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Scientist tells young people about possibility of life on Mars

By Sophia Fischer sfischer@theacorn.com



TEACHING ABOUT THE EXPLORATION OF MARS—Deborah Bass, a Santa Rosa Valley resident, employee of the Jet Propulsion Laboratory (JPL) and part of the NASA Phoenix mission to explore Mars, speaks to a group of Discovery Center teen volunteers at the Goebel Senior Center recently in Thousand Oaks. The Phoenix lander collected and analyzed soil samples on Mars.

JANN HENDRY/Acorn Newspapers

A local scientist recently spoke to area teens about an investigation that examines the possibility of life on Mars.

Deborah Bass discussed her work for NASA's Jet Propulsion Laboratory in Pasadena with teen volunteers from the Discovery Center for Science and Technology based in Thousand Oaks. The teens, in grades eight through 12, come from public and private middle and high schools and home school programs throughout the Conejo and Simi valleys.

Bass is involved in strategic planning for the Mars program. She supervises 13 engineers and scientists who are examining data from the planet to determine if it ever contained water or sustained life and what may have happened to change it to the cold, rocky, dry planet it is today. Bass worked on the Spirit and Opportunity rovers and the Phoenix

lander mission. During her talk she showed slides of Mars and the spacecraft.

"Everywhere on Earth that we find water we see life. So there's this water/life connection," said Bass, who joined JPL in 2001. "That's the issue I was all psyched about."

Phoenix launched in August 2007 and landed safely in May 2008. It took scientists five years of study to decide where the spacecraft could safely land, Bass said. Phoenix went the furthest north of any mission.

Over the course of 156 days, Phoenix dug into the frozen surface using its robotic arm, collecting soil samples that were analyzed by a portable laboratory on the spacecraft.

"We dug in all these different places. We made quite the mess on Mars," Bass said.

About 30,000 photos were taken of the horizon and the surface and transmitted to the scientists. The shapes and cracks in the soil show that there was movement on Mars, possibly due to water, Bass said.

"All these pictures tell you little clues, like a little puzzle, a forensic game that tells you what happened," Bass said. "It doesn't sound like much, but everything is a clue to geologists."

Sophisticated equipment in the lander include a meteorological station for weather experiments, a machine that analyzes gas samples and a device used to measure the

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roughness of the planet's sand grains.

"That had never been done before on another planet," Bass said. "We are very proud of that."

Phoenix sent science data to scientists on Earth until the craft was entombed in ice in November 2008 during the frigid Mars winter, Bass said. NASA's Mars orbiter, Odyssey, has tried obtaining a signal from Phoenix multiple times, but to no avail. With temperatures ranging from minus 143 to minus 3 degrees Fahrenheit, the climate in the planet's northern region is too cold for electronics to withstand, even though Phoenix contains a heat shield, Bass said.

"We kind of expected that to happen," Bass said. "That's a lot for a little spacecraft to deal with."

The primary focus of the Mars exploration program for the next 20 years will be bringing soil and rock samples back from the planet for study.

"We want to use human critical analysis. It's an expensive proposition in this era of cost-cutting measures," Bass said.

As new technologies are developed, higher resolution images, precision landings and longer-range surface mobility will help scientists answer questions.

"I think it drives at one of the fundamental questions we as humans want to answer: Are we alone in the universe?" Bass said. "It's easier to make life than perhaps we thought, and it might mean that life in another solar system might be easier to locate as well."

Bass, originally from Palo Alto, earned a doctorate in planetary geology from UCLA. At JPL, Bass first worked as an engineer then became deputy chief of Mars Exploration's Spirit and Opportunity rovers. She was a deputy project scientist on the Phoenix Mars Lander mission. Bass also participates in public outreach activities for the space program.

She and her family lived in Simi Valley for five years before moving to Santa Rosa Valley in 2006. Bass said she doesn't mind her 50-mile, one-hour commute between home and work, nor the fact that her car has 192,000 miles on it.

"I love living amongst avocado and citrus groves and adore the farm smell of the horses on our property and the view of the cliffs around the valley. The fields and green in Santa Rosa Valley refresh my soul," Bass said. "It amazes and thrills me that I can live in a somewhat rural area and still work in high tech."

All data collected is available online at <http://marsprogram.jpl.nasa.gov>.

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