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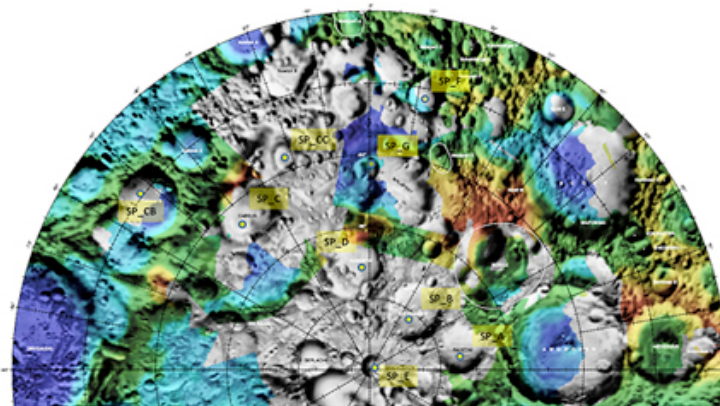
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### RECOMMENDED BOOKS



July 19, 2009

## [Let's Name the LCROSS Impact Crater After Walter Cronkite](#)



**Editor's note:** The other night I [started to Twitter](#) that I thought it would be a good idea that the crater LCROSS will form should be named in honor of veteran space journalist Walter Cronkite who died the other day. Others joined in and repeated that idea.

So what is the [LCROSS NASA](#) team's [response](#)? They dodge the issue: "Our team heard your requests. When it comes to naming craters, it is up to the IAU. NASA can explore possibility of petition to IAU to name."

As you will recall during Apollo missions, crew members named craters and other features. And the Mars rover people name craters, rocks, pebbles, and all manner of things all the time. Do they ask the IAU for permission to do that? NO. Indeed, the names given to rocks at the Viking lander sites in 1976 by mission personnel are still in use.

So c'mon guys. Use a little imagination - use crowd sourcing and involve the public - the same public who paid for your mission and who were well served by Mr. Cronkite for decades. LCROSS can certainly recommend a name and use their own name in the mean time. There is no legally binding reason to prohibit NASA from doing this - nothing IAU does has the force of law. Indeed, the IAU does not have any interest whatsoever in the view of the public anyway.

To virtually all who watched him, Walter Cronkite was always a face on a screen - one painted upon our eyes by photons. Imagine how many thousands - maybe millions - would now stop for a moment to watch as this crater was created in his

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- [Moontoday.net](#)
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July 2009

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MoonViews  
 Apollo 11: Before and After  
 15 Jul 2009

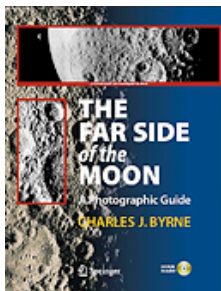
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### RECENT POSTS



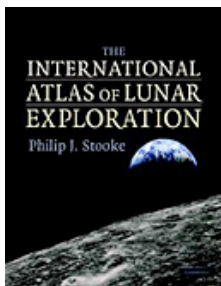
[Lunar Orbiter Photographic Atlas of the Near Side of the Moon](#)



[The Far Side of the Moon: A Photographic Guide](#)



[The Clementine Atlas of the Moon](#)



[The International Atlas of Lunar Exploration](#)



[Voices from the Moon: Apollo Astronauts Describe Their Lunar Experiences](#)

name? How often can you stand in your backyard and see that? In so doing, Walter Cronkite can have one last stupendous effect on the world - from the Moon - through a blast of photons travelling one last time to our eyes.

