

Chandrayaan-2 has mapped sodium content on Moon's surface

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In news— According to ISRO, the X-ray spectrometer 'CLASS' on the Chandrayaan-2 Orbiter has mapped an abundance of sodium on the moon for the first time.

Key updates-

- Chandrayaan-2 mapped the abundance of sodium on the Moon for the very first time using CLASS (Chandrayaan-2 Large Area Soft X-ray Spectrometer).
- Built at the U R Rao Satellite Centre of ISRO in Bengaluru, CLASS provides clean signatures of the sodium line thanks to its high sensitivity and performance.
- Chandrayaan-1 X-ray Fluorescence Spectrometer (C1XS) detected sodium from its characteristic line in X-rays which opened up the possibility of mapping the amount of sodium on the Moon.
- X-ray fluorescence is commonly used to study the composition of materials in a non-destructive manner.
- When the sun gives out solar flares, a large amount of X-ray radiation falls on the moon, triggering X-ray fluorescence.
- The CLASS measures the energy of the X-ray photons coming from the moon and counts the total number.
- The energy of the photons indicates the atom (for instance, sodium atoms emit X-ray photons of 1.04 keV) and the intensity is a measure of how many atoms are present.
- The study found that a part of the signal could be arising from a thin veneer of sodium atoms weakly bound to the lunar grains.

- These sodium atoms can be nudged out of the surface by solar wind or ultraviolet radiation more easily than if they were part of the lunar minerals.
- Also shown is a diurnal variation of the surface sodium that would explain the continuous supply of atoms to the exosphere, sustaining it.
- An interesting aspect that widens the interest in this alkali element is its presence in the wispy atmosphere of the moon, a region so thin that the **atoms there rarely meet.**
- **This region, termed an 'exosphere', begins at the surface of the moon** and extends several thousand kilometres merging into the interplanetary space.
- Earlier moon missions, like Apollo-11, Luna and Chang'e-5, brought back rock samples. The amount of sodium in the rocks was precisely gauged.

Further

reading:

<https://journalsofindia.com/findings-of-chandrayaan-2-mission/>