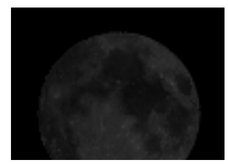
SEARCH BLOG FLAG BLOG Next Blog»

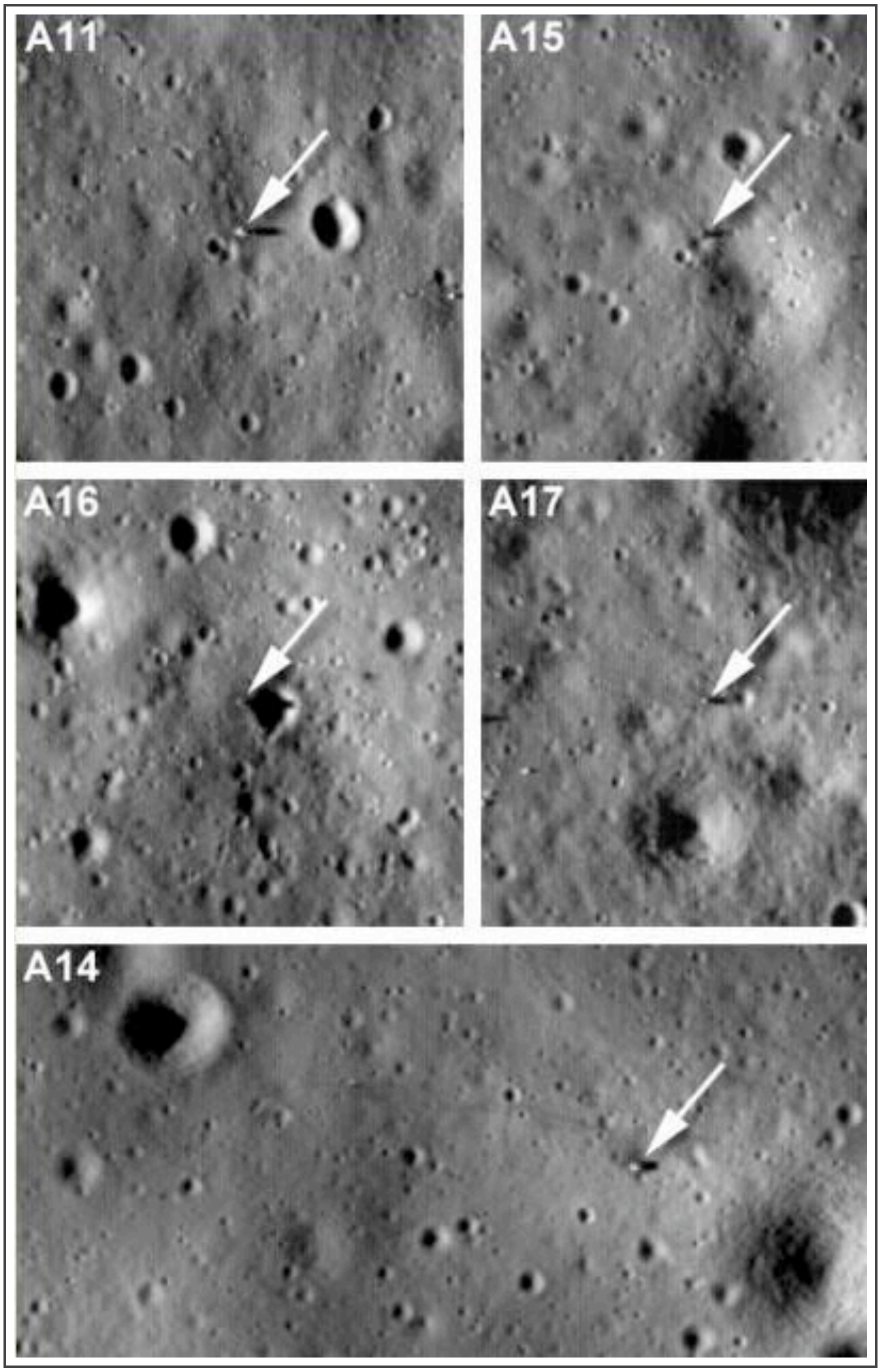
Showing posts with label **LROC**. Show all posts

SUNSET RICCIOLI NORTH



FRIDAY, JULY 17, 2009

Finally...



Still very early in the calibration phase of what will be its long-awaited two-year mission exploring the Moon, Arizona State University's stewards of the LRO wide and narrow angle camera system have delivered just preliminary photographs of five of the six Apollo lunar module descent stages (which turned out situated *precisely where they were supposed to be* when left behind almost forty years ago.

