





February Skies over the Pinnacles

February 2024

by Jeff Hutton

February's Four Principal Phases of the Moon

February 2	Last Quarter	
February 09	New Moon	
February 16	First Quarter	
February 24	Full Moon	

We Are All Nearly Blind to the Cosmos (More or Less)

We see so little of the Cosmos because we generally look just with our eyes. During Christmas of 1995, things were a little slow at the Space Telescope Science Institute (STSci) in Baltimore, so researchers were given permission to point the Hubble Space Telescope towards what seemed to me a tiny, empty, patch of the sky near the Big Dipper for 10 days just to see what showed-up in the camera. That resulted in the famous Hubble Deep Field Image, seen below.



This picture shows hundreds of galaxies and almost no individual stars. Nearly each patch of light represents millions of individual stars. Most telescopes, let alone our eyes, are too feeble to pick up the light from the billions of galaxies that are staring down at us. If we could see them all, the day and night skies would be equally bright.

So, if a person is unsighted, they are only a *little* less able to 'see' the Cosmos than if their vision is 20/20.



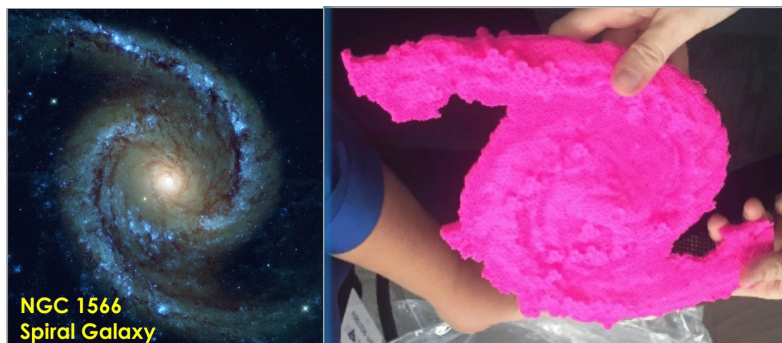
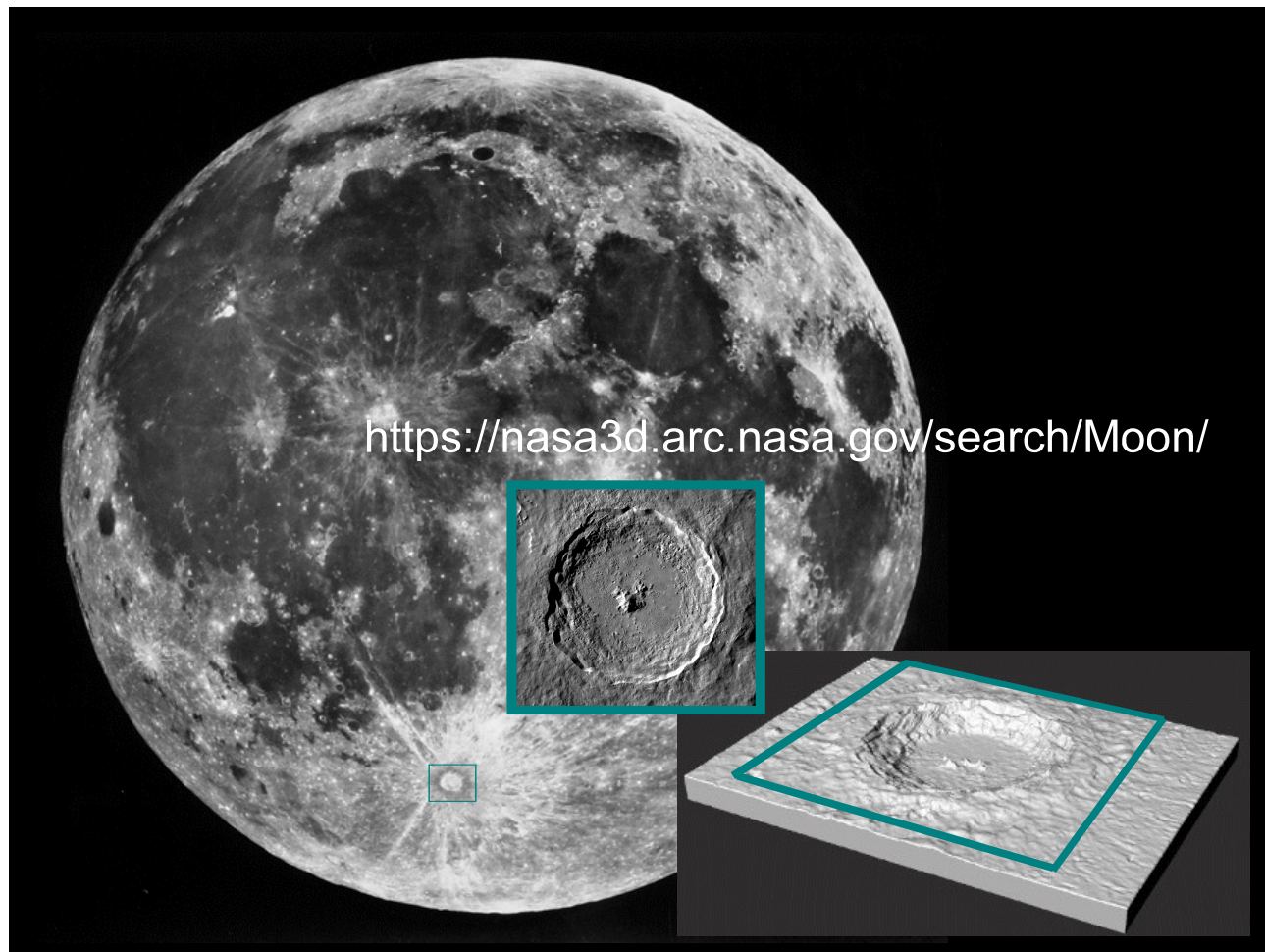
Meet Noreen Grice. Ms. Grice believes everyone should be able to experience the universe, whether they are sighted or not. Check out how she pursues her mission at:

<https://nfb.org/sites/default/files/images/nfb/publications/fr/fr29/4/fr290408.htm>

Her most famous publication is ***Everyone's Universe***. If you have low vision or no vision, or know someone who does, I invite you to visit her website at

<https://www.youcandoastronomy.com/>

Below is an example of how anyone can experience our Moon. Look at the small crater in the blue box on the lower part of the image of the full Moon. Above that, is a high resolution NASA image of this crater called Tycho. At right is a 3D printed image of Tycho that you can hold in your hand. If you have access to a 3D printer, try to print your own models from the website provided.



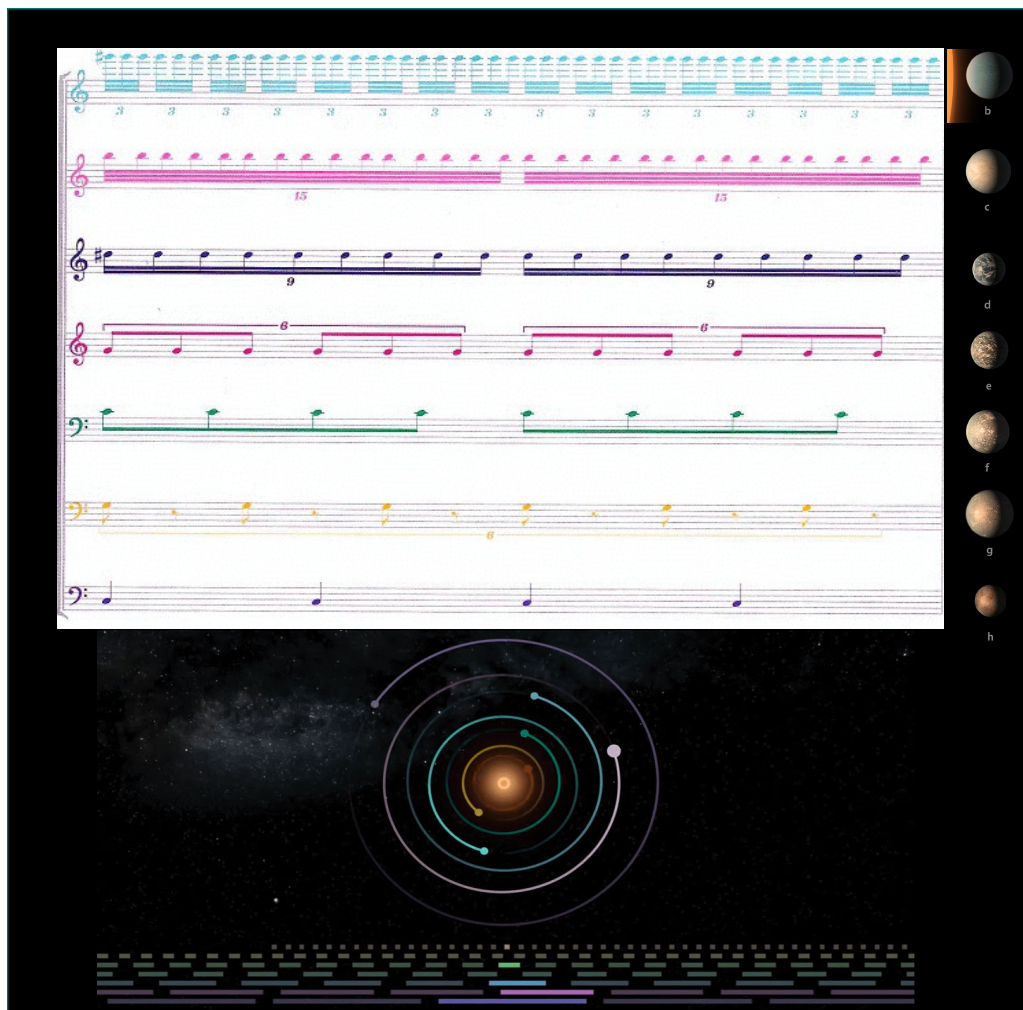
Above is an example of a 3D printed model of a spiral galaxy located in the southern constellation, Dorado, the swordfish. Astronomers use estimated distance to individual stars in this galaxy for depth information. Such 3D printed models have been used to introduce unsighted people to the universe.

The March issue of the magazine ***Sky and Telescope*** has an interesting article about professional astronomers who are also experiencing the Cosmos using senses other than sight. Some use music! One of the ways we learn about planetary systems, like our solar system, is by understanding how far planets on their orbits are from their central star. Planets in close to their star orbit faster than ones further out. There is always a mathematical relationship between the time it takes close orbiting planets and their cousins further away. For instance, every time the planet Mars orbits the Sun, The Earth orbits about two times.

Another solar system, Trappist-1 is about 39½ light years away. You may have heard that the city of Lexington recently beamed tourist information to Trappist-1. If an intelligent inhabitant in that planetary system got that message, they might make it here in 80 or so years, assuming they mastered light-speed space travel. This may demonstrate a rare example of long term planning by our elected leaders.

The Sky and Telescope article by Isabel Swafford points out that we may be able to understand complex information by hearing, than by sight. Think of holding a conversation with someone at a noisy party. We have a greater ability to filter out noise in sound than static in sight.

Matt Russo is an astrophysist and Andrew Santaguida is a musician. These two men formed a friendship in High School, playing in the same band. Together, they wrote the musical score, reprinted from Sky and Telescope, shown below. Each note represents one planetary orbit and each staff represents one planet.



