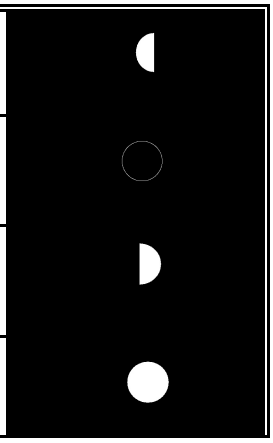
November Skies over the Pinnacles

November 2023

by Jeff Hutton

November's Four Principal Phases of the Moon

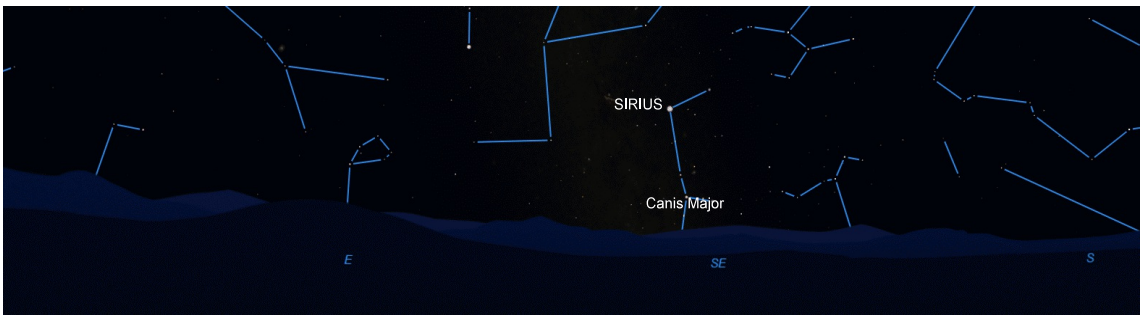
November 5	Last Quarter	
November 13	New Moon	
November 20	First Quarter	
November 27	Full Moon	

Twinkle, Twinkle Little Star...

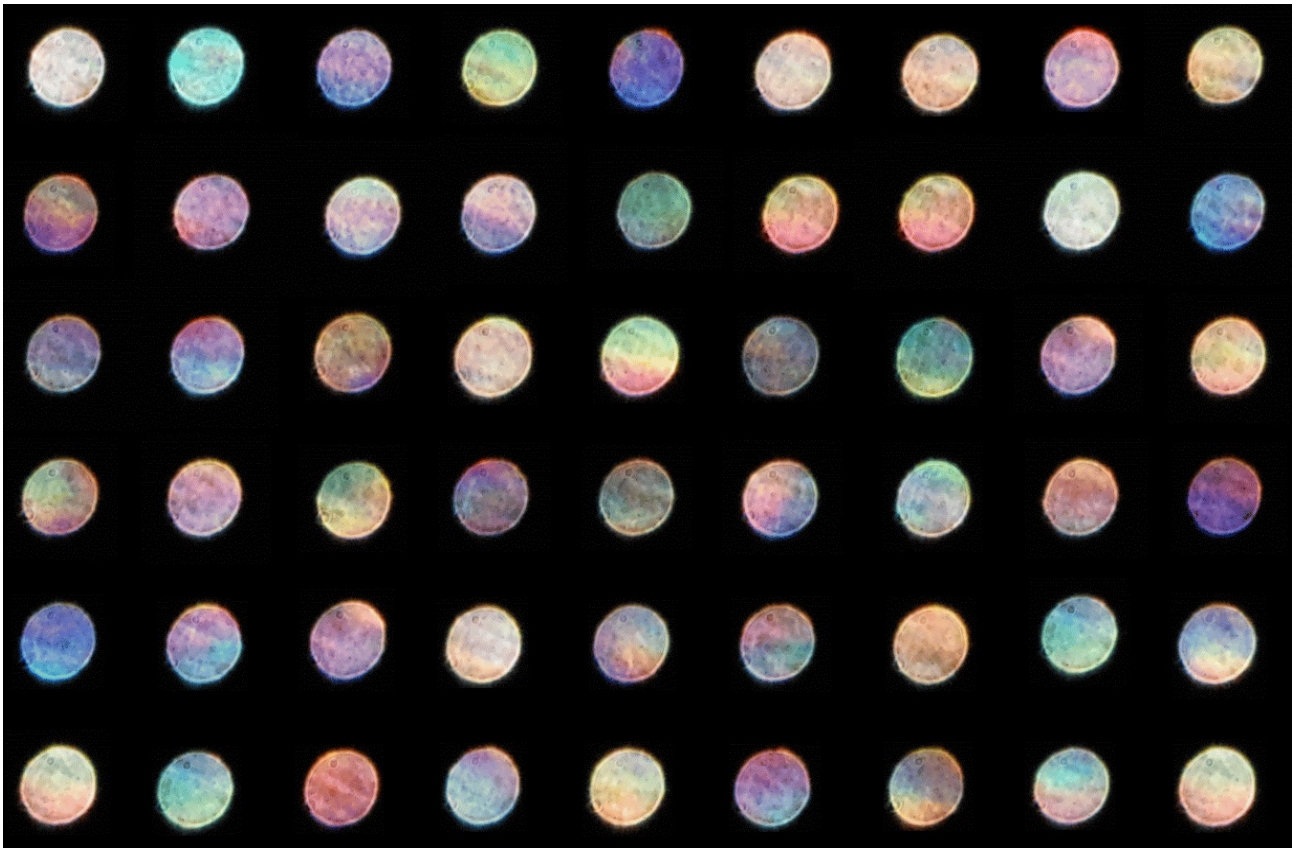
Did you know that the fall of the year brings on some of the best **scintillation** views of the year? What's that? **Scintillation** is a term that astronomers use that causes the 'twinkling' of stars. When stars flash on and off it makes a beautiful sight! It's caused by our atmosphere directing light from pinpoint stars to constantly scatter around. Sometimes the light from a distant star completely misses your eye and it blinks out, then pops back like a disappearing and reappearing act of a magician. As the seasons change, warmer air mixes with cooler air more often. 'Blobs' of air that have different temperatures bend light in different amounts. So if your star blinks out, that means it's light got diverted away from your eye for a moment because a different temperature 'blob' sent its light away from your eye. The amount that light is bent when it passes through something like air or clear glass is determined by its **index of refraction**. Some telescopes use this to let us magnify distant worlds.

