“Fire and Ice”

How a Handshake in Space Turned Cold War Agendas from Competition to Cooperation

by

Kacey Manlove

Senior Division

Individual Paper

*Some say the world will end in fire, some say in ice…* Robert Frost

 Between 1945 and 1991, Robert Frost’s “Fire and Ice”presented sobering possibilities as Cold War confrontations dominated world politics. Both America and the Soviet Union postured for superiority in nuclear strength, building armories with potential to annihilate the world in fiery holocaust. October 4, 1957, marked the first major turning point when Sputnik’s launch catapulted the possibility of destruction into space. Their tense competition for nuclear dominance on earth and control of activities in space appeared unsolvable until 1975, when their Cold War space agencies initiated the next major turning point, symbolically transforming American-Soviet relations from conflict to détente as the commanders of their joint Apollo-Soyuz mission reached across space to shake hands. That handshake planted the seed for other cooperative events, first Shuttle-Mir and later the International Space Station, today’s symbol of international cooperation.[[1]](#footnote-1)

When World War II ended in 1945, mutual distrust between America and the Soviet Union led to the dissolution of their wartime alliance. The Soviet Union controlled most of Eastern Europe, condemning America’s interference in the internal affairs of other countries. Western leaders implemented the Truman Doctrine to contain Soviet expansion and the “iron curtain” that had descended over Europe.[[2]](#footnote-2) President Truman’s “rapid and sustained build-up of political, economic, and military strength of the free world” set the stage for the Cold War. [[3]](#footnote-3) Conflicting ideologies and fear of annihilation prompted a deadly arms race between the new “superpowers”; by 1953, both possessed massive nuclear arsenals.[[4]](#footnote-4)

As early as 1938, The House Un-Activities Committee (HUAC) investigated Communist/Fascist activities within America. By 1952, Senator Joseph McCarthy ignited America’s Red Scare, which, coupled with Soviet bomb tests - atomic in 1949 and hydrogen in 1953 – profoundly impacted 1950s America. Public schools created bomb shelters and held “duck and cover” drills. American families built and stocked fallout shelters, and Cold War nightmares dominated American media, see appendix A. Soviets explored ways to shield Moscow against American nuclear attacks.[[5]](#footnote-5)

The Korean Civil War (1950-1953) initiated the first cold war – a proxy war rather than a direct confrontation - between American-backed South Korea and Soviet-backed North Korea. When Soviets supplied North Korea with Soviet tanks and planes, Truman implemented “police action” to support South Korea and stop communist aggression. Wielding America’s superior arsenal as a trump card, President Dwight Eisenhower negotiated a truce for armed peace in 1953. However, this turning point in American-Soviet relations set a precedent for future cold war conflicts in Cuba and Vietnam.[[6]](#footnote-6)

Soviets challenged America’s prominence on October 4, 1957, launching Sputnik, the first intercontinental ballistic missile to reach orbit, see appendix B. Superiority in science and technology had become “key measures of a nation’s military prowess and international strength.”[[7]](#footnote-7) This “October Surprise” alarmed Americans, promoted Soviet socialist society, and re-defined world opinion that America lagged behind the Soviets. To promote peace, President Eisenhower advocated joint space ventures, but Soviets remained unresponsive, and the space race began before America had reached orbit.[[8]](#footnote-8)

To compete, Eisenhower combined America’s existing space programs, and on July 29, 1958, Congress passed the National Aeronautics and Space Act, creating the National Aeronautics and Space Agency (NASA). Eisenhower insisted that America’s space program would focus on researching the problems of flight within and outside the earth’s atmosphere.[[9]](#footnote-9) To increase emphasis on technology and science, Congress enacted the National Defense Education Act, and American schools revised curricula.[[10]](#footnote-10)

 In 1958, the International Council of Scientific Unions met in London, establishing the Committee on Space Research (COSPAR). COSPAR provided an initial bridge between American and Soviet scientists, opening opportunities for informal collaboration on problems affecting scientific space research without the gravity of Cold War political agendas. Inspired by cooperative communication, NASA Administrator, Dr. Keith Glennan, proposed a joint space project with the Soviets on September 8, 1959, to promote détente and solicit participation by other nations, but tensions in Cuba preempted his idea.[[11]](#footnote-11)

