

NASA eyes White Sands monument for testing Mars equipment

Alamogordo Daily News

By Elva K. Osterreich, Associate News Editor

Article Launched: 08/17/2008 12:00:00 AM MDT

Crawling over the surface of Mars, looking for life, the rover keeps plugging along and finding information.

Here on Earth, scientists are practicing for more planetary exploration, and they have found the best analog to Mars on Earth: White Sands National Monument.

"White Sands is a proving ground for science and equipment we want to fly to Mars," said NASA scientist Max Coleman. "Scientifically, White Sands a remarkable look-alike for a particular part of Mars."

Coleman and fellow scientific researchers Randy Mielke and Frank Grunthaner spent two days last week at the monument exploring the white sand for its potential as a Mars research site. They work out of the Jet Propulsion Lab at the California Institute of Technology.

The Mars Exploration Rover has exceeded its design lifetime by a bundle, Coleman said. Rovers Opportunity and Spirit landed on Mars in January 2004 to begin missions originally planned to last three months. They have continued operating for more than four years, though each shows some signs of aging.

"One of the places (a Mars rover) has been has sediments that look like white sands and a little lake which evaporated, leaving crystals," Coleman said. "They have a very distinct, finely layered structure."

Technology to enable science to analyze the sand layer by layer is important to the process of seeing if life is viable in the environment. Missions to Mars are planned to look for just that, a sign of life.

"We are interested in the environment and watching organic matter," Coleman said. "We have things that look like they are organic but can be produced non-organically."

At White Sands, the NASA experts know there is organic matter and can test how to get reliable samples layer by layer. New technology has to be developed because, in order to not destroy the samples, the layers have to be collected and examined without the use of common tools, such as augers.

"Normal drilling destroys organic matter and water," Coleman said. "The energy you put in can cause the loss of water."

What the equipment on Mars will be looking for are clues to life so rare and so small they are detected in amounts less than one per trillion, said Grunthaner, who is a NASA senior research scientist. He compared it to finding a needle in a field of haystacks.

"The equipment designed has to be a customized prototype and will fit on and be part of a joint project between the European Space Agency and NASA," Grunthaler said. "To get a result with confidence is determined by how you get a sample."

Because it is so costly to transport large pieces of equipment to Mars, the team is putting together a full university lab in a 4.5 kg. package.

"It will be a little bigger than a shoebox, and automated," Grunthaler said.

The target of upcoming missions is to look for life on Mars, Grunthaler said. For life, scientists agree, there must be water.

"So this is a critical search for water," he said. "Was there a trickle (on Mars) or was there a body (of water)?"

"Minerals tell us about the environment," Coleman said. "The principle is a mineral like gypsum grows in water with layers, like a snowball. You have captured in layers a history of the layers."

With that kind of information from Mars, they can know how humid the environment was.

"We got subtle information by taking a single crystal apart," Coleman said. "On Mars we are dealing with sediments four billion years old."

While there is almost nothing left of Earth's earliest phases, the early phases of Mars may still be there, Grunthaler said. There could be clues to Earth's beginnings, too.

The trip to White Sands, Coleman said, has been remarkably successful. The team will be returning to test equipment sometime next month.

Grunthaler said the three visiting scientists are part of a much larger team.

"A group of scientists have been working very hard on this project," he said.