



From the Chief Historian



It has been a very busy spring for us here in the NASA History Program. We've managed to get a number of publications into print—or pixels, I suppose I should say, for those of you who enjoy our works on a screen. While we remain committed to hardcopy publication, the ease of downloading our content has driven a huge growth in our readership. This allows us to do so much more with less. So while we continue to tighten our belt, the numbers of readers of our books, monographs, and this newsletter are all up.

Our publications may be the most visible part of our work, but we've also been busy preparing for a number of significant upcoming anniversaries. 2014 marks the 45th anniversary of a remarkable year in space history. Coming off the Christmas 1968 mission of Apollo 8, NASA flew four astounding Apollo missions in 1969: test-flying the Lunar Module for the first time in Earth orbit (Apollo 9), verifying the entire lunar landing mission (to within 50,000 feet of the surface) (Apollo 10), landing on the Moon (Apollo 11), and doing that again with pinpoint precision four months later (Apollo 12). We have been marking the Apollo 45th anniversary events mostly online with a variety of special features. There will be some physical events in July to mark the 45th anniversary of Apollo 11, but in keeping with current policy, this year's events will not be on the same scale as the 40th anniversary. In fact, here in the History Program, our attention is more

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Lankes: Little-Known Artist of the NACA, Part 2

By Mary Gainer,
Historic Preservation Officer at NASA Langley Research Center

Article continued from the last issue of News and Notes, vol. 31, no. 1

Julius John Lankes made big news in the fall of 1945. A full article in *Air Scoop* detailed the conception and execution of four murals depicting the history of flight. The murals were to be hung in the rotunda of the Administration Building (587) at Langley. By 1949, Center Director Dr. H. J. E. Reid was using the rotunda as the location for special events. Photographs of two ceremonies given in the year show the murals as the backdrop.



Harry Lyons receives the first Meritorious Service Emblem, and Beth Walker accepts Dr. Reid's contribution to the Red Cross campaign. Both photos were taken in 1949.

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From the Chief Historian (continued)

focused on long-range planning for the next decadal anniversary—the 50th anniversary celebration in 2019.

More immediately, we are hard at work now preparing for the centennial of the creation of the National Advisory Committee for Aeronautics (NACA). While the anniversary of the creation of the NACA falls on 3 March 2015, you may already have detected an increased attention to the NACA in our work over recent months. We are, of course, planning a significant event to mark the centennial itself. But we are also working on other events for the coming year that will emphasize the importance of the NACA to the worldwide development of aeronautics, how the NACA's post-World War II research laid the basis for the Space Age, and how the legacy of the NACA lives on at NASA. In support of these activities, we have several publications in the production pipeline, including a new centennial history of the NACA and NASA. One of our small but important projects is a campaign to help everyone pronounce NACA properly. Those who worked there named it by the letters, not as a word (like we do with NASA). So, remember, it is “en-ay-see-ay.”

Finally, harking back to the print-versus-screen issue that I mentioned earlier, if you get a paper copy of this newsletter and prefer to read it electronically, you can find what you prefer at <http://history.nasa.gov/nltrc.pdf>. If you like, you can also turn off your paper subscription (and help us tighten our belt a bit more) simply by sending a note to Giny Cheong (giny.cheong@nasa.gov). She'll be happy to update your address or remove your name from the hardcopy newsletter mailing list.

Have a great summer, and Godspeed,



William P. Barry
Chief Historian

Lankes: Little-Known Artist of the NACA (continued)

Lankes created the original design and supervised Lee Wade's execution of the four paintings. In an interview, Lankes indicated that the original idea of murals occurred during the heyday of the Works Progress Administration (WPA), one of President Franklin D. Roosevelt's New Deal programs. Although a competition had been announced for mural designs, the work at the NACA was not deemed appropriate for WPA projects.¹ Since the WPA and its successors ran from 1933 to 1942², it is likely that the idea of the murals was based on the Federal Art Project murals but that the NACA project was never considered for the federal program. True to the spirit of the WPA projects in which workers received little money but great pride in pursuing their dreams, Lankes used downtime to work on the murals.

The proposed panels would span the history of flight, from the early "whimsical flights of the imagination" to the then-contemporary with contributions made by the NACA. As the design for the third panel was nearing completion in 1945, Lee Wade joined that staff. As an experienced painter, he took the lead in transforming the watercolors Lankes had prepared into the final oil and canvas murals.



Detail of "whimsical flights of the imagination."

The murals were large: roughly 7 feet wide by 5 feet tall. The fourth panel had been particularly trying as any aircraft they painted would have been "old" by the time the painting was completed. The final design includes an aircraft carrier deck just visible in the lower right corner.

1 *Air Scoop* 4, no. 44 (16 November 1945): 1.

2 Don Adams and Arlene Goldbard, "New Deal Cultural Programs: Experiments in Cultural Democracy" (1995), available at <http://www.wwcd.org/policy/US/newdeal.html> (accessed 14 May 2014).

The murals were removed from the rotunda in 1977 when the building was turned over to Langley Air Force Base. Kept in storage for a number of years, they are now on loan to the National Institute of Aeronautics in Hampton, Virginia.



Granddaughters Jeanie and Elizabeth Lankes pose with two of the panels.

Two years after the murals were unveiled, a related article appeared in *Air Scoop*. A booklet, *A Brief History of Aeronautics*, was being distributed to all employees. This pamphlet was written by Lankes and printed in the NACA Mechanical Reproduction Section. The purpose was to provide a description of each image in the panels. The introduction attributes the design and supervision of the four murals to Lankes with the execution by Lee Wade, Francis McVay, and Harry DeVoto.³

The work of J. J. Lankes appeared one final time in the *Air Scoop* of late October 1948. A competition was held to design meritorious service medals that would be presented to civil servants upon completion of 20 years or more of service. Lankes submitted a design, but it was not selected for the final emblem.⁴

Lankes was not entirely satisfied with his work at the NACA. Due to the times and the secretive nature of research at the NACA, much of the work done by the technical artists was either for illustrations or was designated confidential. In a letter to a Mr. Fraser, Lankes complained that “there is a magnificent lot of good material to be had here if only it weren’t forbidden, everything we do here is confidential or

³ *Air Scoop* 6, no. 17 (2 May 1947): 1.

⁴ *Air Scoop* 7, no. 43 (28 October 1948): 4.



