**Mangalyaan**

Mangalyaan is a spacecraft that was sent by the Indian Space Research Organisation (ISRO) to Mars. It was launched on November 5, 2013, and reached Mars on September 24, 2014. This was India's first-ever mission to another planet, and it made ISRO the fourth space agency to achieve Mars orbit after Roscosmos, NASA, and the European Space Agency. Mangalyaan also made history by being the first Asian spacecraft to orbit Mars and the first one to succeed on its first try. The spacecraft used eight 22N Thrusters for 431 seconds to increase its speed by 97.5 meters per second.

A spaceship called Mars Orbiter Mission was sent to space from India on November 5, 2013. It was launched from Satish Dhawan Space Centre in Andhra Pradesh using a big rocket called Polar Satellite Launch Vehicle rocket C25. It was launched during a 20-day period that started on October 28, 2013. The spaceship stayed around the Earth for a month and did some moves before going to Mars on November 30, 2013. It took almost a year, 298 days to travel from Earth to Mars. Finally, on September 24, 2014, it started to orbit Mars.

The mission was made to show how to create the technology needed to design, plan, manage, and operate a mission to a different planet. There were five scientific tools on the spacecraft. People watched the spacecraft from a control center at ISRO Telemetry, Tracking, and Command Network (ISTRAC) in Bengaluru. They also had help from the Indian Deep Space Network (IDSN) antennae in Bengaluru, Karnataka.

As of October 2, 2022, it was announced that the orbiter lost communication with Earth and can't be fixed. This happened after it was exposed to darkness for seven hours in April 2022, which was not planned for. The Indian Space Research Organisation (ISRO) tried to reestablish communication but failed. On the next day, ISRO confirmed that all attempts to revive Mangalyaan failed and it's now officially considered dead due to the loss of fuel and battery power to the probe's instruments.

The mission to Mars cost around ₹450 Crore (US$73 million), which is the least expensive mission to Mars ever. The mission was cheap because of some reasons, such as the modular approach, fewer ground tests, and long working hours for scientists. ISRO Chairman K. Radhakrishnan said that these factors helped make the mission inexpensive.

**Goals:**

* To learn about Mars' surface features, scientists study its shape, land forms, and minerals.
* Study the constituents of Martian atmosphere including methane and CO2 using remote sensing techniques
* Investigate the movement of gases in the upper part of Mars' atmosphere, the impact of solar wind and radiation, and how gases escape into space.