In his inaugural speech, January 1961, President John Kennedy proposed that Soviet/American space agencies “explore the stars” together to ease tensions.[[12]](#footnote-12) He reasoned that, to defend peace and freedom, America had to rank first because control over space meant control over earth, but on April 12, 1961, Soviet fighter pilot, Yuri Gagarin, became the world’s first pilot in space on the Vostok. His success reinforced Soviet dominance in space, eliminating incentives for Soviet cooperation. Then Kennedy’s Bay of Pigs invasion in Cuba April 15 - 19, 1961, failed miserably, antagonizing Fidel Castro and Soviet leaders.[[13]](#footnote-13)

The first positive turning point for America occurred the following month when Alan Shepard became the first American in space. Kennedy utilized the event to unite America, challenging NASA to land a man on the moon by the end of the decade. On May 25, Kennedy urged Congress to make a moon landing national priority to “win the battle between freedom and tyranny”[[14]](#footnote-14) and to counteract the increasing appeal of communism. To fulfill his goals, NASA implemented Projects Mercury, Gemini, and Apollo, and John Glenn, Jr. became the first American to orbit Earth on February 20, 1962. Glenn’s success leveled the playing field. In a congratulatory letter to President Kennedy, Khrushchev suggested for the first time that the two countries pool their efforts to advance science for man’s benefit instead of “for ‘cold war’ purposes and the arms race.”[[15]](#footnote-15) Kennedy embraced this turning point, but obstacles stymied progress: NASA was not a military agency; Soviet programs were, their documents classified as top secret. Furthermore, Khrushchev shipped missiles to Cuba in October 1962, initiating another Cold War crisis. For thirteen days of heated negotiations, the world balanced on the brink of nuclear war.[[16]](#footnote-16)

To avoid nuclear holocaust, Kennedy agreed not to invade Cuba if Soviets withdrew.[[17]](#footnote-17) The successful outcome of the crisis allowed Kennedy to employ NASA as a tool for détente in the form of a joint mission to the moon. His chief objectives included prevention of weapons in space and assurance that America’s scientific image and efforts remained at the top. Congress objected, stipulating that no part of NASA’s appropriations could be used for a joint mission without Congressional approval. Furthermore, Khrushchev continued to link Soviet space cooperation with nuclear disarmament. Until his assassination November 22, 1963, Kennedy pursued détente with the Soviets through the Bilateral Space Agreement to prevent nuclear weapons in space and the Limited Test Ban Treaty to stop nuclear testing in the atmosphere, the first diplomatic turning points initiated by East and West to control Atomic Age weapons.[[18]](#footnote-18)

Kennedy’s legacy continued under President Lyndon Johnson, but America’s involvement in Vietnam escalated the second American-Soviet cold war; thus, competition, not cooperation, became the goal. Project Gemini advanced America’s space program, followed by Apollo, and on July 20, 1969, six months after President Richard Nixon’s inauguration, Apollo11 astronauts—Neil Armstrong, Michael Collins, and Edwin "Buzz" Aldrin Jr.—realized President Kennedy's dream, see appendix C. Their moon landing not only marked a turning point, demonstrating to the world that America had won the space race, but also symbolized the first cooperative venture - American astronauts carried to the moon medals awarded posthumously to Cosmonauts Gagarin and Komarov, who had perished in Soviet space-related tragedies. After Apollo’s success, American interest in space exploration waned, and opposition to the expensive program grew, particularly among America’s black population, who wanted funds diverted to alleviate poverty, and members of the American Association for the Advancement of Science, who wanted funds diverted to improve American education. Congress’ willingness to fund space also diminished, and Nixon declared that America’s post-Apollo Program objectives would focus on international cooperation.[[19]](#footnote-19)

