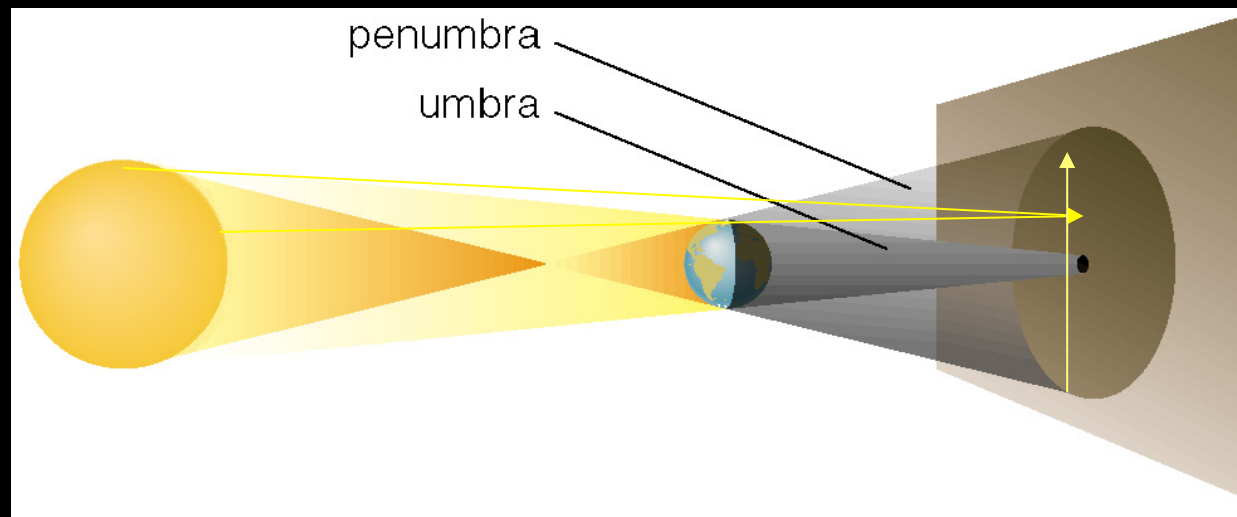


What Causes Eclipses?

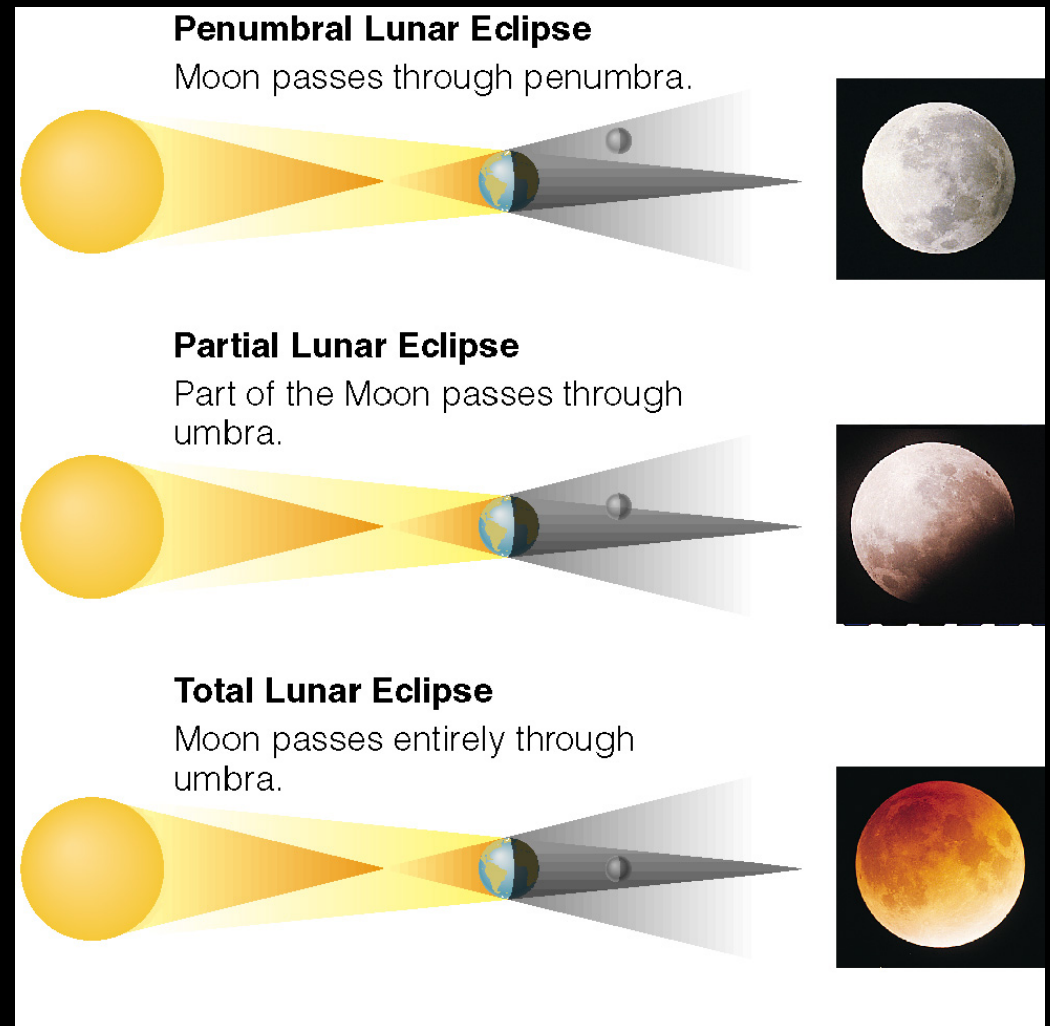
- Earth and Moon cast shadows.
- When either passes through the other's shadow, we have an eclipse.
- Because the Sun is an extended bright object, there are two different regions of the shadow:
 - Penumbra: partly illuminated. Umbra: completely dark



