

Water on Mars...



Laboratory tests aboard NASA's Phoenix Mars Lander have identified water in a soil sample. The lander's robotic arm delivered the sample Wednesday to an instrument that identifies vapors produced by the heating of samples.

"We have water," said William Boynton of the University of Arizona, lead scientist for the Thermal and Evolved-Gas Analyzer, or TEGA. "We've seen evidence for this water ice before in observations by the Mars Odyssey orbiter and in disappearing chunks observed by Phoenix last month, but this is the first time Martian water has been touched and tasted."

With enticing results so far and the spacecraft in good shape, NASA also announced operational funding for the mission will extend through Sept. 30. The original prime mission of three months ends in late August. The mission extension adds five weeks to the 90 days of the prime mission.

"Phoenix is healthy and the projections for solar power look good, so we want to take full advantage of having this resource in one of the most interesting locations on Mars," said Michael Meyer, chief scientist for the Mars Exploration Program at NASA Headquarters in Washington.

The soil sample came from a trench approximately 2 inches deep. When the robotic arm first reached that depth, it hit a hard layer of frozen soil. Two attempts to deliver samples of icy soil on days when fresh material was exposed were foiled when the samples became stuck inside the scoop. Most of the material in Wednesday's sample had been exposed to the air for two days, letting some of the water in the sample vaporize away and making the soil easier to handle.

"Mars is giving us some surprises," said Phoenix principal investigator Peter Smith of the University of Arizona. "We're

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and Liquid lakes on Titan

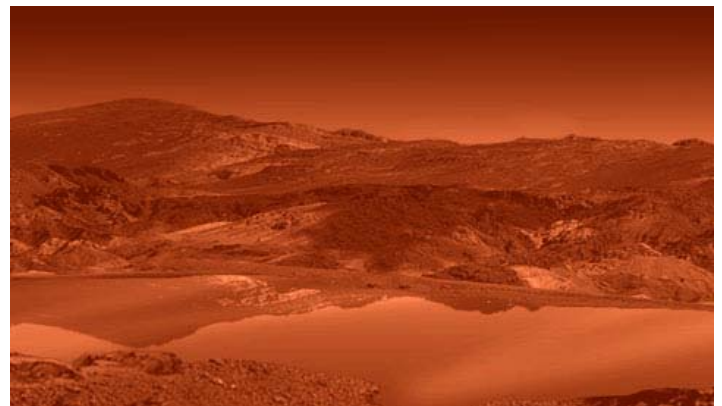
NASA scientists have concluded that at least one of the large lakes observed on Saturn's moon Titan contains liquid hydrocarbons, and have positively identified the presence of ethane. This makes Titan the only body in our solar system beyond Earth known to have liquid on its surface.

Scientists made the discovery using data from an instrument aboard the Cassini spacecraft. The instrument identified chemically different materials based on the way they absorb and reflect infrared light. Before Cassini, scientists thought Titan would have global oceans of methane, ethane and other light hydrocarbons. More than 40 close flybys of Titan by Cassini show no such global oceans exist, but hundreds of dark lake-like features are present. Until now, it was not known whether these features were liquid or simply dark, solid material.

"This is the first observation that really pins down that Titan has a surface lake filled with liquid," said Bob Brown of the University of Arizona, Tucson. Brown is the team leader of Cassini's visual and mapping instrument. The results will be published in the July 31 issue of the journal Nature.

Ethane and several other simple hydrocarbons have been identified in Titan's atmosphere, which consists of 95 percent

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Water Discovered on Mars

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excited because surprises are where discoveries come from. One surprise is how the soil is behaving. The ice-rich layers stick to the scoop when poised in the sun above the deck, different from what we expected from all the Mars simulation testing we've done. That has presented challenges for delivering samples, but we're finding ways to work with it and we're gathering lots of information to help us understand this soil."

Since landing on May 25, Phoenix has been studying soil with a chemistry lab, TEGA, a microscope, a conductivity probe and cameras. Besides confirming the 2002 finding from orbit of water ice near the surface and deciphering the newly observed stickiness, the science team is trying to determine whether the water ice ever thaws enough to be available for biology and if carbon-containing chemicals and other raw materials for life are present.

