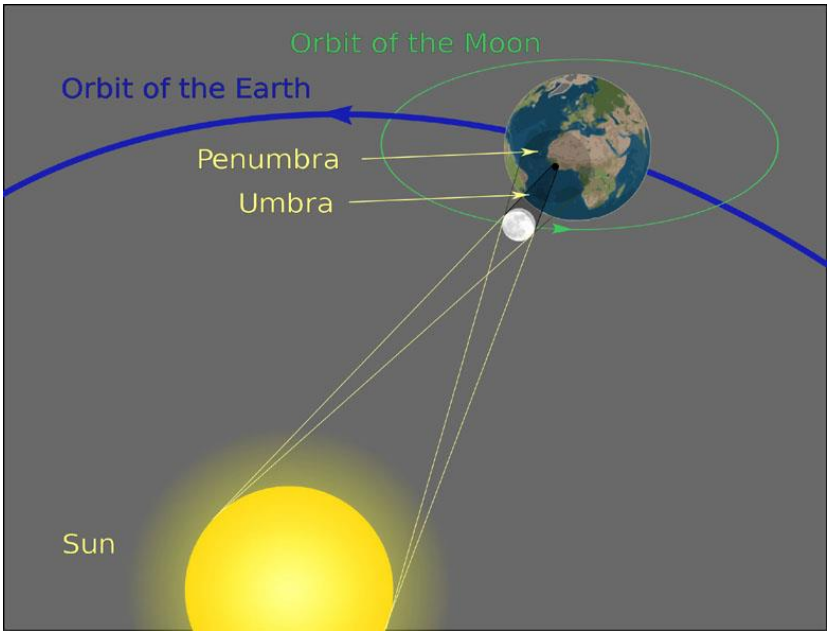
Acadiana Sky

Solar Eclipse Basics

Solar eclipses happen every year somewhere in the world, but there will be no more total or annular solar eclipses anywhere in the continental United States until 2045 (although Acadiana will have additional partial eclipses in 2028, 2029, 2031, and 2040).



Solar eclipses happen when the moon passes between Earth and the sun, temporarily blocking the sun from view. The moon's shadow falls on a very small part of our planet, and only people where that happens can actually see the eclipse. Because solar eclipses happen when the moon passes between Earth and the sun, these eclipses can only happen at new moon.

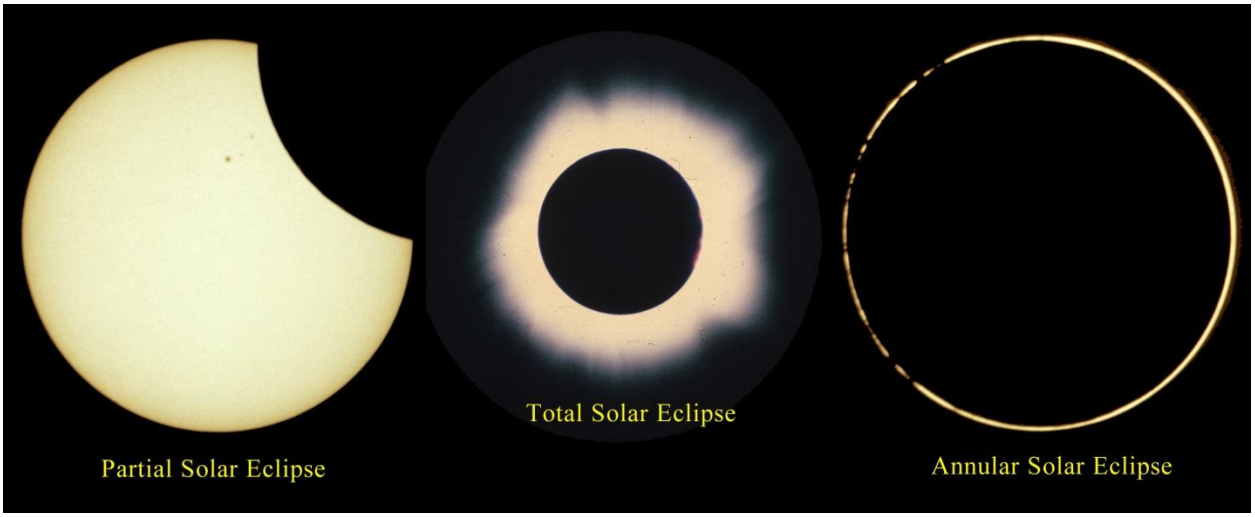
Why don't we see an eclipse at every new moon? It's because the moon's orbit is tipped a bit more than 5° relative to the plane of Earth's orbit. Usually at new moon the moon is a little above or below Earth's orbit and its shadow misses our planet.

You may notice in solar eclipse drawings that the moon is shown with two shadows—an inner shadow called the umbra, and an outer shadow called the penumbra. These may seem puzzling since the sun is the only light source for those shadows but remember that the sun is far bigger than either Earth or the moon (in fact, the sun's diameter is more than three times bigger than the

distance between Earth and the moon). The umbra is the region shadowed from all parts of the sun while the penumbra is only partly shadowed.

You can see this phenomenon every clear day, by the way. You have two shadows also. Look closely at your shadow and you'll see a dark inner shadow with a lighter shadow around the edges, your own personal umbra and penumbra.

There are three basic kinds of solar eclipse: a partial eclipse, when the observer is only in the penumbra and the moon blocks only part of the sun from view; a total eclipse, when the observer is in the umbra and the sun is briefly but completely blocked from view; and an annular eclipse, when the umbra does not quite reach Earth's surface because the moon is near its farthest point from our planet (and hence appears slightly smaller than the sun's disk), and the observer sees a narrow *annulus* (or ring) of sunlight around the moon's silhouette. Total solar eclipses are the really spectacular ones when the sky darkens enough for the sun's corona to be seen, but that can't last more than 7 ½ minutes.



Unfortunately, total eclipses are far more rare than partial eclipses—the last total solar eclipse in Acadiana itself was in 1778 and the next one won't be until May 11, 2078 (but it will be a doozy with almost 5 minutes of totality)! There will be a shorter wait for the partial solar eclipses in 2028 and 2029.