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Lunar Reconnaissance Orbiter



This blog follows the progress of the LRO mission through Integration and Testing at NASA's Goddard Space Flight Center and launch site processing at KSC\Astrotech. Its purpose is to enable communication to the entire LRO Team about the status of ongoing activities.

LRO was launched June 18th, 2009 at 5:32pm EDT from KSC. This BLOG will follow the progress of the mission as LRO travels to the Moon and establishes orbit around it.

This BLOG will be periodically updated during LRO's early mission but as the nominal mission unfolds the official [NASA LRO website](#) and the [LRO Science Instrument's own websites](#) will evolve into a more interesting sources of LRO science results as postings appear there first and LRO engineering and operations (source of this site) will become increasingly routine.



LRO LINKS

[LROC Homepage \(Great Stuff!\)](#)

[NASA LRO Mission Page](#)

[NASA LCROSS Mission Page](#)

[LRO GSFC Public WebSite](#)

[KSC Webcams](#)

[Decoder for Latin Quotes](#)

[KSC Video Feeds including LRO at Astrotech](#)

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[Instrument Integration Video](#)

CONTRIBUTORS

[Steve Andrews](#)

[LRO](#)

TUESDAY, SEPTEMBER 15, 2009

LRO Mission Orbit Insertion Completed!

Today at 3:32pm ET today LRO executed a 3 minute propulsion burn near the periselene of our last commissioning phase orbit. This placed LRO in a 50 km (mean) circular polar orbit about the Moon. With this maneuver LRO has begun its primary 1 year Exploration mission.

Below is a paste of the NASA Media Advisory announcing the upcoming LRO First Light press conference this Thursday.

MEDIA ADVISORY: M09-174

NASA TO RELEASE FIRST RESULTS FROM LUNAR MISSION THURSDAY, SEPT. 17

GREENBELT, Md. -- NASA will showcase new images from the Lunar Reconnaissance Orbiter's seven instruments and provide updates about the topography of the moon's south pole during a news conference at 1 p.m. EDT Thursday, Sept. 17. NASA also will provide an update about the spacecraft's status and mission plans. The briefing will take place at NASA's Goddard Space Flight Center in Greenbelt, Md., and will be broadcast live on NASA Television and the agency's Web site.

Panelists are:

- Craig Tooley, Lunar Reconnaissance Orbiter project manager, Goddard Space Flight Center
- Michael Wargo, chief lunar scientist, Exploration Systems Mission Directorate, NASA Headquarters, Washington
- Richard Vondrak, Lunar Reconnaissance Orbiter project scientist, Goddard
- David Smith, Lunar Orbiter Laser Altimeter principal investigator, Goddard

To RSVP or to participate by telephone, reporters should contact Rani Gran at 301-286-2483 by noon Sept. 17.

Reporters attending the event at Goddard should sign in at the center's main gate by 12:30 p.m. Thursday. The gate is located at 8800 Greenbelt Rd. in Greenbelt. NASA representatives will be available to escort reporters from the gate to the event.

For NASA TV streaming video, downlink and scheduling information, visit:

<http://www.nasa.gov/ntv>

POSTED BY CRAIG TOOLEY AT 9/15/2009 03:45:00 PM 0 COMMENTS 

THURSDAY, SEPTEMBER 10, 2009

LRO Completion of Commissioning

A review was held yesterday, September 9th, during which it was verified LRO is ready to proceed to the 50km polar mapping orbit