In any planetary system, the planets closest to the host star revolve around that star faster than any planets further out. Each blue note above would strike when the closest planet (b) completes one orbit around the star. The notes on the next staff below represent the orbit of the next planet further out and so on. The planets were first discovered using the TRansiting Planets and Planetesimals Small Telescope (TRAPPIST). Check out the audio at <https://www.system-sounds.com/trappist-sounds/> When you do, I think you'll find it easier to understand the orbital relationships between the planets of this system. Astronomers call these relationships between planets as their individual gravities interact by the name, **resonance**. The central star is a long lived red dwarf.

Update on Berea College's Retired Telescope

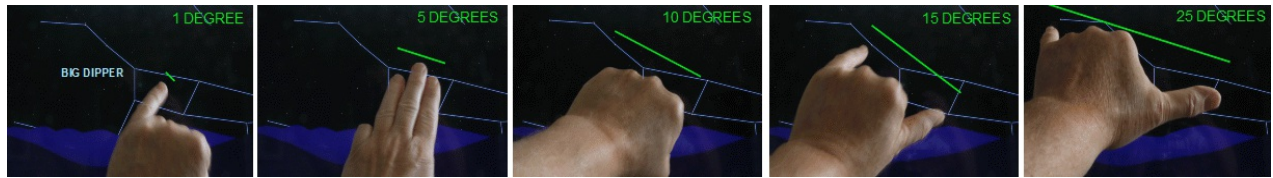
You might recall that in 2021 I headed a team to save the telescope that resided atop the old Hall Science Building before it was demolished. Peter Ceravolo, the Canadian astronomer who absorbed the costs of removing the telescope by crane and who later restored the telescope is the new happy owner..



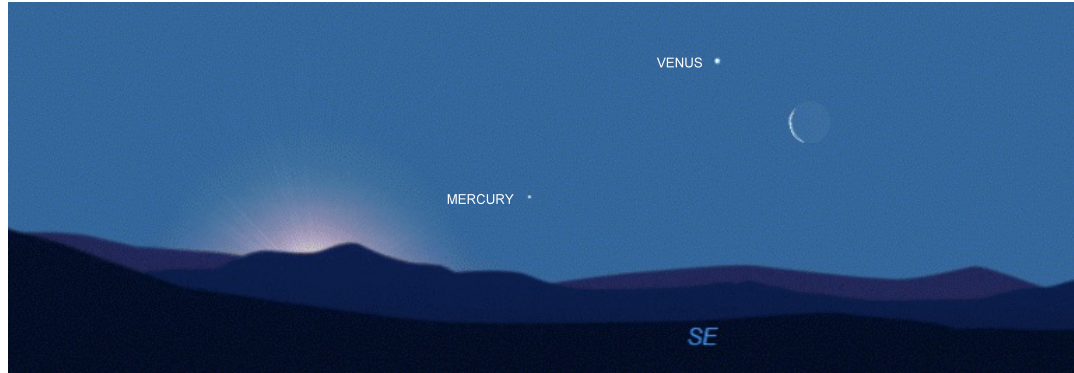
The image at left was taken by Mr. Ceravolo using Berea's old telescope and the image at right was taken by the Hubble Space Telescope. The Hubble picture is clearly better, but that telescope is 6 times larger and is in space! You can read about the telescope rescue in the July, 2021 issue of Skies over the Pinnacles: <https://forestryoutreach.berea.edu/skies-over-the-pinnacles/>

Attractions in February

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.



February 7 Maybe you'll find yourself going to school or work just as the dawn is breaking. If you do, check out the sky, low in the southeast. You'll see the neat trio of the planets Mercury and Venus forming a neat triangle with the crescent Moon, close to the horizon.



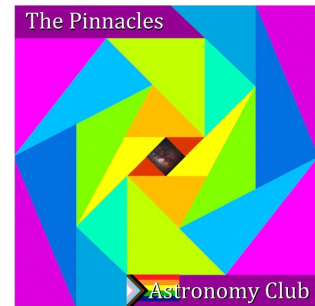
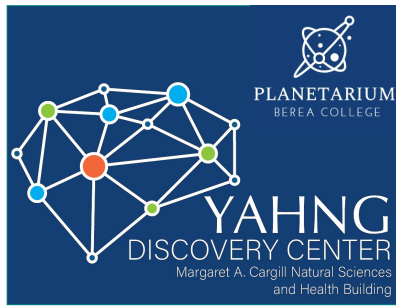
February 14 Look for a nice pairing of the planet Jupiter and Venus high in the southwestern sky, just as it is getting dark. They begin the evening just 4 degrees apart and appear to get even closer as they set.



