Eclipses

Solar and Lunar

Lunar Eclipse

Lunar Eclipse
Sun, Earth, Full Moon

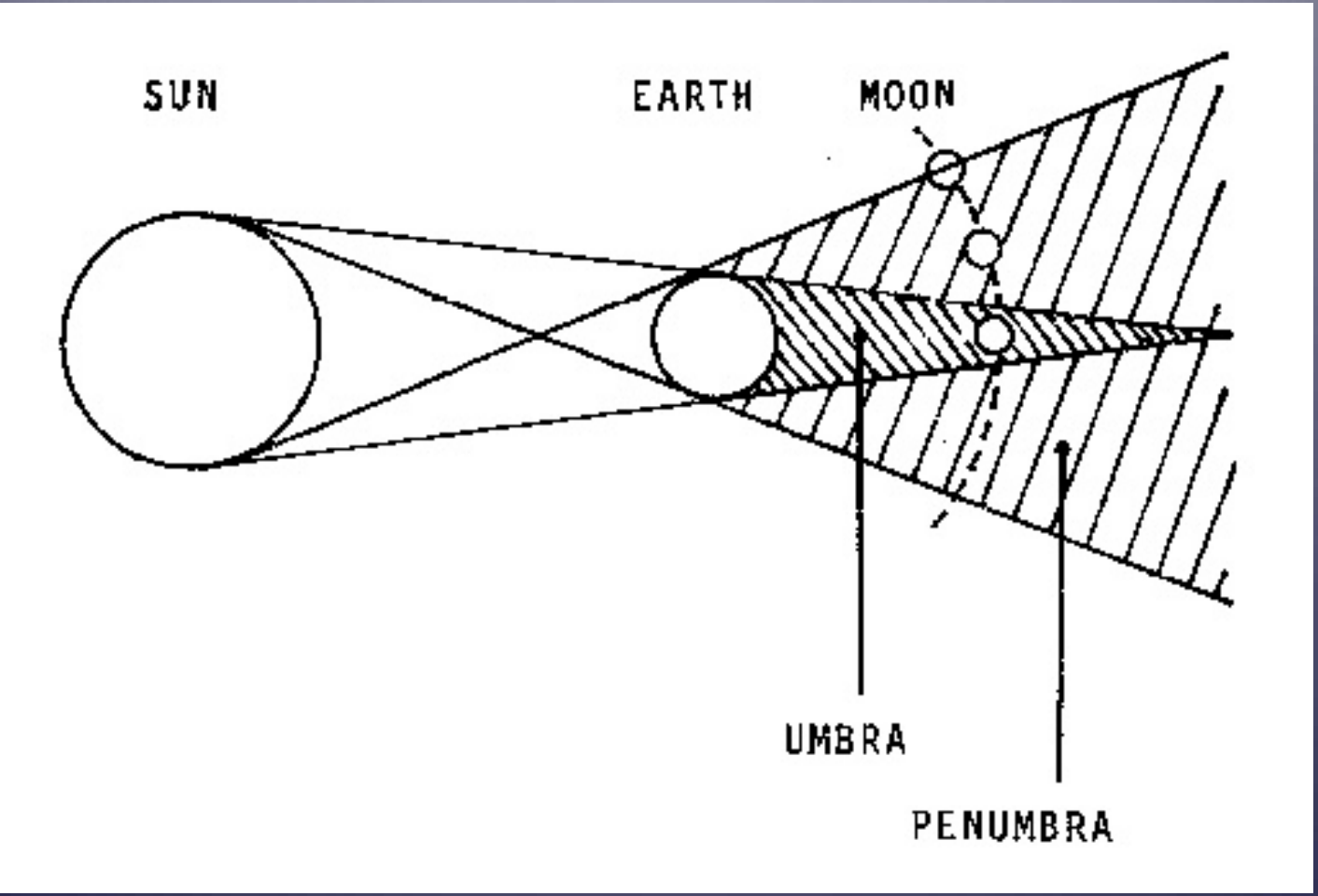
Occurs when all three are directly in a line(in the same plane)

Perfect alignment (***doesn't*** happen every month)
Study tip
The full moon is far from the Sun. (think f/f far/full)

Lunar Eclipse (You don't see the moon lit up.)

