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the Skyscraper

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

In This Issue:

Exoplanet Climate Infrared Telescope

An Online Presentation by Tim Rehm
Saturday, January 8, 7:00pm EST via Zoom

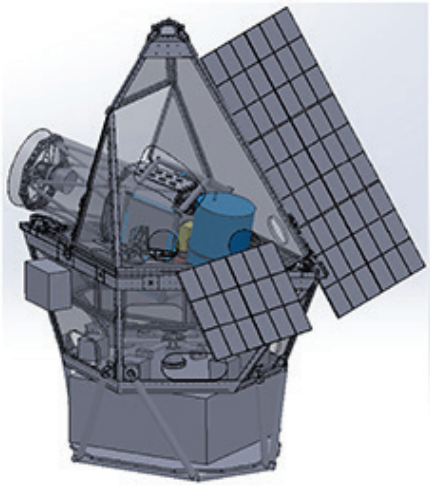
Contact Steve Hubbard (cstahhs@gmail.com) for Zoom Meeting link and information.

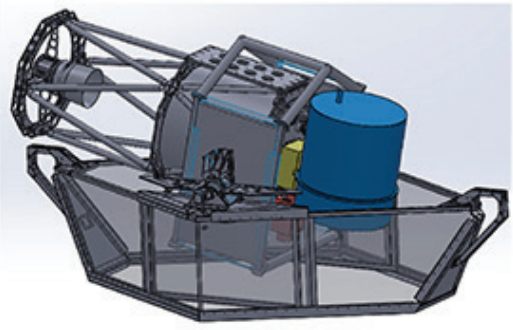
Synopsis:

This talk will be focused on the development and science behind the Exoplanet Climate Infrared Telescope (EXCITE). Despite almost 5000 confirmed exoplanet detections, very little is known about their atmospheres. This includes molecular composition, thermal structure and dynamics. Efforts to characterize exoplanet atmospheres have relied on lengthy, space-based observations to achieve high precision measurements, but EXCITE is a near-infrared spectrograph designed to be flown at stratospheric altitudes on a long duration balloon platform from McMurdo Station in Antarctica. This will make EXCITE the first dedicated instrument for observing exoplanet atmospheres. EXCITE will perform phase-resolved spectroscopy on hot Jupiters throughout entire orbital periods. Also discussed are the benefits of balloon-borne observing with respect to the science return from space-based observatories like James Webb Space Telescope.

Biography:

My name is Tim Rehm. I received my bachelor's in Physics from Cornell University and am currently a third-year PhD candidate in Physics at Brown University working on exoplanet atmospheres and instrument design for the EXCITE experiment. I've been apart of research in 21cm cosmology which included neutral hydrogen intensity mapping in the North Celestial Cap and identifying low-redshift galaxy clusters with Arecibo and the ALFALFA survey. I've also been involved in Physics education research with a focus on remodeling introductory physics courses for undergraduate students. I enjoy space, telescopes and teaching





President's Thoughts

by Steve Siok

Happy New Year everyone!

I was hoping we would be done with masks and Zoom by now. I was hoping we would have our meetings in person and we could all rekindle our friendships and share old stories and observing memories. But it cannot happen just yet. The e-board decided our first two meetings of 2022 will be on Zoom. The good news is that we now have a process in place so we can hold our winter meetings even if there is a snowstorm.

As I think about 2021 I recognize it went relatively well for Skyscrapers. Our Zoom meetings were successful. We usually saw attendance comparable to our in person meetings at Seagrave. And we got to hear speakers from across the country and around the world, like John Briggs and Steve O'Meara. All the publicity from Facebook and Night Sky Network has increased our membership since the pandemic began by 40 percent. Financially we are in very good shape. A big thank you to everyone who made donations, both in money and in things. The Trustees have been very busy with repairs. I would say the buildings and scopes are in great condition.

This year of 2022 can be an even better year for us. Our first two meetings will be via Zoom so please attend if you can. Also starting this month our members Michael Corvese and Conrad Cardano will be conducting multiday workshops, starting on Zoom. Michael will begin his workshop on lunar observing on Jan. 10 at 7PM. Conrad will begin his workshop on astrophotography on Jan. 15 at 7PM. You need to sign up so please do so. Linda has sent an e-mail describing both events. Also our member Greg Shanos has alerted us that the Kalamazoo Astronomical Society is offering its Introduction to Amateur Astronomy five part workshop which starts on Jan. 15 at 1PM. If you are a new member of Skyscrapers I strongly suggest you sign up and participate.

We are once again going to try open nights. Last year was terrible for clear Saturday nights. But January. 15 and 29 are our next attempts. There are scout groups attending so please consider helping out.

I hope all of you take advantage of our activities. And keep trying to observe on your own. Stay safe and keep looking up.

Wishing you clear skies.

Steve

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 **January 15** to Jim Hendrickson, 1 Sunflower Circle, North Providence, RI 02911 or e-mail to jim@distantgalaxy.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.

Lunar Observing Workshop

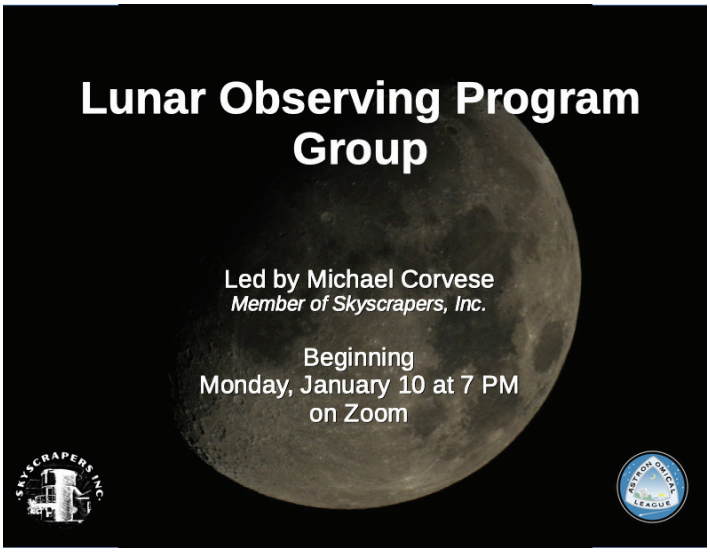
By Michael Corvese

I am happy to announce that Skyscrapers, Inc. will be initiating a Lunar Observing Program group for interested beginner and intermediate amateur astronomers. The Astronomical League, which has developed the program, is composed of over 240 local amateur astronomical societies from across the United States. These organizations form one of the largest amateur astronomical organizations in the world with Skyscrapers, Inc. as a member. Membership enables us to participate in Astronomical League observing programs that lead to awards of a pins and certificates upon completion and acceptance of the program requirements. The work will consist of making various observations and completing forms and checklists. More information is located at astroleague.org.

The Lunar Observing Program will utilize a combination of naked-eye, binocular, and telescopic observations over the course of a lunar cycle. There is no time limit to fulfill the requirements. You may make the observations as quickly or as leisurely as you wish. I anticipate 2-3 months to complete the program, just due to personal time constraints and our variable New England sky conditions. But again, we are in no rush! Once the work is completed, documents will be sent to our ALCor (Astronomical League Correspondent), Jeff Padell for review and submission to the Astronomical League. This is the first of three lunar programs from the Astronomical League, and we hope to offer the next two programs in succession.

Astronomical League observing programs as offered by Skyscrapers, Inc. are a terrific way to learn more about the night sky and about your fellow members while working towards a common goal. I am planning to facilitate biweekly **Zoom** calls to discuss progress, challenges, and talk about general astronomy and equipment. I will hold the first meeting on **Monday, January 10, 2022, at 7pm** to discuss the program and explain the rules and requirements.

If you are interested in participating in this program, please send an email to corvesemichael@gmail.com and I will send out an invitation to the inaugural meeting. Thanks, and hope to see you there!



Astrophotography Workshop

By Conrad Cardano

Back in the early 1970's, I tried my hand at astrophotography with film, a DLSR camera, and a 6" telescope on a motorized Edmund Scientific equatorial mount.

You would have to:

· expose the whole roll of film (a 20 or 36 exposure roll),
· take it to a "drug" store to be processed,
· wait a week, and
· then see the results.

Did I say it was frustrating? Oh, Yes it was.

· Maybe the mount jiggled and blurred the image
· Maybe an airplane flew across the image and ruined it
· Maybe it wasn't in good focus.
· Maybe the drug store lost your roll of film.

