

July Skies over the Pinnacles

Evening Star, Morning Star

We expect to see and hear fireworks on the evening of July 4 and the cosmos will answer with a little bit of excitement of her own. On July 5, the Moon on its orbit will pass through the shadow of the Earth shortly after it rises at around 10:15 PM. I say a little bit because the Moon will only skirt the outer, fainter, part of Earth's shadow. That part is called the *penumbra*. When the Moon passes through the central, darker part of Earth's shadow, called the *umbra*, it's face can turn coppery orange and even can appear to disappear from the sky for awhile. Alas, on July 5 it will take very clear skies and a sharp eye to see the upper part of the Moon's face get just a slight shade darker. Below is a diagram, courtesy of Wikipedia, showing the moon dipping a third of the way into Earth's penumbra shadow.



Sorry to say that 2020 isn't a good year for lunar eclipses. There will be another penumbra lunar eclipse on November. If you liked the July eclipse, you'll like November's eclipse just as much!

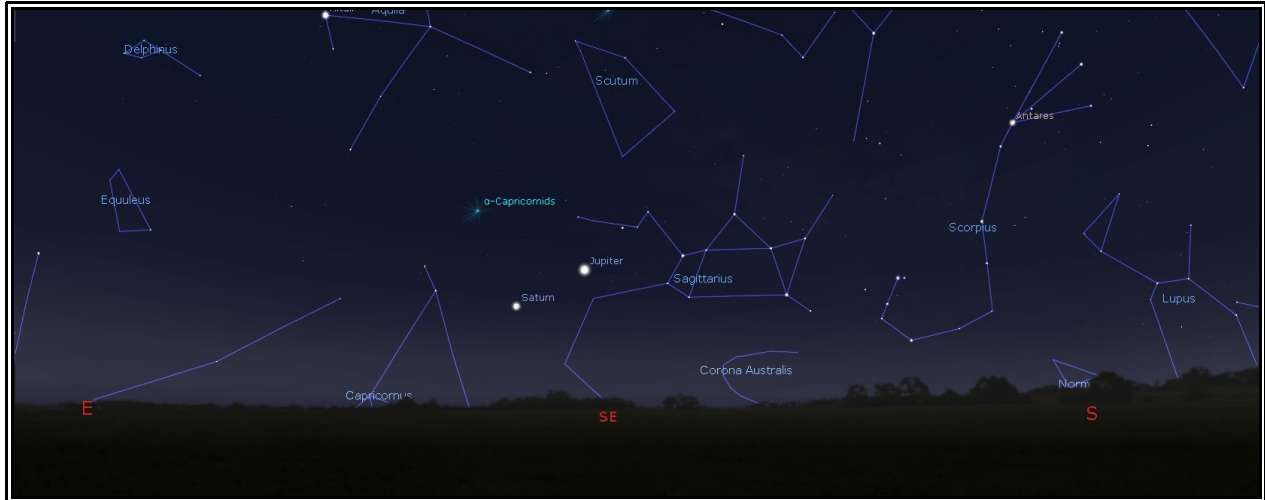
But remember! There will be a total eclipse of the Sun in 2024 and you won't have far to travel to see it! More about this as we get closer...

July's four principal phases of the moon

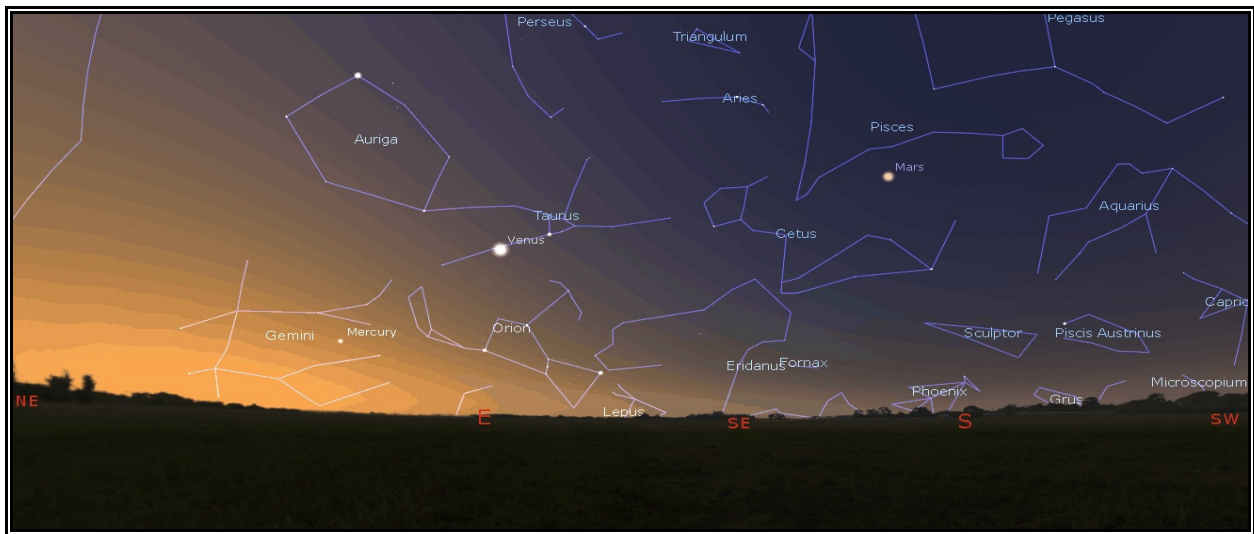
July 5	Full Moon	
June 12	Last Quarter	
June 20	New Moon	
June 27	First Quarter Moon	

Dance of the Planets

Blazing in July skies will be the two largest planets of our solar system, Jupiter and Saturn. They will be separated by a distance similar to the bowl of the Big Dipper. That's about one hand-width held out at arm's length. They are rising together at about 11PM in early July but earlier as each night passes. On July 14 you could draw a line from the Sun, through the Earth and directly to Jupiter. On that date we say that Jupiter is at *opposition* to Earth and is about as close to us (and as bright) as it ever gets. On July 20, Saturn will be in the same position. Not sure you see them? Here's a trick. Most of the time, stars twinkle and planets don't. To the naked eye, Jupiter's color is the same as straw and Saturn appears a little grayer. Here's a mid July finder chart for Jupiter and Saturn. The time is around 11PM.



Do you remember how we tried to find little planet Mercury low in the western sky after sunset in July? If your luck was like mine, the clouds kept that from happening. Now the speedy little guy has rounded the Sun and is back in the eastern morning sky. On July 22, Mercury's travels on its orbit will make it appear about as far from the sun as it can get. So get up well before the Sun on the 22d and you may be treated to a view like this. (Hey, be the first person on your street who can brag that you've seen Mercury!)



While you're at it, look for Venus to the upper-right and orange Mars further to the right, almost due south.

I haven't taken any more pictures recently to share with you but I've had a great time teaching an astronomy course to students enrolled in Berea College's Upward Bound program. Last week we used two sticks and the Sun's shadow to measure the circumference of the Earth. (Our answer was within 350 miles of the true distance.) In case you're curious, Earth's circumference is 40,000KM.

I'll also have more time to contribute my weekly columns about what to see in the sky, starting in late July.

Remember, its better to see starlight than streetlights!

For more detailed celestial information, check out skyandtelescope.org.