- Earth blocks Sun's light from reaching the Moon
- Earth casts a shadow on the moon
- Happens during a full moon but not every full moon

Umbra darkest part of shadow
Penumbra lighter yet larger shadow



Total Lunar Eclipse

Total Lunar Eclipse

- Moon is in Earth's umbra
- Can be "seen" anywhere on Earth
- Reddish tint(earth's atmosphere bends sunlight)

Partial Lunar Eclipse

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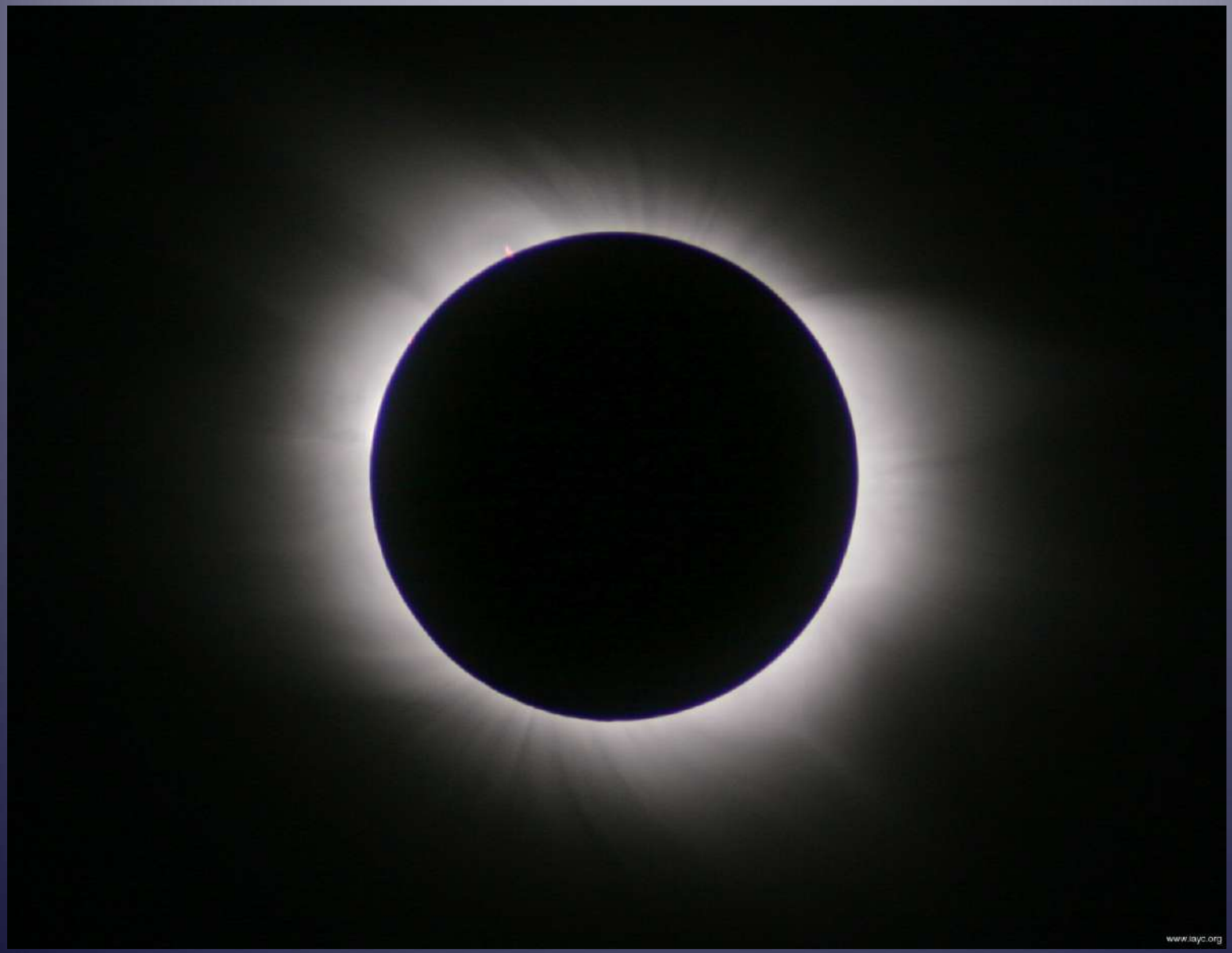
Partial Lunar Eclipse

