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Back to the Moon: NASA to Launch New Lunar Scouts

By [Tariq Malik](#)
 Senior Editor
 posted: 18 June 2009
 08:48 am ET

Nearly 40 years after humans first set foot on the lunar surface, NASA is gearing up to go back with the planned launch today of two unmanned scouts, the robotic vanguard for the first U.S. return to the moon in a decade.

An Atlas 5 rocket is poised to launch the two probes, a [powerful lunar orbiter](#) and a smaller spacecraft that will hunt for water ice by crashing into the moon, at about 5:12 p.m. EDT (2112 GMT) today from the Cape Canaveral Air Force Station in Florida. The mission, NASA hopes, will lay the foundation for its plan to return astronauts to the moon by 2020.

"We're getting ready to take longer strides. To leave the shallows, once again, and step into deeper waters of what President Kennedy called the new ocean of space," said Todd May, manager for NASA's Lunar Precursor Robotic Program. "The first island we plan to explore is the moon itself, [our nearest neighbor](#)."

The \$583 million mission has been delayed since October 2008 and was slated to launch on Wednesday. But NASA opted to delay the flight by one more day to allow the space shuttle Endeavour to try and launch after a hydrogen gas leak thwarted its initial attempt. The leak reappeared and the shuttle remains on Earth at the nearby Kennedy Space Center in Cape Canaveral, Fla.

Return to the moon

Shuttle delay aside, NASA's two new lunar spacecraft are ready to fly.

They are the first U.S. moon probes since 1998's Lunar Prospector, though China, Japan and India have [sent lunar probes](#) in recent years. Today's launch is also the inaugural flight of NASA's long-term exploration vision of sending astronauts back to the moon to stay.

During NASA's Apollo lunar landing missions, 12 astronauts explored six equatorial regions on the moon for days at a time. When astronauts return, NASA plans to send them to unexplored regions, like the tantalizing south pole, for months at a time. But to do that, scientists need to know more about the long-term environment future lunar astronauts will face.

The new mission's flagship is NASA's Lunar Reconnaissance Orbiter (LRO), a satellite the size of a Mini Cooper car with a roof rack that will build new maps of the moon in unprecedented detail to seek out future landing zones and resources for astronauts.

"Probably most important to all of us is to find safe landing sites, but we also need to find interesting landing sites," said Craig Tooley, NASA's LRO project manager.

LRO is carrying seven instruments to map the moon from a 31-mile (50 km) orbit, measure its temperature extremes and study its radiation environment using a special plastic designed to mimic human tissue. It will spend a year studying the moon to aid future astronaut missions before NASA turns it over to a science team for a potential

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A ULA Atlas 5 rocket carrying NASA's Lunar Reconnaissance Orbiter and Lunar Crater Observation and Sensing Satellites (LRO/LCROSS) rolls out from its Vertical Integration Facility at Space Launch Complex-41, Cape

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years-long extension.

Hunting moon water

Riding piggyback on LRO's Atlas 5 rocket is the Lunar CRater Observation and Sensing Satellite (LCROSS), a smaller probe added because there was extra room on the booster. LCROSS is [NASA's double whammy](#) for the moon to dredge up any water ice hidden in permanent darkness at the lunar south pole.

Past missions have found ample traces of hydrogen suggesting water ice may lurk in the moon's shadowed craters, but NASA hopes LRO and LCROSS will be able to find direct evidence of the wet resource.

There are no guarantees the water ice is actually there, or what kind of shape it is in, mission managers said. Some observations predict ice rinks of the stuff, while others suggest the ice is in blocky chunks or buried, if it is there at all, they added.

"That illustrates the importance of our mission," said Daniel Andrews, NASA's project manager for the LCROSS probe. "Let's go see what it is."

It costs \$50,000 a pound to send anything to the moon, so finding water ice or permanent regions of sunlight for solar power stations could be vital to help support future moon bases, NASA officials said.