Naturally, the Lunar Pioneers can't think of a better way to celebrate the accomplishment of Apollo 11. (The intensive tracking

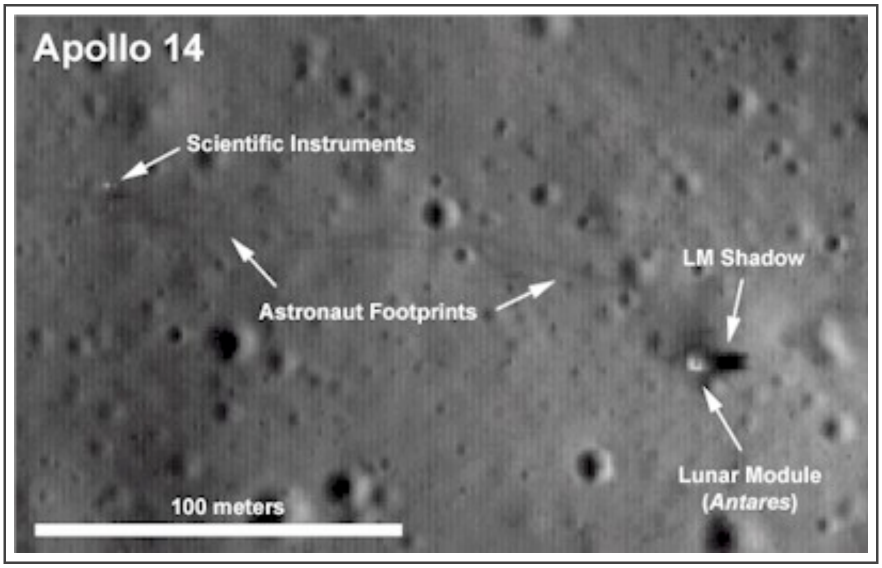
BLOG ARCHIVE

left behind by the boots of Alan Shepard and Edgar Mitchell on Fra Mauro in February 1971 can easily be seen, having left an obvious trail between the ALSEP and *Antares*.)

LROC Site Link **HERE**.

POSTED BY JOEL RAUPE AT 8:02 PM 0 COMMENTS
LABELS: APOLLO 11, APOLLO 14, APOLLO 15, APOLLO 16, APOLLO 17, LRO, LROC

Five Apollo landing sites photographed



The Lunar Reconnaissance Orbiter (**LRO**) has returned its first imagery of the Apollo moon landing sites. The pictures show Apollo lunar module descent stages from five of the six successful manned landing site resting on the moon's surface, as long shadows from a low sunset phase angle make the modules' locations distinct.

All six manned lunar landing missions took place at or soon after local lunar sunrise, so the long shadows fall away close to the direction from which they arrived.

The Apollo 12 site, around 100 meters from the earlier landing site of Surveyor 3, is expected to be photographed in coming weeks.

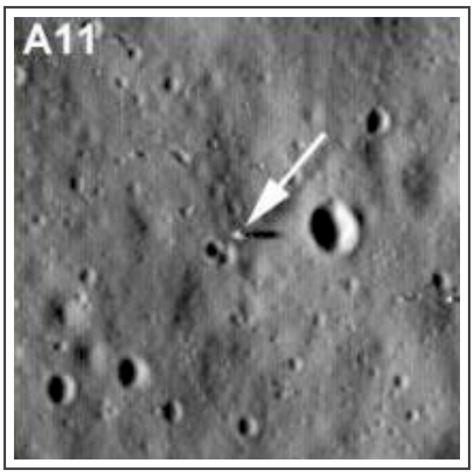
"The **LROC** team anxiously awaited each image," said LROC principal investigator Mark Robinson of Arizona State University. "We were very interested in getting our first peek at the lunar module descent stages just for the thrill -- and to see how well the cameras had come into focus. Indeed, the images are fantastic."

NASA Science News Release **HERE**.

POSTED BY JOEL RAUPE AT 2:42 PM 0 COMMENTS
LABELS: ALAN SHEPHERD, APOLLO 14, APOLLO HISTORY, ARIZONA STATE, EDGAR MITCHELL, LRO, LROC

THURSDAY, JULY 16, 2009

Arizona: More Moon than ASU's LROC



Now, as then, AZ's involvement in lunar exploration is extensive

By Tom Beal
Arizona *Daily Star*

Arizona was full of lunatics 40 years ago, and the tradition continues.

On July 20, 1969, when Neil Armstrong took that historic "small step," it was onto a lunar surface first mapped in Flagstaff by teams of astronomers and graphic artists.

This year, as NASA celebrates the 40th anniversary of the moon landing, scientists at Arizona State University in Tempe are mapping the moon once again, this time with an orbiting suite of cameras that, combined with an array of other instruments, will help NASA select a site for the return of man to the moon in 2020.

Before Monday's anniversary, the ASU team hopes to process images of Mare Tranquillitatis (Sea of Tranquility), where Armstrong stepped into history.

Read the article HERE.

POSTED BY JOEL RAUPE AT 4:09 PM
LABELS: APOLLO 11, APOLLO HISTORY, ARIZONA, ARIZONA STATE, LRO,

Sir Patrick Moore patiently persists...
Not just another, high-res radar map
Lunar Network Delays: An Apology
LRO LROC returns first images

► June (155)
► May (136)
► April (100)
► March (80)
► February (109)
► January (85)
► 2008 (572)
► 2007 (10)
► 2006 (1)

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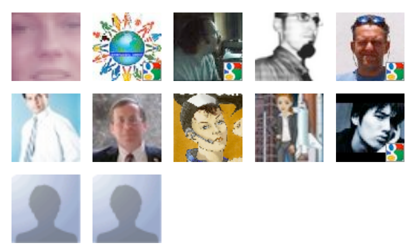

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A Babe in the Universe
AbsolutSpaceGirl
Aero-News Network
Ambrose Liao
AmericaSpace
AMSAT News

