed about LaRC's role with Ares 1-X, Mr. Barry Meredith was interviewed about LaRC's work on the Space Shuttle. Ms. Gail Langevin was interviewed about the Space Task Group and the Mercury 7 astronauts.

Wording is being finalized for a marker placed by the City of Hampton detailing LaRC's role in space exploration. Hampton's main thoroughfare, Mercury Boulevard, honors America's first crewed space program. In addition, six small bridges throughout the city are named for six of the Mercury astronauts. Commander Shepard Boulevard, which leads from LaRC to Hampton, honors the first American in space. An elementary school bears the name of Hampton native Christopher Kraft, Jr. Kraft, who began his career at LaRC, was flight director for the Mercury, Gemini, and Apollo programs and eventually director of Johnson Space Center. Details of these Hampton place names are also given on the marker. An additional history marker and taped-for-broadcast history minutes are also planned.

ARES HISTORIAN VIEWS ARES I-X FLIGHT DEVELOPMENT TEST

Tracy McMahan, who has been chronicling the Ares I launch vehicle development for the Marshall Space Flight Center (MSFC), witnessed history as it happened on 28 October. She was among those who watched the first Ares I flight test launch from the Banana Creek viewing area at Kennedy Space Center (KSC).

"As the Ares I-X test vehicle climbed into the blue sky, you could see it for a long time. The trajectory looked perfect." McMahan said. "The Constellation team has been working on this test flight for three years, so it was thrilling when the rocket lifted off from Launch Complex 39B.

The portion of flight powered by a four-stage solid rocket booster borrowed from the Space Shuttle program lasted 2 minutes, and the test vehicle ascended to an altitude of 28.41 statute miles (45.72 kilometers). The entire test flight lasted 6 minutes from lift-off to splashdown of the rocket's booster in the ocean about 150 miles (240 kilometers) down range. The upper stage and the crew module were simulators that separated from the booster, landed in the ocean, and were not recovered. The successful separation of the first and second stage was a crucial part of the flight. Engineers in the launch complex also monitored the roll of the vehicle. Some predicted a vehicle with this design might roll significantly on its axis during launch and



The Ares I-X test flight lasted about six minutes from its launch until splash down of the rocket's booster stage nearly 150 miles down range. This shot was taken from the rocket looking back at the launch pad. The roll control motors were used to control the vehicle during flight.

ascent. This did not occur, and the roll control system designed to counteract vehicle roll was only fired a few times during the flight.

"I don't believe you can overestimate the significance of the first development flight test for the Ares I crew launch vehicle," McMahan said. "It has been more than 40 years since NASA has performed an unmanned test flight for a rocket being designed to carry crews to space."

This will be remembered as the first test of a rocket this size that uses only a solid-propellant first stage to lift the rocket off the pad. Another unusual design feature shared by the 327-foot-tall (99.67-meters-tall) test vehicle and Ares I is the larger diameter second stage (18 feet/5.5 meters) and the smaller diameter first stage (12.2 feet/3.72 meters). One primary flight objective was to prove that an in-line rocket with this design could be controlled during launch and ascent. The mission achieved all its primary objectives.

More than 700 sensors were located throughout the vehicle and recorded data on the aerodynamics of the flight and pressure oscillations. Most sensors worked, and engineers recorded and downlinked terabytes of data that now are being analyzed. The Ares I-X flight was proposed early in the design phase of the vehicle to provide data for improving the Ares I design before the Critical Design Review scheduled for 2011. Ares I-X and the Ares I outer mold lines were not identical, and Ares I-X used a four-segment booster with a dummy fifth segment simulator, while Ares I will be powered by a five-segment solid rocket booster motor. However, the two vehicle

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Ares Historian Views Ares I-X Flight Development Test (continued)

designs are similar enough to provide valuable data on how an integrated vehicle with an Ares design is controlled and flies and how the space environment affects the vehicle from launch to booster recovery.

“So far, the Ares Projects have conducted more than 7,500 hours of wind tunnel tests and produced numerous complex computer models,” McMahan said. “Now, designers can compare flight data to the wind tunnel test data and models.” This information will be valuable to all launch vehicle designers. Most modern designers rely far more on computer modeling than testing because testing and flight tests are more expensive than modeling.

The parachute recovery system was another key system that everyone was interested in since the three, 150-foot diameter parachutes represented the largest parachutes of this type ever manufactured. Unfortunately, the parachute system did not work as planned. Soon after the flight, the team learned that the first stage booster hit the ocean harder than expected, which has happened to solid rocket boosters on Shuttle missions. The steel booster case received some damage, but the data recorders on the booster appeared to be fine.

“The parachute recovery system was identical to the system being tested for Ares I, so this is one area where Ares I-X data will directly impact the Ares I design,” McMahan said. The recovery system performed as planned during one ground drop test of the whole system in May 2009, but a flight test was the only way to test the system fully at the correct loads.

In addition to technical lessons learned, Ares I-X taught the Constellation team many lessons about managing and organizing a test flight with a lean team involving multiple NASA Centers with different cultures. These issues as well as technical lessons learned are being recorded during knowledge capture sessions led by the NASA Headquarters Exploration Systems Mission Directorate. The goal is to capture knowledge that will mitigate risks. McMahan attended some of these sessions, and immediately after the launch, she conducted five oral history interviews with NASA and Alliant Techsystems (ATK) managers who worked in the Launch Control Center during the test flight.

“Watching the launch was a unique cultural experience,” McMahan recalled. “A number of the launch attendees were family members of people who were working during the mission. Many had never seen a space launch before.”

