

“AD ASTRA PER ASTRONAUTA”

BRINGING THE PUBLIC “UP TO SPACE” AND ASTRONAUTS “DOWN TO EARTH”

by

AUSTIN KLINOCK

Submitted to The Department of History of the University of Kansas in partial fulfillment
of the requirements for departmental honors

Thesis Committee:

Dr. Sean Seyer, Thesis Coordinator

Dr. Robert C. Rowland, Committee Member

Dr. Erik R. Scott, Committee Member

Date Defended: April 19, 2023

June 29th, 1965, a young Joe Engle flew through the atmosphere at 3,477 miles per hour.¹ He was piloting an experimental aircraft known as the X-15, a rocket-powered hypersonic plane meant to push the boundaries of aerodynamics and human capability. Launched from beneath the wing of a B-52 bomber, Engle was sent shooting toward the stars on his mission to kiss the edge of space. Reaching an altitude of 53 miles or 282,000 feet, Engle returned to Earth as America's youngest spaceman at 32 years old. In his interview with the press, he reflected on his 11-minute flight, saying "What an impressive view - I wish I could have had more time up there."²

An impressive view indeed, Engle described the show he witnessed as he traveled up to his apogee. He marveled at the bands of color formed on the horizon which he called, "the browns and greens of Earth merging into clouds and haze, topped by zones of light blue, dark blue, and purple fading into the black of space."³ Adding to his description, he looked at the sun and saw it as "a light bulb against a dark backdrop," in stark contrast to the bright blue sky seen by observers on the ground.

These observations were part of the research conducted by Engle as he flew his mission. The *Salina Journal* explained that there is distortion between the horizon and the edge of space when flying at such high altitudes, and that future test pilots would need to understand this haze as they used the dividing line as a reference point.⁴ But it was not the scientific importance of these sights which captivated the public, but rather their spectacular beauty. Joe Engle's brief flight on the edge of space offered a glimpse into a world that had been unreachable only a few years prior, and the way his experience was portrayed to the public through newspapers represented the dawn of two journalistic strategies that would see use from these first steps into space through the modern day. This thesis will follow these strategies throughout the history of the US space program, tracking their presence in the media coverage of spaceflight from the very beginning through the changing social and political climates that shaped the motivations and goals for establishing a human presence in space.

¹ "The Salina Journal, June 30, 1965, Page 8."

² Ibid.

³ Ibid.

⁴ Ibid.

The Beginning of Spaceflight and America's "Open" Space Program

Why go to space? Historian Walter McDougall is one of the leading scholars on the motivations for spaceflight and the impact it had on society. He writes that the primary catalyst of America's early space program was the fact that Soviets were far ahead in missile technology.⁵ Rocket and missile technology are one in the same, and the promotion of peaceful uses for these tools helped garner support for their development from the public and created a more socially acceptable reason for the continued creation of ever-more powerful delivery systems.

In President Kennedy's speech at Rice University, he claimed that America's mission to explore space was driven by a peaceful desire to push the boundaries of human capability.⁶ But when discussing the same matter with his cabinet, he took a slightly different tone, saying, "I want to see our country mobilized to a wartime basis, because we are at war."⁷ This statement is a crucial reflection of how the political battles of the Cold War were often fought, through technology and PR.

In addition to the military arms race, there were existential concerns over the change in the balance of power between the East and the West. Prior to the launch of Sputnik 1, the first artificial satellite, it was generally accepted that the USSR was far behind the US in its potential capabilities of launching a satellite. By achieving this landmark before the United States, the USSR showed that it could successfully challenge the US in a field in which the United States had once excelled.⁸

The United States' space program was a measure of its prestige. The launch of Sputnik by the Soviet Union threatened to undermine America's position of superiority on the world stage. And when the USSR sent the first person into orbit in 1961, members of congress expressed utter disbelief that the Soviet Union could do so, with the wide consensus being that it was merely "a face-saving device in

⁵ Walter A. McDougall, *The Heavens and the Earth: A Political History of the Space Age* (New York: Basic Books, 1985), 313.

⁶ John F. Kennedy, "Address at Rice University on the Nation's Space Effort," Speech, Rice University, Houston, September 12, 1962.

⁷ McDougall, *The Heavens and the Earth: A Political History of the Space Age*, 317.

⁸ "'Impact of U.S. and Soviet Space Programs on World Opinion,' 7 July 1959." accessed September 20, 2022, <https://history.nasa.gov/sputnik/july59.html>.

anticipation of an American breakthrough at an early date.”⁹ Their skepticism was warranted, as it was true that the Soviet Union kept their activities in space close to their chest. But it was also true that America had fallen behind in manned spaceflight, and the country’s reputation was in jeopardy.

But as time progressed following this first achievement in space, the shock of Sputnik gave way and the United States Information Agency noted that public attention over subsequent events had waned substantially.¹⁰ What followed was a cascade of ambitious programs by both sides in an attempt to regain the enthusiasm and support of the public while raising the bar for their opponents, from the first satellite to the first man in orbit, to the lunar landings and their legacy. This produced a “see-saw pattern” of events in which the lead was taken and lost repeatedly by both sides, with neither holding a definitive position of superiority until the end of the Apollo program.¹¹ The Mercury program put America’s first astronauts into space in small single-person capsules, followed by the Gemini program and the first spacewalks by American astronauts, eventually leading to the Apollo program and the historic first steps on the Moon. As this push and pull between the world’s superpowers progressed, there was one factor which had a resounding impact on the success of America’s space program, its openness.¹²

While the Soviet space program was comparatively shrouded in secrecy, the United States excelled in the dissemination of information on NASA’s activities.¹³ If the space race was to be framed as a battle between ideologies, then it was little surprise that the United States embraced the freedom of speech through public engagement with the program. The United States put its democratic values on full display by keeping its space program open to publicity, all the while cementing space exploration in American culture. While the Soviet approach may not have had as heavy of a focus on open access to information, both the United States and the USSR used space exploration as a propaganda tool to promote their values and to highlight the faults in those of their adversaries. The Soviet Union put a woman in

⁹ *Congressional Record* 107 (1961): 6334–43.

¹⁰ *Ibid.*

¹¹ Teasel Muir-Harmony, *Operation Moonglow: A Political History of Project Apollo* (Basic Books, 2020) 276.

¹² *Ibid.*

¹³ *Ibid.*

space 20 years prior to America's first female astronaut, thereby making an effective statement on the importance of gender equality in Soviet culture and the lack thereof in the United States. The flight of Valentina Tereshkova sparked a wave of congratulatory letters from women across the USSR as they revered the launch of an individual with whom they could identify.¹⁴ Particularly in the first decades of space exploration, the individuals who flew above the Earth were depicted to the public as heroes by both sides of the space race, and their experiences in space became legends that would captivate the people across the world who were eager to join them.

Spaceflight became so ingrained in the American zeitgeist that a term was coined to describe its impact: "Astroculture." Historian Margaret A. Weitekamp broke down the influence of spaceflight on American culture in her book, *Space Craze: America's enduring fascination with real and imagined spaceflight*. She wrote that not just spaceflight, but flight itself has offered "an escapist fantasy" from the Great Depression into the twenty-first century, "tapping into foundational ideals about national identity."¹⁵ Pioneering, progress, manifest destiny, all these elements of America's national mythology are reflected in space travel. It is no wonder fictional television such as *Buck Rogers* and *Star Trek* arose at the dawn of space exploration, as they gave the public a medium through which they could be a part of this new age of exploration. Actual space missions functioned in a similar way through their coverage by the press which evoked the same sense of vicarious participation.

The framing of the United States space program is reflected in the words Neil Armstrong spoke as he took his first steps on the Moon, as it was not merely a "giant leap" for America, but for "all mankind." Particularly in the wake of the Apollo 11 Moon landing, the United States realized that the most beneficial aspect of the space program was in its ability to create a feeling of participation among the public.¹⁶ Historian Alexander Geppert coined the term "Post-Apollo Paradox," which describes the

¹⁴ Roshanna P. Sylvester, "'You Are Our Pride and Our Glory!' Emotions, Generation, and the Legacy of Revolution in Women's Letters to Valentina Tereshkova," *The Russian Review* 78, 3 (July 2019): 392-413.