LROC

WEDNESDAY, JULY 15, 2009

Cracked Gauss tests LRO WAC

annakhtoniv

Apollo Archive

Artificial Intellegency

Astroblog

Astrocast.TV

Just part of a larger LRO Wide-Angle Camera (WAC) image which includes Hahn to the southwest, reveals the tortured morphology on the floor of 170 km-wide

Astroengine.com
Astronaut Tom Jones: Flight Notes
Astronomy Cast
Astronomy Education Review
Astronomy Online
Astronomy Today
Astronomy Weather Blog
Astrophysics Spectator
Astropixie
astroprof
AstroSpaceNow
ATV ESA Blog
Aviation Week OnSpace
Avventure Planetarie (Paolo Amoroso)
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Bad Astronomy
Black Holes & Stuff
Black Holes and Astro Stuff
Blueshift (GSFC Podcast)
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Chandrayaan Images & Data
Chesmont Astronomical Society
China Lake Weather
Chuck Wood's Moon
CollectSPACE
Colony Worlds
Commercial Space Gateway
Cornel University Library
Cosmic Variance
CosmicLog (Alan Boyle)
CosmicRAY
Cosmos Review
Daily Galaxy
Design News (Design & Engineering)
Digg / Space
Digital Chosunilbo (English)
Discovery Enterprise

Gauss (35.7 N - 79E).

From the LRO Press Release:

"*If the material on the floor is due to extrusive volcanism, the color filters of the WAC will help to determine its composition relative to the surrounding terrain. The Narrow Angle Cameras (NACs) will allow us to see small vents and pyroclastic deposits that often occur in similar floor-fractured craters, helping to confirm that these cracks are due to volcanic activity beneath the crater*."

Charles Wood's perspective "**A Hahnsome View**,"
Lunar Picture of the Day, July 15

POSTED BY JOEL RAUPE AT 3:02 PM 0 COMMENTS
LABELS: GAUSS, LRO, LROC, LUNAR MORPHOLOGY, WAC

SATURDAY, JULY 11, 2009

LROC: Fractured Floor of Compton

Orbit 136 took LRO over the Imbrian-aged Compton Crater (162 km diameter) at an altitude of 172 kilometers. At this height, large boulders can be seen casting shadows, especially on the rims of the numerous secondary impacts that cover this ancient surface. But there is more to this image than craters and boulders. In the upper part, the western edge of Compton's huge central peak is visible. The wide, sloping flat floored trough (or graben) records a period of uplift of the crater floor. The uplift caused the floor to break and

Discovery Enterprise
Discovery Space
Dr. Vector
e!
Elizabeth Howell
Encyclopedia Astronautica
Engadget
Fighting for the Moon
Flame Trench (Florida Today)
Flight Global HYPERBOLA
FreeRepublic
GeoChristian
George Varros
Google Moon
Heliophysics and the Moon
Hobby Space
Hobby Space Blog
Honeysuckle Creek Legacy
Hot Astronomy
http://www.sassyscience.com
Icarus
Ichat Science
Inside The Apollo Project
Interactions.org
International Planetary Cartography Database
io9 - Lunar Exploration
Italian Online Space Forum
James Oberg
Joint Recon Study Group
KAGUYA(SELENE) Image Gallery
KAGUYA(SELENE) Video/Image Gallery
Ken's Lunar Library
Kwajalein Atoll and Rockets
Larry Russell Kellogg
LCROSS Flight Director's Blog
Liftport Staff Blog
Lights in the Dark
Linda Cureton. CIO NASA/Goddard

pull apart, forming the graben. The cause of the uplift and fracture of crater floors is not yet fully understood.

One possibility is the slow readjustment of the crust after the crater-forming impact. Asteroids and comets strike the Moon at speeds greater than 15 km/second. So much energy is released that rock behaves as a plastic for a brief instant - the crust is pushed down. Over time the crust relaxes and uplifts towards its original position, fracturing lava flows that were erupted and hardened after the impact. Another idea concerns the intrusion of lava into the shallow subsurface. As this magma follows existing cracks, it exerts pressure on the surrounding rock causing uplift and more fracturing. Unraveling the origin of lunar tectonic features like this one is a primary focus of LROC science team.

