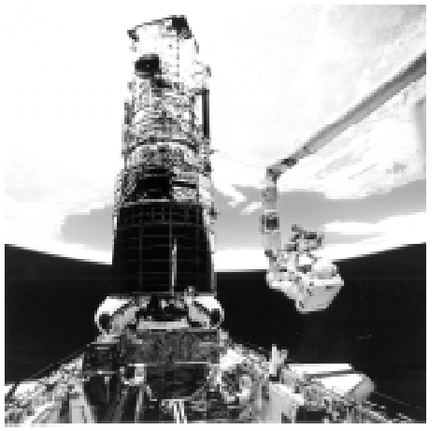
STS-1

Jan. 28, 1986. STS 51-L, Challenger. Scobee, Smith, Resnick, Onizuka, McNair, McAuliffe, Jarvis. Crew killed during mishap 73 seconds into flight.

May 4-8, 1989. STS-30, Atlantis. Walker, Grabe, Thagard, Cleave, Lee. Magellan mission to Venus. First U.S. interplanetary explorer in 11 years.



STS-61

1990s

April 24-29, 1990. STS-31, Discovery. Shriver, Bolden, Hawley, McCandless, Sullivan. Deployed Hubble Space Telescope, first of NASA's four Great Observatories.

Dec. 2-13, 1993. STS-61, Endeavour. Covey, Bowersox, Musgrave, Hoffman, Thornton, Akers, Nicollier. First Hubble Space Telescope servicing mission.

June 27-July 7, 1995. STS-71, Atlantis. Gibson, Precourt, Baker, Harbaugh, Dunbar, Solovyev, Budarin. First Shuttle-Mir docking.

Sept. 16-26, 1996. STS-79, 4th Shuttle-Mir docking, Atlantis. Shannon Lucid returns to Earth after 188 days in space, setting a U.S. record for human long-duration spaceflight as well as a record for a woman in space.

Oct. 15, 1997. Cassini, Titan IVB/Centaur. Mission to Saturn. Largest U.S. interplanetary spacecraft ever launched.

Future:
January 1998. Lunar Prospector, Athena launch vehicle. Discovery Program mission.

June 1998. Earth Observing System (EOS)-AM 1, aboard an intermediate class vehicle. First spacecraft in the EOS series. Will provide detailed measurements of clouds, atmospheric chemistry and the Earth's energy balance. Mission to Planet Earth Program.

June 1998. Functional Cargo Block, first International Space Station (ISS) element, to be launched on a Russian launch vehicle.

July 1998. STS-88, Endeavour. First U.S. International Space Station assembly flight.

July 1998. Deep Space 1, Delta. Asteroid and comet flyby, also Mars flyby. New Millennium Program.

August 1998. STS-93, Columbia. Advanced X-ray Astrophysics Facility (AXAF-I). Great Observatories mission, will perform extended research of X-ray sources.

September 1998. Wide-Field Infared Explorer (WIRE), Pegasus. Small telescope to study evolution of galaxies. NASA's Origins as well as Small Explorer Programs.

Late 1998. First flight of the X-34 technology demonstrator spacecraft. Suborbital.

First half 1999. Earth Orbiter 1 (EO-1). Mission to validate revolutionary technologies for Earth observation. Part of New Millennium as well as Mission to Planet Earth Programs.

January 1999. ISS 2R, Soyuz. Establishes first International Space Station habitation with three-person crew. Provides assured crew return capability without the orbiter present.

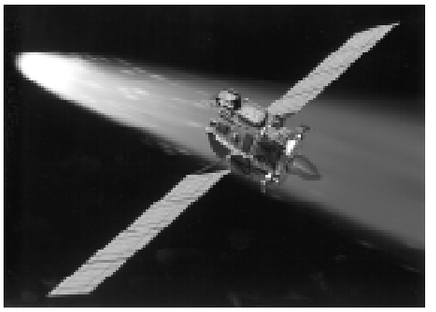
February 1999. Stardust. Will capture samples of interstellar dust particles and samples of dust from a comet. Discovery Program mission.

Late 1999. First flight, X-33 Advanced Technology Demonstrator, possible predecessor of next-generation launch vehicle.

2000s

2000, date TBD. High Energy Solar Spectroscopic Imager (HESSI), Pegasus. Small Explorer mission. Will observe the Sun to study particle acceleration and energy release in solar flares.

2001, date TBD. Galaxy Evolution Explorer (GALEX), Pegasus. Small Explorer mission. Two-year mission using an ultraviolet telescope to explore the origin and evolution of galaxies and the origins of stars and heavy elements.



Deep Space 1

January 2001. Genesis spacecraft, launch vehicle TBD. Discovery Program mission. Designed to collect samples of the charged particles in the solar wind and return them to Earth for study.

February 2001. STS-113, Columbia. X-38 Return Crew Vehicle flight demonstration.