February 15

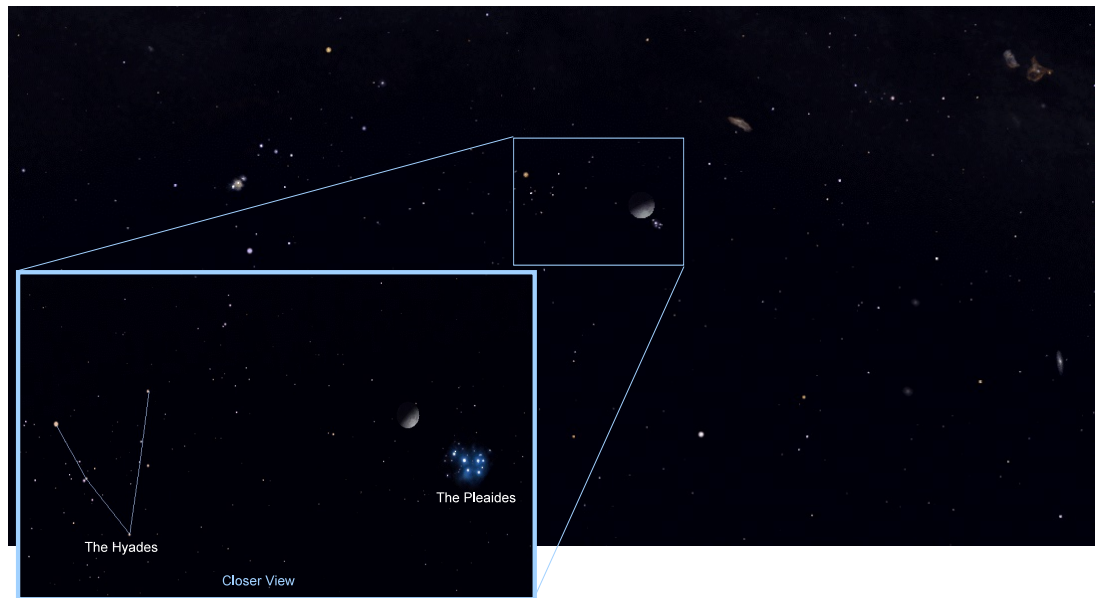
The Pinnacles Astronomy Club will hold its Monthly meeting at the Planetarium at the Yahng Discovery Center Located at the Margaret A. Cargill Center on the Berea College Campus.

Everyone is Welcome!