This mission was managed by the Johnson Space Center through the Constellation Program and involved traditional human space flight centers (KSC and MSFC) as well as NASA Centers (Glenn Research Center and Langley Research Center) that have not been as involved in human space flight launches. During the last few months before flight, many people moved to KSC to help with final launch vehicle assembly, testing, and checkout. This meant long workdays away from home. “Many people told me how proud they were to attend the launch and witness the result of their family member’s hard work,” McMahan said.

People who worked on Ares I-X will now become part of teams developing NASA’s next-generation of launch vehicles. Ares I-X knowledge and people will help improve the design and safety of vehicles that will help humans explore space.

An Ares I-X mission report was issued 30 days after the mission. Subsequent reports will be issued 60 and 90 days after the flight. Updates on the mission results are being posted at http://www.nasa.gov/mission_pages/constellation/ares/flighttests/aresIx/index.html.

RECENT PUBLICATIONS

NASA Publications

NASA Historical Data Book, Volume VII: NASA Launch Systems, Space Transportation, Human Spaceflight, and Space Science 1989-1999 (NASA SP-2009-4012) by Judy A. Rumerman. A fundamental reference tool, this new work presents information, much of it statistical, documenting the development of critical areas of NASA responsibility for the period between 1989 and 1998. This volume can be purchased for \$55 from the NASA Center for AeroSpace Information (CASI) at <http://ntrs.nasa.gov/search.jsp>, the NASA Information Center, the Government Printing Office, or private vendors.

Ikhana: Unmanned Aircraft System Western States Fire Missions (NASA SP-2009-4544 Monograph in Aerospace History No. 44) by Peter W. Merlin. Individuals interested in receiving a copy should send a self-addressed, stamped Priority Mail envelope (\$4.95 postage) to: History Office, NASA Dryden Flight Research Center, Bldg. 4839, 4800 Lilly Drive, Edwards, CA, 93523, and request the book by title.

Nose Up: High Angle-of-Attack and Thrust Vectoring Research at NASA Dryden 1979-2001 (NASA SP-2009-4534) by Lane Wallace and Christian Gelzer. Individuals interested in receiving a copy should send a self-addressed, stamped Priority Mail envelope (\$4.95 postage) to: History Office, NASA Dryden Flight Research Center, Bldg. 4839, 4800 Lilly Drive, Edwards, CA, 93523, and request the book by title.

John A. Eddy, *The Sun, The Earth, and Near-Earth Space: A Guide to the Sun-Earth System (NASA NP-2009-1-066-GSFC)* is a very accessible primer for students and other interested lay readers on the subject of heliospheric science. Published posthumously, this book project was shepherded by Jennifer Rumburg of the Science Mission Directorate. The book covers an important, yet often ignored or little understood, scientific subject that has significant practical effects, such as “space weather.” This book is not in the NASA History Series but may interest newsletter readers.

NASA Publications Reprinted by Dover Publications

Apollo Expeditions to the Moon: The NASA History, edited by Edgar M. Cortright (Dover Publications, November 2009). This new edition of an official NASA publication presents the thrilling inside story of the Apollo program. Engineers, administrators, and astronauts offer firsthand accounts of the program’s unprecedented challenges and triumphs. Written in direct, jargon-free language and featuring numerous illustrations, including more than 160 dazzling color photographs, this is a compelling adventure story.

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Commercially Published Works

Compiled by Chris Gamble.

U.S. and Russian Cooperation in Space Biology and Medicine: Space Biology and Medicine, Volume 5, edited by Arnauld E. Nicogossian, Stanley R. Mohler, Oleg G. Gazenko, and Anatoliy I. Grigoriev (American Institute of Aeronautics and Astronautics [AIAA], October 2009). This fifth and final volume of the joint U.S.–Russian series Space Biology and Medicine is a comprehensive summary of U.S. and Russian cooperation in the fields of space biology and medicine. It summarizes the experience and insights drawn from many years of Russian and American cooperation in the peaceful study and use of outer space.

Space Shuttle Operations and Technology, by Lance K. Erickson (Linus Publications, June 2009). Space Shuttle Operations and Technology is a broad review of NASA's Space Transportation System that is focused primarily on the program and hardware. The book also provides a historical backdrop for examining the vehicle's development and its operations, from the early Space Shuttle concepts to its recent missions.

The Seventh Landing: Going Back to the Moon, This Time to Stay, by Michael Carroll (Springer, August 2009). Just 40 years ago, in July 1969, one of humankind's greatest dreams was accomplished. Men flew safely to the Moon, landed and walked on its surface, and then returned home. There were six Moon landings by the Apollo team in that time period, but today we are making big plans again, and this time, our plans include not only setting up a permanent settlement on the Moon, but preparing the way for an eventual trip to Mars. Many countries, in fact, are contributing to this effort, some as part of an international venture with the United States spearheading the effort, some making plans to go on their own. The "seventh landing" on the Moon will begin a new era in spacefaring.

Solar System Moons: Discovery and Mythology, by Jürgen Blunck (Springer, November 2009). Starting from Mars outward this concise handbook provides thorough information on the satellites of the planets in the solar system. Each chapter begins with a section on the discovery and the naming of the planet's satellites or rings, followed by a section presenting the historic sources of those names. The book contains tables with the orbital and physical parameters of all satellites and is illustrated throughout with modern photos of the planets and their moons as well as historical and mythological drawings.