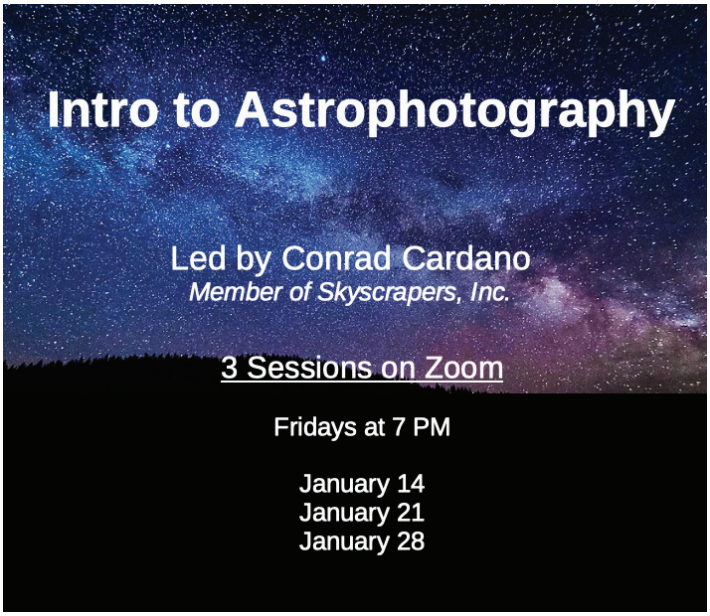
Astrophotography has never been better for the amateur! However, there is more to learn than in the 1970's.

This presentation/workshop, "Intro to Astrophotography", is meant for people who have never tried astrophotography, but would like to.

It will be presented in three **Zoom** meetings on **Fridays, January 14, 21 and 28 at 7 PM**. Each session will be about 45 minutes, longer with questions and answers.

Contact me, Conrad, at cardanoconrad@gmail.com, if you have any questions.

If you are interested in participating, please contact Linda Bergemann at LBergemann@aol.com so we can get the Zoom link to you.



Skylights: 2022

by Jim Hendrickson

January is a month of transition for our evening sky. For the past several months, it has been dominated by our three bright planets, Venus, Saturn and Jupiter. Starting with Venus, on the 8th, Venus passes through inferior conjunction, and because it passes well north of the Sun (sorry, no transit this time), it will remain visible low in the southwest even up until a day or two before conjunction, assuming you have a clear horizon. Even though it is rather low, do watch it, as it is now showing a large and thin crescent phase, about one arcminute across, which should be visible even with binoculars.

While Venus is dropping out of our evening sky, Mercury is coming back into it, and for a brief time it joins Saturn before passing its maximum elongation 19 west of the Sun on the 7th, and dropping back out of view later in the month as it approaches inferior conjunction on the 23rd.

Both Venus and Mercury become visible in the morning sky later in the month. Mercury will have to wait until the very end of the month, as it will remain rather low, but Venus becomes prominently visible by the third week, and closes distance with Mars.

Saturn is beyond its optimal viewing window for the season as its pale golden glow can only be seen through a substantial amount of airmass and through encroaching twilight. The waxing crescent Moon appears near Saturn on the 4th. By the end of the month, Saturn will no longer be visible, as it nears conjunction on February 4th.

Venus at 1.5% phase on Jan 2, 2022 by Greg Shanos. The planet was only 6° above the horizon at the time of capture. Meade LX200GPS 10 inch f/10; ZWO 290MM with Baader 685 longpass IR filter.

Jupiter, likewise, is also disappearing from view early in the evening. During the second half of January, it will be the only bright planet visible in the evening sky, so don't miss these last few nights of gazing at it and its four Galilean moons before it dips below the horizon.

Neptune remains visible with binoculars or small telescopes in the early evening. Early in the month is the best time for viewing, before bright Moonlight interferes.

Uranus is the best-placed planet this month. Located in Aries, about midway between Hamal (Alpha Arietis) and Menkar (Alpha Ceti), it should be easy to track with binoculars, even in bright Moonlight.

If you have been watching dwarf planet Ceres as it wanders through Taurus, you can still find it, although it will be dimmer than it was a few weeks back, about 6° south of the Pleiades cluster as it nears its stationary point and begins moving prograde. On the 12th, the waxing gibbous Moon is just 0.4° north of Ceres, which will make a good pair in a telescope.

While you may have not seen Mars in a while, January presents the opportunity to begin viewing it early in the morning sky. The waning crescent Moon joins Mars on the 29th.

New Moon occurs on the 2nd, beginning Lunation 1225. First quarter is on the 9th, Full Wolf Moon occurs on the 17th, rising near the twins of Gemini, Pollux and Castor, with last quarter on the 25th.

Earth is at its closest point to the Sun on January 4. Known as perihelion, the Earth-Sun distance will be 0.983 AU.

The Quadrantid meteors are most active on the 2nd-3rd. Expect a few meteors to originate from the area of northern Bootes. The meteor shower is named for Quadrans Muralis, an obsolete constellation that occupied this area of sky.

Finally for January, we have asteroid 7 Iris, a main-belt asteroid roughly 200km in diameter that is closest to Earth on the 4th, at a distance of 1.094 AU, and at opposition on the 13th. It draws a wide but shallow arc through southern Gemini and shines as bright as magnitude 7.7, making it a good target for binoculars.

For the remainder of 2022, we have several highlights awaiting us under clear skies:

2022 is a Mars opposition year, with this year's best viewing occurring in December. Opposition occurs on the 8th, with closest approach occurring a week earlier, on December 1, at a distance of 0.544 AU. While not as close as the two most recent oppositions, Mars will still appear as large as 17 arcseconds in a telescope, which is approximately the size of Saturn's globe.

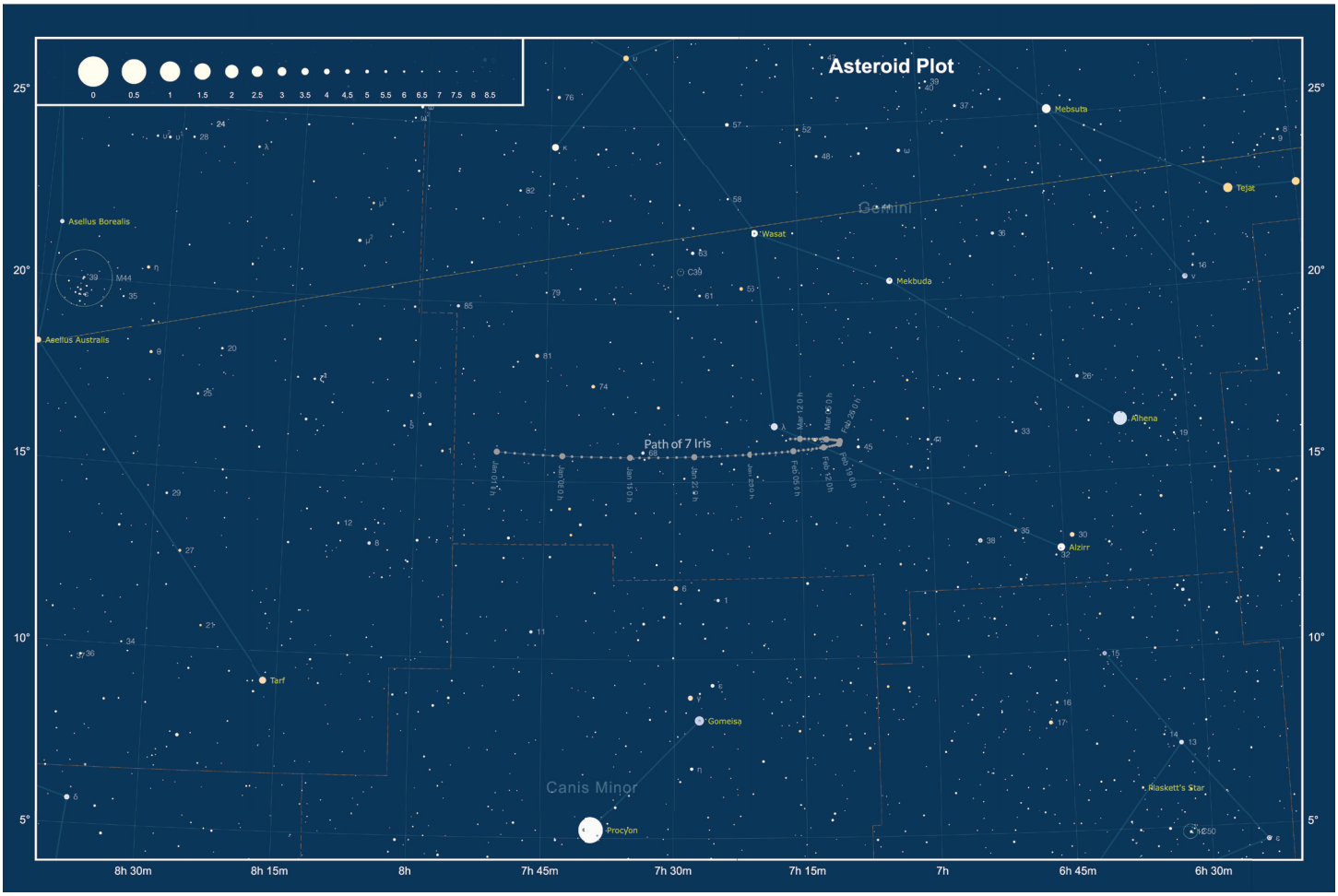
A notable event occurs on opposition night, which is also the night of the Full Cold Moon, when an occultation of the Red Planet occurs, though not for Rhode Island, but the southern limit of the grazing line occurs in central Massachusetts. For us, at Seagrave Observatory, Mars will be just 25" from the southern limb of the Moon at 11pm.