Designed by J. J. Lankes

Lankes's design submittal for the 20-year Meritorious Service Emblem.

secret, consequently no sketching is permitted except as pertains to illustration for engineers' reports."⁵ Welford Taylor, in *The Woodcut Art of J.J. Lankes*, wrote, "pay was steady, but the work—much of it reminiscent of the technical drawing he had done as a young man—was far from creative."⁶

After years of service, Lankes was fired in 1950 for what he believed were political reasons. He explained in a letter to Rockwell Kent that he had met with a lawyer to get his job back but was told that he had been fired "as a communist."⁷ Welford Taylor wrote that Lankes's "dismissal from NACA in 1950 is no better documented than his termination from Wells [college teaching position]," but Taylor suggested that bureaucratic politics were involved, with Lankes confessing to "some strong language with Civil Service sewer sleuths."⁸

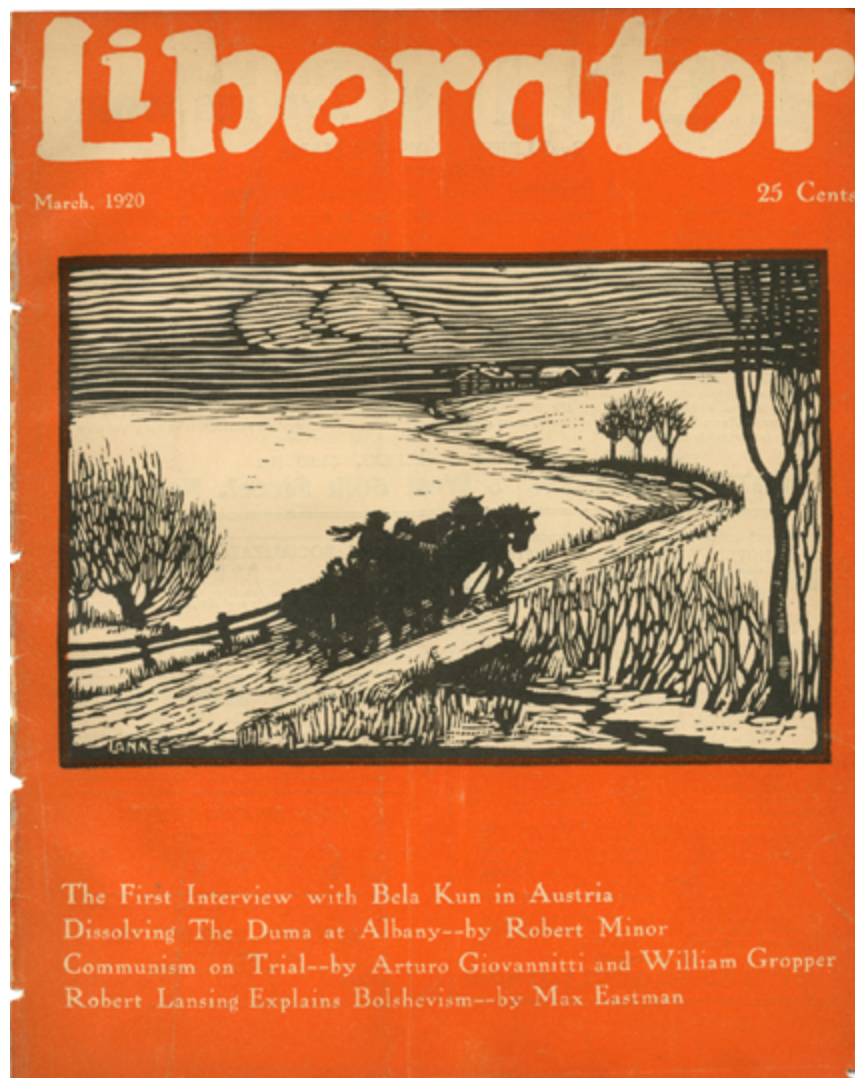
The House Committee on Un-American Activities (HUAC) was established in 1938 to investigate alleged disloyalty and subversive activities. It was chaired by Martin Dies, Jr., and hence known as the Dies Committee. In 1946, the committee focused its efforts on the possibility of the American Communist Party's infiltration of the WPA. It was a time when headlines screamed about "red artists."

5 E-mail from Elizabeth Lankes to Mary Gainer, 29 August 2012.

6 Welford Dunaway Taylor, *The Woodcut Art of J.J. Lankes* (New Hampshire: David R. Godine, Inc., 1999), p. 34.

7 E-mail from Elizabeth Lankes to Mary Gainer, 29 August 2012.

8 Taylor, *The Woodcut Art of J.J. Lankes*, p. 34.



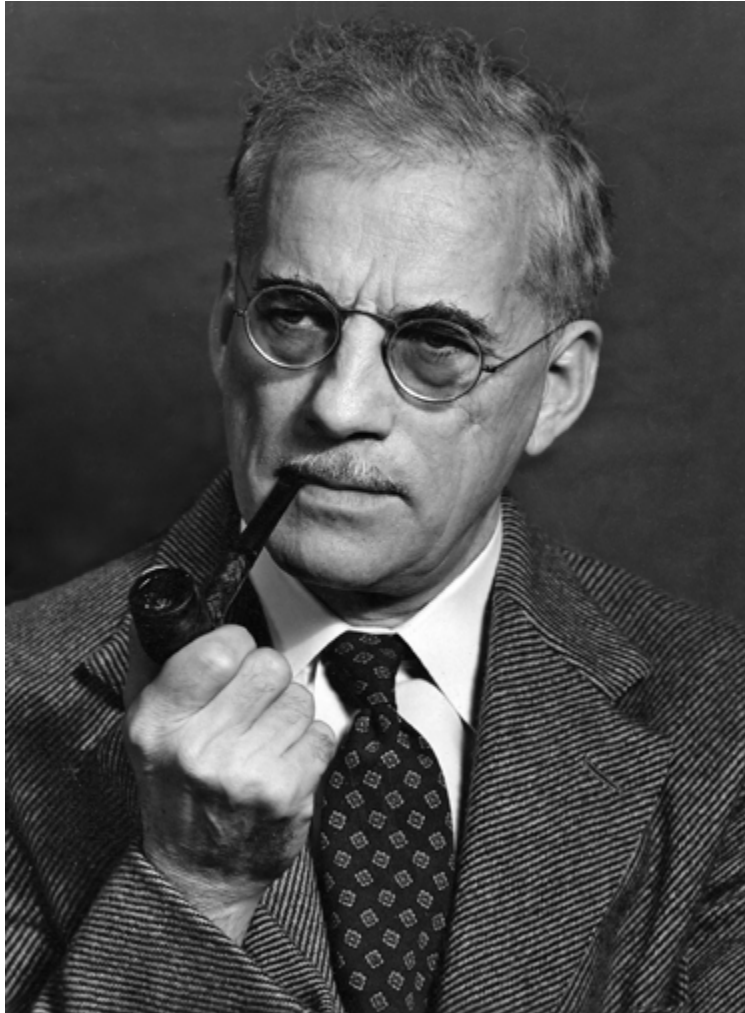
The March 1920 cover of *Liberator* with Lankes's woodcut.⁹

Lankes had a history of association with organizations that were under scrutiny. His first opportunity as an illustrator had been with Max Eastman and *Liberator*. An advertisement for the subscriptions and bound volumes stated, "Where else could one find in the same volume such an intriguing combination as Lankes's woodcuts, Clive Weed's portraits and Gropper's funny humans!"¹⁰ The Marxists Internet Archive Riazanov Library Project has scanned the *Liberator*. An introduction to the digital collection describes Lankes as one of the finest artists of the day. That notoriety may have indeed followed him to Hampton, Virginia.

⁹ Scan of the March 1920 cover of *Liberator*, available at <http://www.marxists.org/history/usa/culture/pubs/liberator/#1920> (accessed 14 May 2014).

¹⁰ *Liberator* (22 January 1920): 44, available at <http://www.marxists.org/history/usa/culture/pubs/liberator/> (accessed 14 May 2014).

In 1951, Lankes moved to Durham, North Carolina. After suffering a stroke in 1959, he died in April 1960.