¹⁵ Weitekamp, Margaret A. *Space Craze: America's Enduring Fascination with Real and Imagined Spaceflight*. 2022, 10.

¹⁶ *Ibid*, 11.

questioning of what NASA's goals would be following the success of the Moon landings in an age where manned space operations would be conducted only in low-Earth-orbit.¹⁷ The response would be an increased focus on the liberalization of space, to "revolutionize transportation into near space by routinizing it," as President Nixon said in his announcement of the Space Shuttle program.¹⁸ With the Shuttle, a more diverse assortment of astronauts could travel to space to push the new boundaries of not how far humans could go in space, but of who could go to space. Increased openness of access to space for a more diverse group of astronauts meant a greater representation of the people following their journeys on Earth.

It was through the accounts of their experiences that a wider audience of people could envision themselves in their place. What set crewed missions apart from the rest was that they were distinctly "human" in nature, with real people who brought distinct personalities, curiosities, and often unexpected quirks and difficulties with them on their missions. These personal aspects, perhaps more than anything else, served a central role in fostering a sense of connection between the public and the space program. The importance of human participation in space exploration has been an area of contention throughout the history of spaceflight. Understanding the relationship between NASA and the press and the history of how the two worked to present the importance of the US space program reveals a set of strategies whose consistent use over time offers insight into how human activity in space was made appealing to the public. And at the center of this effort to connect the public with space are the individuals who bridge the gap between the two: astronauts.

The Kansan Astronauts

The state of Kansas has been the home to four astronauts whose distinguished careers range from the very beginning of the space program to the modern day, three of whom will be covered in this paper. Kansas is not often the first place to be thought of when discussing contributions to spaceflight. New

¹⁷ Geppert, Alexander. *Limiting Outer Space: Astroculture After Apollo*. New York: Palgrave Macmillan, 2018, 10.

¹⁸ *Ibid*, 12.

York, California, and Texas have each produced at least two dozen individuals who served as NASA astronauts.¹⁹ Even in the Midwest, Kansas is typically outshined by states such as Ohio, which has the distinction of being the home of John Glenn and Neil Armstrong, the first man to orbit the Earth and the first to set foot on the Moon, respectively.²⁰

The lack of scholarship on the role of Kansas in the space program motivated the focus of this study. There is a strong connection to the US space program in the state, and the even distribution of these three astronauts' careers across both the Apollo and Shuttle programs presents the opportunity to analyze how American astronauts and their experiences were portrayed throughout the history of spaceflight.²¹ In this way, Kansas is an ideal candidate for a case study of the media trends that were employed to create a personal sense of connection between the public and the US space program.

These three astronauts: Joe Engle, Ron Evans, and Steven Hawley, demonstrate the capacity of people from humble beginnings to make an outsized impact on the march of human progress. Defying expectations, they looked up at the bright blue Kansas sky and forged a path to get there, truly embodying the state's motto of "Ad astra per aspera," "to the stars, through difficulty."

"Up to Space" - The Audience Joins the Astronauts

Maintaining the public's interest in the space program is a crucial component of its continued funding. Without an appreciation for NASA's activities, congressmen would not petition on behalf of their constituents for ambitious and expensive projects in space. From the position of the press, human spaceflight provided a stream of content that could sell papers, so long as the stories remained interesting and engaging. The astronauts provided them with perspective, a lens through which the audience could glimpse spaceflight for themselves.

¹⁹ NASA Space Place. "NASA in the 50 States!" Accessed April 10, 2023.
<https://spaceplace.nasa.gov/nasainthe50states/>.

²⁰ Ibid.

²¹ "Boeing News, Volume 48, Number 28, Page 4, 1989."

The Boeing aircraft plant in Wichita produced parts that would see use on the Apollo 11 moon landing.

The account of Joe Engle's X-15 flight presented above is a demonstration of a rhetorical strategy that allowed the audience to figuratively join astronauts on their journey to space. Descriptive details such as his vivid retelling of the vibrant colors he saw on the horizon enabled readers to experience the flight vicariously. By encouraging the audience to imagine themselves in the pilot seat bearing witness to an unprecedented view, the writers effectively brought them "up to space" with Engle on his journey. This is a strategy that was used repeatedly by media outlets throughout the space race and continues to be a key component of modern-day coverage of space exploration.

While bringing the audience "up to space" was an important step in the development of a close feeling of connection among the public with the space program, it was only one of two techniques used to accomplish this goal. To create a powerful sense of connection, the audience must not only be able to see through the eyes of the astronauts, but also see themselves represented through the astronauts. To accomplish this, astronauts were portrayed in a manner with which the public could identify. Just as the news media would bring its readers "up to space," there was a concerted effort bring the astronauts "down to Earth."

"Down to Earth" - The Importance of Interpersonal Relatability

December 9th, 1972, 48 hours had passed since the launch of Apollo 17, the final crewed mission to the Moon. On board, astronauts Eugene Cernan, Ronald Evans, and Harrison "Jack" Schmitt settled in for their third round of sleep with Evans as the assigned duty officer for the night. When the time came for the crew to begin their next day of work, Houston's attempts to wake the astronauts were met with silence. To rouse the sleeping astronauts, mission control played a rendition of the Jayhawk Fight Song directly into Evans' headset, but after three play-throughs, still no response. Over an hour of wake-up calls went by and finally, a high-pitched oscillating tone was transmitted into the capsule along with another chorus of "I'm a Jayhawk." Jack Schmitt grumbled, "We're asleep" over the radio. Ron Evans would later explain that he had turned off the power to his headset, effectively forgetting to "set his

alarm.”²² The press jumped on this story, and it would soon be revealed that Evans had a history of being a heavy sleeper while serving on aircraft carriers; his wife stated to reporters that “he literally just sleeps through anything.”²³

Following their stalled awakening, command module pilot Evans conducted a critical realignment of the spacecraft to ensure that they would enter a clean orbit around the Moon instead of making a direct impact. This important step in the mission which was executed flawlessly by Evans was, however, undertaken with little notice by the press. The media’s attention had been directed toward another developing situation which captured the interest of the public. Flying at 24,000 miles an hour and halfway to the Moon, Ron Evans had lost his scissors.²⁴ While crucial parts of the mission were glossed over, great attention was given to issues that were comparatively trivial. In Evans’ memoir, these events were recalled as being among a group of “domestic” issues that occurred during the mission which garnered a remarkable amount of public attention.²⁵

What was it that made these stories so appealing to the press? The most compelling aspects of the astronauts’ domestic dilemmas were in their relatability. While audiences may find it difficult to relate to the precise and heavily calculated maneuver that ensured the capsule was on a safe trajectory, sleeping through your alarm and having office supplies seemingly disappear are experiences that are shared almost universally. Between the heavily packed schedules and NASA’s technical jargon, the audience could connect with the simple and fundamentally human situations in which the astronauts found themselves. These shared experiences are an essential component in bringing the astronauts “down to Earth,” creating identification between the public and the astronauts and breaking down their larger-than-life personas to present them as more human than hero.

²² Bowman, Geoffrey. *A Long Voyage to The Moon: The Life of Naval Aviator and Apollo 17 Astronaut Ron Evans.* In *Outward Odyssey: A People's History of Spaceflight*, edited by Colin Burgess, 291-322. Lincoln: University of Nebraska Press, 2021, 255.

²³ *Ibid*, 256.

²⁴ “The Wichita Beacon, December 10, 1972, Page 15.”

²⁵ Bowman, *A Long Voyage to The Moon*, 257.

