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Perspective

Insights of Chandrayaan-2 Mission

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DESCRIPTION

The Moon provides the best linkage to understand Earth's early history and offers an undisturbed record of the inner Solar system environment. In spite of several missions to the Moon, there remain several unanswered questions. Continued high resolution studies of its surface, sub-surface/interior and its low-density exosphere, are essential to address diversities in lunar surface composition and to trace back the origin and evolution of the Moon. With the goal of expanding the lunar scientific knowledge through detailed studies of topography, mineralogy, surface chemical composition, thermo-physical characteristics and the lunar exosphere, Chandrayaan-2 was launched on 22 July 2019 and inserted into the lunar orbit on 20th August 2019, the orbiter completed more than 4400 orbits around the Moon and all the instruments are currently performing well. The orbiter is being maintained in 100 ± 25 km polar orbit with periodic Orbit Maintenance (OM) maneuvers.

Hence payload operations are planned optimally during the Dawn-Dusk season SAR payload is operated. DFRS is operated as and when opportunities arise. IDSN-18 m antenna and JPL Deep Space Networks (DSN) stations support S-Band telemetry and X-band payload data dumps. Downloaded data are transferred to ISSDC for processing, archival and dissemination. This area is of scientific importance as it contains a type of light plains deposit that appears to lie on the top of an ancient basaltic surface. The image shows Balmer 'R' and Maclaurin 'D' craters. The one km diameter ray impact crater system is clearly visible in the image. The Digital Elevation Model (DEM) has been generated from the stereo triplets. Lunar lobate scarps are relatively small-scale tectonic landforms which are low angle thrust faults, believed to be young lunar landforms. However, in lower sun angles, the subtle variations in topography is enhanced by the corresponding shadows. Boulders can be easily identified using OHRC images due to its very high spatial resolution. Hundreds of boulders, ranging from 1 m to 50 m in diameter, are distributed within ejecta close to the crater rim. These boulders represent the deepest material excavated during crater formation. Boulders on the Moon surface are often found around young impact craters. The far side hidden from Earth's view is quite different from the side we can see.

CONCLUSION

Most of the lunar mare volcanism is confined to the nearside. All of the returned samples collected by the Apollo missions are from the nearside equatorial region which serve as a calibration standard for remote sensing measurements. Previous observations of lunar poles carried out with ground-based radars as well as orbital-based SAR data from Mini-SAR (Chandrayaan-1) and Mini-RF (Lunar Reconnaissance Orbiter) yielded ambiguous results on the possible presence of water ice in the permanently shadowed regions. These observations were constrained by limited viewing geometry and polarization measurements of afore mentioned radar instruments. Chandrayaan-2 DFSAR, with its capability to acquire images at multiple incident angles with multiple polarization modes, has been imaging the lunar surface at both L and S-band wavelengths.

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