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Quantum fluctuations in space, science, exploration and other cosmic fields... served up regularly by MSNBC.com science editor Alan Boyle since 2002.

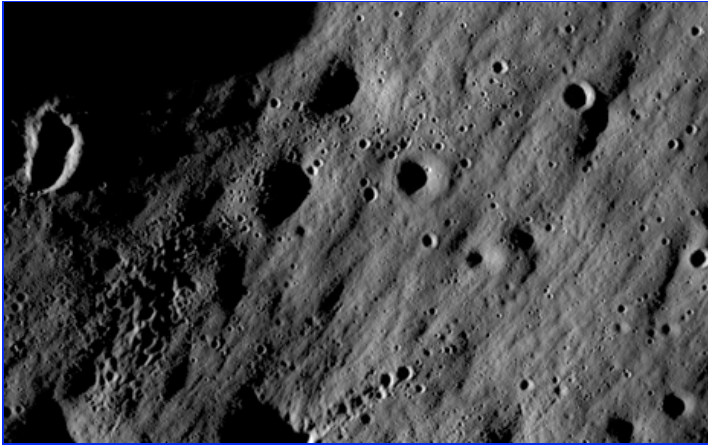


Alan Boyle covers the physical sciences, anthropology, technological innovation and space science and exploration for MSNBC.com. He is a winner of the [AAAS Science Journalism Award](#), the [NASW Science-in-Society Award](#) and other honors; a contributor to "[A Field Guide for Science Writers](#)"; and a member of the board of the [Council for the Advancement of Science Writing](#).

Check out Boyle's [biography](#) or send a message to Cosmic Log via cosmiclog@msnbc.com.

New moon vistas revealed

Posted: Thursday, July 02, 2009 1:20 PM by Alan Boyle



NASA / GSFC / ASU

This image shows a cratered region near the moon's Mare Nubium (Sea of Clouds) region, as photographed by the Lunar Reconnaissance Orbiter Camera. Click on the image for a larger version from NASA's Web site.

[Today's first images](#) from NASA's Lunar Reconnaissance Orbiter provide a fresh perspective on the moon, just weeks before the 40th anniversary of the [first manned lunar landing](#).

Lunar Reconnaissance Orbiter, or LRO, was [launched on June 18](#), along with another probe destined to crash into the moon's south pole - known as the Lunar Crater Observation and Sensing Satellite, or LCROSS.

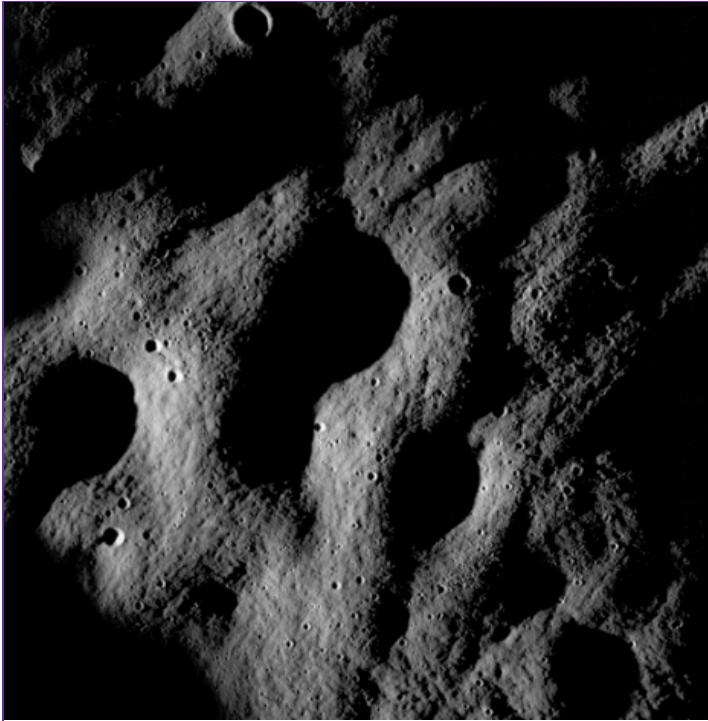
LRO [entered lunar orbit](#) just last week, on the same day that LCROSS transmitted [its own first imagery](#) of the moon. Mission managers had figured it would take longer for LRO to send back higher-resolution images worth sharing, but they were surprised to find that the pictures they got back after the orbiter's cameras were activated on Tuesday were real stunners.

"Our first images were taken along the moon's terminator - the dividing line between day and night - making us initially unsure of how they would turn out," Arizona State University's Mark Robinson, the principal investigator for the Lunar Reconnaissance Orbiter Camera, said in [today's image advisory](#). "Because of the deep shadowing, subtle topography is exaggerated, suggesting a craggy and inhospitable surface. In reality, the area is similar to the region where the Apollo 16 astronauts safely explored in 1972. While these are magnificent in their own right, the main message is that LROC is nearly ready to begin its mission."