- Moon passes through **penumbra**
- More common than total lunar eclipse
- You can look at it

Total Solar Eclipse



Solar Eclipse

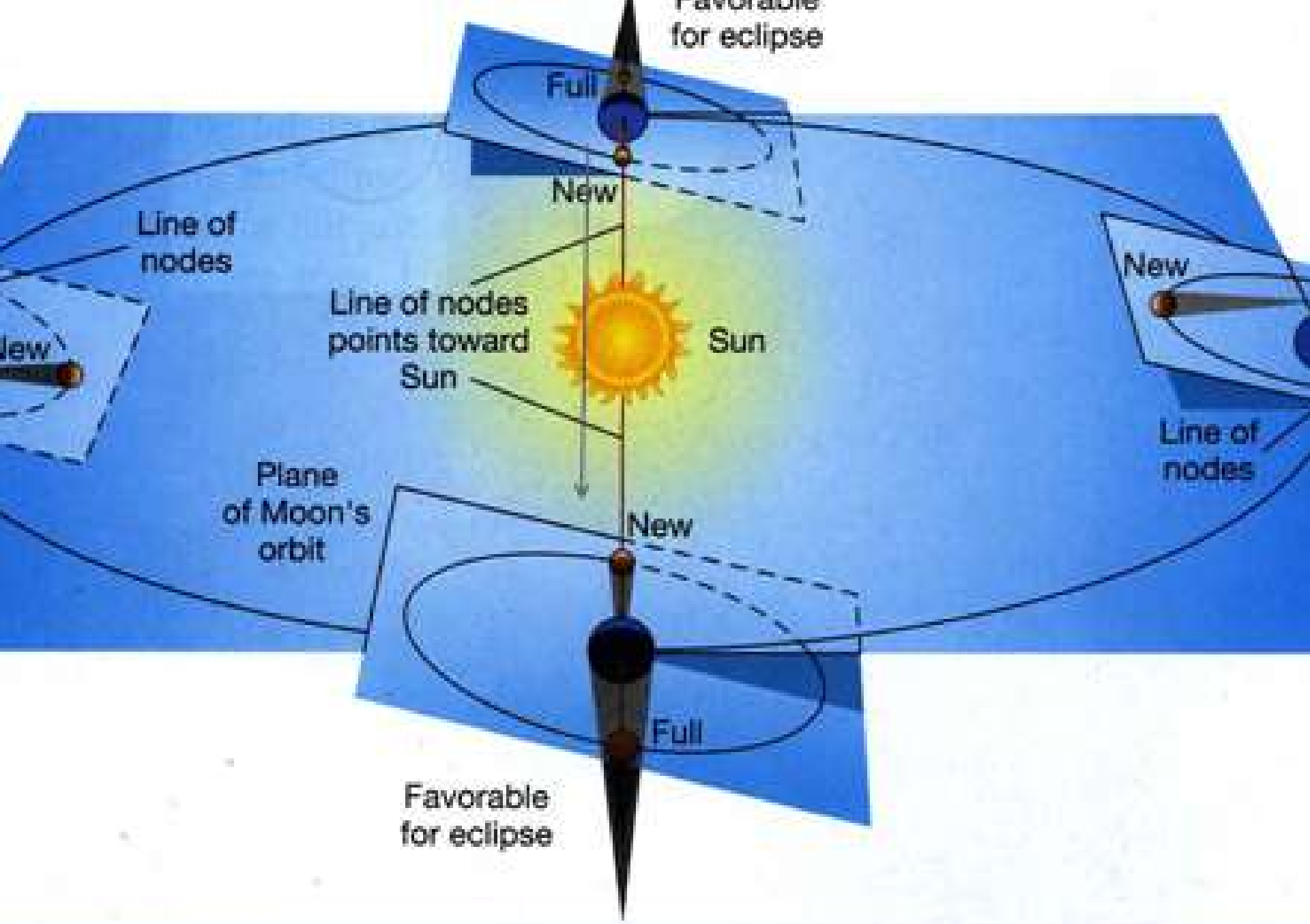
- Sun- **New Moon** -Earth Alignment
- Moon blocks sunlight from reaching Earth
- Rare
- Don’t look at without protection
- Needs to be a new moon
- Does not happen every new moon!
- Needs to be directly aligned.
- All three need to be in the same plane.