After spending the past six years in the southerly portion of the ecliptic, Jupiter crosses the celestial equator in May, and will spend the next six years in the northern part of the sky. It reaches opposition on September 26 in Pisces, just below the eatern edge of the Great Square of Pegasus. Favorable viewing begins in late June, and lasts through December. It is notable, that in the path up to opposition, Jupiter spends

Events in January

2	**New Moon**
3	Latest Sunrise (7:13am)
3	Moon 1.7° SW of Mercury
4	Earth Perihelion
4	Moon 4.5° SE of Saturn
5	Moon 5.4° S of Jupiter
7	Mercury Greatest Elongation East (19°)
8	Venus Inferior Conjunction
9	**First Quarter**
12	Saturn 3.4° E of Mercury
13	7 Iris Opposition (mag. 8.9)
13	Mercury Stationary
16	Pluto Conjunction
17	**Full Wolf Moon**
18	Uranus Stationary
23	Mercury Inferior Conjunction
25	**Last Quarter**
26	Mars 0.5° N of M8
29	Moon 3.3° SW of Mars
29	Venus Stationary
30	Uranus Eastern Quadrature

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



about two months in the non-zodiac constellation Cetus.

In 2022, Saturn is once again a summer planet, with opposition occurring on August 14 in Capricornus, and favorable viewing extends from mid-May through mid-November. It is still summer in Saturn's northern hemisphere, but with just three years until Saturnian equinox, the ring-plane angle is noticeably narrower than we saw in 2021..

Uranus, in Aries, continues to inch its way eastward towards the Taurus border. Moving about 4.25° farther east, and reaching opposition about 4.5 days later each year, Uranus is now an easy star-hop from the Pleiades, about 14° away. Opposition of Uranus occurs on November 9, and is in favorable viewing position from mid-August through February 2023.

It is notable that Uranus is just eight years from its solstice, which means that the planet is nearly two-thirds through its northern hemisphere's autumn. Due to the extreme axial tilt of the Uranian system, this means we're looking at the orbital plane of its moons nearly face-on. With Uranus high on the ecliptic, the next two decades provide great opportunities for observing its larger satellites, which can be seen in a 12-inch telescope.

Not to be overlooked, Neptune is in favorable viewing position from mid-June through mid-December, reaching opposition on September 17. Our solar system's most distant planet can be found not far from its position last year, a few degrees south of the Circlet asterism in Pisces, though the planet crosses the border and is actually located within the boundaries of Aquarius for much of the year.

There are two total lunar eclipses happening in 2022. The first one occurs on the evening of May 15-16, Sunday night into Monday. The Moon rises and sets uneclipsed, and is at maximum just after midnight, when the Moon is relatively high in the sky. Located in Libra, the Moon doesn't share this part of the sky with any planets or notable bright objects, but should present a great visual observing opportunity.

The second lunar eclipse occurs on the morning of Tuesday, November 8. This one presents the best photographic opportunities, as the Moon will be in total eclipse at Moonset, so be sure to find a place with a good view of the west-northwestern horizon. The Moon will be in Ares, so a wide-angle photo will include the sparkling star clusters of Taurus, and a narrow-angle view may capture Uranus, just 2° to the east.

There are two partial solar eclipses in 2022, one on April 30, and one on October 25, neither of which will be visible from North America.

If dwarf planet hunting is your thing, Ceres starts 2022 in Taurus, and moves into Gemini before being lost in the glare of twilight in May. It returns in September as it moves from Cancer through Leo, on its way to Its next opposition in March 2023.

Pluto is at opposition on July 20 and is best viewed through the summer. This will be the last full year for Pluto to be located within Sagittarius, as it wanders across the border into Capricornus next year.

There are several notable planetary conjunctions occurring in 2022.

On the morning of March 28, the waning gibbous Moon joins Venus, Saturn and Mars, but it will be worth watching the three bright planets for a week before and after this date, including a spectacular pairing of Venus and Jupiter on April 30-May 1, when the two brightest planets will be just 0.5° apart. This series of conjunctions culminates on April 5, when Mars is just 0.4° southeast of Saturn.

A week later, on April 12, Jupiter will be just 0.1° north of Neptune. This occurs low

in the eastern sky, deep in twilight, but a modest telescope should be able to resolve our solar system's most distant planet hanging just below its largest.

On April 27, a spectacular binocular conjunction will occur with the waning crescent Moon joining Venus and Jupiter in the morning sky. Neptune will still be just 0.5° from Jupiter,

Mars joins Neptune on May 18, and even though Mars is 20 times closer and 700 times brighter than Neptune, the color contrast of the two planets as seen through a telescope is notable.

An easier-to-observe conjunction occurs when Mars joins Jupiter on the 29th, when the two bright planets will be just 0.6° apart.

Large and bright (binocular visible) asteroids reaching opposition in 2022 include: 13 Iris, January 13; 20 Massalia, February 5; 16 Psyche, March 3; 8 Flora, April 12; 15 Eunomia, April 16; 10 Hygiea, April 29; 4 Vesta, August 22; and 3 Juno, September 7.

Oppositions of the known dwarf planets in 2022 include: Makemake; March 28, Haumea: April 14, Pluto: July 14, and Eris: October 17. The next opposition of 1 Ceres is in 2023.

An Inexpensive Piggyback Mount

By Bob Janus

One of the simplest ways to piggyback a camera on a telescope tube is via a screw or stud that extends out a threaded hole on one of the telescope tube mounting rings and into the ¼-20 hole found on the bottom of most cameras. With this single point attachment the camera is susceptible to swinging sideways rather than remaining stationary when the telescope is turned, particularly when the camera has a long lens attached to it.

An alternative mounting method is described here. In figure 1 two pieces of tongue and groove board are fastened to a flat board which serves as a base plate. Two countersunk holes in the base plate are positioned over the threaded holes in the two telescope mounting rings. The bevel head screws shown in the photo are inserted in these holes.

Another piece of tongue and groove board is shown in figure 2. Two wooden dowels along with a ¼-20 screw that protrudes thorough the board cradle the camera as shown in figure 3. (The head of the screw is countersunk on the other side of the board.) Note that a piece of plastic tubing has been slipped over one of the dowels to obtain a snugger fit for the camera.

The board that cradles the camera is slid onto the base plate as seen in figure 4. The tongue and groove arrangement provides a pair of guide tracks for the cradle. A bolt is inserted in a clearance hole behind the camera to pin the cradle to the base plate. The red elastic band stretches over one set of tracks to further secure the cradle to the base plate. The blue elastic band fits into the other track to remove any play between the cradle and base plate.

In addition to preventing sideways swing this homemade mount allows the camera to be easily removed from the telescope. I do not know if anyone has thought of this idea before. It is an alternative to more expensive mounting solutions.

