



FEATURE

Print This Close Window

A Lunar Convergence: Eclipse & Return to the Moon

10.25.04

The year 2004 is shaping up to be a memorable one for the Moon. Wednesday night brings us a total lunar eclipse visible throughout the country, while at the same time NASA begins preparations to return to the Moon with its new focus on exploration.

Image to Right: Lunar eclipses can only take place during a full Moon when the Moon passes into the dark portion of the Earth's shadow, called the umbra. Click on image for animation or print resolution image. Credit: NASA



Lunar eclipses are one of the most beautiful and easiest celestial events to witness - just walk outside and look up - no telescopes or special glasses required. During totality, Earth casts a reddish-colored shadow over the Moon lasting over an hour.

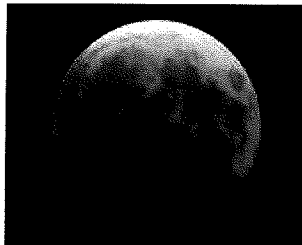
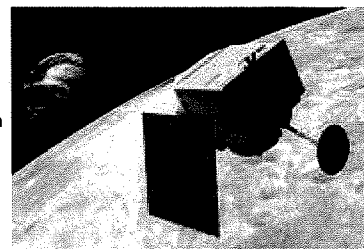


Image to Left: The actual color of the Moon depends on air quality. If a major eruption had resulted at Mt. St. Helens, for example, the shadow would appear darker. This photograph was taken in Greece during the Jan. 9, 2001 lunar eclipse. More images. Credit: Fred Espenak

"The basic interest in lunar eclipses is that it's a chance to gauge the quality of the Earth's atmosphere by judging and making measurements of the coloration of the moon," said Dr. Fred Espenak, NASA Astronomer. "If we have major dust storms off the Sahara Desert, big forest fires, or more specifically, a major volcanic eruption which throws lots of material up into the Earth's stratosphere, this can sharply color and darken the Moon during that total phase."

Because the active volcanic eruption events at Mt. St. Helens have been largely steam with little ash, Wednesday's Moon should appear bright and coppery red during totality, between 10:23 and 11:45 pm EDT. For times throughout the U.S., just factor in your time zone.

Image to Right: Artist depiction of the Lunar Reconnaissance Orbiter (LRO). The final design and instrument suite will be chosen within the next few months. Credit: NASA



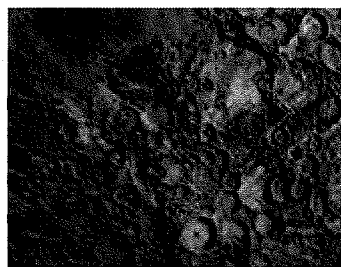
This month NASA is also working to firm up the design and instruments for the Lunar Reconnaissance Orbiter (LRO). Slated to launch in 2008, the mission is the first in a wave of robotic probes paving the way for human missions no later than 2020. Its mission is to create high-resolution maps, seek landing sites, and continue to search for water ice and other useful resources.



Image to Left: Artist renderings of humans exploring and living on the Moon. Temperatures on the lunar surface range from a steamy 212 F (100 C) to a freezing -200 F (-150C). Credit: NASA

NASA will use this LRO mission, together with its follow-ons to make key decisions about where the first humans back to the Moon should go, the safety of their landing sites, and what they will do while on the Moon. Human lunar exploration will lay the groundwork and provide a testbed to prepare for Mars and other destinations.

Image to Right: After Apollo, NASA sent Clementine (shown in movie) in 1994 and Lunar Prospector in 1998 to map the Moon and search for usable resources. Right now ESA's SMART-1 is on course to orbit the Moon in November 2004. Japan is also preparing two science missions set to launch in 2006. Credit: NASA



"The Moon is our first step with human explorers back into the realm of Deep Space, and will serve as our 'natural proving ground' for the types of exploration activities we want to enable at Mars. LRO is our first new guide to the best sites for humans to begin exploring other worlds, and ultimately to seek information about life beyond Earth," said Dr. Jim Garvin, NASA's Chief Scientist.

+ Want to find out MORE? Starting Tuesday, check out our new multimedia viewer. Through a series of videos, graphics, and animations, Astrophysicist Fred Espenak describes the anatomy of a lunar eclipse, what is indicated by the colors, when you can see it in your area, and much more. Also learn about previous missions to the Moon and the Explorer School Challenge, "NASA's Return to the Moon."

Additional Links

[Views of Oct. 27 Eclipse](#)
[Eclipse Guide & Webcast](#)
[Lunar Eclipse Background](#)
[Artistic Visions of Exploration on the Moon and Mars](#)
[NASA's Historical Image Database](#)
[Apollo 11 Anniversary Site](#)
[Read More on the Vision for Space Exploration](#)
[NASA History Office](#)

Rachel A. Weintraub
NASA Goddard Space Flight Center

Find this article at:
<http://www.nasa.gov/vision/universe/solarsystem/lunar1027.html>