

Topic of the week for discussion: 9th to 15th Oct. 2014

Topic: India's Mission to Mars: MOM

Background:

More missions have been attempted to Mars than to any other place in the Solar System except the Moon, and about half of the attempts have failed. Some of these failures occurred because Mars was the first planet Earth attempted to explore, and the early exploration attempts taught us many lessons that have made subsequent missions more successful. But many failures have occurred relatively recently, proving again and again that space exploration is very, very difficult.

But since 1996, Mars exploration has undergone a Renaissance, with data from four orbiters and four landed missions developing a revolutionary new view of Mars as an Earth-like world with a complex geologic history.

The Mars Orbiter Mission (MOM), also called Mangalyaan 'Mars-craft' is a Mars orbiter launched into the Earth's orbit on November 5, 2013 by the Indian Space Research Organisation (ISRO).

It successfully entered Mars' orbit on 24 September 2014, which has made ***India the first Asian nation to send a satellite to Mars, and the first nation in the world to do so on its first attempt.***

Need of this Mission:

The mission is a "***technology demonstrator***" project to develop the technologies for design, planning, management, and operations of an interplanetary mission.

Moreover, the ***search for methane*** in the Martian atmosphere is probably the most significant part of the MOM mission. Mangalyaan has gone equipped with an instrument that will try to measure methane in the atmosphere. MOM will measure methane in the Martian atmosphere. So, even though Mangalyaan has a small payload, it will actually address some of the biggest questions on the Red Planet.

Earth's atmosphere contains billions of tonnes of methane, the vast majority of it coming from microbes, such as the organisms found in the digestive tracts of animals.

The speculation has been that some methane-producing bugs could perhaps exist on Mars if they lived underground, away from the planet's harsh surface conditions.

Importance of this Mission:

The Mars Orbiter Mission cost **Rs. 450 crore (£46 million)** in comparison to NASA's Maven orbiter costing £413 million.

Topic
Introduction

It is the **cheapest inter-planetary mission** ever to be undertaken since Martian exploration began. The low cost of the mission was ascribed by **Kopillil Radhakrishnan, the chairman of ISRO**, to various factors, including a "modular approach", a small number of ground tests and long (18-20 hour) working days for scientists. Other factors mentioned are lower worker costs, home-grown technologies, simpler design, and significantly less complicated payload.

Criticism of this mission:

After India's successful Mars mission, there was a supposition among many Western as well as Indian media and people, that space activity should be left to the wealthy, developed countries and that it can have no worth to the developing nations.

The argument was that money could be rather spent on healthcare and improved sanitation. But what was thus disregarded is that investment in science and technology builds competence and aptitude and helps develop the people who further profit the financial system and the society.

The developed nations already know that space activity is also a wealth producer, and have radically increased their spending on space activities in recent years.

India wants to be a part of this too, and through Mangalyaan and its other space missions, the nation is putting itself into a strong position in international markets for space products and services.

What's next?

The Mars spacecraft will orbit the Red Planet, mapping its surface and studying the atmosphere. Mangalyan has already starting sending photographs of the red planet.

Further, a Nasa-backed study is exploring the feasibility of lowering the cost of a human expedition to Mars by putting the astronauts in deep sleep.

The deep sleep, called therapeutic **torpor**, would reduce astronauts' metabolic functions with existing medical procedures. This is a form of deep sleep, also referred to as a type of 'hibernation'. The crew would be put to sleep for the 180-day journey to Mars by lowering their body temperature through their nose. They would then be woken by stopping the flow of coolant at the red planet. Once mission was complete, they'd be put to sleep again for the return trip.

Read further:

<http://www.spaceflight101.com/mars-orbiter-mission.html>

<http://economictimes.indiatimes.com/news/science/nasa-to-put-astronauts-in-deep-sleep-for-mars-mission/articleshow/44415644.cms>

<http://www.telegraph.co.uk/news/worldnews/asia/india/11119362/India-celebrates-Mars-mission-cheaper-than-a-movie.html>