Browse **the full resolution frame** or **watch the Youtube movie**

POSTED BY JOEL RAUPE AT 2:24 AM 0 COMMENTS
LABELS: COMPTON, LRO, LROC

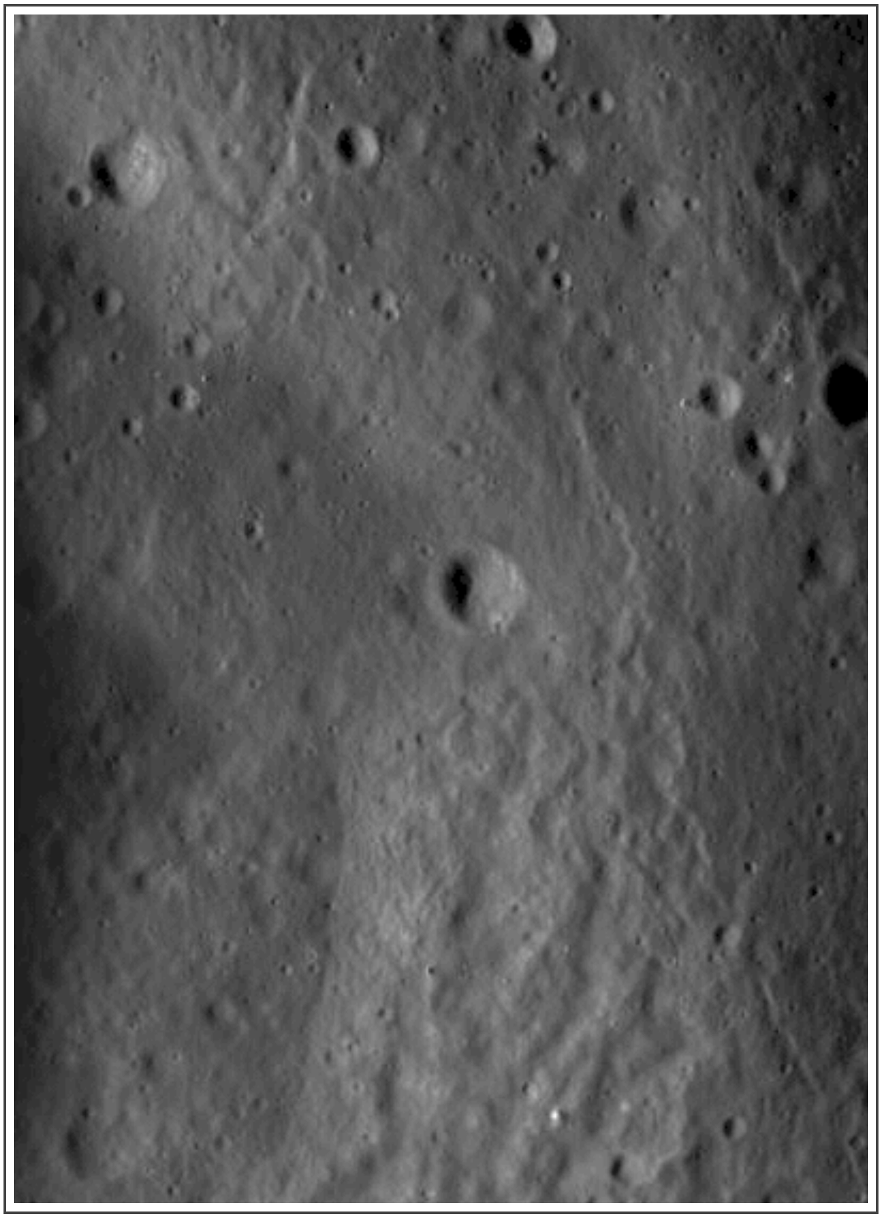
FRIDAY, JULY 10, 2009

POSTED BY JOEL RAUPE AT 3:30 PM
LABELS: LRO, LROC

TUESDAY, JULY 7, 2009

Ten new LROC releases

LPOD slow archive
Luna C/I: Moon Colonization and Integration
Lunar Captures by George Tarsoudis
Lunar News Network
Lunar Update
LUNAR-OCCULTATIONS.COM
Lunarpedia
M3 Science Blog (MMM)
Meridiani Journal
Michael Addison in Lipan, Texas
Mid-Atlantic Regional Spaceport Blog
Mike Brown's Planets
Miles O'Brien
MirCorp
Monsters in Space
Moon Daily
Moon Poster
Moon Society
Moon Society Blog
Moon Today
MoonConnection.com
NASA Asteroid Comet Impact Hazards
NASA EDGE
NASA Moon Mars News
NASA Spaceflight
NASA STI
NASA Tech Briefs
NASA Watch
NASA's EDGE Blog
NASA's Shana Dale's Blog
National Space Society Blog
Near Earth Object Program
NEQNET
New Frontiers Blog
New Scientist
New Scientist Space Blog
Next Big Future



Detail from Uncalibrated view of the rim of Anaxagoras A, (LROC), June 30, 1604 UT; full view centered on 72.18645° North, 351.15175° East (1.85 m/pixel resolution). Among ten new LRO Camera releases, taken along the terminator, during LRO orbit 74, mostly in and around Mare Frigoris, in the far north of the Moon's near side. [NASA/GSFC/Arizona State University]

