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Man's Best Friend On Mars Could Be A Robot

Vanderbilt University professors, including a former astronaut, can add context to your stories on President Bush's proposal to return to the moon and send astronauts to Mars.

"A GRAND CHALLENGE"

Rick Chappell, director of Science and Research Communications, director of the Dyer Observatory, and former associate director for science at NASA's Marshall Space Flight Center in Huntsville—can discuss the educational, technological and scientific importance to the United States of a return to the moon and a manned mission to Mars. "Returning to the moon and setting out for Mars offers a grand challenge that can influence our children to have careers in science and technology," Chappell said. "It stretches us as a nation and will cause us to make unprecedented advances in technology. It is something a great nation like America is capable of doing, and it is something we ought to do."

While with NASA, Chappell served as an alternate payload specialist on a 1992 space shuttle mission and was mission scientist for Spacelab 1 from 1976 to 1985. Chappell can also discuss the importance of finding fossil evidence of past life on Mars—possibly with a completely different genetic structure than life on Earth—as well as the implications of finding remaining pockets of water on Mars.

MAN'S BEST FRIEND ON MARS COULD BE A ROBOT

Alan Peters, associate professor of electrical engineering—can discuss the role of robots in space. Peters has been working with NASA on the "Robonaut" project, which is developing humanoid robots that would likely be a key part of a new moon mission or Mars trips. The robonauts can be left outside to make repairs and act as assistants on a variety of tasks, protecting the safety of the astronauts and allowing work to get done more rapidly. "Both astronauts and robonauts have essential roles to play in future space exploration," Peters said. "The ideal would be to develop human/robot teams."

MAKE YOUR OWN AIR, WATER AND FUEL ON MARS

How do we get back from Mars once we're there? The high energy requirements of a manned mission to Mars may mean astronauts will need to make the fuel, air and water they need to return to Earth from raw materials found on the red planet's surface. Vanderbilt researchers explain how this can be done.

Ken Debelak, associate professor and director of information technology for chemical engineering—can discuss how to recover minerals and water from the Martian surface. "You can't take enough material with you to get back, so you have to manufacture the fuel you need to return," Debelak said. "Our research focuses on what we might be capable of doing with resources found on Mars."

In addition to fuel, Debelak's research seeks methods to recover water on Mars. "Water may be tied up in minerals on Mars as it is on Earth," Debelak continued. "We can use technologies we use here on Earth to unlock that water."

M. Douglas LeVan, Centennial professor and chair of the Department of Chemical Engineering—can explain how astronauts may be able to create oxygen on Mars for breathing and for fuel. "What we need to create breathable and burnable oxygen is present in the Martian atmosphere, which is 90 percent carbon dioxide," LeVan said. LeVan can also discuss his research to reduce the energy requirements of air purification systems on long-term space missions and on the space station.

RESISTING RADIATION DURING INTERPLANETARY TRAVEL

Ron Schrimpf, professor of electrical engineering—leads the Radiation Effects Research Group at Vanderbilt, the largest group of its type at any American university, and can discuss the electronics needs and challenges of surviving the high radiation environment of interplanetary space on the long mission to Mars. Schrimpf is also the director of the Institute for Space and Defense Electronics, which performs design, analysis and modeling work for a variety of space and defense-oriented organizations.

This story has been adapted from a news release issued by Vanderbilt University.

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