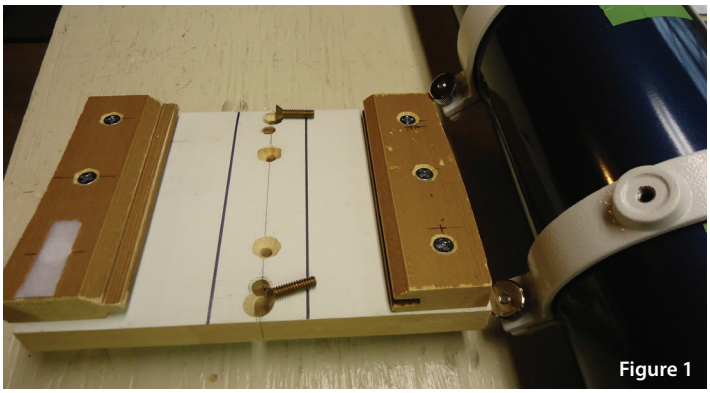


Figure 1

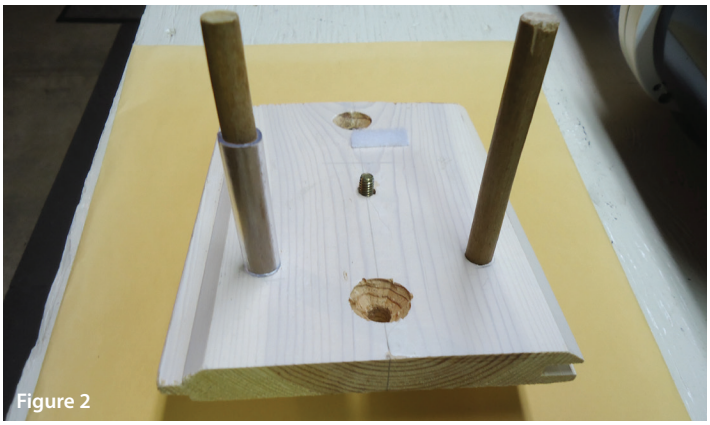


Figure 2

Figure 3

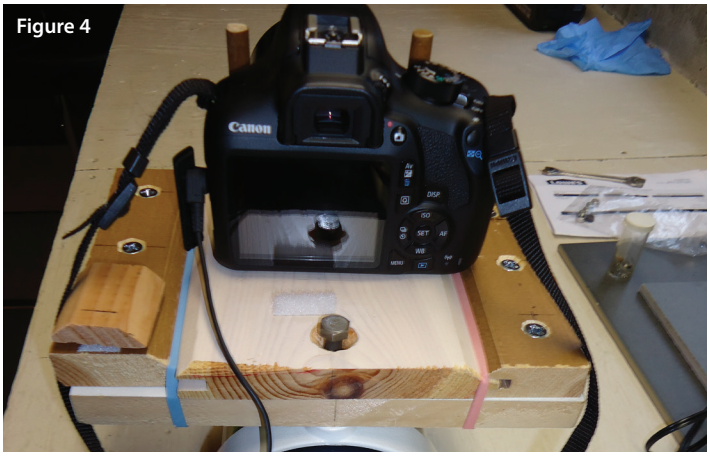


Figure 4

Geminids 2021 Observing Report

By Greg Shanos

I observed the Gemenid Meteor Shower on December 13th and 14th, 2021 from my backyard at Longboat Key (Sarasota), Florida Long 82 36' 19.37" W Lat 27 21' 58.65" N. I utilized the official ALPO/IMO Visual Meteor Observing Form to record specifics such as time, magnitude, type, color, speed and train for each meteor seen. Finalized results were submitted to Richard Lunsford of ALPO/IMO.

December 13, 2021 observation summary

I began observing at 2:00am (7h 00m UT) under perfectly clear skies. A 72% phase waxing gibbous moon was setting in the west at the start of my observations. The darkness rating was SQM 20.04, Bortle scale 6.04 Suburban skies. Limiting magnitude of +4. The temperature was 70.1 F with a relative humidity of 94%. The ambient light reflected off the atmospheric moisture. The evening began with perfectly clear skies however, fog rapidly rolled in and the skies became completely overcast by 2:39 am local time (7h 39m UT). The sky was still overcast at sunrise. I was only able to witness 9 Gemenid meteors and no sporadics. The two brightest meteors were magnitude zero.

Total Meteors Seen in 39 minutes of Observing: 9 Gemenid meteors, 0 Sporatics

December 14, 2021 observation summary

I began observing at 1:00 am (6h 00m UT) under perfectly clear skies. An 80% phase waxing gibbous moon was approximately 30 degrees above the western horizon. The darkness rating was SQM 20.01, Bortle scale 6.06 Suburban skies. Limiting magnitude of +4. The temperature was 70.5 F with a relative humidity of 90%. The evening began with perfectly clear skies however, fog rapidly rolled in and the skies became completely overcast by 3:35 am local time (8h 35m UT). The sky was still cloudy at sunrise and the day remained completely overcast. I witnessed 17 Gemenid meteors from 1:00 am to 1:59 am (6h 00m to 6h 59m UT) There were two bright fireballs at magnitudes -1 and -4. From 2:00am to 2:59am (7h 00m to 7h 59am). I witnessed 19 Geminids and 1 sporadic. During this time there was a Gemenid fireball twice the brightness of Venus with a train and terminal flash. From 3:00 am to 3:15am (8h 00m UT to 8h 15m UT) I observed 7 Gemenid meteors. I took at break from 3:15am to 3:35am (8h 15m to 8h 35m UT). To my surprise the sky had completely clouded over by 3:35 am (8h 35m UT).

Total Meteors Seen in 2h 15m of Observing: 42 Gemenid meteors, 2 Sporatics

Time For A Late Autumn Shower

By Michael Corvese

Each year we have an opportunity to take time to observe one of nature's greatest shows, the Geminid meteor shower. It is named the Geminids because the meteors are observed to radiate from the constellation Gemini. Unlike most meteor showers that are the result of Earth moving through the dust trail of a comet, the Geminids are the result of Earth passing through the dust trail of an asteroid. Yes, asteroid Phaethon is responsible for the substantial number of meteors we see during the Geminids shower. Its orbit it brings it closer to the Sun than any other named asteroid (about one half of Mercury's perihelion) and may be responsible for its generous dust trail.

This year, the peak occurred in the early morning hours of Tuesday, December 14th. As I scanned the weather reports and considered an early morning viewing for 2021, I thought of last year's shower. It was predicted to be one of the better recent showings, having to do with the concentration of dust and the direction in which the earth turned into the dust field. I was not disappointed to see about fifty meteors in less than an hour under my moderately light polluted sky and this was not even during the predicted peak!

As the day approached, I resolved to head out that morning. The weather prediction was for a clear sky and a mild 40-degree temperature. A waxing gibbous Moon would be in the sky but low in the west and setting about 2:30am. I set my alarm and lay down for a few Z's.

At 1am, I got up, dressed, and headed outside. I kept the lights off to preserve my night vision and to not disturb the rest of the family. I quietly set up a zero-gravity chair in the backyard, using the house as a screen for the Moon. As soon as I unfolded the chair and sat down, a bright meteor with a 15-degree trail flashed across Orion. What a great omen! I then reclined to a horizontal position with my feet facing south. The sky was beautifully clear, the temperature mild, and Gemini was high in the southern sky as it crossed the meridian.

As I began to see more meteors, I could not help but admire the various stars and constellations while I waited between the dazzling trails of light. Betelgeuse, Rigel, Sirius, were all shining brightly in the late autumn sky hinting at the winter to come. The meteors were appearing quickly, and my count rose rapidly. Sometimes, I would see 3 or 4 in quick succession in the same part of the sky.

I was fortunate to have some company during my observations. A pair of great horned owls on opposite sides of a field behind my house began calling to each other. One was higher pitched and more urgent, the other, lower pitched and calmer. I could only imagine this as a conversation between an older wiser owl and its eager, younger protege. The elder imparting wisdom of life and nature to the younger. The meteors continued to fall at a high rate, and though most were short, bright streaks, several fireballs with long, lingering trails were observed.

After a little more than an hour and eighty-four meteors later, I folded my chair and walked back into the house with a smile on my face and satisfaction in my heart. Although I was disappointed that none of my family elected to join me (unlike me, they had to work in the morning), there is something to be said for sitting alone under a glorious sky on a pleasant evening and watching the heavens unfold before you with a couple of owls for company. – Michael Corvese

Movie Review: Don't Look Up

By Francine Jackson

It's not often that a science fiction movie actually gets a lot of press, except for a vast number of previews seen as commercials on almost any television show. However, it is unique that we see so much hype on one, especially a movie that virtually guest-appeared in movie theaters, then found itself just relegated to Netflix. Of course, this can pose a problem for those who don't subscribe to these extra channels, especially as there's so much talk about it. Such is the way with Don't Look Up.

For a science fiction movie, first of all, the cast is incredible: Leonardo DeCaprio, Jennifer Lawrence, Cate Blanchette, Tyler Perry, Meryl Streep, Jonah Hill, Ron Perlman, et al. Of course, the concept, sadly, isn't totally inconceivable: We're gonna die. A comet is coming directly at us, and no one believes it. We have six months to live.

Surprisingly, although Rotten Tomatoes gives it an unhearty 55%, most of the critics are actually behind the movie. The script is fairly believable, and just to round up the actors who are in it has to be a coup for the producer/director Adam McCay. It is also quite long for a movie these days, way over two hours, but it seems to keep the audience's attention for the entire time.