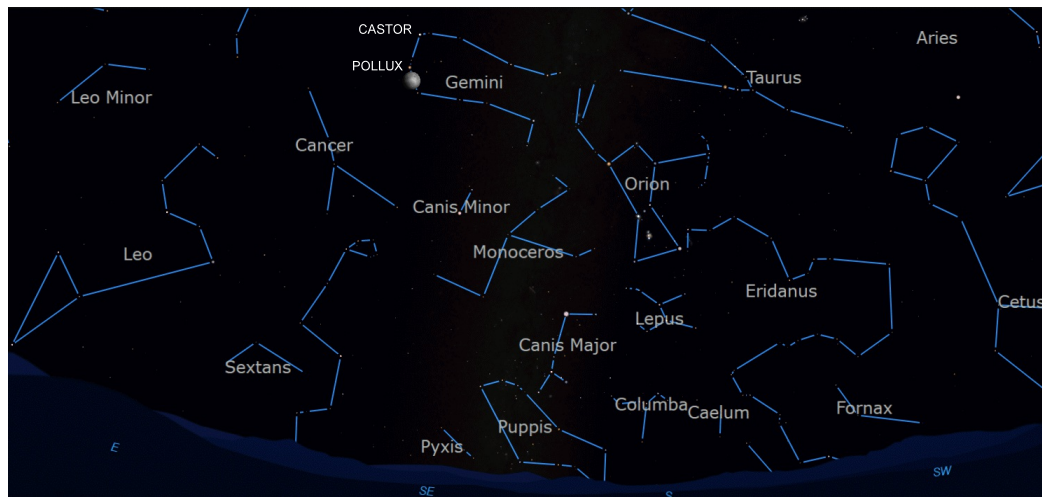
February 16

Once again the beautiful naked-eye star cluster in Taurus, known as the Pleiades is visited by the moon, this time in the first-quarter phase, where we see $\frac{1}{2}$ of the day side in sunlight. Don't forget to look a little left (East) to see the V-shaped star cluster called the Hyades. These stars are said to form the face of Taurus the Bull.



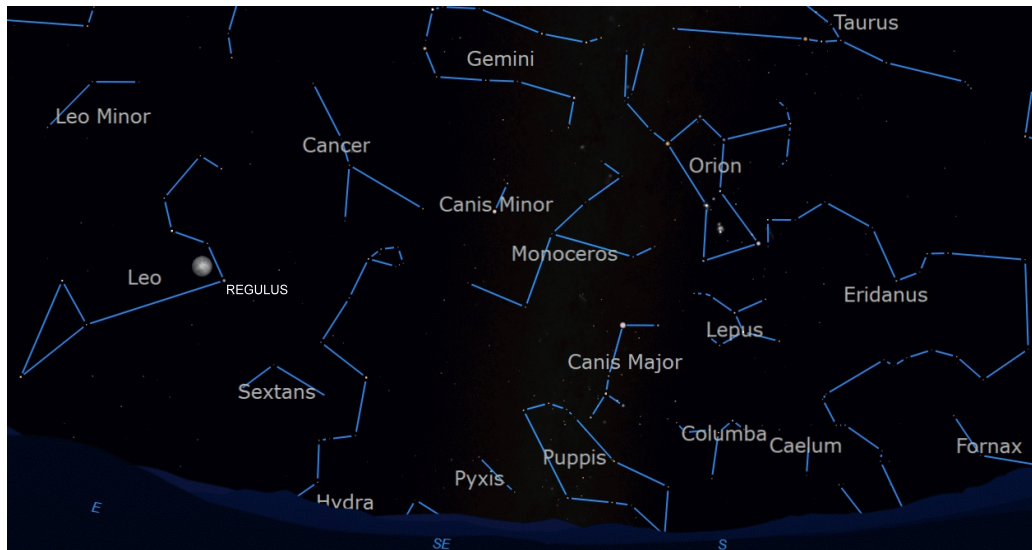
February 20

Look this evening for the full Moon just grazing the star Pollux, in the constellation, Gemini. I've put in the constellation lines and labels in this illustration. Check out Leo, to the left (east)



February 23

3 evenings later, check out the almost-full Moon nestled near the sickle of Leo, just 3 degrees from Regulus, brightest star in this constellation.



Solar Eclipse Update



April 8, 2024 is the big day.

If you haven't made plans to travel to an area where the Sun will be totally eclipsed by the Moon, it may already be too late! I am planning to lead a group from Union Church to Indiana on the big day. Watch for additional announcements on how you may join a group leaving from Berea to experience this great event. It's the last total solar eclipse that can be seen from anywhere in the United States until 2045.

In the coming months, my NASA volunteer Eclipse Ambassador and Berea student, Diego Colorado, and I are planning to offer presentations on solar eclipses and how to safely view and image them. Most events will be held at the Berea College Forestry Outreach Center at Indian Fort. Watch for announcements!

Questions or comments? Feel free to contact me at sawandtelescope@gmail.com.