The Cambridge Aerospace Dictionary, by Bill Gunston (Cambridge University Press, 2nd edition; September 2009). The Cambridge Aerospace Dictionary is an authoritative and accessible reference useful to scholars and enthusiasts alike. This dictionary is an essential tool for professionals involved in the aerospace industry and flight, and for anyone who must read and understand the technical literature of the aerospace industry and about specific air and spacecraft.

Nutritional Biochemistry of Space Flight, edited by Scott M. Smith, Sara R. Zwart, Vickie Kloeris, and Martina Heer (Nova Science Publishers, September 2009). Besides covering a broad range of issues relating to space nutrition, this book presents the knowledge of nutritional biochemistry of spaceflight that has resulted from five decades of space life sciences research and operations. It covers research and observational findings on space travelers, as well as ground-based analogue

studies with human subjects in such venues as bed rest, closed chambers, Antarctica, and under the sea. This book serves as a historical record of nutrition as related to spaceflight, specifically to nutrient requirements in a spaceflight environment.

Remote Sensing from Space: Supporting International Peace and Security, edited by Bhupendra Jasani, Martino Pesaresi, Stefan Schneiderbauer and Gunter Zeug (Springer, August 2009). This book provides the reader with an overview of the state-of-the-art Earth Observation (EO) related research in the most relevant topics of security research. Whilst focusing on remote sensing technologies the book follows an interdisciplinary approach. It comprises management aspects (issues and priority of security research, crisis response), applied methodologies and process chains (treaty monitoring, estimation of population densities and characteristics, border permeability models, damage assessment) and the latest developments in generic tools (feature recognition, change detection, and visualization). Additionally the book tackles the issues of data sharing, data standards, and new approaches of training security relevant techniques.

Apollo 17: The NASA Mission Reports Volume Two, by Robert Godwin (Apogee Books Space Series/Collector's Guide Publishing, Inc., August 2009). Packed with never-before-seen materials, this reference is a complete guide to the Apollo 17 mission and includes press releases from the launch as well as NASA mission reports. Easily accessible NASA resources pair with mission details and accomplishments. A companion DVD, featuring an exclusive interview with astronaut Gene Cernan, the last man to set foot on the Moon, is also included.

Canadians in Space: The Forever Frontier, by John Melady (Dundurn Press, August 2009). On 5 October 1984, Marc Garneau became Canada's first astronaut when he rocketed into space from a launch pad at Cape Canaveral, Florida. In doing so, Garneau became a national hero. Seven of his fellow citizens followed in his footsteps, many more than once. This book was written as a 25th anniversary tribute to these brave men and women who defied tremendous odds, risked their lives, and soared from Earth on sheets of flame. By leaving the only planet known to be habitable, they became true explorers in an ever-expanding universe we will never completely know.

Cosmic Collisions: The Hubble Atlas of Merging Galaxies, by Lars Lindberg Christensen, Davide de Martin, and Raquel Yumi Shida (Springer, September 2009). Like no other telescope ever invented, the Hubble Space Telescope has given us magnificent high-resolution views of the gigantic cosmic collisions between galaxies. Hubble's images are snapshots in time and catch the colliding galaxies in different stages of collision. Thanks to a new and amazing set of 60 Hubble images, for the first time these different stages can be put together to form a still-frame movie-like montage showing the incredible processes taking place as galaxies collide and merge.

The Astronaut's Cookbook, by Charles T. Bourland and Gregory L. Vogt (Springer, October 2009). Astronauts, cosmonauts, and a very limited number of people have experienced eating space food due to the unique processing and packaging required for space travel. This book allows anyone with a normal kitchen to prepare space food. Since some of the processing such as freeze dehydration, and packaging cannot be accomplished in the normal kitchen, many of the recipes will not produce the food that would be launched in space, but will prepare food similar to what the

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Recent Publications (continued)

astronauts would eat after they had added water to the food in space. Recipes in this book are extracted from the NASA food specifications and modified for preparation in a normal kitchen. In addition, astronaut home favorite recipes and NASA quarantine food recipes are included. Interesting tidbits of space food history is spread throughout the book.

Conquering the Sky: The Secret Flights of the Wright Brothers at Kitty Hawk, by Larry E. Tise (Palgrave Macmillan, September 2009). Despite their great achievements following their first powered flights in 1903, Wilbur and Orville Wright still enjoyed virtual anonymity until 1908. In seven crucial days in May of that year, however, the eyes of the world were suddenly cast upon them as they sought lucrative government contracts for their flying technology and then had to prove the capabilities of their machines. In these pivotal moments, the brothers were catapulted into unwanted worldwide fame as the international press discovered and followed their covert flight tests, and reported their every move using rudimentary telegraphs and early forms of photography. From the brothers' rise to fame on the historic Outer Banks, to the quickly expanding role of the world press and the flights' repercussions in war and military technology, Tise weaves a fascinating tale of a key turning point in the history of flight.

400 Years of Astronomical Telescopes: A Review of History, Science and Technology, edited by Bernhard R. Brandl, Remko Stuik, and J.K. (Jet) Katgert-Merkeli. Reprinted from *Experimental Astronomy* journal, Vol. 25/1-3 and 26/1-3, 2009 with additional contributions and CD-ROM (Springer, November 2009). To celebrate the invention of the telescope and the resulting developments, Leiden Observatory, in cooperation with ESTEC, organized an international meeting on "400 Years of Astronomical Telescopes." The meeting took place from 29 September–2 October 2008 at the ESTEC conference centre. This book presents the meeting's highlights.