American superiority in space provided a bargaining chip for détente with the Soviet Union, and President Nixon approved the Apollo-Soyuz Test Project. Beginning in 1970, this project included joint and separate scientific experiments, beginning with extensive training in both America and the Soviet Union and culminating with the docking of American and Soviet craft in space. According to General Alexey Leonov, this training period began to shift the Russian people’s negative perspective of Americans.[[20]](#footnote-20) On July 15, 1975, Apollo launched carrying astronauts Thomas Stafford, Vance Brand and Donald Slayton; Soyuz launched carrying cosmonauts Alexey Leonov and Valeriy Kubasov. On July 17, Stafford opened the hatch leading to Soyuz, initiating a carefully staged handshake to symbolize a shift in the American-Soviet relationship from competition to cooperation, see appendix D. Soviet President Leonid Brezhnev saluted this turning point, “realized by means of cooperative friendship between Soviet and American scientists, designers, and cosmonauts.”[[21]](#footnote-21) The combined team conducted five joint experiments and exchanged souvenirs, opening “a crack in the door regarding communication between the two superpowers.”[[22]](#footnote-22) To maintain a sense of world community, Nixon’s Space Task Group recommended that post-Apollo programs mirror Apollo-Soyuz by employing joint working groups and utilizing the same procedures and protocols, which, according to General Tom Stafford, “laid the groundwork for the Shuttle-Mir and International Space Station Programs yet to come.”[[23]](#footnote-23) NASA also shifted to the shuttle concept, retiring its single-flight vehicles in favor of reusable models.[[24]](#footnote-24)

After Nixon’s resignation, President Gerald Ford worked with Brezhnev to continue the partnership. Apollo-Soyuz proved the rivals could work together, but Cold War politics and thirty years of negative propaganda complicated the process. President Jimmy Carter feared Soviets would gain American technology and by 1978 closed the door on all docking discussions, focusing instead on control and limitation of nuclear weapons. His support for the shuttle program hinged on its importance to national security and the public attention it attracted.

When President Ronald Reagan took office in 1981, the Soviet invasion of Afghanistan and Reagan’s Strategic Defense Initiative thwarted further collaboration, and Reagan allowed the Space Cooperation Agreement with the Soviets to lapse. In his 1984 inaugural address, Reagan proposed Space Station Freedom, a permanently manned space station. Fearful of Reagan’s “Star Wars” agenda, Congress passed Joint Resolution 236 on October 10, 1984, calling for renewed space cooperation. When Mikhail Gorbachev became Soviet leader in 1985, Reagan agreed to meet. November 1985, they signed an agreement for scientific cooperation, lessening their Cold War tension and refocusing America’s basic goal in space to one of leadership through cooperation. Both Gorbachev and Reagan understood that cooperation in space enabled cost reductions and eliminated duplication of efforts that drained each country’s finances. The Challenger disaster three months later set American space initiatives back for the next several years, but on February 20, 1986, Soviets launched six modules that became the Mir Space Station, subsequently leading to a five year agreement on space cooperation in April 1987. Although Apollo-Soyuz’s technical impact had been negligible, its symbolic importance had been pivotal in Reagan’s decision to proceed with the space station.[[25]](#footnote-25) Furthermore, Shuttle-Mir exhibited the reversal of former Cold War agendas, from secrecy to open communication and cooperation between the two space agencies.[[26]](#footnote-26)

President George H. W. Bush expanded cooperation between American and Soviet space agencies, providing employment opportunities on non-military projects for Russian scientists and engineers and giving American industry access to Soviet space technologies. In April 1989, Bush established The National Space Council to direct America’s space initiative in the post-Cold War era. In November, the Cold War’s most visible symbol, the Berlin Wall, came down; on December 8, 1991, the Soviet Union ceased to exist. President Bush feared that Russian space scientists and engineers with nuclear expertise might, because of Russia’s economic problems, offer their knowledge to Third World dictatorships that wanted to build nuclear weapons. As a result, in October 1992, America and the Russian Federation signed the Implementing Agreement on Human Space Flight Cooperation, initiating joint missions with cosmonauts aboard space shuttles and astronauts aboard Mir and allowing for American purchases of Russian space services. The mission included a joint docking of Mir and the Space Shuttle by 1995.