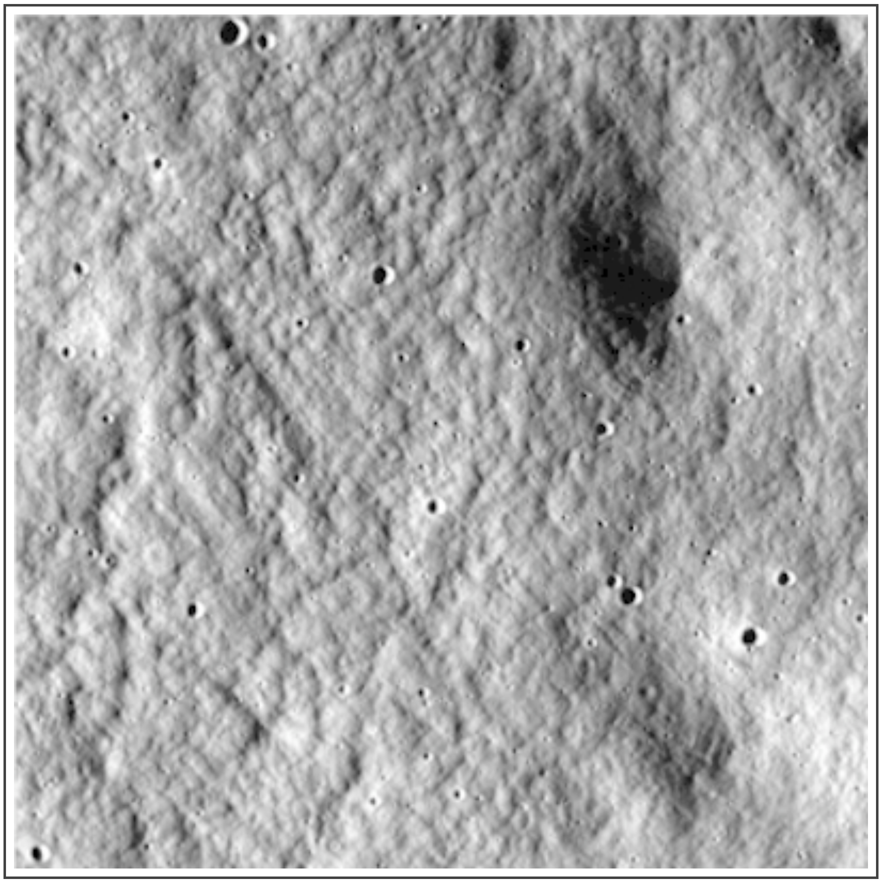
The latest ten raw calibration images among 14 now in the LROC image gallery, showing the mere potential and promise just ahead from the Lunar Reconnaissance Orbiter.

POSTED BY JOEL RAUPE AT 8:28 AM 0 COMMENTS
LABELS: ANAXAGORAS A, LRO, LROC

Nightpixels
NTRS
NWS Space Weather Prediction Center
Observatoire de la Côte d'Azur
Once & Future Moon (Smithsonian Air & Space)
One-Minute Astronomer
OnORBIT
Orbital News Releases
Orbiting Frog
Orbiting Frog
Our Night Sky with Tavi Greiner
Out of the Cradle
PARABOLIC ARC
Personal Spaceflight
Peter Greco's Live Moon Cam
PHYSORG
Plasma Wind
Political Action for Space
POPSCI.COM
Portal to the Universe
Primezone Media
RIA Novosi (Science)
Robot Living
ROBOTS.NET
Rocket Racing League
Rocketforge.org
Russian Space Web
Satellite Today
Science Blog
Sciencedude
Scientific Blogging
Scotts Astonomy Page (10th Year)
Selenology Today
Silicon (networks)
Six Millennium Catalog of Phases of the Moon
Sky & Telescope

SATURDAY, JULY 4, 2009

LRO LROC commissioning Clavius



Close-up view of the lunar highlands, southeast of Clavius [NASA/GSFC/Arizona State University]
Larger view, click on Image.

Arizona State-NASA Goddard - Tuesday's Lunar Reconnaissance Orbiter Camera (**LROC**) images were purely engineering tests, and this particular frame was part of a sequence specifically designed to check one of the NAC's settings.

The engineering frames were acquired with only one-tenth the number of lines of a standard 52,224-line NAC frame to allow the full sequence to be acquired in one orbit. As an added bonus we captured this spectacular view of the lunar highlands southeast of Clavius crater.

From 56 km altitude, small features such as fresh craters and boulders can be readily identified. Many hills in the in highlands

SkyGuy
Skymania
slashdot.org
Space Age Publishing Company
Space and Astronautics News
Space Blogger (Space Daily)
Space Buff
Space Calendar
Space Coalition Blog
Space Collective
Space Fellowship
Space Flight Now
Space Jockey
Space Law Probe
Space Lifestyle Magazine
Space Politics
Space Pragmatism
Space Prizes
Space Resource World
Space Review
Space Spin
Space Travel
Space Ventures
Space Weather
Space Weather Radio
Space-Industry
space.alltop.com
Space.com
Space4Commerce
Spacecrazed
Spacefacts
Spacenews
Spacephysicist.com
SpacePoliceOnline.com
Spaceports
spaceprizes.blogspot.com
SpaceRef
spacetoday.net
SpaceVidCast.com

exhibit the so-called "tree bark" or "elephant skin" texture, which really stands out in this picture. "Tree bark" was first identified by lunar scientists analyzing Apollo-era photography during the 1970s, and its origin remains a mystery. As NAC images accumulate and more examples are revealed, scientists will delve into the processes that form this distinctive surface texture. - *Samuel Lawrence*

LP Ed. NOTE: *The "Elephant Skin" or "tree bark" texture seen in the lunar highland anorthosite, blanketed with dust, has a curious similarity with the larger scale structure seen in the cross-hatched kilometer-high rolling hills of the Descartes Formation.*

POSTED BY JOEL RAUPE AT 10:41 PM 0 COMMENTS
LABELS: ANOMALOUS, CLAVIUS, LRO, LROC

THURSDAY, JUNE 18, 2009

USGS Astrogeology returns to its roots with LRO

Critical science support for NASA's Lunar Reconnaissance Orbiter (LRO) launched from Cape Canaveral, today, helping pave the way for further human and robotic exploration of the Moon.

