

NASA To Show Intelligent Space Robots In Action At Ames "Marscape"

NASA will showcase two intelligent robots on Monday, October 3, in the outdoor 'Marscape' at NASA Ames Research Center, located in California's Silicon Valley.

The two robots – 'K-9' and 'Gromit' – are smart enough to make decisions about how to achieve objectives on a planet or moon without detailed instructions from human beings. Researchers will also demonstrate 'mobile agent' software that may someday help robots and human beings on Earth, the moon and Mars communicate with each another.

"To efficiently explore the moon and Mars, flight crews will have to be much more self-reliant than before," said David Korsmeyer, chief of the Intelligent Systems Division at NASA Ames. "Development of such self-reliance requires machine intelligence, coupled tightly with human direction," Korsmeyer explained.

Eventually, robots may work together to prepare landing sites, habitats or resources on extraterrestrial sites, according to scientists. Robots and human beings will form teams on moons and planets to explore them, ventured Korsmeyer.

NASA Ames computer scientists are developing additional intelligent systems that can operate seamlessly with human ground and flight crews.

Not only will robots and computers be more self-sufficient because they will be able to plan ahead, but they will be able to work more efficiently and safely with their human crewmates – even enabling the flight crews to manage spacecraft health autonomously, reducing dependence on earth-based mission support staff, according to scientists.

"We are developing capabilities to allow humans and robots to operate competently and efficiently together in harsh, partially understood environments," said Alonso Vera of NASA Ames. "Candidate missions for robots include constructing lunar habitats, constructing large space structures, and performing science measurements for Earth or space science," Vera noted.

Robot-human communications 'mobile agent' software comes in several types, according to Bill Clancey of NASA Ames.

"The key thing is that the explorer will talk with the computer mobile agent software about science observations being made," said Clancey. "There are three specifics that the explorer relays to the agent – the name of the location, which sample bag the explorer is using to collect samples, and a narration of contents of the bag and the geologic context."

During future planetary exploration, this kind of data will be relayed by personal agent software to others on the science team, both on the planet's surface and back on Earth, according to Clancey. Information will be stored in a database in a Mars or planetary human habitat.

The personal agent software will send this data via e-mail to the Earth-bound science team. The software also automatically will transmit images taken by the astronauts to their planetary habitat and to Earth.

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