



# the Skyscraper

vol. 49 no. 12  
December 2022

AMATEUR ASTRONOMICAL SOCIETY OF RHODE ISLAND \* 47 PEEPTOAD ROAD \* NORTH SCITUATE, RHODE ISLAND 02857 \* WWW.THESKYSCRAPERS.ORG

## In This Issue:

- 2 President's Message
- 3 We Lost the Lunar Eclipse – to Daylight!
- 4 Finding Pluto
- 4 In Memory of Althea Doodson
- 5 The Simple Pleasures of Observing a Lunar Eclipse
- 6 Skylights: December 2022
- 8 Book Review: Stars in Your Hand: A Guide to 3D Printing the Cosmos
- 9 The Sun, Moon & Planets in December
- 10 Lunatic's Corner: Mysteries of Crater Schiller
- 11 Field Trip to Frosty Drew Observatory
- 11 Observer's Challenge: NGC 7184
- 13 NASA Night Sky Notes: Binoculars: A Great First Telescope
- 14 Star Party Reports
- 14 November Lunar Eclipse Report
- 15 Celebrating the 70th Anniversary of AstroAssembly: 1952-2022
- 15 October Reports
- 18 AstroAssembly Astrophoto Contest Winners
- 24 Starry Scoop

## Holiday Meeting & Potluck Dinner Saturday, December 17

at North Scituate Community House

Meeting & Speaker: at 6:15 PM

Topic: Stonehenge: An Epic Enigma

Speaker: J. Kelly Beatty (In-person) Meeting presentation will also be conducted over Zoom. Contact Linda Bergemann ([L.Bergemann@aol.com](mailto:L.Bergemann@aol.com)) for Zoom Meeting link and information.

Some 5,000 years ago, a Neolithic civilization in southern England erected the world's most famous standing-stone monument. Yet its builders left no written records, so why and how they constructed it remains a mystery. Many of the smaller pillars, known as bluestones, were hauled to the site from central Wales — more than 100 miles away. And while Stonehenge is most famous for its alignment with the rising Sun during summer solstice, some researchers have suggested that it could have been constructed to serve as a daily calendar or even an eclipse calculator. Whatever its true purpose, Stonehenge remains an iconic enigma visited by 800,000 people each year.

J. Kelly Beatty has been explaining the

science and wonder of astronomy to the public since 1974, when he joined the staff of Sky & Telescope. An award-winning writer and communicator, he specializes in planetary science and space exploration. In 2018, after 43 years of pounding the keyboard, he retired from full-time work but remains actively involved in many S&T articles, tours, and other projects. You'll occasionally hear his interviews on The Weather Channel and National Public Radio. Kelly holds a Bachelor's degree from the California Institute of Technology and a Master's degree from Boston University. Asteroid 2925 Beatty was named on the occasion of his marriage in 1983, and in 1986 he was chosen one of the 100 semifinalists for NASA's Journalist in Space program.

**Seagrave Memorial  
Observatory  
Open Nights**  
December 3 & 10, 7pm

please join us for a  
**Holiday Potluck Dinner**

Saturday, December 17  
5:00 – 6:30 PM  
(Doors open at 4:45 PM)

North Scituate Community House  
546 West Greenville Road (Rt. 116)  
North Scituate, RI 02857

RSVP to Kathy Siok  
([kathys5@cox.net](mailto:kathys5@cox.net))

*Please bring a Main Course, Side or Dessert to share!  
(Power outlets available)*

# President's Message

by Linda Bergemann

I can not believe that it is December already. Time flies quickly when you're busy and having fun.

Our December meeting has been moved to Saturday, December 17 and will take place at the North Scituate Community House. We will begin the evening with a Holiday Potluck Dinner at 5 PM and conclude with our speaker, J. Kelly Beatty, beginning at about 6:15 PM. Note that the time of the presentation is different than normal because we must vacate the facility by 8 PM. You will find more details elsewhere in this newsletter. If possible, we will Zoom the presentation; watch for an email.

For all the newcomers, our winter meetings, January, February and March are not held at Seagrave Memorial Observatory. In the recent past, we have met at the Community House during these months. But, scheduling and access has become an issue. This year, meetings for these three months will be held on Zoom, and not in person. I

know that many have escaped from Zoom, never to return, but this option makes the most sense. We will return to Seagrave in April with a celebration of some kind. We will continue to open the observatory to the public on Saturday nights through the winter, as weather and conditions on the ground permit.

Speaking of January: Our speaker on January 7th will be meteorologist Joe Rao. Joe will present "Adventures of an Eclipse Chaser", a talk he had planned to give at AstroAssembly. He will come to us remote from New York. For February, we are discussing a potpourri of member presentations on their recent trip to Iceland and the Northern Lights.

Happy Holidays!

## Upcoming Events

**Dec. 3 - 7:00 PM Public Observing at Seagrave**

**Dec. 8 - 6:00 PM Astronomy Night at Winman Middle School, Warwick**

**Dec.10 - 7:00 PM Public Observing at Seagrave**

Volunteers needed for all events.

## New Members Welcome to Skyscrapers

Charles Miller  
of Hopkinton, MA

Gregory & Julie Driscoll  
of Warwick



## Skyscrapers Presentations on YouTube

Many of our recent monthly presentations on Zoom have been recorded and published, with permission, on the Skyscrapers YouTube channel. Go to the URL below to view recent presentations.

<https://www.youtube.com/c/SeagraveObservatorySkyscrapersInc>



*The Skyscraper* is published monthly by Skyscrapers, Inc. Meetings are held monthly, usually on the first or second Friday or Saturday of the month. Seagrave Memorial Observatory is open every Saturday night, weather permitting.

### Directions

Directions to Seagrave Memorial Observatory are located on the back page of this newsletter.

### Submissions

Submissions to The Skyscraper are always welcome. Please submit items for the newsletter no later than **December 15** to Jim Hendrickson at hendrickson.jim@gmail.com.

### E-mail subscriptions

To receive The Skyscraper by e-mail, send e-mail with your name and address to jim@distantgalaxy.com. Note that you will no longer receive the newsletter by postal mail.

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# We Lost the Lunar Eclipse – to Daylight!

by Francine Jackson

The November 8th total lunar eclipse was to be the last we would be able to see for several years. The previous one, in May, was for most sky watchers clouded out, either all or in part. Therefore, this was one many of us were hoping to see. Unfortunately, its timing wasn't really great: The Moon entered the dark shadow, the umbra, at 4:00 o'clock in the morning. Anyone who wanted to see and/or photograph this event had to realize there was going to be a big loss of sleep. But, many of us did it, anyway.

Jim Hendrickson and I went to Chase Farm, a couple miles from me in Lincoln, as it has a fairly good western horizon, broken up only by silos belonging to nearby Butterfly Farm. We arrived a little after 4:00 A.M., just as the Moon was beginning to enter the Earth's dark shadow, the umbra. From then, we watched as it slowly disappeared, finally reaching second contact at 5:16.

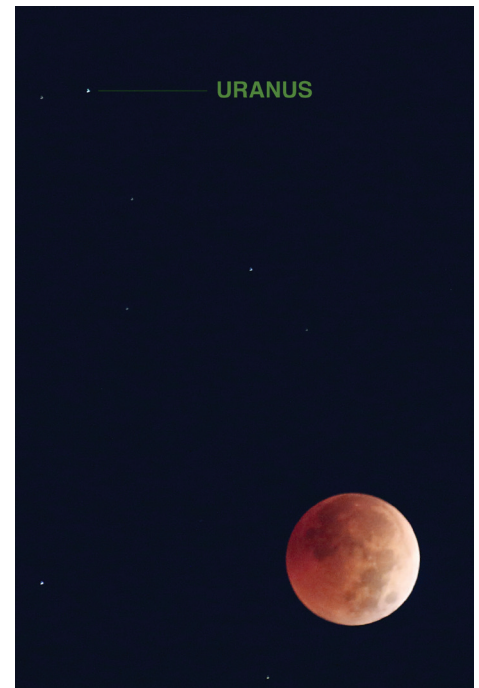
As usual, the media did try to hype this eclipse, by calling it a "blood Moon," as for some reason it believes the public likes to think about the Moon dripping blood;

actually, although the color was reddish, it was nowhere near the dark scarlet that "blood" would seem to infer. Instead, it was a steady, ruddy glow.

Although we had stopped at the local police station to ask permission to set up in the middle of the night in a town park, apparently, it wasn't necessary, as cars kept coming into the lot and parking. The first belonged to a father and his young son, who walked up the path, then stood around, apparently looking up; a few minutes later, as always, a dog owner came in, followed by a group who began "cooking" something – not the obvious – further away from us. Suddenly, though, I heard my name. I had mentioned the eclipse to a group I had met with Monday night, and one of the mem-

bers came up to enjoy the sight with us. As she had to work early that morning, she only stayed about an hour, but was very im-

Right: Uranus was at opposition the day following the lunar eclipse, and was clearly visible just 2° east of the Moon with binoculars during totality. Below: The fully eclipsed Moon sets into brightening morning twilight from Chase Farm in Lincoln. Photos by Jim Hendrickson





pressed with the Moon's different coloring.

In addition, we enjoyed observing the entire winter set of constellations, and seeing Mars virtually overhead. Plus, we were able to watch both the ISS and Tiangong make beautiful passes, and to listen to a rooster whose internal clock wasn't the greatest, as he cocked almost every fifteen minutes.

An amazing observation was that we weren't going to watch the entire lunar eclipse, as third contact took place after the Moon set; also, the Moon was becoming almost invisible, and was being drowned out by dawn, an interesting effect.

Although getting out of bed in the middle of the night isn't the greatest feat, it was

worth it, even though we had recently returned from Iceland, and were still on their time, but, we won't have another total lunar eclipse until springtime, 2025; plus, the next one's totality won't be as long as this one. And, of course, after so many eclipses that were clouded out, this one was worth the sleep loss.

## Finding Pluto

by Lloyd Merrill

Over the past few decades, there has been a lot of talk about Pluto from losing its status as an official planet to the spectacular fly-by images of the New Horizons spacecraft. It's an object that was so remote and dim that I never thought of actually seeking it out. Looking at my planetarium program, I soon discovered that Pluto's magnitude was 14.4. I wasn't quite sure what the limiting visual magnitude on my 152mm f5.9 refractor was but after finding an online calculator for that question, I got my answer, 12.5. I did find the math for calculating limiting magnitude an interesting topic that I may expand upon in a future article. The bottom line was, I wasn't going to see Pluto visually through my telescope.

All summer long I had my telescope configured for deep sky imaging and it dawned on me that Pluto was more of a stellar object. My deep sky camera would give me the image I wanted. I knew that my mount would center on the target but would I be able to pick out Pluto, and how would I identify it from all those other points of light?

