



Written by [James Heiser](#) on October 9, 2009

## LCROSS Space Probe Hits Moon

NASA normally strives to keep its robotic probes from crashing, but today's conclusion to a mission to the Moon was a break in that modus operandi.

The primary mission of the Lunar Crater Observation and Sensing Satellite ([LCROSS](#)) was a search for lunar water; according to the mission website:



The Mission Objectives of the Lunar Crater Observation and Sensing Satellite (LCROSS) include confirming the presence or absence of water ice in a permanently shadowed crater at the Moon's South Pole. The identification of water is very important to the future of human activities on the Moon. LCROSS will excavate the permanently dark floor of one of the Moon's polar craters with two heavy impactors in 2009 to test the theory that ancient ice lies buried there. The impact will eject material from the crater's surface to create a plume that specialized instruments will be able to analyze for the presence of water (ice and vapor), hydrocarbons and hydrated materials.

LCROSS was successfully launched on June 18 and consisted of two components: the Shepherding Spacecraft and the Centaur rocket. The Lunar Reconnaissance Orbiter (LRO) was launched at the same time, but with a different mission: while the whole purpose of LCROSS was to ultimately crash into the lunar surface on October 9, the LRO is engaged in a year-long mission of observation that included assisting the LCROSS in picking a target crater — Cabeus Crater — at the Moon's south pole.

LCROSS reached the conclusion of its mission at 7:31 a.m. ET today; now scientists will analyze the data from the impact to learn more about the presence of water on the Moon. As the [USA Today](#) reports,

"I guess my summary is 'really cool'," said Pete Worden of NASA's Ames Research Center in Moffett Field, Calif., which ran the mission. "Today, we kicked up some moon dust and all indications are we are going to have some really interesting results."

Aimed at determining whether the moon contains ice deposits in its shadowed polar craters, the \$79 million mission's booster landed at 7:31 a.m. ET, kicking up a moon dust plume.

The mission's "shepherd" spacecraft passed through the plume, observing its chemistry, and then



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hit the left wall of the crater at 7:35 a.m. ET., kicking up its own plume. Earth observatories and spacecraft observed both impacts.

While the mission was a success, in that the impact was successfully recorded so that the data may be studied, it was not the telegenic success story for which some news outlets, and NASA, had been hoping. According to [National Geographic](#):

NASA's much anticipated LCROSS mission sent two spacecraft "bombing" into the moon early this morning. The craft successfully struck their target, a crater thought to harbor frozen water.

But the much-hyped moon show that had been expected to accompany the impact, however, turned out to be a flop—no billowing plumes of dust and ice visible through backyard telescopes or on NASA TV. The low-impact impact had one NASA expert musing that LCROSS may have struck a "dry hole."

For a generation raised on Hollywood pyrotechnics and computer-generated special effects, the "real thing" may not seem very impressive, visually-speaking, when it comes to an explosion on the Moon. But the science facts that will be revealed in the data are very exciting. Regardless of whether or not LCROSS struck a "dry hole," the mission was a scientific success. The presence or absence of water on the Moon is of critical significance to any plan for future manned exploration of the lunar surface. If the LCROSS data reveal the presence of water, potential sources of ice will be of tremendous interest to the future of the manned space program, and would be a significant factor in any future plans for a lunar base.



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