NACA Portrait, 1946

News from Headquarters and the Centers

NASA Headquarters

History Program Office

By Bill Barry

The big news at the History Program Office is that our archival team is moving back into our beautifully renovated space on the concourse (basement) level of NASA Headquarters. We got a sneak peek at the nearly completed renovation in March and posted a few pictures on our Facebook page (<https://www.facebook.com/NASAHistoryOffice>) on 12 March. We've included one of those pictures here. It shows the new compact shelving that replaces the balky old Lektrievers and much of the shelving we used to have. Unfortunately, we had to wait while the renovation of the hallways and spaces around ours were completed over the last couple of months before they would let us move in. It took us over 3 months to pack up the paper files and ship them off to storage last year. Since Chief Archivist Jane Odom put so much careful thought into the pack-out, we expect that the unpacking will take substantially less time. So, leaving some slack for the inevitable teething pains, we are planning to reopen the Reference Collection for researchers and visitors by the end of the summer. Keep an eye on our Web site and social media this summer for an announcement of our official reopening.



Speaking of Jane, she has had a most productive detail with the NASA Headquarters Office of Human Capital Management (OHCM) for the last six months. Her research skills and eye for detail have been so welcome at OHCM that I've been a bit worried that they wouldn't let go of her. But, she comes back to her chief archivist duties in mid-June to lead the reconstitution of the Reference Collection. We're delighted to have her back and happy to see that her talents were put to such good use during the detail.

This spring was a particularly busy time for history publications. Our latest book, *Archaeology, Anthropology, and Interstellar Communication*, should be in distribution by the time you read this. Edited by Doug Vakoch of the SETI Institute, this is a fascinating collection of essays about the search for extraterrestrial intelligence from the perspective of the disciplines of archaeology and anthropology, rather than astronomy and physics. Instead of looking at the likelihood of the emergence of intelligent life elsewhere in the universe, this book looks at how our efforts to

understand different human cultures (both past and present) can inform our ability to detect other intelligences and (perhaps) communicate with them. We were also happy this spring to see the publication of Monographs in Aerospace History, No. 52: Christian Gelzer's *The Spoken Word III: Recollections of Dryden History; The Shuttle Years*. This is another excellent addition to the collections of oral histories from Dryden (now Armstrong) Flight Research Center. Our next monograph, *Historical Analogs for the Stimulation of Space Commerce*, by our friend Roger Launius, will be out this summer. We also have posted the latest in our chronology reference series as a PDF on our Web site. *Aeronautics and Astronautics: A Chronology: 2010* is the most recent of the annual summaries of significant events created by the NASA History Program. The series dates all the way back to the creation of the NACA in 1915 and is an invaluable source of reliable data on events in aerospace history. You can find copies on all of these chronologies at our publications Web site (<http://history.nasa.gov/series95.html>). In the 1960s, the History Program created these chronologies with a fairly substantial in-house staff, but in recent years we have relied on the Federal Research Division (FRD) of the Library of Congress to compile these volumes for us under contract. They are working on the 2011 and 2012 chronologies now, and we hope to have these available on our Web site by the end of the year.

The quarterly lunchtime history speaker for the second quarter this year was Andy Jenks of the University of California, Long Beach. Andy was the NASA American Historical Association Fellow in Aerospace History for 2013–14 and is the author of *The Cosmonaut Who Couldn't Stop Smiling: The Life and Legend of Yuri Gagarin*. On 13 May 2013, he gave us a great talk about his fellowship research on transnational encounters in space—the Apollo-Soyuz mission, the Soviet Interkosmos missions, and the formation of the Association of Space Explorers in 1985. The title of his talk was “Hot Tubs, Hippies, and Space Cadets.” As always, Andy brought a lot of energy and some interesting perspective to the topic. For the third quarter this year, we are planning to have a program on our newest book, *Archaeology, Anthropology and Interstellar Communication*. In our continual efforts to make these events more accessible to those of you outside of the DC area, we are looking at a new approach for this one. Stand by for details on that “brownbag speaker” event later this summer.

We said goodbye to our spring interns Andres Almeida and Erin Ammon in early May. They did a spectacular job for us, particularly in the social media realm. Thanks to some great writing skill (and a bit of fortuitous tweaking of the Facebook algorithms), we added about 50,000 Twitter followers (50 percent growth) and about 325,000 Facebook “likes” (190 percent growth). Fortunately for us, we only had about a week's gap before our summer interns began to arrive. They are Will



Andres Almeida and William Barry.

Thompson and Mary Catherine Bitter. Will is a junior at Virginia Commonwealth University double majoring in anthropology and finance, and Mary Catherine is a junior at George Washington University majoring in business administration. They are both working with us until early August.



Erin Ammon and William Barry.

One of the things that our spring interns (Andres in particular) pushed to completion for us was to shift the Great Images in NASA (GRIN) Web site content to a new platform on Flickr. If you go to “NASA on the Commons” on Flickr (<https://www.flickr.com/photos/nasacommons/sets/>), you will find all of the original content and functionality from GRIN, plus some enhancements that we hope you will enjoy. This move was prompted by the fact that the underlying software for the GRIN Web site was outdated and no longer supported. Although it was a time-consuming process, we think that the conversion was worth the effort.

Less visibly, we’ve also been doing some other important software restructuring. We are working with a contractor to overhaul the <http://history.nasa.gov> Web site. This effort will probably take a while. One of the major frustrations we face with the Web site is that it is chock-full of great material but our visitors have a hard time finding what they are looking for. The statistics tell us that about 50 percent of the visitors to our home page leave without following any of the links after looking at the page for just over a minute. We now have a plan for improved site navigation, but the hard work of figuring out how to pour all of the old content into the new bottle has just begun. In addition to overhauling our Web site, the database software that we use to manage the Headquarter Reference Collection also needed to be replaced. Like GRIN, the underlying software engine was obsolete. The database has served both as a storage tool and a finding aid for the Reference Collection. Any of you who have done research here in person, or have used the Mira site (<https://mira.hq.nasa.gov/history/>) via our Web page, have seen the old software in action. We’ve been getting great support from the Headquarters software development team, and I’m very optimistic that the new “database” interface will be a significant step ahead in speed and functionality.

One other thing that isn’t visible now, but will be later this year, is our work on the NACA centennial. We have been working closely with the Aeronautics Research Mission Directorate here at Headquarters to coordinate outreach efforts relating to the 100th anniversary of the creation of the NACA on 3 March 2015. Later this year, you will start to see a concerted effort to highlight the NACA legacy as a part of NASA’s communications about aeronautics research. Within the History Program, we are working on several publications for the centennial year. This includes a new popular history of the NACA/NASA on the model of *Orders of Magnitude* (NASA SP-4403 and subsequent versions). Former Chief Historian

Roger Launius is writing this new work for us. We also have Joe Chambers (a Langley retiree who has written a number of histories) writing a monograph for us on the NACA and NASA insignias. For those of you who remember Joe's two-part article on the NASA "Meatball" in News and Notes last year, this monograph will build on that effort. In addition, we have a centennial reference work under way as well. We've asked the Federal Research Division at the Library of Congress to create an annotated bibliography on the NACA for us. We anticipate that this will also be published in monograph form early next year. Finally, we have prevailed upon our oral history experts at Johnson Space Center (Rebecca Wright, Jennifer Ross-Nazzal, and Sandra Johnson) to beef up our collection of NACA oral histories. They have already tracked down a number of NACA employees that have not had an oral history interview and will continue that effort throughout the year. Our oral history collection is a fascinating resource. If you haven't ever taken a look at it, you should start here: <http://history.nasa.gov/oralhistory/ohcatalog.htm>. But, I warn you, make sure you have some free time before you start reading, because if you are like me you'll be hooked once you start reading.

