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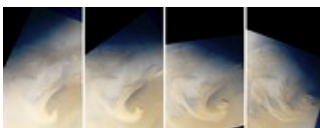
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## News

### University faculty and students turn their eyes toward Mars



Martian dust storms, like those photographed in the above time-lapse series by the Mars Global Surveyor in 1999, can affect the landing of rovers like the Mars Spirit. University Prof. Nilton Renno has served as a dust-deliv expert for the Spirit mission. (NASA/JPL/Malin Space Science Systems)

*Professors' expertise tapped for recent Martian exploratory missions*

By Naila Moreira, Daily Staff Reporter  
January 12, 2004

When NASA's Mars Spirit rover touched down safely last week on the red soil of Mars, University Prof. Nilton Renno could take a little bit of the credit.

Renno, a professor of atmospheric, oceanic and space sciences, studies dust storms, a common and often violent weather phenomenon on Mars. As a

member of NASA's Entry, Descent and Landing Science Advisory Board for the Mars Exploration Rover, Renno used his expertise to help design an effective landing strategy for the Spirit.

"As the dust content of the atmosphere changes, the density of the atmosphere changes, and that affects a lot the landing of the spacecraft," Renno said.

Because of the colossal challenges rovers face in a trip to the Martian surface, Renno said, NASA must accept a failure rate of 15 to 20 percent.

"They refer to EDL as the 'six minutes of terror,'" Renno said. "The spacecraft goes from 12,000 kilometers to 12 kilometers per hour. ... We have to lose three zeroes in six minutes."

The rover then leaves the main spacecraft, approaching the surface on a parachute that releases the rover about 50 feet above the ground. Once free, the rover faces further perils as it bounces as high as a five-story building before gradually settling on the Martian surface.

"They just let it go," Renno said. "Boing," he added, laughing.

Since its arrival, the Mars Spirit rover has taken panoramic color photos of the Martian surface and begun to conduct visual analysis of surrounding rocks. The rover will not begin moving around the landing site before Thursday at the earliest, NASA scientists announced yesterday.

Renno isn't the only University faculty member watching events on Mars. Sushil Atreya, director of the University Planetary Science Laboratory, is a scientific adviser for the European satellite Mars Express. The Express, associated with the European Space Agency's missing Mars rover Beagle 2, arrived in orbit around Mars on Dec. 25.

Atreya works with data from an infrared instrument on the satellite that can analyze the lower 60 km of the Martian atmosphere.

"With our instrument ... we're looking at the composition of the atmosphere, in terms of the gases, the aerosols, etc.," said Atreya. He and research fellow Ah-San Wong are searching for clues to help confirm theories that Mars once possessed a warm, wet climate habitable to life.

Wong works with Atreya to model how molecules are distributed in the Martian atmosphere. Some of the molecules the Express will try to measure on Mars, such as

[surface roll-out](#)

sulfides and methane, may be indicators of life, she said.

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Although Wong has studied planets such as Jupiter and its moon Titan, she prefers to study Mars, she said. "In Mars there's more opportunities - and I can tell my mom about it and she'll say, 'So, have you found life yet?'"

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Atreya said his team does not consider itself in competition with the Mars Spirit. "It's all great fun," he said. "I know Steve Squyres (the principal scientist for the Mars Spirit mission) and actually he's on our team too."

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To spur the enthusiasm of University undergraduates about Mars, Renno and Engineering Prof. Robert Dennis have also designed an interdisciplinary course, Engineering 450, which begins this semester. The course examines how robotic exploration could lead to human exploration of Mars and is sponsored by \$100,000 of funding from NASA's Jet Propulsion Laboratory.



"We are bringing people from JPL to do the first month of lectures, to inspire the students and get them excited about Mars and space exploration," Renno said. The lectures are open to the entire University community.



For instance, Jeff Simmonds, a team scientist for NASA's 2009 rover, named Mars Space Laboratory, spoke to students Thursday about high tech cameras he expects will travel to Mars in the future.

"We're using (Spirit) as a giant stepping stone, in terms of technology (and) capability," Simmonds said.

Simmonds' lecture sparked the interest of students like Engineering senior Ilya Wagner. "I was checking out the NASA website ... and a lot of the stuff he said makes sense now when I look at the pictures," Wagner said.

Wagner is also involved with the University Mars Rover Team, a student group whose mission is to design manned vehicles that could explore Mars. "I feel like student input right now really matters, because we're going to be engineers ... maybe when the human mission goes up," he said.

Atreya said that he thinks the public is very excited about missions to explore Mars. "Are we alone? Is there other life besides us? These are questions that concern everyone," he said. "Not that we're going to be able to answer those questions any time soon, but this is a step in the right direction."

University faculty and students turn their eyes toward Mars

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