Robotic Precursors to Human Exploration (03)
Lunar Robotic Precursor Missions (1)

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CABLE CANADIAN AMERICAN BRITISH LUNAR EXPLORER

Abstract

The Moon, our closest celestial partner, is strategically important and can harbour a relatively pristine, "frozen-in" impact history of the Earth-Moon system. Lunar stratigraphy may provide clues about the solar system's transportation system based on impacts by asteroids that could have deposited a late-stage veneer of water and biomaterials that facilitated the evolution of life on Earth.

CABLE is a low-cost lunar lander/microRover mission concept based on international collaboration of niche technologies. CABLE includes collaborations with the University of Surrey/Surrey Space Centre

on soft-landing lander technology and the University of Hawaii and Hawaii Space Flight Laboratory on the required Earth-Moon transfer stage.

CABLE will employ Canadian technologies in miniature spectrometers, robotics, semi-autonomous science-driven navigation and a highly capable microRover platform to reduce the required lunar payload mass while extending the science capability. Risk is minimized through the use of hazard-avoidance soft-landing technologies.

The baseline science mission is to investigate surface characteristics of a region of the Moon that has never been explored in situ, Aristarchus Plateau, to address fundamental geologic and lunar resources issues for the first time. The Aristarchus Plateau, located on the lunar near side, is rich in diverse geologic features, including lunar volcanic rilles that resulted from the collapse of lunar lava tubes, source vents, and volcanic materials that erupted in giant explosive events, all of which can provide insights into the lunar volcanic processes and composition of the interior. This site has also been identified by the international science community as a potential human outpost because of its resource exploitation potential for extended human presence, astro-physics, heliophysics, and Earth observation experiments.

The main science goals for this mission address key international interests, including mapping lunar surface geology to determine the extent and composition of pyroclastic deposits on the plateau. The mission will also explore the availability and distribution of near-surface volatiles from prior impacts and in situ resources (e.g., ilmenite) using a robotic trenching capability.

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