Ames Research Center (ARC)

By Glenn Bugos

NASA Ames moved forward with plans to celebrate its 75th anniversary. Kay Twitchell is organizing an open house for July 26, allowing our neighbors in Silicon Valley to tour some of the facilities at which Ames people did their best work. Steve Jobs saw his first computer as a 10-year-old on a visit to NASA Ames in the mid-1960s. He said often that that encounter was when he "fell in love with" computers. For a documentary biography on Jobs, we have recently been working to identify exactly which computer he might have seen (uncharacteristically, Jobs did not recall the precise name). It is inspiring for us to know, in advance of all the work we are doing to prepare the Center for its open house spotlight, that this personal contact may be inspiring the next Steve Jobs.

Former Ames archival intern Susan Edwards won the Jean Wichers Award for Professional Practice from the San Jose State University School of Library and Information Science. The award recognizes a student for outstanding ability in professional practice. Susan did her internship with April Gage, processing the papers of her late father, aeroelastician John W. Edwards, which included both analog (27 cubic feet) and digital records (more than 6,000 files). Susan did the work from the Armstrong Flight Research Center, and her finding aid is available on the Ames History Office Web site. Most recently, Ratana Ngaotheppitak also won the award in 2011 for her internship with April at NASA Ames.



NASA announced in February that it intends to negotiate a lease for Moffett Federal Airfield with Planetary Ventures, LLC (a unit of Google), under appropriate historic preservation laws. General Services Administrator Dan Tangherlini stated that “Hangar One was the landmark of Silicon Valley well before the rise of today’s high-tech titans.... NASA’s partnership with the private sector will allow the [A]gency to restore this treasure for more efficient use.” Anticipating this work, Historic Preservation Officer Keith Venter managed the review of a new Integrated Cultural Resources Management Plan. Glenn Bugos continues his search through the federal record system for the official Navy documents on Moffett Field. Tim Naumowicz of the Ames aeronautics directorate undertook the task of cleaning out Hangar 2 and finding homes for old items stored there, including some interesting smaller models that were accessioned by the Ames History Office.

Other accessions of note in the Ames archives include artwork and cartoons by former Ames engineer Roger Arno, as well as Flexkites and other items from the family of Vernon Rogallo. Space artist Carter Emmart of the American Museum of Natural History visited Ames to lecture on his new planetarium film, *Dark Matter*, and specifically to thank all the people at Ames who helped with the historically realistic depiction of the Galileo Probe entering the atmosphere of Jupiter.

The number of reference requests we are fielding, from within NASA and from the public, has grown dramatically. Still, we’ve updated the lists of winners of the various Ames and NASA-wide honor awards on our Web site, April continues to work through a big collection of digitized visual media, Glenn continues his research on relations between Ames and the state of California, and Jack Boyd keeps the Center leadership out of trouble.



California Assemblyman Richard S. Gordon (L) presented a proclamation, also signed by Senator Jerry Hill and Assemblyman Al Muratsuchi, to NASA Ames Deputy Director Lewis Braxton III congratulating the Center on its 75th anniversary as part of the third annual California Aerospace Week in March 2014.

Armstrong Flight Research Center (AFRC)

By Christian Gelzer

Christian has split his time between two tasks: cleaning out his office for a move and conducting research for a small monograph about Armstrong’s Flight Loads Laboratory. Code T is relocating from its beautiful agglomeration of landmark, historic preservation trailers (every time a plane went supersonic, the place acted like a bass drum) to the ground floor of historic building 4800, a structure into

which the NACA moved in 1954 from its sandy, drafty quarters at South Base. Our current location turns to be the most energy inefficient building at the Center, and bulldozers are waiting for us to vacate the premises.

The Center's Flight Loads Laboratory opened its doors in 1964, initially to conduct loads and thermal tests on the X-15, the first piloted aircraft to fly in the hypersonic realm. Doing this in a laboratory setting was not only challenging, it had never been done before, but that did not deter the engineers. By the early '70s the laboratory was enveloping an entire YF-12A (5,000 square feet) in quartz lamps to bake the airplane at temperatures it would endure at Mach 2.9 for hours on end. It was this sort of testing with which the laboratory established a reputation that set it apart from other such facilities around the nation, capable of conducting loads and thermal testing at subsonic, supersonic, and hypersonic speeds. This made it the logical choice for testing elements of the Space Shuttle when that vehicle came along, as well as other, proposed vehicles. The laboratory remains in the vanguard of such research and is celebrating its 50th anniversary this fall.

Glenn Research Center (GRC)

By Anne Mills

Glenn Research Center is gearing up for next year's 100th anniversary of the NACA. Glenn was the third of the original NACA Centers, established in 1942 as the Aircraft Engine Research Laboratory, later renamed the Lewis Flight Propulsion Laboratory before being absorbed into NASA as the Lewis Research Center. Lewis Research Center was renamed Glenn Research Center at Lewis Field in 1999 in honor of Ohio astronaut John Glenn. This June, historian Rebecca Wright will visit from Johnson Space Center to conduct oral history interviews with local NACA retirees. Also in June, History Officer Anne Mills will present on the cultural impact that the NACA has on our Center today at GRC's monthly "Connections" forum.

Jet Propulsion Laboratory (JPL)

By Erik Conway and Courtney O'Connor

The Caltech general counsel's office has finally signed a contract with Johns Hopkins University Press to publish Erik Conway's tentatively titled *JPL and the Exploration of Mars*.

The office has also worked to publish Craig Waff's history of the Deep Space Network (DSN), which he completed in the early 1990s but never published. Trudy Bell recently supplied a set of electronic files of the manuscript chapters; the chapters were edited for grammar, spelling, and the occasional missing date. Waff's history is a diplomatic and political history of the DSN through the mid-1970s and is complementary to Doug Mudgway's more technical history, *Uplink-Downlink*.

On February 19, we premiered the fifth installment of our ongoing documentary series on JPL history, *The Stuff of Dreams*, at Caltech's Beckman Auditorium. The film explores JPL in the late 1970s, a period of declining NASA funding for planetary exploration. It played to a full house in Beckman, nearly 1,300 people from the Los Angeles area, and was well received.

As part of the yearlong celebration of the 50th anniversary of NASA's Deep Space Network, JPL hosted a two-day NASA Social for 50 of its social media followers on 1–2 April, at the Laboratory campus in Pasadena and the Deep Space Network complex in Goldstone, California.

The attendees, who follow NASA and JPL on Twitter, Facebook, Google+, and other social networks, were provided a unique experience that they were encouraged to share online. On 1 April at JPL, attendees were based inside the Mission Control Center of NASA's Deep Space Network. Tour stops included the Spacecraft Assembly Facility, where hardware for upcoming missions is under construction, and the Mars Yard. On 2 April, participants attended the Deep Space Network's 50th anniversary celebration at the Goldstone Deep Space Network Communications Complex. The tour also included Apollo Valley, site of the historic Apollo antenna; Mars Valley, home of the 70-meter Mars antenna; and the Spacecraft Operations Control Center.

NASA TV broadcast a portion of the NASA Social event on 1 April. To watch a recording, go to <http://www.ustream.tv/recorded/45638999>.

