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# Moon-Smashing Probe Aims for New Target Crater

NASA's LCROSS Spacecraft Is Set to Collide With Moon Next Week

By RACHEL COURTLAND  
Sept. 29, 2009

NewScientist  
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NASA's LCROSS spacecraft, which is set to collide with the moon next week, has switched its targeted impact site to a different crater to boost its chance of finding water ice.

Trace amounts of water may be widespread on the moon, but many suspect significant water deposits – a potential resource for future lunar outposts – may be hidden in permanently shadowed craters at the moon's poles.

NASA's Lunar CRater Observation and Sensing Satellite (LCROSS) is set to collide with the moon's south pole so that researchers can search for signs of this water in the plume of material it ejects. On 9 October, the spacecraft will shepherd the 2400-kilogram upper stage of its launch rocket into the lunar surface before colliding itself 4 minutes later.

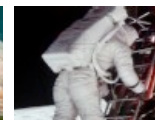
Orbiting satellites report billions of gallons of ice in the moon's soil.

Earlier this month, the team announced that they had picked the spacecraft's target, a 48-kilometre-wide crater called Cabeus A on the moon's south pole. The most promising spot was a smaller crater perched on the rim of Cabeus A, dubbed A1, that seemed to contain high levels of hydrogen, and thus potentially water, according to data collected by NASA's Lunar Prospector, which orbited the moon in 1998 and 1999.

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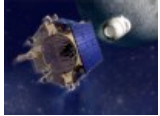


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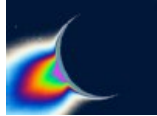
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But new measurements taken with NASA's Lunar Reconnaissance Orbiter (LRO) now circling the moon do not show much hydrogen in the smaller crater. Likewise, Cabeus A itself is a less-than-ideal target, since much of the hydrogen it contains does not seem to be in permanent shadow, which would help protect water ice there from the sun's heat.

In light of this data, LCROSS will now target a 98-kilometre-wide crater called Cabeus. Data from both Lunar Prospector and LRO "show a lot of hydrogen" there, says LCROSS principal investigator Anthony Colaprete of NASA's Ames Research Center in Moffett

Field, California.

Cabeus was not the team's first choice because a large ridge obstructs the view of the crater from Earth. "There is a large mountain that's about six kilometres tall or so on the northern side of the crater. So the ejecta has to fly up higher before it becomes visible to Earth observers," Colaprete told New Scientist. Most of the debris in the plume created by LCROSS's launch rocket stage is expected to extend no more than 10 kilometres above the lunar surface.

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