

9. Transcript: Courtesy NASA, time code 04:14:15:06.
10. Transcript: Courtesy NASA, time code 04:14:13:42.
11. Transcript: Courtesy NASA, time code 04:13:51:30.
12. Transcript: Courtesy NASA, time code 04:14:08:55.

EVA is the NASA abbreviation for Extra-Vehicular Activity. EVA is also called a “space walk.” The first EVA was by Soviet cosmonaut Aleksei Leonov on March 18, 1965; he was tethered to the Voskhod 2 spacecraft. The first American astronaut to “go EVA” was Ed White on June 4, 1965; he was tethered to the Gemini IV capsule. The first woman to go EVA was Soviet cosmonaut Svetlana Savitskaya on July 25, 1984; she was tethered to the Salyut 7 space station. The first non-tethered EVA was by American astronaut Bruce McCandless on February 7, 1984, during Space Shuttle *Challenger* mission 41-B.

Tethered or not, “going EVA” is very dangerous. The primary danger is collision with micrometeoroids and space debris. Micrometeoroids are high velocity fragments from passing comets that are as small as a grain of sand, and they can easily puncture an astronaut’s spacesuit. Space debris is trash that has been left in Earth orbit by decades of space exploration and satellite launches. In Anthony’s time, there are millions of fragments of rocket bodies, spacecraft parts, paint chips, and lost equipment in Earth’s orbit. Space debris objects larger than ten centimeters in diameter are tracked by NASA radar so that satellites and space shuttles can steer around them.

13. After the launch of Sputnik in 1957, millions of people went out at night to spot the lone artificial satellite. Even with the naked eye, it is easy to see a satellite moving through the night sky because it reflects the light of the sun and moves with constant speed. In Anthony’s time, thousands of satellites orbit the earth and it’s easy to spot one every few minutes on a clear night.
- ✓ **Anthony Recommends:** *Secrets of the Night Sky*, by Bob Berman [006097687X, NF, MS+].
14. The man most responsible for the Soviet Union’s early success in space was Sergey Korolev. In 1933, Korolev directed the launch of the first liquid-propelled rocket in the Soviet Union, and it looked as though he would lead the Soviet Union’s rocket research programs. Then, in 1938, his boss was accused of treason and executed. Korolev was sentenced to ten years hard labor in a gold mine in Siberia. Half-way through his prison sentence, Korolev was released and ordered to develop rockets for the Soviet Army during World War II. In 1957,

Korolev created and tested the world’s first intercontinental ballistic missile (ICBM); it was Korolev’s ICBM engine technology that put Sputnik into orbit. In the 1960s, Korolev directed the Soviet Union’s Soyuz manned space missions. The Soviet Union kept Korolev’s role in its space program secret until his death in 1966.

For the record, here are some American space program achievements: The first American in space was Alan Shepard on May 5, 1961. The first American to orbit the earth was John Glenn on February 20, 1962. The first American to walk in space was Ed White on June 4, 1965. The first man to stand on the moon was Neil Armstrong on July 20, 1969. The first American woman to go into space was Sally Ride on June 18, 1983.

15. Courtesy NASA History Office.
16. “Kennedy to Johnson Memorandum re: Space Program,” 4/20/1961, courtesy JFK Library/U.S. National Archives and Records Administration (hereafter cited as: NARA).
17. “Special Message to the Congress on Urgent National Needs,” 5/25/1961, courtesy JFK Library/NARA.
18. Ibid.
19. Ibid.
20. “Address at Rice University on the Nation’s Space Effort,” 9/12/1962, courtesy JFK Library/NARA.
21. Anthony didn’t know it, but there was a significant debate over whether or not the Apollo 11 astronauts should plant the United States flag on the moon. The debate had its roots in the 1967 United Nations Outer Space Treaty signed by the United States. Article II of the treaty states: “Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means. . . .” Planting the U.S. flag on the moon, some people argued, constituted national appropriation. They suggested that the astronauts should plant the United Nations flag on the moon, instead. The U.S. Congress settled the issue on June 10, 1969, when it informed NASA that only the American flag would be raised on the moon. Congress made its decision law [PL.91–119, 83 Stat.202, 11/18/1969] with the following words: “The flag of the United States, and no other flag, shall be implanted or otherwise placed on the surface of the moon, or on the surface of any planet . . . as a part of a mission under any subsequent program, the funds for which are provided entirely by the

Government of the United States. This act is intended as a symbolic gesture of national pride in achievement and is not to be construed as a declaration of national appropriation.”