Johnson Space Center (JSC)

By Rebecca Wright

For the second time in two years, the Society for History in the Federal Government awarded the JSC Historian with the Charles Thomson Prize. Jennifer Ross-Nazzal was honored for her essay "You've Come a Long Way, Maybe: The First Six Women Astronauts and the Media," a look into the challenges faced by the first women of American space. The article was included in the book *Spacefarers: Images of Astronauts and Cosmonauts in the Heroic Era of Spaceflight*, published by the Smithsonian Institution Scholarly Press. The Thomson Prize is awarded annually by the Society for History in the Federal Government for excellence in an article or essay that deals with any aspect of the federal government's history written in or for a federal history program. Entries are judged for value in furthering the understanding and history of the federal government, the quality and thoroughness of the research, the style and appropriateness of the presentation, the suitability and rigor of methodology, and the use of original and primary materials.

The JSC History team began a summer-long project to capture oral histories from surviving NACA retirees. The effort is a part of the NASA Headquarters History Program Office's preparation for the NACA centennial next year. The JSC team

will be recording previously overlooked stories of NACA employees from a wide variety of backgrounds that will be a significant contribution to the historical record for generations to come. Earlier this year, they visited the Langley Research Center to talk with NACA veterans and they will be in Ohio and California in the coming months to talk with former NACA members who worked at the research centers there.

From 2006 to 2013, the Commercial Orbital Transportation Services program, administered by the Commercial Crew and Cargo Program Office (C3PO) at the Johnson Space Center endeavored to stimulate U.S. commercial space transportation capabilities by pursuing a new way of doing business with industry. C3PO collaborated with a team of attorneys, procurement specialists, and even a venture capitalist to formulate and implement a new form of funded Space Act Agreements (SAA) based on the Agency's "Other Transaction" Authority. NASA then worked with companies to meet financial, programmatic, and technical milestones that would culminate in the development of viable, commercially owned transportation cargo services to the International Space Station. The JSC History team produced the program report and conducted a number of oral history interviews with many of the individuals who contributed to the success of the COTS program. These transcripts are available on the JSC History Portal at http://www.jsc.nasa.gov/history/oral_histories/c3po.htm. The program report (NASA/SP-2014-617) that includes excerpts from the transcripts was released in May.

In addition to these projects, over the past months the JSC Historian has worked with the Office of Inspector General (OIG) to gather documents and establish provenance of several objects for sale, including a Rotation Hand Controller on Apollo 11. In the spring of 2013, NASA learned that the controller was identified to be sold at auction. NASA requested that the artifact be pulled to ensure that the controller was no longer federal property. The OIG asked Jennifer Ross-Nazzal to locate the controller's records, including its part and serial number, the 50-state tour of Command Module (CM)-107 (now on display at the Smithsonian), the procedures taken to clean and save the spacecraft after splashdown, and the CM's location following its cleaning until its donation to the National Air and Space Museum. This request required research within the JSC History Collection, as well as assistance from the National Archives and former North American employees. All requested materials were found and shared with the OIG.

Marshall Space Flight Center (MSFC)

By Brian Odom

July marks the 15th anniversary of the launch of the Chandra X-ray Observatory, which together with the Hubble Space Telescope, the Spitzer Space Telescope, and the now deorbited Compton Gamma Ray Observatory make up NASA's Great Observatories. In preparation for the anniversary, the Marshall History Office is conducting a series of oral history interviews with program participants

from Marshall Space Flight Center, the Smithsonian Astrophysical Observatory, the Massachusetts Institute of Technology, the Pennsylvania State University, and the National Space Science and Technology Center. The more than 30 hours of interviews conducted to date have revealed great insight in the areas of program management, the science behind the observatory, lessons learned, and the relationships forged over the program's 38-year lifetime. The goal of the project is to have these interviews transcribed, preserved in the History Office Archive, and made available for research. Participants in this project so far have included Project Scientist Dr. Martin Weisskopf, Deputy Program Manager Jean Olivier, and co-author of the original 1976 Chandra proposal Dr. Harvey Tananbaum. Planning is also under way for a panel discussion to celebrate the 15th anniversary of the launch of Chandra.

The Marshall History Office is also in the process of collecting oral histories from scientists at Marshall with experience working in the Center's Science Space Laboratory from the Apollo era forward. Related interviews have been conducted with Dr. Jerry Fishman and Dr. Charles Meegan of the Burst and Transient Source Experiment (BATSE), the Gamma Ray burst monitor for the Compton Gamma Ray Observatory.

Stennis Space Center (SSC)

By Daphne Alford

The John C. Stennis Space Center History Office is making strides in expanding its multimedia collection. Raw video footage of three decades of research at Stennis has been added to the history Web site.

The collection includes videos of both the Apollo and Space Shuttle programs with footage from the Center's earliest days, when the site operated under the names Mississippi Test Facility (MTF) and National Space Technology Laboratories. Video footage ranges from the 1967 arrival of an S-IC (the first stage of a Saturn V rocket) aboard a barge powered by an Apollo tugboat on the Pearl River, to aerial views of the site, to employees working in a test control center.

The shortest video in the collection is less than four minutes, with the longest more than 25 minutes in duration. All videos were reviewed and approved by team members of the scientific and technical information process community at Stennis.

Stennis Space Center is America's largest rocket engine test complex and is home to NASA's Rocket Propulsion Test Program Office, the principal implementing authority for the Agency's rocket propulsion testing.

Forty-two tests were conducted at Stennis for the Apollo Program, including tests performed on engines used on the program's uncrewed mission.

Before the Apollo Program ended in 1972, NASA announced on 1 March 1971 that the then-MTF would test main engines for the Agency's new reusable spacecraft, the Space Shuttle. For 34 years, Stennis and major contractor Pratt & Whitney Rocketdyne (now Aerojet Rocketdyne) would test every main engine used to power the Shuttle into orbit on 135 missions. The last Space Shuttle Main Engine was tested at Stennis on the A-2 Test Stand on 29 July 2009.

The 48 years of rocket engine testing in the history of NASA's Apollo and Space Shuttle programs and now the Space Launch System Program at Stennis feature many history-making events.



An Apollo tugboat with a S-IC on the Pearl River in 1967.



The first stage of a Saturn V rocket undergoes a hot-firing on the B-2 stand in 1967 at the then-MTF.



During the 1960s, employees in the Test Control Center monitor a testing at Stennis.

Other Aerospace History News

National Air and Space Museum (NASM)

By Mike Neufeld

In April 2014, the NASM announced a \$30-million donation by Boeing, the largest corporate contribution the museum has ever received, to fund an overhaul of the Milestones of Flight hall, the central entrance space of the museum (<http://airandspace.si.edu/about/newsroom/release/?id=341>). This transformation is slated for completion by 2016, the 40th anniversary of the Mall museum building and the 100th anniversary of the Boeing Company. The money will also support other exhibition upgrades, education programs, and lecture programs.

Several space history curators participated in the annual meeting of the American Historical Association in Washington, DC, in January 2014. Margaret Weitekamp participated in the roundtable session “Aerospace History: Changes in the Field through the Eyes of AHA Aerospace History Fellows,” Martin Collins presented a paper on the history of the Iridium satellite system, and Roger Launius participated in a roundtable discussion of “Curating the Anthropocene: Debate and Discussion.”