Eileen Hawley, former NASA Director of Communications and Public Affairs and wife of Dr. Steven Hawley, stressed the importance of bringing astronauts “down to Earth,” saying that this approach “demonstrated that while astronauts are heroes, they are also normal people who like the same things you do. All of these things that show the human side of human spaceflight are beneficial and help the public feel connected to NASA.”²⁶ People wanted to see astronauts living lives similar to their own, which is why these “domestic” details were given such great attention. “When Astronaut Susan Helms was on the space station, she talked with the stars of the X Files because she was a fan of the show. And Shannon Lucid, when she was on Mir, made green Jello on Sundays to share with her cosmonaut partners. People loved these sorts of things.”²⁷ While descriptions of spaceflight in all its wondrous detail brought the public closer to space, it was the relatable experiences that brought the astronauts closer to home.

The human presence in space is essential to the development of the public’s appreciation for NASA and their work. The combined efforts of the space administration and the press that covered them created an image of a world in which space would be accessible to everyone, but this never was nor will be the case. The challenge faced by those who promote space exploration lies in the formation of an appreciation of spaceflight among people who would never visit space themselves. The notion of there being certain extraordinary characteristics that lend particular individuals to careers as astronauts as suggested in Tom Wolfe’s 1979 book, *The Right Stuff*, worked against efforts made by the NASA and the press to present their astronauts as relatable.²⁸ While the early astronauts such as John Glenn and Gus Grissom were portrayed as heroic characters, this form of framing would become less common as spaceflight evolved with the changing social and political climate. In order for the strategy of bringing the reader “up to space” to be effective, the astronauts’ experiences had to be portrayed in a fashion with which the general public could identify, allowing them to effectively see themselves in space along with them. The vivid descriptions of the sights and sensations of spaceflight would not have an effective impact on the

²⁶ Eileen Hawley, Interviewed by author, 2023.

²⁷ Eileen Hawley, Interviewed by author, 2023.

²⁸ Wolfe, Tom. *The Right Stuff*. New York: Farrar, Straus and Giroux, 1979.

audience if those experiencing them were seen as being in a league unachievable by most; as inherently “other” from everyone else. These two strategies of bringing the audience “up to space” and bringing the astronauts “down to Earth” are not mutually exclusive, but rather work together to form a sense of personal connection between the reader and the US space program through the individuals who give space exploration a human identity.

The Apollo Era

It was test flights such as those made by Joe Engle and the X-15 in 1965 which paved the way for more ambitious endeavors as the American space program continued to make rapid progress. Neil Armstrong flew an X-15 himself when he was serving as a NASA test pilot before becoming the first person to set foot on the Moon on Apollo 11.²⁹ Five more Apollo missions followed before Kansas astronaut Ron Evans flew on the final manned voyage to the Moon, a record which still stands to this date. The loss of Evans’ scissors, as we have seen, generated a great deal of coverage by the press. It presented a familiar situation in unfamiliar circumstances, an “up to space” story model which would continue to captivate public attention throughout the history of spaceflight. In this story titled, “Look, Houston, No Cavities” from the December 8, 1972, issue of the *Kansas City Star*, we can see a fixation on another “domestic issue.” As every dentist would hope, brushing one’s teeth is another example of a ubiquitous experience shared by both astronauts and people back on Earth. The crew of Apollo 17 were no different, but the weightlessness of spaceflight presented a new set of challenges to performing this otherwise routine task. They had to use specially engineered paste that would not foam nor interfere with the studies of the astronauts’ metabolisms.³⁰ The astronauts had to keep their mouths closed while brushing to avoid generating floating debris, which meant they also had to “suck the toothbrushes dry” and swallow their toothpaste, which was not advisable for the average Earthly brusher.³¹

²⁹ “Neil Armstrong and the X-15,” accessed November 21, 2022, <https://airandspace.si.edu/stories/editorial/neil-armstrong-and-x-15>.

³⁰ “Kansas City Star, December 8, 1972, Page 42.”

³¹ Ibid.

For the astronauts, brushing their teeth was an experience that was not taken for granted. They had no way to bathe in the Apollo capsule, and brushing was one of a few ways for them to feel refreshed. One even claimed that the toothpaste tasted better than the food.³² It is safe to say that the typical reader did not harbor as much appreciation for dental care as the crew of Apollo 17. Mundane parts of a daily routine can become a luxury when living thousands of miles away from Earthly comforts such as good food and showers, and the astronauts' perspective offers the reader a sense of what it would be like to live without experiences they had become accustomed to.

Routines are a common bond held between astronauts and the people back on Earth. Just as brushing one's teeth takes on a new level of significance and complexity when it is part of a space mission, so do many other aspects of an astronaut's schedule. The December 11, 1978, issue of the *Wichita Eagle* was filled with coverage of the imminent Apollo 17 Moon landing. Among the stories were accounts of the astronauts' excitement over their arrival at the Moon along with statements made by previous astronauts when they had made the journey.

Additionally, in a section aptly titled "Apollo Schedule," the reader was presented with a detailed list of activities to be carried out by the astronauts on the day of the landing and onward.³³ Laid out in a minute-by-minute format, the mission plan for Apollo 17 offered a glimpse into the crew's unique and highly regimented plan. Before reading the schedule, the audience learns that all times are listed in Central Standard. This was the time zone used in Houston and aboard the spacecraft from the launch and throughout the mission, an important detail to consider with the absence of time zones in space.³⁴ With this in mind, the public would be able to follow the astronauts' planned activities in real time on Earth, even if video and radio coverage of the events would not be broadcast until later. The schedule itself reads like a script for a play, outlining each major planned event in as close to "real time" as was possible for a newspaper.

³² Ibid.

³³ "The Wichita Eagle, December 11, 1972, Page 1."

³⁴ "Apollo 17 Flight Journal - Day 4, Part 1: Clock Update," accessed November 22, 2022, https://history.nasa.gov/afj/ap17fj/09_day04_part1_clock_update.html.

The key to this piece's effort to create a connection between life on Earth and life in space is in its relatability as well as its divergence from expectations. With the assumption that everyone has a form of daily routine, this article allowed the reader to compare and contrast between the astronaut's schedule and their own, and in the process, form a sense of identification with the parts of daily life which are consistent in space and an appreciation for those which change.

The minute-by-minute layout highlighted aspects of the mission which may have otherwise gone unnoticed. For instance, the astronauts required 8 hours of sleep just like everyone else, though the reader learns that while the lunar excursion is taking place, the astronauts in the lander would be on a different sleep schedule than Evans, who remained in the command module.³⁵ Furthermore, they learn that the astronauts would lose contact with mission control while the spacecraft flew behind the Moon, a detail that is made far more salient when the reader can see the list of precisely timed actions including two engine burns which were to be performed in this window. All of this had to be done while these three men were the most isolated people alive.

This article brought its audience "up to space" to offer them a more nuanced appreciation of the astronaut's experiences. More than anything, it shed light on the intense periods of isolation these men had to endure. The critical tasks which had to be performed out of contact with Earth adds to the audience's perception of the danger they faced. The staggered sleep schedule shows how NASA sought to maximize time-efficiency and makes Evans' time alone in the command module come across as particularly isolated. The three and a half hour gap between landing on the Moon and setting foot upon it attained a level of dramatic suspense when the reader is able follow along as the mission unfolds over the following days.³⁶ By publishing this schedule in advance, not only is the anticipation surrounding the mission's milestones heightened, but the audience could also gain a greater appreciation for the level of danger, stress, and loneliness that these astronauts faced.

³⁵ "The Wichita Eagle, December 11, 1972, Page 1."

³⁶ Ibid.

