X9.02 Surface Mobility/Mechanisms

Lead Center: JPL

Participating Center(s): GRC, JSC

This subtopic seeks innovative mobility and mechanisms technologies for robotic systems, crew vehicles, and cargo systems for robotic lunar and Mars missions.

Precursor Mobility Systems

Precursor mobility systems address development of hardware and software mobility technologies for precursor lunar missions that also support missions to Mars. Topics include enabling technologies for modular robotic systems, alternative mobility systems, and the development of software to autonomously control and integrate mobility technologies. Mechanisms include traditional wheel motor and harmonic drives, distributed mechanical drives, traction drives, tracked drives, and walking mechanisms.

Proposals may also focus on surface systems for autonomous robotic outposts. Emphasis is placed on the ability to test, verify, and validate such system prototypes in representative laboratory and field environments. The applicable technologies and design concepts span the full range of surface mobility including high dexterity robotic scouts, long-range navigation on the lunar surface, and robotic systems for structural construction, inspection and repair.

This year, emphasis is placed on: 1) modular robotic systems and subsystems (mechanical and electrical), 2) assembly and control of modular systems, and 3) alternative mobility systems such as inflatable systems or tracked vehicles, and walking systems.

Crew Mobility Systems

We will also consider highly innovative mobility technology in specific support of crew and cargo vehicles. Proposals addressing this area should focus on space-relevant hardware, mobility options, crew transports over rough terrain, and logistical issues such as ingress/egress and loading/unloading.