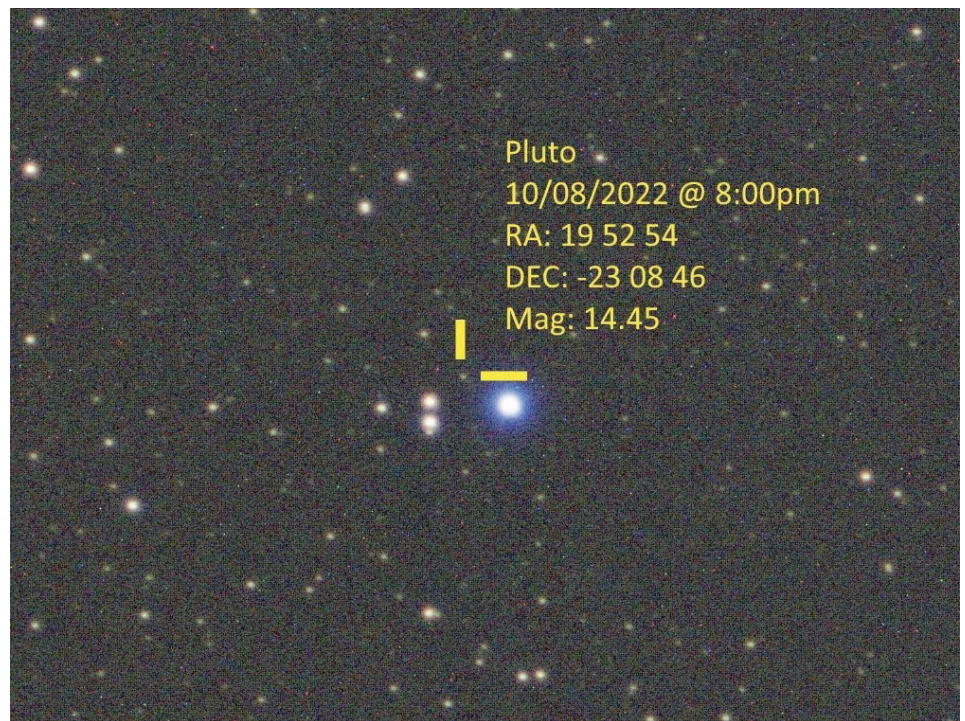
I took a 15-second image, plate solved, and adjusted the mount for the slight point-

ing error. I then took a 3-minute image. The picture came out great but which point of light was Pluto?

Using my planetarium program I knew the exact celestial coordinates for Pluto at that time. To make sure, I did a plate solve on the 3-minute image and then used an as-

tronomical tool to click on the point which I thought was Pluto. One click on the object and the exact coordinates I was looking for were displayed. I had identified Pluto!

It may be a trivial exercise but it brought me great satisfaction to stick with it and get a positive id on this now dwarf planet.



## In Memory of Althea Doodson

by Linda Bergemann

Sadly, I must report the loss of one of our newer members. Althea Doodson passed away on October 19; she was 89.

Althea and her husband Wayne joined Skyscrapers in 2018. Althea used a walker due to a severe back injury, but made it into our meeting hall with Wayne's caring assistance. Althea had an outgoing personality, as does Wayne, and they immediately engaged with my then 18-year-old nephew, Alex. At the time, Alex was contemplating joining the Coast Guard. Wayne, a career Coast Guardsman, and Althea regaled Alex

with stories of Coast Guard assignments around the US and the world. Alex did join the Coast Guard and Althea always asked of his well-being when I saw her in person, or when I spoke with both her and Wayne on the phone.

Unfortunately, I have not seen Althea since before COVID. We did talk about a year ago when they paid their membership dues up to 2025, and inquired of Alex. I will miss her caring and loving spirit. My thoughts and prayers are with Wayne and her family at this difficult time.



# The Simple Pleasures of Observing a Lunar Eclipse

by Bob Horton

I can't even say how many lunar eclipses I have seen over the years. I wish I had kept count, but it really doesn't matter. There is just something special about each eclipse, and no two have been the same.

The different experiences come from a number of factors. First of all, the appearance of the Moon is determined by the amount of particulates and aerosols in Earth's atmosphere, affecting the color and brightness of the Moon at mid-eclipse. The appearance can range from a bright copper-colored Moon if our atmosphere is predominantly clear, to a dull, brick red, if more of the sunlight is being scattered due to recent forest fires and/or volcanic eruptions here on earth. I can recall one lunar eclipse that we observed from Ladd Observatory many years ago when the Moon simply disappeared from view, leaving nothing more than a dark spot in the sky.

Another influence that will add to the experience, and an important one to me, is the location one chooses to observe an eclipse from. I have observed previous eclipses from a variety of locations. A more recent one was from home, just after an ice storm that left tree branches coated with

ice, and a gentle breeze that night that made swaying branches sound like the clinking of crystal glass. Another time I observed and photographed an eclipse from Beaver-tail State Park, listening to the waves crash against the rocks, and the sound of the lighthouse horn periodically piercing the quiet of the night.

And finally, one has the choice of making their observations something to enjoy as either a solitary experience, or to join in with others. When you read the personal accounts from others, you will see that their experiences differ from one another, each one unique to the individual observer.

Because this eclipse happened so early in the morning, I opted to keep my photographic ambitions in check by not lugging a lot of equipment into the field at such an early hour. Instead, my plan was to simply enjoy watching the eclipse with a portable, small telescope and a pair of binoculars. I wanted to observe this eclipse from a location that was not far from home, and had a scenic view looking towards the western horizon, allowing me the opportunity to enjoy the eclipse, low in the west during the pre-dawn sky.

In scouting locations ahead of time, a couple of friends invited me to check out the view from their home, perched on a hill in nearby Connecticut. This turned out to be the perfect location for the photograph I had envisioned - distant, rolling hills, with a village nestled in the valley below, complete with a church that has a tall steeple.

I enjoyed observing this lunar eclipse, from first contact all the way until the sky got so bright that it was difficult to still see the Moon. Most of my observations were done from relaxing in a folding chair and observing with a pair of binoculars. I would occasionally get up and view through my small telescope, but honestly, I think I enjoyed the more three dimensional view that the binoculars provided, showing the bright, copper-colored Moon at mid-eclipse, floating among the stars. My camera setup was simple - just my 35mm DSLR with a 50mm lens on a sturdy tripod. At mid-eclipse, I took a few photos, and the one presented here is the one that I think best captures the experience I had - a beautiful, eclipsed Moon hanging in a star-filled sky over a scenic landscape.



# Skylights: December 2022

by Jim Hendrickson

December brings the solstice, and with it, the longest nights of the year. The final month of 2022 gives us a favorable opposition of Mars, which, although not the closest, always brings excitement and enthusiasm for planetary observers, as it returns only once every 26 months.

The Red Planet is at its closest to Earth early on the 1st, at a distance of 0.544 AU. That's 4.5 light minutes away. Through a telescope, you will see a 17 arcsecond globe with surface features that rotate slightly slower than Earth. About 40 minutes later each night, you will see the same longitude of Mars facing Earth.

During early December, Mars is just 1° north of open cluster NGC 1746, a large and loose binocular-visible cluster in Taurus. Notice how dramatic Mars's motion is in our sky, moving about 1/2° westward each night. By the end of the month, it will be located just north of Davis's Dog, a large and bright, yet often overlooked asterism located close to both the more prominent Hyades and Pleiades clusters. The asterism was first noted by the late John Davis, a prolific deep-sky observer from western Massachusetts, who enjoyed attending many of the local conventions, including AstroAssembly.

The Full Cold Moon occurs on the 7th. This month's full Moon is notable for two reasons: The first is that it is the most northerly full Moon of 2022. This is because the full Moon closest to the winter solstice will be near the northernmost region of the ecliptic, opposite the Sun, which is at the southernmost point.

The December full Moon is best experienced late at night from an area located

away from artificial lights. Close to midnight, the high angle of the moonlight illuminating your surroundings is evocative of the sunlight experienced at noon near the June solstice. This effect is further enhanced by the lack of foliage, and a freshly-fallen snow will give the night an almost daylight-like appearance. This is the best time to take a moonlit night hike.

The second reason that this month's full Moon is noteworthy is that during the late evening of December 7, it will pass very close to Mars, which will be at opposition just a few hours later. For observers north of a line that extends from southern New Hampshire and through central and western Massachusetts, the Moon will actually occult Mars. At Seagrave Observatory, the closest the two objects will appear to each other is 25 arcseconds, or just 1.5 times the apparent diameter of Mars at the time. This will occur at about 11:30pm, and should be a spectacular sight.

The Sun is traversing the most southerly position of the ecliptic this month, and it is notable that it spends a significant amount of time in a constellation that is not part of the set of twelve, known as the zodiac. From the final day of November, through the 18th of December, the Sun transits the constellation Ophiuchus, the serpent-bearer. From there, it enters Sagittarius, where it will spend the next month.

Solstice occurs at 16:30 EST on the 21st. At the most southerly point of the Sun's path across our sky, it lies 23.4° south of the celestial equator, and at 11:44 EST on the 21st, it climbs no higher than 24.7° in our sky, as seen from Seagrave Observatory. On the longest night, we have 14 hours

## Events in December

- 1 Moon 2.2° S of Jupiter
- 4 Neptune Stationary
- 7 **Full Cold Moon**
- 7 Moon 25" N of Mars
- 8 Earliest Sunset (4:14pm)
- 8 Mars Opposition
- 13 Geminids Meteor Shower Peaks
- 14 Neptune Eastern Quadrature
- 16 **Last Quarter Moon**
- 21 Solstice
- 21 Mercury Greatest Elongation East (20°)
- 21 Jupiter Eastern Quadrature
- 23 **New Moon**
- 24 Moon, Venus & Mercury in a 7° circle
- 26 Moon 4.6° SE of Saturn
- 28 Moon 2.8° SE of Neptune
- 28 Venus 1.5° S of Mercury
- 28 Mercury Stationary
- 29 **First Quarter Moon**
- 29 Moon 6.7° E of Jupiter

Ephemeris times are in EST (UTC-5) for Seagrave Observatory (41.845N, 71.590W)

and 53 minutes of night (between sunset on the 21st and sunrise on the 22nd), although true astronomical darkness (when the Sun is greater than 18° below the horizon) is actually 11 hours and 31 minutes.

In an event of cosmic coincidence, the Sun appears to cross the galactic equator just eight hours after the solstice, though it doesn't eclipse the exact center, as its point of passage is 6.4° north of Sgr A\*. If we could see the sky behind the Sun, the Lagoon Nebula, Messier 8, would be less than 1° to the southeast of the Sun.

The earliest sunset occurs at 4:14pm on the 8th.

Mercury and Venus have been in our evening sky for several weeks, but have been hovering too low in twilight to be easily observed. The second half of December brings our two innermost planets back into good viewing position.