On 29 January, space history curator David DeVorkin gave the annual Ilan Ramon Lecture at the International Ilan Ramon Space Conference held in Tel Aviv, Israel. The lecture and space conference honor the Israeli astronaut who perished on the Space Shuttle Columbia in January 2003. Space history curator Valerie Neal spoke about “Living and Working on the International Space Station” at the Southern Cross Astronomical Society’s 30th annual Winter Star Party near Key West, Florida, on 26 February. On 20 February, space history curator Michael Neufeld lectured to a graduate space science class at the University of Central Florida via videoconference. His subject was “First Mission to Pluto: Policy, Politics, Science, and Technology in the Origins of New Horizons, 1989–2003.” One of the class instructors is Alan Stern, the principal investigator of New Horizons. On 13 March, Michael Neufeld gave a Smithsonian Affiliates lecture to over 200 people at the Durham Museum in Omaha, Nebraska, “The Apollo 8 Mission: First Voyage to the Moon.” The lecture was in conjunction with the “1968” touring exhibit, now at the Durham Museum, in which NASM has contributed three Apollo 8 artifacts.

On 14 March, the National Air and Space Society held an evening program at the Steven F. Udvar-Hazy Center. Neal moderated a program on “Shuttle Missions and Memories” with former astronauts Robert L. Crippen and Sandra H. Magnus and former flight director and Space Shuttle program manager N. Wayne Hale, Jr. On 15 March, NASM held a Women in Aviation Heritage Family Day at the Udvar-Hazy Center. Neal introduced Space Shuttle astronaut Pamela A. Melroy, who talked about her experiences as a pilot and the commander of Space Shuttle Discovery.

Three space history curators (Paul Ceruzzi, Cathy Lewis, and Mike Neufeld) spoke at the Embattled Heavens: The Militarization of Space in Science, Fiction, and Politics conference in April 2014 at the Free University of Berlin, Germany. Paul Ceruzzi's book, *A History of Modern Computing* (MIT Press), has just been released in a Japanese edition.

The recently published *X-15* (Zenith Press, 2014), by aeronautics curator John Anderson and volunteer Richard Passman, has received positive notice from the *Seattle Post-Intelligencer*: "The book is a joy to read and to learn of the nine years the X-15 flew, usually for about 10 minutes and covering no more than 300 miles during each flight.

"Smaller than a coffee table book yet too large for an airline seat table/tray this book is well written by authors who know the material but, more importantly, know the esteemed place in history occupied by the North American X-15. Anderson and Passman recall the starts, the activities and the accomplishments of the X-15 program which generated a unique data set still in use five decades after the 199th and final X-15 flight."¹

Zenith Press has also recently published *Milestones of Space: Eleven Iconic Objects from the Smithsonian National Air and Space Museum*, edited by Michael Neufeld, with contributions from most of the staff of space history, plus Bill Leslie and Layne Karafantis of Johns Hopkins University.

1 Joseph May, *Seattle Post-Intelligencer*, "X-15: the World's fastest rocket plane and the pilots who ushered in the Space Age," 13 February 2014, available at <http://blog.seattlepi.com/travelforaircraft/2014/02/13/x-15-the-worlds-fastest-rocket-plane-and-the-pilots-who-ushered-in-the-space-age/> (accessed 15 May 2014).

Recent Publications and Online Resources

Commercially Published Works

Compiled by Chris Gamble

Aerothermodynamic Data of Space Vehicles, by Claus Weiland (Springer, March 2014). The capacity and quality of the atmospheric flight performance of space-flight vehicles is characterized by their aerodynamic databases. A complete aerodynamic database would encompass the coefficients of the static longitudinal and lateral motions and the related dynamic coefficients. This book considers the aerodynamics of 27 vehicles, of which only a few actually flew. Therefore, the aerodynamic databases are often not complete, in particular when the projects or programs were more or less abruptly stopped, often due to political decisions. Configurational design studies or the development of demonstrators usually happened with reduced or incomplete aerodynamic datasets. Therefore, some datasets are based on the application of one of the following tools: semi-empirical design methods, wind tunnel tests, or numerical simulations, making a high percentage of the data incomplete and in need of verification.

America's Great Endeavour, by Robert A. Adamcik (Apogee Prime, March 2014). This book is the sequel to the author's *Voyages of Discovery*. In this volume, Adamcik takes readers to the flight deck of NASA's youngest orbiter, Space Shuttle Endeavour. Constructed to replace Challenger, Endeavour and its 25 crews conducted some of the most important missions of the Space Shuttle era, from the rescue of the Intelsat VI satellite, to the repair of the crippled Hubble Space Telescope, to the construction of the International Space Station. Written with a minimal amount of technical jargon, *America's Great Endeavour* chronicles the 19-year career of this amazing spacecraft.

Crowded Orbits: Conflict and Cooperation in Space, by James Clay Moltz (Columbia University Press, April 2014). This book offers readers a valuable primer on space policy from an international perspective. It examines the competing themes of space competition and cooperation while providing readers with an understanding of the basics of space technology, diplomacy, commerce, science, and military applications.

Earthrise: My Adventures as an Apollo 14 Astronaut, by Edgar Mitchell and Ellen Mahoney (Chicago Review Press, April 2014). This is the inspiring and fascinating biography of the sixth man to walk on the Moon. Of the nearly seven billion people who live on Earth, only 12 have walked on the Moon, and Edgar Mitchell was one of them. *Earthrise* is a vibrant memoir for young adults featuring the life story of this internationally known Apollo 14 astronaut. The book focuses on Edgar's amazing journey to the Moon in 1971 and highlights the many steps he

took to get there. In engaging and suspenseful prose, he details his historic flight to the Moon, describing everything from the very practical (eating, sleeping, and going to the bathroom in space) to the metaphysical (experiencing a life-changing connectedness to the universe).

Camp Cooke and Vandenberg Air Force Base, 1941–1966: From Armor and Infantry Training to Space and Missile Launches, by Jeffrey E. Geiger (McFarland, February 2014). During World War II, hundreds of military training installations were built throughout the United States to prepare servicemen for the rigors of overseas combat. One such installation was Camp Cooke in California, which since 1957 has become an internationally recognized missile and rocket base renamed Vandenberg Air Force Base. This book examines the location's history, beginning with its construction. Established some 150 miles north of Los Angeles, Cooke was designed for armored divisions, but by the end of the war hundreds of other specialized organizations trained there. With the outbreak of the Korean War, Cooke supported Army National Guard and reserve units. Its large hospital cared for war evacuees and Army medical cases from other parts of the globe. When it became an Air Force base, America's first spy satellite program was conducted from there. The intelligence data collected from these missions exploded the myth of a "missile gap" with the Soviet Union. At the height of the Cold War, America's first ICBM equipped with a nuclear warhead was based at Vandenberg.

Liberty Bell 7: The Suborbital Mercury Flight of Virgil "Gus" Grissom, by Colin Burgess (Springer-Praxis, April 2014). The second in the *Pioneers in Early Spaceflight* series following *Freedom 7—The Historic Flight of Alan B. Shepard, Jr.*, the book is devoted to the second crewed U.S. spaceflight, MR-4 Liberty Bell 7, which was flown by NASA's Project Mercury astronaut Virgil "Gus" Grissom on 21 July 1961. After piloting the spacecraft to a successful splash-down, Grissom performed a hurried exit while struggling to stay afloat because the craft's hatch blew prematurely. Grissom watched helplessly as the recovery helicopter pilot valiantly fought a losing battle to save the sinking capsule. That day, NASA not only lost a spacecraft, but came perilously close to losing one of its Mercury astronauts, a decorated Korean War fighter pilot from Indiana who might one day have soared to the highest goal of them all as the first person to set foot on the Moon.

