

Space History Matures—and Reaches a Crossroads

By:

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In 2000, Dr. Roger D. Launius, then Chief Historian at the National Aeronautics and Space Administration (NASA) coined the phrase “The New Aerospace History” in a *Space Policy* article. In doing so, he distinguished that new body of scholarship from either the Huntsville School’s laudatory histories or critiques of space flight written as histories. Rather, he argued, the “New Aerospace History” developed in the 1990s as a body of historical writing done by “professionally-trained scholars of differing ideologies and prerogatives who concentrate on questions other than whether or not space exploration is justifiable.” His chosen name deliberately echoed “the New Social History,” a body of American historical practice rooted in insights gleaned from the social movements of the 1960s and 1970s. Launius was well positioned to suggest that space history had attained a certain scholarly maturity. After serving as NASA’s Chief Historian from 1990 to 2002, he took positions as a curator and later Associate Director at the Smithsonian National Air and Space Museum from 2002 to 2016. In those roles, he personally mentored many of the scholars whose work created the basis for the appellation.¹

In 2005, I published my analysis of the New Aerospace History in the *Critical Issues in the History of Spaceflight* volume. In preparation for the conference that inspired the edited collection, Launius and his successor, NASA chief historian Dr. Steven J. Dick, tasked me with evaluating the state of the field and its relationships to the various subdisciplines. Only a few years out of graduate school at the time, I was still freshly experienced in writing essays

¹ Roger D. Launius, “The Historical Dimension of Space Exploration: Reflections and Possibilities,” *Space Policy* 16 (2000): 23-38; Eric Foner, ed., *The New American History* (Philadelphia, Pennsylvania: Temple University Press, 1990).

demonstrating the breadth and depth of my own reading and understanding. Indeed, such historiographical reflections have not only served as solid training for students learning the profession but also have been fundamentally characteristic of the academic field itself. As Pulitzer-Prize-winning historian Michael Kammen wrote in 1980 in his own assessment titled, “The Historian’s Vocation and the State of the Discipline in the United States”, “Ever since... [the founding of the American Historical Association in 1884-85], the guild has had a penchant for introspection.” Reviews of the state of the field provides the starting point for every research project and serves as periodic assessments of the rigor and vigor of the scholarly community as well.²

At the time, I concluded that, “...the insights of the New Social History have still been only incompletely incorporated into space history. This deficit is not attributable to a lack of source material, but rather to a limited perspective on what it would mean to integrate the story of race, class, ethnicity, and gender into space history more fully.”³ My resulting essay called on space history to engage the scholarly tools offered by gender studies, critical race studies, and other theoretically inflected humanities fields. Some people in the audience that day expressed skepticism about how useful that suggestion would be. Could fields so seemingly dependent on academic jargon offer much to empirical historians? A decade later, however, analytical frameworks that were first developed in the humanities have emerged from their ivory-tower origins into everyday language. Ordinary people in online communities regularly employ complex understandings of gender as a fluid category, as well as concepts of privilege,

² Michael Kammen, ed., *The Past Before Us: Contemporary Historical Writing in the United States* (Ithaca, New York: Cornell University Press, 1980), 19.

³ Margaret A. Weitekamp, “Critical Theory as a Toolbox: Suggestions for Space History’s Relationship to the History Subdisciplines,” in Steven J. Dick and Roger E. Launius, eds. *Critical Issues in the History of Spaceflight*, NASA SP-2006-4702, (Washington, DC: National Aeronautics and Space Administration Office of External Relations, 2006), 549-572.

whiteness, and intersectionality. The deft use of such theoretically grounded scholarly tools is refreshingly common for emerging scholars at both the undergraduate and graduate level. At the same time, aerospace historians have incorporated such concepts into compelling historical arguments built on close readings of documents and other archival sources. As the Cold War has receded further into history and different voices joined the conversation, scholars have also questioned the national focus that underlay many space history studies. Just as writers have revealed new historical actors (“hidden figures”) in recent years, so too new research has widened the lens, revealing international contexts and exchanges overshadowed by Cold War preoccupations. As a result, a dozen years later, I welcomed the opportunity to revisit and build upon my 2005 essay.

