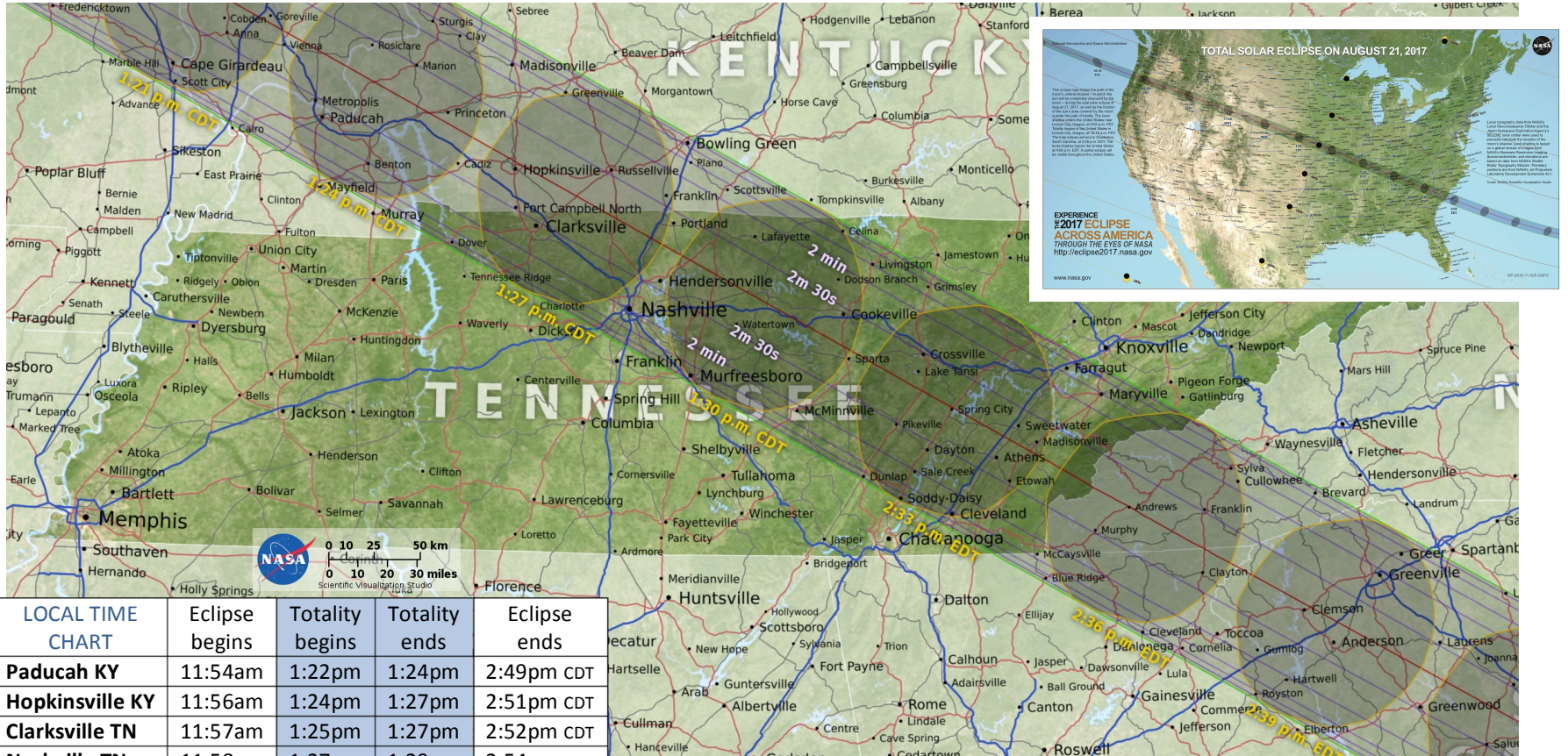


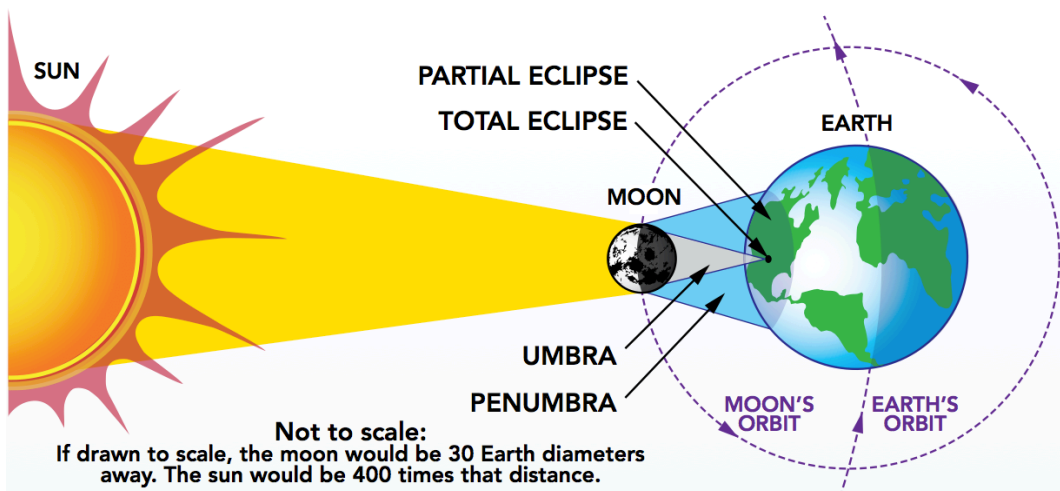
2017 Total Solar Eclipse

On August 21, 2017, North America is in for a major treat. Starting on the western seaboard, the shadow of the Moon will begin sweeping across the continent and will block out at least a portion of the Sun for all North Americans. Along this swath of totality, we will have the opportunity to see the Sun completely blocked for up to 2 minutes and 42 seconds – a total solar eclipse. Nashville, Tennessee is the largest city in the path of totality.



