EXPERIENCE THE 2017 ECLIPSE ACROSS AMERICA
THROUGH THE EYES OF NASA
http://eclipse2017.nasa.gov
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Credit: S. Habbal, M. Druckmüller and P. Aniol

Credit: Rick Fienberg, TravelQuest International and Wilderness Travel

LUNAR RECONNAISSANCE ORBITER

What the Moon Will See

The Lunar Reconnaissance Orbiter (LRO), is a NASA Planetary Science robotic mission currently orbiting the Moon. LRO maps the Moon's surface with resolutions down to 1 meter (~3.3 feet) in black and white, and the complete lunar surface at 100-meter (almost 330-foot) resolution in color and ultraviolet light and enabled the creation of three-dimensional maps. LRO observations have enabled numerous groundbreaking discoveries, creating a new picture of the Moon as a dynamic and complex body, which improves our understanding of processes throughout the solar system.

LRO has helped scientists characterize the lunar high energy particle radiation environment; identify areas cold enough to preserve ice deposits for billions of years; assessed rough terrain, rock abundance, and other landing hazards; created high-resolution maps of hydrogen distribution and gather information about the neutron component of the lunar radiation environment; and has measured the lunar topography identifying permanently illuminated and permanently shadowed areas.

# What Does a Solar Eclipse Look Like From the Moon?

Current plans are for the LRO's high resolution imager to capture up to four images of the Earth, two on each of two successive orbits. LRO has an orbital period about the Moon of nearly 2 hours (117 mins). If successful, these images will show the Moon's shadow passing over the Earth. The shadows of two images taken on a single orbit are fairly close together and the following orbit the shadow will have moved considerably.

Unfortunately, the geometry that provides LRO with the opportunity to look at the Earth during the eclipse works against us for downloading the image data. Therefore, the Earth eclipse data will not be available until the following day.

A total solar eclipse is a spectacular sight from the Moon!

LRO Objectives

- Characterization of the lunar radiation environment, biological impacts, and potential mitigation. Key aspects of this objective include determining the global radiation environment, investigating the capabilities of potential shielding materials, and validating deep space radiation prototype hardware and software.
- Develop a high resolution global, three dimensional geodetic grid of the Moon and provide the topography necessary for detecting future landing sites.
- Assess in detail the resources and environments of the Moon's polar regions.
- High spatial resolution assessment of the Moon's surface addressing elemental composition, mineralogy, and regolith characteristics.
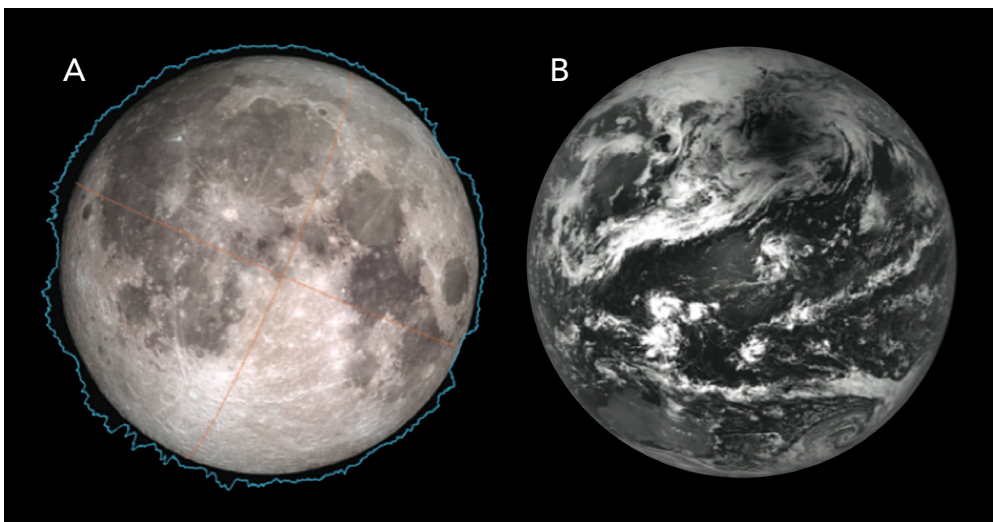
A. The altitude of the lunar surface provides scientists with detailed information about where the Sun's light will brighten just before totality.

B. LRO turned to image the Earth four times during the solar eclipse on 20-21 May 2012. In this view the Moon's shadow is seen passing over the Aleutian Islands in the upper right.