Although I don't have any known extra channels, I happened to visit an old friend who does, and begged to watch it. And, actually, it isn't that bad. Also, there are several YouTubes that actually, if not praise the effort, give it a fairly good thumbs-up (except Rotten Tomatoes, of course, which not many viewers care about anymore anyway), even such a scientist as Brian Cox, who was pleasantly surprised with the effort.

I mention Don't Look Up for a couple reasons: First, I wouldn't mind seeing it again, this time with a group of like-minded people, to learn their take on it. It would be great to have a night "at the movies" at Seagrave to discuss it. Also, there is at least one other scifi movie coming up, Full Moon, and it might be a nice idea to do what had been done decades ago, see it and tear it apart, if needed. This idea actually came from Jim Hendrickson, who has wanted to do something like this for some time. In the meantime, though, let's start with Don't Look Up. I'd love to know other Skyscrapers' opinions.

NASA Night Sky Notes:

Hunting the Hunter: Observing Orion

By David Prosper

If you are outside on a clear January night, it's hard not to notice one distinctive star pattern above all: Orion! While we've covered Orion in earlier articles, we've never discussed observing the constellation as a whole. Perhaps you've received a new telescope, camera, or binoculars, and are eager to test it out. Orion, being large, prominent, and full of interesting, bright objects, is a perfect constellation to test out your new equipment and practice your observing skills - for beginners and seasoned stargazers alike.

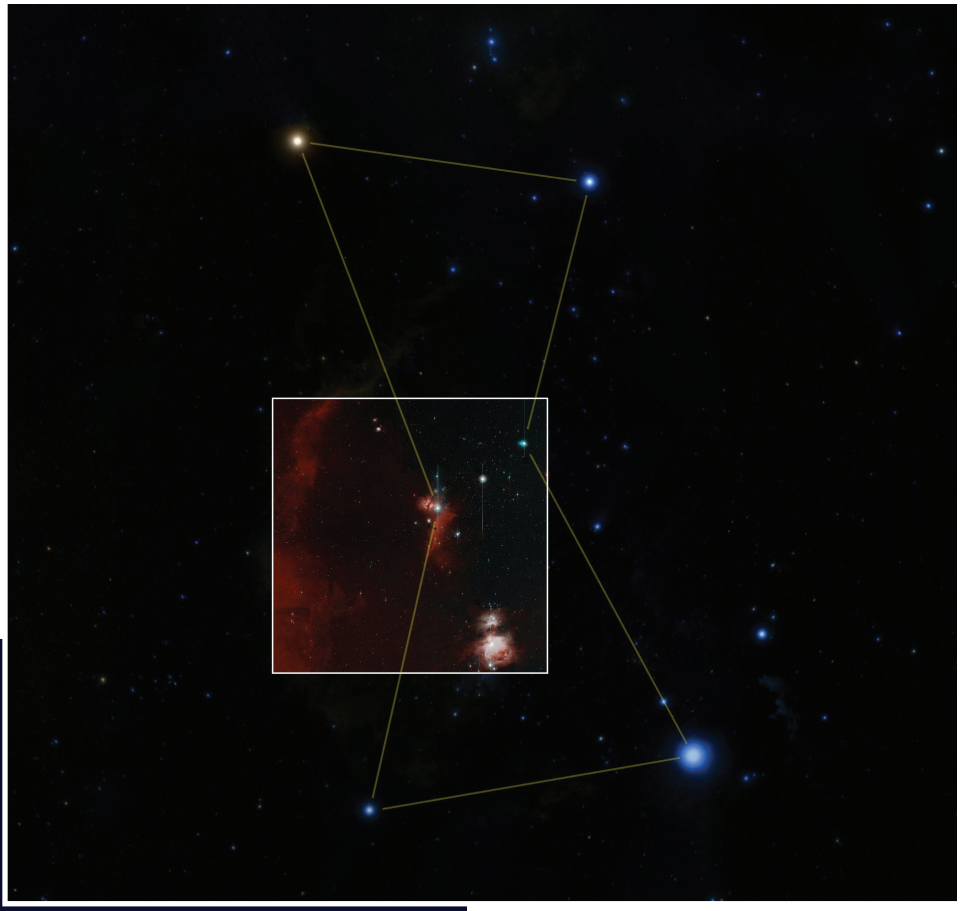
In Greek mythology, Orion is a strong hunter, with numerous legends about his adventures. Being such a striking group of stars, cultures from all around the world have many myths about this star pattern. There are so many that we can't list them all here, but you can find a wonderful interactive chart detailing many cultures' legends on the Figures in the Sky website at figuresinthesky.visualcinnamon.com .

What sights can you see in Orion? Look above the variable orange-red supergiant "shoulder star" Betelgeuse to find the stars making up Orion's "club," then move across from Betelgeuse towards the bright star Bellatrix (Orion's other "shoulder") and the stars of his bow and arrow - both essential tools for the Hunter. Many interesting sights lie near Orion's "belt" and "sword." Orion's belt is made up of three bright giant stars forming an evenly spaced line: Alnitak, Alnilam, and Mintaka. Move from the belt stars towards the stars Rigel and Saiph (Orion's "feet" or "knees") to arrive at Orion's distinctive Sword, parts of which may appear fuzzy to your unaided eyes. Binoculars reveal that fuzz to be the famed Orion Nebula (M42), perched right next to the star Hatysa! Diving in deeper with a telescope will show star clusters and more cloud detail around the Nebula, and additional magnification brings out further detail inside the nebula itself, including the "baby stars" of the Trapezium and the next-door neighbor nebula M43. Want to dive deeper? Dark skies and a telescope will help to bring out the reflection nebula M78, the Flame Nebula (NGC 2024), along with many star clusters and traces of dark nebula throughout the constellation. Very careful observers under dark clear skies may be able to spot the dark nebula known as the Horsehead, tracing an equine outline below both the Belt and the Flame Nebula. Warning: the Horsehead can be a difficult challenge for many stargazers, but very rewarding.

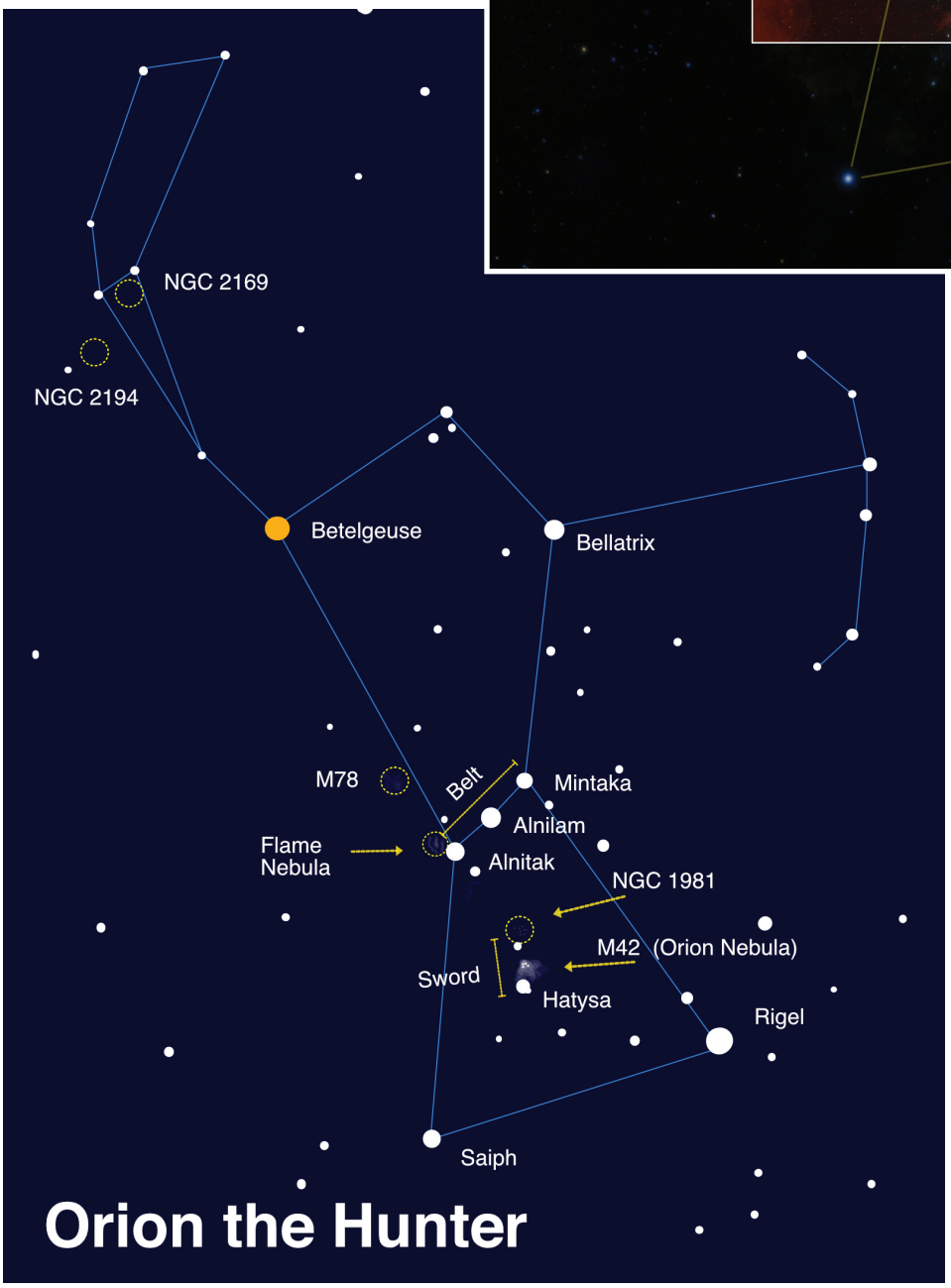
This is just a taste of the riches found within Orion's star fields and dust clouds; you can study Orion for a lifetime and nev-