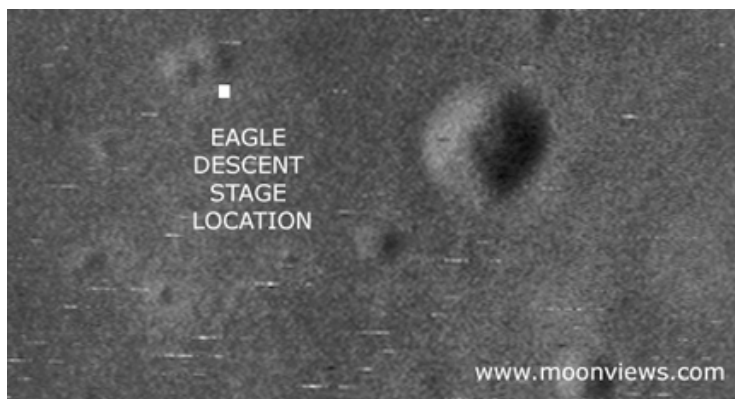
[Continue reading "Let's Name the LCROSS Impact Crater After Walter Cronkite"](#)

»

Posted by Keith Cowing on July 19, 2009 9:41 AM | [Comments \(1\)](#)

July 17, 2009

[Damaged Tape and Murky Moon Views](#)



*Image: Our retrieved image with the location of Apollo 11's Eagle Descent Stage.*

With the 40th anniversary of Apollo 11's landing on the Moon upon us, everything old is new - or so it would seem. Yesterday we saw digitally remastered footage [released](#) showing the first steps on the Moon in unprecedented clarity. Also this was made from a copy that itself was a copy. The original video, recorded live as the Moon walks were underway has slipped into history - either misfiled or, more likely, erased and reused years later - much like a floppy disk. That said, the new footage does provide a window into the past with detail heretofore unseen.

Another place where windows are being opened into the past is the [Lunar Orbiter Image Recovery Project](#) (LOIRP) housed at NASA Ames Research Center. Utilizing ancient FR-900 tape drives, [thousands of pounds](#) of long forgotten image tapes, lots of loaned help including retired engineers and scientists, some money (from NASA ESMD, ARC, IPP, and NLSI, SkyCorp, and SpaceRef Interactive, and Odyssey Moon) and an old abandoned McDonalds restaurant (it was available - we call it "McMoons"), we've been able to bring these images back to life at resolutions greater than ever seen before. In many cases, until Lunar Reconnaissance Orbiter (LRO) takes new images, thee tapes represent the highest resolution images of the Moon ever taken from orbit.

As we ponder the sad news that the original Apollo 11 video has been lost, it is important to note that our Lunar Orbiter tapes might otherwise have been destroyed several years ago had not a stop order been placed on their destruction due to NASA's search for Apollo 11 tapes and data. One project's sad news is

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[The Story of Project McMoon's - As Reported in Italy](#)

[Moon Missions - 40 Years Apart - But Still Like Minded](#)

[LOIRP In The News](#)

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- [NASA IPP](#)
- [NASA ARC](#)
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[Apollo: Through the Eyes of the Astronauts](#)

another's execution relieve.

Among our successes has been bringing the iconic [Earthrise](#) and [Copernicus](#) back to life in unprecedented detail. This time we need to report a major disappointment.

We recently released two Apollo landing site images - [Apollo 12](#) and [Apollo 14](#) and had embarked upon getting an nice crisp image of the Apollo 11 landing site in time for the anniversary.

Alas, unlike the unprecedented resolution we obtained for these two sites, Apollo 11 was a let down. The image is murky and far less clear than previous images. This is not due to the Lunar Orbiter spacecraft or our restored hardware. Rather, we expect, it had to do with someone playing this tape years ago and getting it jammed for an instant. Alas, the interesting part of this tape is Framelet 411 which shows the Apollo 11 landing site. So, if there was a natural place on this tape to be paused, rewound, and played again and again and again, it is this location. Little surprise that the chance for damage to this portion of the tape occurred.

Our collection of tapes covers the entire five mission Lunar Orbiter project. While we are getting better at deciphering the nomenclature and labeling on the tapes, we still have much to learn. We can now find a specific tape and image in a straight forward process but have still only scratched the surface. And, paradoxically, we seem to have more tapes marked "Lunar Orbiter V" than we need to contain all of the images from that mission. We suspect that we have two (or more) archival collections mixed in or (for some reason) multiple copies of the same images. The only way to know for sure is to look at every tape - one by one.