It's been a whole decade since the last U.S. moon probe [smashed into the lunar surface](#), but it's not as if the moon has been terra incognita over the past few years. Several international spacecraft have been sending back pictures of our nearest celestial neighbor - including Europe's [SMART-1](#), China's [Chang'e 1](#), India's [Chandrayaan 1](#) and Japan's [Kaguya](#) probe.

Nevertheless, LRO is a big deal: Its high-resolution pictures and other data will be used to plan NASA's [future push to the moon](#), designed to climax in a manned lunar landings sometime around 2020.

This month, the world will be remembering the [Apollo 11 lunar landing](#) and the explorations that followed between 1969 and 1972. The pictures coming from LRO should remind people that the best is yet to come.



NASA / GSFC / ASU

This image shows another cratered area near the moon's Mare Nubium region, as photographed by the Lunar Reconnaissance Orbiter Camera. The region pictured is about 1,400 meters (0.87 miles) wide. The bottom of the image faces lunar north. Click on the image for a larger version from NASA's Web site.

Here's more about LRO's progress from a [NASA news release](#) issued today:

"... The satellite also has started to activate its six other instruments. The Lunar Exploration Neutron Detector will look for regions with enriched hydrogen that potentially could have water ice deposits. The Cosmic Ray Telescope for the Effects of Radiation is designed to measure the moon's radiation environment. Both were activated on June 19 and are functioning normally.

"Instruments expected to be activated during the next week and calibrated are the Lunar Orbiter Laser Altimeter, designed to build 3-D topographic maps of the moon's landscape; the Diviner Lunar Radiometer Experiment, which will make temperature maps of the lunar surface; and the Miniature Radio Frequency, or Mini-RF, an experimental radar and radio transmitter that will search for subsurface ice and create detailed images of permanently shaded craters.

"The final instrument, the Lyman Alpha Mapping Project, will be activated after the other instruments have completed their calibrations, allowing more time for residual contaminants from the manufacture and launch of LRO to escape into the vacuum of space. This instrument is an ultraviolet-light imager that will use starlight to search for surface ice. It will take pictures of the permanently-shaded areas in deep craters at the lunar poles.

" 'Accomplishing these significant milestones moves us closer to our goals of preparing for safe human return to the moon, mapping the moon in unprecedented detail, and searching for resources,' said LRO Project Scientist Richard Vondrak of NASA's Goddard Space Flight Center in Greenbelt, Md.

"While its instruments are being activated and tested, the spacecraft is in a special elliptical commissioning orbit around the moon. The orbit takes less fuel to maintain than the mission's primary orbit. The commissioning orbit's closest point to the lunar surface is about 19 miles over the moon's south pole, and its farthest point is approximately 124 miles over the lunar north pole.

"After the spacecraft and instruments have completed their initial calibrations, the spacecraft will be directed into its primary mission orbit in August, a nearly circular orbit about 31 miles above the lunar surface.

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

Still more about LRO imagery:

- [Locator: 1994 Clementine picture shows Mare Nubium](#)
- [Locator: White boxes indicate location for images shown above](#)
- [Learn more at Arizona State University's LROC Web site](#)
- [Space Coalition Blog: Get ready to revisit Apollo landing sites](#)

Join the Cosmic Log corps by signing up as my [Facebook friend](#) or hooking up on [Twitter](#). And if you really want to be friendly, ask me about my upcoming book, "[The Case for Pluto](#)."

This item was last updated at 2:30 p.m. ET July 2.

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Thanks for showing us the first pictures from our new LRO orbiter around the moon Alan! So nice to see new pics so soon after launch. It will be interesting to see the pics from the LCROSS impact in a few months. I sure hope that the scientists find usable water on the moon so we can put crews up there for really long duration visits.

I hope that President Obama will change our Ares program to allow for foreign cooperation, we don't need to do a space race again just to show off our technical prowess in space when it costs too much to do that kind of childish grandstanding.

Eric, Salinas, CA (Sent Thursday, July 02, 2009 2:12 PM)

I love the pictures we get from all the spacecraft. Just great stuff.

Richard Busic, Fox River Grove IL, (Sent Thursday, July 02, 2009 2:18 PM)

why do all the impact holes look like 90 degrees impacts, no angular impacts can be seen?

Ehy do all the impact holes appear to be 90 degrees? No angular impact holes visible. (Sent Thursday, July 02, 2009 2:46 PM)

It would be really interesting if we can get pics from the dark side of the moon...

pat huntington ny (Sent Thursday, July 02, 2009 2:49 PM)

If the moon has gravity, why can't it hold 1 inch of atmosphere?

Marvin (Sent Thursday, July 02, 2009 2:55 PM)

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