



## NASA SBIR 2015 Phase I Solicitation

### H6.01 Human Robotic Systems - Mobility Subsystem, Manipulation Subsystem, and Human System Interaction

Lead Center: JSC

Participating Center(s): ARC, KSC

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 (tele-operation 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 three subtopics:

- *Mobility* - Subsystems to improve the transport of crew, instruments, and payloads on planetary surfaces, asteroids, and in-space. This includes hazard detection sensors/perception, active suspension, grappling/anchoring, legged locomotion, robot navigation, and infrastructure-free localization.
- *Manipulation* - Subsystems to improve handling and maintenance of payloads and assets. This includes tactile sensors, human-safe actuation, active structures, dexterous grasping, modular plug and play mechanisms; mechanisms for deployment and setup, small/lightweight excavation devices, and novel manipulation methods.
- *Human-system interaction (HSI)* - Subsystems that enable crew and ground controllers to better operate, monitor and supervise robots. This includes robot user interfaces, automated performance monitoring, tactical planning software, ground data system tools, command planning and sequencing, real-time visualization/notification, and software for situational awareness.