Women Aviators: From Amelia Earhart to Sally Ride, Making History in Air and Space, by Bernard Marck (Flammarion, October 2009). This book charts the rise of women in the male-dominated field of aviation through the stories of record-breaking aviatrixes: from those who piloted the earliest aircrafts to the first women in space almost a century later. These women from across the world took to the skies, fighting their way to recognition against all odds. The backgrounds and life stories of these women differ wildly, and yet they all offer a reminder of what can be achieved through ambition and perseverance.

The Search for Extraterrestrials: Intercepting Alien Signals, by Monte Ross (Springer-Praxis, October 2009). Here Monte Ross explores in detail the key problems in starting a search, the programs that have failed and those that continue. He includes the fundamental considerations and the physics of the necessary laser, UV, IR, and RF technologies, as well as coding and information theory considerations.

Far Out: A Space-Time Chronicle, by Michael Benson (Abrams, October 2009). In *Far Out: A Space-Time Chronicle*, author and filmmaker Michael Benson assembles an outstanding collection of astronomical images from observatories around the world and in space. We live in a golden age of astronomical observation. Some of the resulting images are well known and have inspired millions of people; others, equally breathtaking, have never been published before. For this book, Benson has culled the very best and organized them into a thrilling journey through space and time to the universe's great places, ranging from "nearby" nebulae in our own

Milky Way galaxy to the light of the Hubble Deep Field that has traveled billions of light-years.

The Apollo Story, by John Christopher (The History Press Ltd, October 2009). When Neil Armstrong and Buzz Aldrin stepped onto the surface of the Moon in July 1969, it marked the pinnacle of the Apollo program and a victory over the Soviets. But victory came at a terrible price, as politicians drove engineers forwards, beginning with the disastrous Apollo 1 launch-pad fire that killed three astronauts, and ending with the unfolding drama of the ill-fated Apollo 13 mission. Following on from the Moon landings, the Apollo program went on to push the boundaries of long-endurance space missions aboard Skylab, and it finished on a triumphant note with the American and Soviets joining forces in orbit, concluding a decade of feuding and paving the way for the International Space Station. Eight short years saw not only an incredible technological advancement, but also the unbelievable bravery of an elite team of astronauts who rode into the unknown on the most powerful rockets ever devised.

Energy Crisis: Solution from Space, by Ralph Nansen (Collector's Guide Publishing, Inc./Apogee Books Space Series, October 2009). Presenting a bold solution for global climate change and dependence on oil—and the threat of war over its diminishing supply—this visionary reference explores how developing solar energy could bring about unprecedented economic prosperity and opportunity on a global scale. By using existing technology in revolutionary ways, this new energy plan would have the potential to create jobs and revitalize the economy while offering a clean, affordable, and long-term solution.

Red Cosmos: K.E. Tsiolkovskii, Grandfather of Soviet Rocketry, by James T. Andrews (Texas A&M University Press, October 2009). Long before the space race captured the world's attention, K.E. Tsiolkovskii, often called the grandfather of Russian rocketry, first conceived of multi-stage rockets that would later be adapted as the basis of both the U.S. and Soviet rocket programs. James T. Andrews explores the complexities of this man to show that Tsiolkovskii was much more than either a rocket inventor or a propaganda tool. He was a science popularizer, novelist, technical inventor, and visionary, whose science fiction writings included futuristic drawings of space stations long before they appeared on any engineer's drawing board.

Titan from Cassini-Huygens, edited by Robert Brown, Jean Pierre Lebreton, and Hunter Waite (Springer, October 2009). This book reviews our current knowledge of Saturn's largest moon Titan featuring the latest results obtained by the Cassini-Huygens mission. A global author team addresses Titan's origin and evolution, internal structure, surface geology, the atmosphere and ionosphere as well as magnetospheric interactions. The book closes with an outlook beyond the Cassini-Huygens mission.

Servicing the Hubble Space Telescope: Shuttle Atlantis—2009, by Dennis Jenkins and Jorge Frank (Specialty Press, September 2009). This book follows the final shuttle servicing mission to the Hubble Space Telescope from the press conference announcement through crew training and vehicle launch preparation. Stunning on-orbit photography taken by the astronauts during five spacewalks is featured along with Atlantis's triumphant return to the Kennedy Space Center.

Canadian Wings: A Remarkable Century of Flight, by Stephen Payne (Douglas & McIntyre, November 2009). This book gives a full and copiously illustrated account of how powered flight developed during its first century in Canada, as well as the

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contribution that Canadians made to the wider story of flight in the world. *Canadian Wings* draws on the unparalleled collections of the Canada Aviation Museum in Ottawa, for its nearly 200 images including archival photographs, paintings, and memorabilia.

Space Project, by Lynn Davis (The Monacelli Press, November 2009). Lynn Davis's photographs of the architectural icons, cornerstones, and abandoned sites of the space race reflect the many facets of a historically complex industry: the beginnings of space exploration; the changing nature of technology; and a fascination with otherworldly ruins. She emphasizes the bold modernism of these sites while evoking the presence of obsolete technologies. Davis traveled to historic sites in Kazakhstan, Russia, Germany, French Guiana, and the United States. She received special permission to visit Baikonur in Kazakhstan, a leading launch site shrouded in secrecy since the 1950s, and her photographs offer one of the first inside glimpses of launches, transmission towers, fuel lines, and satellites.