LRO
Philip Luers
Cathie Peddie
Craig Tooley
Joanne
Rick Saylor
Arlin
Steve Zug

BLOG ARCHIVE

- ▼ 2009 (192)
 - ▼ 09/13 - 09/20 (1)
 - LRO Mission Orbit Insertion Completed!
 - ▶ 09/06 - 09/13 (1)
 - ▶ 08/23 - 08/30 (1)
 - ▶ 08/16 - 08/23 (1)
 - ▶ 08/09 - 08/16 (1)
 - ▶ 08/02 - 08/09 (2)
 - ▶ 07/19 - 07/26 (1)
 - ▶ 07/12 - 07/19 (4)
 - ▶ 07/05 - 07/12 (4)
 - ▶ 06/28 - 07/05 (8)
 - ▶ 06/21 - 06/28 (30)
 - ▶ 06/14 - 06/21 (44)
 - ▶ 06/07 - 06/14 (1)
 - ▶ 05/31 - 06/07 (5)
 - ▶ 05/24 - 05/31 (6)
 - ▶ 05/17 - 05/24 (3)
 - ▶ 05/10 - 05/17 (6)
 - ▶ 05/03 - 05/10 (2)
 - ▶ 04/26 - 05/03 (5)
 - ▶ 04/19 - 04/26 (2)

and begin the prime mission. On September 15th LRO will execute the Mission Orbit Insertion (MOI) propulsive maneuver and establish the nominal mission orbit. LRO is ready to begin the prime mission, the spacecraft, the instruments, and the ground system are performing flawlessly!

Upcoming next week NASA will hold a "First Light" LRO press conference. Watch for the NASA media advisory which will have the details. Once announced it will also be posted here.

LRO is also preparing to support the LCROSS impact on October 9th, having already providing observations and data to aid in the final LCROSS target selection.

POSTED BY CRAIG TOOLEY AT 9/10/2009 10:08:00 AM 0 COMMENTS 

WEDNESDAY, AUGUST 26, 2009

LRO Videos Available

Aloha LRO Team and Fans - now posted to the Goddard Multimedia website are 11 videos, various views of the LRO/LCROSS launch, in several different formats for your viewing pleasure ☐

Also posted is brand new footage of the LRO Project Team at GSFC's Mission Operations Center (MOC) and Launch Support Room (LSR) before, during, and post launch on June 18th....you all totally ROCKED!!

Check them all out at:

<http://svs.gsfc.nasa.gov/vis/a010000/a010400/a010469/>

POSTED BY CRAIG TOOLEY AT 8/26/2009 10:05:00 AM 0 COMMENTS 

WEDNESDAY, AUGUST 19, 2009

LRO to Perform Bi-Static Radar Experiment with Chandrayaan-1

On Aug. 20, 2009 NASA and the Indian Space Research Organization (ISRO) will attempt a novel joint experiment that could yield more information on whether ice exists in a permanently shadowed crater near the north pole of the moon. Currently the ISRO's Chandrayaan-1 and NASA's Lunar Reconnaissance Orbiter (LRO) spacecraft are

- ▶ 04/12 - 04/19 (1)
 - ▶ 03/29 - 04/05 (4)
 - ▶ 03/22 - 03/29 (1)
 - ▶ 03/15 - 03/22 (3)
 - ▶ 03/08 - 03/15 (4)
 - ▶ 03/01 - 03/08 (2)
 - ▶ 02/22 - 03/01 (3)
 - ▶ 02/15 - 02/22 (7)
 - ▶ 02/08 - 02/15 (7)
 - ▶ 01/11 - 01/18 (2)
 - ▶ 01/04 - 01/11 (30)
 - ▶ 2008 (286)
-

orbiting the moon. While LRO is in its commissioning phase the two spacecraft pass close enough to each other when they are over the lunar north pole to attempt a unique experiment. Both spacecraft are equipped with a NASA Miniature Radio Frequency (RF) instrument that functions as a Synthetic Aperture Radar (SAR), known as Mini-SAR on Chandrayaan-1 and Mini-RF on LRO. The experiment uses both radars to point at Erlanger Crater at the same time.

Normally the Mini-RF Instrument sends radio pulses to the moon and precisely records the radio echoes that bounce straight back from the surface, along with their timing and frequency. From these data scientists can build images of the moon that not only show areas they otherwise couldn't see, such as the permanently-shadowed areas near the lunar poles, but also contain information on the physical nature of the surface.

For the Bi-Static experiment the Mini-SAR on Chandrayaan-1 performs its normal SAR imaging (transmitting and receiving) while the Mini-RF is set to receive only. The two instruments look at the same location from different angles. Comparing the signal that bounces straight back to Chandrayaan with the signal that bounces at a slight angle to LRO provides unique information about the surface.

