

MALAPERT MOUNTAIN IS STRONG CANDIDATE SITE FOR CLPS MOON MISSIONS, WITH OPTIMAL OBSERVATION, COMMUNICATION AND POWER CONDITIONS. S. Durst,¹ International Lunar Observatory Association (65-1230 Mamalahoa Hwy D20, Kamuela HI 96743, info@iloa.org)

Introduction: Power and Communications are necessary conditions to conduct observational and analytic (spectrographic) science from the Moon's surface. Being inclined $1\frac{1}{2}^\circ$ from the ecliptic plane results in areas of near-continuous [1],[2] sunlit conditions around Moon South Pole (MSP) as the Sun hovers close to the horizon, enabling energy generation and storage via hydrogen fuel cells during brief periods of darkness – brevity which also moderates thermal conditions, favorable for lunar night survivability.

Conversely, permanently shadowed regions are also in abundance in MSP area, owing to the same inclination phenomenon creating long duration shadows – suitable areas to prospect for molecular water ice, methane, ammonia and other volatiles [Fig. 1]. Malapert Mountain, a peak within Malapert Massif ($0^\circ, 86^\circ$ S, just 4° from the South Pole and 120 km from Shackleton Crater) fulfills these criteria (70-80% sunlight at 4,990-km elevation) while also offering plateau landing site and proximity to geological / mineralogical sites of interest related to South Pole Aitken Basin formation thought to contain pre-Nectarian regolith [Fig. 2] - dating of which is pertinent to proving impactor hypothesis and determining models of impact flux, making sample return from the area highly desirable. Evidence derived from orbital study suggests concentrations of hydrogen, helium-3, aluminum, and rare earth metals conducive to long duration construction, power, life support necessary for lunar base buildout are present [3].

Furthermore, direct line of sight from near side lunar surface to Earth with uninterrupted observation and communication due to tidal locking effect – permitting long duration study of climate change, storm and drought tracking etc while also providing an inspiring view of the lunar horizon. Astronomical observation can be conducted in various spectra (IR, Visible, UV, X-ray, Radio) directly from Malapert Mountain as well as providing convenient physical and signal access to the far side (via southern slope) championed by astronomers and cosmologists for near-absolute radio silence [4]. Starting from the high ground will enable communication / command and wireless power delivery to rovers, Lunar Terrain Vehicles, mining instruments and ‘mini hoppers’ while conducting surveying operations of the region – including scientifically interesting Shackleton, Cabeus, and Nobile craters.



Fig. 1 Malapert Summit (Credit: NASA)

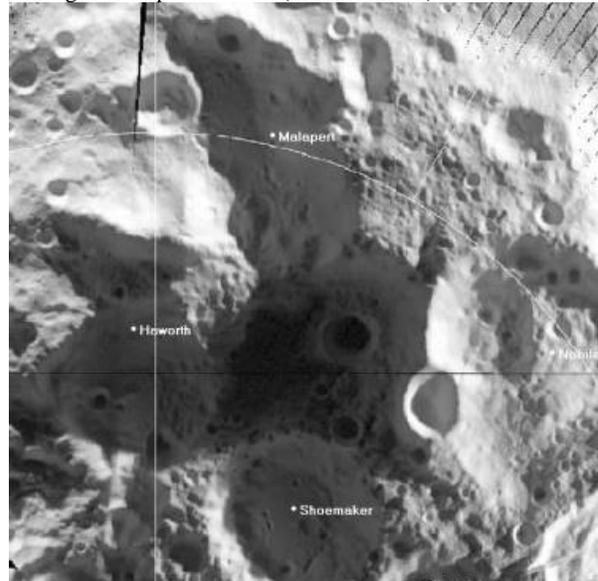


Fig. 2 Malapert Massif geologic features (Credit: Lunar Terminator Visualization Tool)

References:

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