The mission is examining the sky as well as the ground. A Canadian instrument is using a laser beam to study dust and clouds overhead.

"It's a 30-watt light bulb giving us a laser show on Mars," said Victoria Hipkin of the Canadian Space Agency.

A full-circle, color panorama of Phoenix's surroundings also has been completed by the spacecraft.

"The details and patterns we see in the ground show an ice-dominated terrain as far as the eye can see," said Mark Lemmon of Texas A&M University, lead scientist for Phoenix's Surface Stereo Imager camera. "They help us plan measurements we're making within reach of the robotic arm and interpret those measurements on a wider scale."

The Phoenix mission is led by Smith at the University of Arizona with project management at NASA's Jet Propulsion Laboratory in Pasadena, CA., and development partnership at Lockheed Martin in Denver.

For more about Phoenix, visit: <http://www.nasa.gov/phoenix>

Liquid Lakes on Titan

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nitrogen, with methane making up the other 5 percent. Ethane and other hydrocarbons are products from atmospheric chemistry caused by the breakdown of methane by sunlight.

Some of the hydrocarbons react further and form fine aerosol particles. All of these things in Titan's atmosphere make detecting and identifying materials on the surface difficult, because these particles form a ubiquitous hydrocarbon haze that hinders the view. Liquid ethane was identified using a technique that removed the interference from the atmospheric hydrocarbons.

The visual and mapping instrument observed a lake, Ontario Lacus, in Titan's south polar region during a close Cassini flyby in December 2007. The lake is roughly 7,800 square miles in area, slightly larger than North America's Lake Ontario.

The ethane is in a liquid solution with methane, other hydrocarbons and nitrogen. At Titan's surface temperatures, approximately 300 degrees Fahrenheit below zero, these substances can exist as both liquid and gas. Titan shows overwhelming evidence of evaporation, rain, and fluid-carved channels draining into what, in this case, is a liquid hydrocarbon lake.

Earth has a hydrological cycle based on water and Titan has a cycle based on methane. Scientists ruled out the presence of water ice, ammonia, ammonia hydrate and carbon dioxide in Ontario Lacus. The observations also suggest the lake is evaporating. It is ringed by a dark beach, where the black lake merges with the bright shoreline. Cassini also observed a shelf and beach being exposed as the lake evaporates.

"During the next few years, the vast array of lakes and seas on Titan's north pole mapped with Cassini's radar instrument will emerge from polar darkness into sunlight, giving the infrared instrument rich opportunities to watch for seasonal changes of Titan's lakes," Soderblom said.

For information on Cassini, visit: <http://www.nasa.gov/cassini>

Final Shuttle Schedule

Following a detailed, integrated assessment, NASA selected target launch dates for the remaining eight space shuttle missions on the current manifest in 2009 and 2010. The manifest includes one flight to the Hubble Space Telescope, seven assembly flights to the International Space Station, and two station contingency flights, planned to be completed before the end of fiscal year 2010. The agency previously selected Oct. 8 and Nov. 10 as launch dates for Atlantis' STS-125 mission to service Hubble and Endeavour's STS-126 /ULF-2 mission to supply the space station and service both Solar Alpha Rotary Joints on the port and starboard end of its truss backbone that supports equipment and solar arrays.

The approved target dates are subject to change based on processing and other launch vehicle schedules. They reflect the agency's commitment to complete assembly of the station and to retire the shuttle fleet as transition continues to the new launch vehicles, including Ares and Orion.

SHUTTLE FLIGHTS IN 2009

Feb. 12 — Discovery (STS-119 / 15A) will kick off a five-flight 2009 with its 36th mission to deliver the final pair of U.S. solar arrays to be installed on the starboard end of the station's truss. The truss serves as the backbone support for external equipment and spare components, including the Mobile Base System. The 14-day flight will include four planned spacewalks. STS-119 marks the 28th shuttle flight to the station.

