

SPACE EXPLORATION SYMPOSIUM (A3)
Interactive Presentations (IP)

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LUNAR TRANSPORTATION FOR A SUSTAINABLE SPACE ECONOMY

Abstract

As the world looks to move beyond Low Earth Orbit (LEO), advanced in-space transportation is required. Masten Space Systems (Masten) and United Launch Alliance (ULA) are developing the uniquely suited eXperimental Enhanced Upper Stage (XEUS) to meet this need. XEUS is an economical, commercial lunar lander capable of delivering large payloads to the Moon. XEUS' technology is based on Masten's XL-1 lunar lander design and leverages ULA's Advanced Common Evolved Stage (ACES) second stage as the structural backbone. XEUS is a specific mission kit for ACES, allowing for landing and take-off from the Moon, and enabling regular transportation from Earth to Earth Moon L1, Low Lunar Orbit (LLO), and the lunar surface.

This paper describes the concept and capabilities of XEUS, including missions such as propellant delivery to L1, large payload delivery to the lunar surface, and regular service to the Moon, and describes related technologies in development, such as EDL, GNC, and distributed propulsion. This new vehicle results in an affordable lunar lander with a large payload capacity to enable a sustainable space economy. With reliable and regular lunar transportation, and the ability to lift extracted propellant off the Moon, the space beyond LEO is suddenly accessible, affordable and sustainable.