



LEMS: Lunar Environment Monitoring Station

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Platform: Lander, Rover (commercial or scientific missions)

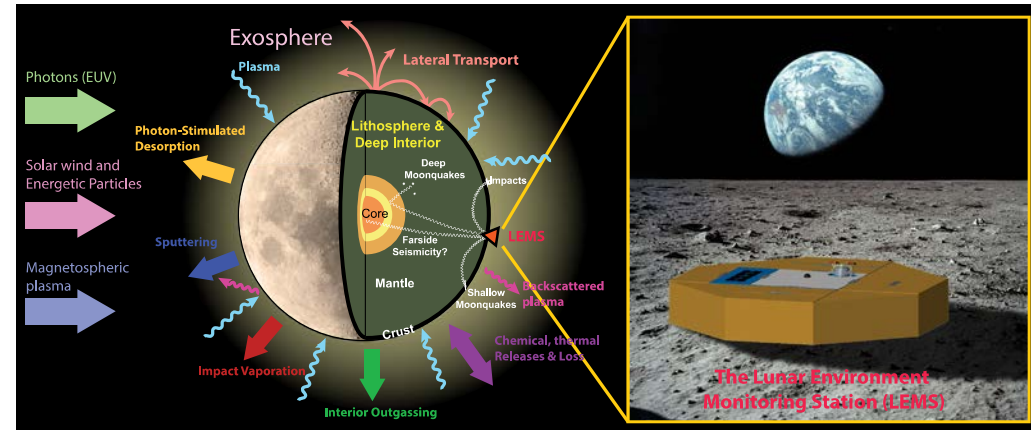
Science:

- Obtain direct measurement or establish upper limit for other organic and inorganic species such as CO , N_2 , NH_3 , H_2S , H_2CO , C_2H_2 , C_2H_6 , and CH_3OH .
- Measure temporal variations of known volatile species on the dayside and nightside (He , Ar , Ne , H_2O , CO_2 and CH_4) on time scales of lunar days for a minimum duration of one Earth year.
- Measure the continuous ground motion at each LEMS location using at least one component of motion (vertical) to monitor for seismicity resulting from thermal, impact, and internal stress releases.

Objectives:

- Validating and maturing the architecture of an integrated and self-sustaining mass spectrometer and seismometer package to TRL6.
- Validating the concept of operation and expected performance of a flight-like LEMS instrument.

CoIs: Malespin, Sarantos/GSFC; Raaen/Beacon; Schmerr/UMD, Dai, Zhao/ASU



The LEMS instrument will enable comprehensive and continuous measurements of the exosphere and its interaction with the space environment, surface and interior of the Moon.

Key Milestones:

- Maturation of System Design and Subsystem Interfaces
- System Design, Fabrication and Integration
- Functional and Environmental Testing and Characterization

TRL 4 to 6