At the 1993 Clinton-Yelsin summit meeting, newly elected President Bill Clinton proposed the idea of merging American and Russian space programs to develop a space station. His goal was to support Russian reforms, using space programs to promote Western values, and to help Russia maintain its status as a leader in human space flight. Clinton’s proposal resulted in a turning point in Russian manufacturing, shifting production from “weapons for the Russian military to products for Western companies” supporting the space station.[[27]](#footnote-27)

Cosmonaut Sergei Krikalev flew on the Space Shuttle Discovery, February 1994, and from 1995 – 1998 seven American astronauts worked with Russian cosmonauts aboard Mir, paving the way for the International Space Station (ISS), which began construction in 1998. On October 31, 2000, the first station crew, consisting of Russian cosmonauts Yuri Gidzenko and Sergei Krikalev and American astronaut Bill Shepherd arrived on a Russian-Soyuz spacecraft; since then at least three researchers have stayed in orbit around Earth. Collaboration between fourteen international partners now symbolizes peaceful international cooperation.[[28]](#footnote-28)

For the first twenty years of the Cold War, the idea of global leadership and the need to demonstrate space superiority guided American and Soviet space programs. Early Soviet achievement in space set America’s priorities. Cooperation was offered and rejected. Competition in space and conflicts on the ground influenced the political ideologies of both countries, and nuclear annihilation hovered during each bitter conflict. The rest of the world balanced between fire and ice: would nuclear weapons or hatred end the world as they knew it? Only after fulfilling Kennedy’s dream of landing a man on the moon, signaling a clear win in the Space Race, did America have a viable bargaining chip with which to engage the Soviets in cooperative efforts.

Though Apollo-Soyuz initially represented a carefully choreographed, symbolic handshake between Cold War rivals, its significance as a turning point in history still impacts the world today. This one event planted the seed for cooperation, creating a small crack in the Iron Curtain. While Cold War leaders, events, and ideas placed the world on a political roller-coaster, Apollo-Soyuz opened a back door to détente between American and Soviet Space agencies, enabling both nations to shift objectives from competition to cooperation once the Cold War ended.[[29]](#footnote-29) Shuttle-Mir and the International Space Station mirror their progenitor and embrace the idea behind the symbolic handshake. Today, the space station’s laboratories conduct experiments in science and technology, study fluids and combustion, and utilize microgravity to grow vaccines that are purer than any that can be made on Earth.[[30]](#footnote-30) Although the full significance of these experiments may take decades to determine, their impact has already prompted significant improvements in the fields of health, medicine, science, technology, education, farming, and weather. Apollo-Soyuz proved that the idea of international cooperation would work; its offspring now provides the stage from which many nations are learning how to live and work together in space for the good of mankind.

