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Return to the Moon (02)
Concepts for Robotic and Human Missions to the Moon (3)

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EARLY TELEROBOTIC EXPLORATION OF THE LUNAR FARSIDE USING ORION SPACECRAFT AT EARTH-MOON L2

Abstract

Missions to the Earth Moon L2 Lagrange point using Orion spacecraft offer the best opportunity for early, productive human exploration capability. Mission objectives may include remote operation of a mobile system to collect and return samples from the South Pole-Aitken basin, or teleoperated deployment of a low-frequency radio telescope array on the lunar farside. Experiments with telepresent remote operation systems would lay the ground work for future missions to Mars orbit using similar techniques by determining the necessary bandwidth, latency, and operations techniques for effective remote control. Early missions could also deploy small satellites for purposes such as communications relay and navigation over the lunar farside. The Orion spacecraft can be deployed to an EM-L2 halo orbit using the planned initial configuration of the SLS launch vehicle and the baseline Orion configuration by executing a lunar swingby with a propulsive retro burn at perilune. Orion could operate at EM-L2 alone for a single lunar daylight cycle (14 days), or could rendezvous with a pre-deployed habitat element for longer stays. Several possible options for this habitat element will be described, including derivatives of ISS modules and of ISS servicing vehicles from various nations. Missions could begin by the end of the decade.