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NASA scientists find hydrogen in moon's sunlit regions

It could mean water is buried underground, scientists say.



Scientists have suggested that water ice millions of years old might be found in the shadowed craters of the moon's north and south poles, where the sun never shines. (AP)

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NASA names target for water hunt at moon's south pole



NASA's goals and budget not in the same orbit, report says

By John Johnson Jr.
September 18, 2009

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NASA's lunar-mapping satellite has just begun its four-year mission searching for water on the moon, but it has already turned up a discovery that has scientists scratching their heads.

The Lunar Reconnaissance Orbiter's seven scientific instruments have indeed confirmed the presence of large amounts of hydrogen -- a marker for water -- in permanently shadowed south pole craters, where scientists had known there were deposits of hydrogen. But the instruments have also found the element in regions where the sun shines.

NASA scientists said Thursday that this could mean water is

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buried underground. Water could not exist on the surface, where it is exposed to daytime temperatures as high as 220 degrees Fahrenheit, according to Richard Vondrak, project scientist for the mission, known as LRO.

"We don't know the abundance or how deeply it is buried," Vondrak said at a briefing at Goddard Space Flight Center in Greenbelt, Md. Nor do they know whether the hydrogen is water in the form of ice. If it is, the discovery would greatly improve the chances for a successful return to the moon by astronauts.

Water on the moon would reduce the need for hauling it from Earth to supply future colonists. Water could also be used to produce oxygen for respiration and to make rocket fuel for a trip to Mars.

The orbiter was [launched three months ago on a mission](#) to produce the most detailed map of the moon ever, in large part to find evidence of water and potential building sites for future human colonists.

A second spacecraft, the Lunar Crater Observation and Sensing Satellite, or LCROSS, separated from the reconnaissance orbiter just after launch and is now positioning itself to send its Centaur rocket crashing into a crater [called Cabeus A](#).

Scientists hope that the collision, scheduled for the morning of Oct. 9, will send up a cloud of dust and ice particles that can be measured by the sensing satellite and the orbiter, which will observe the crash.

The reconnaissance spacecraft has spent most of the last three months checking its instruments, which include a radiation detector, radar, a laser altimeter, a Russian-built neutron detector that picks up the presence of hydrogen, and an ultraviolet spectrometer that can also sniff out evidence of water. All the instruments are functioning well, scientists said.

Researchers said that in just the last few days, the orbiter has provided fresh information about Earth's nearest neighbor. An instrument called Diviner has measured temperatures in south pole craters that never get sunshine at minus-300 degrees Fahrenheit. That ranks among the coldest temperatures in the solar system, Vondrak said.

The scientists attached to the two companion missions speculate that stores of ice possibly millions of years old could be hidden in these permanently darkened areas.

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