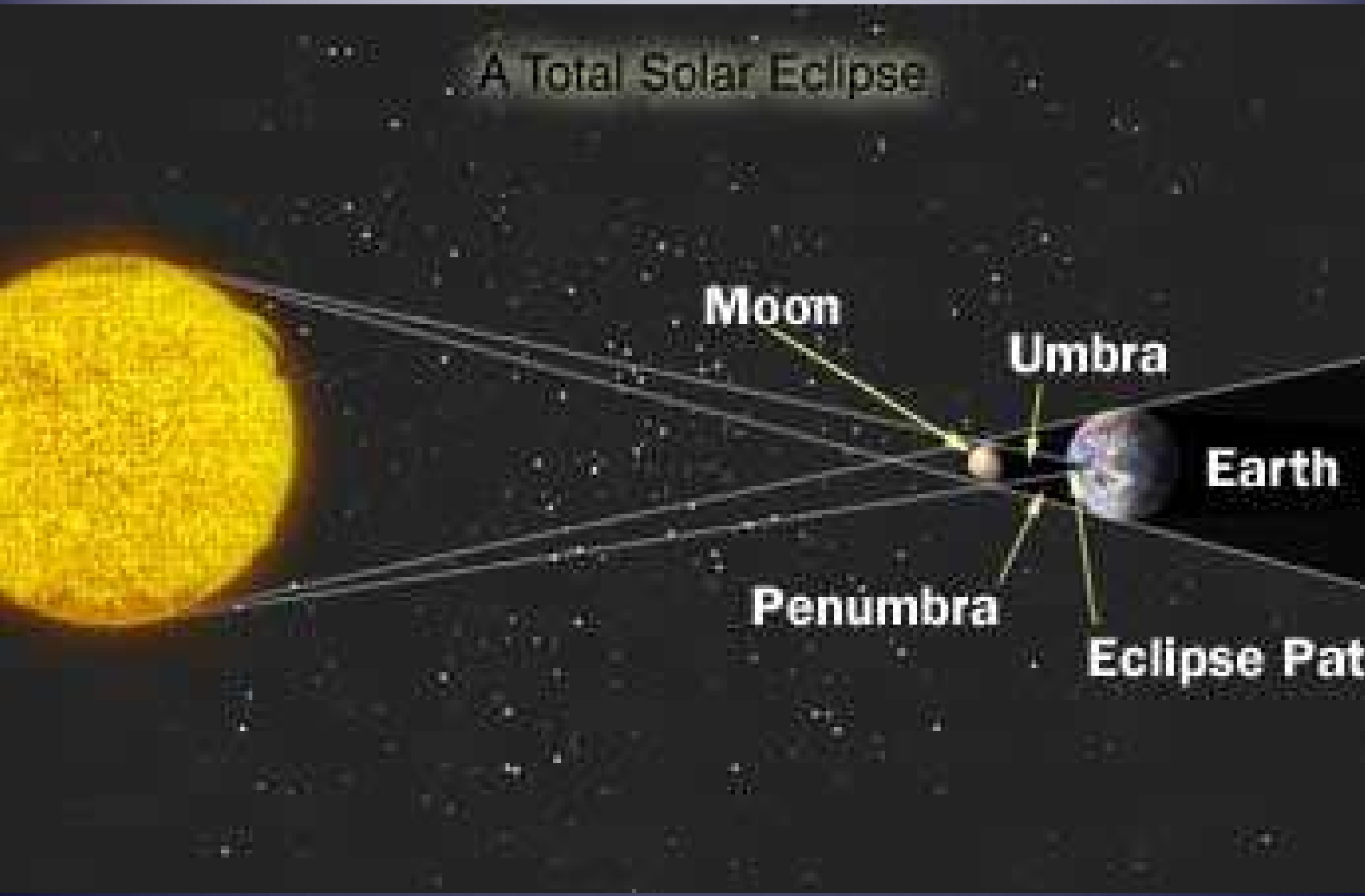
RARE!!!!! Must be directly aligned!!!