Recent work in space history builds on a strong analytical record. In the first decade of the 21st century, NASA’s Headquarters History Office, helmed from 2003-2009 by Steve Dick, produced an impressive set of edited volumes exploring a broad set of scholarly questions. In addition to the “Critical Issues” conference and volume mentioned above, in September 2006 the NASA headquarters History Office and the Smithsonian’s National Air and Space Museum organized a meeting investigating the societal impact of spaceflight that convened in Washington, DC. Then in 2007, to mark the fiftieth anniversary of the first artificial satellite, the Soviet *Sputnik*, the same two organizations collaborated again, inviting “big picture” historians and scholars from “outside the usual circle of space history” to consider the space age’s meaning “in the broadest sense of the word.” Edited volumes documented the findings of both meetings for future scholars. An interdisciplinary volume on *Cosmos and Culture* followed in 2009, exploring cosmic evolution from many different angles. Finally, in 2015, the NASA History Office organized a series of in-depth studies into an edited volume exploring the “relationship

between science, technology, and society.” Together, these substantial published volumes testify to the solid grounding in critical scholarly practice nurtured by that federal history office, now under the leadership of Dr. William “Bill” Barry.⁴

This retrospective essay was itself inspired by the innovative conference organized in March 2017 by the History Office of NASA’s Marshall Space Flight Center. Inspired by Jacqueline Dowd Hall’s pathbreaking essay, “The Long Civil Rights Movement and the Political Uses of the Past,”⁵ participants considered the history of NASA programs and centers, including Marshall, as embedded in the history of the New South and the Civil Rights Movement. Inspired by this creative scholarly linkage, the resulting conference drew together different communities of scholars and activists to consider in fresh ways how space history was embedded in larger social, cultural, political, and racial histories. The conversations that resulted modeled informed civil discourse, asking participants to respond thoughtfully to what they had learned. The new connections on display at that meeting got me thinking again about the assessment of the field that I had completed more than ten years before.

Examining the past dozen years or so of active scholarship, then, what has developed? What shapes this field now? In that compressed timeframe, it can be difficult to discern broad patterns in categories of scholarship that most longer-term historiographies try to identify.

Understanding that review essays cannot be comprehensive nor exhaustive, however, I suggest

⁴ Steven J. Dick and Roger D. Launius, eds. *Critical Issues in the History of Spaceflight*, NASA SP- 2006-4702 (Washington, DC: National Aeronautics and Space Administration Office of External Relations, 2006); Steven J. Dick and Roger D. Launius, eds., *Societal Impact of Spaceflight*, NASA SP-2007-4801, (Washington, DC: National Aeronautics and Space Administration Office of External Relations, 2007); Steven J. Dick, *Remembering the Space Age*, NASA SP-2008-4703 (Washington, DC: National Aeronautics and Space Administration Office of External Relations, 2008), x. Steven J. Dick and Mark L. Lupisella, eds., *Cosmos & Culture: Cultural Evolution in a Cosmic Context*, NASA SP-2009-4802 (Washington, DC: National Aeronautics and Space Administration, 2009); Steven J. Dick, ed., *Historical Studies in the Societal Impact of Spaceflight*, NASA SP-2015-4803 (Washington, DC: National Aeronautics and Space Administration, 2015), vii.

⁵ Jacqueline Dowd Hall, “The Long Civil Rights Movement and the Political Uses of the Past,” *Journal of American History* 91 (March 2005): 1233-1263.

here that attention should be paid to three major areas of growth in the field: individual and collective biography, fresh takes on technologies in their broader contexts, and international/global history. First, some of the most innovative work has been done in critical histories that document the stories of participants, whether through biography, collective biography, or social history. Second, there have recently been creative takes on traditional space history topics including spacesuits, places of invention, and planetary exploration. Finally, new efforts to develop histories of international spaceflight have revealed how the field's Cold War mentality has long overshadowed global history frameworks. Notably, all three categories overlap significantly, as global or international history can no longer be meaningfully isolated as just one part of the field.

Biography and Social History

In the last ten years, the literary form of historical biography has emerged as a powerful way to make strong analytical arguments about the practice of science and technology, as well as the lives and influences of those who made spaceflight happen. Two sterling examples are James Hansen's exhaustive biography of the taciturn Apollo 11 moonwalker Neil Armstrong and Michael Neufeld's definitive biography of charismatic rocket engineer Wernher von Braun.⁶ Each author relied on years of research to uncover the fullest possible histories of men with very public personas and complex personal lives. Hansen's investigation of Armstrong mined every possible documentary and living source—with the participation and blessing of the man himself, even as Armstrong continued his lifelong pattern of short, to-the-point answers without elaboration. The resulting story illustrates how one person took on the lasting responsibility of being the first man on the Moon. Neufeld's critical look at von Braun grappled with the

⁶ James R. Hansen, *First Man: The Life of Neil A. Armstrong* (New York: Simon & Schuster, 2005); Michael J. Neufeld, *Von Braun: Dreamer of Space, Engineer of War* (New York: Knopf, 2007).

complexities of his relationship with the Nazi party before and during World War II—as well as the implications for those associations in his later work and professional reputation. The result is not only the portrait of a man, but also a clear-eyed investigation into how a complex history of remembering and forgetting became a key thread woven into the very fabric of the early United States space program.