Hitler's Miracle Weapons Volume 3: From the 'America Rocket' to an Orbital Station. Germany's Efforts to Develop Intercontinental Weapons and the First Space Programme, by Friedrich Georg (Helion and Company, October 2009). The third volume in this now-established series expands its coverage to examine Nazi Germany's efforts to develop intercontinental weapons and nothing short of a space program. The author begins by examining whether the V2 rocket was the final development produced by Hitler. He then proceeds to examine, in great detail, Germany's efforts to develop what was called the 'America Rocket,' an intercontinental weapon. A final section of the book examines further German rocketry projects that were on the drawing board by the end of the war, including sophisticated orbital craft.

History of Rocketry and Astronautics, vol. 31, edited by Hervé Moulin, American Astronomical Society History Series (IAA History Symposia 1967–2000, Abstracts and Index; 2009). Since 1967, the International Academy of Astronautics (IAA) has held history symposia at the International Astronautical Congresses. The papers delivered at these symposia have, in turn, been republished, or, in many cases, published for the first time in the AAS History Series. This volume is a general index and abstracts of all the papers presented at the 1967–2000 IAA History Symposia, and is designed to help the user find exactly where the full papers are published using several methods.

Yesterday We Were in America: Alcock and Brown—First to Fly the Atlantic Non-Stop, by Brendan Lynch (Haynes Publishing, November 2009). On 14 June 1919 John Alcock and Arthur Whitten Brown took off from Newfoundland in their open-cockpit Vickers Vimy converted bomber to attempt a non-stop crossing of the Atlantic. Some 16 hours later they landed at Derrygimla in Connemara, Ireland, to become national heroes. Navigating blind for most of the way, they had flown almost 1,900 miles, the longest distance ever flown by man. In researching one of the most significant flights in history, Brendan Lynch has drawn on the written records of Alcock and Brown, and interviewed the last surviving witness of their dramatic arrival in Ireland and the adventurer Steve Fossett, who recreated the flight in 2005.

Ambassadors from Earth: Pioneering Explorations with Unmanned Spacecraft, by Jay Gallentine (University of Nebraska Press, November 2009). *Ambassadors from Earth* relates the story of the first uncrewed space probes and planetary explorers—from the Sputnik and Explorer satellites launched in the late 1950s to the thrilling

interstellar Voyager missions of the '70s—that yielded some of the most celebrated successes and spectacular failures of the Space Age. Utilizing original interviews with key players, bolstered by never-before-seen photographs, journal excerpts, and primary source documents, Jay Gallentine delivers a quirky and unforgettable look at the lives and legacy of the Americans and Soviets who conceived, built, and guided those unmanned missions to the planets and beyond.

Rocketbelt Pilot's Manual: A Guide by the Bell Test Pilot, by William P. Sutor (Apogee Books Space Series/ Collector's Guide Publishing, Inc., November 2009). The rocketbelt—a device designed by Bell Aerosystems in the 1960s to be a tactical rescue vehicle for the United States Army—is described here for the first time by one of the machine's original test pilots. Covering everything from service and fueling to step-by-step directions for use, the guide also includes an in-depth technical background of the flying device and a detailed, easily accessible explanation of the science behind jet propelled flight. Accompanied with photos of each distinct component of the machine and an explanation as to how the parts relate to one another, this unique guide answers more than four decades worth of questions on the rocketbelt and ultimately encapsulates the sheer excitement of flight from a man who experienced it firsthand.

Saturn from Cassini-Huygens, edited by Michele Dougherty, Larry Esposito and Tom Krimigis (Springer, November 2009). This book reviews our current knowledge of Saturn featuring the latest results obtained by the Cassini-Huygens mission. A global author team addresses the planet's origin and evolution, internal structure, composition and chemistry, the atmosphere and ionosphere, the magnetosphere, as well as its ring system. Furthermore, Saturn's icy satellites are discussed. The book closes with an outlook beyond the Cassini-Huygens mission.

America's Future in Space: Aligning the Civil Space Program with National Needs, by Committee on the Rationale and Goals of the U.S. Civil Space Program and National Research Council (National Academies Press, September 2009). As civil space policies and programs have evolved, the geopolitical environment has changed dramatically. Although the U.S. space program was originally driven in large part by competition with the Soviet Union, the nation now finds itself in a post-Cold War world in which many nations have established, or are aspiring to develop, independent space capabilities. Furthermore discoveries from developments in the first 50 years of the Space Age have led to an explosion of scientific and engineering knowledge and practical applications of space technology. The private sector has also been developing, fielding, and expanding the commercial use of space-based technology and systems. Recognizing the new national and international context for space activities, *America's Future in Space* is meant to advise the nation on key goals and critical issues in 21st century U.S. civil space policy.

Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts, by Committee to Review the NASA Institute for Advanced Concepts and National Research Council (National Academies Press, October 2009). The NASA Institute for Advanced Concepts (NIAC) was formed in 1998 to provide an independent source of advanced aeronautical and space concepts that could dramatically impact how NASA develops and conducts its missions. Until the program's termination in August 2007, NIAC provided an independent open forum, a high-level point of entry to NASA for an external community of innovators, and an external capability for analysis and definition of advanced aeronautics and space

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Recent Publications (continued)

concepts to complement the advanced concept activities conducted within NASA. As requested by Congress, this volume reviews the effectiveness of NIAC and makes recommendations concerning the importance of such a program to NASA and to the nation as a whole, including the proper role of NASA and the federal government in fostering scientific innovation and creativity and in developing advanced concepts for future systems.