The Shuttle Era

Though he served as a backup crew member in the Apollo program, Joe Engle never flew to the Moon. With a lapse in manned missions throughout most of the 70s following Apollo 17 and the Skylab space station, Joe Engle became one of the first American astronauts to return to space, and in a familiar fashion. Over a decade after his brief flights to the edge of space on board the X-15, Engle flew landing test missions for the Space Shuttle before serving as Mission Commander for STS-2 and STS51-I.³⁷ Notably, he was the only astronaut to have flown to space onboard two entirely different winged spacecraft.³⁸

The Space Shuttle was intended to help the US space program adapt to a new era of post-space race operations. With the near limitless budgets of the Apollo program a thing of the past, the Shuttle was born out of a desire for a reusable and chemically fueled “space tug” to travel between the surface and low Earth orbit. President Richard Nixon announced the Shuttle as a “space truck,” the new vehicle which would bring with it an age of cheap and routine flights into space, or at least that was the intention.³⁹

STS-2, featuring Space Shuttle Columbia, was NASA’s second ever Space Shuttle mission, and was the first time a manned reusable vehicle had returned to space.⁴⁰ This record breaking flight was intended to be the primary test of the Canadian robotic arm that would become a crucial part of many missions to come, and was both Engle’s and his pilot Richard Truly’s first trips into orbit.⁴¹ In a series of segments published in the *Wichita Eagle* on the day after the launch, November 13th, 1981, the paper discussed the events surrounding the launch of STS-2 from the perspectives of both the astronauts and the audience watching from Engle’s hometown of Chapman, as well as explaining an issue with one of the Shuttle’s fuel cells that would lead it to return to Earth prematurely.

³⁷ “Engle, Joe H. ‘Joe H. Engle Oral History.’” Interview by Rebecca Wright and Sandra Johnson. NASA Johnson Space Center Oral History Project, March 14, 2006.

³⁸ Ibid.

³⁹ “NASA. Report of the Space Task Group, 1969. Washington, D.C.: National Aeronautics and Space Administration, 1969.”

⁴⁰ “The Wichita Eagle, November 13, 1981, Page 1.”

⁴¹ Ibid.

Through the eyes of the astronauts, we are offered a glimpse at their experience in the hours before Columbia's launch. They awoke at 4 AM to prepare for their trip, and ate breakfast, Truly was presented with a cake in the shape of a Space Shuttle to celebrate his 44th birthday. Complimented by a central picture of Engle and Truly as he blows out the candles, this short insight into the relationships between the astronauts presents to the reader a look into the more personal, human side of the mission and those who would fly it.⁴² The reader followed them from this morning celebration into the crew cabin in the moments before launch. They were wished well by the conductor in the firing room at T-9 minutes, and then at a few milliseconds before launch, the audience is treated to a detailed description of the engine ignition from the perspective of a viewer on the ground which portrayed Columbia as "a gleaming white craft" as it climbed "into the bright blue" Florida sky until it "vanished in an envelope of its own exhaust vapors."⁴³

The moment-by-moment account of the astronauts' experiences prior to launch were mirrored by that of the observers who remained on Earth. The left column of the article placed the reader in the middle of Chapman, Kansas as fans of the hometown hero Joe Engle awaited his inaugural flight. Set at the downtown bar of Lundeen's, the events immediately leading up to the launch are chronicled. At t minus 8 minutes, "Joe is guaranteed to go this time" was heard over a color TV set.⁴⁴ A minute later, an enthusiastic supporter of Engle was introduced dressed in regalia adorned with his name who described how her heartbeat so fast in the final seconds. At t minus 5, an eight-year-old child walked in with his sign "We're proud of Joe Engle," and asks the journalist, "Did you know Joe Engle went to my school?" Chapman's bank was locked up at t minus 3 minutes in an unprecedented move so the staff could enjoy the "once in a lifetime experience."⁴⁵ TV sets were turned up at t minus 1 minute in Lundeen's bar as Mission Control's voice took over the broadcast. Silence fell at t minus 31 seconds, and at t minus 10 seconds, the crowd began to count out loud until they erupted in cheers as Columbia took off.

⁴² Ibid, 6.

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Ibid.

This article exhibits both of the “up to space” and “down to earth” strategies seen in the Apollo program and those which came before it. The astronauts were humanized through the image of Truly’s birthday celebration, showing the personal side of their relationships with each other that would have otherwise remained unseen in the official broadcast. The reader was taken into the crew cabin, along with the astronauts, to join them in their final moments prior to takeoff, before taking on the perspective of a viewer on the ground, experiencing the launch through detailed visual descriptions and metaphors describing its ascent. The countdown first presented from the astronauts’ perspective is mirrored by that experienced by onlookers in Chapman, effectively taking the viewer on a journey from the astronauts’ crew quarters, to the launch pad, and then to Lundeen’s bar. While the audience may not have been treated to a vicarious experience in space itself, they were taken along to witness the excitement of the launch along with those who were watching it live. This technique presented the full scope of the excitement experienced by both the astronauts and fans on the ground, taking all involved “up to space,” if only for the first moments of Joe Engle and Columbia’s journey into orbit.

The Space Shuttle went on to perform dozens of successful missions following Engle’s flight on STS-2. Astronaut Steven Hawley was there for Engle’s flight as a member of the support crew before going on to begin his own spaceflight experience in 1984 as he flew aboard Discovery for its maiden voyage.⁴⁶ Hawley’s career featured several more milestones, including the launch and later servicing of the Hubble space telescope and the deployment of the Chandra X-ray observatory, the heaviest payload ever carried by a Space Shuttle.⁴⁷

But before he received his astronaut wings, Steven Hawley was already the subject of great personal attention by the press. In an article of the July 31, 1983, edition of the *Kansas City Star* titled, “Kansan Steve Hawley: Kid Next Door, Astronaut,” the public was introduced to the newest face from the Midwest about to fly into orbit. Already having a level of celebrity due to his marriage to Sally Ride,

⁴⁶ “Hawley, Steven A. ‘Steven A. Hawley Oral History.’ Interview by Jennifer Ross-Nazzal. NASA Johnson Space Center Oral History Project, October 31, 2016. Accessed April 10, 2023. https://www.nasa.gov/sites/default/files/atoms/files/Hawley_steven.pdf.”

⁴⁷ Ibid.

the first American woman in space, the articles detailed the story of Hawley life leading up to his time with NASA. He was framed as a child whose fascination with astronomy would follow him through his time at KU earning his PhD. His love of space began in an era when “there were only seven guys in the whole country with ‘the right stuff.’”⁴⁸ Though going to space himself was seemingly impossible when he was a child, a call for astronaut candidates on a college billboard set him on the path toward his first flight.⁴⁹

Beyond their shared love for their careers, the article made a point to depict the family life of Hawley and his then-spouse, Sally Ride. Rather than focusing on her record-setting career, the article discussed the personal lives of the two astronauts. Framing the two as a typical couple with extraordinary lines of work, they were displayed as relatable husband and wife who enjoyed eating with friends or going home to “veg out” after a long day dedicated to work, which they both enjoyed greatly. Despite his great fascination with astronomy, the writer chose to focus on Hawley’s interest in sports and his support of the aptly named Houston Astros and Rockets.⁵⁰ Themes of space travel may have been imbued into many aspects of his life, but just like millions of other Americans reading the story, his personal life was presented as being just like everyone else’s. The pair both worked out regularly, albeit to meet NASA physical requirements. Sally Ride followed minor league football with a fierce dedication, and despite having what many would consider a “dream job,” that did not stop Hawley from complaining about work just like the rest of America.⁵¹

Hawley's story was relatable in that, like many people, he did not expect to find himself in his eventual career. In effect, this makes the job of being an astronaut seem more within the reader’s reach and the process of landing the position to be comparable to the experience of many Americans in their own careers. The portrayal of the astronaut couple’s personal lives was not meant to put them on a

⁴⁸ “Kansas City Star, July 31, 1983, Page 7.”

⁴⁹ Ibid.

⁵⁰ Ibid, 8.

⁵¹ Ibid, 9.

pedestal, but rather to bring them “down to Earth” as a familiar and relatable pair of people whose experiences on the ground did not differ greatly from that of the audience.

