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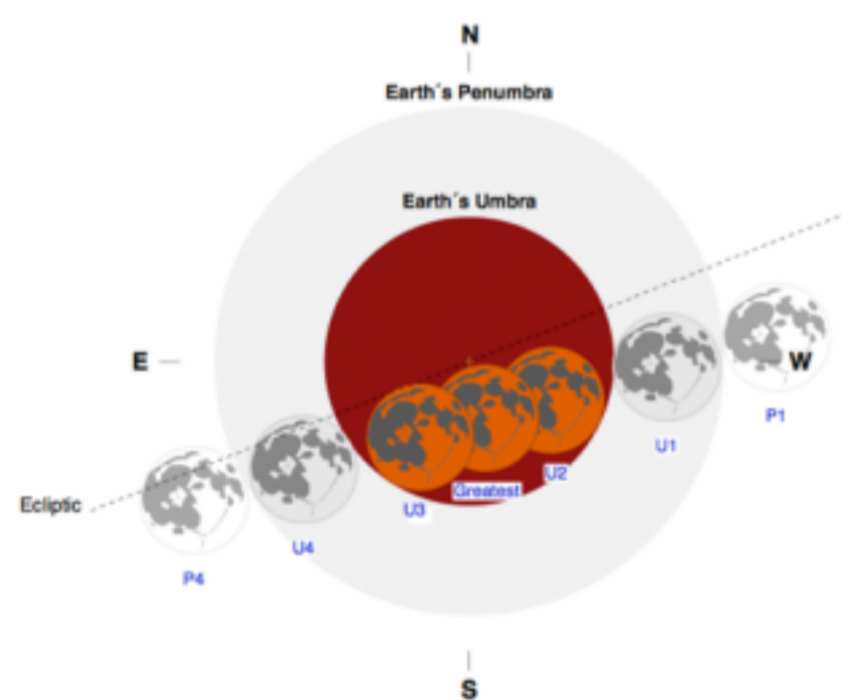
$E=mc^2$

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Blog

Tax Day Eclipse

Posted by admin on March 13, 2014



April 15 in the United States is Tax Day, which in 2014 [opens with a total lunar eclipse](#). In a sun-earth-moon alignment, the orbiting moon ducks into the shadow of the earth where the moon takes on a strange orangish hue.

The earth has two shadows--a faint outer penumbra and a dark inner umbra--because the sun has significant diameter, as opposed to being a point source of light. The two shadows can be simulated in a simple [Lunar Eclipse Shadows](#) activity.

Observers can safely watch the moon's left edge creep into the dark umbra at 1:58 a.m. EDT. At 3:06 a.m. EDT the moon is totally within the umbra--a total lunar eclipse--for the next hour and 17 minutes. Notice how the orange darkness is deeper on the part of the moon toward the center of the shadow.

Shown at mid-eclipse ([image](#) at 3:46 a.m. EDT), the moon is very close to the bright star Spica in the constellation of Virgo. To the left of

the eclipsed moon is the ringed planet Saturn.

Up and to the right of the moon is the bright ruddy planet Mars, which was at opposition on April 8, 2014. Additionally, on this April 15th, Mars is at its closest approach to Earth, about 57 million miles away, so it looks bigger and brighter than normal. By comparison, during Mars' famous close encounter of August 2003 (the one for which that ubiquitous email spam keeps circulating) it was fewer than 35 million miles away.

Then, at 4:24 a.m., the left edge of the moon brightens as the moon segues from the umbra to penumbra. All of the United States will see this much of the eclipse. Experienced observers can sometimes discern the faint penumbra shadow on the moon after 05:33 a.m., but it's especially difficult as twilight begins. A video simulation of the April 15th eclipse is at <http://vimeo.com/89766307>.



Eclipse Times

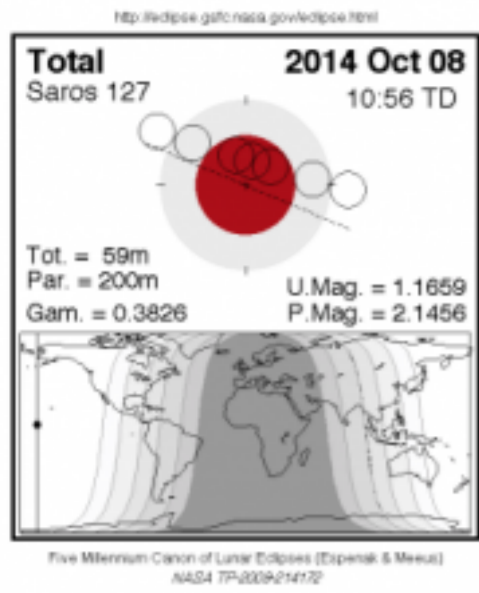
(Penumbral* Eclipse Begins: 00:53 EDT)
Partial Eclipse Begins: 01:58 EDT
Total Eclipse Begins: 03:06 EDT
Greatest Eclipse: 03:46 EDT
Total Eclipse Ends: 04:24 EDT
Partial Eclipse Ends: 05:33 EDT
(Penumbral* Eclipse Ends: 06:37 EDT)



*The penumbral eclipse portion is difficult to discern, as the shadow is very subtle.

The Tax Day Eclipse begins a tetrad of lunar eclipses in which four eclipses in a row are total. I had not heard of this before, but it's explained at http://science.nasa.gov/science-news/science-at-nasa/2014/27mar_tetrad/.

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