Summer Skies over the Pinnacles

June, 2026

by Jeff Hutton

Summer's four Principal Phases of the Moon

June 8	Last Quarter	
June 15	New Moon	
June 21	First Quarter	
June 29	Full Moon	

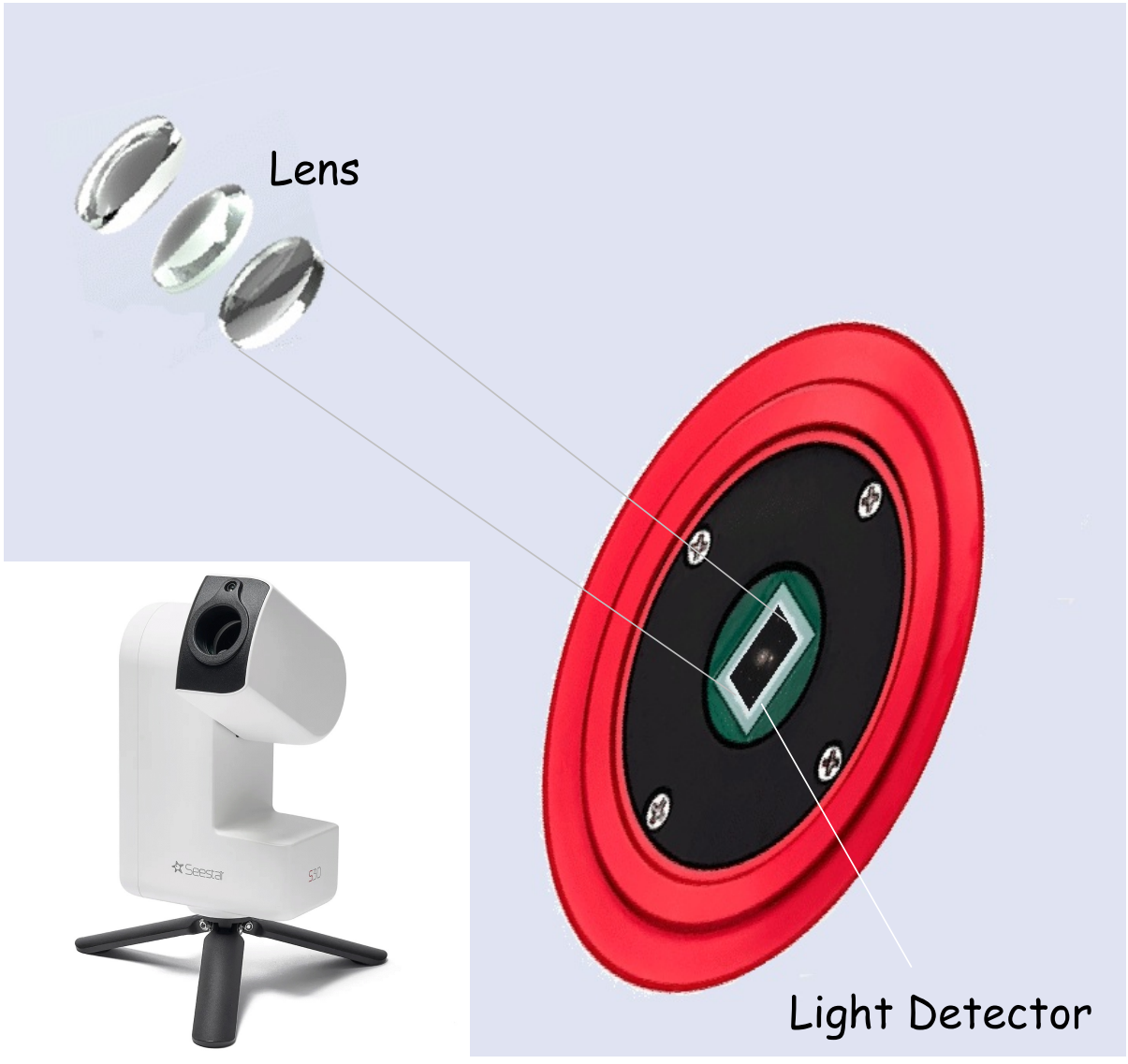
July 7	Last Quarter	
July 14	New Moon	
July 21	First Quarter	
July 29	Full Moon	

August 6	Last Quarter	
August 12	New Moon	
August 20	First Quarter	
August 28	Full Moon	