In an interview with the author, Hawley stated that his selection was largely due to circumstances out of his control. He never expected to have a chance to apply, as all the astronauts before him had been test pilots.⁵² The Space Shuttle era opened up the world of space travel to a wider range of professionals, and Hawley found himself with a career plan consistent with what NASA was looking for in their mission specialists. His entry into the program coincided with a new sense of openness in space travel, a trend which brought about one of NASA most ambitious programs... and one of the darkest moments in human spaceflight.

The Challenger Disaster - A Moment of Reflection and Change in Human Spaceflight

American attitudes toward manned space exploration experienced shifts as the space program matured along with the social and political climate of the United States. Optimism for a new age of spaceflight open to the public was high going into the 1980s. The newly commissioned Space Shuttles promised routine and rapidly reusable rides to space that could one day be opened to the masses, and as Margaret Weitekamp notes, “the reality of who could be an astronaut... changed over time in ways that reflected social, political and cultural contexts.”⁵³ The opening of space was discussed in Alcestis R. Oberg’s 1985 book, “Spacefarers of the ‘80s and 90s,” in which a space architect named Larry Bell predicted that there would be “people from all walks of life working in space in the year 2000... doctors and nurses, housekeepers and galley workers.”⁵⁴ Others were more skeptical, such as NASA administrator James Beggs, who stated that he did not expect to see the “average man” in space in 20 years’ time, citing the high degrees of technical skills required to handle missions in space.⁵⁵ Beggs, however, understood the importance of connecting the general public to the activities of astronauts. Even

⁵² Dr. Steven Hawley, Interviewed by author, 2023.

⁵³ Weitekamp, *Space Craze*, 14.

⁵⁴ Oberg, Alcestis. *Spacefarers of the '80s and '90s*. Columbia University Press, 1985, 217.

⁵⁵ *Ibid.*

if the imagined egalitarian future of manned spaceflight seemed distant, the desire to form a closer public connection to the program remained. When discussing the potential of putting the first civilian in space, he suggested that “the first should probably be a journalist or someone who writes for a large circulation publication.”⁵⁶

Journalists, as discussed by Oberg, were “the people most eager” to go to space.⁵⁷ They had the creative talent to absorb the many aspects of their experience in space and the necessary background in disseminating that information to the public. But if NASA were to have decided to send a journalist as the first member of the Citizens in Space program, they would have faced two issues, the first being the tendency of journalists to “make waves.”⁵⁸ The way in which the story of the first citizen in space was to be told was of utmost importance to the continued support of NASA and its manned space program, and any implicit bias or criticism held by a journalist could open the possibility for negative press, contrary to NASA’s goals. Second, journalists had the perception of being a level removed from the laypeople of the public. Rarely did the common citizen encounter a journalist, denying them the sense of familiarity and trust held by the candidate NASA would settle on: a teacher.

It was in 1984 that President Regan decided that the first astronaut of the Citizens in Space program would be a teacher.⁵⁹ This decision aligned well with the administration’s focus on bolstering public education, and the role of the first citizen-astronaut was to be the embodiment of the principle of bringing NASA’s audience “up to space,” through an individual who seemed more “down to Earth” than a journalist or any other spacefarer before them. A teacher also possessed the distinct ability to connect with the younger audience, making her launch an important event in the lives of the next generation of NASA supporters. Anything written or spoken by them about their journey from their selection, to

⁵⁶ Ibid, 128.

⁵⁷ Ibid, 217.

⁵⁸ Ibid, 133.

⁵⁹ Ibid, 129.

training, and finally to launch, was to be committed to the public domain,⁶⁰ thus making their experience one that would be shared by the public without the necessity of cooperating with any specific publication.

Whether a journalist or a teacher, the first citizen in space would have been an educator whose experiences would have allowed the public to envision themselves in a world once out or reach, but now closer. After a long selection process and years of planning, this was the mission of Christa McAuliffe, who planned to film her lessons from space to inspire people young and old across the world.⁶¹

McAuliffe's lessons from space were intended to capture the imaginations of students around the country, vicariously bringing them into orbit along with her as she demonstrated many of the principles they learned in class in a microgravity environment. Newton's laws of motion, magnetism, and the operation of simple machines were all to be demonstrated in a setting never before experienced by an instructor or her pupils, but her mission went beyond scientific demonstrations.⁶² As part of the Teacher in Space program, it was her goal to "communicate the experience and flight activities to the public," and her video-lesson titled "The Ultimate Field Trip" would have employed the methods of bringing the audience "up to space" discussed in this analysis, "allowing students to compare daily life on the Shuttle with that on Earth."⁶³ In addition to touring the Shuttle and introducing the crew, she would have demonstrated the similarities and differences between eating, exercising, sleeping, and maintaining personal hygiene while in space compared to that on Earth. In just the same way as the newspaper publishers discussed earlier in this report, it fostered a sense of connection in the public with the space program through shared experiences, McAuliffe's demonstrations would have offered the perspective of a private citizen through which the public could truly explore the experience of spaceflight.

NASA understood the critical nature of maintaining this sense of connection, and her second lesson titled, "Where We've Been and Where We're Going" would have explained the importance of

⁶⁰ Ibid.

⁶¹ NASA. "STS-51L Press Kit." Washington, D.C.: NASA, 1986, 5.

⁶² Ibid, 23.

⁶³ Ibid, 22.

continuing space exploration along with the benefits of spaceflight.⁶⁴ NASA's funding ultimately originates with the public and its tax dollars, and the continuation of the space program past the end of the space race with the USSR would require public support. A citizen in space could have made the argument for continued space exploration with a sense of unbiased trust and credibility that a NASA employee could never attain, and who better than a teacher to present this case to the public, particularly youth, in a manner easy to understand? Christa McAuliffe would have lived at the center of NASA's effort to reinvigorate public support for manned spaceflight, had Space Shuttle Challenger not fallen apart 73 seconds after launch.⁶⁵

Challenger marked an irreversible turning point for the future of humans in space. Until then, the creation of a sense of connection between the public and the space program was accomplished in large part through personal identification with astronauts and their experiences. The public was left in horror as the first citizen to fly in the Shuttle, the person whose experiences would have taken all those who remained on the ground into space with her, tragically died along with the rest of the crew of STS-51-L. The close connection with the crew of Challenger made the grief brought on by the disaster especially potent, as the human loss, particularly that of an individual whose launch was preceded with such anticipation, far outweighed that of any payload or mission. In the state of Kansas, the personal connection that had been fostered with their own native astronauts was employed to channel the sorrow of the public.

In a January 28th, 1986, edition of the *Manhattan Mercury*, Kansas Governor John Carlin evoked this connection with Joe Engle, Ron Evans, and Steven Hawley, when he said, "We, as Kansans, felt particularly close to the space program because these three native sons are directly a part of that space program... Even though no Kansan was involved in this tragedy today, the impact is felt by Kansans with the rest of the nation through [their] involvement."⁶⁶ The relationships formed with astronauts through

⁶⁴ Ibid.

⁶⁵ Rogers Commission. "Report of the Presidential Commission on the Space Shuttle Challenger Accident." Washington, D.C.: U.S. Government Printing Office, 1986, 189.

⁶⁶ "The Manhattan Mercury, January 28, 1986, Page 8."

sharing in their experiences and harnessing the relatability of their human characteristics allowed the public to express their grief with an added level of personal connection. But while these connections we're helpful in coping with the tragedy, the close relationship the American people had formed with Christa McAuliffe had been shattered. After forming this connection, and then having it broken, people were reluctant to get so closely attached to astronauts in the future, and as John Pike of the Federation of American Scientists said in a 1991 issue of the *LA Times* in reference to the possibility of losing another crew, "I don't think people have the stomach for that."⁶⁷

This was not NASA's first disaster. Nearly 20 years prior to Challenger, the young American space program experienced the loss of three astronauts onboard the Apollo 1 test capsule in rehearsal on the ground. Due to an all-oxygen environment and an inward opening hatch, astronauts Gus Grissom, Edward H. White, and Roger B. Chaffee died in what was intended to be a routine exercise.⁶⁸ But the fallout from this disaster was minimal compared to the aftermath of the Challenger breakup. Following the Apollo disaster, NASA doubled down on its efforts for "early achievement of the lunar landing objective" to conserve future costs despite the setback.⁶⁹ This can be attributed to several factors, the first of which being the fact that this was not a highly anticipated mission, but rather a ground test. There was practically no publicity surrounding Apollo 1, as opposed to the months of anticipation preceding Challenger's launch from the announcement of the Teacher in Space program.