er feel done with your observations. To be fair, that applies for the sky as a whole, but Orion has a special place for many. New telescopes often focus on one of Orion's treasures for their first test images. You can discover more of NASA's research into Orion's stars - as well as the rest of the cosmos - online at 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 to find local clubs, events, and more!



The inset image is the "first light" photo from the Zwicky Transient Facility, a large survey telescope designed to detect changes in the entire night sky by detecting "transient objects" like comets, supernovae, gamma ray bursts, and asteroids. For many astronomers, amateur and pro alike, Orion is often the "first light" constellation of choice for new equipment! Image Credit: Caltech Optical Observatories



Northern Hemisphere observers can find Orion during January evenings in the east/southeast skies. Can you spot the Orion nebula with your naked eye, in Orion's sword? How does it look via binoculars or a telescope? What other details can you discern? Please note that some deep sky objects aren't listed here for clarity's sake. For example, M43, a nebula located directly above M42 and separated by a dark dust lane, is not shown. Orion's Belt and Sword are crowded, since they star-forming regions! You can read more in our November 2019 article Orion: Window Into a Stellar Nursery, at bit.ly/orionlight .
Image created with assistance from Stellarium.

The Sun, Moon & Planets in January

This table contains the ephemeris of the objects in the Solar System for each Saturday night in January 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
Sun	**1**	18 45.8	-23 01.3	Sgr	-26.8	1951.7	-	-	-	0.98	07:13	11:49	16:26
	8	19 16.6	-22 16.4	Sgr	-26.8	1951.7	-	-	-	0.98	07:13	11:53	16:33
	15	19 46.9	-21 10.1	Sgr	-26.8	1951.2	-	-	-	0.98	07:11	11:55	16:40
	22	20 16.7	-19 43.9	Cap	-26.8	1950.2	-	-	-	0.98	07:07	11:57	16:49
	29	20 45.9	-17 59.8	Cap	-26.8	1948.6	-	-	-	0.98	07:01	11:59	16:58
Moon	**1**	16 54.0	-24 18.8	Oph	-9.5	1973.6	25°W	5	-	-	06:08	10:40	15:09
	8	23 54.8	-6 05.9	Aqr	-11.4	1883.3	69°E	33	-	-	11:07	17:12	23:27
	15	5 26.6	24 44.9	Tau	-12.4	1792.3	147°E	92	-	-	14:29	22:29	06:30
	22	11 26.1	8 27.8	Leo	-12.4	1837.2	134°W	85	-	-	20:36	03:19	09:51
	29	17 33.7	-25 47.2	Oph	-10.7	1944.6	45°W	15	-	-	04:58	09:25	13:51
Mercury	**1**	20 02.7	-22 18.5	Sgr	-0.6	5.9	18°E	78	0.36	1.14	08:29	13:08	17:47
	8	20 37.8	-19 18.7	Cap	-0.3	6.9	19°E	57	0.33	0.97	08:22	13:13	18:05
	15	20 49.8	-16 37.8	Cap	1.0	8.5	16°E	24	0.31	0.79	07:54	12:54	17:55
	22	20 27.1	-16 01.1	Cap	6.0	10.0	4°E	1	0.32	0.67	07:00	12:01	17:02
	29	19 53.4	-17 19.3	Sgr	2.8	9.9	13°W	10	0.35	0.68	06:05	11:02	15:58
Venus	**1**	19 38.5	-18 35.4	Sgr	-3.7	61.8	13°E	2	0.72	0.27	07:45	12:37	17:30
	8	19 21.0	-17 28.2	Sgr	-3.8	63.6	5°E	0	0.72	0.27	06:55	11:52	16:49
	15	19 03.2	-16 39.5	Sgr	-3.7	62.1	11°W	2	0.72	0.27	06:07	11:07	16:07
	22	18 50.5	-16 14.2	Sgr	-4.0	57.9	21°W	6	0.72	0.29	05:26	10:28	15:30
	29	18 45.8	-16 11.2	Sgr	-4.3	52.4	29°W	12	0.72	0.32	04:54	09:56	14:58
Mars	**1**	16 46.6	-22 30.0	Oph	1.6	4.0	27°W	98	1.54	2.34	05:13	09:49	14:25
	8	17 08.1	-23 06.8	Oph	1.5	4.1	30°W	97	1.53	2.30	05:10	09:43	14:17
	15	17 29.9	-23 32.9	Oph	1.5	4.1	32°W	97	1.52	2.26	05:06	09:38	14:09
	22	17 52.0	-23 47.8	Sgr	1.5	4.2	34°W	97	1.51	2.22	05:02	09:32	14:02
	29	18 14.2	-23 51.1	Sgr	1.4	4.3	36°W	96	1.50	2.18	04:57	09:27	13:57
1 Ceres	**1**	3 50.3	18 02.9	Tau	7.7	0.7	139°E	99	2.72	1.90	13:39	20:49	03:59
	8	3 47.7	18 23.1	Tau	7.9	0.6	131°E	98	2.71	1.96	13:07	20:19	03:31
	15	3 46.5	18 46.2	Tau	8.0	0.6	124°E	98	2.71	2.03	12:37	19:51	03:04
	22	3 46.7	19 12.1	Tau	8.1	0.6	117°E	97	2.70	2.11	12:08	19:23	02:39
	29	3 48.3	19 40.5	Tau	8.2	0.6	110°E	97	2.69	2.19	11:40	18:54	02:15
Jupiter	**1**	22 11.9	-12 12.7	Aqr	-2.0	35.3	50°E	99	4.99	5.57	09:55	15:13	20:31
	8	22 17.2	-11 42.2	Aqr	-2.0	34.8	44°E	100	4.99	5.65	09:31	14:50	20:10
	15	22 22.8	-11 10.0	Aqr	-1.9	34.4	39°E	100	4.99	5.72	09:07	14:28	19:50
	22	22 28.6	-10 36.3	Aqr	-1.9	34.0	33°E	100	4.99	5.78	08:43	14:07	19:31
	29	22 34.6	-10 01.3	Aqr	-1.9	33.7	27°E	100	4.99	5.84	08:19	13:45	19:11
Saturn	**1**	20 58.4	-18 00.6	Cap	0.7	15.4	31°E	100	9.92	10.75	09:04	13:59	18:54
	8	21 01.5	-17 47.8	Cap	0.7	15.3	25°E	100	9.92	10.80	08:39	13:35	18:30
	15	21 04.8	-17 34.4	Cap	0.7	15.3	19°E	100	9.92	10.84	08:14	13:10	18:07
	22	21 08.1	-17 20.5	Cap	0.7	15.2	12°E	100	9.92	10.87	07:48	12:46	17:44
	29	21 11.4	-17 06.3	Cap	0.7	15.2	6°E	100	9.91	10.89	07:23	12:22	17:21
Uranus	**1**	2 34.6	14 43.6	Ari	5.7	3.7	120°E	100	19.72	19.21	12:37	19:34	02:30
	8	2 34.3	14 42.2	Ari	5.7	3.6	113°E	100	19.72	19.31	12:10	19:06	02:02
	15	2 34.1	14 41.6	Ari	5.7	3.6	106°E	100	19.72	19.43	11:42	18:38	01:35
	22	2 34.1	14 41.7	Ari	5.8	3.6	99°E	100	19.72	19.54	11:14	18:11	01:07
	29	2 34.3	14 42.7	Ari	5.8	3.6	92°E	100	19.72	19.66	10:47	17:44	00:40
Neptune	**1**	23 27.5	-4 44.4	Aqr	7.9	2.3	70°E	100	29.92	30.24	10:42	16:27	22:12
	8	23 28.0	-4 41.1	Aqr	7.9	2.3	63°E	100	29.92	30.35	10:15	16:00	21:46
	15	23 28.6	-4 37.2	Aqr	7.9	2.2	56°E	100	29.92	30.46	09:48	15:33	21:19
	22	23 29.2	-4 32.8	Aqr	7.9	2.2	49°E	100	29.92	30.55	09:21	15:07	20:52
	29	23 30.0	-4 28.0	Aqr	7.9	2.2	42°E	100	29.92	30.64	08:54	14:40	20:26
Pluto	**1**	19 53.1	-22 39.4	Sgr	14.4	0.2	15°E	100	34.43	35.38	08:19	12:54	17:29
	8	19 54.1	-22 37.3	Sgr	14.4	0.2	9°E	100	34.44	35.41	07:52	12:27	17:02
	15	19 55.1	-22 35.2	Sgr	14.4	0.2	2°E	100	34.44	35.43	07:25	12:01	16:36
	22	19 56.0	-22 33.2	Sgr	14.4	0.2	6°W	100	34.45	35.43	06:59	11:34	16:09
	29	19 57.0	-22 31.2	Sgr	14.4	0.2	12°W	100	34.45	35.41	06:32	11:07	15:43