The path to getting this Apollo 11 landing site image was complicated. The image was taken by Lunar Orbiter V on 12 August 1967 at 22:21:13.809 GMT at an altitude of 98. km. Properly retrieved, the resolution of our image should be 2.387 meters per pixel.

After our first round of image retrievals, the heads for our FR-900 tape drive needed to be refurbished. This is an expensive and time consuming process with only one or two places in the world capable of doing it. With the heads refurbished we were prepared to run the tape. As we did we found out that our custom made frame grabber had a bad chip which needed to be replaced.

Once the gear was good to go, the process of running the tape began. There was an ominous note on the tape can that a section of the tape might be damaged. We soon discovered that indeed there was some damage to a 4 minute segment and it was the portion we were most interested in.

Undaunted, Ken Zin, our experienced video tape drive engineer, Al Sturm our electronics guru and Austin Epps, our vigilant student intern worked long hours to get everything working to see what sort of image we could get. Austin ran the tape multiple times so as to get multiple images we could use to produce a super resolution image of the landing site.

Despite this attempt to coax a little clarity out of the noise, the damage to the tape precluded an image of the quality we had hope for - and had achieved for other images. That disappointment aside, we feel that it is important to show our failures and disappointments as well as our crowning achievements. As you will see when you compare it to the best Lunar Orbiter images, the resolution is low. Yet if you compare it with the new LRO images you can clearly see that something appeared in the image and that the regolith was disturbed around that object (humans).

- [SMART-1](#)
- [Surveyor](#)
- [Zond](#)

#### Commercial

- [Google Lunar X Prize](#)



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We will be combing through the Lunar Orbiter tapes this weekend with the hope that there is another (hopefully undamaged) version of this image.

We feel that it is equally important to reveal our failures and disappointments as it is to crow about our successes. We expect to have many of both.

Such is the curse of Apollo 11 - for an event so epic in its nature, the frail means where by we captured it and the planning that led up to it - are fleeting. One more reason why all of this fragile history needs to be maintained with constant vigilance - else we lose all of this to the dust of time.

For more information on the Lunar Orbiter Image Recovery Project (LOIRP) visit <http://www.moonviews.com>

For information on NASA's Lunar Science Institute visit <http://lunarscience.arc.nasa.gov/>



Figure 1 Our retrieved image with the location of Apollo 11's Eagle Descent Stage.

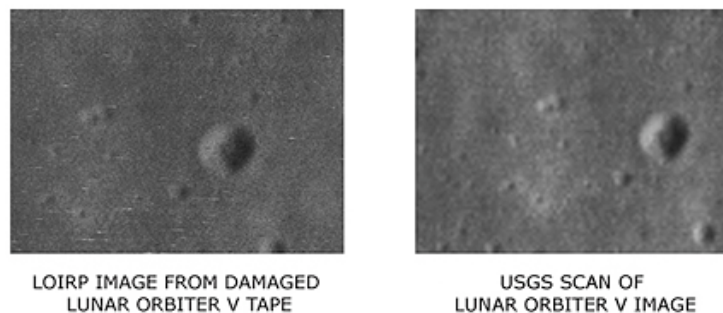


Figure 2 Comparing our retrieved image and that scanned by the USGS

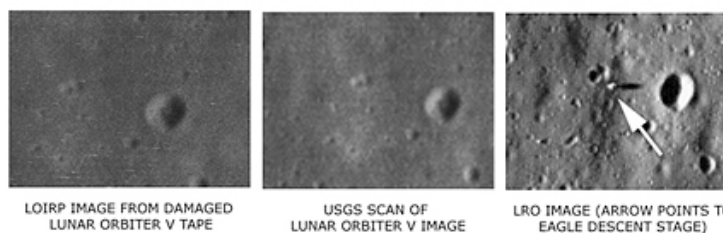


Figure 3 Comparing our retrieved image, one scanned by the USGS, and LRO's

recent image.

