

Title: Robotic Technology Efforts at the NASA/Johnson Space Center
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The NASA/Johnson Space Center has been developing robotic systems in support of space exploration for more than two decades. The goal of the Center's Robotic Systems Technology Branch is to design and build hardware and software to assist astronauts in performing their mission. These systems include: rovers, humanoid robots, inspection devices and wearable robotics. Inspection systems provide external views of space vehicles to search for surface damage and also maneuver inside restricted areas to verify proper connections. New concepts in human and robotic rovers offer solutions for navigating difficult terrain expected in future planetary missions. An important objective for humanoid robots is to relieve the crew of "dull, dirty or dangerous" tasks allowing them more time to perform their important science and exploration missions. Wearable robotics one of the Center's newest development areas can provide crew with low mass exercise capability and also augment an astronaut's strength while wearing a space suit.

This presentation will describe the robotic technology and prototypes developed at the Johnson Space Center that are the basis for future flight systems. An overview of inspection robots will show their operation on the ground and in-orbit. Rovers with independent wheel modules, crab steering, and active suspension are able to climb over large obstacles, and nimbly maneuver around others. Humanoid robots, including the First Humanoid Robot in Space: Robonaut 2, demonstrate capabilities that will lead to robotic caretakers for human habitats in space, and on Mars. The Center's Wearable Robotics Lab supports work in assistive and sensing devices, including exoskeletons, force measuring shoes, and grasp assist gloves.