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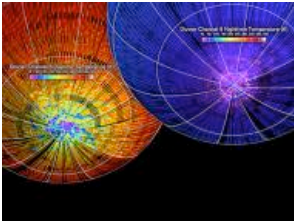
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NEW MOON VIEW

Lunar Reconnaissance Orbiter releases detailed images

By Laura Sanders

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Lunar mercury

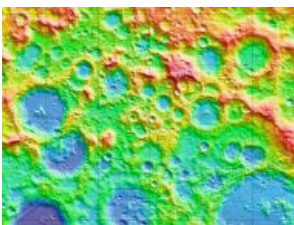
The Lunar Reconnaissance Orbiter detected surface temperatures on the moon's south pole during the day (left) and night (right). Regions sheltered from the sun remain cold enough to harbor water ice or other volatiles.

NASA/UCLA

The Lunar Reconnaissance Orbiter satellite has imaged the moon's craggy craters in great detail and identified new possible markers of water ice, NASA scientists reported September 17 at a press briefing.

Launched June 18, 2009 and charged with getting an improved topographical map of the moon, LRO orbits about 50 kilometers (31 miles) above the moon's surface. Cameras aboard LRO could image a car if it were sitting on the lunar surface, said Richard Vondrak, LRO project scientist at NASA Goddard Space Flight Center in Greenbelt, Md.

So far, the data coming back from LRO's seven instruments "exceed our wildest expectations," Vondrak said. "We're looking at the moon now with new eyes."



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Seeing the surface

Altitude measurements give scientists a detailed look at the topography of the lunar south pole, shown here. Red regions are high altitude, and blue regions are low altitude.

NASA's Goddard Space Flight Center

Early images have turned up fresh craters, boulders and smooth sites that would be good for landings, should humans or robots return to the moon's surface. Also important for future expeditions, LRO's equipment measured the types and amounts of damaging radiation at various points near the moon.

With infrared radiation detectors, LRO found that temperatures never exceed about 35 kelvins, or -238° Celsius deep in some permanently shaded regions. Vondrak said that these bitterly cold regions at the lunar south pole "are perhaps the coldest part of the solar system." Such cold temperatures could allow volatiles, such as water ice, to survive.

Instruments aboard LRO also found hallmarks of hydrogen—a potential marker of water—in unexpected places. Signs of hydrogen turned up in cold, permanently shaded regions of the moon, as scientists expected, but also in warmer places.

"There's still an awful lot to be done," says Michael Wargo, chief lunar scientist at NASA Headquarters in Washington, D.C. "And the maps will only get better."