- We don't have a solar eclipse every month because it is rare for the sun, moon earth to line up directly!!!

- Usually the moon goes a little above or below the plane and it is not in direct alignment.

The next slide will show you how the Sun, Moon, an Earth need to line up perfectly for an eclipse


for eclipse
Full
New
Line of
nodes
Line of nodes
points toward
Sun
Sun
New
Line of
nodes
Plane
of Moon's
orbit
New
Full
Favorable
for eclipse


A Total Solar Eclipse
Moon
Umbra
Earth
Penumbra
Eclipse Pat

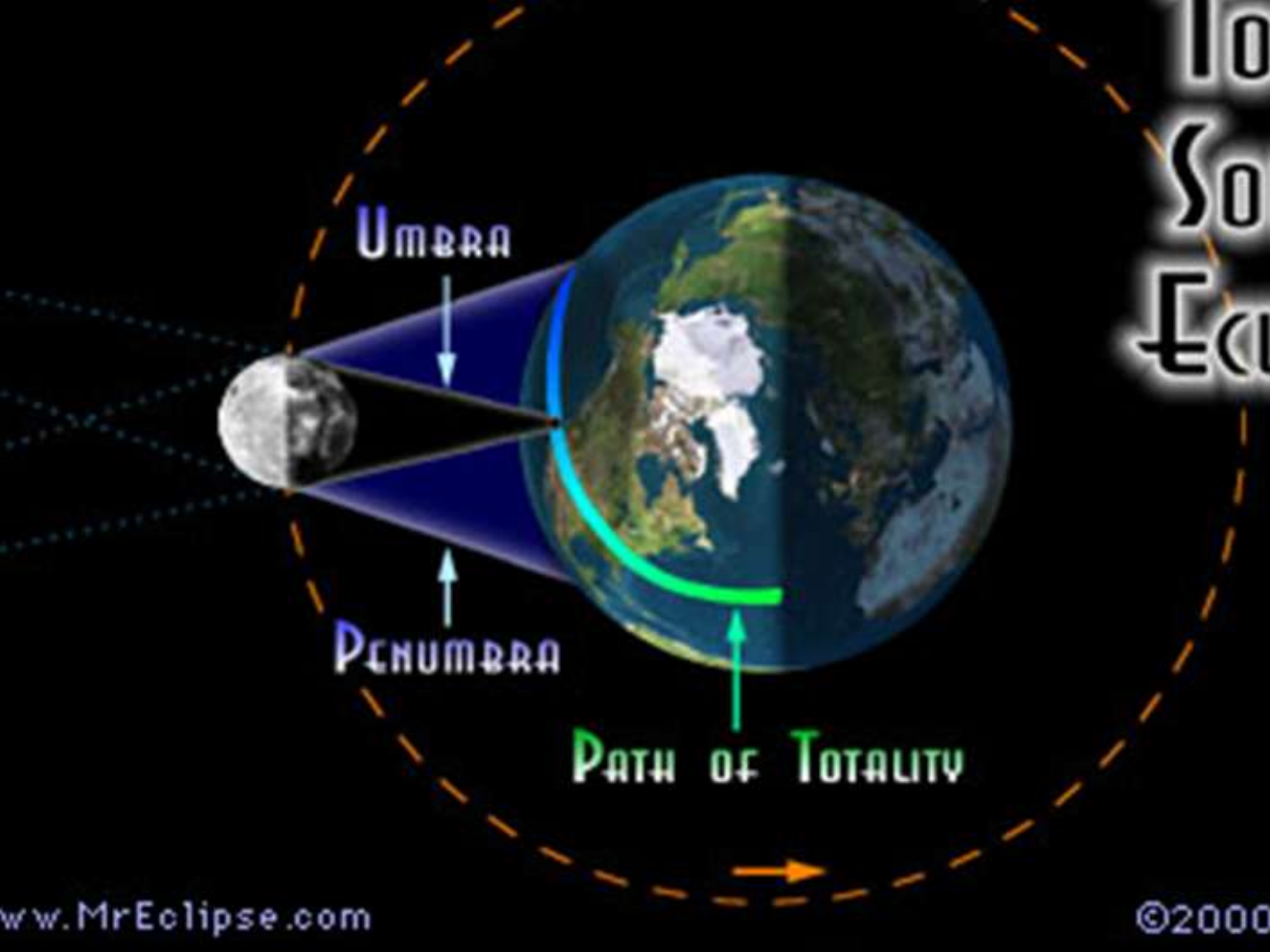
Eclipse Stages – *not moon phases*

See the corona!!!


Sun
Moon
Corona(looks like a crown)
Moon
Moon
Moon

Total Solar Eclipse

- Only seen if you are in the **umbra**
- **Dark sky occurs after sun is blocked**