While this coordination sounds easy, this experiment is extremely challenging because both spacecraft are traveling at about 1.6 km per second and will be looking at an area on the ground about 18 km across. Due to the extreme speeds and the small point of interest, NASA and ISRO need to obtain and share information about the location and pointing of both spacecraft. The Bi-Static experiment requires extensive tracking by ground stations of NASA's Deep Space Network, the Applied Physics Laboratory, and ISRO. In addition LRO will perform a 23 second propulsion burn today to adjust LRO orbit phasing to enable the coordinated observations.

The [Mini-RF website](#) will be the place to look for the first results of this experiment. The event is illustrated in the simulation below.

POSTED BY CRAIG TOOLEY AT 8/19/2009 05:31:00 PM 0 COMMENTS 

FRIDAY, AUGUST 14, 2009

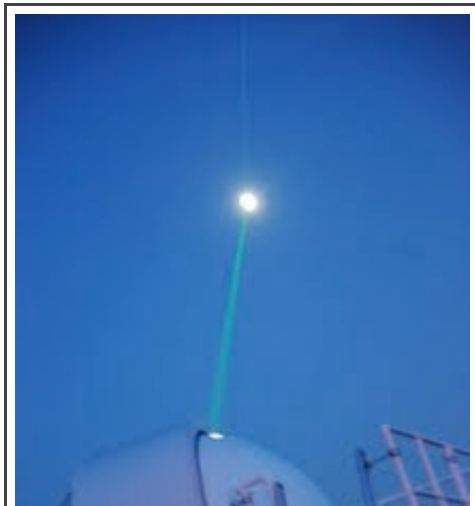
LRO Status

The LRO mission is now well past the halfway point of our commissioning phase during which we have been calibrating and testing the instruments. We now plan to lower our orbit down to the 50 km polar orbit on September 15th, 2009 and start the nominal mission.

POSTED BY CRAIG TOOLEY AT 8/14/2009 05:35:00 PM 0 COMMENTS 

WEDNESDAY, AUGUST 5, 2009

We're at the Moon Event Video compilation





Aloha LRO Fans - Check out this awesome video compilation from Saturday's "We're at the Moon" Event:

<http://svs.gsfc.nasa.gov/vis/a010000/a010400/a010475/index.html>

Many thanks to Andy Freeberg for being videographer extraordinaire!!

Enjoy,
Cathy

POSTED BY CATHIE PEDDIE AT 8/05/2009 11:15:00 AM 0 COMMENTS 

MONDAY, AUGUST 3, 2009

An Awesome Weekend for LRO





Above photo is of Fans of LRO lining up to get a glimpse of the Moon and maybe LRO!

Aloha LRO Team! Congratulations to all of us for a totally awesomely successful weekend!

On Saturday night, the “We’re at the Moon” event held at the Goddard Visitor Center was a smashing success!! Many folks came out to celebrate with us and enjoy the LRO Project’s phenomenal success thus far. A Very Special Thank You to our Event Volunteers: Carmel Conaty, Trusilla Steele, Michelle Jones, Lora Bleacher, Heather Weir, Steph Stockman, Frank Ireton, Ron Zellar, Cindy Taylor, Rich Vondrak, Paul Lowman, Mark Beckman, Jan McGarry, Leigh Janes, Oscar Hsu, Rick Saylor, Maria Acevedo Rivera, and Nancy Neal Jones.