May 15 — Endeavour (STS-127 / 2JA) sets sail on its 23rd mission with the Japanese Kibo Laboratory's Exposed Facility and Experiment Logistics Module Exposed Section, the final permanent components of the Japan Aerospace Exploration Agency's contribution to the station program. During the 15-day mission, Endeavour's crew will perform five spacewalks and

deliver six new batteries for the P6 truss, a spare drive unit for the Mobile Transporter and a spare boom assembly for the Ku-band antenna. It will be the 29th shuttle flight to the station.

July 30 — Atlantis (STS-128 / 17A) launches on its 31st flight, an 11-day mission carrying science and storage racks to the station. In the payload bay will be a Multi-Purpose Logistics Module holding science and storage racks. Three spacewalks are planned to remove and replace a materials processing experiment outside the European Space Agency's Columbus module and return an empty ammonia tank assembly. STS-128 marks the 30th shuttle flight dedicated to station assembly and outfitting.

Oct. 15 — Discovery's (STS-129 / ULF-3) 37th mission will focus on staging spare components outside the station. The 15-day flight includes at least three spacewalks. The payload bay will carry two large External Logistics Carriers holding two spare gyroscopes, two nitrogen tank assemblies, two pump modules, an ammonia tank assembly, a spare latching end effector for the station's robotic arm, a spare trailing umbilical system for the Mobile Transporter and a high-pressure gas tank. STS-129 marks the 31st shuttle mission devoted to station assembly.

Dec. 10 — Endeavour (STS-130 / 20A) will close 2009 with its 24th mission to deliver the final connecting node, Node 3, and the Cupola, a robotic control station with six windows around its sides and another in the center that provides a 360-degree view around the station. At least three spacewalks are planned during the 11-day mission. The 32nd station assembly mission by a shuttle does not yet have a crew named.

Final Shuttle Schedule Announced

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SHUTTLE FLIGHTS IN 2010

Feb. 11 — Atlantis (STS-131 / 19A) begins its 32nd mission as the first flight in 2010, carrying a Multi-Purpose Logistics Module filled with science racks that will be transferred to laboratories of the station. The 11-day mission will include at least three spacewalks to attach a spare ammonia tank assembly outside the station and return a European experiment that has been outside the Columbus module. It will be the 33rd shuttle mission to the station.

April 8 — Discovery's (STS-132 / ULF-4) 38th mission will carry an integrated cargo carrier to deliver maintenance and assembly hardware, including spare parts for space station systems. In addition, the second in a series of new pressurized components for Russia, a Mini Research Module, will be permanently attached to the bottom port of the Zarya module. The Russian module also will carry U.S. pressurized cargo. The first Russian Mini Research Module to go to the station is scheduled to launch on a Russian rocket in the summer of 2009.

Additionally, at least three spacewalks are planned to stage spare components outside the station, including six spare batteries, a boom assembly for the Ku-band antenna and spares for the Canadian Dextre robotic arm extension. A radiator, airlock and European robotic arm for the Russian Multi-purpose Laboratory Module also are payloads on the flight. The laboratory module is scheduled for launch on a Russian rocket in 2011. The mission marks the 34th mission to the station.

May 31 — Endeavour's (STS-133 / ULF-5) 25th mission will carry critical spare components that will be placed on the outside of the station. Those will include two S-band communications antennas, a high-pressure gas tank, additional spare parts for Dextre and micrometeoroid debris shields. At least three spacewalks are planned to be carried out by the crew, which has yet to be named. The 15-day mission will be the 35th to the station.

For the shuttle launch manifest, visit:

http://www.nasa.gov/mission_pages/station/structure/iss_manifest.html

For details on upcoming shuttle missions and their crews, visit: <http://www.nasa.gov/shuttle>

