NASA SBIR 2011 Phase I Solicitation

X7.02 Human-Robotic Systems - Mobility Subsystems

Lead Center: JSC

Participating Center(s): ARC, JPL

The objective of this subtopic is to create human-robotic technologies (hardware and software) to improve the exploration of space. Robots can perform tasks to assist and off-load work from astronauts. Robots may perform this work before, in support of, or after humans.

Ground controllers and astronauts will remotely operate robots using a range of control modes (teleoperation to supervised autonomy), over multiple spatial ranges (shared-space, line-of-sight, in orbit, and interplanetary), and with a range of time-delay and communications bandwidth.

Proposals are sought that address the following technology needs:

- Subsystems to improve the transport of crew, instruments, and payloads on planetary surfaces, asteroids, in-space; and improve handling and maintenance of payloads and assets. This includes hazard detection sensors/perception, active suspension, grappling/anchoring, legged locomotion, robot navigation, and infrastructure-free localization. As well as, tactile sensors, human-safe actuation, active structures, dexterous grasping, modular "plug and play" mechanisms for deployment and setup, small/lightweight excavation/drilling devices to enable subsurface access, and novel manipulation methods.