Unlike LRO - which should take just four days to [reach the moon](#) - the smaller LCROSS will spend months attached to the Atlas 5 rocket's large Centaur upper stage, which it will ultimately steer into a steep collision course that will slam into a shadowed crater at the moon's south pole at about 5,580 mph (8,980 kph). After studying the crash from afar, LCROSS will fly through the crash plume and make its own death dive minutes later.

LRO, the Hubble Space Telescope and other assets in space and skywatchers on Earth are expected to observe the lunar smackdown, which is slated to occur in early October. The final collision date depends on when the mission launches. The target crater will be decided about a month before impact.

"The spacecraft is here now, we're ready to go for launch and the science team is ready," said LRO project scientist Richard Vondrak.

LCROSS is following in the footsteps of many spacecraft that have intentionally hit the moon. Earlier this month, Japan's Kaguya lunar probe ended its year-long mission with a moon crash. China's Chang'e 1 probe did the same earlier this year.

Multiple chances

The Atlas 5 rocket carrying the LRO and LCROSS probes actually has three chances to blast off today. NASA is targeting the first opportunity, but two other one-second windows are available at 5:22 p.m. EDT and 5:32 p.m. EDT, respectively.

If the rocket is unable to launch today, NASA can try again Friday at 6:41 p.m. EDT (2241 GMT). Two other Friday opportunities are available in 10-minute intervals after the first target. The mission's flight window closes on Saturday, after which the two lunar probes would have to wait another two weeks before the moon returns to a position that is favorable for launch.

After months of delay, LRO and LCROSS researchers said they are chomping at the bit to get started.

"We were ready to go last fall," Vondrak said, adding that the delays were frustrating at times. "We're eager, we're ready to go."

NASA will broadcast the launch of its new moon probes on NASA TV beginning at 2:00 p.m. EDT (1800 GMT). [Click here](#) for live launch coverage and SPACE.com's NASA TV feed.

[New Video - Target Moon: NASA's New Lunar Scouts, Part 2](#)

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Canaveral Air Force Station, Fla., to its launch pad for a June 18, 2009 launch. Credit: Pat Corkery/ULA.



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NASA's Lunar Reconnaissance Orbiter is kick-starting a volley of robot craft that will explore the Moon prior to a human return. Image Credit: NASA/GSFC



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NASA's Lunar Reconnaissance Orbiter (LRO), top, and its Lunar Crater Observation and Sensing Satellite (LCROSS) are being prepared for a June 2009 launch toward the moon. Here, they are packed inside the shroud-like nosecone fairing for their Atlas 5 rocket. Credit: NASA/Jack Pfaller



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NASA's Lunar Reconnaissance Orbiter is kick-starting a volley of robot craft that will explore the Moon prior to a human return. Image Credit: NASA/GSFC

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The people behind NASA's new lunar scout discuss the U.S. return to the moon. Credit: NASA/GSFC

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A behind-the-scenes look at how NASA built its newest moon orbiter. Credit: NASA/GSFC

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HanShotFirst wrote: posted 18 June 2009, 9:03 am ET

I can't believe I'll be the first to wish god speed to LRO/LCROSS, as the long-term exploration vision of sending astronauts back to the moon to stay gets under way! Ad Luna!

As a shameless plug, but relevant to the topic, I own a software company that makes a Lunar simulator add-on for Microsoft's Flight Simulator - please check it out at www.terrabuilder.com

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moon in this mission animation.
Credit: NASA/GSFC

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Mr_RSeay wrote: posted 18 June 2009, 10:07 am ET

Now that the shuttle is out of the way, maybe the moon can get a recall on the water thingy.

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MartianSam1 wrote: posted 18 June 2009, 1:09 pm ET

I wonder why the intervals are 10 minutes apart. I guess it's a parking orbit thing - it doesn't matter when you launch so much as when you leave the parking orbit. Again, that's pure speculation on my part.

I noticed they missed the ESA SMART-1 mission in the list of countries. Oh, well. I think it was meant to test the engines more than do anything groundbreaking with the sensors.

It will be interesting when astronauts walk up on a crater that's younger than they are, especially in a billions-of-years-old landscape.

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Globalfm wrote: posted 19 June 2009, 10:21 am ET

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