PLANETARY SCIENCE RESEARCH DISCOVERIES
CosmoSparks

Quick Views of Big Advances

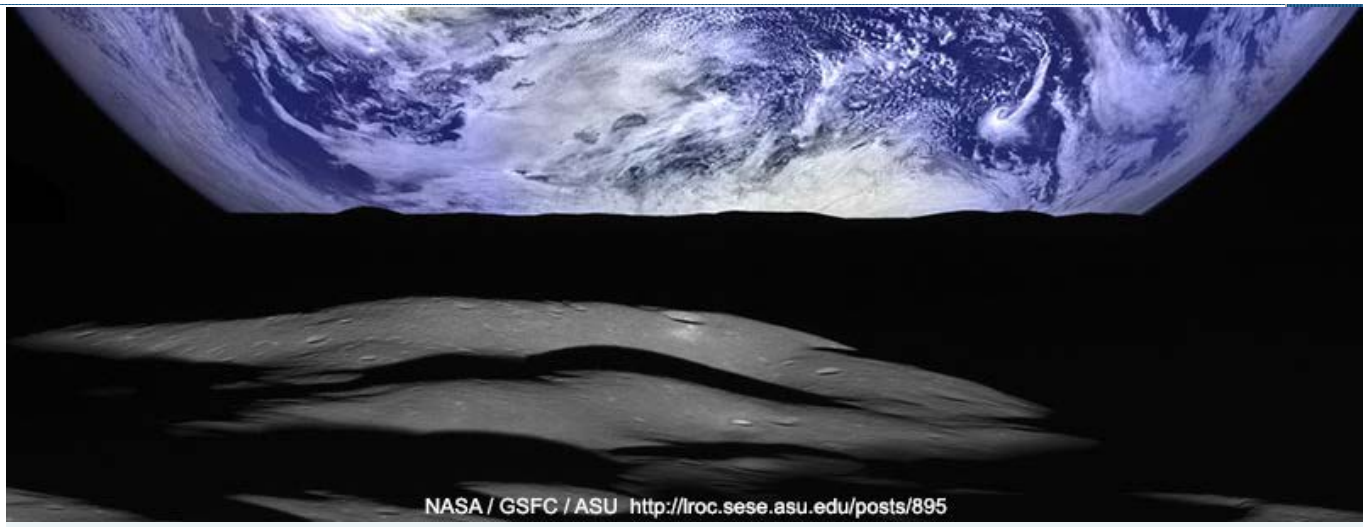
Total Solar Eclipse – August 21, 2017

The total solar eclipse happening on Monday, August 21, 2017 will give scientists abundant data about the Sun and it's corona (hot outer atmosphere of plasma) and thousands of people a rare chance to stand in two minutes or so of daytime darkness in the Moon's shadow.

Click to watch an animation from the NASA Scientific Visualization Studio explaining that a solar eclipse occurs when the Moon passes between the Sun and Earth, casting a shadow on the Earth. Click the image for details and download options.

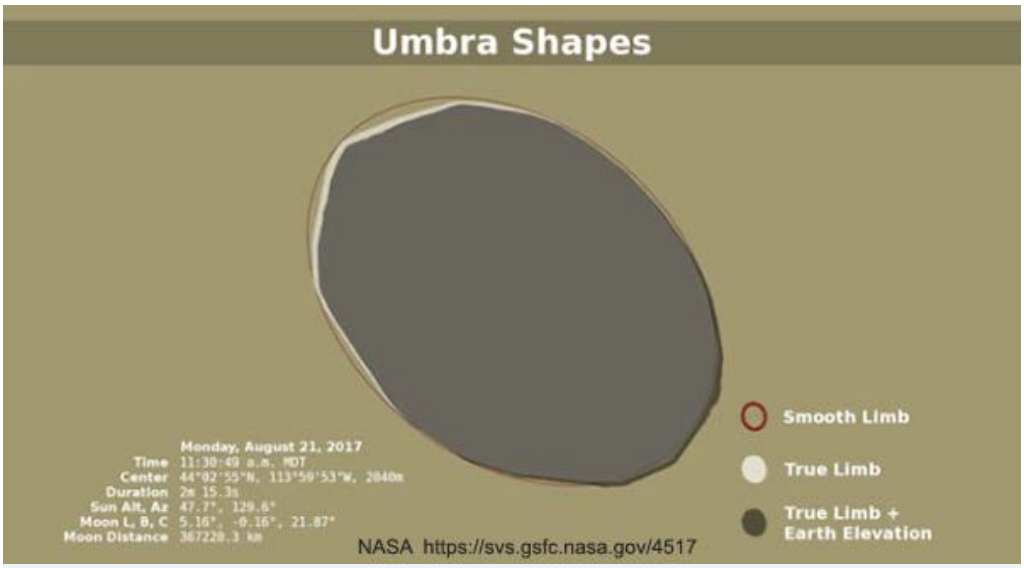
Did you know the Moon's topography affects the shape of its shadow on Earth's surface during the solar eclipse?

Take a look at one of **PSRD**'s favorite images (shown below) taken by the Lunar Reconnaissance Orbiter Camera (LROC) on NASA's Lunar Reconnaissance Orbiter (***LRO***). The Moon's topographic highs and lows create an undulated, black edge of the lunar surface in front of the Earth.



The black horizon of the mountains on the Moon forms a sharp contrast to the backdrop of planet Earth's sky and clouds. The image was taken when LRO spacecraft was passing 134 kilometers (83 miles) above the crater named Compton on the Moon's farside. Click the image for more information and download options.

The mountains and valleys on the Moon actually affect the shape of the Moon's shadow on Earth during the total solar eclipse. Yes, the Moon has a lot of elevation—the ***highest point on the Moon (see the LROC image)*** is 10,786 meters (35,387 feet) above the mean radius! See how the NASA Scientific Visualization Studio explains the effects of lunar topography on umbra shapes.



The lunar umbra is the part of the Moon's shadow where the entire Sun is blocked by the Moon. ***Watch*** a video from the NASA Scientific Visualization Studio explaining how the shape of the lunar umbra during a solar eclipse is altered by the lunar terrain. Click the image for details and download options.

PSRD encourages everyone to experience the total solar eclipse, if not in person, then via live video streams and public programs. Here are more resources to help you enjoy this natural space phenomenon.

Resources:
- ***Solar Eclipse 2017*** from NASA Goddard Media Studios.
- ***2017 Total Solar Eclipse Map and Shapefiles*** from the NASA Scientific Visualization Studio.
- ***Eclipse Live Stream*** from NASA.
- ***The Science and Beauty of a Total Solar Eclipse*** video, Linda Martel and Jeff Taylor talk with Nathalia Alzate, a Post-Doctoral Solar Scientist at Aberystwyth University, Wales and Visiting Scientist at the Institute for Astronomy at the University of Hawai'i at Mānoa.

Written by Linda M. V. Martel, Hawai'i Institute of Geophysics and Planetology, for ***PSRD***.