

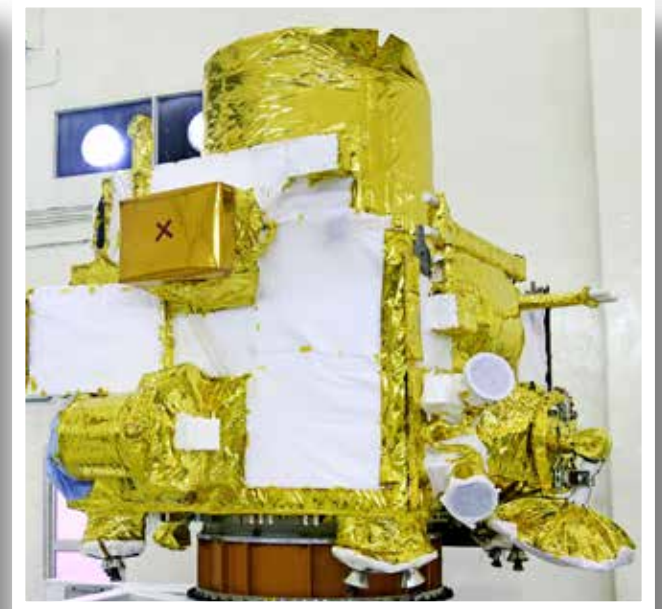
GSLV Mk III-M1 / Chandrayaan-2 Mission

22 July, 2019

THE MISSION

GSLV Mk III-M1 carrying on-board the Chandrayaan-2 Spacecraft lifted-off from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota at 2:43 PM (IST) on July 22, 2019. A series of maneuvers were carried out to raise Chandrayaan-2's orbit. On August 14, 2019, following Trans Lunar Insertion (TLI) maneuver, the spacecraft escaped from orbiting the Earth and followed a path that took it to the vicinity of the Moon.

On August 20, 2019, Chandrayaan-2 was successfully inserted into Lunar Orbit. While orbiting the Moon in a 100 km Lunar Polar Orbit on September 02, 2019, Vikram Lander was separated from the Orbiter in preparation for landing. Subsequently, two de-orbit maneuvers were performed on Vikram Lander so as to change its orbit and begin circling the moon in a 100 km x 35 km orbit. Vikram Lander descent was as planned and normal performance was observed upto an altitude of 2.1 km. Thereafter, communication from lander to the ground stations was lost.



Chandrayaan-2 mission was a highly complex mission. It comprised an Orbiter, Lander and Rover to explore the unexplored South Pole of the Moon. The mission is designed to expand the lunar scientific knowledge through detailed study of topography, seismography, mineral identification and distribution, surface chemical composition, thermo-physical characteristics of top soil and composition of the tenuous lunar atmosphere, leading to a new understanding of the origin and evolution of the Moon.

GSLV Mk III-M1

THE LAUNCH VEHICLE

GSLV Mk III is a three-stage heavy-lift launch vehicle developed by ISRO. The vehicle has two solid strap-ons, a core liquid booster and a cryogenic upper stage. The vehicle is designed to carry 4 ton class of satellites into Geosynchronous Transfer Orbit (GTO) or about 10 tons to Low Earth Orbit (LEO), which is about twice the capability of the GSLV Mk II. In this mission, GSLV Mk III components were compiled of - S200 Solid Rocket Boosters, L110 Liquid Stage and C25 Cryogenic Stage.

SPECIFICATIONS

Height	43.43 m
Lift-Off Mass	640 t
No of Stages	3
Payloads	Chandrayaan-2 Spacecraft
Launch Pad	Second Launch Pad (SDSC, SHAR)



CHANDRAYAAN-2

THE SPACECRAFT



Chandrayaan-2 is India's second mission to the Moon. It comprises a fully indigenous Orbiter, Lander (Vikram) and Rover (Pragyan). The Rover Pragyan is housed inside Vikram Lander.

SPECIFICATIONS

Weight	3,850 kg
Type of Satellite	Planetary Observation

THE ORBITER

Chandrayaan-2 Orbiter is capable of communicating with Indian Deep Space Network (IDSN) at Byalalu as well as the Vikram Lander. The precise launch and mission management has ensured a mission life of almost seven years instead of the planned one year. The Orbiter payloads will conduct remote sensing observations from a 100 km orbit.



SPECIFICATIONS

Weight	2,379 kg
Power	1,000 W
Payloads	<ul style="list-style-type: none"> • Terrain Mapping Camera – 2 • Chandrayaan-2 Large Area Soft X-ray Spectrometer (CLASS) • Solar X-Ray Monitor • Imaging IR Spectrometer • Dual Frequency Synthetic Aperture Radar • Chandra's Atmospheric Composition Explorer – 2 • Orbiter High Resolution Camera • Dual Frequency Radio Science Experiment
Mission Life	7 Years

THE LANDER-VIKRAM

The Lander of Chandrayaan-2 was named Vikram after Dr Vikram A Sarabhai, the Father of the Indian Space Programme. It was designed to function for one Lunar Day, which is equivalent to about 14 Earth days.



