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The Mission



Rocket: Atlas 5 (AV-020)
Payload: LRO/LCROSS
Date: June 18, 2009
Times: 5:12, 5:22 and 5:32 p.m. EDT
Site: Complex 41, Cape Canaveral, Florida

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NASA's lunar mapper goes into orbit around the moon

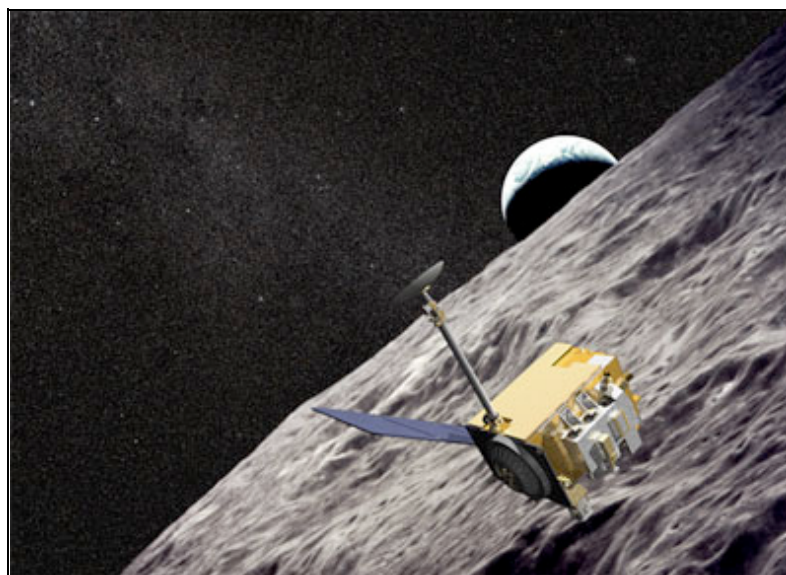
BY WILLIAM HARWOOD

STORY WRITTEN FOR [CBS NEWS "SPACE PLACE"](#) & USED WITH PERMISSION

Posted: June 23, 2009

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Four-and-a-half days after launch, NASA's \$504 million Lunar Reconnaissance Orbiter fired its main thrusters for 40 minutes early Tuesday, successfully braking into an initial elliptical orbit around the moon.



Artist's concept of LRO in orbit around the moon. Credit: NASA

The critical rocket firing began around 5:47 a.m. EDT and ended as planned at 6:27 a.m., putting the spacecraft into an orbit tilted 30 degrees from the moon's poles with a low point of 136 miles and a high point of 1,926 miles.

"All stations, this is flight," the mission flight director said. "Congratulations on a successful LOI. LRO has returned NASA to the Moon."

Over the next five days, the Lunar Reconnaissance Orbiter will carry out four additional rocket firings to put the spacecraft in its so-called commissioning orbit with a low point of about 18.5 miles above the moon's south pole and a high point of 134 miles above the north pole. The orbit eventually will be circularized at about 31 miles above the

Current Shuttle Mission Patch

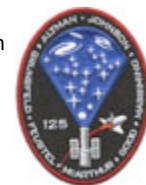
The official embroidered patch for shuttle Endeavour's flight to finish building Japanese section of the space station.



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Hubble Patch

The official embroidered patch for mission STS-125, the space shuttle's last planned service call to the Hubble Space Telescope, is available for purchase.



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Ares Patch

The Ares Project will develop two new rockets to launch astronauts back to the Moon under NASA's



Vision for Exploration. The Ares 1 will employ a single space shuttle solid rocket booster to loft the Orion crew capsule. The gigantic Ares 5 will haul the equipment and cargo needed for such lunar voyages. This is the Ares emblem.

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Project Orion

The Orion crew

moon.

"The tracking shows we're essentially where we planned to be, we're at the moon," said LRO project manager Craig Tooley. "It went like clockwork. With a mission like this, we spent literally years practicing for every possible contingency to be ready for this. In the end, it went exactly as planned."

LRO will spend two months in its commissioning orbit before maneuvering into the desired 31-mile-high mapping orbit.

Equipped with seven state-of-the-art cameras and other instruments, LRO will look for suitable landing sites for future manned missions while creating the most detailed lunar atlas ever assembled.

The 4,200-pound solar-powered spacecraft also will measure the solar and cosmic radiation that future lunar explorers will face and map out the surface topology, mineralogy and chemical composition of Earth's nearest neighbor. One year will be spent scouting future landing sites followed by three years of purely scientific observations.

LRO was launched by an Atlas 5 rocket from the Cape Canaveral Air Force Station last Thursday along with a companion spacecraft, the \$79 million Lunar Crater Observation and Sensing Satellite, or LCROSS. The two spacecraft separated shortly after launch.

LCROSS is designed to guide the Atlas 5's spent Centaur second stage to an impact in a permanently shadowed crater near the moon's south pole on Oct. 9. Instruments aboard LCROSS, LRO, the Hubble Space Telescope and at observatories on Earth will study the debris thrown up by the crash to look for evidence of ice.

The Orion crew exploration vehicle is NASA's first new human spacecraft developed since the space shuttle a quarter-century earlier. The capsule is one of the key elements of returning astronauts to the Moon.

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