



Chandrayaan-5 (LUPEX)

[Source: IE](#)

Following the **successful** soft landing of **Chandrayaan-3** and the **proposed** lunar sample return by ISRO's **Chandrayaan-4 mission**, India and Japan have **jointly planned** the upcoming **Chandrayaan-5 (LUPEX) mission** to study the **Moon's surface and the subsurface** for locating **lunar water and ice deposits**.

- **Chandrayaan-5** also known as [LUPEX \(Lunar Polar Exploration\)](#) is a joint lunar mission by [ISRO \(India\)](#) and [JAXA \(Japan's space agency\)](#), scheduled for **2027-28** launch on **Japan's H3 rocket**.
 - **Rover** will be developed by [JAXA](#) and **lander** by [ISRO](#).
 - It will carry **7 scientific instruments**, including a **mass spectrometer** by [ESA](#) and **neutron spectrometers** by [NASA](#).
- **Mission Objectives:**
 - Mapping **lunar water presence**.
 - Drilling **lunar regolith** to analyze **water content, quality, and composition**.
 - Performing **in-situ scientific observations** using spectrometers and sensors.
- It is a proposed **100 days (3.5 months)** with possible **extension to a year** and an attempt to explore the **Moon's far side**.
- [Chandrayaan-4](#) will be a **lunar return sample mission**, scheduled before **Chandrayaan-5**.
- [Chandrayaan-3](#) made India the **first country** to **soft-land** on the **Moon's south pole** in 2023.

CHANDRAYAAN 3

India's 3rd lunar mission; a successful attempt at achieving a soft landing on lunar south

BRIEF HISTORY

Lunar Mission	Aim	Launch Vehicle	Success
Chandrayaan 1 (2008)	Create a 3D atlas of moon & Mineralogical mapping	PSLV – C11	Detection of water and hydroxyl on lunar surface
Chandrayaan 2 (2019)	Exploring lunar south pole	GSLV MkIII-M1	Lander and rover crashed but orbiter successfully collected data

COMPONENTS

- Lander - **Vikram**; Rover - **Pragyan** (same as Chandrayaan 2)
 - ▶ Both designed to last for 14 days; not supposed to come back to the earth
- Spectro-polarimetry of Habitable Planet Earth (**SHAPE**)
 - ▶ An experimental payload in propulsion module
 - ▶ Study spectro-polarimetric signatures of Earth (near-infrared wavelength range)

ASPECTS TO STUDY

- Lunar quakes
- Thermal properties of lunar surface
- Changes in plasma near the surface
- Accurately measuring distance b/w Earth and the moon

MISSION LIFE

- 1 Lunar day (~14 Earth days)

LAUNCH VEHICLE

- LVM3 - M4



India became the 1st country to successfully land on Lunar south pole and 4th to achieve soft-landing on Lunar surface (after US, Russia and China)

Why Chandrayaan 3 Succeeded?

- A "failure-based design", unlike the "success-based design" of Chandrayaan-2
 - ▶ Even if all the sensors failed and engines stopped, **Vikram was sure to make the landing**
 - ▶ Provision of **multiple attempts** for landing if attempt 1 failed
- Developed accordingly to **rule out the scenario of crash landing**
 - ▶ Expanded landing area for more flexibility to land safely
 - ▶ Equipped with more fuel to enable longer-distance travel

Importance of Lunar South Pole

- Vastly different, more **challenging terrain** compared to lunar equatorial region
- Potential repositories of valuable **information about early Solar System**
- Impact **future deep space exploration** significantly
- **Water may be concentrated** in the moon's southern hemisphere



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Read More: [Evolution of India's Space Program](https://www.drishtiias.com/printpdf/chandrayaan-5-lupex)