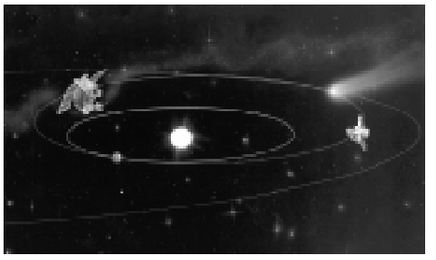
December 2001. Space Infrared Telescope Facility (SIRTF), Delta. Astrophysics mission to provide infrared imaging and spectroscopy. Part of NASA's Origins Program.

Late 2001. New Millennium Interferometer. Three spacecraft to be launched together and then deployed in formation. NASA Origins program.

July 2002. Comet Nucleus Tour (CONTOUR), launch vehicle TBD. Discovery Program mission. Will take images and comparative spectral maps of at least three comet nuclei and analyze the dust flowing from them.

2007. Next Generation Space Telescope, launch vehicle TBD. Will use infrared imaging and spectroscopy to study first stars and galaxies that formed after universe first cooled. Will operate farther away from Earth than Hubble.

End of first decade of new millennium. Terrestrial Planet Finder, launch vehicle TBD. NASA Origins Program to detect planets that fall into category of Earth-like.



StarDust

2010s

2013. Space Shuttle support for International Space Station is completed.

2013? First human mission to Mars.

** This is a selection of highlights from U.S. space exploration history rather than a complete chronology. Dates provided indicate when the mission was launched. See also Page 16 for Mars-related missions, past, present and future.*

Martian Odyssey

Milestones in the U.S. exploration of Mars

• **Nov. 5, 1964**, Mariner 3. Failed Mars flyby.

• **Nov. 28, 1964**, Mariner 4. First successful Mars flyby, July 14, 1965, returned 21 photos.

• **Feb. 24, 1969**, Mariner 6. Mars flyby, July 31, 1969.

• **March 27, 1969**, Mariner 7. Mars flyby. Returned 126 photos.

• **May 8, 1971**, Mariner 8. Mars flyby. Failed during launch.

• **May 30, 1971**, Mariner 9. First spacecraft to orbit another planet. Began orbiting Mars July 13, 1971.

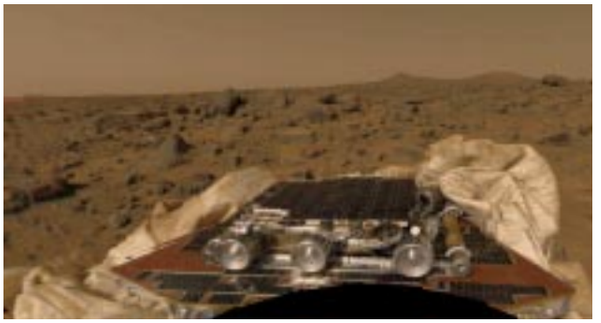
• **Aug. 20, 1975**, Viking 1. Placed an orbiter in orbit around planet and a lander on the surface.

• **Sept. 9, 1975**, Viking 2. Same as Viking 1.

Mariner 4 spacecraft simulator test

• **Sept. 25, 1992**, Mars Observer. Lost prior to Mars arrival 1993.

• **Nov. 7, 1996**, Mars Global Surveyor. Arrived Sept. 11, 1997.



Mars Pathfinder arrives on Mars, July 4, 1997.

• **Dec. 4, 1996**, Mars Pathfinder. Landed on Mars July 4, 1997, deployed a rover to surface.

• **1998**, Planet-B. U.S./Japanese mission to study Martian atmosphere.

• **December 1998**, Mars Surveyor '98 Orbiter. Will characterize the Martian atmosphere.

• **January 1999**, Mars Surveyor '98 Lander. Will access Martian water reservoirs and deliver two soil microprobes that are part of the Deep Space 2 mission.

Mars Surveyor, 2001

• **March 2001**, Mars Surveyor '01 Orbiter. Characterize surface mineralogy and chemistry.

• **April 2001**, Mars Surveyor '01 Lander/Rover. Characterize the terrain over greater geographical distances. Select and gather soil samples for possible later return.

Viking 1 liftoff, Aug. 20, 1975, aboard Titan Centaur launch vehicle.

Mars Sample Return Mission, 2005

• **June 2003**, Mars Surveyor '03 Lander/Rover. Characterize terrain over wide area at a site chosen earlier. Other objectives, related to eventual human exploration, are expected to be added.

• **2003**, Mars Surveyor '03 Orbiter. Provide communications and navigation for 2003 and later missions to Mars.

• **2005**, Sample Return Mission to Mars. Return a sample from one of the rovers launched in 2001 and 2003.

• **2011**? Two Cargo Lander missions launched toward Mars, paving way for humans to follow.

• **2013**? First human crew lifts off on 180-day trip to Red Planet.

Human mission to Mars, 2013?

John F. Kennedy Space Center

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