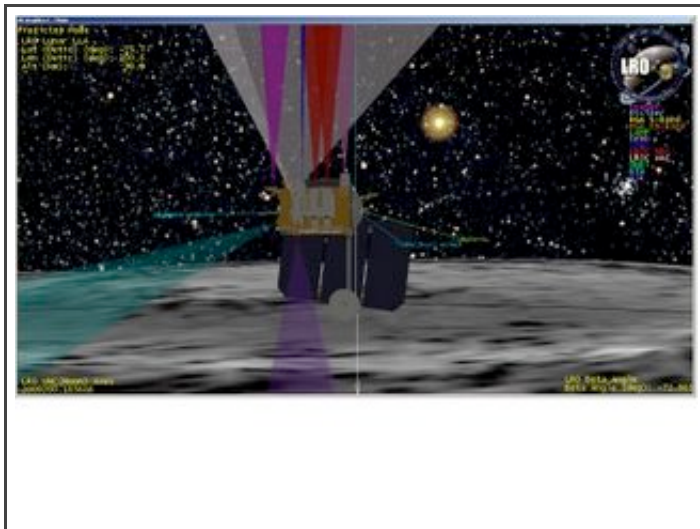
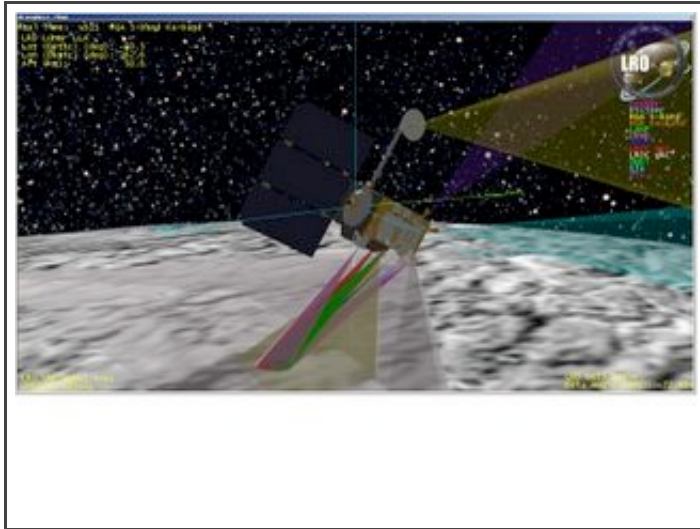
On Sunday, our LAMP instrument had its First Light. Congrats to our LAMP team!!

Rock on LRO!
Cathy

POSTED BY CATHIE PEDDIE AT 8/03/2009 04:57:00 PM 0 COMMENTS 

MONDAY, JULY 20, 2009

LRO Status July 18-19, 2009



Above STK images are of the start of the Star Cal and at target

LRO continues to perform very well in its commissioning orbit.

This weekend we performed LEND and LROC NAC Star Calibrations (see below STK images for the start of the Star Cal and at target). Data collection continues for all instruments, except for LAMP. LAMP Phase 2 will begin later this week.

Hope you all have seen and enjoyed LROC's images of the Apollo Landing sites at:

http://www.nasa.gov/mission_pages/LRO/main/index.html

Or

<http://lroc.sese.asu.edu/index.html>

Congratulations to our totally awesome LROC team for making history!! Congratulations to all on LRO!!

Cathy

POSTED BY CATHIE PEDDIE AT 7/20/2009 09:33:00 AM 0 COMMENTS 

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Opening of Window Launch Date/Time (EDT)	Duration of Launch Window (min)	Number of Discrete Launch Opportunities	Worst Case Time to Ground Station AQS (min)	Worst Case LOI-1 dV (m/sec)	Opening of Window Transfer Traj Duration (hrs)	Closing of Window Transfer Traj Duration (hrs)
21 May 2009 17:32:00	60	7	4.8	547.7	94	109
22 May 2009 19:05:00	60	7	6.0	553.5	94	106
23 May 2009 20:52:00	60	7	7.7	559.9	93	106
03 Jun 2009 17:24:00	instantaneous	1	0.0	506.1	126	NA
04 Jun 2009 17:58:00	60	7	0.7	512.1	112	126
05 Jun 2009 19:31:00	60	7	1.9	519.7	112	127
17 Jun 2009 15:11:00	60	7	4.6	547.6	94	112
18 Jun 2009 16:32:00	60	7	5.4	554.7	95	108
19 Jun 2009 18:11:00	60	7	6.9	563.6	93	105
20 Jun 2009 19:58:00	60	7	8.9	570.6	92	104