Another reason that the fall and spring are great twinkling seasons is that some of the brightest stars in the night sky swing into view. The brighter the star, the more you notice it twinkle. As November approaches, look for the bright star, Capella, rising proudly in the northeastern sky.

In about another month, you'll be able to catch the brightest star in the night sky, Sirius, blazing above the southwestern horizon.



If you're already a fan of twinkling, there may be a special treat in store for you from these especially bright stars! Get comfortable inside your favorite winter coat and watch these stars carefully, especially when they are low above the horizon. Besides twinkling wildly, do you notice other changes? Do they seem to flash changing colors?



One evening last winter, I made a mp4 movie of the star, Sirius, with a telescope. I made the image way out of focus so the light of the star was spread-out into a big disk. Why? So I could show how the light from Sirius, a white star, is spread out into the whole spectrum of colors by our turbulent atmosphere. Each image above represents a single frame of a movie, lasting less than a 30th of a second. The whole movie lasted about half a minute and each image is a single frame 'grab'. How many colors can you see?

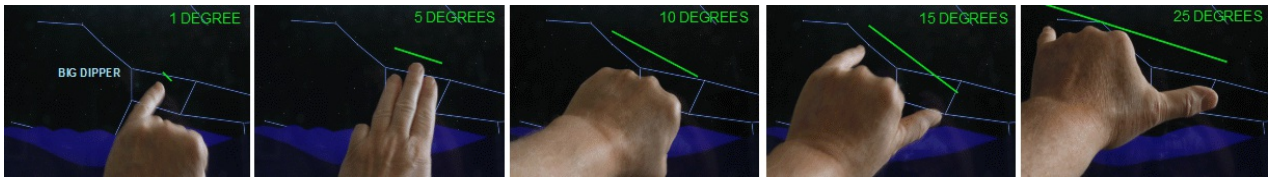
Now, astronomers hate scintillation. The same colorful twinkling we enjoy, shakes, smooshes and distorts the images they try to see and photograph through their telescopes. The term they use for this is called **seeing**. The **seeing** scale is measured from 1 to 10. A value of 1 means the stars are twinkling wildly and astronomers put their telescopes away and just enjoy the show. If the **seeing** scale is near 10 and you have a good telescope, you can see tiny craters on the moon, the rings of Saturn are razor sharp and stars appear as tiny pinpoints, like diamonds on black velvet!

Results of October's Partial Solar Eclipse

On Saturday, October 14, members of the Pinnacles Astronomy Club gathered to witness and share the partial solar eclipse at the Forestry Outreach Center. Clouds obscured most of the event but I managed a smartphone image of the partially eclipsed Sun. Club member, Peter Hille, was in New Mexico for the event and took this marvelous image of annularity with his telescope (inset). The bright ring is the Sun, and the dark disk in the center is the Moon. Many thanks to all who participated and congratulations, Peter!

Attractions in November

When you hold your hand all the way out and hold three fingers out, like the scout's salute in panel 2, your fingers create an **angular distance** of 5 degrees**,** about the width of the bowl of the Big Dipper. When I talk about the angular distance between, say, the Moon and a star or planet, I'll say that they are separated by a certain number of degrees. Sky and Telescope magazine is my source for most of the following information.