The Little Book of Space Law, by Matthew J. Kleiman (American Bar Association, February 2014). The term "space law" refers to the international and national laws that govern human activities in outer space. Space law was born simultaneously with the Space Age on 4 October 1957, when Earth's first artificial satellite, Sputnik, was launched into orbit. Following Sputnik, the international community quickly recognized that outer space was a legal vacuum. Spacecraft have since become essential to life on Earth. They perform a wide variety of useful functions, including telecommunications, navigation, exploration, mapping, environmental monitoring, scientific research, and, more recently, space tourism. The prominence of space law has grown in recent years as private companies rapidly

expand their spaceflight capabilities and open new markets in outer space. With this transition, the space industry has many new opportunities and must also confront increased risks. Well-conceived laws that govern spaceflight activities minimize the risk to people and property in outer space and on the ground while not prematurely stifling innovation. This book examines some of these laws and subsequent court cases.

Live TV From Orbit, by Dwight Steven-Boniecki (Apogee Prime, March 2014). The book describes the planning and development of the TV systems used to broadcast Skylab, Apollo-Soyuz Test Project, and Space Shuttle flights. Engineers and planners involved with NASA, Westinghouse, and RCA provide detailed analysis of the efforts that went into beaming historic video from Earth's orbit to people's living rooms. Using internal memos and status reports as its foundation, this book digs deep to uncover the story behind the cameras. Unlike the days of Apollo, NASA had to fight against the growing apathy of the general public; yet despite this hurdle, NASA managed to document many iconic moments from outer space, all with a glorious clarity that had never been seen before.

Marketing the Moon: The Selling of the Apollo Lunar Program, by David Meerman Scott and Richard Jurek (MIT Press, February 2014). In July 1969, 94 percent of American televisions were tuned to coverage of Apollo 11's mission to the Moon. How did space exploration, once the purview of rocket scientists, reach a larger audience than the hit sitcom "My Three Sons"? Why did a government program whose standard operating procedure had been secrecy turn its greatest achievement into a communal experience? In *Marketing the Moon*, David Meerman Scott and Richard Jurek tell the story of one of the most successful marketing and public relations campaigns in history: the selling of the Apollo program. The authors describe sophisticated efforts by NASA and its many contractors to market the facts about space travel—through press releases, bylined articles, lavishly detailed background materials, and fully produced radio and television features—rather than push an agenda. Generously illustrated with vintage photographs, artwork, and advertisements, *Marketing the Moon* shows that when Neil Armstrong took that giant leap, it was a triumph not just for American engineering and rocketry but for American marketing and public relations.

The Men Who Gave Us Wings: Britain and the Aeroplane 1796–1914, by Peter Reese (Pen & Sword Aviation, April 2014). Why did the British, then the leading nation in science and technology, fall far behind in the race to develop the airplane before the First World War? Despite Britain's initial advantage it was surpassed by the Wright brothers in the United States and by France and Germany. Peter Reese, in this highly readable and thoroughly illustrated account, delves into aviation's fascinating early history. His narrative is illustrated with a wonderful selection of over 120 archival drawings and photographs.

N-1: For the Moon and Mars—A Reference Guide to the Soviet Superbooster, by Matt Johnson, Nick Stevens, Alexander Shliadinsky, Igor Bezyaev, and Vladimir Antipov (ARA Press, January 2014). Written by a team of international experts in Russia, England, and the United States, this book covers the history of the N-1 from its origins as a booster for missions to Mars and Venus to the abrupt change with a directive from the highest levels of Soviet government to “beat the Americans to the Moon!”

The Smithsonian Book of Air & Space Trivia, edited by Amy Pastan (Smithsonian Books, March 2014). Who was the first person to dine in space? How long was the Wright brothers’ first successful flight? What famous aircraft was named after a grape-flavored soft drink? What toy based on an animated film accompanied astronauts on a Shuttle mission in 2000? These questions and many more are answered in this book. In addition to the breadth of space and aviation information, the pages are illustrated with more than 125 images of objects from the Smithsonian National Air and Space Museum’s collections.

The Space Shuttle Endeavour, by Stephen Hayward Silberkraus (Arcadia Publishing, April 2014). Endeavour performed 25 vital and historic missions for humanity in its 19-year career. Endeavour’s story ended with one final mission: its move from Florida to its new home in California. Atop the Shuttle Carrier Aircraft, Endeavour was flown piggyback across the United States for a final victory lap. Welcomed by millions of admirers, the Shuttle was transported through the streets of Los Angeles to its final destination, the California Science Center.

Suborbital: Industry at the Edge of Space, by Erik Seedhouse (Springer-Praxis, February 2014). Until recently, spaceflight has been the providence of a select corps of astronauts whose missions were experienced vicariously by the rest of the world via television reports and Internet feeds. These spacefarers risked their lives in the name of science, exploration, and adventure, thanks to government-funded human spaceflight programs. The nascent commercial suborbital spaceflight industry will soon open the space frontier to commercial astronauts, payload specialists, and, of course, spaceflight participants. This book examines the tantalizing science opportunities offered when suborbital trips become routine and describes the difference in training and qualification necessary to become either a spaceflight participant or a fully fledged commercial suborbital astronaut. It also explains how the commercial suborbital spaceflight industry plans for the challenges of hiring astronauts. It examines how a partnership with governments and the private sector may permanently integrate the free market’s innovation of commercial suborbital space activities.

The Universe Through the Eyes of Hubble, by Oli Usher and Lars Lindberg Christensen (Springer, December 2013). Using entrancing images and an attractive layout, this book gives the reader a guided tour of the cosmos through the eyes of the Hubble Space Telescope. The selected photographs explore key themes in recent astronomy, including planetary science, cosmology, and stellar evolution, explaining Hubble's contributions to our understanding of the universe. Hubble's unique images are presented with a mix of cutting-edge science that highlights the key discoveries of the past few years and how they fit into Hubble's growing list of scientific achievements.

X-15: The World's Fastest Rocket Plane and the Pilots Who Ushered in the Space Age, by John Anderson and Richard Passman (Zenith Press, February 2014). The exciting story of the X-15—the iconic rocket plane of the Cold War space race—is recounted by John Anderson, curator of aerodynamics at the Smithsonian National Air and Space Museum. This experimental space plane was on the cutting edge of hypersonic aerodynamics, and its winged reentry from space foreshadowed the development of the Space Shuttle decades later. Launched from the wing of a modified B-52 bomber—again foretelling a concept that would be used decades later, in this case by SpaceShipOne and SpaceShipTwo—the ship rocketed higher and faster than any crewed aircraft of the time. Designed to approach seven times the speed of sound, it was the first hypersonic aircraft ever created and was engineered to function both in Earth's atmosphere and at the edge of space. Illustrated with period NASA and U.S. Air Force photographs, as well as exclusive Smithsonian photography of the first X-15 built, the book captures the risks and dangers of the X-15 program as Anderson follows the test pilots (including Neil Armstrong) who pushed the very limits of their piloting skills to master groundbreaking experimental technology.

