Major moments in the US shuttle program

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The US space shuttle is part cargo truck, part passenger bus, part airplane built for orbit, and has known soaring highs and devastating lows during its 30-year career.

Here are some of the major moments in the US space shuttle program:

FIRST FLIGHT:

Columbia launched on April 12, 1981 with two astronauts on board and became the first shuttle to fly in orbit.

CHALLENGER DISASTER:

Challenger exploded 73 seconds after liftoff on January 28, 1986. The blast was seen on live television by countless Americans including millions of school children who tuned in to watch the shuttle lift off carrying teacher Christa McAuliffe, 37, who planned to be the first to give lessons from space.

McAuliffe and the other six crew on board perished, and the shuttle program was grounded for nearly three years. The cause of the problem was linked to a faulty seal on one of the rocket boosters.

HUBBLE LAUNCH, REPAIRS:

Discovery in 1990 deployed the Hubble Space Telescope, which has revolutionized the world's knowledge of astronomy.

The Hubble mission was piloted by Charles Bolden, today NASA's chief administrator and the first African-American to hold the US space agency's top post.

In 1993, the shuttle Endeavour and its crew of seven embarked on a mid-orbit repair mission to clear up a problem with the telescope's main mirror, and in early 1994 the first sharp images from Hubble were released.

Four more maintenance missions have been performed on subsequent shuttle flights, the latest being in 2009.

FIRST US-RUSSIA MISSION:

In February 1995, Discovery carried a Russian cosmonaut and performed the first flyaround of the station by a US shuttle in preparation for the first mission to Russian space station Mir by Atlantis four months later.

The start of a Russian-American partnership in space was signed by president George H. W. Bush and Russian president Boris Yeltsin, so that Russian cosmonauts would fly on US shuttles and US astronauts would spend time working aboard Mir.

The Russian orbiting laboratory was the world's largest until it was replaced by the International Space Station, and was operational from 1986 to 2001.

Atlantis brought five Russians and one American on its trip to Mir in June-July 1995. A total of nine shuttle missions eventually docked at the Russian space lab, bringing supplies and equipment.

ISS:

The space shuttle gained its true focus in 1998 with the launch of construction on the International Space Station.

The first unit, the Zarya module, was sent up by Russia in November 1998. The space shuttle Endeavour launched one month later and mated the Unity nodule with the Zarya, marking the start of a more than decade-long construction process.

Thirty-seven shuttle dockings have helped assemble the space outpost, a project that involves 16 nations -- including Russia, Canada, Japan, several European countries and the United States -- and has cost 100 billion dollars to build.

COLUMBIA EXPLOSION:

On February 1, 2003, Columbia's seven astronauts died a fiery death when the shuttle broke apart during its return to the Earth's atmosphere due to damage caused by a piece of foam from the external fuel tank that took a chunk out of the orbiter's wing during liftoff.

Again, the shuttle program was grounded for more than two years, as NASA underwent drastic changes aimed at improving the culture and safety of the US space agency.

FINAL SPACE FLIGHTS:

Discovery became the first to retire following its mission to the ISS in February-March this year. Endeavour flew its last mission in May-June, and the Atlantis is set to return to Earth on July 21 at 5:56 am (0956 GMT), marking the end of the 135th space shuttle mission.