Recent biographies have attempted to contextualize and explain the impact of spaceflight professionals famous for their competence, such as Johnson Space Center director George Abbey (profiled by writer Michael Cassutt) and first American woman in space, Dr. Sally K. Ride (written by journalist Lynn Sherr). In particular, Sherr's book explored of the very private life of a public woman, whom she considered to be a personal friend but about whom she only learned certain key facts after the astronaut's untimely death in 2012. Her thoughtful and thoroughly-researched account that will be useful to historians. Andrew Jenks' analysis of Yuri Gagarin uses the myth and memory of the first man in space as a way to examine the cultural history of spaceflight in the Soviet Union. Historian Jared Buss's account of Willy Ley adds to the trend in space history of accomplishing nuanced historical writing through the form of biography.⁷ To those accounts should be added memoir and autobiography. In particular, scholars should be grateful for *Rockets and People*, a four-volume translation of the memoirs of Russian space pioneer Boris Chertok. Translated by the man himself with guidance from series editor Asif

⁷ Michael Cassutt, *The Astronaut Maker: How One Mysterious Engineer Ran Human Spaceflight for a Generation* (Chicago: Chicago Review Press, 2018); Jared S. Buss, *Willy Ley: Prophet of the Space Age* (Gainesville, Florida: University Press of Florida, 2017); Lynn Sherr, *Sally Ride: America's First Woman in Space* (New York: Simon & Schuster, 2015); Andrew L. Jenks, *The Cosmonaut Who Wouldn't Stop Smiling: The Life and Legend of Yuri Gagarin* (Dekalb, Illinois: Northern Illinois Scholarly Press, 2012).

Siddiqi, the resulting volumes were published by NASA in 2005, 2006, 2009, and 2011.⁸ Such resources add depth to the materials available to future historians.

In addition to analytical books about single historical figures, strong new scholarship in the New Aerospace History also includes analyses of groups. *Inventing the Astronaut*, Matt Hersch’s fresh take on the NASA astronaut corps as a labor force and a professional guild should now be counted as essential reading for anyone doing human spaceflight history. In addition, scholars should take note of David Onkst’s long-awaited dissertation on the engineers at Grumman Aerospace, whose labor building the Apollo lunar modules also became a story about the quick downturn in the aerospace labor market as Apollo wound down. Finally, in a collaborative effort about a collective group, Mike Neufeld’s edited *Spacefarers* volume examined the social, cultural, and political significance of both astronauts and cosmonauts. Some of the strongest new work in space history, however, involves collective histories of previously unexamined groups.⁹

In my *Critical Issues* essay written in 2004, I concluded that even given the influences of the new social history on the New Aerospace History, “questions of race and ethnicity have been almost entirely ignored.”¹⁰ That is no longer the case. Excellent new books about race, culture, and spaceflight have shown that sources can be found to tell such stories in depth and with

⁸ Boris Chertok, *Rockets and People*, Volume 1 (Washington, DC: National Aeronautics and Space Administration, 2005); Boris Chertok, *Rockets and People*, Volume 2: Creating a Rocket Industry (Washington, DC: National Aeronautics and Space Administration, 2006); Boris Chertok, *Rockets and People*, Volume 3: Hot Days of the Cold War (Washington, DC: National Aeronautics and Space Administration, 2009); Boris Chertok, *Rockets and People*, Volume 4: The Moon Race (Washington, DC: National Aeronautics and Space Administration, 2011).

⁹ Matthew Hersch, *Inventing the American Astronaut* Palgrave Studies in the History of Science and Technology (London: Palgrave Macmillan, 2012); David Onkst, “The Triumph and Decline of the “Squares”: Grumman Aerospace Engineers and Production Workers in the Apollo Era, 1957–1973,” PhD diss., American University, 2011; Michael J. Neufeld, ed., *Spacefarers: Images of Astronauts and Cosmonauts in the Heroic Era of Spaceflight* (Washington, D.C.: Smithsonian Institution Scholarly Press, 2013). In the interest of full disclosure, one of my own essays appears in the *Spacefarers* volume.

¹⁰ Weitekamp, 564.

sensitivity. Radio-producer-turned-writer Richard Paul worked with his own oral histories and historian Steven Moss's pathbreaking Master's thesis to craft *We Could Not Fail*, a history of some of the first African-American engineers working at NASA. (In full disclosure, I advised Paul's fellowship at the National Air and Space Museum.) In addition, Monique Laney's award-winning book, *German Engineers in the Heart of Dixie*, draws on oral history interviews and extensive documentary research to examine the integration of German immigrant rocket engineers into the Southern town of Huntsville, Alabama. The resulting history examines race, religion, culture, politics, and technology along with the history of the Civil Rights Movement.¹¹