Yearbook on Space Policy 2011/2012: Space in Times of Financial Crisis, edited by L. M. Cenan, Blandina Baranes, Peter Hulsroj, and Arne Lahcen (Springer, February 2014). The *Yearbook on Space Policy* is a reference publication that analyzes space policy developments. Each year it presents issues and trends in space policy and the space sector as a whole. Its scope is global and its perspective is European. The yearbook also links space policy with other policy areas; highlights specific events and issues; and provides useful insights, data, and information on space activities.

The History Program Office gives sincere thanks to volunteer Chris Gamble, who compiles this section for us every quarter. Please note that the descriptions have been derived by Chris from promotional material and do not represent an endorsement by NASA.

Upcoming Meetings

The annual conference for the American Library Association will be held **26 June–1 July 2014** in Las Vegas, Nevada. Visit <http://ala14.ala.org/register-now/> for more details.

The joint meeting for the Council of State Archivists, the National Association of Government Archives and Records, and the Society of American Archivists will be held **10–16 August 2014** in Washington, DC. Visit <http://www2.archivists.org/conference/> for more details.

The joint meeting for the Sociedad Latinoamericana de Estudios Sociales de la Ciencia y la Tecnología and Society for Social Studies of Science will be held **20–23 August 2014** in Buenos Aires, Argentina. Visit <http://www.4sonline.org/meeting> for details.

The 65th International Astronautical Congress will be held **29 September–3 October 2014** in Toronto, Canada. Visit <http://www.iac2014.org> for details.

The annual meeting of the Oral History Association will be held **9–13 October 2013** in Oklahoma City, Oklahoma. Visit <http://www.oralhistory.org/annual-meeting/> for details.

The annual meeting for the Society for the History of Technology will be held **6–9 November 2014** in Dearborn, Michigan. Visit http://www.historyoftechnology.org/annual_meeting.html for more details.

The annual meeting for the History of Science Society will be held **6–9 November 2014** in Chicago, Illinois. Visit <http://www.hssonline.org/Meeting/> for more details.

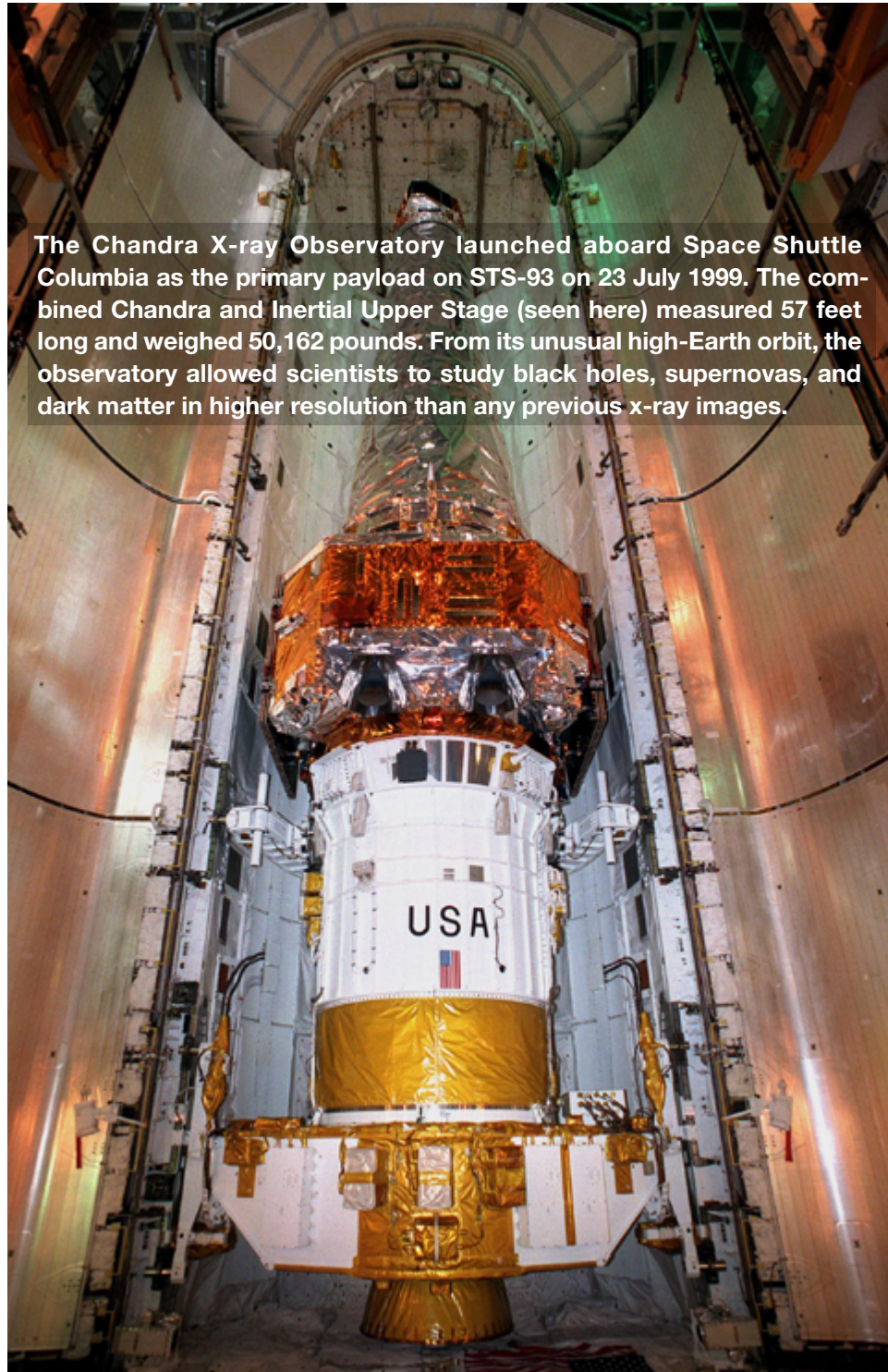
The 46th fall meeting of the American Geophysical Union will be held **15–19 December 2014** in San Francisco, California. Visit <http://fallmeeting.agu.org/2014/> for details.

The annual meeting of the American Historical Association will be held **2–5 January 2015** in New York City. Visit <http://www.historians.org/annual/next.htm> for more details.

The 225th meeting of the American Astronomical Society will be held **4–8 January 2015** in Seattle, Washington. Visit <http://aas.org/meetings/> for details.

Image in Aerospace History

The Chandra X-ray Observatory launched aboard Space Shuttle Columbia as the primary payload on STS-93 on 23 July 1999. The combined Chandra and Inertial Upper Stage (seen here) measured 57 feet long and weighed 50,162 pounds. From its unusual high-Earth orbit, the observatory allowed scientists to study black holes, supernovas, and dark matter in higher resolution than any previous x-ray images.



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Do you have more questions about NASA history in general? Please check out our NASA History Program Office Home Page at <http://history.nasa.gov> on the Web. For information about doing research in the NASA History Program Office, please e-mail us at histinfo@hq.nasa.gov or call 202-358-0384.

We also welcome comments about the content and format of this newsletter. Please send your comments, as well as any changes to your mailing address or requests to stop receiving *News and Notes* in the mail, to Giny Cheong, newsletter editor, at giny.cheong@nasa.gov.

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