Posted by Keith Cowing on July 17, 2009 9:04 AM | [Comments \(0\)](#)

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## July 15, 2009

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### [Apollo 11: Before and After](#)

[Moon Orbiter to Photograph Apollo 11 Landing Site](#), Space.com



*"Taking the something old, something new approach is the Lunar Orbiter Image Recovery Project, located at the Ames Research Center in the heart of California's Silicon Valley. This team effort is led by Dennis Wingo of SkyCorp, Inc. in Huntsville, Alabama and Keith Cowing of SpaceRef Interactive, Inc. of Reston, Virginia.*

*The recovery project involves culling through some 1,700 images taken by NASA Lunar Orbiter missions from the 1960's, convert that data into digital form and then reconstruct the images to yield 21st century pictures far superior than the originals.*

*Ideally, upgrading an old Lunar Orbiter image taken of the Apollo 11 landing zone before Armstrong and Aldrin set foot there, contrasted to a new LRO overhead shot, would present a unique before/after look-see of the historic Tranquility Base site, said Greg Schmidt, deputy director of the NASA Ames-based Lunar Science Institute.*

*The Apollo sites themselves are extremely well characterized thanks to human explorers dispatched to those individual locales, Schmidt noted. LRO images of these areas will let us see the landers -- and likely other artifacts such as the lunar buggies used in the Apollo 15, 16, and 17 missions - all of which will no doubt be very powerful in ways beyond mere science, he said."*

Posted by Keith Cowing on July 15, 2009 8:26 PM | [Comments \(0\)](#)

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## July 13, 2009

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### [Remastered Apollo 11 Tapes](#)

[NASA Holds Briefing to Release Restored Apollo 11 Moonwalk Video](#)



*"NASA will hold a media briefing at 11 a.m. EDT on Thursday, July 16, at the Newseum in Washington to release greatly improved video imagery from the July 1969 live broadcast of the Apollo 11 moonwalk. The release will feature 15 key moments from Neil Armstrong's and Buzz Aldrin's historic moonwalk using what is believed to be the best available broadcast-format copies of the lunar excursion, some of which had been locked away for nearly 40 years. The initial video released Thursday is part of a comprehensive Apollo 11 moonwalk restoration project expected to be completed by the fall. The Newseum is located at 555 Pennsylvania Ave. N.W. The news conference will be broadcast live on NASA Television and streamed on the agency's Internet homepage."*

Posted by Keith Cowing on July 13, 2009 10:55 AM | [Comments \(2\)](#)

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July 2, 2009

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### [LRO's First Images Of The Moon](#)

#### [First Moon Images From NASA's Lunar Reconnaissance Orbiter](#)

"NASA's Lunar Reconnaissance Orbiter has transmitted its first images since reaching the moon on June 23. The spacecraft's two cameras, collectively known as the Lunar Reconnaissance Orbiter Camera, or LROC, were activated June 30. The cameras are working well and have returned images of a region in the lunar highlands south of Mare Nubium (Sea of Clouds). As the moon rotates beneath LRO, LROC gradually will build up photographic maps of the lunar surface.



"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," said LROC Principal Investigator Mark Robinson of Arizona State University in Tempe. "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."

Posted by Keith Cowing on July 2, 2009 10:46 AM | [Comments \(1\)](#)

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July 1, 2009

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### [Books We Recommend](#)

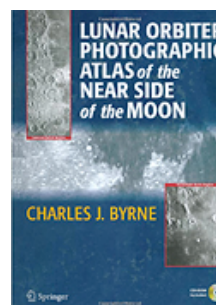
#### [Lunar Orbiter Photographic Atlas of the Near Side of the Moon](#), By Charles Byrne

In 1967, Lunar Orbiter Mission 4 sent back to Earth a superb series of photographs of the surface of the Moon, despite severe degradation caused by scanning artifacts and the reconstruction processes involved in transmission from lunar orbit.

Using 21st century techniques, Charles Byrne, previously System Engineer of the Apollo Program for Lunar Orbiter Photography, has removed the artifacts and imperfections to produce the most comprehensive and beautifully detailed set of images of the lunar surface.