USGS scientists are providing unique knowledge and skills as members of the science teams operating instruments on LRO. The USGS has deep roots in lunar exploration, beginning with geologic and cartographic support and astronaut training of the Apollo manned missions during the 1960s.

Among the instruments carried on LRO, the Lunar Reconnaissance Orbiter Camera (LROC) will acquire high-resolution stereo images that will allow the USGS to create detailed topographic maps of specific sites. USGS maps can be used to prioritize which sites are of the most interest, to guide robotic spacecraft or astronauts to safe landings, and to plan surface operations, including roving and possibly construction on the surface of the Moon.

USGS scientists Laszlo Keszthelyi and Lisa Gaddis, both members of the LROC team, bring their expertise to help understand the volcanic features on the Moon, including picking places to take pictures and then interpreting the images. In addition, Keszthelyi will help calibrate the camera so the locations of specific features on Moon can be precisely determined.

SpaceX in the Media
SpaceX Press
Star Stryder (Dr. Pamela L. Gay)
Stargazer's Lounge
Sydney Observatory Blog
Technorati
Techspedia
TFOT
The Launch Pad (GLXP Blog)
The Old Farmers Almanac
The SAO/NASA Astrophysics Data System (ADS)
The Space Show
The Space Times
The Wright Stuff (Orlando Sentinel)
THEMIS (ARTEMIS)
Today in Astronomy
Tom Jones
Transterrestrial Musings
U.S. Naval Observatory
Uncle Rod's Astro Blog
Unigalactic - Space Travel Magazine
Universe Today
Unmanned Spaceflight Forum
Unreasonable Rocket
Wayne Hale
WikiSky
Xinhua
Луна (Astronominsk)

X PRIZE CLOUD

Google Lunar X Prize
Advaeros
ARCA
Astrobotic Technology, Inc.
Chandah
Euroluna
FredNet

"Of particular importance is making information gathered by LRO compatible with past data," explains USGS cartographer and LROC team member Brent Archinal. Archinal will help establish the cartographic coordinate frame and standards onto which all LRO, international mission, and past mission lunar data will be based, and to help assure that the LRO data can be tied together and placed into that common mapping system.

"I think the most exciting element of the mission will be collecting images and other data of both past and future human landing sites on the Moon," says Archinal. "We should be able to see much of the actual hardware left on the surface during past missions. Images of all of the past robotic and human landing sites, and even sites where spacecraft have previously impacted on the Moon will give us a better understanding of the characteristics of each of these sites, by comparing the 'ground truth' collected at these sites with the new data."

In the search for lunar resources, the Diviner Lunar Radiometer Experiment (Diviner) will map the temperature of the entire lunar surface to identify cold-traps and potential ice deposits, as well as landing hazards such as rough terrain or rocks. USGS senior scientist Larry Soderblom will work with the Diviner team mapping day and night surface temperatures of the Moon to characterize environments for possible habitability.

USGS senior scientist Randy Kirk will work with the miniature synthetic aperture radar (MINI SAR) technology demonstration , which is designed to acquire radar images of the shadowed regions of craters near the lunar poles. MINI SAR's ability to measure the polarity of the reflected signal is critical to identifying and studying ice deposits. Kirk will help turn the radar images into maps that will be used to identify ice as possible resources for future explorers and to assist in selection of future landing sites.

USGS geology, cartography, and image processing support for the LRO mission collectively represent a full-circle return of USGS Astrogeology to its roots as Apollo mission support. USGS scientists, cartographers, technicians, and programmers from the Astrogeology Science Center in Flagstaff have over four decades of experience assembling planetary images and creating maps, starting with those

Independence-X
JURBAN
LunaTrex
Micro-Space
Next Giant Leap
Odyssey Moon
Omega Envoy
Part-Time Scientists
Selene
Synergy Moon
Team Italia
TeamSTELLAR
White Label Space

ORG CLOUD

A.S.I. - Agenzia Spaziale Italiana
AAS
Advanced Vehicle Research Center
Aerojet Corporation
Aerospace Corporation
Aerospace Industries Association
Aerospace States Association
AIAA
Air Force Research Laboratory
Air Force Space Command
Air Force Space Command
Air Lock, Inc. (David Clark Co.)
ALPO
Amateur Geologist
Amazing Space
American Association of Amateur Astonomers
American Astronautical Society
American Physical Society
Americans in Orbit -50 years
Amro
AMSAT
Analex Corporation

acquired to support the Apollo moon landings. In the 1960s, Apollo missions only considered landing sites near the equator on the side of the Moon facing the Earth, but LRO, will be investigating all of the Moon, extending the Apollo-era data (which was excellent for a small part of the Moon) to the whole body.

For LRO, the science support team includes five USGS scientists: Drs. Brent Archinal, Laszlo Keszthelyi, Larry Soderblom, Randy Kirk, and Lisa Gaddis. Astrogeology Science Center Director Jeff Johnson notes that Archinal, Keszthelyi, and Gaddis are three of the 24 competitively selected Participating Scientists on the LRO mission, and Kirk and Soderblom are senior USGS scientists who provide critical assistance to instrument teams for the spacecraft.

"That level of participation on the LRO mission demonstrates our high level of expertise in lunar science and cartography," notes Johnson. "Our team is looking forward to working with the fantastic data sets to be returned by LRO."