The 3.4% illuminated crescent Moon joins the pair on the 24th. Look for it 6.3° southeast (to the left) of Venus, and 4.2° south-southeast of Mercury.

Mercury reaches its greatest elongation on the 21st, when it will be 20° east of the Sun. For a few days on either side of greatest elongation, Mercury remains visible for over an hour after sunset.

Venus appears closest to Mercury on the



A simulated view of the close conjunction of the Moon and Mars on December 7, 2022 using Stellarium. From Seagrave Observatory, Mars appears just 25 arcseconds south of the Moon at 11:30pm EST.



26th, when it will be  $1.5^\circ$  south of the innermost planet. They will then swap positions on the 30th, when Venus begins to set later than Mercury, which dives rapidly towards the Sun for its next inferior conjunction on January 7. The final week of December and first few days of January is the best time for viewing Mercury with a telescope, as it exhibits a rapidly changing phase, and increasing size.

If you're up for a real challenge, Pluto is just  $1^\circ$  south-southeast of Venus on the 31st.

While the prime season for viewing Saturn has passed, the ringed planet remains high enough in the sky during the early evening hours for telescopic observation. You'll notice how its eastward motion is bringing it back towards Nashira and Deneb Algedi (gamma and delta Capricorni), a position it was in back in August. The 4-day crescent Moon passes  $4.6^\circ$  southeast of Saturn on the 26th.

Now over 10 AU away from Earth, Saturn has grown noticeably smaller in a telescope, with its globe being about 16 arcseconds across - slightly smaller than that of Mars through much of December.

The 4-day-old, 17% illuminated waxing crescent Moon passes  $4.5^\circ$  to the southeast of Saturn on the 26th.

Jupiter is visible high in the south during twilight, and remains the most prominent star-like object in the evening sky. By mid-month, Jupiter sets before midnight, and on the 21st, it reaches quadrature,  $90^\circ$  east of the Sun, in heliocentric longitude.

The 9-day gibbous Moon passes  $2.2^\circ$  south of Jupiter on the night of the 1st-2nd.

Our outermost planet, Neptune, is an 8th magnitude, bluish point of light about  $7^\circ$  west of Jupiter along the ecliptic, and can be found in binoculars and telescopes near the midpoint of the southeastern segment of a 1.5 diamond asterism just 5 south of the Circler asterism of Pisces. Neptune ends its retrograde motion on the 4th, resuming its eastward motion along the ecliptic. On the 28th, the 6-day crescent Moon is  $2.8^\circ$  southeast of Neptune, and  $7.5^\circ$  southwest of Jupiter.

Uranus, in Aries, remains well-positioned for observing through December. It is already high in the southeastern sky as twilight fades, so you do not need to wait long to observe it with a telescope. It can be located in a field of similarly bright stars about midway between Bharani (41 Arietis) and Menkar (alpha Ceti). Uranus is a blue-green star-like point that is visible in binoculars or small telescopes. The waxing

gibbous Moon is  $4^\circ$  to its east on the 5th.

The morning sky is now devoid of bright solar system objects, but early risers will notice the return of the constellations of spring, with Ursa Major and Leo at their highest positions just before twilight.

While one dwarf planet (Pluto) leaves our evening sky, the closest one, Ceres, is now easily visible in the morning sky. Rising just after midnight at the beginning of the month, Ceres is just a few degrees south-southeast of Denebola, the tail of Leo. It enters Virgo on the 5th, and will be worth keeping track of throughout winter as it makes an apparent loop around the Realm of the Galaxies. Currently shining at 8th magnitude, slightly dimmer than Neptune, Ceres can be observed with binoculars under dark sky conditions.

Asteroid 2 Pallas reaches opposition in early January, but this is not a favorable apparition for observers in the northern hemisphere, as it is hovering quite low in the sky. If you have a good southern horizon, you can track Pallas moving among the hind legs of Canis Major.

Somewhat easier to observe, 3 Juno and 4 Vesta are visible in the early evening sky. Juno is 9th magnitude, and Vesta is hovering around magnitude 8. Both objects are moving eastward through Aquarius, between Jupiter and Saturn. They are highest in the sky at about the same time Fomalhaut (alpha Piscis Austrinus) is on the meridian.

The Geminids meteor shower is active during December, and peaks on the morning of the 14th. The 71% illuminated waning gibbous Moon rises after 9:00pm EST on the 13th, and 61% illuminated Moon rises after 10:00pm on the 14th, making this a somewhat favorable year for observing what is one of the more consistently productive meteor displays of the year. A patient observer may see several dozen meteors per hour during peak activity. This shower originates from the unusual asteroid 3200 Phaethon, which orbits the Sun in a more comet-like 17-month orbit that ranges from 0.14 to 2.40 AU.

While observing the meteor shower on the 13th, watch the Moon soon after it rises, as it will occult eta Leonis. The 3rd magnitude star disappears behind the bright limb of the Moon at 10:09pm, and reappears from the dark limb at 10:54pm.

Rounding out the lunar calendar, last quarter occurs on the 16th, new Moon is on the 23rd, and first quarter on the 29th.

It is with sadness that we've lost two notable figures from the world of astronomy

recently. The first is Jay M. Pasachoff from Williams College. Pasachoff was known for being a prolific eclipse chaser, having [observed 75 of them](#), including 36 total eclipses, from 1959-2022, as well as both transits of Venus, in 2004 and 2012.

It was from Pasachoff that I first learned of the transits of Venus. While I didn't know Jay personally, much of my early knowledge of astronomy was obtained from my well-worn 1983 edition of *The Peterson Field Guide to the Stars & Planets*, which he co-authored with Donald Menzel. Among the knowledge I gleaned from this book was details on solar system observation, including the clouds and moons of Jupiter, the upcoming (far in future from my reading it in the mid-1980s) transits of Venus in 2004 and 2012, and the (even farther out) 2017 total solar eclipse.

I had always wanted to meet Jay, and have him autograph my copy of the Field Guide. I finally did get to see him in person, albeit briefly, at the 2022 Hartness House Workshop, held in Springfield, Vermont before the Stellafane Convention. He gave an engaging presentation about solar eclipses, including many of his personal experiences. He didn't stick around long after the presentation, and my Field Guide remains unsigned. Jay passed in November at the age of 79.

The second big astronomer who has left us for the stars is Jim Kaler from the University of Illinois. I had never met Kaler, but he taught me much of what I know about stellar evolution and astrophysics through the many excellent books on the topic. While Carl Sagan informed us that "we are made of star stuff," Kaler's work tells us how that star stuff came to be.

Kaler maintained a database of about 1000 of the brightest and most significant stars that I reference often to produce content for this newsletter, as well as other personal knowledge and projects. After learning of [his passing](#), I went into the database and picked a random star to learn about - a bright star, visible high in our sky this time of year, but one that is often overlooked.

Mirfak, alpha Persei, is a circumpolar star from our latitude, meaning that it never rises nor sets. At magnitude 1.75, it is as bright as the stars in the handle of the Big Dipper and in Orion's Belt, yet it never gets its due attention. Perseus, to many, is a constellation associated with the annual August meteor shower, housing the most well-known eclipsing binary star, Algol, and for deep sky observers, the home territory of

the beautiful Double Cluster (even though most star-hopping journeys start in Cassiopeia). To name another notable object in Perseus, many amateur astronomers would hesitate as they try to recall the Messier and Caldwell lists, perhaps recalling M34 from a past experience with the Messier Marathon.

You may be surprised to know that Perseus contains an open cluster that is both larger and brighter than the nearby Pleiades. The Alpha Persei cluster, also known as Melotte 20, is a real treat to binocular

observers, or for an extended gaze with a small, rich field telescope. The cluster consists of mostly hot, young stars, at a distance of 570 light years. Its brightest member, Mirfak, is a class F5 supergiant that lies 590 light years away, contains eight times the mass of the Sun, shines with 5,000 times its brilliance, and has a radius 62 times greater, which is 75% of the semimajor axis of the orbit of Mercury. More fascinating facts about Mirfak can be found on Jim Kaler's [Stars database](#).

The name Mirfak is derived from a longer Arabic name that translates to "elbow of the Pleiades," a name which describes how I often associate the rising of Perseus to the forthcoming rising of the Pleiades, as the longer string of stars in Perseus points directly to the more well-known cluster of Taurus.

The next time you're out under a clear, moonless sky, take a minute to become familiar with Mirfak and the Alpha Persei Cluster.

## Book Review

# Stars in Your Hand: A Guide to 3D Printing the Cosmos

by Kimberly Arcand and Megan Watzke, Cambridge, Mass.: MIT Press, 2022, ISBN [9780262544153](#), paperback, \$21.95 U.S.

Reviewed by Francine Jackson

We're hearing of using 3D printers on the International Space Station, but what about here on Earth? Turns out, many celestial objects can not only be made using three-dimensional printers, but they can be very instructive, and, quite honestly, fun. Imagine being able to hold a supernova remnant! Turning it around, to understand its total makeup. And, what about a galaxy?

The authors, both members of the Chandra X Ray Observatory team, understand how difficult it can be attempting to explain the sky in two dimensions to the public; however, with this added visualization, an object can be transformed into a much easier teaching tool. Using, for example, the Crab Nebula, suddenly its jets are easily explained. Or, one of our largest known galaxies, M87. Several years ago, its giant centralized black hole was imaged through the work of multiple astronomers utilizing an amazing number of telescopes capable of working together. But, the "picture" giv-

en to the public, although striking to those who understood the incredible amount of work needed to create it, possibly needed more explanation. Using 3D, suddenly the size and depth of that black hole comes into focus.

**Stars in Your Hand** is a good introduction to the concept of using 3D imaging to explain what might be difficult to comprehend. And, if the reader would like to know more, including how to make figures such as these, or any other three dimensional representations, the authors have given a [web site](#) to direct all who would like to better understand how this process is done. Of course, the examples in this book are the result of much time needed to understand the celestial objects created, and the final products are amazing. However, for the person who always wondered what can be accomplished using this new educational tool, this book is a great start.



## Francine Jackson Celebrates 50 Years at Ladd Observatory

Francine was recently recognized for her 50 years of volunteerism at Ladd Observatory

<https://drive.google.com/file/d/1w5FUhnjGG54BwohJQUkjl4zvlpqpwB9Y/>



# The Sun, Moon & Planets in December

This table contains the ephemeris of the objects in the Solar System for each Saturday night in December 2022. Times in Eastern Standard Time (UTC-5). Ephemeris times are for Seagrave Observatory (41.845N, 71.590W).

