

Findings of Chandrayaan-2 mission

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In news- Though it failed to make a soft landing, the observations of the Chandrayaan-2 orbiter payloads have yielded discovery-class findings.

About the mission & orbiter-

India's second mission to the Moon, Chandrayaan-2 was launched on 22nd July 2019.

The Orbiter carried eight scientific orbiter payloads-

1. Chandrayaan-2 Large Area Soft X-ray Spectrometer (CLASS).
2. Solar X-ray Monitor (XSM).
3. Chandra's Atmospheric Compositional Explorer 2 (CHACE 2).
4. Dual Frequency Synthetic Aperture Radar (DFSAR).
5. Imaging Infra-Red Spectrometer (IIRS).
6. Terrain Mapping Camera (TMC 2).
7. Orbiter High-Resolution Camera (OHRC).
8. Dual-Frequency Radio Science (DFRS).

Key findings of the mission-

Water on Moon:

- The presence of water on the Moon has already been discovered back in 2008 by Chandrayaan-1.
- But the instrument onboard the first mission to the moon was not sensitive enough to detect the difference between hydroxyl radical (OH) and the water molecule (H₂O), which also has OH).
- This time, **IIRS of Chandrayaan-2 has detected OH and H₂O molecules separately** and further found unique

characteristics about both.

- It has made the **most precise observation about the presence of water molecules on the lunar surface to date.**
- Earlier, water was known to be present mainly in the polar regions of the Moon.
- But, **Chandrayaan-2 unravels the mystery of water by finding signatures at all latitudes** on the surface of the moon.
- Besides, in a first of its kind discovery, **a microwave imaging instrument, the DFSAR has detected potential water ice** at the permanently shadowed regions in Lunar Poles.

Presence of precious elements:

- Apart from major elements like magnesium, aluminium, silicon, calcium, titanium, iron etc., the **CLASS instrument examined and detected minor elements – chromium and manganese for the first time.**
- The findings pave the path for adding knowledge about the magmatic evolution of the Moon, its nebular conditions and much more.

Study of the Sun:

- It has collected information about **Solar flares.**
- **Solar X-ray Monitor (XSM), has witnessed a huge amount of microflares** outside the active regions of the Sun for the first time.
- **This discovery will lead to a better understanding of the mechanism** behind the heating of the solar corona.

Extra reading – <https://journalsofindia.com/chandrayaan-3/>