

December Skies over the Pinnacles

December 2022

December's Four Principal Phases of the Moon

December 8	Full Moon	●
December 16	Last Quarter	◐
December 23	New Moon	○
December 30	New Moon	◑

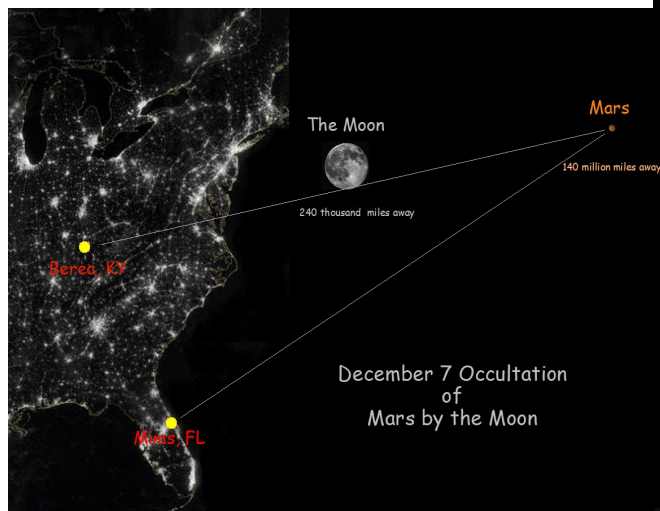
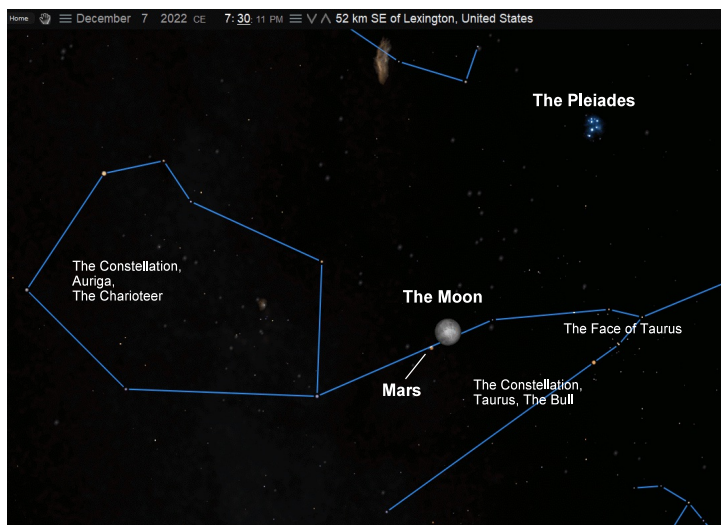
An Interesting Sight To See



Here's a picture that was taken in 2005 of the rare and beautiful sight of the planet Mars as it was nearly covered over by our Moon. According to *Sky and Telescope* Magazine this happens in the night sky somewhere on Earth about every 14 years. Most objects in our solar system (planets, asteroids, dust) revolve around the Sun like marbles on a flat dinner plate. That means that, from time to time a close object like the Moon will appear to pass in front of, or **occult**, another solar system object. This happens all the time to the distant stars but few of us notice that. But when the Moon **occults** something bright, like Mars, it catches the eye, when you know where to look!