Object	Date	RA	Dec	Const	Mag	Size	Elong	Phase(%)	Dist(S)	Dist(E)	Rise	Transit	Set
<b>Sun</b>	<b>3</b>	16 36.8	-22 03.8	Oph	-26.8	1946.7	-	-	-	0.986	06:56	11:36	16:16
	<b>10</b>	17 07.3	-22 53.2	Oph	-26.8	1948.7	-	-	-	0.985	07:02	11:39	16:15
	<b>17</b>	17 38.2	-23 20.7	Oph	-26.8	1950.1	-	-	-	0.984	07:07	11:42	16:17
	<b>24</b>	18 09.3	-23 25.3	Sgr	-26.8	1951.1	-	-	-	0.984	07:11	11:45	16:20
	<b>31</b>	18 40.3	-23 07.0	Sgr	-26.8	1951.7	-	-	-	0.983	07:13	11:49	16:25
<b>Moon</b>	<b>3</b>	0 44.3	1 01.3	Cet	-12.3	1896.1	120° E	75	-	-	13:54	20:28	03:14
	<b>10</b>	6 39.5	26 52.9	Gem	-12.5	1784.0	159° W	97	-	-	18:08	02:11	10:08
	<b>17</b>	12 13.8	1 34.0	Vir	-11.7	1808.9	83° W	44	-	-	00:23	06:37	12:39
	<b>24</b>	18 42.6	-27 54.1	Sgr	-7.3	1988.0	9° E	1	-	-	08:47	13:10	17:38
	<b>31</b>	1 19.1	5 51.4	Psc	-12.1	1891.0	101° E	60	-	-	12:21	19:11	02:14
<b>Mercury</b>	<b>3</b>	17 33.8	-25 25.9	Oph	-0.5	5.0	13° E	93	0.443	1.337	08:11	12:34	16:57
	<b>10</b>	18 20.2	-25 41.0	Sgr	-0.5	5.4	17° E	86	0.413	1.241	08:31	12:53	17:15
	<b>17</b>	19 03.2	-24 45.8	Sgr	-0.5	6.1	19° E	74	0.374	1.109	08:41	13:08	17:35
	<b>24</b>	19 35.9	-22 51.6	Sgr	-0.2	7.2	20° E	53	0.335	0.942	08:36	13:11	17:47
	<b>31</b>	19 43.6	-20 45.0	Sgr	1.3	8.8	15° E	21	0.310	0.770	08:04	12:48	17:31
<b>Venus</b>	<b>3</b>	17 20.7	-23 35.4	Oph	-3.8	10.1	10° E	99	0.727	1.676	07:49	12:20	16:52
	<b>10</b>	17 59.1	-24 09.8	Sgr	-3.8	10.2	12° E	98	0.728	1.662	08:02	12:31	17:00
	<b>17</b>	18 37.6	-24 07.7	Sgr	-3.8	10.3	14° E	97	0.728	1.647	08:13	12:42	17:12
	<b>24</b>	19 15.9	-23 29.2	Sgr	-3.8	10.4	15° E	97	0.728	1.629	08:20	12:53	17:26
	<b>31</b>	19 53.6	-22 15.5	Sgr	-3.8	10.5	17° E	96	0.728	1.610	08:25	13:03	17:42
<b>Mars</b>	<b>3</b>	5 07.5	24 58.7	Tau	-1.7	17.2	172° W	100	1.528	0.545	16:19	23:59	07:40
	<b>10</b>	4 55.6	24 59.0	Tau	-1.7	16.9	177° E	100	1.537	0.552	15:39	23:20	07:00
	<b>17</b>	4 44.4	24 53.7	Tau	-1.6	16.4	168° E	100	1.546	0.570	15:02	22:42	06:22
	<b>24</b>	4 35.1	24 45.0	Tau	-1.4	15.7	158° E	99	1.554	0.597	14:26	22:05	05:45
	<b>31</b>	4 28.3	24 36.3	Tau	-1.2	14.8	150° E	97	1.563	0.633	13:52	21:31	05:10
<b>1 Ceres</b>	<b>3</b>	11 59.1	10 52.4	Leo	8.6	0.5	76° W	96	2.558	2.618	00:14	06:56	13:38
	<b>10</b>	12 07.9	10 24.3	Vir	8.5	0.5	80° W	96	2.558	2.530	23:57	06:38	13:18
	<b>17</b>	12 16.1	10 01.6	Vir	8.4	0.5	85° W	96	2.558	2.441	23:39	06:18	12:57
	<b>24</b>	12 23.6	9 45.0	Vir	8.4	0.5	91° W	96	2.559	2.351	23:20	05:58	12:36
	<b>31</b>	12 30.4	9 35.2	Vir	8.3	0.5	96° W	96	2.559	2.262	23:00	05:37	12:14
<b>Jupiter</b>	<b>3</b>	23 58.4	-1 43.3	Psc	-2.4	43.2	108° E	99	4.952	4.555	12:57	18:53	00:49
	<b>10</b>	23 59.4	-1 34.3	Psc	-2.4	42.2	101° E	99	4.952	4.663	12:30	18:27	00:23
	<b>17</b>	0 01.1	-1 21.5	Psc	-2.3	41.2	95° E	99	4.951	4.773	12:04	18:01	23:58
	<b>24</b>	0 03.3	-1 05.2	Psc	-2.3	40.3	88° E	99	4.951	4.884	11:37	17:36	23:34
	<b>31</b>	0 06.0	-0 45.5	Psc	-2.2	39.4	82° E	99	4.951	4.995	11:11	17:11	23:11
<b>Saturn</b>	<b>3</b>	21 31.2	-16 00.9	Cap	0.8	16.3	69° E	100	9.843	10.150	11:24	16:27	21:30
	<b>10</b>	21 33.2	-15 51.2	Cap	0.8	16.1	63° E	100	9.841	10.255	10:57	16:01	21:05
	<b>17</b>	21 35.3	-15 40.2	Cap	0.8	16.0	56° E	100	9.839	10.355	10:31	15:36	20:40
	<b>24</b>	21 37.8	-15 28.0	Cap	0.8	15.9	50° E	100	9.838	10.447	10:05	15:11	20:16
	<b>31</b>	21 40.4	-15 14.9	Cap	0.8	15.7	43° E	100	9.836	10.531	09:40	14:46	19:52
<b>Uranus</b>	<b>3</b>	2 54.5	16 15.9	Ari	5.7	3.8	155° E	100	19.674	18.775	14:46	21:49	04:51
	<b>10</b>	2 53.5	16 11.8	Ari	5.7	3.7	148° E	100	19.673	18.833	14:18	21:20	04:22
	<b>17</b>	2 52.6	16 08.2	Ari	5.7	3.7	140° E	100	19.672	18.903	13:50	20:52	03:54
	<b>24</b>	2 51.9	16 05.0	Ari	5.7	3.7	133° E	100	19.671	18.985	13:22	20:23	03:25
	<b>31</b>	2 51.2	16 02.5	Ari	5.7	3.7	126° E	100	19.670	19.077	12:54	19:55	02:57
<b>Neptune</b>	<b>3</b>	23 34.9	-4 01.4	Aqr	7.9	2.3	102° E	100	29.913	29.695	12:42	18:30	00:17
	<b>10</b>	23 34.9	-4 00.9	Aqr	7.9	2.3	95° E	100	29.913	29.815	12:15	18:02	23:50
	<b>17</b>	23 35.1	-3 59.8	Aqr	7.9	2.3	88° E	100	29.913	29.936	11:47	17:35	23:23
	<b>24</b>	23 35.3	-3 58.0	Aqr	7.9	2.3	81° E	100	29.913	30.057	11:20	17:08	22:55
	<b>31</b>	23 35.6	-3 55.6	Aqr	7.9	2.3	74° E	100	29.913	30.175	10:52	16:40	22:28
<b>Pluto</b>	<b>3</b>	19 57.3	-22 58.5	Sgr	14.5	0.2	46° E	100	34.659	35.335	10:19	14:53	19:26
	<b>10</b>	19 58.1	-22 56.7	Sgr	14.5	0.2	39° E	100	34.663	35.421	09:52	14:26	19:00
	<b>17</b>	19 58.9	-22 54.7	Sgr	14.5	0.2	32° E	100	34.668	35.496	09:26	13:59	18:33
	<b>24</b>	19 59.8	-22 52.6	Sgr	14.5	0.2	25° E	100	34.673	35.559	08:59	13:33	18:07
	<b>31</b>	20 00.7	-22 50.5	Sgr	14.5	0.2	18° E	100	34.677	35.609	08:32	13:06	17:40

# Mysteries of Crater Schiller

by Michael Corvese

The crater named for Julius Schiller can be found in the southwest quadrant of the moon, very close to the limb and is best viewed on lunar days 11 and 24. Oddly shaped, it somewhat resembles an elongated footprint. The elongation is amplified by its location close to the lunar limb. It is found within a larger structure called the Schiller-Zucchius Basin. Also known unofficially as the Schiller Annular Plain, the Pre-Nectarian basin contains an eroded outer ring about 200 miles in diameter and a partial inner ring.

The crater is 112 miles long by 44 miles wide and is approximately 2.5 miles deep. The walls are terraced with evidence of a significant slide on the northern wall. The floor is primarily smooth, most likely due to lava flows occurring after impact. A strange, double ridge exists in the northern section that cuts the crater in half. The origin of these ridges is not well understood. At the southern terminus, crater Rost B is connected to Schiller by a wide valley. It is not known whether this valley was formed by volcanic activity or by other geologic processes such as igneous intrusion.

It is not known exactly how this crater



was formed but upon close observation, one can see the outlines of three possible impact craters within the larger structure. No natural impact or occurrence can explain the odd shape of this crater. The most credible theory is that a group of meteoroids struck simultaneously, the high heat and melted material obliterating evidence of the separate impacts.

The crater's namesake, Julius Schiller was a monk, lawyer, and astronomer who lived from 1580-

1627 in Augsburg, Germany. He was a close friend of Johann Bayer, author of the famous Uranometria star atlas (1603) and with his support, published a Christianized version of a star atlas in 1627. The 12 zodiac signs were replaced with the twelve apostles, the northern constellations to New Testament figures, and the southern constellations to Old Testament figures. This atlas, though noted for its artistry and originality, was not considered a serious scientific work by the academic community.

There are many unknowns about crater Schiller including its origin, shape, and ridges, and valleys making it an interesting object to observe and study. Put this crater in your eyepiece for a view of a very unique and mysterious lunar feature.

Michael Corvese is a confirmed lunatic of many years regardless of his recent interest in lunar observing.





# Field Trip to Frosty Drew Observatory

by Michael Corvese

On Sunday, November 20th, members of Skyscrapers attended an observing night at Frosty Drew Observatory. It was forecasted to be a cold but clear night with wind chills in the 20s. About 17 intrepid Skyscrapers members bundled up to brave the cold for a view through Frosty Drew's new 24" Plan-eWave, Corrected Dall-Kirkham telescope.