Furthermore, all three astronauts who died in Apollo 1 were military personnel, a group of people whose deaths, albeit unfortunate, typically do not evoke as much public uproar as that of civilians. And finally, there were different expectations surrounding America's space program in these early days of spaceflight. There was an expectation of risk, lending to the characterization of the first astronauts as

⁶⁷ Dunn, Marcia. "Shuttle Tragedy's Lesson Still Fresh 5 Years Later : NASA: Challenger Explosion Showed the Space Agency Was Ignoring Problems. Some Have Been Remedied, but Experts Place Odds of Losing Another Craft at 1 in 100.," Los Angeles Times, January 27, 1991.

⁶⁸ Mars, Kelli. "55 Years Ago: The Apollo 1 Fire and its Aftermath." NASA. February 3, 2022. Accessed April 10, 2023. <https://www.nasa.gov/feature/55-years-ago-the-apollo-1-fire-and-its-aftermath>.

⁶⁹ "NASA Apollo Mission Apollo-1-- Effects Of The Apollo 204 Accident On Schedule And Cost Of The Apollo Program," accessed April 1, 2023, <https://history.nasa.gov/Apollo204/effects.html>.

daring explorers putting their lives on the line. But as Eileen Hawley noted, NASA publicity related to the Shuttle talked about it in terms of how "routine" it would make spaceflight, how it would democratize space.⁷⁰ The Space Shuttle was expected to possess a level of safety and reliability unparalleled by prior vehicles, making its breakup all-the-more a shock to the public.

All these factors combined to create two distinct events with two radically different outcomes. In the wake of an unexpected accident on the ground in a time where every NASA vehicle was inherently experimental, there was room in the public's heart for continuing to push the boundaries. Discussions in Congress over the loss of the crew acknowledged the fire as a tragedy, but in contrast to the Challenger disaster 19 years later, generally expressed a desire to push forward with Apollo. Invigorated with a desire to honor their loss, representatives such as Thomas Pelly and Basil Whitener summarized the prevailing feeling that the US should "justify that loss" and "push forward with the Apollo 1 mission, [the astronauts] would want it that way."⁷¹ At this time, the focus was on the future rather than reflecting on the past. But when the expectation of safety and routineness had been established, and when a teacher whose presence was supposed to demonstrate this reliability tragically died, the American people did not want to continue to push the limits of spaceflight. They wanted to know how this could have been allowed to happen.

When the individual astronauts themselves played a central role in the space program's efforts to reach the heart of the American people, there was the risk of heartbreak. Perhaps this is why there would be no initiatives quite like the "Teacher in Space" program during the Shuttle's career following Challenger, as the PR repercussions from losing another individual as beloved as McAuliffe would have been unbearable. Though a schoolteacher would eventually fly to space in 2007, she had gone through

⁷⁰ Eileen Hawley, Interviewed by author, 2023.

⁷¹ *Congressional Record* 113 (1967): 1787-1869

years of additional training and by then, the focus on civilian spaceflight had shifted away from NASA towards private commercial initiatives such as those we see today in the space tourism market.⁷²

The cost that Challenger imposed on the space program far outweighed that of the Apollo 1 fire. The Shuttle program was grounded for 2 ½ years following the disaster. NASA's 1987 budget escalated to levels not seen since the Apollo Program to cover the investigation into the disaster, a great expense with zero flights to show for it.⁷³ Before the disaster, the Shuttle was beginning to demonstrate the routine flight schedule it had promised at its inception, with plans to begin a phase of reduced operational costs.⁷⁴ The goal of 24 flights per year was replaced by the need to build a new orbiter, and the costs this would incur led to a much more reserved approach by NASA to the capabilities of the Shuttle in its plans for future missions.⁷⁵ Congress was also concerned about what Challenger meant for future investment in the space program. Senator McConnell raised the question of whether the disaster was an indication that "our sights [were] too high, the cost too great." And while no one had forgotten the Apollo 1 disaster from 19 years prior, Senator Paula Hawkins acknowledged the fact that seven American had lost their lives on "perhaps the most publicized flight" to date, the magnitude of the loss was markedly greater.⁷⁶

When manned spaceflight resumed, NASA was hesitant to push any ambitious programs with a primary focus on building a personal connection with their astronauts, and media outlets shifted their focus away from the spacefarer themselves. An analysis of the use of the terms "astronaut" and "NASA" in newspaper publications from Kansas in the years before and after Challenger reflects this trend,

⁷² Daugherty, Greg. "The Challenger Disaster Put an End to NASA's Plan to Send Civilians Into Space." Smithsonian Magazine. Accessed February 21, 2023. <https://www.smithsonianmag.com/history/challenger-disaster-put-end-nasas-plans-send-civilians-space-180957922/>.

⁷³ "History of the NASA Budget - Aerospace Security Project - CSIS," Aerospace Security, September 1, 2022, <https://aerospace.csis.org/data/history-nasa-budget-csis/>.

See Appendix for graph of NASA budget over time.

⁷⁴ "United States Congressional Budget Office. 'Reducing the Deficit: Spending and Revenue Options.' Congressional Budget Office, Government Printing Office, 1987, <https://www.cbo.gov/sites/default/files/100th-congress-1987-1988/reports/doc04a.pdf>."

⁷⁵ Ibid.

⁷⁶ *Congressional Record* 132, no. Number 5 (1/28/1986): S351-S388.

suggesting that while discussion of NASA's activities remained consistent with their pre-Challenger levels, the focus on the astronauts themselves waned significantly in the decade to follow.⁷⁷

“Up to Space” and “Down to Earth” in a New Age of Spaceflight

Section I: The Personification of Machines

To this day, there has been no manned spaceflight initiative created by NASA that rivaled the level of PR risk they put into the Teacher in Space program. Convincing the American people of the space agency's importance was still as critical as it ever was. However, taking big risks in human spaceflight was no longer in the playbook. A more reserved approach to their astronaut program meant that the human side of the space program would become supplementary to the main focus: the science and technology that went to space.

Take the Hubble space telescope an example. It is a unique instrument which has enabled the public to be brought “up to space” in a manner never before achievable. With vivid colorized imagery, it allowed people to see distant worlds once only imagined in the minds of artists and writers. The advent of the internet allowed such imagery to spread even more rapidly, and though it was launched over 25 years ago, it continues to produce material that captures considerable public attention and has maintained a place in the minds of the American people far longer than most astronauts' careers and without the risk of a human on board. The Voyager probes accomplished a similar objective as they sent back images of our solar system in the late 1970s with unprecedented quality. In the near decade gap between the end of Apollo and the start of the Shuttle era, Voyager offered the world a never-before-seen viewpoint of our planetary neighbors, maintaining the personal connection to space in a time when there were no American astronauts who could do so.