Thanks to the success of a best-selling book and a major motion picture of the same name, a shorthand now exists for little-known historical women in aerospace: "hidden figures." In that book, Margot Lee Shetterly documented women who have been well known in the historical community but not previously identified as significant in their own right. Several similar works have added parallel stories to the literature. George D. Morgan's personal reflections on his mother's career, *Rocket Girl*, mixed space history with her individual history refining rocket fuels at North American Aviation. Nathalia Holt's *Rise of the Rocket Girls* documented the women computers at Jet Propulsion Laboratory while Dava Sobel's *The Glass Universe* recounted the history of women assistants at the Harvard College Observatory. An ongoing project continues to examine the notes and other evidence of the women working at the Harvard Observatory. As scholars continue to investigate questions of race and gender, new histories will surely be added to this category.¹²

¹¹ Richard Paul and Steven Moss, *We Could Not Fail: The First African Americans in the Space Program* (Austin, Texas: University of Texas Press, 2015); Monique Laney, *German Rocketeers in the Heart of Dixie Making Sense of the Nazi Past during the Civil Rights Era* (New Haven, Connecticut: Yale University Press, 2015).

¹² Margot Lee Shetterly, *Hidden Figures: The American Dream and the Untold Story of the Black Women Who Helped Win the Space Race* (New York: William Morrow, 2016); George D. Morgan, *Rocket Girl: The Story of Mary Sherman Morgan, America's First Female Rocket Scientist* (Westminster, Maryland: Prometheus Books, 2013);

Technologies in their Broader Contexts

The second major area of new work in space history is really an accumulation of innovative takes on traditional topics. These are not the only topics that have been well developed in space history but they offer some telling examples. In some cases, fresh interpretations of spaceflight subjects have come from interdisciplinary work. Architect Nicholas de Monchaux's thoughtful book, *Spacesuit*, drew its form from the 21 layers of the Apollo lunar spacesuit, weaving together 21 separate stories inspired by that piece of wearable technology and architecture. Before she retired from the Smithsonian Institution, Mandy Young also completed her authoritative book about the spacesuits in the National Air and Space Museum's collection, illustrated with photographs by Mark Avino. David Mindell looked at a different spaceflight technology: the Apollo guidance computer. His interpretations of the intersections between the human being flying in Apollo spacecraft and the computers being used to guide them goes beyond the usual history of how the things were built and used to consider the broader significance of these spaceflight technology innovations.¹³

Scholars have also begun to re-examine how the space program fits into cultural history. Kendrick Oliver's *To Touch the Face of God* explores the many historical connections between NASA, the divine, and religion. In contrast, Matt Tribbe's *No Requiem for the Space Age* argues that the end of the Apollo lunar landing program coincided with a cultural decline in faith of a

Nathalia Holt, *Rise of the Rocket Girls: The Women Who Propelled Us, from Missiles to the Moon to Mars* (New York: Little, Brown and Company, 2016); Dava Sobel, *The Glass Universe: How the Ladies of the Harvard Observatory Took the Measure of the Stars* (New York: Viking, 2016); Alex Newman, "A Team of Women Is Unearthing the Forgotten Legacy of Harvard's Women 'Computers,'" PRI's *The World*, Public Radio International, original airdate July 27, 2017, <https://www.pri.org/stories/2017-07-27/team-women-are-unearthing-forgotten-legacy-harvard-s-women-computers>, accessed November 7, 2018.

¹³ Nicholas de Monchaux, *Spacesuit: Fashioning Apollo* (Cambridge, Massachusetts: The MIT Press, 2011); Amanda Young, *Spacesuits: Within the Collections of the Smithsonian National Air and Space Museum* (Brooklyn, New York: PowerHouse Books, 2009); David Mindell, *Digital Apollo: Human and Machine in Spaceflight* (Cambridge, Massachusetts: The MIT Press, 2011).

very different kind: belief and trust in science. This, he suggests, explained the turn away from such big science and technology programs amidst the flowering of the counterculture. Neil Maher's *Apollo in the Age of Aquarius* sees less inherent conflict between the space program and its cultural context. Maher works instead to re-integrate the space program in to the broader social and cultural history of the late 1960s and 1970s. Teasel Muir-Harmony draws on this scholarship as well as the collection of the Smithsonian Institution in her reflections on the 50th anniversary of the Apollo Program as told through 50 artifacts in the national collection. By including not only spacecraft and personal equipment but also the chairs used in the televised Kennedy-Nixon Presidential debate in 1960 or a collection can used by the Southern Christian Leadership Conference (SCLC) later than same decade, the lens widens, capturing the history of spaceflight efforts as a part of the long 1960s.¹⁴

Creative new scholarship has also been done in the areas of visual and material culture. Elizabeth Kessler's *Picturing the Cosmos* considers the images produced by the Hubble Space Telescope, not only as scientific findings but also as aesthetic images, which have become immensely popular with the public. Megan Prelinger's *Another Science Fiction* tapped the extraordinary visual collections of advertisements held by the Prelinger Library to look at advertising, especially as aimed at engineers, in the early years of the space age. Scholars have also taken new looks at how the physical artifacts of spaceflight have been displayed, discarded, and abandoned, both on Earth and in space. In a detailed look at Apollo Program memorabilia, the two authors of *Marketing the Moon* used their personal collections of collectibles to tell the