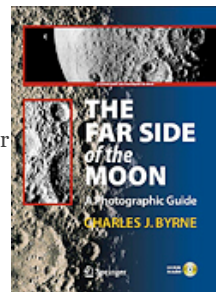
The book has been organized to make it easy for astronomers to use, enabling ground-based images and views to be compared with the Orbiter photographs. The photographs are striking for their consistent Sun angles (for uniform appearance). All features have been identified with their current IAU-approved names, and each photograph has been located in terms of latitude and longitude. To help practical astronomers, all the photographs are systematically related to an Earth-based view.

A CD is included with the book, providing the enhanced and cleaned photographs for screen viewing, lectures, etc.



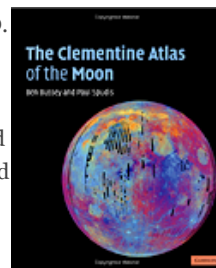
[The Far Side of the Moon: A Photographic Guide](#), By Charles Byrne

The far side of the Moon, also called the 'dark side of the Moon' was unknown to humanity until the Luna and Lunar Orbiter pictures were returned to Earth. Even since then, its nature has puzzled researchers. Now we know that a giant impact struck the near side with such force that it created the 'near side megabasin', opening the way for floods of mare and sending vast amounts of ejecta to the far side. "The Far Side of the Moon" explains this event and also documents the appearance of the features of the far side with beautiful pictures from Lunar Orbiter. As in the previous volume, "The Lunar Orbiter Photographic Atlas of the Near Side of the Moon", the author has taken the original images and cleaned them of system artefacts using modern digital image processing. The best photographic coverage of the far side of the Moon has been the 150 photos taken by the Lunar Orbiter series. The other sources are pictures taken by the Apollo Command Module, which were limited to the equatorial regions, and the Clementine mission, which took pictures at a high sun angle that washed out the topography of the features. Until now, the far side Lunar Orbiter photos have only been available with strong reconstruction lines, but appear here for the first time as complete photographs, unmarred by imaging and processing artefacts. Also, this is the first book to explain in detail how the far side was deeply covered by ejecta from the Near Side Megabasin and modified by later impacts. A CD-R accompanies the book, and contains all the enhanced and cleaned photographs for use by the reader in screen viewing, lectures, etc.



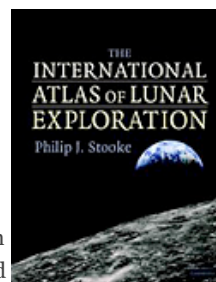
[The Clementine Atlas of the Moon](#), Ben Bussey and Paul D. Spudis

The highly successful Clementine mission to the Moon in 1994 gave scientists their first global look at the Moon, and both the near and far side were mapped. This atlas is based on the data collected by the Clementine mission. It covers the entire Moon in 144 Lunar Aeronautical Charts (LACs), and represents the most complete lunar nomenclature database in existence, listing virtually all named craters and other features. This is the first atlas to show the entire lunar surface in uniform scale and format. A section of color plates shows lunar composition and physical properties.



[The International Atlas of Lunar Exploration](#), Philip J. Stooke

Bringing together a wealth of information from many sources, including some material never before published, this atlas is a comprehensive reference on lunar exploration. It tells the story of every spacecraft mission to the Moon since the dawn of the space age, illustrating each account with a unique combination of maps and annotated photographs. Many of the illustrations were created especially for this atlas, including panoramic photographs from every lunar mission. The missions are listed in chronological order, providing readers with



an easy to follow history of lunar missions. Special attention has been given to describing the processes involved in choosing landing sites for Apollo and its precursors. The atlas also includes missions that were planned but never flown, before looking ahead to future missions as the world's space agencies prepare for a new phase of lunar exploration.

[Voices from the Moon: Apollo Astronauts Describe Their Lunar Experiences](#), Andrew Chaikin

SpaceRef Review: As we descend upon the 40th anniversary of the first humans to stand on the moon, the books, and movies, and DVDs, and websites all seem hell bent on a collision - each one trying to best encapsulate the Apollo experience. While Apollo 11 was the first mission to put people on the moon - other missions followed. And while the experience of walking on the Moon was shared by a precious few, the opinions of the moonwalkers are remarkably diverse so as to allow everyone to identify with what it must have been like to be there.