Credit: Lunar and Planetary Institute

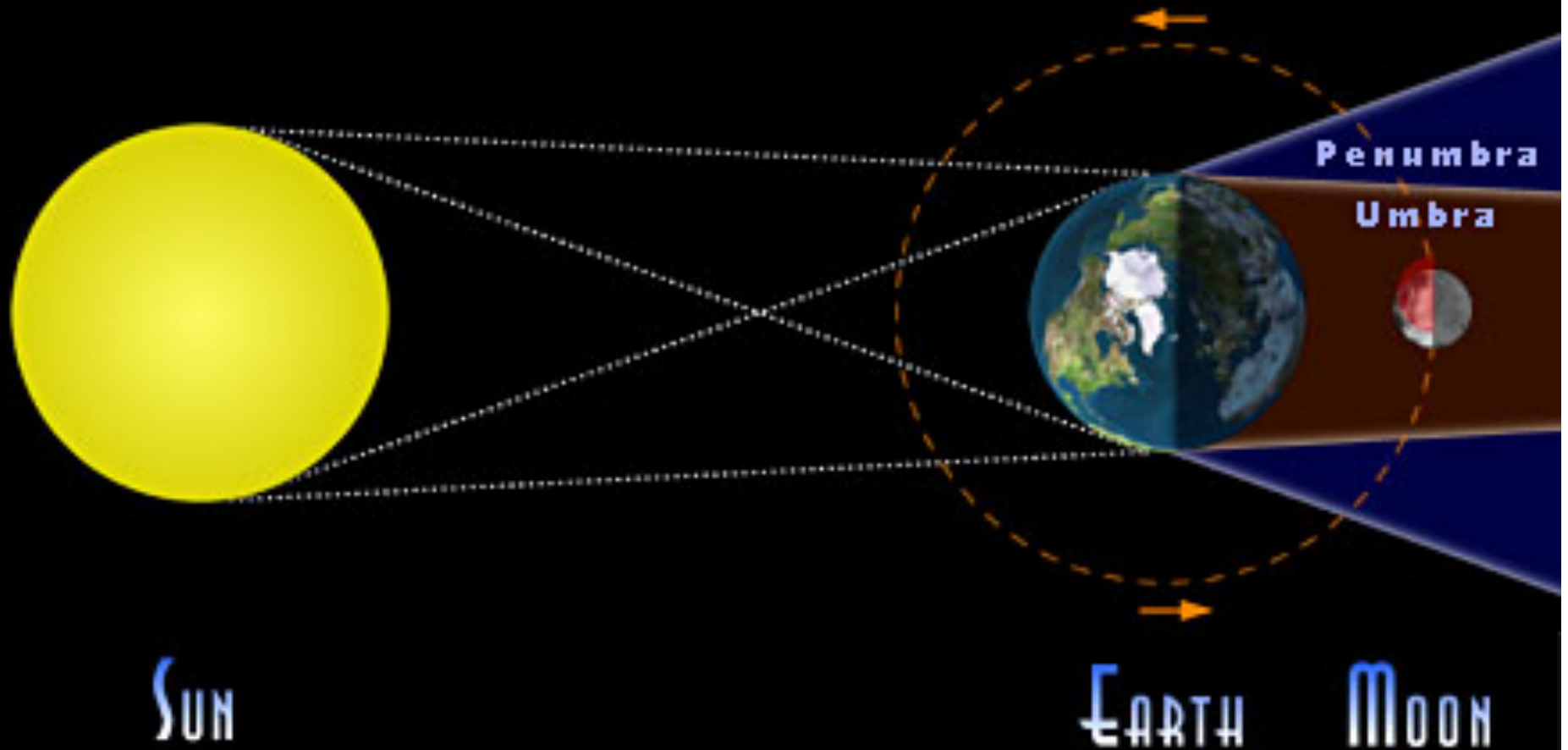
Lunar eclipses

- Lunar eclipses happens when the Moon passes through the shadow of the Earth
- Lunar eclipses can be **partial, penumbral, or total.**
- Lunar eclipses can occur only at **full moon.**



Credit: Lunar and Planetary Institute

LUNAR ECLIPSE GEOMETRY



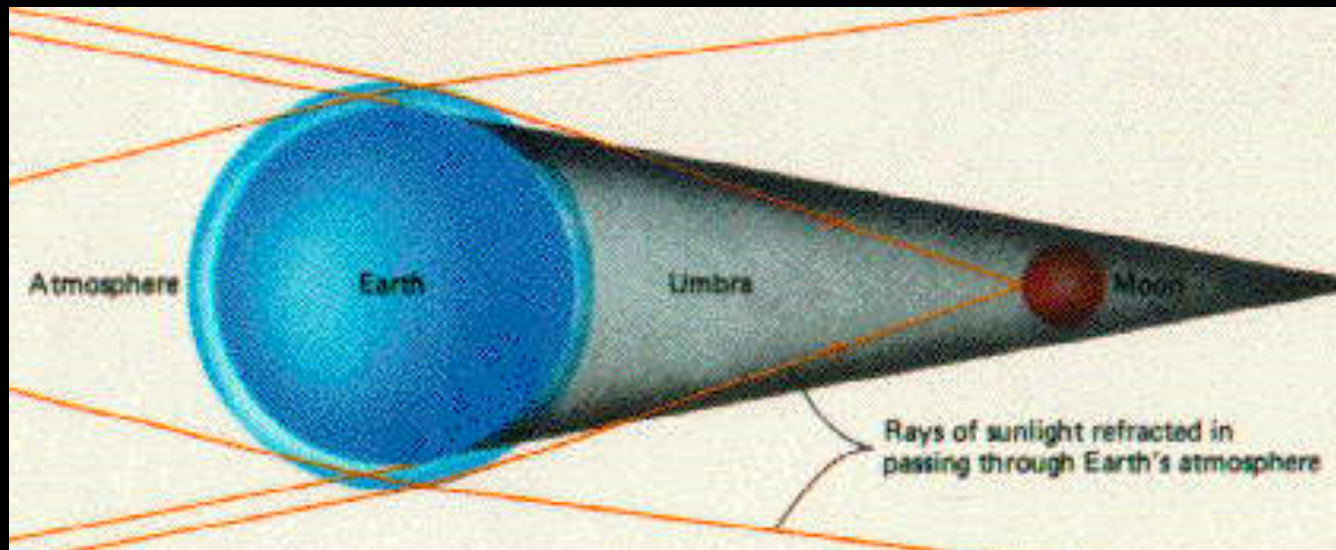
www.MrEclipse.com

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When the Earth's shadow covers the Moon, we have a lunar eclipse

Earth's Umbra has a reddish color

- Solid Earth blocks direct sunlight.
- Earth's atmosphere bends light.
- Earth's atmosphere scatters blue light.
- Only red light fills the umbra.





www.MrEclipse.com

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Images from Fred Espenak
<http://www.mreclipse.com/LEphoto/LEGallery1/LEGallery1.html>

Total Lunar Eclipse: Moon passes completely into total shadow of Earth (Umbra)

Total Lunar Eclipse
March 3, 2007

Begin



Apogee



End

