

India's Mars Mission Creates History

The Indian Space Research Organization (ISRO) has created an unprecedented history on September 24, even leaving behind the China and Japan in the race to explore the red planet-Mars. This project of ISRO has been the most economical one in the history of all the Mars missions carried out so far in the world. India has become the first Asian country to have achieved this, and the first country in the world to have reached the distant Mars with its own steam in the very first attempt.

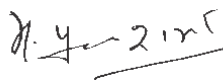
The Mangalyaan of India has travelled 420 million miles in 300 days by spending just dollar 74 million against the huge cost of dollar 671 million incurred by the American space agency NASA. It is no mean achievement on any count, as only 21 missions have succeeded, out of 54 attempts made world over. India has succeeded in its first attempt while Japan had failed in 1999 and China in 2012. Two of NASA's big failures of Mars missions had also served as cautionary events. In September 1999, the \$193 million Mars Climate Orbiter crashed into the Red Planet's surface upon arrival, and 3 months later, the \$120 million Mars Polar Lander also crashed. India has purposefully employed tested technologies it has also used before, and also kept the size of the payload small, at 15 kilograms to keep the cost low. To save fuel, a smaller rocket has been used to put the spacecraft into Earth's orbit to gain enough momentum to slingshot it toward Mars.

The Mars Orbiter Mission (MOM) has begun to accomplish all its planned scientific activities. The 33-pound (15-kilogram) scientific payload of the orbiter comprises five instruments to monitor Mars' atmosphere and weather, take color pictures of the surface and map the planet's mineralogy over the course of six months. India's Mars Orbiter Mission (MOM), has begun orbiting the Red Planet since Sept. 23. The image taken on Sept. 28 shows a dust storm on the surface of the planet which was captured by the Mars Color Camera aboard the spacecraft. The Mars Orbiter will be collecting images and other data from the planet's surface and atmosphere using five sensors.

It is needless to say that India has very impressive presence in space with around 35 Indian satellites in Earth's orbit for communication, television broadcasting and remote sensing. The country last year launched its first military satellite to gather naval intelligence. India spends just \$1.2 billion a year on its space program vis a vis NASA which has a budget of \$17.5 billion for a year. In June as well, ISRO had put five foreign satellites into space in a single launch of the PSLV-IV). The main cargo was Spot-7, a high resolution Earth-observation satellite belonging to the European consortium Airbus Defense & Space Co. It also carried four other smaller satellites: one each from the German Aerospace Center and Nanyang Technological University, Singapore, and two from the Space Flight Laboratory at the University of Toronto Institute for Aerospace Studies in Canada. In 2008 too, India had launched the Tecsar-an Israeli spy satellite – to monitor the movements of the Iranian military.

It was in 1975 when India made a humble attempt to launch its first satellite-the Aryabhata-on April 19, 1975 through a Russian vehicle and since then India has accomplished 113 space missions. ISRO has to its credit, several frontier technologies that have enhanced space-based strategic capability, including the successful GSLV-D5 with Indian Cryogenic Stage, as well as the path-breaking Mars Orbiter mission. Almost 45 more missions are in the pipeline till 2017 to augment capacity and enhance capability of India's Space Infrastructure for communications, navigation and remote sensing. The present Mars mission builds upon the strengths of India's first moon mission, the Chandrayaan 1, which went into lunar orbit in 2008.

The global space market is currently pegged at \$320billion, India can share a large share in this vast pie of \$ 320 billion with its cost effective capabilities.



(Prof. Bhagwati Prakash Sharma)

Editor in chief