Steven Hawley, who flew both with Hubble's during its deployment and later returned on a servicing mission, reflected on the position Hubble had in the eye of the public and the new world of

⁷⁷ See Appendix for data from Newspapers.com

modern mass communication. When he was giving interviews to the press, he “wanted to talk about what we [NASA] were actually doing and why it was important. So, a question like ‘what do you hope that the Hubble Space Telescope can achieve?’ would be a question that [he] wanted to answer.”⁷⁸ Eileen Hawley discussed how Hubble had achieved its own level of celebrity along with several other robotic space explorers, saying, “Let's not discount the popularity of the Mars Rovers. Robotic craft are pathfinders for humans, and in the case of the Mars Rovers, JPL did a tremendous job of giving them personality - they had names, they had twitter accounts. In short, they gave them "life" and people embraced them.”⁷⁹

Section II: New Age of Astronauts

But this is not to say that the place of astronauts as a bridge between space and the public has been relegated to the past. On the contrary, the rise of private spaceflight industries has led to a new sense of openness in the coverage of spaceflight-related material. In a similar vein to what NASA had imagined to accomplish through sending a journalist to space, the private “dearMoon” project, created and funded by Japanese billionaire and space tourist Yusaku Maezawa, aims to bring a crew of creative artists from a wide range of backgrounds on a trip around the Moon. Among them will be visual artists, musicians, writers, and crucially, communicators such as Tim Dodd, also known by his handle “Everyday Astronaut.” He has made a career out of promoting interest in space exploration and educating the public about space history, rocket design, and modern developments in spaceflight technology. He has been chosen to be a part of the upcoming “dearMoon” mission, in which he will fly to space onboard the SpaceX Starship rocket. His stated mission to bring “space down to Earth for everyday people,” demonstrates how despite changes in the space industry, it is still those who fly to space who are best equipped to form a connection between audiences and spaceflight.⁸⁰

⁷⁸ Dr. Steven Hawley, Interviewed by author, 2023.

⁷⁹ Eileen Hawley, Interviewed by author, 2023

⁸⁰ “Meet the dearMoon Crew!,” accessed April 10, 2023, <https://dearmoon.earth/>.

One major shift from the past is in the way audiences access and consume information about space. Steven Hawley notes that, “most people who are interested get their information about spaceflight from a source other than the regular press,” primarily through social media.⁸¹ “Astronauts have their own accounts where they can share their experiences immediately with their followers,”⁸² stated Eileen Hawley, and it is this new age of social media and astronaut-created content, along with the expanding ability for civilians to go to space, which has allowed people such as Tim Dodd to push the frontier of how space is brought “down to Earth” for the public. The role once held by newspapers has largely been taken over by individual citizens, down-to-Earth regular folks who, through missions such as “dearMoon,” are able to provide the rest of the world a new lens through which to experience and appreciate the exploration of space.

The creation of a personal connection has been the central goal of the relationship between NASA and the press throughout the history of spaceflight. These two strategies of bringing the audience “up to space” and the astronauts “down to Earth” built on each other to give an audience of people who may never leave Earth a vicarious experience of spaceflight through the eyes of individuals who, though astronauts, remained grounded by a frame of relatability and honesty. Though the mediums of media consumption have changed over time, the coverage of manned spaceflight will continue to be an indispensable element of NASA’s PR effort and, as Eileen Hawley concludes, “astronauts remain the best spokespeople for why the exploration of space is important.”⁸³

⁸¹ Dr. Steven Hawley, Interviewed by author, 2023.

⁸² Eileen Hawley, Interviewed by author, 2023.

⁸³ Ibid.

Bibliography

“Apollo 17 Flight Journal - Day 4, Part 1: Clock Update,” accessed November 22, 2022,

https://history.nasa.gov/afj/ap17fj/09_day04_part1_clock_update.html.

“Boeing News, Volume 48, Number 28, Page 4, 1989.”

Bowman, Geoffrey. "*A Long Voyage to The Moon: The Life of Naval Aviator and Apollo 17 Astronaut Ron Evans*." In *Outward Odyssey: A People's History of Spaceflight*, edited by Colin Burgess, 291-322. Lincoln: University of Nebraska Press, 2021.

Congressional Record 107 (1961): 6334–43.

Congressional Record 113 (1967): 1787–1869.

Congressional Record 132 (1986): S351–88.

Daugherty, Greg. "The Challenger Disaster Put an End to NASA’s Plan to Send Civilians Into Space."

Smithsonian Magazine. Accessed February 21, 2023.

<https://www.smithsonianmag.com/history/challenger-disaster-put-end-nasas-plans-send-civilians-space-180957922/>.

Dr. Steven Hawley, Interviewed by author, 2023.

Dunn, Marcia. “Shuttle Tragedy’s Lesson Still Fresh 5 Years Later : NASA: Challenger Explosion

Showed the Space Agency Was Ignoring Problems. Some Have Been Remedied, but Experts Place Odds of Losing Another Craft at 1 in 100.,” *Los Angeles Times*, January 27, 1991.

“Engle, Joe H. ‘Joe H. Engle Oral History.’” Interview by Rebecca Wright and Sandra Johnson. NASA Johnson Space Center Oral History Project, March 14, 2006.

Geppert, Alexander. *Limiting Outer Space: Astroculture After Apollo*. New York: Palgrave Macmillan, 2018.

“Hawley, Steven A. ‘Steven A. Hawley Oral History.’” Interview by Jennifer Ross-Nazzal. NASA Johnson Space Center Oral History Project, October 31, 2016. Accessed April 10, 2023.

“History of the NASA Budget - Aerospace Security Project - CSIS,” Aerospace Security, September 1, 2022, <https://aerospace.csis.org/data/history-nasa-budget-csis/>.

“‘Impact of U.S. and Soviet Space Programs on World Opinion,’ 7 July 1959.” accessed September 20, 2022, <https://history.nasa.gov/sputnik/july59.html>.

John F. Kennedy, "Address at Rice University on the Nation's Space Effort," Speech, Rice University, Houston, September 12, 1962.

“Kansas City Star, July 31, 1983.”

“Kansas City Star, December 8, 1972.”

Mars, Kelli. "55 Years Ago: The Apollo 1 Fire and its Aftermath." NASA. February 3, 2022. Accessed April 10, 2023. <https://www.nasa.gov/feature/55-years-ago-the-apollo-1-fire-and-its-aftermath>.

“Meet the dearMoon Crew!," accessed April 10, 2023, <https://dearmoon.earth/>.

“NASA Apollo Mission Apollo-1-- Effects Of The Apollo 204 Accident On Schedule And Cost Of The Apollo Program,” accessed April 1, 2023, <https://history.nasa.gov/Apollo204/effects.html>.

NASA Space Place. "NASA in the 50 States!" Accessed April 10, 2023.

“NASA. Report of the Space Task Group, 1969. Washington, D.C.: National Aeronautics and Space Administration, 1969.”

NASA. "STS-51L Press Kit." Washington, D.C.: NASA, 1986.

“Neil Armstrong and the X-15,” accessed November 21, 2022, <https://airandspace.si.edu/stories/editorial/neil-armstrong-and-x-15>.

Oberg, Alcestis. *Spacefarers of the '80s and '90s*. Columbia University Press, 1985.

Rogers Commission. "Report of the Presidential Commission on the Space Shuttle Challenger Accident." Washington, D.C.: U.S. Government Printing Office, 1986.

Roshanna P. Sylvester, “‘You Are Our Pride and Our Glory!’ Emotions, Generation, and the Legacy of Revolution in Women's Letters to Valentina Tereshkova,” *The Russian Review* 78, 3 (July 2019): 392-413.

Teasel Muir-Harmony, *Operation Moonglow: A Political History of Project Apollo* (Basic Books, 2020).

“The Manhattan Mercury, January 28, 1986.”

“The Salina Journal, June 30, 1965.”

“The Wichita Beacon, December 10, 1972.”

“The Wichita Eagle, December 11, 1972.”

“The Wichita Eagle, November 13, 1981.”

“United States Congressional Budget Office. ‘Reducing the Deficit: Spending and Revenue Options.’

Congressional Budget Office, Government Printing Office, 1987,

<https://www.cbo.gov/sites/default/files/100th-congress-1987-1988/reports/doc04a.pdf>.”

Walter A. McDougall, *The Heavens and the Earth: A Political History of the Space Age* (New York:

Basic Books, 1985).

Weitekamp, Margaret A. *Space Craze: America’s Enduring Fascination with Real and Imagined*

Spaceflight. 2022.

