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SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Going To and Beyond the Earth-Moon System: Human Missions to Mars, Libration Points and NEO's (8-A5.4)

Author: Dr. Christopher Moore
National Aeronautics and Space Administration (NASA), United States, christopher.moore@nasa.gov

TECHNOLOGY DEVELOPMENT FOR NASA'S ASTEROID REDIRECT MISSION

Abstract

NASA is developing concepts for the Asteroid Redirect Mission (ARM), which would use a robotic spacecraft to capture a small near-Earth asteroid, or remove a boulder from the surface of a larger asteroid, and redirect it into a stable orbit around the moon. Astronauts launched aboard the Orion crew capsule and the Space Launch System rocket would rendezvous with the captured asteroid mass in lunar orbit, and collect samples for return to Earth. This bold mission will advance critical technologies needed for human exploration in cis-lunar space and beyond. The ARM could also demonstrate the initial capabilities for defending our planet against the threat of catastrophic asteroid impacts.

NASA projects are maturing the technologies for enabling the ARM, which include high-power solar electric propulsion, asteroid capture systems, optical sensors for asteroid rendezvous and characterization, deep space habitation, advanced spacesuits, and the utilization of asteroid resources. Technology needs and alternatives were identified in mission concept studies, and via a request for information that gathered over 400 ideas, which were then synthesized in a public workshop. Many of the technologies being developed for the ARM may also have commercial applications such as satellite servicing and asteroid mining.