

Chandrayaan-2

Chandrayaan-2 is India's second lunar exploration mission after Chandrayaan-1. Developed by the Indian Space Research Organisation (ISRO), the mission was launched from the second launch pad at Satish Dhawan Space Centre on 22 July 2019 at 2.43 PM IST (09:13 UTC) to the Moon by a Geosynchronous Satellite Launch Vehicle Mark III (GSLV Mk III). It consists of a lunar orbiter, a lander, and a lunar rover named *Pragyan*, all developed in India. The main scientific objective is to map the location and abundance of lunar water.

The lander and the rover will land on the near side of the Moon, in the south polar region at a latitude of about 70° south on 7 September 2019. The lunar South Pole is especially interesting because of the lunar surface area here that remains in shadow is much larger than that at the North Pole. There is a possibility of the presence of water in permanently shadowed areas around it. In addition, South Pole region has craters that are cold traps and contain a fossil record of the early Solar System.

Why are we going to the Moon?

The Moon is the closest cosmic body at which space discovery can be attempted and documented. It is also a promising test bed to demonstrate technologies required for deep-space missions. Chandrayaan 2 attempts to foster a new age of discovery, increase our understanding of space, stimulate the advancement of technology, promote global alliances, and inspire a future generation of explorers and scientists.

Chandrayaan-2 will attempt to soft land the lander - Vikram and rover- Pragyan in a high plain between two craters, Manzinus C and Simpelius N, at a latitude of about 70° south.

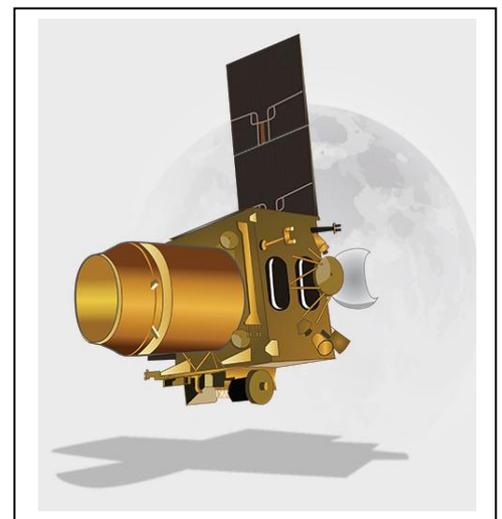
Vikram lander

- Instrument for Lunar Seismic Activity (ILSA) Seismometer by LEOS for studying Moon-quakes near the landing site
- Chandra's Surface Thermo-physical Experiment (ChaSTE) Thermal probe for estimating the thermal properties of the lunar surface
- RAMBHA-LP Langmuir probe for measuring the density and variation of lunar surface plasma.
- A laser retroreflector array (LRA) by NASA Goddard Space Flight Center for taking precise measurements of distance between the reflector on the lunar surface and satellites in lunar orbit. The micro-reflector weighs about 22 grams and can not be used for taking observations from Earth-based lunar laser stations.



Orbiter

The orbiter will orbital the Moon at an altitude of 100 km (62 mi). The orbiter carries five scientific instruments. Three of them are new, while two others are improved versions of those flown on Chandrayaan-1. The approximate

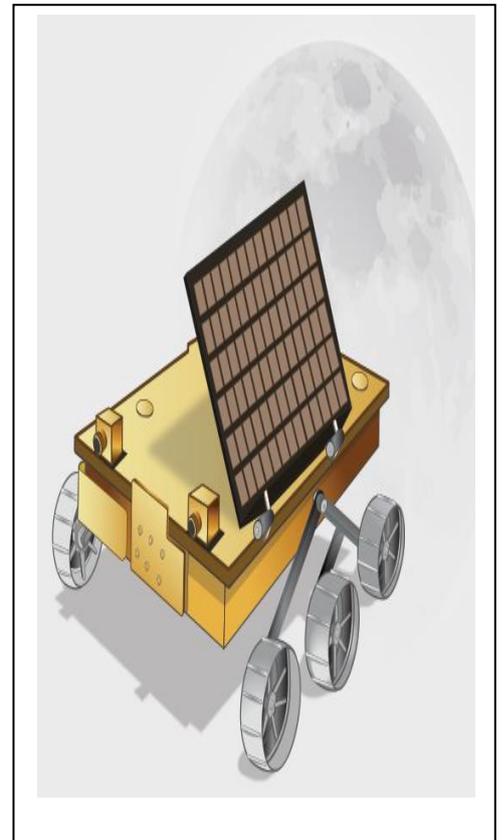


launch mass was 2,379 kg (5,245 lb). The Orbiter High Resolution Camera (OHRC) will conduct high-resolution observations of the landing site prior to separation of the lander from the orbiter. The orbiter's structure was manufactured by Hindustan Aeronautics Limited and delivered to ISRO Satellite Centre on 22 June 2015.

Pragyan rover

The mission's rover is called *Pragyan*. The rover's mass is about 27 kg (60 lb) and will operate on solar power. The rover will move on 6 wheels traversing 500 meters on the lunar surface at the rate of 1 cm per second, performing on-site chemical analysis and sending the data to the lander, which will relay it to the Earth station. For navigation, the rover uses:

- Dimensions: $0.9 \times 0.75 \times 0.85$ m
- Power: 50 W
- Travel speed: 1 cm/sec.
- Mission duration: ≤ 14 days (one lunar day)



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