POSTED BY JOEL RAUPE AT 9:44 PM
LABELS: LRO, LROC, USGS

ASU's LROC team fired up for LRO

Home to the Lunar Reconnaissance Orbiter Camera (LROC) System

Nikki Staab
School of Earth and Space Exploration
Arizona State University

The Interdisciplinary A building on the Tempe campus looks rather average from the outside. There isn't anything that hints at the excitement, talent and innovation hidden behind its nondescript doors, and there is certainly no indication that the first steps of a great journey are taking place inside.

For nearly two years, professor Mark Robinson and his team have called this building home, developing it into a state-of-the-art Science Operations Center (referred to as the SOC) to work in conjunction with their contribution to the Lunar Reconnaissance Orbiter (LRO). The instrument payload of LRO consists of seven scientific instruments from institutions around the nation and globe

Andrews Space, Inc.
Apache Point Observatory
Apollo Image Archive (Arizona State)
Apollo Lunar Surface Journal
Apollo: View from Orbit
Arianespace
Armadillo Aerospace
ARRL
Artemis Project
Association of Space Explorers
Astrium GmbH
Astrobiology NETwork
Astrobiotic Technology, Inc.
Astronaut Journals
Astronomers Without Borders
Astronomy Picture of the Day (APOD)
Astronomy Software
ATK Launch Systems Group
ATV-Jules Verne
AZSU School of Earth & Space Exploration
BAA Lunar Section Topographical
Bear Fight Center
Bigelow Aerospace
Blue Origin
BNSC
Boeing Houston
BonNova
British Interplanetary Society
Buzz Aldrin
Buzz Aldrin's Share Space Foundation
California Space Authority
Canadian Space Agency
Canadian Space Society
Cape Canaveral Air Force Station
Carnegie Mellon Field Robotics Center
Carnegie-Mellon Lunar Rover Initiative

that will return lunar imagery, topography, temperatures, and more. Robinson is Principal Investigator of one of the instruments on board, the imaging system known as LROC (short for Lunar Reconnaissance Orbiter Camera).

"LRO is the ever important first step in America's human return to the moon. We have much to learn as we restart exploring our nearest neighbor," says Robinson. "We are returning to the moon as humankind's first step in leaving planet Earth to explore the Solar System. Learning to live and work on the moon will allow us to build the skills and technologies to take the next steps to Mars, the asteroids, and beyond."

LRO is the first mission in NASA's Space Exploration policy, a plan to return to the moon and then to travel to Mars and beyond. Just as a scout finds the safest way for expeditions on Earth, LRO will act as a robotic scout to gather crucial data on the lunar environment that will help astronauts prepare for future lunar expeditions. The LROC imaging system serves the mission's primary objective of scouting for safe and compelling lunar landing sites.

LROC will retrieve high-resolution black and white images of the lunar surface, capturing images of the lunar poles with resolutions down to 1m, and will image the lunar surface in color and ultraviolet. The imaging system consists of two Narrow Angle Cameras (NACs) to provide high-resolution images, a Wide Angle Camera (WAC) to provide images in seven color bands over a 60-km swath, and a Sequence and Compressor System (SCS) supporting data acquisition for both cameras.

To give you an idea of the scale of resolution, the NAC gives us a resolution of 0.5 meters/pixel so you could recognize features the size of a car on the surface, but you wouldn't be able to read its license plate. Whereas the WAC provides a resolution of 100 meters/pixel in the visible spectrum, which means you could see images the size of a football field.

"We're collecting the data that will be used to determine where the first lunar outposts, and eventually settlements, will be located," says LROC scientist Samuel Lawrence, a postdoctoral fellow in the School of Earth and Space Exploration in ASU's College of Liberal Arts and Sciences.

Caterpillar Moon
CCSDS
CelesTrak
Center for Education Technologies
Center for Space Resources
Centre National d'Etudes Spatiales (CNES)
Centre National d'Etudes Spatiales (CNES)
Challenger Center for Space Education
CHANDRA
Chandrayaan
Chandrayaan 1 (ISRO)
Cimmarron Software Services, Inc.
Clementine
CLEP (Chang' e)
Clive R. Neal, Notre Dame
CNSA
Coalition for Space Exploration
ColabSpace
CONAE
Connect to the Moon
Copenhagen Suborbitals
CSIRO (Commonwealth Scientific and Industrial Research Organisation)
DARPA
Dassault Systèmes
David Clark Company, Inc.
Deep Space Network (JPL)
DEM-Solutions
Direct v2.0
DLR
EADS-Astrium
Edward Peyer Inc.
Eighth Continent
Embedded Systems Conference Silicon Valley
Embry-Riddle Aeronautical University

The LROC facility is normally lively, filled with Robinson's team of scientists, staff, student researchers and instrument developers. But today, the building is unusually still and quiet. With launch only hours away, Robinson and a majority of his team are already awaiting liftoff from the viewing areas at Kennedy Space Center. The hustle and bustle of notebook-carrying students and researchers is gone, and in place of animated hallway discussions on telemetry, trajectories and camera resolution there is only the soft hum of the lights and AC.

Zack Bowles and Sean Merritt, research analysts on LROC's Science Operations Team, are two of the few members left at the SOC. He and Merritt will be responsible for monitoring the power and temperature status of LROC. The duo has spent many hours preparing for the launch, arriving at the SOC as early as 2 a.m. to run through simulated instrument turn-on procedures.