In 1980, American Dennis Hope staked a claim to the surface of the moon, and to the surfaces of all of the other eight planets (and their moons) in the solar system. Hope reasoned that the 1967 United Nations Outer Space Treaty gave him the legal right to stake a claim to solar system real estate because although the treaty forbade “national appropriation” of the moon (and planets), it neglected to mention whether or not individuals could own such property. Citing the precedent set by American western frontier settlers, Hope staked his claim. Hope also formed the Lunar Embassy Corporation to sell solar system real estate to interested buyers and land speculators.

22. Transcript: Courtesy NASA, time code 04:14:15:47.
- The aircraft carrier USS *Hornet* recovered the Apollo 11 astronauts when they splashed down in the ocean on July 24, 1969.
- ✓ **Anthony Recommends:** The USS *Hornet* Naval Museum [Alameda, CA, 510-521-8448, www.uss-hornet.org].
23. “Joint Meeting of the Two Houses of Congress to Receive the Apollo 11 Astronauts,” *The Congressional Record*, 9/16/1969. Reprinted courtesy of *The Congressional Record*. Hereafter cited as: Courtesy CR: 9/16/1969.
24. Transcript: Courtesy NASA, time code 07:09:34:44.
25. Author Tom Wolfe coined the term, “The Right Stuff,” when he titled his book about the test pilots and astronauts who started the U.S. space program.
- One man widely credited with helping the American space program become a success is Wernher von Braun. Von Braun developed rocket weapons for Nazi Germany during World War II. Fearing capture by the Soviet Army at the end of the war, von Braun loaded three hundred railroad boxcars with top-secret German rocket program documents, put his team of engineers aboard the train, and delivered the train into American hands. Von Braun became a U.S. citizen in 1955. Working for NASA, von Braun developed the rockets that carried men into space. Von Braun also wrote books describing space stations, space shuttles, and manned missions to Mars. The books were so popular that Walt Disney collaborated with von Braun to produce television programs dramatizing America’s future in space.
- ✓ **Anthony Recommends:** *Tomorrowland: Disney in Space* [2003, D, NR].

26. If Anthony had spent more time at NASA with the Mercury Seven, he might have run into the “Mercury Thirteen.” In 1960, NASA began a research program to determine whether women could qualify as astronauts. America’s best female pilots were invited to undergo the same physical and psychological tests as the Mercury Seven candidates. Of those women invited to try, thirteen passed the tests and were enrolled in NASA’s experimental female astronaut training program. The Mercury Thirteen were: Rhea Allison Woltman, Myrtle Cagle, Geraldyn “Jerrie” Cobb, twin sisters Jan and Marion Dietrich, Mary Wallace “Wally” Funk, Sarah Gorlick Ratley, Jane “Janey” Briggs Hart, Jean Hixon, Irene Leverton, Geraldine “Jerrie” Sloan Truhill, Bernice “Bea” Trimble Steadman, and Gene Stumbough Jessen.

Even though the thirteen women performed well, the female astronaut program was abandoned in 1964. NASA feared the negative publicity that might result if a female astronaut was killed in a space program accident. Congressional hearings on the subject of women in space also led to the program’s demise, and society’s discrimination against women played a role. Before the program ended, NASA hinted that Jerrie Cobb would have been the first woman to go into space. As a flyer in her twenties, Cobb had set world records for speed, distance, and altitude. In 1949, Cobb was awarded the Amelia Earhart Gold Medal of Achievement.

Jackie Cochran, the famous American female pilot of World War II, served as a consultant to NASA during the female astronaut experiment. During World War II, Jackie Cochran was director of the Women’s Air Force Service Pilots (WASP) program. Cochran directed the training of civilian women pilots in case they were needed for the war effort. More than one thousand women trained and flew military missions ferrying aircraft and towing targets. In 1953, piloting an F-86 Sabre jet, Jackie Cochran became the first woman to break the sound barrier.

✓ **Anthony Recommends:** *Space for Women*, by Pamela Freni [1931643121, NF, MS+]; *Those Wonderful Women in Their Flying Machines*, by Sally Keil [0962765902, NF, MS+]; *The Mercury 13* [2000, D, NR].

27. In April 2001, American businessman Dennis Tito became the world’s first space tourist when he visited the International Space Station as a guest of the Russians; he paid \$20 million for his tour. In May 2002, South African Mark Shuttleworth spent a week at the International Space Station; he paid \$20 million to tag along with the Russian cosmonauts. In August 2002, it looked like Lance Bass, member of the rock band N-Sync, would be the world’s third space tourist, but his funding never came through. In March 2004, American businessman