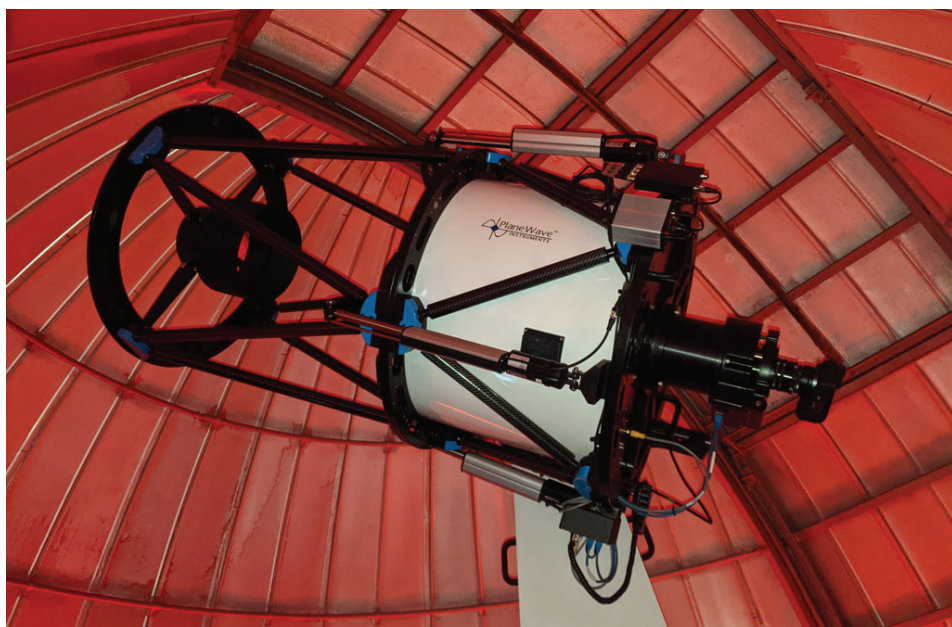
Frosty Drew is in Ninigret Park in Charlestown, RI, and the dark sky was immediately noticeable upon exiting the car. It was so dark that some of us had trouble finding the observatory and parking lot! Once our eyes dark adapted, hundreds of

more stars were visible than in other suburban sites. Andromeda (M31) was a naked eye object there. Led by Scott MacNeill, Frosty Drew Observatory Director, and telescope operator at Brown University, we learned about the purchase and challenges of installing and commissioning such a fine piece of equipment. The mount is as impressive as the telescope itself. It is a direct drive Alt/Az mount that does not require gears. The movement of the telescope is smooth and almost silent as it pivots to reach its target. For someone who loves telescopes, the operation is really something to behold.

As it turned out, the wind died down quite a bit after sunset, providing some relief for our party. Although still cold, the lack of wind made observing a much more pleasurable experience. Scott kept the Theater and Science Center open for anyone to warm up or use the restrooms. Our observing started with deep-sky objects. Old friends M57 (Ring Nebula), M27 (Dumbbell Nebula), and M31 (Andromeda) took on new life observing through a 24" telescope. We then moved to some interesting globular clusters, and some other galaxies, such as M74.

Although the seeing wasn't optimal, we turned the scope to Jupiter and then later, as it got higher in the sky, Mars. After getting past the image brightness provided by this fast focal ratio telescope, the view of Jupiter revealed much detail. The Great Red Spot was clearly visible, as were the equatorial and temperate belts when the atmosphere settled down. Mars was also a treat, showing us its southern polar cap and some dark mare structure. We ended the evening with some double stars, and even a bright red carbon star, S Cephei.

It was a nice evening, and the members were happy they attended. We thank Scott MacNeill for inviting Skyscrapers to Frosty Drew, and for guiding us through a wonderful night of observing with an exceptional telescope. It was agreed that we should organize another such event in the future.



## Observer's Challenge: NGC 7184: Barred Spiral Galaxy in Aquarius

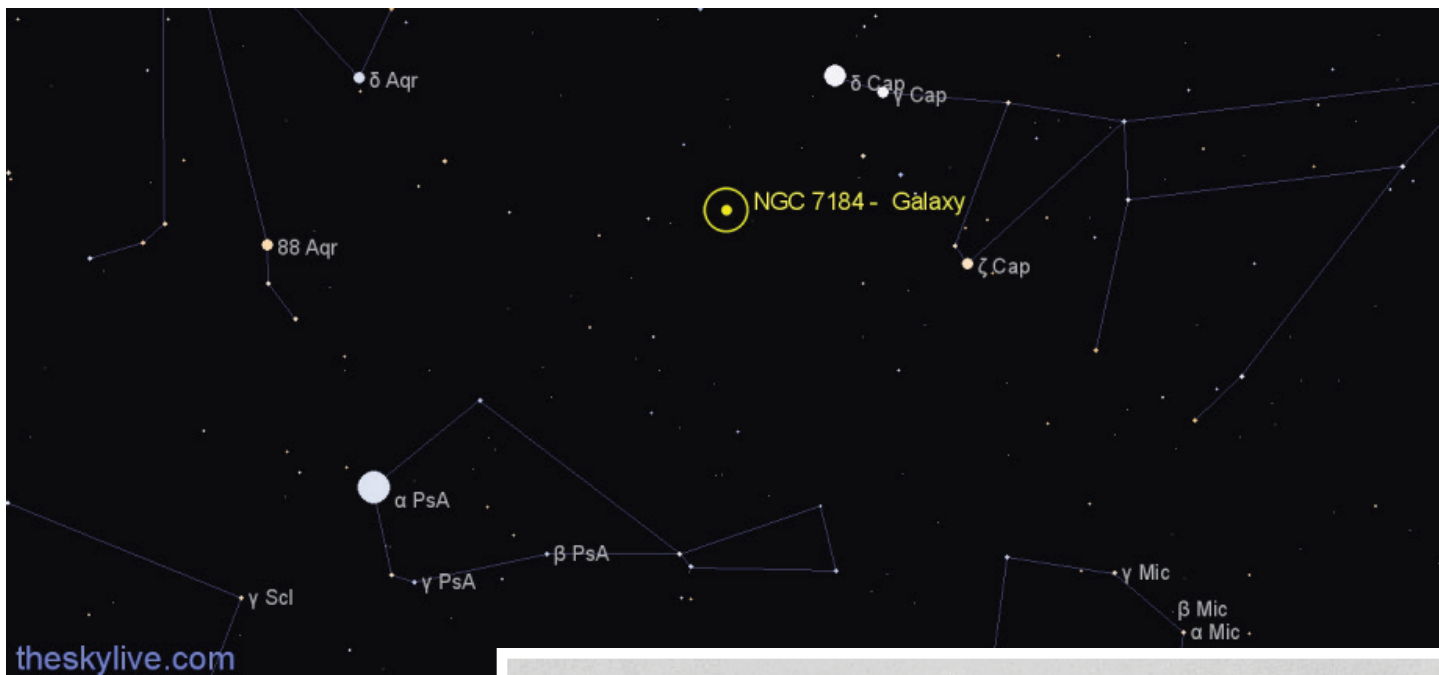
by Glenn Chaple

Magnitude 10.9; Size 6.0' X 1.5"

Visual astronomers are always advised to observe a sky object when it's as high above the horizon as possible. This month's Observer's Challenge, the barred spiral galaxy NGC 7184, makes this piece of advice difficult to follow. Located in the constellation Aquarius at a declination of nearly -21 degrees, it's never very high above the southern horizon for astronomers living in



Mario Motta, MD. "Taken with my 32 inch F6.5, 1 hour Luminance, then 1 hour Blue, 30 min green, and 45 min red filters. I tried H alpha, but the signal was poor in that filter, did not include in processing. Taken with ZWO ASI6200 camera."



mid-northerly latitudes.

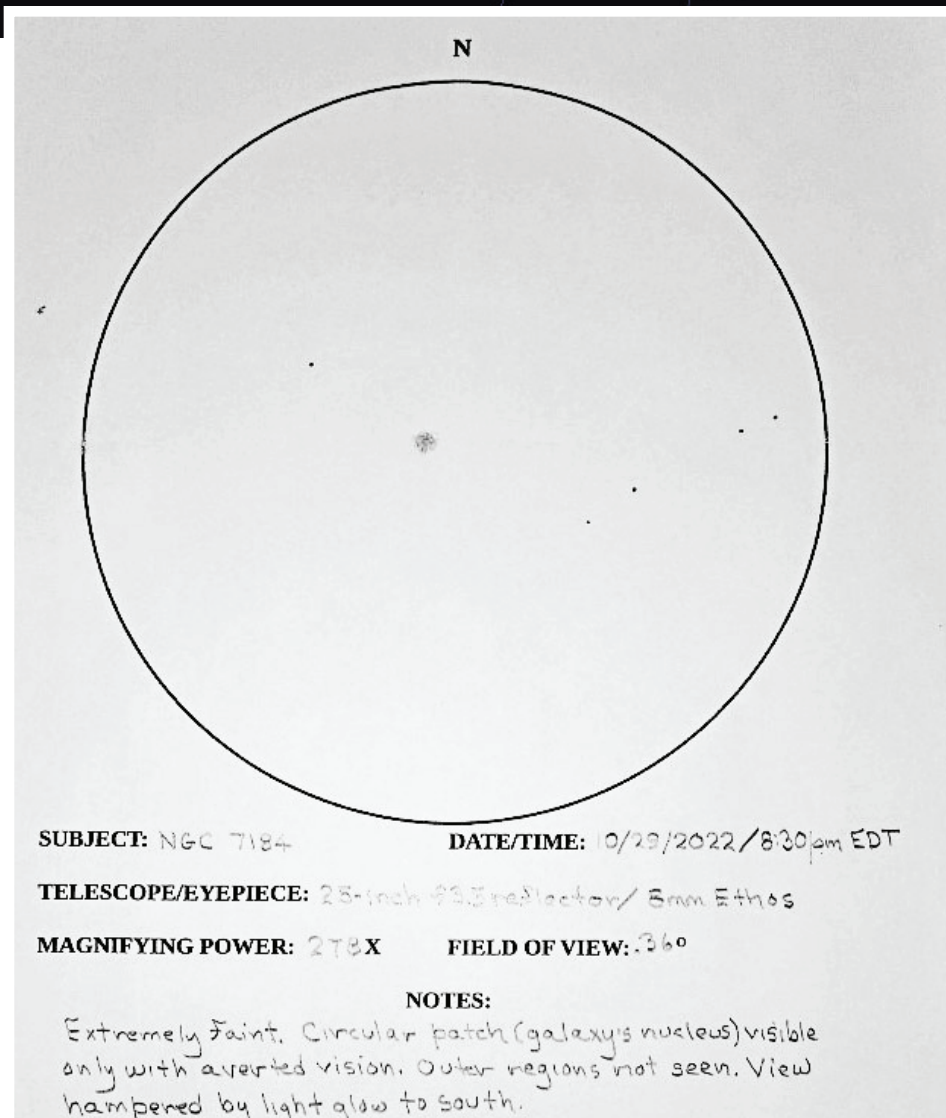
NGC 7184 is located at the 2000.0 coordinates RA 22h02m39.8s, Dec. -20°48'46". It can be found by star-hopping from the stars gamma ( $\gamma$ ) and delta ( $\delta$ ) Capricorni (the stars that form the tail of the Sea-Goat). An alternate and more direct route can be had with a westerly star-hop from the 5th magnitude star 41 Aquarii.