1. Hans Mark, interview by author, March 18, 2013; Kirk Shireman, interview by author, March 11, 2013. [↑](#footnote-ref-1)
2. Sergei Khrushchev, *Memoirs of Nikita Khrushchev: Statesman 1953 – 1964* (University Park, PA: The Pennsylvania State University Press, 2007), 31; David Rees, *The Age of Containment: The Cold War* (New York: St. Martin’s Press, 1967), 23; Robert Rhodes James, ed., *Winston S. Churchill: His Complete Speeches 1897-1963 Volume VII: 1943-1949* (New York: Chelsea House Publishers, 1974), 7285-7293. [↑](#footnote-ref-2)
3. Report to the National Security Council, April 12, 1950, President's Secretary's Files, Truman Papers. *Harry S. Truman Library and Museum,* [http://www.trumanlibrary.org/whistlestop/study\_collections/coldwar/ documents/sectioned.php?documentid=10-1&pagenumber=1&groupid=1](http://www.trumanlibrary.org/whistlestop/study_collections/coldwar/%20documents/sectioned.php?documentid=10-1&pagenumber=1&groupid=1) (accessed December 15, 2012). [↑](#footnote-ref-3)
4. William T. R. Fox, *Superpowers: the United States, Britain, and the Soviet Union,* (New York: Harcourt Brace, 1944). [↑](#footnote-ref-4)
5. “Living Under a Mushroom Cloud: Fear and Hope in the Atomic Age,” *The Wisconsin Historical Museum,* <http://www.wisconsinhistory.org/museum/atomic/fear.asp> (accessed December 15, 2012); “Cold War and American Society,” [http://admin.bhbl.neric.org/~mmosall/ushistory/textbook/Chapter%2026%20Cold %20War%20Begins/ ch%2026%20sect%203%20American%20Society.pdf](http://admin.bhbl.neric.org/~mmosall/ushistory/textbook/Chapter%2026%20Cold%20%20War%20Begins/%20ch%2026%20sect%203%20American%20Society.pdf) (accessed November 22, 2012); David Roipeik, “The Rise of Nuclear Fear,” *Scientific American,* June 15, 2012*,* <http://blogs.scientificamerican.com/guest-blog/2012/06/15/the-rise-of-nuclear-fear-how-we-learned-to-fear-the-bomb> (accessed December 15, 2012); Boris Chertok, *Rockets and People: Hot Days of the Cold War, Vol. 3.* ed. Asif Siddiqi (Washington, DC: NASA SP-2009-4110, 2009), 12. [↑](#footnote-ref-5)
6. “Harry S. Truman – Foreign Policies,” *Profiles of U. S. Presidents,* [http://www.presidentprofiles.com/ Grant-Eisenhower/Harry-S-Truman-Foreign-policies.html](http://www.presidentprofiles.com/%20Grant-Eisenhower/Harry-S-Truman-Foreign-policies.html) (accessed November 5, 2012); Chertok, *Rockets and People,* 30-39. [↑](#footnote-ref-6)
7. Pamela Flattau, et al., “The National Defense Education Act of 1958: Selected Outcomes,” *Institute for Defense Analysis*, Document D-3306. Science & Technology Policy Institute, 2006. [↑](#footnote-ref-7)
8. William J. Jorden, “Soviet Fires Earth Satellite into Space,” *New York Times,* October 5, 1957; “Space Race,” <http://library.thinkquest.org/21149/exploration/spaceright.htm> (accessed December 13, 2012). Eisenhower to Nikita Khrushchev, April 8, 1958, in Gerhard Peters and John T. Woolley, *The American Presidency Project,* <http://www.presidency.ucsb.edu/ws/?pid=11342> (accessed January 12, 2013); F. J. Krieger, “Announcement of First Satellite,” *Pravda,* October 5, 1957, <http://www.nebraskastudies.org/0900/stories/0901_0105_02.html> (accessed December 20, 2012; “Space: Face the Race,” *Time,* February 1, 1960, [www.time.com/time/magazine/article/0,9171 ,826033.00.html](http://www.time.com/time/magazine/article/0%2C9171%20%2C826033.00.html) (accessed March 1, 2013). [↑](#footnote-ref-8)
9. “American Reactions to Crisis,” <http://www.nebraskastudies.org/0900/stories/0901_0105_04.html> (accessed December 14, 2012); Memorandum for Chairman, Joint Chiefs of Staff Regarding Coordination of Satellite and Space Vehicle Operation, July 24, 1959. (DDE’s Records as President, Confidential File, Box 44, NASA (7). *Dwight D. Eisenhower Presidential Library and Museum.* [http://www.eisenhower.archives.gov/ research/online\_ documents/nasa.html](http://www.eisenhower.archives.gov/%20research/online_%20documents/nasa.html) (accessed December 13, 2012); Memorandum of Conference with the President, Dr. Killian, et al., March 5, 1958. (DDE’s Papers as President, DDE Diary Series, Box 31, Staff Notes March 1958 (2). *Dwight D. Eisenhower Presidential Library and Museum.* [http://www.eisenhower.archives.gov/ research/online\_ documents/nasa.html](http://www.eisenhower.archives.gov/%20research/online_%20documents/nasa.html) (accessed December 13, 2012). [↑](#footnote-ref-9)
10. Minutes of Cabinet Meeting, May 15, 1959. (DDE’s Papers as President, Cabinet Series, Box 13),