Out of This World: The New Field of Space Architecture, edited by A. Scott Howe and Brent Sherwood (American Institute of Aeronautics & Astronautics-AIAA, December 2009). Written by the global network of practicing space architects, the book introduces a wealth of ideas and images explaining how humans live in space now, and how they may do so in the near and distant future. It describes the governing constraints of the hostile space environment, outlines key issues involved in designing orbital and planet-surface architecture, surveys the most advanced space architecture of today, and proposes far-ranging designs for an inspiring future. It also addresses earth-based space architecture: space analogue and mission support facilities, and terrestrial uses of space technology.

Australia's Astronauts, by Colin Burgess (The Communications Agency, 2nd edition, 2009). This is the story of Australia's three astronauts: Philip Chapman, Paul Scully-Power, and Andy Thomas. It details the experiences of these three exceptional men and their roles in the space programs of the United States and Russia. The book also narrates the missed opportunities to fly more Australians in space as part of NASA's international payload specialist program and reveals the true story behind adventurer Nik Halik's attempt to become the first Australian space "tourist."

Histoire(S) d'Espace (Space Stories) by Jean-François Clervoy (Paris: Jacob Duvernet Editeur, 2009). In this book Jean-Francois Clervoy recounts his third space mission in 1999 aboard the U.S. space shuttle *Discovery* mission devoted to repair the orbiting Hubble Space Telescope. From the ruthless selection to the unique long-awaited launch of the shuttle, he gives us the chance to experience what some chosen few only lived: orbiting the world in an hour and a half, the exhilarating experience of weightlessness, the risk of flight, life on board, work in a vacuum, the technical prowess, the human challenge of space exploration, the passionate observation of the planet and the extraordinary solitude amid the universe. His story points to the extraordinary uniqueness of Earth.

50 Years of Rockets & Spacecraft, by Ed Buckbee (Ed Buckbee & Associates, Inc., November 2009). U. S. manned space flight began in the Rocket City, Huntsville, Alabama. It's the home of the George C. Marshall Space Flight Center, world's premier rocket center. The men and women, who made up the Marshall team, tell their story in, *50 Years of Rockets and Spacecraft*. It's an exciting space history lesson beginning with Alan Shepard's flight on the Mercury -Redstone and continuing with Saturn rocket rides to the Moon, Skylab, Space Shuttle, International Space Station, Hubble, Ares, and the future. Wernher von Braun's personal Weekly Notes, recently discovered in the archives, are published and reviewed for the first time. The book contains personal behind the scenes stories told by the men and woman who made critical decisions to send American astronauts on journeys into space and on to the Moon. The stories range from humorous anecdotes to gut-wrenching decisions required to safely flying humans to this new frontier.

ONLINE RESOURCES

NASA History

<http://www.grc.nasa.gov/WWW/portallflash/aerol>

Created by the Glenn History Program and the Glenn Imaging Technology Center, “Lessons of A Widomaker (and Other Aircraft)” is an interactive Web site allows users to select different NASA aircraft and learn about its history, specifications, and view images. Visitors to the page can also view video, listen to audio programming, and play educational games.

http://www.nasa.gov/pdf/398311main_Apollo_11_Report.pdf

NASA recently released a report on the search for the Apollo 11 telemetry tapes.

Other Sites of Interest

<http://www.lib.purdue.edu/moon/>

Sponsored by the Archives and Special Collections at Purdue University, with help from Lockheed Martin, “Purdue’s Place in Space: From the Midwest to the Moon” is an online exhibition of their role in aviation history and space exploration, which includes digital artifacts from their numerous alumni who became astronauts.

<http://www.nixontapes.org/nasa.htm>

In celebration of the 40th anniversary of the Moon landing, this Web site presents the digitized versions of the original audio and summaries of the conversations between President Richard Nixon and the crews of Apollo XV, XVI, and XVII.

HISTORIC PRESERVATION NEWS

Space Transportation System (STS) Recordation Complying with the National Historic Preservation Act

By Tina Norwood, NASA HQ and Jim Ellis, DP Associates

There is a vast amount of ongoing history capture associated with the Space Shuttle program. In addition to documenting historic facilities that have supported the program, one recordation effort is focused on the Space Transportation System (STS) “stack” and the shuttle carrier aircraft. The STS falls under the National Historic Preservation Act (NHPA) since the orbiters were surveyed and determined eligible for listing on the National Register of Historic Places (NRHP). The Space Shuttle Main Engines (SSME), the External Tank (ET) and the Solid Rocket Boosters (SRB) are not considered *individually eligible* but have been determined to be *contributing elements* to the STS “stack.”

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NASA is required to comply with the NHPA, which applies to properties that are listed or eligible for listing on the NRHP. The act requires consultation and mitigation for any “undertaking” (a federal program or project) determined to have an adversely affect on historic properties. In this case the undertaking is defined as the *Removal of the STS from Service*. To mitigate this, NASA has begun recording history, also known as “recording.” It’s proving to be an arduous but rewarding process for all involved.

All phases of the shuttle program, from concept development to retirement, will be documented; however, special emphasis will be placed on design and hardware evolution and the changes that occurred in response to the two shuttle accidents. Although documentation will include all three orbiters, *Discovery* has been identified as the “shuttle of record.” Representatives at each of the responsible Centers are working closely with their Center HPO, historian, archivist, artifacts manager, property managers, and records managers to ensure that all recording requirements are being met.

Johnson Space Center (JSC) is leading the recording effort in consultation with the Texas State Historic Preservation Officer in Austin and other consulting parties, supported by a team of representatives from the Space Shuttle program and NASA Centers. As Ms. Fox, JSC

Transition Manager explains, “We are pushing to complete this recording quickly since it involves collecting photographs, oral histories, technical drawings, and operational information from shuttle managers before the program ends.”