When William Herschel discovered this object on October 28, 1783, he described it as "Faint, considerably large, much extended, brighter in the middle, easily resolvable." Faint it is – especially if you live in an area cursed by a light-polluted southern horizon!

My initial attempt at NGC 7184 with a 10-inch f/5 reflector drew a blank – a bigger scope would be needed! A few night later, I teamed up with fellow ATMoB member Steve Clougherty to use the club's 25-inch f/3.5 Dobsonian-mounted reflector. I was able to aim the big scope at the desired location, but it was Steve's trained eye that picked out NGC 7184. The 25-inch failed to reveal the outer spiral arms, capturing only a circular smudge that proved to be the galaxy's core. Bright lights from a shopping center a few miles to our south proved to be our undoing.

Imagers or visual observers working with medium to large aperture scopes under dark sky conditions will make out the details Steve and I missed. Most notable is a bright inner ring formed by the spiral arms. Whether you capture this intricate detail or merely catch a fleeting glimpse of a hazy circular smudge, you're looking at light that left this galaxy some 115 million years ago.

The purpose of the Observer's Challenge



is to encourage the pursuit of visual observing. It is open to anyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'd be happy to include them in our monthly summary. Submit your ob-

servicing notes, sketches, and/or images to Roger Ivester ([rogerivester@me.com](mailto:rogerivester@me.com)). To find out more about the Observer's Challenge, log on to [rogerivester.com/category/observers-challenge-reports-complete](http://rogerivester.com/category/observers-challenge-reports-complete).



# Binoculars: A Great First Telescope

by David Prosper

Do you want to peer deeper into the night sky? Are you feeling the urge to buy a telescope? There are so many options for budding astronomers that choosing one can be overwhelming. A first telescope should be easy to use and provide good quality views while being affordable. As it turns out, those requirements make the first telescope of choice for many stargazers something unexpected: a good pair of binoculars!

Binoculars are an excellent first instrument because they are generally easy to use and more versatile than most telescopes. Binoculars can be used for activities like stargazing and birdwatching, and work great in the field at a star party, along the hiking trail, and anywhere else where you can see the sky. Binoculars also travel well, since they easily fit into carry-on luggage – a difficult feat for most telescopes! A good pair of binoculars, ranging in specifications from 7x35 to 10x50, will give you great views of the Moon, large open star clusters like the Pleiades (M45), and, from dark skies, larger bright galaxies like the Andromeda Galaxy (M31) and large nebulae like the Orion Nebula (M42). While you likely won't be able to see Saturn's rings, as you practice your observing skills you may be able to spot Jupi-

ter's moons, along with some globular clusters and fainter nebulae from dark sites, too.

What do the numbers on those binocular specs actually mean? The first number is the magnification, while the second number is the size in millimeters (mm) of the lenses. So, a 7x35 pair of binoculars means that they will magnify 7 times using lenses 35 mm in diameter. It can be tempting to get the biggest binoculars you can find, but try not to get anything much more powerful than a 10x50 pair at first. Larger binoculars with more power often have narrower fields of vision and are heavier; while technically more powerful, they are also more difficult to hold steadily in your hands and "jiggle" quite a bit unless you buy much more expensive binoculars with image stabilization, or mount them to a tripod.

Would it surprise you that amazing views of some astronomical objects can be found not just from giant telescopes, but also from seemingly humble binoculars? Binoculars are able to show a much larger field of view of the sky compared to most telescopes. For example, most telescopes are unable to keep the entirety of the Pleiades or Andromeda Galaxy entirely inside the view of most eyepieces. Binoculars are also a great invest-

ment for more advanced observing, as later on they are useful for hunting down objects to then observe in more detail with a telescope.

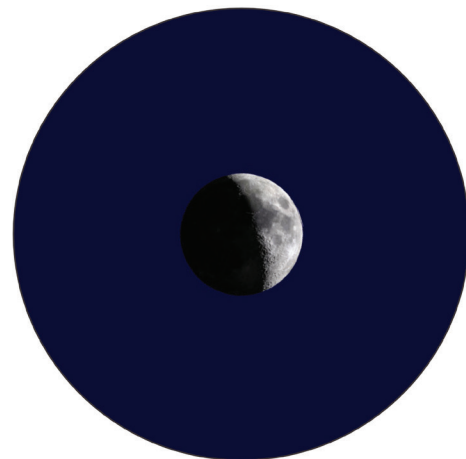
If you are able to do so, real-world advice and experience is still the best for something you will be spending a lot of time with! Going to an in-person star party hosted by a local club is a great way to get familiar with telescopes and binoculars of all kinds – just ask permission before taking a closer look! You can find clubs and star parties near you on the Night Sky Network's Clubs & Events page at [bit.ly/nsnclubsandevents](http://bit.ly/nsnclubsandevents), and inspire your binocular stargazing sessions with NASA's latest discoveries at [nasa.gov](http://nasa.gov).



*This article is distributed by NASA Night Sky Network. The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit [nightsky.jpl.nasa.gov](http://nightsky.jpl.nasa.gov) to find local clubs, events, and more!*



The two most popular types of binocular designs are shown here: roof-prism binoculars (left) and porro-prism binoculars (right). Roof prisms tend to be more compact, lighter, and a bit more portable, while porro-prisms tend to be heavier but often offer wider views and greater magnification. What should you choose? Many birders and frequent fliers often choose roof-prism models for their portability. Many observers who prefer to observe fainter deep-sky objects or who use a tripod with their observing choose larger porro-prism designs. There is no right answer, so if you can, try out both designs and see which works better for you.



A pair of good binoculars can show craters on the Moon around 6 miles (10 km) across and larger. How large is that? It would take you about two hours to hike across a similar-sized crater on Earth. The "Can You See the Flag On the Moon?" handout showcases the levels of detail that different instruments can typically observe on the Moon, available at [bit.ly/flagmoon](http://bit.ly/flagmoon). Moon image courtesy Jay Tanner

# Star Party Reports



**RIEEA**  
**Friday, November 4, 2022**  
**By Michael Corvese**

This was a social event for R.I. Environmental Educators Association (RIEEA) to honor their past and current members of the board of directors. A social hour was conducted, followed by about 2 hours of observing. Skyscrapers opened the 8" Alvan Clark, the 12" Meade, and the 16" Meade. The guests were treated to views of the Moon, Saturn, Jupiter, M31, Albireo, NGC 457, M869 & 884 (double cluster). The guests were very happy with the volunteers

and the facilities and many vowed to return with their families on public viewing evenings. We also added many of the guests to our mailing list.

## **River Bend Farm, Uxbridge, MA** **Friday, November 18, 2022**

**By Jim Hendrickson**

Our final 2022 Night Sky at River Bend Farm event was held on Friday, November 18. With earlier sunsets, the observing began at 6:30pm, with three bright planets visible, and moonless dark sky conditions for best viewing of autumn deep sky objects.

The sky was clear and this was likely our coldest night out so far this year, with temperatures dropping from the low 30s into the 20s. Even with no wind, recent warm temperatures made this night feel exceptionally cold.

Francine Jackson and Jim Hendrickson brought their small refractors. Molly Cardoza, Director of Volunteer and Community Engagement for the Blackstone Heritage Corridor was present, and about a dozen guests came, mainly in two waves, and most of them stayed for the duration of the event,

and were very engaged with questions and various discussions pertaining to astronomy, telescopes, and space exploration.

While we had hoped to showcase Mars, now nearing its closest point to Earth, but it rose too far north to clear the local treeline before the end of our session, so we concentrated on the other two available bright planets, Saturn and Jupiter.

A low, western pass of the International Space Station occurred early in the evening, and a couple of the visitors reported seeing faint meteors, likely from the presently active Taurids shower.

Besides the bright planets, some of the featured highlights were the double star Albireo in Cygnus, the Coathanger Cluster, the Double Cluster, the Pleiades, multiple star Omicron Cygni, and the Andromeda Galaxy.

After about 90 minutes, in a weather pattern seemingly prevalent at River Bend Farm, a thickening band of cloud moved in from the west, eventually covering more than 50% of the sky, ending a successful, but chilly night at River Bend, and our 2022 night sky sessions there.



# November Lunar Eclipse Report

by Dick Parker

Yes I did observe the Lunar eclipse of Nov 8th, 2022. I was not originally going to get up that early to watch it but one of the men that I have breakfast with on Thursday mornings got us interested in it by conversing over Email. He arranged for us to go to a historic farm early in the morning and it was close by with an excellent Western

view. When I awoke at about 4:30 am on the eclipse morning I looked out my window and could see the first bite out of the moon. By the time I got dressed the eclipse had more than half progressed and I watched it go to total from my driveway by watching it through the trees in the West. If the foliage had not fallen I would not have been able to

see it but since the trees were bare without the leaves I was surprised at how well I could see the eclipse developing. Once it became total I got in my car and went to the historic farm and watched the eclipsed moon with my friends until the increasing dawn light made it impossible to see the moon. Then we went to a restaurant for breakfast.



# Celebrating the 70th Anniversary of AstroAssembly: 1952-2022

by Kathy Siok

On Friday night, September 30th (Astro Eve), Skyscrapers hosted an open house and featured talks from Joe Rao, of Hayden Planetarium, and Skyscraper member, Stephen LaFlamme.

This year's AstroAssembly was held on Saturday, October 1, 2022 at Seagrave Observatory. It was in person and also live streamed to remote attendees

At last year's event, the weather was very cooperative, but this day was cloudy with early rain that tapered off during the late morning. Registration was almost 90, but several people decided to attend virtually

due to the weather.

Despite these conditions, attendees were very happy to be present to attend the talks, visit with our vendor and friend, Jeff Norwood of Camera Concepts, and just chat with old friends. Speakers included Sara Schechner of Harvard University, who entertained the group with her collection of old time products that advertised using astronomical themes. Jonathan Pober of Brown University presented details of his newly funded project proposing exploration of the Lunar far side using radio astronomy. Three Skyscraper members also

joined these speakers. John Briggs was via Zoom from New Mexico, and discussed the telescopes of George Ellery Hale. Mike Corvese described the evolution of the moon and Rick Lynch shared his recent visit to the Royal Observatory in Edinburgh Scotland.