SPECIFICATIONS

Weight	1,471 kg
Power	650 W
Payloads	<ul style="list-style-type: none"> • Instrument for Lunar Seismic Activity • Chandra's Surface Thermo-physical Experiment • Langmuir Probe • Laser Retroreflector Array (for the Passive Experiment on Vikram Lander)
Mission Life	1 Lunar Day

THE ROVER-PRAGYAN

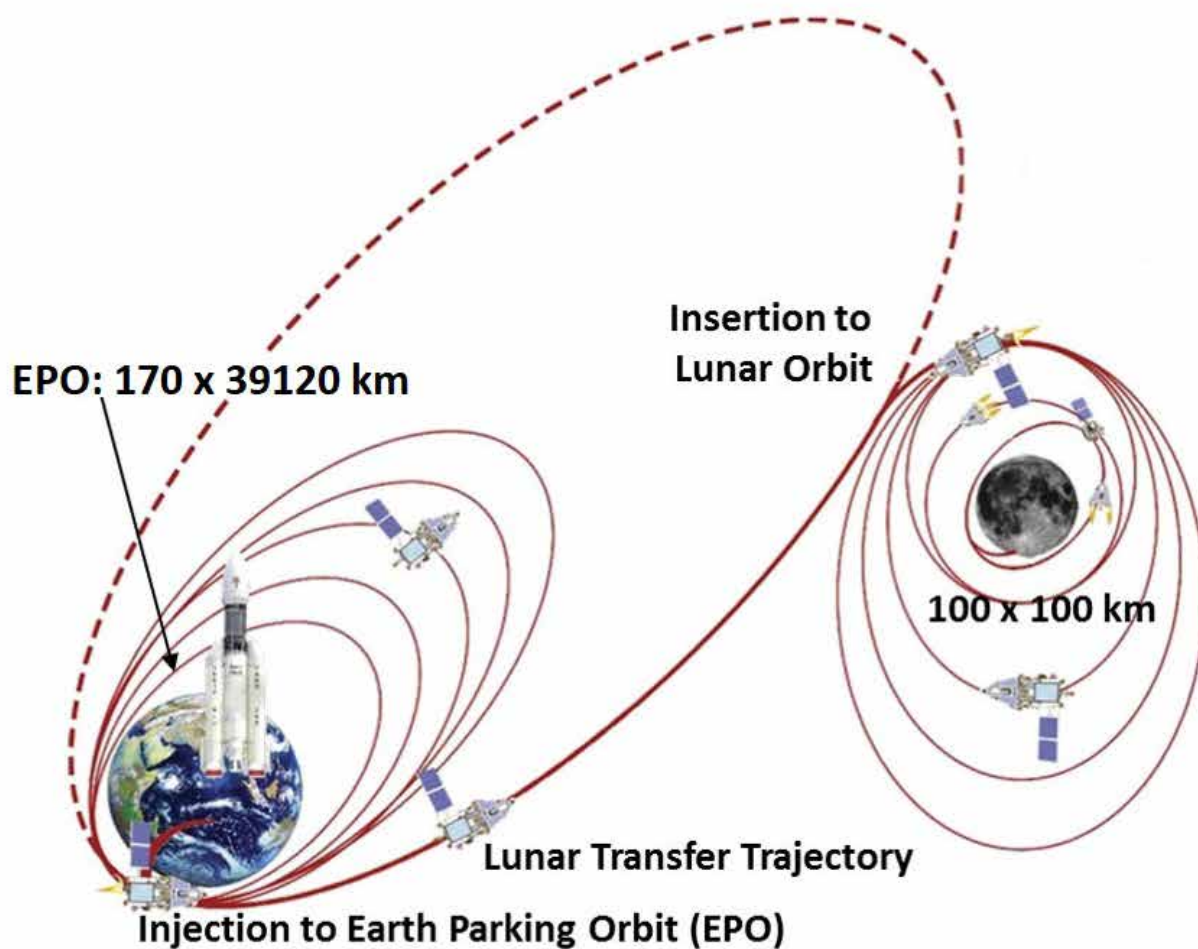
Pragyaan Rover was a 6-wheeled robotic vehicle that can travel up to 500 m (0.5 km) at a speed of 1 centimetre per second, and leverages solar energy for its functioning. It can communicate with the Lander.



SPECIFICATIONS

Weight	27 kg
Power	50 W
Payloads	<ul style="list-style-type: none"> • Alpha Particle X-ray Spectrometer • Laser Induced Breakdown Spectroscope
Mission Life	1 Lunar Day

CHANDRAYAAN-2 MISSION SEQUENCE



PHASE	PERIOD
Earth-bound Phase	Lift-off: 22, July Day 1 to Day 23 (23 days)
Trans Lunar Injection (TLI)	Day 23
Lunar Transfer Trajectory (LTT)	Day 23 to Day 30
Lunar Orbit Insertion (LOI)	Day 30
Lunar Bound Phase (LBN)	Day 30 to Day 42 (13 days)
Lander-Orbiter Separation	Day 43
Deboosting	Day 44
Powered Descent Starts	Day 48
Landing	Day 48