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India launches Mars-bound probe

Spacecraft will orbit red planet to study its composition and look for signs of life.

Sanjay Kumar

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A Polar Satellite Launch Vehicle C-25 carries India's Mars orbiter into space.

NATHAN G./HINDUSTAN TIMES VIA GETTY

India's first mission to Mars has successfully blasted off on its 300-day journey to the Red Planet. The Mars Orbiter Mission, or Mangalyaan, launched from the Satish Dhawan Space Centre at Sriharikota in the east of the country today. It is due to start circling the planet while taking data in September 2014.

"The journey has just begun", said a beaming Koppillil Radhakrishnan, chairman of the Indian Space Research Organization (ISRO), in a televised statement.

Mangalyaan — mostly an indigenous effort assembled by several thousand personnel in two years — will cost the Indian exchequer US\$75 million. NASA will support the mission by providing communication and navigation support to track Mangalyaan when it will not be visible in India.

The probe will be on a 780 million kilometre journey, first circumambulating the earth for several days to garner enough velocity to shoot off towards Mars. It will then enter Martian orbit in September 2014 and will study the planet's geology and atmosphere for 6 months.

As a launch vehicle, ISRO chose a Polar Satellite Launch Vehicle C-25, a proven workhorse, over a more powerful version called the Geo-Synchronous Satellite Launch Vehicle which has suffered repeated failures since 2001.

In the history of space exploration, nearly two-thirds of all space missions heading for Mars have failed. If successful, Mangalyaan will catapult India into the elite club — United States, erstwhile Soviet Union and the European Space Agency — which have reached the orbit of Mars.



Engineers working on the spacecraft in Bangalore in September.

XINHUA/PHOTOSHOT

the University of Michigan, who has worked with NASA's Mars Science Laboratory mission and its rover Curiosity.

Curiosity has not found any signs of methane since it landed on the red planet in August, 2012.

Mangalyaan has faced strident criticism from those who believe that India can ill-afford expensive planetary missions. Indian space scientists retort that the

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The Orbiter carries five India-built, solar-powered instruments to study Martian atmosphere and geology. It will look for signs of the presence of methane in its atmosphere to look for signs of life; measure the ratio of deuterium to hydrogen to study the presence of water; map the planet's surface composition and its mineralogy; and take high-resolution colour images.

Astrobiologists are interested in methane because it could be a sign of life. A feature of the probe that caused particular excitement is that it could detect methane at very low levels. "I will be waiting anxiously to find out if Mangalyaan's methane sensor detects any puffs of methane as it maps the planet", says Sushil Atreya, director of Planetary Science Laboratory at

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Indian space programme gets a mere 0.34% of the central government's budget and that only 7–8% of that is spent on space exploration.

In recent years, Japan and especially China have also ramped up their space efforts and capabilities. Indian strategic experts view Chinese space advancements with suspicion: The two countries have had less-than-friendly relations — India suffered a humiliating defeat in a 1962 war and repeated border incursions that have continued until recently. Chinese test of anti-satellite weapons in 2007 caused global concern.

“India's space program is for peaceful purposes but as a major space-faring nation, it has genuine concerns regarding the security of its space assets”, says Arvind Gupta, director general of Institute of Defence Studies & Analysis, a government-supported think tank.

“While there is no India-specific threat from space [from China], India cannot ignore the implications of the growing militarization of space”, said Gupta.

Following the successful testing of the 5,500-km Intermediate Range Ballistic Missile Agni V in April 2012, India's Defence Research & Development Organization announced the acquisition of anti-satellite weapons capability as a deterrent against the Chinese threat.

In October 2008, India launched its unmanned lunar probe Chandrayaan-1, credited with the discovery of water molecules on the Moon using a NASA-built instrument. Although Chandrayaan-1 was meant to operate for two years, it suffered technical failures and stopped functioning after 312 days. Mangalyaan is supposed to be a significant technological upgrade over Chandrayaan-1, having learnt from its failures.

In 2015, ISRO will launch an ambitious space-based astronomical observatory 'Astrosat'. For the latter part of the decade, the country is also considering a follow-up mission to the Moon, one to study the Solar corona, and a possible second mission to Mars in 2018, says A. S. Kiran Kumar, director of the Space Applications Centre at Ahmedabad.

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Indians are an inquisitive people and astronomy has been a passion for the Hindus. Thus no one should be surprised to hear about this mission. Moreover, one of the greatest astronomers ever, Aryabhata I (476–550 CE), was an Indian. While India and China are two large Asian countries, 2013 is surely not 1962. Let me also refer to the so-called Chinese incursions. According to an Indian Defense spokesman, so far in 2013 in Ladakh, "India made more forays into the so-called Chinese areas." Dr. Upinder Fotadar

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