*Dwight D. Eisenhower Presidential Library and Museum,* [http://www.eishehower.archives.gov/research/ online\_documents/nasa.html](http://www.eishehower.archives.gov/research/%20online_documents/nasa.html) (accessed December 13, 1012); “Federal Role in Education,” *U.S. Department of Education.* [http://www2.ed.gov/about /overview/fed/role.html](http://www2.ed.gov/about%20/overview/fed/role.html) (accessed December 14, 2012). [↑](#footnote-ref-10)
11. “Committee on Space Research (COSPAR),” <http://cosparhq.cnes.fr/About/about.htm> [accessed January 5, 2013; Dr. Glennan to President Eisenhower Regarding Proposal to the Soviet Union, Relating to Cooperation in Space Research, September 8, 1959. (DDE’s Papers as President, Administration Series, Box 15, Dr. Keith Glennan-NASA). *Dwight D. Eisenhower Presidential Library and Museum.* [http://www.eisenhower.archives.gov/ research/online\_documents/nasa.html](http://www.eisenhower.archives.gov/%20research/online_documents/nasa.html) (accessed December 13, 2012). [↑](#footnote-ref-11)
12. Kennedy, Inaugural Address, January 20, 1961. **Accession Number:** USG-17. *John F. Kennedy Presidential Library and Museum* [http://www.jfklibrary.org/Asset-Viewer/BqXIEM9F4024nt Fl7SVAjA. aspx?gclid=CLmKs5DXmLUCFYGpPAodym8AJg](http://www.jfklibrary.org/Asset-Viewer/BqXIEM9F4024nt%20Fl7SVAjA.%20aspx?gclid=CLmKs5DXmLUCFYGpPAodym8AJg) (accessed December 15, 2012). [↑](#footnote-ref-12)
13. “Bay of Pigs.” *John F. Kennedy Presidential Library and Museum,* http://www.jfklibrary.org /JFK/JFK

in-History/The-Bay-of-Pigs.aspx (accessed December 14, 2012). [↑](#footnote-ref-13)
14. Kennedy, “Speech Regarding the Race to the Moon,” Rice University Stadium, Houston, Texas, September 12, 1962 http://www.historyplace. com/speeches/jfk-space.htm (accessed December 14, 2012); Kennedy, Address to Joint Session of Congress, May 25, 1961 [www.space.com/11772-president-kennedy-historic-speech-moon-space.html](http://www.space.com/11772-president-kennedy-historic-speech-moon-space.html) (accessed December 6, 2012). [↑](#footnote-ref-14)
15. Khrushchev to Kennedy, February 21, 1962, *Documents on International Aspects of the Exploration and Use of Outer Space, 1954-1962,* 88th Cong., 1st sess., 1963, 232. [↑](#footnote-ref-15)
16. Boris Chertok, *Rockets and People, Creating a Rocket Industry. Vol. II:* Ed. Asif Siddiqi. (Washington, DC: NASA SP-2006-4110, 2006), xi; President Kennedy to Nikita Khrushchev, March 7, 1962, (Papers of John F. Kennedy, Series 9, President’s Office Files, #JFKPOF-126-015). *John F. Kennedy Library and Museum,* [http://www.jfklibrary.org/ Asset-Viewer/Archives/JFKPOF-126-015.aspx](http://www.jfklibrary.org/%20Asset-Viewer/Archives/JFKPOF-126-015.aspx) (accessed December 30, 2012); Sergei Khrushchev, *Memoirs of Nikita Khrushchev: Statesman 1953 – 1964,* (University Park, PA: The Pennsylvania State University Press, 2007), 244, 337, 343. [↑](#footnote-ref-16)
17. Khrushchev to Fidel Castro, October 28, 1962, *The National Security Archive, The George Washington University,* http://www.gwu.edu/~nsarchiv/nsa/cuba\_mis\_cri/19621028caslet.pdf (accessed January 5, 2013). [↑](#footnote-ref-17)
18. Eugene Kranz, interview by author, March 24, 2013; “Cold War: A New Temperature,” *Time,* August 2, 1963, [www.time.com/time/subscriber/printout/ 0,8816,870319,00.html](http://www.time.com/time/subscriber/printout/%200%2C8816%2C870319%2C00.html) (accessed March 2, 2013); “Kennedy Proposal for a Joint Moon Flight,” *The Partnership: A History of the Apollo-Soyuz Test Project, NASA,*  www.hq.nasa./gov/pao/History/SP-4209ch2-4.htm (accessed March 13, 2013); “World: The Start of SALT,” *Time,* November 21, 1969, [www.time.com/time/subscriber/ printout/0,8816,841628,00..html](http://www.time.com/time/subscriber/%20printout/0%2C8816%2C841628%2C00..html) (accessed March 16, 2013). [↑](#footnote-ref-18)
19. Courtney G. Brooks, James M. Grimwood, and Lloyd S. Swenson, Jr., *Chariots for Apollo: A History of*

