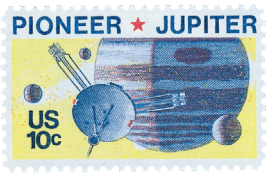
This Day in History… March 2, 1972

Pioneer 10 is Launched



Stamp pictures Pioneer 10 passing by Jupiter.

On March 2, 1972, Pioneer 10 lifted off from Cape Canaveral, Florida. It became the first spacecraft to travel beyond the outer planets and eventually the first human-made object to head out of the Solar System.

The idea for Pioneer 10 began in the 1960s. Aerospace engineer Gary Flandro studied a rare alignment of the outer planets. He realized that Jupiter, Saturn, Uranus, and Neptune would line up in a way that would allow a spacecraft to use gravity to gain speed. This concept became known as the "Planetary Grand Tour." NASA approved a plan in February 1969 for two spacecraft called the Galactic Jupiter Probes. They were later renamed Pioneer 10 and Pioneer 11.

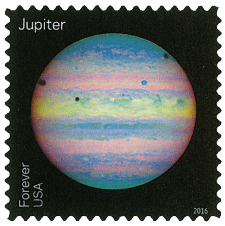
The mission had clear goals. Scientists wanted close-up images of Jupiter. They also wanted to study its atmosphere, magnetic field, radiation belts, and moons. Engineers were not even sure a spacecraft could safely cross the asteroid belt between Mars and Jupiter. Some feared heavy collisions with space debris. Pioneer 10 would test that risk directly.

The spacecraft weighed about 570 pounds at launch. It carried 11 scientific instruments. These included cameras, infrared radiometers, ultraviolet photometers, magnetometers, and detectors for charged particles and cosmic rays. More than 150 experiments were proposed before the final list was chosen. The spacecraft also carried a radioisotope thermoelectric generator powered by plutonium-238. Solar panels would not have worked so far from the Sun.

Just 11 hours after launch, Pioneer 10 passed the Moon, becoming the fastest human-made object at the time and quickly leaving Earth's immediate neighborhood.

Pioneer 10 launched aboard an Atlas-Centaur rocket from Cape Canaveral. At the time, it was the fastest object ever built by humans. It passed the Moon in just 11 hours. Within 10 days, all instruments were turned on and sending data. The spacecraft soon began making discoveries. It detected interplanetary helium atoms, which helped scientists better understand the solar wind.

On July 15, 1972, Pioneer 10 entered the asteroid belt. It traveled through the belt for about eight months. The spacecraft was not destroyed, as some had feared. Instead, it found that most particles were tiny, often smaller than a millimeter. This result reduced concerns for later missions.



In December 1973, Pioneer 10 made the first close flyby of Jupiter, returning more than 500 images, mapping its powerful magnetic field, and discovering that the planet radiates more heat than it receives from the Sun.

Pioneer 10 began approaching Jupiter in November 1973. On November 26, NASA received the first close-range images of the planet. The pictures improved each day. By December 2, images were being shared with the public in near real time. The mission eventually sent back more than 500 images. Scientists confirmed that Jupiter's magnetic field was much stronger than Earth's and reversed in direction compared to earlier assumptions. Instruments also showed that Jupiter radiated more heat than it received from the Sun. This suggested internal heat sources.

Pioneer 10 Stamp from the Celebrate the Century Pane

The spacecraft passed within about 81,000 miles of Jupiter's cloud tops on December 3, 1973. During the closest approach, intense radiation briefly interfered with communications. However, Pioneer 10 survived. It also gathered important data about Jupiter's moons and radiation belts. The success cleared the way for later missions such as Voyager 1 and Voyager 2.

After Jupiter, Pioneer 10 continued outward. It crossed Saturn's orbit in 1976. It crossed Uranus' orbit in 1979. In June 1983, it passed beyond Neptune's orbit, becoming the first spacecraft to travel beyond the major planets. It was now on an escape path from the Sun.

In June 1983, Pioneer 10 crossed Neptune's orbit – the first time a spacecraft traveled beyond the major planets of the Solar System.

The mission officially ended on March 31, 1997, when NASA stopped routine operations. By then, Pioneer 10 was about 6.2 billion miles from the Sun. The spacecraft continued to send faint signals. The last clear transmission was received on April 27, 2002. Very weak signals continued into early 2003. After that, contact was lost.

Pioneer 10 also carried a message. At the suggestion of astronomer Carl Sagan, the spacecraft included a gold-anodized aluminum plaque. The plaque showed diagrams of a man and woman, the location of Earth relative to pulsars, and a map of the Solar System. It was designed in case the spacecraft was ever found by intelligent life.

Today, Pioneer 10 continues traveling through interstellar space. It is more than eight billion miles from Earth. Though silent, it remains a milestone in space exploration. The mission proved that spacecraft could survive the asteroid belt, endure Jupiter's radiation, and journey far beyond the known planets, marking the start of humanity's first step into deep space.

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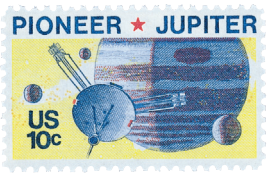

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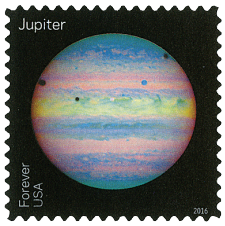

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