HUMAN EXPLORATION OF THE MOON AND MARS SYMPOSIUM (A5)
Going Beyond the Earth-Moon system: Human Missions to Mars, Libration points, and NEO's (4)

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DEMONSTRATING CRITICAL CAPABILITIES TO ENABLE HUMAN DEEP-SPACE EXPLORATION

Abstract

NASA is pursuing a new strategy to enable human exploration missions to the Moon, Lagrange points, Near Earth Objects (NEOs), and Mars. This strategy focuses on long-range technology development, early demonstrations of critical capabilities, and robotic precursor missions to scout potential destinations for human activity. NASA's technology programs are developing key, long-range technologies to provide the foundation for a broad set of future exploration capabilities. These key technologies include advanced in-space propulsion; cryogenic propellant storage and transfer; autonomous systems; human-robot interaction; closed-loop life support and habitation systems; extra-vehicular activity (EVA) technology; entry, descent, and landing technology; high-efficiency space power systems; and in-situ resource utilization. To build up the capabilities needed for human deep-space exploration, a series of near-term technology demonstration projects is planned to validate the designs of prototype systems and test operational concepts. The demonstration projects will use a wide range of platforms and venues, such as ground-based analogs, flight test aircraft, suborbital launch vehicles, robotic spacecraft, and the International Space Station.