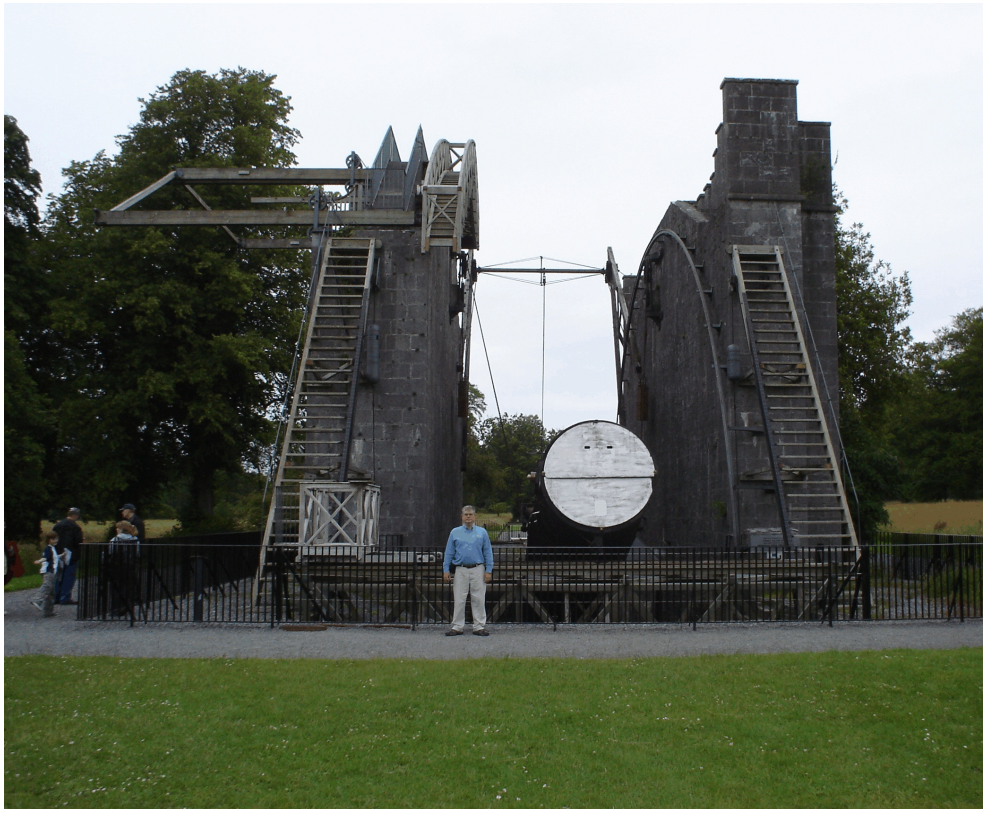
Ways of Seeing

Our vision has evolved to keep us safe. When there is enough light, we see well enough to view out of the window of a car to avoid a collision. In our early hunter-gatherer existence we could see our prey, or keep from being eaten. That is, as long as there was light enough to see. At night, our eyes adapt as much as they can by increasing the sensitivity to light by our retina and by the iris in front of the lens opening wide to allow as much light to enter as possible. For a young adult that opening is as much as 7 millimeters. The more light that lands on the retina, the better we can see in the dark.

In the early 1980's astronomer Jim Gunn helped develop the electronic way of "seeing" that was applied to the Wide Field Planetary Camera that was planned to go into the Hubble Space Telescope. This is the same technology that is used for taking pictures with your smart phone. A lens (or set of lenses) projects an image onto an array of light sensitive electronic detectors and the resulting image is saved as an image on your phone.



Up to the 1860's astronomers had no way of making a record of what they saw through the eyepiece of their telescopes, except for sketching what they saw. Most interesting celestial objects, like galaxies and nebulae are too dim to see with the unaided eye. Galileo could see the moon bright planets with his first telescopes. The lenses of these telescopes were small, about 30 millimeters, so they didn't transmit much light to the eye. After Issac Newton invented his telescope that gathered light by reflecting light off of a curved mirror, larger and larger telescopes started being made. Why mirrors? The answer is mostly that they were much easier to make, and make BIG!



In 1845, A wealthy English landowner in central Ireland named William Parsons completed a telescope so big that a even bigger one wouldn't be made until the 20th century and installed on Mt. Wilson in southern California. With it, Parsons was nearly able to see individual stars in neighboring galaxies. How big was Parsons' mirror? Take a look at the picture above. That's me standing next to the covered front of the telescope that houses the mirror, it's 6 feet across! Below is Parson's famous drawing is of the "Whirlpool Galaxy" located just off the handle of the Big Dipper.

One hour exposure with my Seestar S30 from my back yard

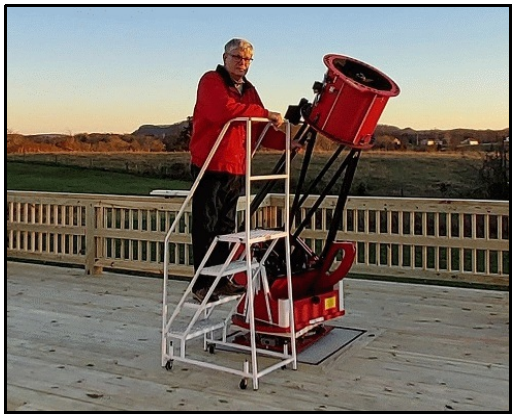
Plate V from *The Orbs of Heaven*, O.M. Mitchell, 1856

Compare the two images above. At left is an image I made over the course of an hour with my robotic astrocamera. The instrument, called a Seestar S30, uses lenes about the size of the one in Galileo's first telescope. At right is the drawing sketched by William Parsons using his great telescope that can gather over 4000 times as much light as the S30. How is it possible to make an image this detailed with a camera with a little 30mm lens? Other robotic imaging telescopes are the Dwarf 3 and the Vaspera II. Each device can accumulate light over time.