This information will be used to develop a Historic American Engineering Record (HAER) in accordance with Department of Interior standards. The HAER collection is maintained by the Library of Congress in Washington, DC, and will be available to future aerospace students and researchers. Final recording products will also be made available through state repositories, museums, universities, libraries, and appropriate Web sites.

Public Input Welcome: As with all undertakings conducted in accordance with the NHPA, public input is sought. Anyone wishing to submit a comment or suggestion about this recording activity can send it to jsc-sts-recording@mail.nasa.gov. Note that the scope of this undertaking is focused on the engineering uniqueness of the STS and does not include disposition of the orbiters or mission specific artifacts. For more information visit www.nasa.gov/transition.

OTHER AEROSPACE HISTORY NEWS

National Air and Space Museum (NASM)

Roger D. Launius, Division of Space History, has published a second edition of *Space Stations: Base Camps to the Stars* (New York: Konecky & Konecky, 2009). The original edition appeared in 2003, and this second edition brings the story of the International Space Station up to date. He also has been working with National

Academies on two studies, contributing to *Approaches to Future Space Cooperation and Competition in a Globalizing World: Summary of a Workshop* (Washington, DC: National Academies Press, 2009) and *Radioisotope Power Systems: An Imperative for Maintaining U.S. Leadership in Space Exploration* (Washington, DC: National Academies Press, 2009).

Roger Launius will be awarded the John F. Kennedy Astronautics Award offered by the American Astronautical Society recognizing, as the award Web site notes, “an individual who has made an outstanding contribution by promoting the Nation’s space programs for the exploration and utilization of outer space.”

Roger Launius and Valerie Neal, also from Division of Space History, presented at the annual meeting of the Society for Social Studies of Science (4S) on 31 October in Crystal City. Roger’s topic was “Constructing the Origins of the Solar System” and Valerie’s was “Microgravity Science: The Quest for Gravitass” in a session on “Inventing the Space Sciences: Constructing Identity and Legitimacy for New Multidisciplinary ‘Disciplines,’” organized by Linda Billings.

“Moving Beyond Earth,” the first stage of a new exhibition on human spaceflight in the shuttle-space station era and beyond, opened 19 November. It features a presentation stage, decision-making interactives, signature artifacts including the COSTAR corrective optics package returned from the Hubble Space Telescope, and an environment that visually puts you in space. The exhibition is funded by NASA. At the same time, NASM began showing to the public the WFPC2 camera, on two-month loan from NASA, also returned from the HST by the last servicing mission in May 2009. Both the exhibit and the instruments were unveiled for the press on 18 November, the day of all-day symposium on the HST in the new gallery, organized by Roger Launius and David DeVorkin. The night before, Dr. John Grunsfeld, the astronomer-astronaut and veteran of five shuttle missions, three of them to HST, gave a public lecture in the IMAX theater.

American Astronautical Society

The American Astronautical Society recognized David Mindell with the 2008 Eugene E. Emme Award for Astronautical Literature for his recent book, *Digital Apollo—Human and Machine in Spaceflight* (MIT Press).

Quest: The History of Spaceflight Quarterly

David Arnold, editor of *Quest: The History of Spaceflight Quarterly*, is seeking articles for publication. The journal is published quarterly and is dedicated to the history of spaceflight. Stories cover the people, projects, and programs that comprise the civil, military, and commercial space programs of the world. Articles submitted by amateur and professional historians are welcome. For more about the journal, go to: <http://www.spacebusiness.com/quest>, or contact Arnold at: historyofspace@aol.com.

NASA Announces Screening of Space Shuttle Artifacts

NASA invites eligible educational institutions, museums, and other organizations to begin the prescreening process to request potential Space Shuttle artifacts. These artifacts represent significant human spaceflight technologies, processes, and accomplishments of the shuttle program.

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Other Aerospace History News (continued)

More information about the types of artifacts that may be available is included in a brochure, "Space Shuttle Program Artifacts," located at <http://www.nasa.gov/transition>.

Fellowships

Monique Laney defended her dissertation, titled "Transnational Migration and National Memory: How German Rocket Engineers Became Americans in Huntsville, Alabama," on 20 August 2009. As the recipient of this year's postdoctoral fellowship offered by the Society for History of Technology and supported by NASA, Dr. Laney is currently revising her dissertation for a book publication and seeking employment in the DC area.

The Future in the Stars: German Research Foundation Funds New Emmy Noether Group with More than One Million Euros

Alexander C.T. Geppert, who teaches cultural history at Freie Universität Berlin, was recently awarded an Emmy Noether Research Grant by the German Research Foundation (DFG). Over the course of the next five years, Geppert will receive more than 1.1 million Euros to set up and direct an independent research group composed of several Ph.D. students and postdocs working on European astrofuturism in the 20th century.

How have European conceptions of the cosmos and extraterrestrial life changed parallel to the continuous exploration of outer space? Has a specifically European perspective on space evolved since the Second World War? And how can the European paradox of comprehensive space enthusiasm concomitant with a decades-long abstinence from actual spaceflight be explained?

The Emmy Noether Grant, the most valuable award for young researchers in Germany, will allow Alexander Geppert to help integrate the cultural history of space into mainstream historiography, and to contribute to the development of a hitherto largely unestablished research field in Europe.

The Emmy Noether Program enables outstanding and highly qualified young researchers to become eligible for tenure-track positions at a German university. This program offers an alternative to the traditional professorial track requiring the so-called Habilitation by giving researchers the opportunity to achieve the qualifications by directing an independent junior research group and assuming an appropriate amount of relevant teaching duties.

