

NASA launches LCROSS Lunar Impactor

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A United Launch Alliance Atlas V rocket roars into space carrying NASA's Lunar Reconnaissance Orbiter and Lunar Crater Observation and Sensing Satellite. Photo credit: NASA/Tom Farrar

NASA launched its first moon shot in a decade Thursday, sending up a pair of unmanned science probes that will help determine where astronauts could land and set up camp in years to come.

NASA successfully launched the Lunar Crater Observation and Sensing Satellite, or LCROSS, Thursday on a mission to search for water ice in a permanently shadowed crater at the moon's south pole. The satellite lifted off on an Atlas V rocket from Cape Canaveral Air Force Station, Fla., at 4:32 p.m. CDT, with a companion mission, the Lunar Reconnaissance Orbiter, or LRO.

LRO safely separated from LCROSS 45 minutes later. LCROSS then was powered-up, and the mission operations team at NASA's Ames Research Center at Moffett Field, Calif., performed system checks that confirmed the spacecraft is fully functional.

LCROSS and its attached Centaur upper stage rocket separately will collide with the moon at approximately 6:30 a.m. on Oct. 9, 2009, creating a pair of debris plumes that will be analyzed for the presence of water ice or water vapor, hydrocarbons and hydrated materials. The spacecraft and Centaur are tentatively targeted to impact the moon's south pole near the Cabeus region. The exact target crater will be identified 30 days before impact, after considering information collected by LRO, other spacecraft orbiting the moon, and observatories on Earth.

"LCROSS has been the little mission that could," said Doug Cooke, associate administrator for NASA's Exploration Systems Mission Directorate at NASA Headquarters in Washington. "We stand poised for an amazing mission and possible answers to some very intriguing questions about the moon."

The 1,290-pound LCROSS and 5,216-pound Centaur upper stage will perform a swing-by maneuver of the moon around 5 a.m. on June 23 to calibrate the satellite's science instruments and enter a long, looping polar orbit around Earth and the moon. Each orbit will be roughly perpendicular to the moon's orbit around Earth and take about 37 days to complete. Before impact, the spacecraft and Centaur will make approximately three orbits.

On the final approach, about 54,000 miles above the surface, LCROSS and the Centaur will separate. LCROSS will spin 180 degrees to turn its science payload toward the moon and fire thrusters to slow down. The spacecraft will observe the flash from the Centaur's impact and fly through the debris plume. Data will be collected and streamed to

LCROSS mission operations for analysis. Four minutes later, LCROSS also will impact, creating a second debris plume.

"This mission is the culmination of a dedicated team that had a great idea," said Daniel Andrews, LCROSS project manager at Ames. "And now we'll engage people around the world in looking at the moon and thinking about our next steps there."

The LCROSS science team will lead a coordinated observation campaign that includes LRO, the Hubble Space Telescope, observatories on Hawaii's Mauna Kea and amateur astronomers around the world.

Ames manages LCROSS and also built the instrument payload. Northrop Grumman in Redondo Beach, Calif., built the spacecraft.

Provided by NASA

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