When we see something, what we are looking at doesn't appear to get brighter the longer we look. So, even if our eyes are totally used to the dark, which takes up to an hour, we hit a point when we can't see any deeper into the darkness. As long as there is enough light, we can notice movement, such as an hungry lion on the hunt. But with an electronic camera, light accumulates and will build up an image. When we look at the display on our computer, the accumulated light shows us something that we could never see, even looking through a large telescope.

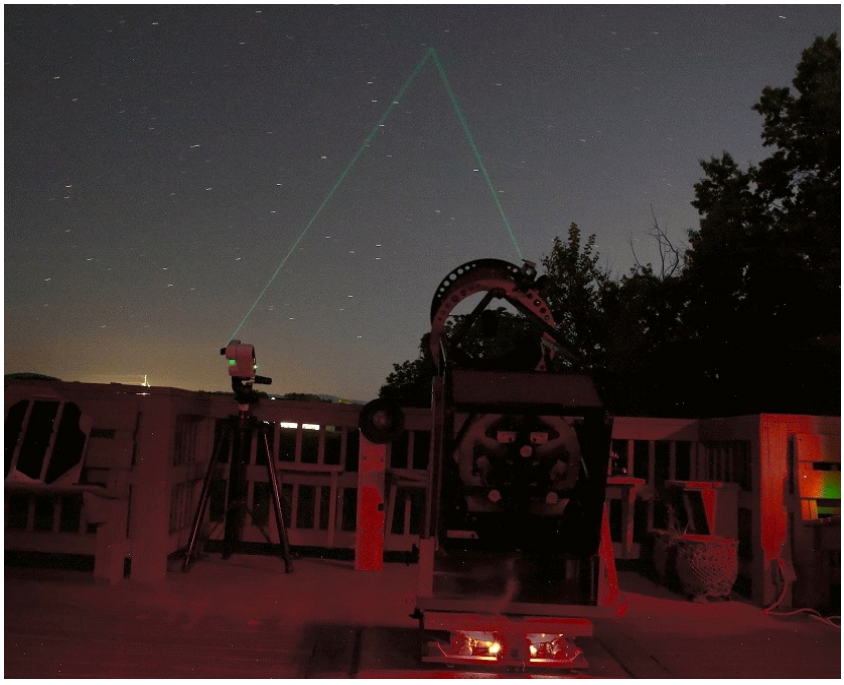
Now look at this image I took of the galaxy M83. See the streaks of light? Sometime over the 25 minute exposure, an airplane flew through the frame. When? That doesn't matter here. However, imagine living 5,000 years ago and telling your companions that you saw a lion walking near our camp. The first question might be, "Where" and the second question, "When?"

Also, look closely at the bright stars in this picture. Notice that they seem to have vertical lines through them. I have no idea how they got there (vibration? AI hallucination?) but intelligent human interpretation suggests that the lines aren't really there. As with all media, don't believe everything you see!



In 2011 I built a Newtonian reflecting telescope with a mirror 16 inches across. Amateur astronomers call this class of telescope a "light bucket" because of its relatively large size. The other night I thought it might be fun to see how this galaxy, M83, would look in this telescope.

I used my Seestar, fitted with a laser, to point out this galaxy. I used another laser on the telescope to help me find M83 in the telescope. At the eyepiece of a telescope that gathers about 200 times as much light as the Seestar, this galaxy was barely a faint smudge. Here's how my experiment looked.



Upcoming Events

June 19 Join us for our second scheduled ***Cosmic Café*** event at the **Berea College Forestry Outreach Center**. At 8PM we will be hosting readers of celestial-based poetry to a backdrop of beautiful astrophotos, mostly made by members of the **Pinnacles Astronomy Club**. Got a poem you'd like to read? Let us know at sawandtelescope@gmail.com. Following readings both inside and outside the FOC classroom, join PAC members to identify summer constellations and enjoy closeup views of the crescent Moon, Venus, Jupiter and beautiful double and triple stars, as well as ghostly objects in deep space. Hopefully, clouds won't interfere!

July 21 Join PAC members for another journey through an aspect of the Cosmos you may not have heard of before. More star gazing is planned. Got a telescope, even if you can't get it to work? Bring it along! Let the experts from the **Pinnacles Astronomy Club** help! This will also be held at the **Berea College Forestry Outreach Center**.