Two research positions, one postdoc and one for a Ph.D. student, will be advertised in January 2010.

For additional information please contact Dr. Alexander C.T. Geppert at alexander.geppert@fu-berlin.de or consult <http://www.geschkult.fu-berlin.de/astrofuturism>.

UPCOMING MEETINGS

The Fourteenth Annual International Symposium of the International Space University, “The Public Face of Space,” will be held **16–18 February 2010** in Strasbourg, France. Please see <http://www.isunet.edu/annualsymposium> for more details.

The annual meeting of the Organization of American Historians will be held **7–10 April 2010** in Washington DC. Please see <http://www.oah.org/meetings/index.html> for more details.

The 16th Annual Space Exploration Educators Conference will take place on **16–18 February 2010** at the Johnson Space Center in Houston, Texas. Please see <http://www.spacecenter.org/TeachersSEEC.html> for more details.

The 41st Lunar and Planetary Science Conference will be held **1–5 March 2010** in Woodlands, Texas. Please see <http://www.lpi.usra.edu/meetings/lpsc2010/> for more details.

The 8th Responsive Space will be held **8–11 March 2010** in Los Angeles, California. Please see <http://www.responsivespace.com> for more details.

The 48th Robert H. Goddard Memorial Symposium, “Earth and Beyond: The Next Decades” will be held **10–11 March 2010** in Greenbelt, Maryland. Please see <http://astronautical.org/events/goddard/> for more details.

The 26th National Space Symposium will be held **12–15 April 2010** in Colorado Springs, Colorado. Please see <http://www.nationalspacesymposium.org/> for more details.

SpaceOps 2010 will be held **25–30 April 2010** at the Von Braun Center in Huntsville, Alabama. Please see <http://www.spaceops2010.org> for more details.

The 29th Annual International Space Development Conference (ISDC) will be held **27–31 May 2010** in Chicago, Illinois. Please see <http://isdc.nss.org/2010> for more details.

OBITUARIES

Konrad Dannenberg

The family of Konrad Dannenberg, a member of the original von Braun team that built the V-2 (A-4) rocket, bequeathed his personal papers to the University of Alabama-Huntsville’s (UAH) Salmon Library on 28 October. Mr. Dannenberg died on 16 February 2009. To commemorate this donation—which included photos, memorabilia, journals, artifacts, papers, and awards—UAH’s Salmon Library, the Dannenberg family, and the Huntsville Alabama L5 Society (HAL5) hosted a daylong tribute to Dannenberg’s life and work. According to HAL member Bart Lehey from Huntsville, the event attracted 60 attendees. Originally an expert in

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Obituaries (continued)

diesel engines, Mr. Dannenberg became captivated with the idea of building rockets to go to Mars when he was in high school.

When he and the other German rocket men were brought to the U.S. through “Operation Paperclip,” they brought their lessons learned in wartime rocketry to the Redstone engines that powered the first American satellite and astronauts into space. These engines in turn became the basis for the Saturn I and Saturn IB, which launched the first manned Apollo mission and the missions to Skylab and the Apollo-Soyuz Test Project. At Marshall Space Flight Center, Dannenberg, as deputy manager of the Saturn V, went on to train and supervise the teams that developed the Saturn V’s F-1 and J-2 engines that sent astronauts to the Moon.

After retiring from NASA in 1973, Dannenberg remained active in space exploration advocacy and education, helping to found HAL5, supporting tours at the U.S. Space & Rocket Center, and serving at Space Camp as a “resident rocket scientist.”

Konstantin Feoktistov

Konstantin Feoktistov, one of the first civilian Soviet cosmonauts, died on 22 November 2009. Previous to Feoktistov, cosmonauts had all come from the military. After fighting in World War II, he graduated from the Moscow Bauman Technical Institute with a degree in mechanical engineering and spent his career working on spacecraft design. Feoktistov worked on Soyuz, Soyuz-T, Soyuz-TM, Progress and Progress-M spaceships, and Salyut and Mir orbiting stations at the Energia Aerospace Corporation. He flew on the first Voskhod spaceship from 12–13 October 1964.

Qian Xuesen (Tsien Hsue-shen)

Qian Xuesen, the man commonly referred to as the father of China’s space and rocketry programs, died on 31 October 2009 in Beijing. He came to the United States in 1930s to study aeronautical engineering at the Massachusetts Institute of Technology and also completed graduate work in rocket propulsion at the California Institute of Technology.

Qian served on the U.S. Science Advisory Board during World War II and helped to found the Jet Propulsion Laboratory. In 1950, the Federal Bureau of Investigation began investigating charges against him of being a Communist, which he denied, but still resulted in his deportation.

After returning to China, Qian worked for the defense ministry in developing Chinese rocketry that resulted in the “Long March” missiles and their first satellite launch in 1970.

Richard Whitcomb

NACA and NASA aeronautical pioneer and former NASA Langley Research Center employee Richard Whitcomb passed away on 13 October 2009. Whitcomb was awarded the prestigious 1954 Collier Trophy for developing the “area rule” to reduce the shock wave drag that builds up when aircraft fly near the speed of sound. He also developed supercritical wings and winglets. See http://www.nasa.gov/topics/people/features/richard_whitcomb.html for details of Whitcomb’s career.

The NASA History Division, under the Office of External Relations, NASA Headquarters, Washington, DC 20546, publishes *News and Notes* quarterly.

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