November 5 The Sun miraculously sets an hour earlier this evening! OK, not really. The clocks we all depend on are finally put back in sync with the natural world. In other words "Daylight Savings Time" is suspended and astronomers get to see more the night sky before going to bed**.**

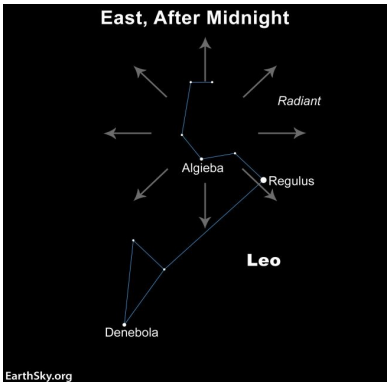
November 9 If you're up a quarter after 6AM, check out the close pairing of the thin crescent moon and bright planet Venus. Just ½ degree separates them.

November 16 Meeting of the Pinnacles Astronomy Club 7PM**.** The planetarium at the Yahng Discovery center.

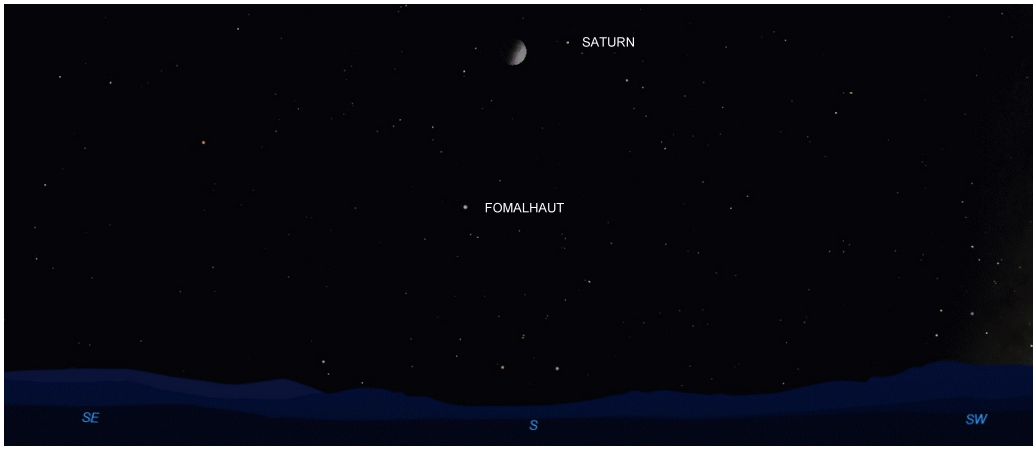
YAHNG
DISCOVERY CENTER

All are welcome! Come to the Margaret A. Cargill Center on the Berea College Campus. We'll have a short planning meeting, followed by a presentation in the planetarium.

November 18 Time for the annual Leonid Meteor Shower. Occasionally this shower turns into a real meteor storm but this year, that's not predicted (but you never know until after it happens). Most likely, if you get up between 3AM and dawn, you might spy a half dozen 'shooting stars'. The meteors will mostly seem to come from the constellation, Leo, because that's the patch of celestial real estate that the Earth is headed toward on the arc of its orbit. The Moon will be a thick crescent and will set long before the show. Dress warm!

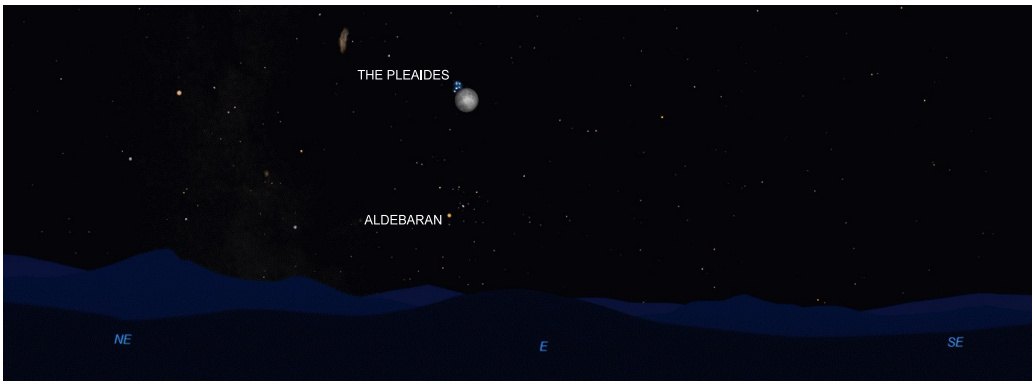


November 20 This evening, just as it gets dark, check out the nice pairing of the first-quarter Moon just to the left of the planet Saturn. While you're there, look a little further down to find the bright star Fomalhaut. This star is one of the first to be positively identified as having a planetary system and is surrounded by a disk of dust. It also has one of the most mispronounced names. Say "foamalot", and you're close!



November 23 Happy Thanksgiving!

November 26 Binocular Alert! Go outside about 7PM and check out the almost-full Moon just about one degree below my favorte star cluster, the Pleaides. The close V-shaped star cluster that forms the face of Taurus, the Bull, has the red star, Aldebaran at its eastern-most tip.



November 30 At about 10:30 this evening, check out the Moon as it rises in the east, pushing ahead of it the stars Castor and Pollux of the constellation, Gemini.