*Manned Lunar Spacecraft,* (Washington, D.C.: U. S. Government Printing Office, 1979); “The Moon: Awe, Hope, and Skepticism on Planet Earth,” *Time,* July 25, 1969, [www.time.com/time/subscriber/printout/0,8816,901 105,00.html](http://www.time.com/time/subscriber/printout/0%2C8816%2C901%20105%2C00.html) (accessed March 2, 2013); “Space: To Moon or Not to Moon,” *Time,* May 31, 1963. [www.time.com/time/subscriber/printout/0,8816,896833,00.html](http://www.time.com/time/subscriber/printout/0%2C8816%2C896833%2C00.html) (accessed March 16, 2013). [↑](#footnote-ref-19)
20. General Alexey Leonov, email interview with author, May 8, 2013. [↑](#footnote-ref-20)
21. Seven J. Dick and Roger D. Launius, eds. *Societal Impact of Spaceflight,* (Washington, D.C.: National Aeronautics and Space Administration, 2007), 96; Edward Clinton Ezell and Linda Neuman Ezell, *The Partnership: A History of the Apollo-Soyuz Test Project,”* (Washington, D.C.: U. S. Government Printing Office, 1978), 329. [↑](#footnote-ref-21)
22. “Former Astronaut Recalls Historic Apollo-Soyuz Mission,” *NASA,* NASA Dryden News Releases, July 21, 2000. <http://www.nasa.gov/centers/dryden/news/NewsReleases/2000/00-53_pf.html> (accessed March 8, 2013). [↑](#footnote-ref-22)
23. Lt. General Tom Stafford, interview by author, May 7, 2013. [↑](#footnote-ref-23)
24. “Epilogue,” *NASA,* <http://www.hq.nasa.gov/pao/History/SP-4209/epilog.htm> (accessed March 13, 2013). [↑](#footnote-ref-24)
25. Roald Sagdeev and Susan Eisenhower, “United States-Soviet Space Cooperation During the Cold War.” May 28, 2008, [www.nasa.gov/50th/50th\_magazine/coldWarCoOp.html](http://www.nasa.gov/50th/50th_magazine/coldWarCoOp.html). (accessed December 18, 2012); Dr. Hans Mark, *The Space Station: A Personal Journey,* (Durham: Duke University Press, 1987), 45. [↑](#footnote-ref-25)
26. Maj. General Joe Engle, interview by author, May 7, 2013. [↑](#footnote-ref-26)
27. John M. Logsdon and James R. Millar, eds., “U.S.-Russian Cooperation in Human Space Flight: Assessing the Impacts,” *Institute for European, Russian and Eurasian Studies,* Elliott School of International Affairs, (Washington, D.C.: George Washington University), February 2001. [↑](#footnote-ref-27)
28. Shireman. [↑](#footnote-ref-28)
29. Stafford. [↑](#footnote-ref-29)
30. Shireman. [↑](#footnote-ref-30)