¹⁴ Kendrick Oliver, *To Touch the Face of God: The Sacred, the Profane, and the American Space Program, 1957–1975*, New Series in NASA History (Baltimore, Maryland: Johns Hopkins University Press, 2012); Matt Tribbe, *No Requiem for the Space Age: The Apollo Moon Landings and American Culture* (Oxford, United Kingdom: Oxford University Press, 2014); Neil M. Maher, *Apollo in the Age of Aquarius* (Cambridge, Massachusetts: Harvard University Press, 2017); Teasel Muir-Harmony, *Apollo to the Moon: A History in 50 Objects* (Washington, DC: National Geographic, 2018).

story of how the Apollo program was sold to the public—and then, in turn, used by advertisers to tap into the zeitgeist of the late 1960s. We can also look forward to more new scholarship in the fields of visual culture, material culture, and built environments.¹⁵

The volume that contains this essay examines the local histories of NASA Centers as intersecting with the Civil Rights histories of Alabama and the American South. In the last ten years, innovative work has also been done in examining the sites of aerospace and technological development as places of invention. Historian of computing Paul Ceruzzi focused on Tyson’s Corner, Virginia as a place that transformed from a sleepy farm town into the crossroads of the Internet and a hub of computing. In 2009, Joe Bassi completed a dissertation analyzing how Boulder, Colorado became a center for space and atmospheric science. Finally, at the University of Southern California, in association with the Huntington Library, Peter Westwick led a study of aerospace industry in southern California. The work resulted in an exhibit and an accompanying edited volume, both called “Blue Sky Metropolis: The Aerospace Century in Southern California.”¹⁶

¹⁵ Elizabeth S. Kessler, *Picturing the Cosmos: Hubble Space Telescope Images and the Astronomical Sublime* (Minneapolis, Minnesota: University of Minnesota Press, 2012); Megan Prelinger, *Another Science Fiction: Advertising the Space Race 1957–1962* (New York: Blast Books, 2010); David DeVorkin and Michael Neufeld, “Space Artifact or Nazi Weapon?: Displaying the Smithsonian’s V-2 missile, 1976-2011,” *Endeavour* 2011 35 (4, December 2011): 187-95; Roger D. Launius, “Abandoned in Place: Interpreting the U.S. Material Culture of the Moon Race,” *The Public Historian* 31 (August 2009): 9-38; Alice Gorman, “The Archaeology of Orbital Space,” *Australian Space Science Conference 2005* (Melbourne, Australia: RMIT University, 2005), 338-357; David Meerman Scott and Richard Jurek, *Marketing the Moon: The Selling of the Apollo Lunar Program* (Cambridge, Massachusetts: The MIT Press, 2014); Jennifer Levasseur, “Pictures by Proxy: Images of Exploration and the First Decade of Astronaut Photography at NASA,” PhD diss., George Mason University, 2014; Lisa Ruth Rand, “Orbital Decay: Space Junk and the Environmental History of Earth’s Planetary Borderlands,” PhD diss., University of Pennsylvania, 2016; Layne Karafantis, “Under Control: Constructing the Nerve Centers of the Cold War,” PhD diss., Johns Hopkins University, 2016.

¹⁶ Paul Ceruzzi, *Internet Alley: High Technology in Tysons Corner, 1945—2005*, Lemelson Center Studies in Invention and Innovation series (Cambridge, Massachusetts: The MIT Press, 2008); Joseph Bassi, “Creating a Scientific Peak: How Boulder, Colorado Became a World Center for Space and Atmospheric Science, 1945-1965,” PhD diss., University of California, Santa Barbara, 2009; Peter J. Westwick, ed., *Blue Sky Metropolis: The Aerospace Century in Southern California*, Western Histories (San Marino, California: Huntington Library and University of California Press, 2012).

In the last ten years, the end of the Space Shuttle Program has also offered scholars an opportunity to begin to account for its full history. Historian T.A. Heppenheimer completed his two-volume prehistory of the space shuttle, focusing on the initial technology decision and system development, ending in 1981 with the vehicle's first flights. In addition, former shuttle engineer Dennis Jenkins has written a multivolume history of the actual missions flown by the reusable Space Transportation System. For future scholars, these will be invaluable and authoritative resources. Valerie Neal has also written two books about the shuttle. The first expanded upon each of Space Shuttle *Discovery*'s individual missions; the second offers a larger analytical history about how the overall program was sold, explained, and rationalized. For his part, Jim David has investigated the relationships that NASA had with the defense and clandestine agencies in the United States during the space shuttle period. One looks forward to additional scholars getting to bring a critical eye to this period.¹⁷