Planetary Nebula in Camelopardalis:
NGC 1501

by Glenn Chaple for LVAS

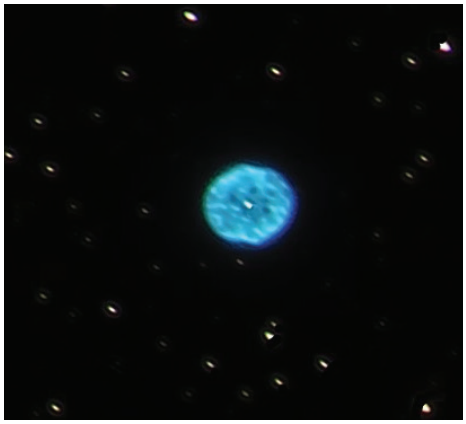
(Magnitude 11.5, Size 52")

There are two major reasons why this month's Observer's Challenge, the planetary nebula NGC 1501, is largely unobserved. First of all, it's located in the extremely faint circumpolar constellation Camelopardalis. Star-hoppers will have a rough time navigating around a constellation that lacks stars brighter than 4th magnitude. A second reason has to do with its published magnitude- 13.0 in a number of web sources and observing handbooks. That's faint enough to scare away anyone observing with a small-aperture scope! But 13.0 is its photographic magnitude. Its visual magnitude is a more accomodating 11.5.

Although NGC 1501 can be viewed with small-aperture scopes under dark-sky conditions, its mottled appearance requires larger instruments. The 14.5-magnitude central star will challenge an 8-inch telescope. Embedded in the surrounding nebulosity like a pearl in a shell, it gives NGC 1501 its nick-name, the Oyster Nebula.

If you own a GoTo scope, you can get to the Oyster by punching in its 2000.0 celestial coordinates: RA 04h 06m 59.4s, DEC +60° 55' 14.4". Star-hoppers can begin at nearby Kemble's Cascade- a remarkable asterism consisting of a 2½ degree-long near-straight chain of some 20 magnitude 7 to 10 stars punctuated near the middle by a 5th magnitude star. To find the Cascade, make a low-power (25-30X) search of the area marked by a line drawn from beta (β) to epsilon (ε) Cassiopeiae and extended an equal distance beyond (refer to finder Chart A). Once you've found it, keep the low power eyepiece in place and take a moment to admire this stunning stellar arrangement. At its southernmost end, you'll spot a tiny sprinkling of stars. This is the open cluster NGC 1502. A switch to a higher magnification (60-75X will reveal several dozen stars of 9th magnitude and fainter surrounding a pretty double star (Struve 485, magnitudes 6.9 and 6.9, separation 18 arc-seconds). If you had gone directly to NGC 1502 via GoTo technology, you would have missed an amazing asterism, a neat little star cluster, and an attractive double star. Your final leg of the star-hop takes you 1.4 degrees south of NGC 1502 (refer to Chart B). Once the Oyster comes into view, you'll want to switch to the highest magnification your telescope and the seeing conditions will allow.

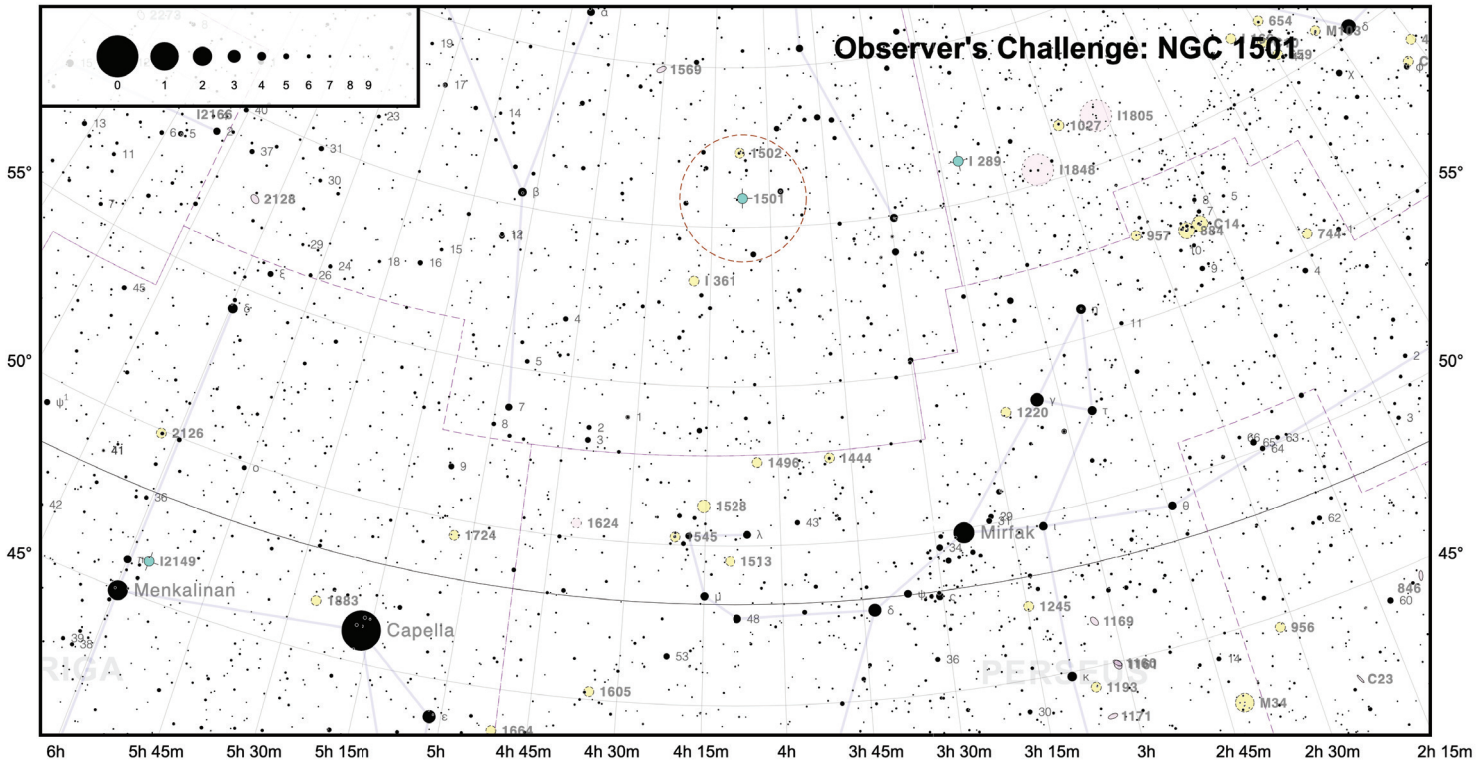
My first encounter with NGC 1501 was via a 3-inch f/10 reflector (Edmund Scientific's Space Conqueror) on the evening of February 2, 1986. According to the notes I wrote in my logbook it was "very faint, but