Solar Eclipses – Why Do They Occur?

A solar eclipse occurs when the Moon, as seen from Earth, blocks the Sun. In order for this to occur, the three bodies (Sun, Moon, and Earth) have to be in a nearly perfectly straight line. As a result, a solar eclipse can only occur during a New Moon. Solar eclipses are fairly common – there are typically two solar eclipses per year occurring somewhere on Earth.



Credit: NASA

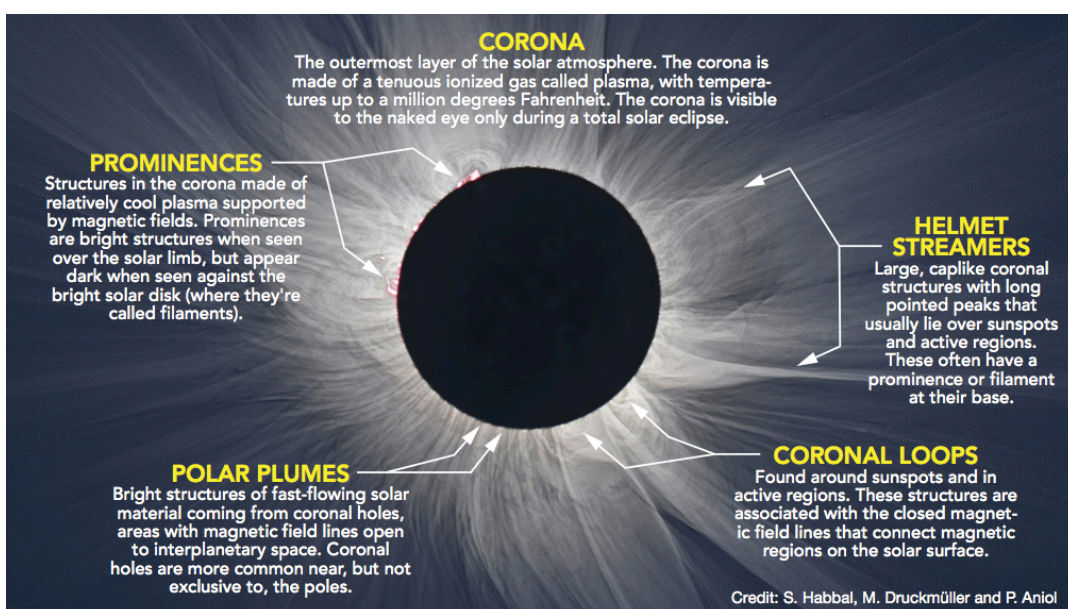
Most viewers of a solar eclipse will not get the opportunity to witness the grandeur of a *total* solar eclipse because of the narrow strip of totality. As shown in the figure, the Moon casts two shadows – a lighter, outer shadow known as the **penumbra**, and a darker, inner shadow known as the **umbra**.

Eclipse viewers located in the larger penumbra shadow will only witness a *partial* solar eclipse. As the Moon glides along its orbit, a portion of the Sun, anywhere from a little less than 1% to approximately 99.9% will be blocked. The degree to which the Moon obscures the Sun during a partial solar eclipse depends on the observer's location on the Earth. The closer to the umbra (the darker, inner shadow of the Moon) the observer is, the more of the Sun that is obscured and the longer the partial eclipse.

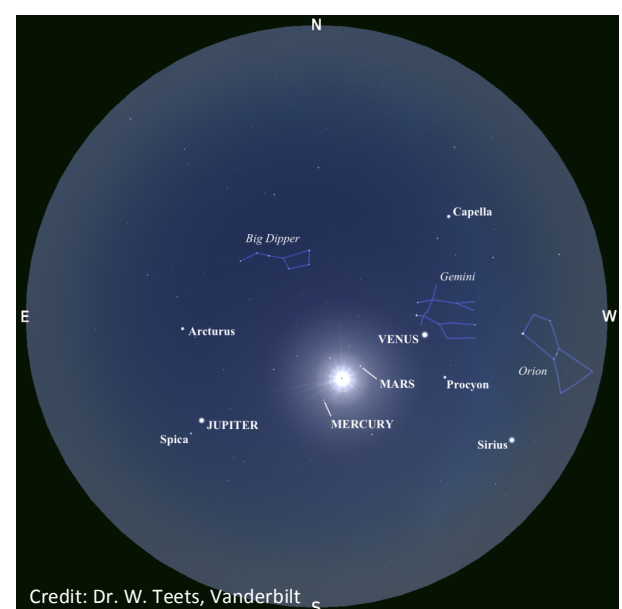
Eclipse viewers located in the smaller umbra will witness a *total* solar eclipse.

What You Can See During a Total Solar Eclipse:

This eclipse will offer some spectators (especially a bit north of Nashville) who are directly in the center of the path of totality up to 2 minutes and 42 seconds of dusk-like darkness. During this period, numerous bright stars will be visible, including some well-known constellations and asterisms like Orion, Gemini, and the Big Dipper. The planets Jupiter and Venus will be easily spotted halfway up in the eastern and western skies, respectively, while fainter Mars and Mercury will be on either side of the eclipsed Sun. Also visible will be spectacular features of the Sun, which are not normally visible to the naked eye.



Credit: S. Habbal, M. Druckmüller and P. Niol



Credit: Dr. W. Teets, Vanderbilt