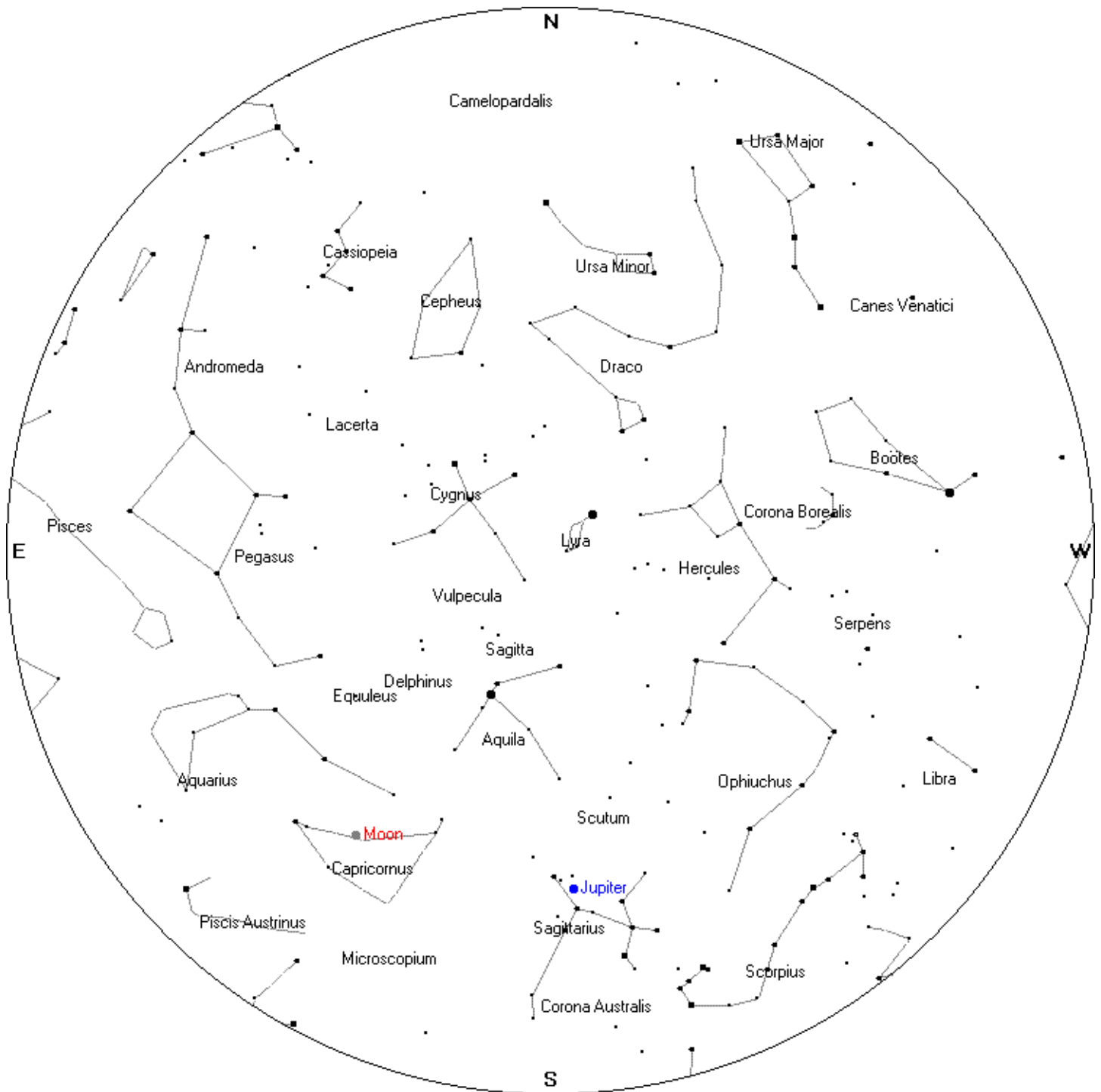
Go and See It!

Want to know when the Space Shuttle, the ISS, or other satellite is visible? Check out www.heavens-above.com. Enter your viewing location or coordinates, then bookmark your home location's page. Great links to other space information, too!



August Skymap

August 1 - 12:00 A.M.
August 15 - 11:00 P.M.
August 31 - 10:00 P.M.



Skymap from www.heavens-above.com

News from Texas Astronomical Society

Anousheh Ansari “First Female Private Space Explorer & First Space Ambassador” to speak at meeting



Our speaker at the August TAS General Meeting is Anousheh Ansari who will present a program explaining how the first space ambassador used spaceflight to promote peace and understanding amongst nations and how the amateur astronomical community can continue this journey.

