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Early LRO maps show cold Moon may host hydrogen - September 18, 2009

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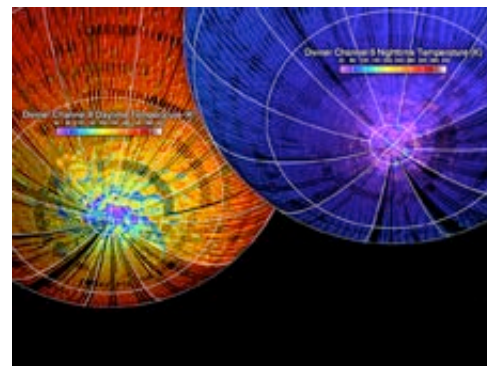
NASA's Lunar Reconnaissance Orbiter team released [early maps](#) from the spacecraft's commissioning phase yesterday. Diviner, one of seven instruments aboard the spacecraft, measured surface temperatures as low as -238 Celsius, lower than the surface of Pluto according to the [Associated Press](#) and [Daily Telegraph](#). The presence of such permanently cold spots "greatly increases the likelihood that water or other compounds are frozen there."

Also exciting was the tentative finding that "hydrogen is not confined to permanently shadowed craters," according to Project Scientist Richard Vondrak ([CNET](#)). The extent and accessibility of hydrogen on the Moon will shape future manned lunar missions because astronauts might use hydrogen to create water, rather than bringing it from Earth.

But Scientific American's 60-Second Science [blog](#) points out that "a neutron detector on board NASA's Lunar Prospector found what was initially hailed as evidence of water ice in 1998, but that finding has since been cast into doubt." LRO carries a more modern Russian-designed neutron detector called Lunar Exploration Neutron Detector (LEND). The [Los Angeles Times](#) adds that the science team speculates that ice hidden in the Moon's supercold crannies could be millions of years old.

[MSNBC](#) mentions another instrument, the Lunar Orbiter Laser Altimeter (LOLA), whose first map reveals rough terrain near the south lunar pole which, "would be difficult to drive a truck or car over, let alone a moon rover."

Photo: NASA/JPL/UCLA



Posted by Lucas Laursen on September 18, 2009
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We've known about this since the very first sample return by Apollo 11 in 1969. Hydrogen is present in returned lunar soil (implanted solar wind) in quantities ranging from about 10 to over 100 parts per million. This finding was confirmed by the mapping of global hydrogen by Lunar Prospector in 1998. There is no reason why one could not have solar wind-derived hydrogen in sunlit areas and hydrogen in the form of water ice from cometary sources in the permanently dark areas.

LRO also carries Mini-RF, an imaging radar whose data will be used to look for unique radio backscattering properties indicative of ice. A similar experiment has already flown on the Indian Chandrayaan-1 mission of the past year.

Posted by: [Paul Spudis](#) | [September 18, 2009 07:49 PM](#)

AT-AT could make it over that terrain no problem

Posted by: john | [September 19, 2009 06:52 AM](#)

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