- You can see the corona of the sun


Umbra
Penumbra
Path of Totality
www.MrEclipse.com
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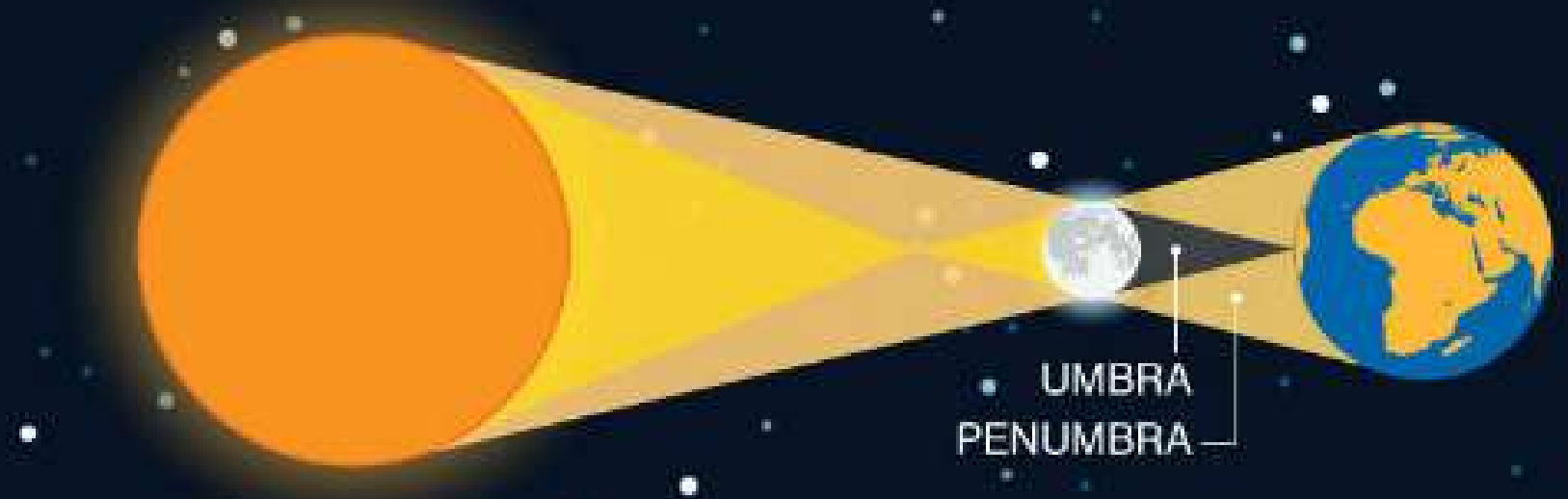
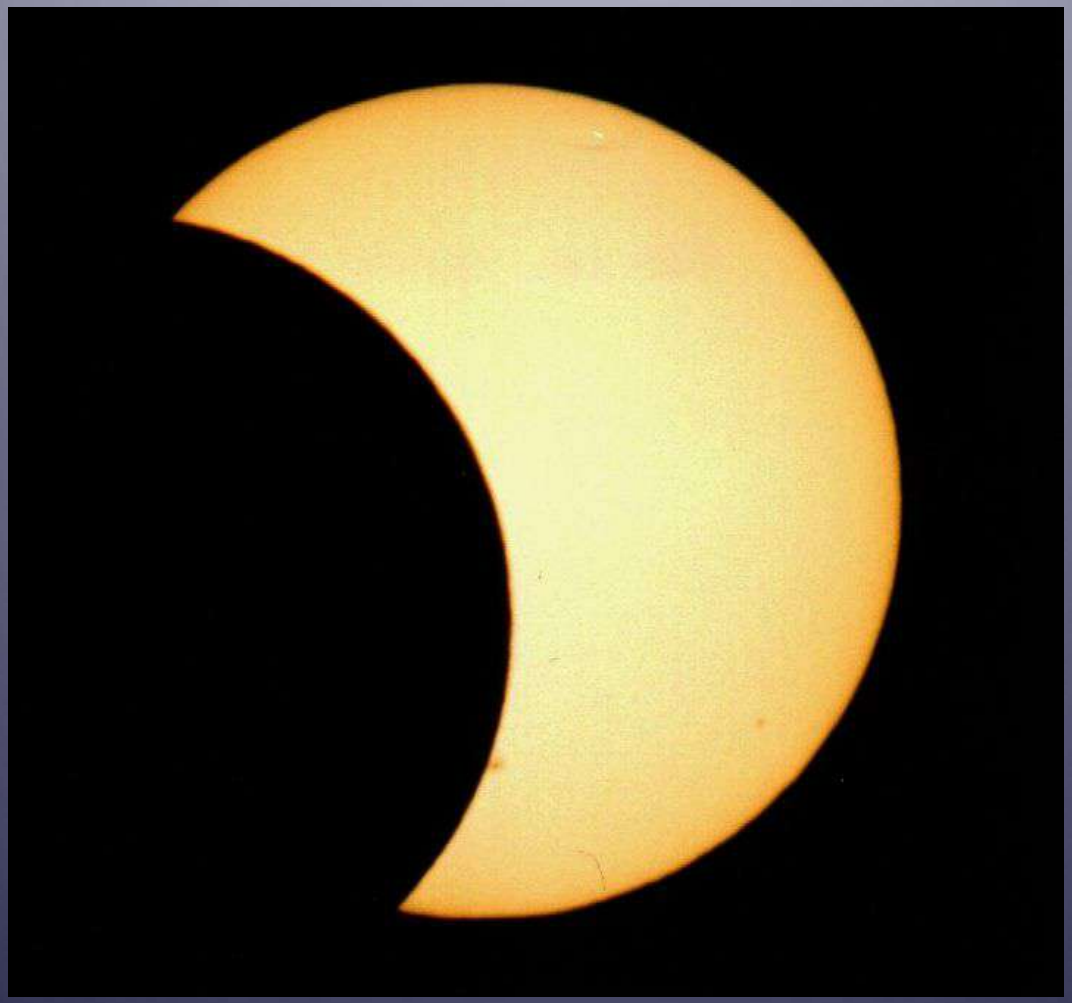
HOW DOES IT WORK?

A solar eclipse occurs when the moon, as i
Earth, passes directly in front of the sun, ob
its rays and casting a shadow on Earth's su



This shadow is composed of two parts: the outer or ***penumbral shadow*** and the inner or ***u***
shadow. From within the penumbra, only part of the sun is obscured. In contrast, the dark, ce
umbra is the shadow of complete or total eclipse.

Partial Solar Eclipse



Partial Solar Eclipse

People in penumbra see a partial eclipse

Part of the sun is visible from earth

http://eclipse.gsfc.nasa.gov/solar.html

- *WARNING!*
- **Permanent eye damage can result from looking at the disk of the Sun directly, or through a camera viewfinder, or with binoculars or a telescope even when only a thin crescent of the Sun or Baily's Beads remain.**
- **The 1 percent of the Sun's surface still visible is about 10,000 times brighter than the full moon. Staring at the Sun under such circumstances is like using a magnifying glass to focus sunlight onto tinder.**
- **The retina is delicate and irreplaceable. There is little or nothing a retinal surgeon will be able to do to help you. Never look at the Sun outside of the total phase of an eclipse unless you have adequate eye protection.**