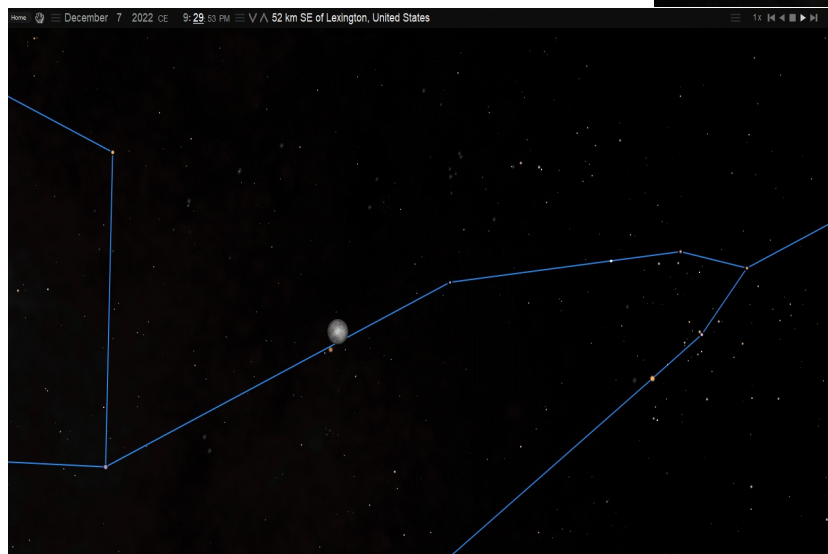
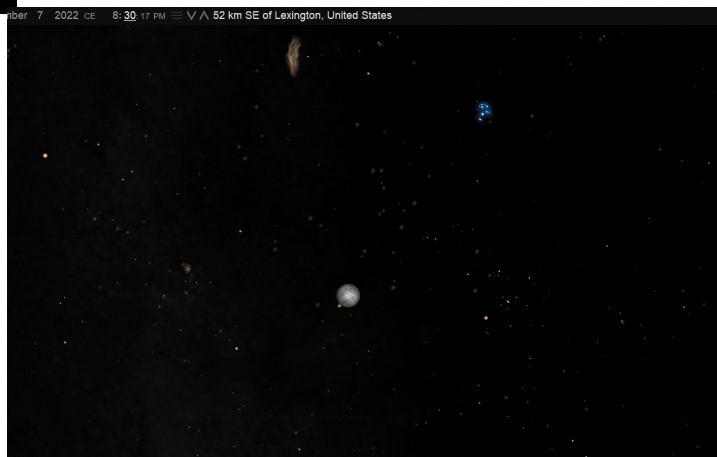
The Moon has a diameter of about 2000 miles and is about half the size of Mars but Mars is about 58 times farther away than the Moon. So the Moon appears much larger than Mars from our view from Earth.

We, in Berea will be treated to a **occultation** of the planet Mars by our Moon on December 7. If skies are clear and you have a view of the eastern sky, here's what you'll see when you look toward the Moon at around 7:30! Why Berea? The timing of what you see this night depends on where on Earth you happen to be. The added bonus is that Mars' orbit brings it close to us in early December, giving us an especially good view of the planet.



