



Lunar Librarian Newsletter

May 2009

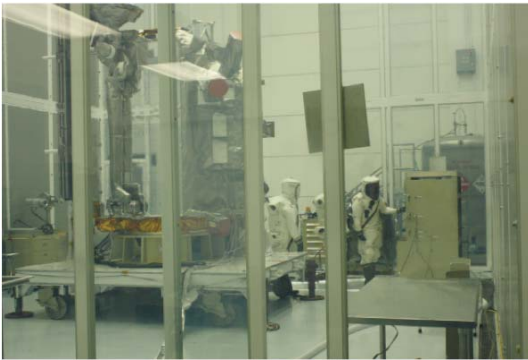
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LRO News

LRO's day in space is rapidly approaching. There is so much going on down at Cape Canaveral and here at NASA Goddard. Scientists and engineers are running through simulations, and practicing what will happen on the day of launch.

Wrapping and Stacking

LRO is now stacked on LCROSS and ready for encapsulation. On May 5, we completed fueling of the LRO spacecraft. The Orbiter now weighs almost a ton more than it did the week before! On May 7, we completed an aliveness test, and we bagged the Orbiter on May 8 in preparation for today's stacking.



To the left is the fueling operation in progress. The fueling team wore Self-Contained Atmospheric Protective Ensemble (SCAPE) suits for protection from the toxic hydrazine fuel. You can see the source tank on the right. All non-essential personnel, including photographers, were outside the clean room.

To the right is the Orbiter just before the bagging, which preceded the stacking operation. All of the instrument covers are removed. You can see that the two Narrow Angle Cameras (NAC) point in slightly different directions to create a wider field of view. Above the NAC's is the LOLA instrument, with the laser and telescope apertures visible. LAMP's black aperture is to the left of the NAC's. The Wide-Angle Camera (WAC) is above the left corner of LOLA, with its black aperture shade barely visible to the right and left. Diviner's aperture is pointed inward, in the safe position. LEND and CRaTER are fully blanketed, since the radiation they are measuring easily penetrates blankets. The Mini-RF antenna is covered in RF-transparent blankets.



Above is LCROSS waiting for the stacking of LRO. An access structure surrounds LCROSS.

Above is LCROSS waiting for the stacking of LRO. An access



To the left is LRO being lowered down onto LCROSS. You can see the technicians standing on the access structure around LCROSS. LRO is bagged to protect the instruments from contamination.

On the morning of May 15, 2009, LRO held a media-day event, with beautiful views of the Orbiter stacked on LCROSS and ready for fairing installation. All of our red-tag items are removed. This is our last

look at LRO. Meanwhile, on the launch pad, the LRO rocket is undergoing a "wet dress rehearsal". The launch vehicle team is loading fuel and oxidizer into the tanks to verify proper operation of the system.

To the right, LRO is stacked on LCROSS and ready for fairing installation. All covers are removed except the LCROSS star tracker red cover. This



shows the instrument module side of LRO, with the white radiators of the instruments visible.



To the left, the Atlas V rocket half way between the Vertical Integration Facility on the left and the pad on the right. The spherical tank to the right of the rocket holds 465,000 gallons of liquid oxygen.



To the right, the Atlas is at the pad. The four towers support wires for lightning protection.

To the left, the upper stage of the rocket is being pushed out to the launch pad.





The upper stage of the rocket will remain attached to LCROSS until just before impact with the moon. The absence of the payload is quite obvious.

For more photos of LRO down at Kennedy, please visit:
<http://www.launchphotography.com/LRO.html>



NASA News

Apollo 11: 40th Anniversary Event on NASA TV and Web on July 20

On Monday, July 20, from 2-3 pm Eastern Daylight Time, NASA and the Newseum plan to broadcast a special panel event commemorating the first human landing on our Moon. Moderated by journalist Nick Clooney, panelists tentatively include astronauts Buzz Aldrin (Apollo 11), Alan Bean (Apollo 12), and Charlie Duke (Apollo 16). Additional panelists will be announced when confirmed.

The event will be broadcast and webcast on NASA TV (http://www.nasa.gov/multimedia/nasatv/MM_NTV_Breaking.html). If you do not have a satellite dish to receive NASA TV directly, please check with your local cable or satellite TV provider. The event will be archived on the Newseum's website.

Additional resources are available on the NASA Apollo 11 40th anniversary website:
http://www.nasa.gov/mission_pages/apollo/40th

- <http://www.lpi.usra.edu/resources/apollo/>
- <http://apollo.sese.asu.edu/>

Hubble Servicing Mission 4



Hubble's final servicing mission has come to an end. The astronauts repaired Hubble over the course of five spacewalks. They installed two new instruments, and repaired two others. They also replaced essential components of the telescope including batteries and insulation. "Not everything went as we planned, but we planned a way to work around everything and with the whole team pulling together ... we've been able to do some incredible things," Commander Scott Altman reported as the shuttle released Hubble to return to space. "And now Hubble can continue on its own, exploring the cosmos and bringing it home to us." Engineers continue to perform

testing on the telescope, with the first new images expected in September.