Thanks to the generosity of many members, we once again held our traditional raffle of interesting astronomical items. Also, there were many volunteers who helped to make this a memorable weekend for all.

We look forward to our 71st AstroAssembly in 2023!

## October Reports

by Angella Johnson

### Minutes- Skyscrapers Executive Committee Meeting via Zoom Monday October 17, 2022 | 7PM

Meeting called to order at 7:06 PM by President Linda Bergemann

Present: Linda Bergemann, Kathy Siok, Steve Siok, Dave Huestis, Steve Brown, Bob Janus, Ed Walsh, Francine Jackson, Michael Corvese, Laura Landen, Jim Hendrickson, Angella Johnson| Total:12

Agenda Items:

Open Action Items

Open Night Schedule for November (Steve Siok & Michael Corvese)

Roofing contractor quotes (Bob Janus)

Initiate Telescope Loan Program (Steve Hubbard & Bob Janus)-Scopes are available for borrowing by all members.

Occupancy of Meeting Hall (Bob Janus)-Meeting Hall looked good for AstroAssembly

Develop Planet Info Cards for Open Nights (Linda Bergemann)- Currently in progress

Purchase Armbands for Observatory Crew Identification (Linda Bergemann)-Currently in progress

Insurance Rider for Community Center (Laura Landen & Kathy Siok)-Kathy will follow up with the agent

Duties for Open Night volunteers (Steve Siok & Linda Bergemann)- Currently in progress

Officer Reports

Monthly Meetings- Ed Walsh

November- Andy Knoll (will present via Zoom), the Fisher Professor of Natural History at Harvard University. For the past decade, he has served on the science team for NASA's MER mission to Mars. His topic will be "Mars Exploration: Looking Forward from MER,"

December 17- J. Kelly Beatty is an award-winning science journalist and astronomer. His topic will be "Stonehenge: An Epic Enigma."

January- Joe Rao- Joe Rao is Space.com's skywatching columnist, as well as a veteran meteorologist and eclipse chaser who also serves as an instructor and guest lecturer at New York's Hayden Planetarium. His topic will be "Adventures of an Eclipse Chaser."

April- Anthony Case (In person) from Harvard & Smithsonian's Center of Astrophysics is an astrophysicist. He is the instrument scientist for Parker Solar Probe, and the Solar Probe Cup (SPC) which will travel 95% of the way to the Sun to stare directly at it and measure the solar wind and coronal plasma that constantly flows away from the Sun. He also worked on the plasma instrument on the Deep-Space Climate Observatory (DSCOVER).

Francine Jackson asked about Dawn Candice as a potential presenter for February or March. Kathy Siok inquired about having a special presentation for all those who traveled to Iceland. Also, there was a

question on getting early access to set up food before the December party. Volunteers will be needed to help set up tables and prepare food.

Radio Jove- The set up of radio telescope antenna has been initialized. Discussion followed as to a final location. Bob Janus suggested an unobstructed spot that allows access to the building. A likely location is west of the balcony of Alvin Clark building. Steve Siok requested that information on the tentative location be sent to Jeff Padell to review and offer input.

AstroAssembly- Francine Jackson/Kathy Siok

A preliminary financial report from Astro Assembly was first presented by Laura Landen. See below:

Overall, AstroAssembly was a success. Kathy commented on the catered food and the likelihood of going with a different vendor next year. She also commented that the raffle went well but was hindered by the weather. Most of the donated items were from members and not companies.

Dave Huestis acknowledged Linda Hurd, Maria & Steve Brown for their hard work maintaining the refreshment area. This is in addition to all the other volunteers that worked during AstroAssembly.

Laura Landen questioned advertising Friday's program more prominently and a discussion followed. Linda Bergemann will arrange a meeting in November to discuss

AstroAssembly and receive feedback for future programs.

Membership - Angella Johnson- New members as of September 2022: Wayne Buck & Isabell Knox, Linda Cesario, Ed Clemence, Tony Costanzo, Maureen & Matthew Elliott, Harry Ann Jacobson, Peter Leveillee, Matthew & Lauren Ouellette, Tom Perkins & Ed Meadows, Glenn McCauley

Finances - Laura Landen

Treasurer's Report - attached

Program committee - Michael Corvese  
Upcoming events (volunteers needed for all events)

October 23- Frosty Drew 7pm (invited by Scott MacNeill)

Rhode Island Environmental Association (Nov 4)- This will be a social event. They are not interested in a formal program. The event will go on rain or shine. An alternate plan is in the works in case of rain.

Tentative Events

Moonrise on the Seekonk (Oct. 9) was successful with upwards of 70 in attendance. A total of five volunteers with telescopes assisted. Steve Siok inquired about whether a donation box or Skyscraper signage was set up. A discussion followed with Linda Bergemann encouraging the use of our signage.

November 16- William L. Callahan Public School Viewing Night (Dave Huestis encourages all to participate).

November 18- River Bend Farm

December 8- Winman Middle School in Warwick

December 10- Astrophotography workshop (rain date: 12/11)

December 28- Audubon Caratunk Refuge (tentative)

Jim Hendrickson asked about an informal gathering to observe occultation of Mars. It was decided that Jim would spearhead an informal gathering of interested members. Date: December 7-8, 2022.

Starting January 7- Mirror Grinding Workshop (Instructors: Dick Parker & Al Hall). Linda Bergemann requested a write up with a brief description to make the members aware of the workshop. Steve Siok volunteered to give a description.

Observatory Committee-Steve Siok

Two new members have offered to volunteer their time and are a welcome addition. Michael Corvese sent out an email looking for additional volunteers but received no response. More volunteers are still needed to fill positions of support staff and scope operation. Also, Bob Janus has

interested members who want to be trained on the 12 inch.

Steve Siok asked Bob Janus about the drive of the 12 inch telescope. Bob Janus confirmed that Mark Muncasy checked the telescope and it is in good working condition.

For December the observatory will only be open the 3rd and the 10th. The holiday party is the 17th and the observatory will be closed during the holidays.

Individuals who desire to be trained on the telescopes should be identified and trained (Steve Siok).

Trustees- Bob Janus

Bob Janus explained the issue with the security camera. The camera is currently not remotely accessible. Jim Crawford and Jeff Padell installed the system and are working on it. Jim Crawford will troubleshoot it later in the week but the security system currently is offline.

Bob Janus will meet with Debug for the annual refilling of the bait boxes for the rodent control.

Linda Bergemann thanked Bob Janus and all his assistants for his hard work during AstroAssembly.

Dave Huestis thanked Bob Janus for help with his donated books.

Unfinished Business

Linda Bergemann plans to review the auditors' information on Skyscrapers finances and member access to the facilities..

Update the trustees on the inventory list in order to document items that have been removed. Bob Janus emailed the inventory and photo library to Rich with the goal of making it more user friendly. In addition to this, identifying surplus telescopes.

Several committee members were contacted by Kelly Beatty about putting together a chapter of the International Sky Association in Rhode Island. Katerina Chaves was referred to members of the group but has not been able to attend any of the meetings.

New Business

Policy for Allowing Greater Member Access to Facilities- Linda Bergemann wants the observatory used as much as possible and to make things more available to our membership. Steve Siok suggested that this topic should be discussed by a special committee and presented to the Executive Committee. Linda Bergemann will appoint members to a special committee to consider this and provide a proposal.

"Good of the Organization"

Next Executive Committee Meeting: November 28, 2022

Cash Flow 2022-09

4/1/2022 through 10/31/2022

Category

4/1/2022-10/31/2022

INFLOWS

Astro Assembly Income	
Astro Assembly Income:Banquet	655.00
Astro Assembly Income:Doantions	464.95
Astro Assembly Income:Misc	13.00
Astro Assembly Income:Raffle	385.00
Astro Assembly Income:Registration	1,675.00
TOTAL Astro Assembly Income	3,192.95
Astronomical League Membership Contrib.	75.00
Donation	
Donation:Amazon Smile Donation	59.62
Donation:Misc Donation	764.90
Donation:Refreshment Donation	0.00
TOTAL Donation	824.52
Dues	
Dues:Family	540.00
Dues:Junior	15.00
Dues:Regular	1,000.00
Dues:Senior	525.00
TOTAL Dues	2,080.00
Misc Income	50.00
Misc Income:Interest Inc	117.08
Misc Income:Sale of Items	2,481.08
TOTAL Misc Income	2,648.16
Shipping	191.72
Star Party Donations	100.00
TOTAL INFLOWS	9,112.35

OUTFLOWS

Astro Assem Exp	
Astro Assem Exp:Banquet	479.07
Astro Assem Exp:General Refreshments	37.64
Astro Assem Exp:Printing	355.00
Astro Assem Exp:Speaker Expenses	73.15
TOTAL Astro Assem Exp	944.86
Astronomical League Membership Expense	194.00
Corporation, State Fee	10.00
Domain Name	152.94
Food & Dining	
Food & Dining:Groceries	0.99
TOTAL Food & Dining	0.99
Misc Expenses	493.70
Outreach	340.10
PayPal Fee	170.76

Account Balances 2022-09 - As of 10/31/2022

Account	10/31/2022 Balance
Bank Accounts	
36 Month EZ Access-6686	25,380.75
Coastal1 Checking-4792	3,362.82
Coastal1 Savings-4783	16,509.84
PayPal Account	58.30
TOTAL Bank Accounts	45,311.71
Cash Accounts	
Cash Account	50.00
TOTAL Cash Accounts	50.00
OVERALL TOTAL	45,361.71

Adjourned: 8:45PM by Linda Bergemann

Respectfully Submitted,

Angella Johnson

October 28, 2022











# AstroAssembly Astrophoto Contest Winners



## 1st Place: Deep Sky

Elephant Trunk Nebula by Joe Zajac

Elephant Trunk Nebula SH2-131 in Hubble Palette Narrow Band

Gear: Astrotech AT102ED Doublet Refractor, Classic SBIG ST-8300 Mono CCD Camera, ATR8 0.8X Field Flatteners FL 571mm (F/5.6), Celestron CGEM mount Hypertuned, ZWO EAF Autofocus, DIY automated myFilterwheel, Dew Controller

Acquisition: 2 hours Ha 7nm Bin 1x1, 1hr 50m OIII 9nm Bin 2x2, 1hr 50m SII 7nm Bin 2x2, Grand total of 5h40m on July 30th 2022, Combined as SHO palette

Software: APT, PHD2, SIRIL, GIMP, Celestron CPWI, Teamviewer, Topaz Denoise, Starnet++

Misc: Bortle 5 sky in the front yard, central Massachusetts



## Runner-Up: Deep Sky

M27 Dumbbell Nebula by Greg Shanos

Camera was an Atik Horizon one-shot color with an Optec 6.2 focal reducer. The telescope was a Meade LX200GPS 8 inch 2000mm f/10 in Alt-Azimuth mode. No dark frames, no flat frames and no bias frames were taken. This is a 2x2 binned live stack of seventy-six 12 sec FITS file exposures totaling 15 minutes that were aligned, stacked, and field derotated in real time by the Atik Infinity software. This image is what appeared on my computer screen! I simply saved a jpg image. That is it- no post processing whatsoever.