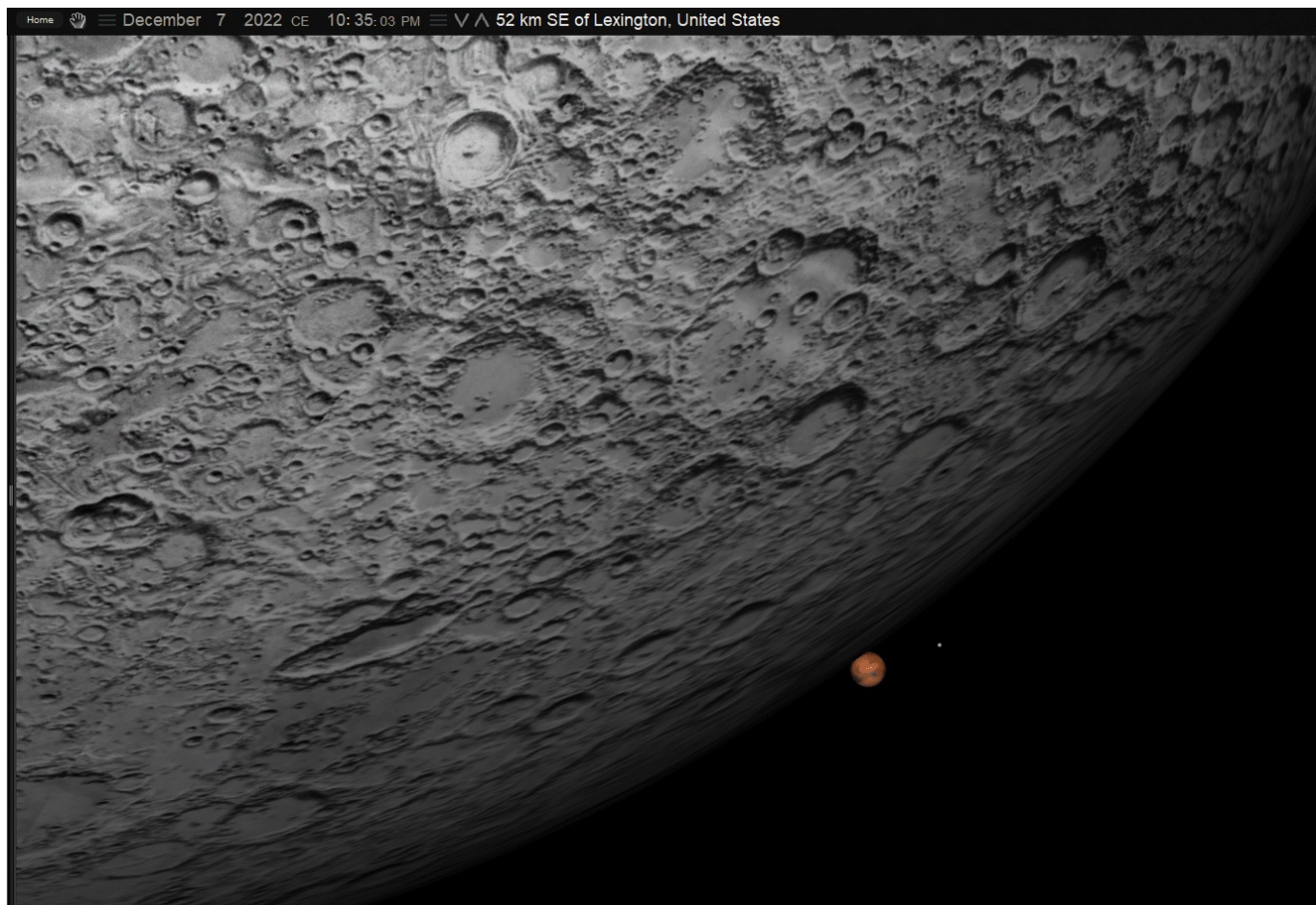
My friend, Steve, who lives in Mims, Florida, will see a different view of the Moon and Mars on December 7. In fact, he won't see an **occultation** at all! From his perspective the Moon will seem to pass far to the north of Mars. Weather permitting, I plan to show you comparison pictures Steve and I plan to take of the event. Look in January's issue of "Skies" for the results!

At 8:30, a casual look at the Moon will show Mars nearly "touching" the Moon's southern edge (called the '**limb**'). Binoculars will still show some separation between the two.



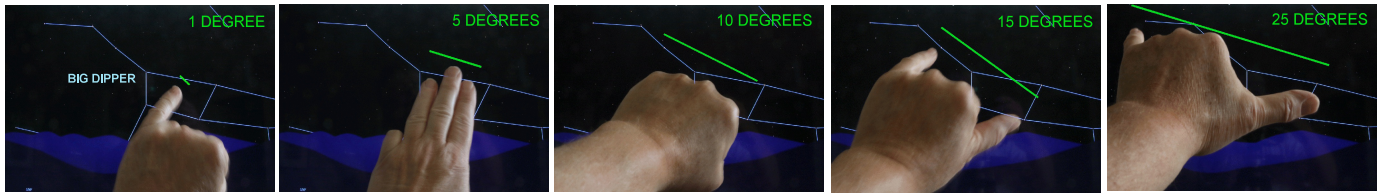
Looking closer with Binoculars or a small telescope, The Moon has "backed" even closer to the red planet. This is the view for about 9:30.

If my computer program, called "The Sky", is correct, the Moon should appear to appear to just scrape over the northern **limb** of the planet Mars, covering its northern polar cap. Technically, this might be called a **grazing** or **transitional occultation**. A telescope with at least 150 times magnification would be needed to enjoy this view.



Attractions in December

Astronomers use a measuring scale of **angular distance** to show the apparent distance that separates two objects in the sky. A trip all the way around the sky would take 360 degrees. Here's a handy guide to estimate **angular distance** that you can use when you're out under the stars.