For images of the repair mission please visit:
http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/sts125/multimedia/gallery/gallery-index.html

This servicing mission will extend the life of Hubble through 2013. The repairs and new instruments will allow Hubble to see solar systems and galaxies previously unseen. Some of the images taken by Hubble can be found at: <http://hubblesite.org/gallery/>



In this tightly cropped image, the NASA space shuttle Atlantis is seen in silhouette during solar transit, Tuesday, May 12, 2009, from Florida. This image was made before Atlantis and the crew of STS-125 had grappled the Hubble Space Telescope.

Science News



NASA Science News has published several articles last month. Please follow the links to read the full stories. Check out our RSS feed at <http://science.nasa.gov/rss.xml>!

New Gamma-Ray Burst Smashes Cosmic Distance Record

A gamma-ray burst detected by NASA's Swift satellite has smashed the previous distance record for the most powerful explosions in the Universe. Researchers are calling it "an incredible find" and a "true blast from the past." http://science.nasa.gov/headlines/y2009/28apr_grbsmash.htm?list907815

Mercury More Active than Scientists Thought

A NASA spacecraft gliding over the surface of Mercury has revealed that the planet's atmosphere, magnetosphere, and its geological past display greater levels of activity than scientists first suspected. http://science.nasa.gov/headlines/y2009/30apr_mercury.htm?list907815

Salmonella Spills its Secrets on the Space Shuttle

NASA-supported researchers have figured out why Salmonella bacteria become more virulent when they travel on board spaceships. They've also learned how to calm the bacteria down again--a trick that could come in handy for fighting diseases here on Earth. http://science.nasa.gov/headlines/y2009/06may_salmonella.htm?list907815

Space Shuttle Atlantis Launches on Final Mission to Hubble

After a smooth countdown and picture-perfect liftoff, space shuttle Atlantis and a crew of seven astronauts are in space, ready to begin their 11-day mission to service NASA's Hubble Space Telescope. Atlantis lifted off Launch Pad 39A at NASA's Kennedy Space Center in Florida at 2:01 p.m. EDT on May 11th. http://science.nasa.gov/headlines/y2009/11may_hubblemission1.htm?list907815

Wake Up and Smell the Coffee--on the Moon!

Have you ever wondered how you'd make your morning coffee if you were living on another planet? NASA engineers have power http://science.nasa.gov/headlines/y2009/15may_stirling.htm?list907815



Librarian News

What summer programs are you planning based on LRO and LCROSS?

The LRO launch has been shifted again. As of right now, launch is set for June 17, 2009. Keep an eye on how the launch date might change. Please check out:

<http://www.nasa.gov/missions/highlights/schedule.html> periodically.



Links of the Month...

- NASA's Image of the day: <http://www.nasa.gov/multimedia/imagegallery/iotd.html>
- Apollo images:
 - <http://www.lpi.usra.edu/resources/apollo/>
 - <http://apollo.sese.asu.edu/>
- THERMAL VENTS AND PLATE TECTONICS, Woods Hole Oceanographic Institution, Learn about deep ocean exploration, thermal vent ecology, and plate tectonics. <http://www.divediscover.whoi.edu/>
- PESTICIDE NATIONAL SYNTHESIS PROJECT, USGS, The NAWQA Pesticide National Synthesis Project, which began in 1992, is a national-scale assessment of the occurrence and behavior of pesticides in streams and ground water of the United States and the potential for pesticides to adversely affect drinking-water supplies or aquatic ecosystems. <http://water.usgs.gov/nawqa/pnsp/>
- BEYOND PENGUINS AND POLAR BEARS, Kimberly Lightle, Beyond Penguins and Polar Bears is an online magazine for K-5 integrating science, literacy, and the polar regions. In each month's issue, you can:
 - * Learn science concepts and literacy strategies
 - * Read about misconceptions, equity, and technology
 - * Discover standards-based lessons and resources
 - * Integrate polar science into your curriculum<http://beyondpenguins.nsdl.org/>

Monthly Activity



Make a scale model of NASA's Hubble Space Telescope using easy-to-find supplies and our printable materials.

These models aren't working telescopes – you can't peer at the sky with them. But they can give you an up-close look at the telescope's structure and a challenging project to engage your model-making skills.

For directions and templates, please visit:

http://hubblesite.org/the_telescope/hand-held_hubble/