The maturity of space history as a scholarly field can also be seen in the ways that planetary exploration has been analyzed. Contributions such as Peter Westwick's history of the Jet Propulsion Laboratory (JPL) and Eric Conway's analysis of JPL's Mars missions reveal the bureaucratic corridors that exploratory missions must successfully traverse before they every leave the Earth—and how institutions foster and support science missions. Likewise, Michael Neufeld's analysis of the long prelaunch journey of the *New Horizons* probe, even before it traveled all the way to Pluto and beyond, is ably supported by the first-person account published

¹⁷ T.A. Heppenheimer, *History of the Space Shuttle, Volume Two: Development of the Space Shuttle, 1972-1981* (Washington, DC: Smithsonian Books, 2010); Dennis R. Jenkins, *Space Shuttle: Developing an Icon 1972-2013* (Forest Lake, Minnesota: Specialty Press, 2017); Valerie Neal, *Discovery: Champion of the Space Shuttle Fleet*, Smithsonian Series, (Minneapolis, Minnesota: Zenith Press, 2014); Valerie Neal, *Spaceflight in the Shuttle Era and Beyond: Redefining Humanity's Purpose in Space* (New Haven, Connecticut: Yale University Press, 2017); James E. David, *Spies and Shuttles: NASA's Secret Relationships with the DoD and CIA* (Gainesville, Florida: University Press of Florida, 2015).

by *New Horizons* principal investigator Alan Stern in collaboration with writer David Grinspoon. Work in the history of planetary science is moving beyond the simple recording of missions to ask bigger questions about the complex interplay of institutions, budgets, people, design, science, and technology.¹⁸

International and Global History

The last ten years have seen a broad turn in the practice of American history to considering the United States in the world. *NASA in the World*, co-written by John Krige, Angelina Long Callahan, and Ashok Maharaj offers a fine example of that lens applied to space history. The well-researched and detailed volume offers an extensive history of NASA collaborations with Western Europe, as well as with the Soviet Union, Japan, and India. In the concluding section, Krige turns attention to both the international cooperation undergirding the International Space Station and the guidance intended to forestall problematic technology transfers that is the International Traffic in Arms Regulations (ITAR). Such restrictions originated as Cold War provisions, which were later adapted to the modern war on terror. The overall study illuminates the long history of NASA's international agreements and projects. In-depth studies of the Chinese human spaceflight program, the Indian space program, or other spaceflight efforts around the world will be welcomed as they are produced.¹⁹

¹⁸ Peter Westwick, *Into the Black: JPL and the American Space Program, 1976-2004* (New Haven, Connecticut: Yale University Press, 2006); Erik M. Conway, *Exploration and Engineering: The Jet Propulsion Laboratory and the Quest for Mars*, New Series in NASA History (Baltimore, Maryland, Johns Hopkins University Press, 2015); Michael J. Neufeld, "First Mission to Pluto: Policy, Politics, Science, and Technology in the Origins of New Horizons, 1989–2003," *Historical Studies in the Natural Sciences* 44 (3): 234–276; Alan Stern and David Grinspoon, *Chasing New Horizons: Inside the Epic First Mission to Pluto* (New York: Picador, 2018). See also Roger D. Launius, ed., *Exploring the Solar System: The History and Science of Space Exploration* (New York: Palgrave Macmillan, 2013).

¹⁹ John Krige, Angelina Long Callahan, and Ashok Maharaj, *NASA in the World: Fifty Years of International Collaboration in Space*, Palgrave Studies in the History of Science and Technology (London: Palgrave Macmillan, 2013).

Some of the strongest scholarship in the field of space history in recent years has been done about the cultural history of spaceflight in the Soviet Union/Russia. As recently as the 1990s, Asif Siddiqi was working to compile the names, dates, and events that comprised the first comprehensive history of the Soviet space program. Now a number of scholars, himself included, have deepened that knowledge through biography and cultural history.²⁰

Moving away from the point of view of either of the Cold War superpowers, however, Dr. Alexander C. T. Geppert's group at the Free University of Berlin has inspired important work in space history from a European perspective. Beginning in 2010 and until 2016, Geppert directed the Emmy Noether Research Group called "The Future in the Stars: European Astroculture and Extraterrestrial Life in the Twentieth Century" at Freie Universität Berlin. Geppert's conferences and volumes, one of which is still forthcoming,²¹ have contributed substantially to developing the field of European space history. In particular, much of this work has centered around the idea of "astroculture," a shorthand for the cultural history of spaceflight, broadly considered.

