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NASA TESTING HUMAN-ROBOT INTERACTIONS IN UTAH DESERT

Two NASA robots and two geologists are now simulating an expedition to another planet during a field test expected to continue until April 15 in Utah's Southeast Desert, near Hanksville.

During the ongoing 'Mobile Agents Project,' NASA engineers are working to improve human-robot interactions to help NASA accomplish its Vision for Space Exploration to return to the moon and venture to Mars. The wheeled robots are attempting to help the astronaut team to maintain connection with a wireless computer network.

"As you look at NASA's exploration vision to return to the moon and go on to Mars, human-robotic cooperation will be vital to achieve that vision," said Eugene Tu, deputy director for the Exploration Technology Directorate at NASA Ames Research Center in California's Silicon Valley.

"One of our biggest problems is to break out of preconceived notions rooted in science fiction or existing robotic technology," said Bill Clancey, principal investigator for the Mobile Agent project. "By building and testing prototypes, we can test design concepts."

During the field exercise, the researchers' objective is to develop ways to enable robots to take the initiative to work together to help a team of astronauts.

Scientists and engineers from NASA Ames and NASA Johnson Space Center, Houston, are taking part in the test. Prototype 'Extravehicular Activity (EVA) Robotic Assistants,' developed at NASA Johnson, will follow geologists and respond to voice commands at the Mars Society's Mars Desert Research Station.

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According to NASA scientists, human-robotic interactions can best be improved using *in-situ* experiments, during which people and robots cooperate to do research. Scientists plan to examine the interacting constraints of landscape, distance, work coordination and other factors to suggest what new tools and methods are needed to refine existing technology.

This process will bring together the remote science team, mission support, the habitat and its crew, robots, computer networks and astronauts to simulate planetary surface exploration.

A team that includes about 20 people has placed equipment in and around the Mars Desert Research Station. Team members are using prototype tools, including a wireless computer network, the voice-commanded robots and voice-commanded mission control communication services that partly automate the role of the kind of communications used during the Apollo missions to the moon in the late 1960s and early 1970s.

Researchers are continuing to conduct a series of human-robot simulated geology missions to scout new terrain during multiple days. These simulations also involve the remote science team. Scientists are making audio and video recordings of the activities.

Researchers later will evaluate the data to learn about human-robot interactions including voice commands and work preferences. From analysis of the recordings and other data, investigators can assess equipment, software and procedures. Scientists can then write new requirements and specifications to improve human-robot interactions and cooperation.

Publication-size images are available at:

<http://www.marssociety.org/MDRS/fs04/>

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