



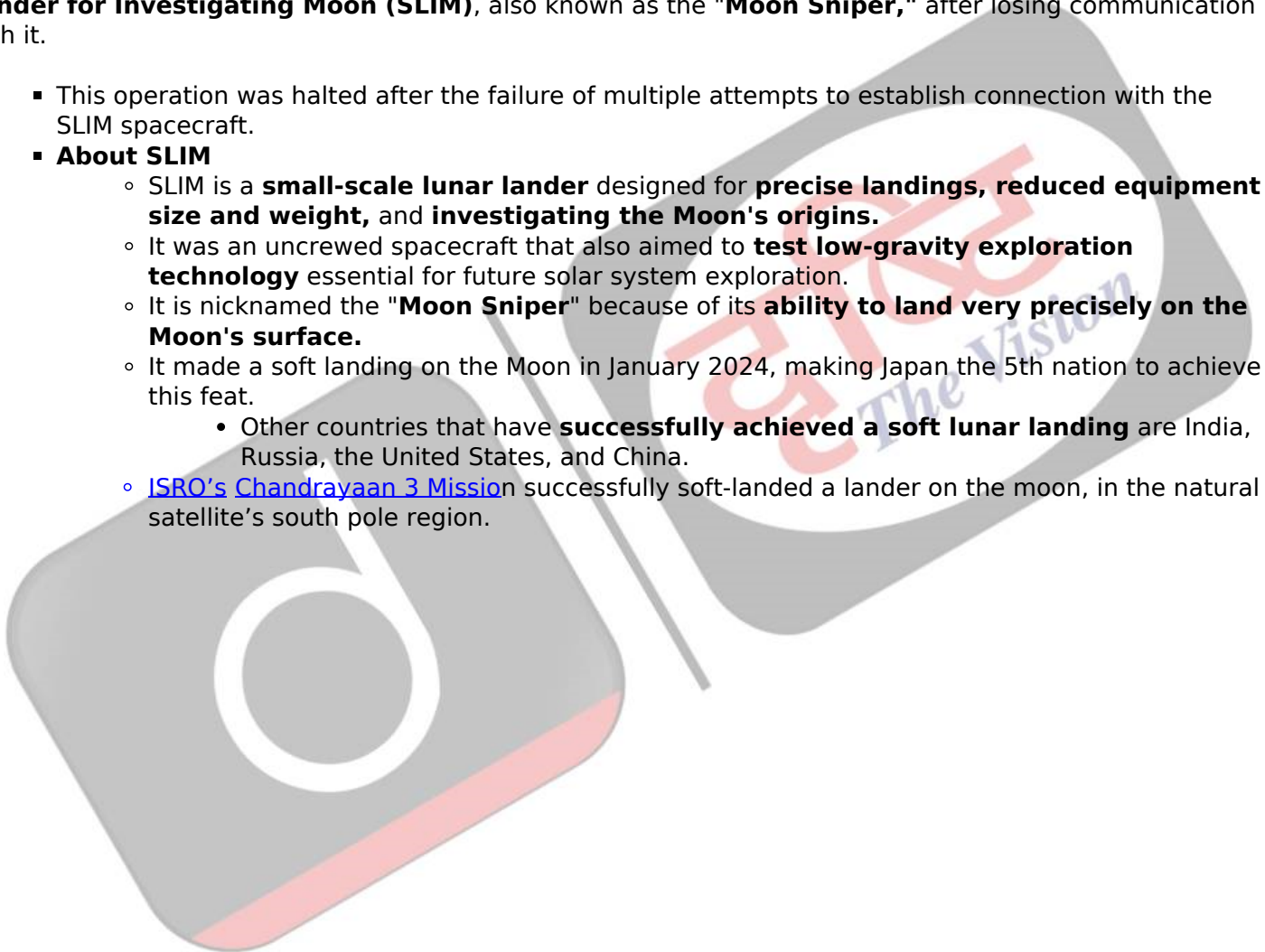
## Japan's SLIM Moon Mission

[Source: PhysOrg](#)

Recently, **Japan's space agency, JAXA**, has concluded operations of its **Moon lander**, the **Smart Lander for Investigating Moon (SLIM)**, also known as the "**Moon Sniper**," after losing communication with it.

- This operation was halted after the failure of multiple attempts to establish connection with the SLIM spacecraft.
- **About SLIM**
  - SLIM is a **small-scale lunar lander** designed for **precise landings, reduced equipment size and weight**, and **investigating the Moon's origins**.
  - It was an uncrewed spacecraft that also aimed to **test low-gravity exploration technology** essential for future solar system exploration.
  - It is nicknamed the "**Moon Sniper**" because of its **ability to land very precisely on the Moon's surface**.
  - It made a soft landing on the Moon in January 2024, making Japan the 5th nation to achieve this feat.
    - Other countries that have **successfully achieved a soft lunar landing** are India, Russia, the United States, and China.
  - [ISRO's Chandrayaan 3 Mission](#) successfully soft-landed a lander on the moon, in the natural satellite's south pole region.

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# CHANDRAYAAN 3

India's 3<sup>rd</sup> 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 1<sup>st</sup> country to successfully land on Lunar south pole and 4<sup>th</sup> 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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