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### NASA: Arizona will play key role in next moon mission

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NASA astronaut Mike Gernhardt answers questions outside the Lunar Electric Rover, which he helped test recently at the Black Point Lava Flow two hours north of Flagstaff (Cronkite News Service Photo by Iain Woessner)

By IAIN WOESSNER  
Cronkite News Service

Mike Gernhardt, a veteran of four space shuttle missions and several space walks, uses a joystick and computer touchscreen to pilot the Lunar Electric Rover across a desolate, rock-strewn landscape.

One command sends the rover and its airtight capsule scuttling sideways. Another lowers the craft, offering close-up views of rocks through an observation port in the floor.

Gernhardt then turns and grins at a several journalists crowded in the capsule. He doesn't have much time to answer questions; others lined up outside are waiting to ride.

Arizona played a key role as NASA prepared to put men on the moon, allowing Neil Armstrong, Buzz Aldrin and other astronauts to work on landscapes resembling the lunar surface and to get a crash course in field geology. Today, as NASA plans for the next U.S. footprints on the moon and eventually its first on Mars, the state's evolution into a center of space research means it will have a role even bigger than just a place to study geology, said Ashley Edwards,

a NASA spokeswoman.

"The state of Arizona will definitely be able to say it played a role in NASA's return to the moon," Edwards said in an e-mail interview.

"The landscape itself has provided NASA the opportunity to test its lunar surface systems in an environment that is similar to the terrain we expect to find on the moon," she said. "The temperature extremes, gusty winds and grit and dust of Arizona's high desert an ideal location to field test and evaluate prototype planetary exploration gear."

There was plenty of wind, grit and dust recently when Edwards accompanied journalists and scientists to the Black Point Lava Flow two hours north of Flagstaff, where Gernhardt and others tested the rover, cargo capsules, scout robots and other technology.

For the past 12 years, a group of NASA scientists and technicians calling themselves the DesertRATS (Research and Technology Studies) has been coming to Arizona to test new technology. What began with several researchers last month drew more than 100 to simulate a lunar mission.

The rover Gernhardt demonstrated, riding on a platform with six sets of tires, is designed to carry two astronauts forward, backward and sideways across the lunar surface for up to 14 days. Astronauts can squeeze through hatches into spacesuits mounted on the back, and the platform can carry winches, drills or cranes.

The DesertRATS also tested a set of robotic legs called the Tri-ATHLETE, designed to carry cargo modules to resupply astronauts roaming the lunar surface.

"I am absolutely confident that we'll see this on the moon," Gernhardt said. "It's just a matter of when, and sooner is

better as far as I'm concerned."

The next mission to the moon, tentatively set for 2020, aims to have four astronauts living for 14 days on the lunar surface, using two rovers to explore across thousands of kilometers, study the moon's geology and collect rocks.

Kip Hodges, director of the School of Earth and Space Exploration at Arizona State University, is part of a team providing field geology training to the next generation of astronauts. That includes an exercise scheduled for January in south-central Arizona.

"We have very little experience doing any kind of geologic research on the surface of the moon," Hodges said in a phone interview. "Doing geology on the surface of the moon is very different from doing geology on Earth. It's like a new science that has to be developed."

Hodges said lessons learned during the next moon mission will have implications for those on Earth.

"If you're interested in long-term sustainability of human societies, you really have to understand how humans and this planet co-evolved through time," he said.

Mark Robinson, a professor in ASU's School of Earth and Space Exploration, developed a Lunar Reconnaissance Camera that's allowing NASA to create detailed maps of the moon from an unmanned orbiter. Those will help determine landing sites.

"I would say that ASU is playing a key role for helping us to get there," Robinson said. "By providing a facility and moral support, they are making the Lunar Reconnaissance Camera a huge success."

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