"We are now very confident in our reaction to different situations involved with monitoring the spacecraft and LROC specifically," states Bowles who recently graduated from ASU with an M.S. in Geology. "To be this involved with an active mission is not something I expected so soon after finishing my master's."

The general schedule of launch day activities begins roughly 12 hours before launch when the mission operations staff at NASA Goddard begins setup. About 10 hours before launch, Bowles and Merritt will establish communication and start running through the launch day configuration procedures. At 6 hours prior to launch, the orbiter, and specifically, the instruments, begin powering on during the "Aliveness Test".

"During this sequence, we deliver LROC's 'Go!/ No go' status to the payload manager at Goddard who will relay the official payload readiness to the LRO Mission Operations staff prior to launch," explains Bowles. "After the Aliveness Test is performed, the instruments are powered down in preparation for launch – and then it is liftoff!"

Lillian Rose Ostrach, one of Robinson's graduate students working at LROC, is also staying on site for launch. She and a handful of other team members unable to attend launch intend to camp out in front of the big screen TV in the conference room to watch the live

ESA
ESA ILEWG
ESO
Euroconsult
European Space Policy Institute
Experimental Aircraft Association
Federation of Galaxy Explorers
Finnish Meteorological Institute
Florida Spcae Research & Information
Frontier Astronautics
Galaxy Zoo
Geological Lunar Research Group
Griffin Space
Hamilton Sundstrand
Harris Corporation
He-3 - Fusion Technology Institute (UWis-Madison)
Hermes
HUBBLE Site
IAAA
IAU
IBEX
IIT-Bombay
ILC Dover
ILOA
International Academy of Astronautics
International Astronautical Federation
International Space University
Interorbital Systems
ISPCS
ISRO
ISRO Sriharikota
ISS
JAXA
Jeff Krukin
Jiuquan, Taiyuan and Xichang

of the big screen TV in the conference room to watch the live countdown.

Since August, Ostrach has helped with whatever needed to be done at LROC, from transfering hand-written calibration notes into spreadsheets to viewing calibration ratio images for possible issues.

"I never imagined that I would be a member of the LROC team; in fact, I never imagined I'd become a lunar scientist," says Ostrach. “There are not many people who get the opportunity of being one of a handful of people viewing, processing, and analyzing new lunar images."

Ostrach's previous research focused on Mars, a planet she was content to stay on, but Robinson helped alter her trajectory. In addition to great training and preparation for future independent, high-caliber research, he offered her the chance to become one of the next generation's lunar scientists and the opportunity to be part of a team seeing the moon in a brand-new way.

"The students involved with LROC will engage in significant data analysis and other projects important to the mission. By graduation, they will be able to point to work accomplishments that are as real and significant as any in the full-time arena," says Tim Donnelly, a member of the LROC Mission Operation Team.

"What we learn here is so unique, but at the same time so universally applicable to space mission operations, that all of us should be able to find positions in future space exploration endeavors," he adds.

A Day in the SOC

The SOC isn't your typical office workplace – unless you're accustomed to working in a fish bowl permeated by Apollo-era enthusiasm. Visitors are offered an unimpeded view of LROC operations in action. Wall-size lunar images from the Apollo missions decorate the walls of the glass-enclosed work area containing four workstations facing a large 9-screen grid mounted on the back wall.

After LRO is on its way to the moon Robinson and the rest of the team return from Kennedy Space Center, the real work begins. During its year in low polar orbit around the moon, LROC will

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capture thousands of images of the lunar surface. The LROC SOC will become a hub for the collection and processing of NAC and WAC images and the accompanying information and meta data such as location, exposure, time, and camera temperature.

LROC Mission Operations team members will plan which lunar regions to image, target them, deliver commands to Goddard Space Flight Center to be relayed to the instrument, and then manage and process all the incoming data. The SOC team is also tasked with analyzing the telemetry of the instrument. Telemetry tells the story of the health of the LROC instrument suite and through simple measures of power and temperature.

Managing and processing the incoming data will also keep the team busy. LROC and Mini-RF, a synthetic aperture radar also onboard LRO, produce large volumes of data in a short amount of time. On a typical day LRO sends down about 440 Gbits (55 Gbytes) of LROC images.

In addition to the science mission of LROC, as part of a separate project Robinson and his team are working with the NASA Johnson Space Center to scan and archive the original flight films from the Apollo missions. The newly scanned images have great scientific (and historic) value and are are bing used by lunar scientists today. LROC will rephotograph the surface in areas where the highest resolution **Apollo orbital images** were taken to look for new craters that formed in the past 40 years.

LROC images will be posted frequently on the **LROC webpage**. All the LRO data will be deposited in NASA's Planetary Data System (PDS) for permanent archive and access. The **PDS** is a publicly accessible repository of planetary science information. LRO mission data will be deposited into PDS starting six months after the start of the primary mission.

If this article has piqued your interest or left you with questions, you are invited to visit lroc.sese.asu.edu/EPO/askquestion to submit your lunar questions. A team of LROC educators and advocates are collecting questions from students and the general public and interviewing lunar experts and mission affiliates. The responses to the questions will be videotaped and then uploaded to the LROC Web site and YouTube.

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