Science News

Lunar Reconnaissance Orbiter: NASA Returns To The Moon With First Lunar Launch In A Decade

ScienceDaily (June 19, 2009) — NASA's Lunar Reconnaissance Orbiter launched at 5:32 p.m. EDT Thursday aboard an Atlas V rocket from Cape Canaveral Air Force Station in Florida. The satellite will relay more information about the lunar environment than any other previous mission to the moon.

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The orbiter, known as LRO, separated from the Atlas V rocket carrying it and a companion mission, the Lunar Crater Observation and Sensing Satellite, or LCROSS, and immediately began powering up the components necessary to control the spacecraft. The flight operations team established communication with LRO and commanded the successful deployment of the solar array at 7:40 p.m. The operations team continues to check out the spacecraft subsystems and prepare for the first mid-course correction maneuver. NASA scientists expect to establish communications with LCROSS about four hours after launch, at approximately 9:30 p.m.

"This is a very important day for NASA," said Doug Cooke, associate administrator for NASA's Exploration Systems Mission Directorate in Washington, which designed and developed both the LRO and LCROSS missions. "We look forward to an extraordinary period of discovery at the moon and the information LRO will give us for future exploration missions."

The spacecraft will be placed in low polar orbit about 31 miles, or 50 kilometers, above the moon for a one year primary mission. LRO's instruments will help scientists compile high resolution three-dimensional maps of the lunar surface and also survey it at many spectral wavelengths. The satellite will explore the moon's deepest craters, exploring permanently sunlit and shadowed regions, and provide understanding of the effects of lunar radiation on humans.

"Our job is to perform reconnaissance of the moon's surface using a suite of seven powerful instruments," said Craig Tooley, LRO project manager at NASA's Goddard Space Flight Center in Greenbelt, Md. "NASA will use the data LRO collects to design the vehicles and systems for returning humans to the moon and selecting the landing sites that will be their destinations."

High resolution imagery from LRO's camera will help identify landing sites for future explorers and characterize the moon's topography and composition. The hydrogen concentrations at the moon's poles will be mapped in detail, pinpointing the locations of possible water ice. A miniaturized radar system will image the poles and test communication capabilities.

"During the 60 day commissioning period, we will turn on spacecraft components and science instruments," explained Cathy Peddie, LRO deputy project manager at Goddard. "All instruments will be turned on within two weeks of launch, and we should start seeing the moon in new and greater detail within the next month."

"We learned much about the moon from the Apollo program, but now it is time to return to the moon for intensive study, and we will do just that with LRO," said Richard Vondrak, LRO project scientist at Goddard.

All LRO initial data sets will be deposited in the Planetary Data System, a publicly accessible repository of planetary science information within six months of launch.

NASA's LRO and LCROSS spacecraft on top of the Atlas V rocket launch from Complex 41 on Cape Canaveral Air Force Station. (Credit: United Launch Alliance/Pat Corkery)

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Goddard built and manages LRO. LRO is a NASA mission with international participation from the Institute for Space Research in Moscow. Russia provides the neutron detector aboard the spacecraft.

The LRO mission is providing updates via @LRO_NASA on Twitter. To follow, visit:

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