The event is Aug 22 at 7:30pm at UTD in Founders North. The campus address is: 800 West Campbell Road; Richardson, TX 75080. On the map below, the building is FN and parking is available in Lot H which is reached by entering the main entrance, turning left at the T-intersection, then right onto H-Street, then right into lot H. For another view of the map see: <http://www.utdallas.edu/maps/>

On September 18, 2006, Anousheh Ansari captured headlines around the world as the first female private space explorer. Anousheh earned a place in history as the fourth private explorer to visit space and the first astronaut of Iranian descent.

Anousheh is a serial entrepreneur. To help drive commercialization of the space industry, Anousheh and her family provided title sponsorship for the Ansari X Prize, a \$10 million cash award for the first non-governmental organization to launch a reusable manned spacecraft into space twice within two weeks.

Anousheh immigrated to the United States as a teenager who did not speak English. She earned a bachelor’s degree in electronics and computer engineering from [George Mason University](#), followed by a master’s degree in electrical engineering from [George Washington University](#). She has an honorary doctorate from the International Space University. She is currently working toward a master’s degree in astronomy from Swinburne University.

Anousheh is a member of the [X Prize Foundation’s](#) Vision Circle, as well as its Board of Trustees. She is a life member in the Association of Space Explorers and on the advisory board of the Teacher’s in Space project. She has received multiple honors, including the World Economic Forum Young Global Leader, the Working Woman’s National Entrepreneurial Excellence Award, George Mason University’s Entrepreneurial Excellence Award, George Washington University’s Distinguished Alumni Achievement Award, and the Ernst & Young Entrepreneur of the Year Award for Southwest Region. While under her leadership, Telecom Technologies earned recognition as one of Inc. magazine’s 500 fastest-growing companies and Deloitte & Touche’s Fast 500 technology companies.

Ansari currently works to enable social entrepreneurs to bring about radical change globally, with organizations such as X Prize, ASHOKA and the PARSA Community Foundation.

Ansari believes the key to a better future for humankind is in the hands of our young generation, and it is up to us to provide them with the right tools through education and as good role models. Through it all, Anousheh continues to quote Gandhi, one of her personal heroes, who said, “Be the change you want to see in the world.”



In the Sky this Month

The Sun

	Sunrise:	Sunset:
August 1	6:43 A.M.	8:26 P.M.
August 15	6:52 A.M.	8:13 P.M.
August 31	7:03 A.M.	7:54 P.M.

There was a total solar eclipse on August 1, but it was not visible from Texas.

Moon

New Moon	August 1
First Quarter	August 8
Full Moon	August 16
Last Quarter	August 23
New Moon	August 30

There is a partial eclipse of the Moon on August 16 but it will not be visible from Texas.

Planets

Jupiter was at opposition on July 9, and it dominates the night sky in terms of brightness. The only drawback is Jupiter is so low on the ecliptic that it only gets about 30 degrees above the horizon at its highest point.

Have you spotted Venus yet? Venus slowly returns to our early evening sky after sundown, starting another viewing in its 19 month cycle. Venus will set later each evening and will be a feature of our early evening skies this Summer and Fall.

Meteors

The Perseid meteor shower peaks on the morning of August 12. Best viewing is after midnight and away from city lights.

Meteors, or shooting stars, are bits of dust or ice that orbit the Sun which enter the Earth's atmosphere and burn up from the friction with the Earth's air. Perseid meteor shower pieces have been shed by Comet 109P/Swift-Tuttle.

Planetarium this Month Summer schedule ends August 31

Tuesdays

2:30 Stars of the Pharaohs

Wednesdays

2:30 Astronaut

Thursdays

2:30 Stars of the Pharaohs

Fridays:

2:30 Astronaut

7:00 Astronaut

8:00 Rock Hall of Fame

Saturdays:

1:00 Astronaut

2:30 Stars of the Pharaohs

Sundays:

1:00 Astronaut

2:30 Stars of the Pharaohs

4:00 Pharaohs (en espanol)



Prices:

- \$5 - adults
- \$4 - Kids (18 & under), Seniors, Non-UTA students
- \$3 - UTA Faculty/Staff/Alumni (with ID)
- \$2 - UTA students
- \$3 - Groups of 10 or more with reservation