When you hold your hand all the way out and hold three fingers out, like the scout's salute, your fingers create an **angular distance** of 5 degrees, about the width of the bowl of the Big Dipper. When I talk about the distance between, say, the Moon and a star or planet, I'll say that they are separated by so many degrees.

December 1

As it is getting dark, take in the pretty sight of Jupiter as the Moon slides under it about 2-1/2 degrees away. In one week a more interesting close approach with the planet Mars will happen!



December 7

In my opinion, tonight holds December's most interesting astronomical event. Start by checking out the Moon as it rises with tonight's companion, Mars. See this month's article above.

December 10

Here's an interesting trick of geometry, again by the Moon, now joined by the bright stars, Castor and Pollux in the constellation Gemini.



December 14

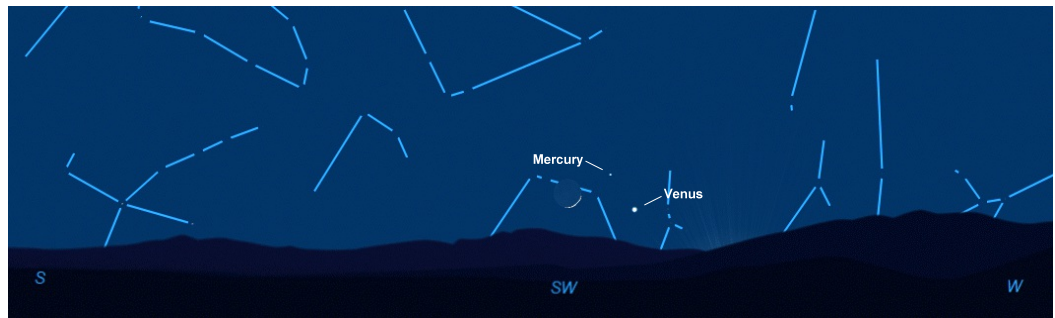
Brave the chilly morning before sunrise and see how many meteors you can count as our Earth passes through the interplanetary dust cloud to give us the Geminid Meteor Shower. As the name implies, most meteors this morning will *appear* to come out of the Constellation, Gemini.

December 21

It's the Winter Solstice. The Earth's northern hemisphere is pointed as far as it can go away from the sun, giving us the longest period of night. Starting tomorrow, the period of daylight gets longer each day.

December 24

Here's an early cosmic Christmas present for you! Go outside just as the sky is darkening, around 5:45, and try to find a spot with a good view of the southwestern horizon. If you can manage that, you'll be treated to a fine grouping of a fingernail-thin Moon accompanied by the planet Mercury just to its upper-right and Venus to its lower-right. Once you've found this planetary pair, see if you can keep track of them getting closer together until December 29 when they will be a snug 2 degrees apart. They won't stay above the horizon for long!

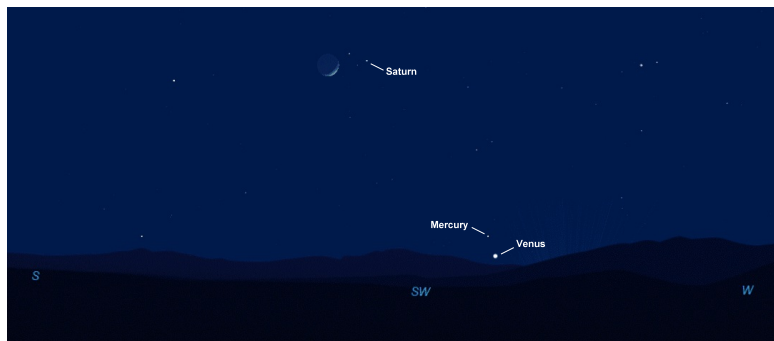


December 25



December 26

Check out the thin, waxing (growing thicker) crescent Moon as it shows itself just 5 degrees to the left of the planet Saturn. Don't forget Mercury and Venus.



December 31

As a New Year's Eve treat, look to high in this evening's eastern sky to find Mars, the Moon and Jupiter neatly arranged in a long line as the constellation Orion rises in the east.