**Deep Sky**  
M45 Pleiades by  
Laura Landen

Date Taken: February 28, 2022, Camera: Olympus E-M1mkIII, Lens: M.Zuiko 75mm f/1.8, Aperture: f/2.2, Shutter: 2 min, using tracker, ISO: 1600, Processing: Deep Sky Stacker, Lightroom Classic and Photoshop CC

**Deep Sky**  
M8 Lagoon  
Nebula by  
Lloyd Merrill

Constellation of Sagittarius, 5000 LY from Earth, Imaged in early September 2022,

Equipment: 152mm F5.9 refractor, SBIG STF-8300C color camera, OAG using Starlight Xpress Lodestar 2 guide camera, Software and capture, 20 X 300s subs for 1H 40Min, Captured in N.I.N.A, Calibrated and post-processed using Pixinsight





**1st Place:**  
**Solar System**  
Jupiter by Greg  
Shanos

Jupiter  
Shadow Transit of Io  
July 22, 2022

Meade LX200GPS 250mm fl 2500mm f/10  
ZWO ASI 462MC one-shot color  
Vernonscope 1.25x Barlow fl 3600mm f/15  
Baader CMOS optimized UV-IR cut filter

Magnitude: -2.6  
Diameter: 43.3"  
Phase: 99.1%  
Altitude: 52°  
Seeing: 9/10 Very Good  
Transparency: 6/10 Ave  
Resolution: 0.17"  
De: 2.5° Ds: 2.0° Ls: 358°



10h 02.3m UT  
CMI: 243.3° CMI: 4.4° CMIII: 277.3°  
Ganymede (top) Io (bottom)



10h 03.8m UT  
CMI: 244.2° CMI: 5.3° CMIII: 278.2°  
Ganymede (top) Io (bottom)



**Runner-  
Up: Solar  
System**

Saturn by Laura  
Landen

Date Taken: April 11, 2022,  
Camera: OM System OM-1,  
Lens: M.Zuiko 100-400mm  
f/5.0-6.3 at 400mm, Aper-  
ture: f/6.3, Shutter: 1/60 sec,  
ISO: 800, Processing: Topaz  
Gigapixel AI and Lightroom  
Classic







## 1st Place: Landscape

Milky Way over Stellafane by Bob Horton



## Runner Up: Landscape

Milky Way by Laura Landen

Date Taken: April 11, 2022, Camera: Olympus E-M1mkIII, Lens: M.Zuiko 17mm f/1.8, Aperture: f/1.8, Shutter: 10 sec, ISO: 6400, Processing: 2 row panorama, 11 images/row, Software: Lightroom Classic and Photoshop CC,





## Landscape

Crescent Moon

by Mercedes

Rivero H.

Handheld Olympus  
Stylus TG-4, auto mode,  
(4X wide optical zoom 4.5-  
18.0 mm, 1:2.0-4.9), July 30,  
2022 (as shown on the pho-  
to's bottom right-hand side  
corner), No processing



## Landscape

Venus by

Kenneth Fye

Venus photographed over  
Orleans Cove July 16, 2022  
about 4:30 am., Canon ELPH  
180

# STARRY SCOOP

Editor: Kaitlynn Goulette



## WHAT'S UP

December evenings reveal the brilliant winter stars rising over the eastern horizon, and those willing to stay out late are treated to the Winter Hexagon region that is progressing higher and higher in the southern sky. The Winter Hexagon is an asterism comprised of some of the brightest stars in this region of the sky. For the early birds out there, the Winter Hexagon is also visible in the hours leading up to sunrise in the southwestern sky.

This month, a few planets are stretched across the heavens, offering great views throughout the night. In the early evening hours, Jupiter can be found high in the southern sky shining at about -2.5 magnitude, brighter than any star. Jupiter is past its opposition but remains a great telescopic target. Its atmospheric bands, together with its Galilean moons, are always interesting observations. Saturn, in the early evening hours, can be found in the southwestern sky. With the unaided eye, it appears much like a bright, yellow star at about 0.8 magnitude. The rings of Saturn can be easily seen with a backyard telescope and are always a worthy observation. Mars reaches opposition on the 8th and rises at about sunset this month. Its reddish glow is visible throughout most of the night and is a spectacular sight at -1.9 magnitude! Mars is currently making its closest approach to Earth for the year, which makes December the best time to glimpse its features through a telescope.

Two meteor showers peak this month, the Geminids and the Ursids. The Geminid meteor shower runs annually from December 7th to the 17th. It's considered one of the year's best showers, producing up to 120 meteors an hour at its peak, which occurs on the night of December 13th into the morning of the 14th. Our second meteor shower is the Ursids, which runs annually from December 17th to the 25th. This year, it peaks on the night of the 21st and morning of the 22nd and produces about 5 to 10 meteors per hour. Both of these showers are best viewed from a dark location after midnight.

December 7th marks the 50-year anniversary of the famous "Blue Marble" photograph. This beautiful photo depicts Earth as seen by the Apollo 17 crew as they were on route to the moon. It has become one of the most reproduced images in history and is called the "Blue Marble" because the earth resembles crystal-like balls that are used in children's games. This photo emphasized the need to take care of our planet and its environment.

## DECEMBER'S SKY

**8: Full Moon**

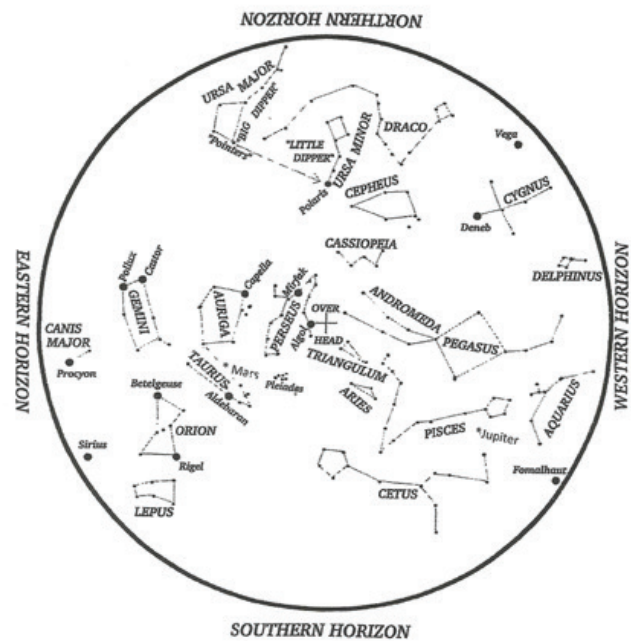
**8: Mars at Opposition**

**13-14: Geminid Meteor Shower Peak**

**21: December Solstice**

**21-22: Ursid Meteor Shower Peak**

**23: New Moon**



Credit: Roger B. Culver

Hold star map above your head and align with compass points.



# OBSERVATIONS

On the morning of November 8th, I woke up a few hours before the sun rose to prepare for a rare total lunar eclipse. I packed my Canon DSLR camera and 8-inch Newtonian telescope and traveled to a location with a low eastern horizon. I was joined by friends, family, and members of my high school Space and Astronomy Club.

The air was very crisp, and the skies were clear while we awaited totality. We were treated to the winter stars shining overhead and I gave a tour of the sky, reviewing the Winter Hexagon with club members as they discussed predictions of what the eclipse would look like. As totality arrived, the moon became completely engulfed in the earth's shadow and displayed an orange-red color. Everyone was amazed at how dim the moon had become and took turns viewing it through Springfield STARS Club President, Richard Sanderson's Dobsonian telescope.

Due to my location, this eclipse was very interesting. The sun rose as totality was still occurring, which caused the moon to become dimmer as the sky was getting brighter. Eventually, the moon faded from view and became invisible to the unaided eye. I hope you all got a chance to observe this rare event because the next total lunar eclipse won't occur until the year 2025!

My recent observations have continued to include Jupiter and its Galilean moons. I'm working on a project that requires me to make observations of these distant satellites and time occultations of Io, Europa, and Ganymede. This project has taught me much about Jupiter and its moons, and how they interact. I will be continuing these observations for a few more months and look forward to the results.



The purpose of the Starry Scoop is to communicate current astronomy and space events. If you want to share your observations or get digital copies of the Starry Scoop, contact [starryscoop@gmail.com](mailto:starryscoop@gmail.com). Clear skies!

# OBJECT OF THE MONTH

The featured object for the month of December is Melotte 20, a star group in the constellation Perseus. This object is also known as the Alpha Persei Group and is estimated to be over 33 light-years across. It's comprised of about 100 stars at a distance of roughly 600 light-years. Astronomers debate whether this star group is a true galactic cluster because its stars are so dispersed, even though they have the same directional motion in space and were born from the same gas cloud. Whether it's a cluster or not, it remains a spectacular object to observe with a pair of binoculars or a telescope at low power.

Melotte 20 can be found surrounding the bright star Mirfak in Perseus. Mirfak shines at about 1.8 magnitude and is the brightest of the Alpha Persei Group. This cluster is very bright and is visible with the unaided eye under dark skies. Use the star map below to help you find it.



Melotte 20



# Directions to Seagrave Memorial Observatory

## From the Providence area:

Take Rt. 6 West to Interstate 295 in Johnston and proceed west on Rt. 6 to Scituate. In Scituate bear right off Rt. 6 onto Rt. 101. Turn right onto Rt. 116 North. Peeptoad Road is the first left off Rt. 116.

## From Coventry/West Warwick area:

Take Rt. 116 North. Peeptoad Road is the first left after crossing Rt. 101.

## From Southern Rhode Island:

Take Interstate 95 North. Exit onto Interstate 295 North in Warwick (left exit.) Exit to Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.

## From Northern Rhode Island:

Take Rt. 116 South. Follow Rt. 116 thru Greenville. Turn left at Knight's Farm intersection (Rt. 116 turns left) and follow Rt. 116. Watch for Peeptoad Road on the right.

## From Connecticut:

- Take Rt. 44 East to Greenville and turn right on Rt. 116 South. Turn left at Knight's Farm intersection (Rt. 116 turn left) and follow Rt. 116. Watch for Peeptoad Road on the right.
- or • Take Rt. 6 East toward Rhode Island; bear left on Rt. 101 East and continue to intersection with Rt. 116. Turn left; Peeptoad Road is the first left off Rt. 116.

## From Massachusetts:

Take Interstate 295 South (off Interstate 95 in Attleboro). Exit onto Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.



47 Peeptoad Road  
North Scituate, Rhode Island 02857