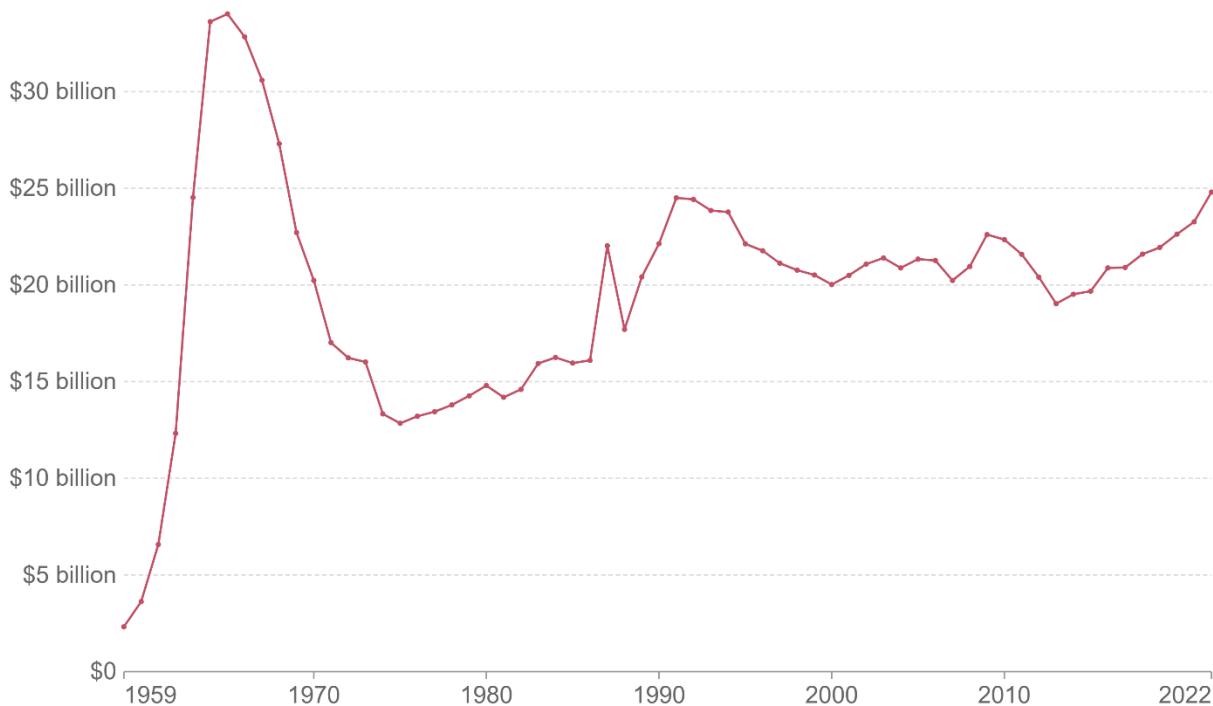
Wolfe, Tom. *The Right Stuff*. New York: Farrar, Straus and Giroux, 1979.

Appendix

NASA Annual Budget:

Annual budget of NASA

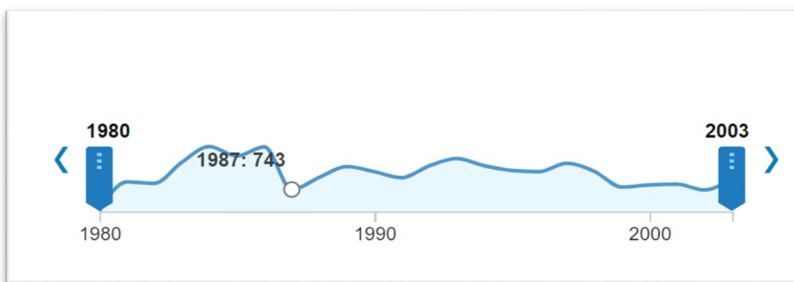
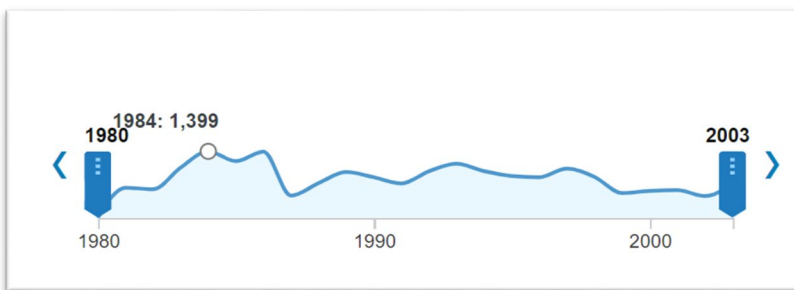
This data is adjusted for inflation.

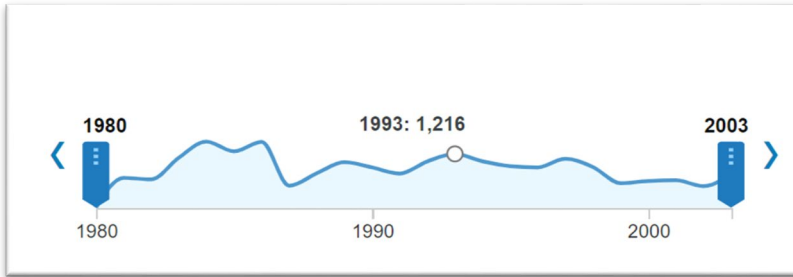


Source: CSIS Aerospace Security Project (2022)

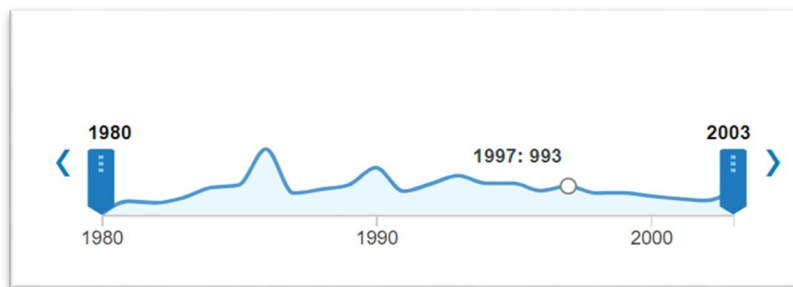
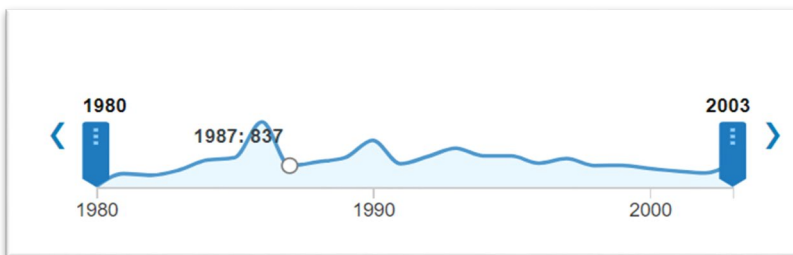
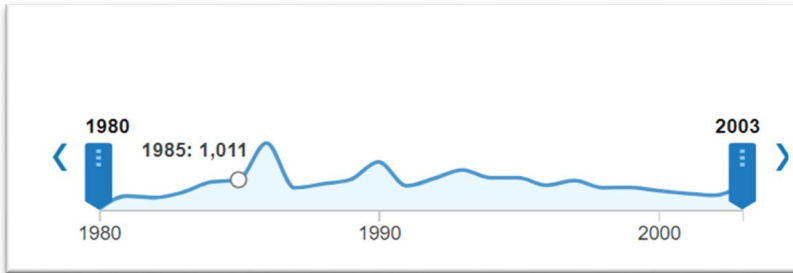
OurWorldInData.org/space-exploration-satellites • CC BY

Use of the term "Astronaut" in Kansas newspapers:





Use of the term "NASA" in Kansas newspapers:



Note: Even in 1997, we still see similar levels of interest NASA's activities as before the Challenger disaster. While the rate of discussion of NASA would recover after challenger and remain relatively consistent through the 1990s, the discussion of the astronauts themselves following the incident would never reach its pre-Challenger height.