In another important development, the recent publication of Israeli author Deganit Paikowsky's *The Power of the Space Club* offers a historically-grounded analytical perspective for framing current international space policy discussions. Paikowsky used the case studies of various international space efforts to analyze why having an internal spaceflight capacity has

²⁰ Asif A. Siddiqi, *Challenge to Apollo: The Soviet Union and the Space Race, 1945-1974* (Washington, DC: NASA History Division, 2000); Asif A. Siddiqi, *The Red Rockets' Glare: Spaceflight and the Russian Imagination, 1857-1957*, Cambridge Centennial of Flight (Cambridge: Cambridge University Press, 2010); Slava Gerovitch, *Soviet Space Mythologies: Public Images, Private Memories, and the Making of Cultural Identity* (Pittsburgh, Pennsylvania: University of Pittsburgh Press, 2015).

²¹ Alexander C.T. Geppert, ed., *Imagining Outer Space: European Astroculture in the Twentieth Century*, Palgrave Studies in the History of Science and Technology (London: Palgrave Macmillan, 2012). Alexander C.T. Geppert, ed., *Limiting Outer Space: Astroculture After Apollo*, Palgrave Studies in the History of Science and Technology (London: Palgrave Macmillan, 2018). A future volume will complete the trilogy: *Militarizing Outer Space: Astroculture and Dystopia in the Cold War*.

been seen by nation-states as an important marker of their prestige and status on the world stage. As more and more nations join the space club (Bangladesh launched its first communications satellite in 2018), her study provides a useful tool for policy makers as well as a must-read for future scholars considering national and international space programs.²²

Scholars have already begun answering the appeal made in Asif Siddiqi's 2010 essay in *Technology and Culture* calling for a new global history of spaceflight. Siddiqi, writing from his perspective as both an American-trained scholar and the one of the foremost historians of the Soviet-Russian space program, stepped back in 2010 to publish a directive for space history as a whole. Arguing that "...our understanding of the half-century of space travel is still firmly rooted in the framework of the national imagination," he suggested that "...the maturation of other national space programs—those of China, Japan, and India, for example—will require us to approach space history with new lenses as more and more 'new' narratives join the old cold-war-centered approach to space history." Siddiqi points out that international transfers of people, knowledge, and technologies are not new (think for instance, of the postwar integration of German vehicles and engineers who helped to develop rocketry in the United States). But past scholars have told these stories as part of nationally focused histories, without considering them as global influences. In contrast, Siddiqi called on historians "to incorporate a broader matrix of approaches, including, particularly, the highlighting of global flows of actors and knowledge across borders, communities, and identities. ...[resulting in, for] the first time a global and transnational history of rocketry and space travel." By "decentering" the focus, Siddiqi argued,

²² Deganit Paikowsky, *The Power of the Space Club* (Cambridge, United Kingdom: University of Cambridge Press, 2017).

“one might expect a multitude of smaller, local, and ambiguous processes and meanings to become visible.”²³

Indeed, numerous scholars are already writing histories on those terms, driven by an inherent interest in globalization and its uneven effects. For instance, Martin Collins’ history of the Iridium satellite, Motorola, and satellite phones explicitly grounds its analysis in the complicated construction and implications of “the global.” Likewise, Paul Ceruzzi’s new concise history of GPS grapples with the worldwide implications of this now ubiquitous space-based technology and its analogous systems in other countries. And Michael Neufeld’s brief volume on *Spaceflight*, part of MIT Press’s “Essential Knowledge” series, deliberately integrates the newest scholarship on space programs outside of the United States and Russia into a story that used to be told primarily in reference to those two superpowers.²⁴

The Current Moment

As historians look to the future, 2018 finds the aerospace industry in the United States both thriving and at a crossroads. Many historians of technology are already watching the developing field of commercial human spaceflight. In 2004, Scaled Composites Tier One won the \$10 million Ansari X Prize for the two successful flights of SpaceShipOne, the first privately-developed, suborbital, human spaceflight vehicle. Commercially available space tourism seemed to be imminent until SpaceShipTwo crashed during a test flight in 2014, killing one of the two pilots on board. In the summer of 2017, the characteristically frank designer of SpaceShipOne, Burt Rutan, openly expressed his frustration with the failure of the space tourism

²³ Asif A. Siddiqi, “Competing Technologies, National(ist) Narratives, and Universal Claims: Toward a Global History of Space Exploration,” *Technology and Culture* 51 (April 2010): 425-443. Quotes from pages 425 and 426.

²⁴ Martin Collins, *A Telephone for the World: Iridium, Motorola, and the Making of a Global Age* (Baltimore, Maryland: Johns Hopkins University Press, 2018); Paul Ceruzzi, *GPS*, The MIT Press Essential Knowledge Series (Cambridge, Massachusetts: MIT Press, 2018); Michael J. Neufeld, *Spaceflight*, The MIT Press Essential Knowledge Series (Cambridge, Massachusetts: MIT Press, 2018).

business to live up to its promised schedules. At the same time, the next generation astronomical instrument, the James Webb Space Telescope, has been delayed in its launch even as the Hubble Space Telescope has been operating on reduced gyroscopic power and the Kepler planet finder went offline in November 2018 after running out of fuel. The next Mars lander, InSight, landed and began examining the interior structure of Mars that same month.²⁵