Once again, in his book "Voices From the Moon: Apollo Astronauts Describe Their Lunar Experiences", author Andy Chaikin has managed to distill and then capture the essence of Apollo. Indeed, if there is anyone who has lived and breathed Apollo for the past 40 years, it has been Andy. He kept the flame alive when most of us looked at Apollo as old hat. Now, suddenly, it is new again.

Andy did not write this book in the traditional sense. The words are virtually all from the Apollo crews. Nor did he take the pictures - they were also taken by others. Rather, Andy's artistry is evidenced in how he sat and listened as the crew spoke - sometimes from the grave. He weaved their words and pictures into a narrative about what it was like to go, to live, and then to return from this amazing place.

Many of the images are familiar but many more are not. Often, the images chosen for this book were not what people wanted to see in Life Magazine in 1969, so they were never seen by more than a small few. My favorite in this book is opposite Chapter 9 - "Apollo 13". I am not certain if it was taken on approach or on return from the Moon. That said, it shows a small grey orb, partially lit in the distance - again it is either a destination or a memory. Across from the image is a quote from Apollo 13 astronaut Fred Haise which captures the moment when the crew simultaneously knew that their dreams were crushed - and their lives were very much at risk.

Another favorite is a lunar panorama with a telephoto insert showing the Lunar Module "Falcon" utterly dwarfed as it is set against the vast expanse of the Moon. We seem to have forgotten just how awe-inspiring a place the Moon truly is. Maybe it is time to go back and get re-awed all over again.

It is good that these voices were brought back together, perhaps one last time. As we celebrate the 40th anniversary of this grand human adventure, the eyewitnesses have already begun to dwindle in number. A decade hence, that number will be much smaller.

Soon there will only be words and pictures. This book will be at the top of the pile.

Keith Cowing, editor, NASAWatch.com, SpaceRef.com, OnOrbit.com

[Apollo: Through the Eyes of the Astronauts](#), by Robert Jacobs, Michael Cabbage, Stephen Hawking, Lucy Hawking

Apollo is a photographic commemoration of the Apollo lunar missions as seen through the eyes of the astronauts. Each of the surviving 21 astronauts from the Apollo missions has chosen a favorite photograph from his space flight especially for this book. These selections are accompanied by other iconic photographs from the Apollo missions. Bestselling astrophysicist Stephen Hawking and his daughter Lucy Hawking contribute a foreword on the meaning of the space exploration. July 20, 2009, marks the 40th anniversary of the first manned landing on the Moon by Neil Armstrong and Buzz Aldrin of Apollo 11. Apollo is the only photographic book on the Apollo missions to be created by NASA, and is the perfect commemorative volume about this epochal program, where legendary achievement was recorded in powerful images.



Posted by Keith Cowing on July 1, 2009 9:30 AM | [Comments \(0\)](#)

June 29, 2009

### [LOIRP Article in Computer World: How We Got The Images](#)

[The lost NASA tapes: Restoring lunar images after 40 years in the vault](#), Computerworld

*"Liquid nitrogen, vegetable steamers, Macintosh workstations and old, refrigerator-size tape drives. These are just some of the tools a new breed of Space Age archeologists is using to sift through the digital debris from the early days of NASA, mining the information in ways unimaginable when it was first gathered four decades ago. At stake is data that could show Earth's risk of an asteroid strike, shed light on global warming and -- perhaps -- even satisfy those who think the moon landings were a hoax. The most visible of the archeologists is arguably Dennis Wingo, head of Skycorp Inc., a small aerospace engineering firm in Huntsville, Ala. He's the driving force behind the Lunar Orbiter Image Recovery Project, operating out of a decommissioned McDonald's (since dubbed McMoon's) at NASA's Ames Research Center in Mountain View, Calif. The project's goal is to recover and enhance as many of the original lunar landing images as possible."*



Posted by Keith Cowing on June 29, 2009 6:18 AM | [Comments \(0\)](#)