

# Phoenix Mars Mission

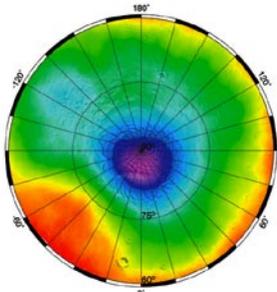


# Phoenix Mars Mission



## Uncovering the Mysteries of the Martian Arctic

The **Phoenix Mars Mission**, scheduled for launch in August 2007, is the first in NASA's "Scout Program." **Phoenix** is designed to study the history of water and search for organic molecules in the ice-rich soil of the martian arctic. Phoenix inherits a highly capable spacecraft built for the Mars Surveyor Program 2001 (MSP '01) lander, as well as scientific instruments from the Mars Polar Lander (MPL). Using the lessons learned from the MPL and MSP '01 experiences, the mission engineering team is working on developing enhanced spacecraft reliability through extensive testing, (i.e. beyond normal integration and environment testing that occurs for all missions).



2001 Mars Odyssey Gamma Ray Spectrometer  
North Pole Water Map

H<sub>2</sub>O Low H<sub>2</sub>O High

## What will Phoenix find in Mars' Northern Plains?

Mars is a cold desert planet with no liquid water on its surface. However, discoveries made by the Mars Odyssey orbiter in 2002 show large amounts of subsurface water-ice in the northern arctic plains. The **Phoenix** lander targets this region. A robotic arm digs through the protective top soil layer to the water-ice below and, ultimately, brings both soil and water-ice to the lander platform for scientific analysis.

## Phoenix Mars Mission: Water on Mars

Today, Mars is a cold, dry world with a thin, carbon-dioxide atmosphere. Mars' surface has no liquid water – no rivers, lakes, or oceans. However, evidence exists suggesting Mars was very different in the past. How do we know? What is the evidence? Extensive spacecraft exploration of Mars has revealed geologic features that lead us to believe liquid water once flowed on Mars. Channels connect high and low areas convincing most scientists that water eroded these channels long ago. Gullies are another geologic feature providing evidence of past liquid water on Mars, and scientists are actively debating the formation of these gullies.

## Phoenix Science Payload

Instruments	Partner
Robotic Arm (RA)	Jet Propulsion Laboratory
Robotic Arm Camera (RAC)	University of Arizona and Max Planck Institute
Surface Stereoscopic Imager (SSI)	University of Arizona
Thermal and Evolved Gas Analyzer (TEGA)	University of Arizona and University of Texas, Dallas
Microscopy, Electrochemistry, and Conductivity Analyzer (MECA)	Jet Propulsion Laboratory, University of Arizona, and University of Neuchatel
Mars Descent Imager (MARDI)	Malin Space Science Systems
Meteorological Station (MET)	Canadian Space Agency

One idea suggests that liquid water, flowing underneath a protective layer of snow, may form martian gullies similar to those on Earth. No evidence exists of liquid water currently flowing on the surface, but evidence of past liquid water on the surface continues to build. Liquid water is important because all known life forms require it to survive. The exploration and discovery continues with scientists on Earth, robots like Phoenix, and maybe someday, humans on Mars.

The Phoenix mission is the first chosen for NASA's Scout program, an initiative for lower-cost, competed spacecraft. Named for the resilient mythological bird, Phoenix uses a lander that was intended for use by 2001's Mars Surveyor lander prior to its cancellation. It also carries a complex suite of instruments that are improved variations of those that flew on the lost Mars Polar Lander.

The Phoenix Mission is led by Principal Investigator Peter H. Smith of the University of Arizona, with project management at NASA's Jet Propulsion Laboratory and development partnership with Lockheed Martin Space Systems. International contributions for Phoenix are provided by the Canadian Space Agency, the University of Neuchatel (Switzerland), the University of Copenhagen, and the Max Planck Institute in Germany. In addition, scientists from other academic institutions and laboratories around the world will participate in the mission.

For More Information visit  
the Phoenix website at:  
[phoenix.lpl.arizona.edu](http://phoenix.lpl.arizona.edu)