

The Ninety-Nines, Inc.,® International Organization of Women Pilots®

# Aviation Adventure Guide

## Module 3 - Astronauts & Space Fight



# Module 3

## Astronauts & Space Flight



## United States Programs

The Space Race started in 1957. It was a race between the United States (US) and the United Soviet Socialist Republic (USSR) to put the first human in space. Originally a United States Air Force (USAF) program, it was taken over by the civilian space agency, the National Aeronautics and Space Administration (NASA), to help expedite the program.

### Project Mercury

Project Mercury was the first human spaceflight program of the United States, from 1958 through 1963. It conducted six human flights. United States citizens were shocked when the USSR put the first human, Yuri Gagarin, into a single orbit on April 12, 1961. On May 5, 1961, the US launched its first astronaut, Alan Shepard, into a suborbital flight.

The US reached its orbital goal on February 20, 1962, when John Glenn made three orbits around the Earth. When Mercury ended in May 1963, both nations had sent six people into space, but the Soviets led the US in total time spent in space.

The Mercury project gained popularity, and its missions were followed by millions on radio and TV around the world. Its success laid the groundwork for Project Gemini.

Mercury Astronaut, John Glenn.



## Project Gemini



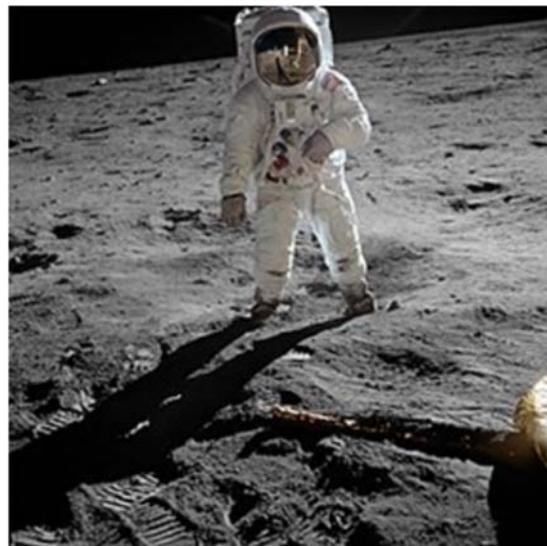
Project Gemini was the second US spaceflight program. The Gemini spacecraft carried a two-astronaut crew. The missions flew during 1965 and 1966. Gemini's objective was the development of space travel techniques to support the Apollo Program which was to land astronauts on the moon. The Gemini Project allowed the US to catch up and take the lead in the human space program from the USSR.

Pictured: Ed White walking in space.

## The Apollo Program

This was the US program which landed the first humans on the Moon in 1969. President John F. Kennedy set the national goal for the 1960s of landing a man on the Moon and returning him safely to Earth. Apollo ran from 1961 to 1972. The first crewed flight took place in 1968. The Apollo Program encountered a major setback in 1967 when an Apollo 1 cabin fire killed the entire crew during a prelaunch test. The goal to land on the Moon was met on the Apollo 11 mission when astronauts Neil Armstrong and Buzz Aldrin landed their Apollo Lunar Module on the Moon, July 20, 1969. Astronaut Michael Collins remained in the lunar orbit in the command and service module.

Apollo set several major human spaceflight milestones. It stands alone in sending crew missions beyond low Earth orbit. Apollo 8 was the first crewed spacecraft to orbit another celestial body, and Apollo 11 was the first crewed spacecraft to land humans on one. Five subsequent Apollo missions landed on the moon. In these missions, twelve people walked on the Moon. The last mission was in December 1972.



## Space Transport System (STS) - The Space Shuttle

The Space Shuttle program was the fourth human spaceflight program. From 1981 to 2011 it accomplished routine transportation for Earth-to-orbit crew and cargo. It flew 135 missions and carried 355 astronauts from 16 countries.



The Space Shuttle was composed of an orbiter (a spacecraft designed to orbit a celestial body without landing on its surface) with two reusable solid rocket boosters. It carried up to eight astronauts. When its mission was complete, the orbiter would reenter the Earth's atmosphere and land like a glider at either the Kennedy Space Center, FL or Edwards Air Force Base, CA. It is the only winged spacecraft to achieve orbit and land. It was the first reusable space vehicle.

The shuttle program was responsible for the construction of the International Space Station. It also completed service missions including repair of the Hubble Space Telescope and orbiting satellites.

The program had five shuttles. Two were destroyed in flight. The other three are on display at the Kennedy Space Center, The California Science Center and the Intrepid Museum.

After the end of the Shuttle program the only way for US astronauts to travel to the International Space Station was aboard the Russian Soyuz rockets launched from Kazakhstan.

In May 2020 the US regained the ability for human spaceflight with the launch of the SpaceX Falcon 9 rocket from the Kennedy Space Center.



## Space Exploration Technologies Corp. (SpaceX)



SpaceX is an American space technology company headquartered in Starbase, TX. Since its founding in 2002 the company has made numerous advances in rocket propulsion, reusable launch vehicles, human spaceflight and satellite constellation technology. As of 2023 SpaceX is the world's dominant space launch provider. SpaceX, NASA and the United States Armed Forces work closely together using government contracts.



NASA astronauts Douglas Hurley (left) and Robert Behnken (right) wearing custom-fit spacesuits designed by SpaceX.

## Other Human Space Programs

### Russia (formerly USSR)

From 1922 to 1991 the **United Soviet Socialist Republic (USSR)** entered into what was known as the Space Race with the United States. When the USSR dissolved in 1991 the USSR space program was replaced with the Russian program. They had several firsts. Yuri Gagarin (pictured below left) was the first person in space. Valentina Tereshkova (pictured below right) was the first woman in space in 1963. They also accomplished the first space walk in 1965.



### China

The start of the **Chinese Manned Space Agency (CMSA)** was approved in 1992. In October 2003 Yang Liwei (pictured right) became the first Chinese citizen in space.

The program is designed to develop and enhance human spaceflight capabilities for China. The Chinese space program is pursuing a manned mission to the Moon, space transportation, in-orbit maintenance of spacecraft, space telescope, counterspace capabilities, quantum communications, orbiter and sample-return missions to Mars, and exploration missions throughout the Solar System and deep space.

Chinese astronauts are called taikonauts.



1. Which country had the first man in space?
  - a. United States
  - b. Russia
  - c. China
2. How many orbits did John Glenn make?
  - a. Two
  - b. Three
  - c. Five
3. During which project did the US astronauts first spacewalk?
  - a. Mercury
  - b. Apollo
  - c. Gemini
4. Who were the first two astronauts to walk on the moon?
  - a. Buzz Aldren and Michael Collins
  - b. Neil Armstrong and Buzz Aldren
  - c. Michael Collins and Neil Armstrong
5. Who was the first woman in space?
  - a. Sally Ride
  - b. Valentina Tereshkova
  - c. Amelia Earhart
6. How many astronauts did the space shuttle carry?
  - a. Eight
  - b. Seven
  - c. Nine
7. What is the first reusable space vehicle?
  - a. Apollo spacecraft
  - b. Space Shuttle
  - c. SpaceX Falcon 9
8. How many missions did the Space Shuttle fly?
  - a. 135
  - b. 125
  - c. 145
9. What country was the first to spacewalk?
  - a. United States
  - b. Russia
  - c. China
10. Who is currently the world's foremost space launcher?
  - a. United States
  - b. NASA
  - c. SpaceX