In the last decade, other businesses have pursued different aspects of spaceflight. In May 2016, NASA's pressurized the Bigelow Expandable Activity Module (BEAM), an inflatable test module developed from old NASA plans using new NASA money. And in what has been called a new space race, internet billionaires have poured resources into developing new launch vehicles. While Jeff Bezos' Blue Origin has made quietly steady progress, Elon Musk's SpaceX has seemingly perfected the recovery of spent first stages of Falcon 9 launch vehicles via controlled upright landings on robotic seafaring barges. At the same time that SpaceX is developing the Dragon spacecraft for cargo and crew supplies to the International Space Station, Boeing is also developing a next generation human spaceflight vehicle, the CST-100 Starliner. Whether or not these efforts represent true disruptions in techniques, technologies, or business models depends upon who is asked. As more time passes, however, this new public face of commercial spaceflight will continue to evolve from a topic of contemporary space policy to being the subject of historical consideration. As it does, Launius' recent studies of historical analogs for commercial space, comparing these new business ventures to the development of federally subsidized railroads and airlines provide useful guides.²⁶

²⁵ Jeff Foust, "What the hell happened?: The rise and fall of suborbital space tourism companies," *SpaceNews*, June 5, 2017 <http://spacenews.com/what-the-hell-happened-the-rise-and-fall-of-suborbital-space-tourism-companies/>, accessed November 7, 2018.

²⁶ Roger D. Launius, "The Railroads and the Space Program Revisited: Historical Analogues and the Stimulation of Commercial Space Operations," *Astropolitics: The International Journal of Space Politics & Policy*

At the same time, historians will be watching the next direction for national and international space efforts. In 2017, President Donald Trump issued an executive order reconstituting the National Space Council as a means of guiding national efforts in three key areas: civil space, commercial space, and national security space. The policy decisions that emerge from that executive body's deliberations will guide space policy—and the vast existing businesses already servicing this sector—in United States in the near future. And in keeping with Siddiqi's call for a global history of spaceflight, historians should also be paying attention to international spaceflight efforts—and the true global nature of seemingly national ones. Specifically, historians will be watching how international alliances weather the end of the International Space Station sometime in the next decade. More so, the historical roots of spaceflight efforts in nations around the world remain rich areas for scholarly exploration.

Conclusion

I will end this historiographic assessment with a note that is somewhat discouraging for this writer but hopeful for the overall field: this essay will be obsolete as soon as it appears. Many prominent aerospace authors have been working on significant pieces aimed to coincide with the 50th anniversary of the Apollo 11's first landing of humans on the Moon in July 1969. As a result, however, whoever writes the next version of this essay should begin with contributions from 2019, which promises to be an *annus mirabilis* for space history.

More important, 50th anniversaries mark a significant shift, from memory to history. It is a sad reality that fewer of the people who made the history of the Apollo lunar landings in the 1960s are around to celebrate the 50th anniversary than were present at the 40th anniversary

12 (2014): 167-179; Roger D. Launius, *Historical Analogs for the Stimulation of Space Commerce*, Monographs in Aerospace History, no. 54, SP-2014-4554 (Washington, DC: National Aeronautics and Space Administration, 2014).

celebrations in 2009. Likewise, more and more of the scholars who address space history topics in the future will only know those events as history, not lived memory. There is potential danger in this transition. Just after the 50th anniversary of the end of the American Civil War, for instance, various organizations began to enshrine the myth of the Southern “Lost Cause” in statues and memorials on battlefields throughout the theater of war. Those distortions of the history remain politically contested almost one hundred years later. In the 50 years since the Moon landings, for example, conspiracy theories about the lunar landings and even the idea that the world is flat have proliferated. For space history, there is distinct value lost as those who participated in or otherwise witnessed the golden age of human spaceflight retire. Yet, the passage of the 50th anniversary also has great potential for growth in rigorous scholarship. A new generation of scholars will be able to analyze the history of spaceflight with fresh eyes.

Several initiatives are in the works to foster this. In anticipation of the Apollo 11 anniversary, the “To Boldly Preserve” conference gathered historians, librarians, and archivists in 2017 to consider how best to manage and preserve the physical and digital history of the space age. That initiative is in the process of becoming a more permanent collaboration that will support space history endeavors. At the same time, the NASA History Office and the National Air and Space Museum’s Space History department are marking the Apollo 11 50th anniversary year by once again collaborating to convene a gathering of space history scholars, this time for a workshop exploring the future of the field. The hope is to inspire a new generation of scholars to mine the untapped potential of space history topics in future dissertations, articles, and books. Yet, all of that material will emerge after this article appears. That bodes well for a mature historical field—as well as for the potential for rigorous scholarship to reach a wider reading audience who might be inspired by the anniversary to investigate space topics.