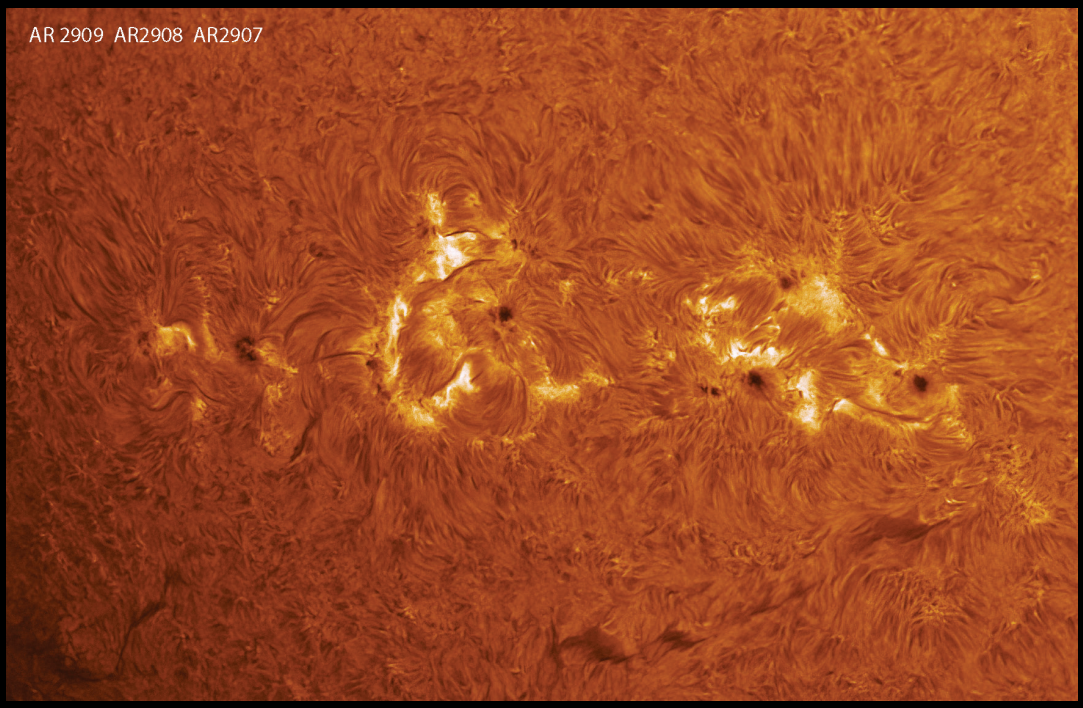


definitely seen. Visible at 60X." A sketch made with 120X shows the roundish form I saw. I was surprised to see this planetary at all, as my source gave a magnitude of 13.3, and I estimated it to be more like 11.0.

NGC 1501 was discovered by William Herschel on August 27, 1787. Its estimated distance is around 5000 light years, which translates to an actual dimension of 1.3 light years.

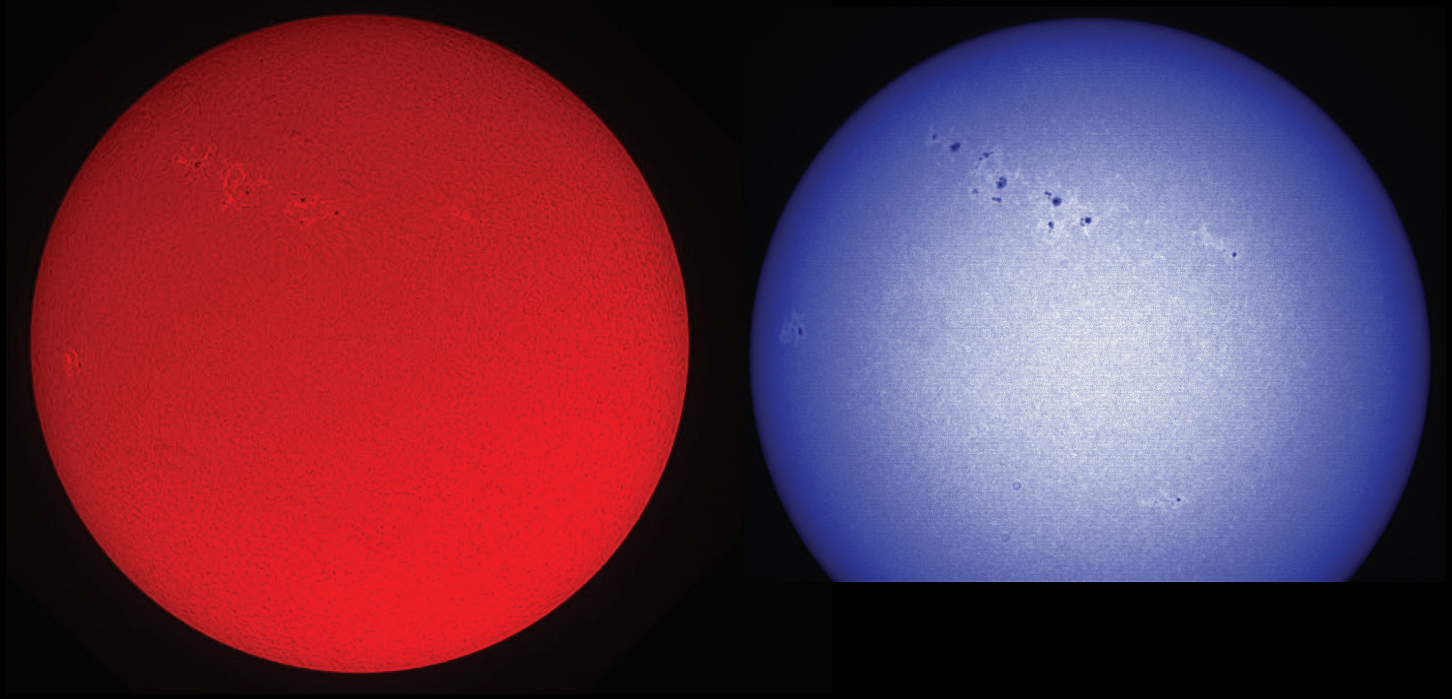
The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'll be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to Roger Ivester (rogerivester@me.com). To find out more about the Observer's Challenge or access past reports, log on to rogerivester.com/category/observers-challenge-reports-complete.





3 active regions in close proximity on December 17: AR2907 2908 2909; The air was very unstable, this image is from 8,000 frames and the best 50 stacked; Lunt ED102 achromatic, Daystar Quark Chromosphere, ZWO ASI174mm; by Jeff Padell

The Sun in narrowband taken on 12/18/2021 by Conrad Cardano;
H-alpha image: Lunt 60mm H-alpha scope; Camera - ZWO ASI174MM; 8-bit avi video; FrameCount=1000;
CaK image: 60mm f/8 scope with CaK filter; Camera - ZWO ASI174MM; ZWO ASI174MM; 8-bit avi video; FrameCount=2000
Stacked using AutoStakkert, Color enhanced using AstroArt



Comet C/2021 A1 Leonard
on December 19, 2021 taken by Ron Zincone from Charlestown, RI; TeleVue 60 APO @ prime focus (360mm @ f6) with a Canon 6D on a Manfrotto tripod; ISO 1600, 5 sec

Comet C/2021 A1 Leonard
taken from Longboat Key (Sarasota), Florida by Greg Shanos on December 25 with a Nikon D300 12MP camera at 135mm f/5.6 15 sec exposure. Stack of 7 photos in Deep Sky Stacker.

January 2022

Volume 22

STARRY SCOOP

Editor: Kaitlynn Goulette

WHAT'S UP

The winter season brings us some of the brightest stars and constellations. Dominating a large region of the sky is the Winter Hexagon, which is a large asterism that envelopes many constellations. It can be used as a guide to navigate the sky. It's comprised of Rigel, Aldebaran, Capella, Pollux, Procyon, and Sirius, some of the brightest stars in the night sky. At the center of this star pattern is the red supergiant star Betelgeuse. At more than 900 times the size of our sun, it reveals its reddish color to the unaided eye. You can find all of these stars labeled on the star map below.

On the evenings of the 3rd through the 5th, the crescent moon joins a planetary alignment cascading from Jupiter to Saturn, Mercury, and Venus towards the southwest horizon.

Jupiter remains a visual spectacle in the southwestern evening sky all month, while Saturn becomes a more difficult target by month's end as it approaches the horizon.

On the 8th, Venus reaches inferior conjunction, when it is positioned between the earth and the sun, and will continue on its way to becoming our bright "Morning Star." On the 29th, you can find the ruddy-colored Mars between the waning crescent moon and Venus low in the southeastern morning sky before sunrise.

The Quadrantid Meteor Shower runs from January 1st to the 5th, peaking on the night of the 3rd through the morning of the 4th. It produces up to 40 meteors per hour and radiates from the constellation Boötes, although meteors can be seen anywhere in the sky. For the best viewing, observe under dark skies after midnight.

The 30-year anniversary of the discovery of the first exoplanet, or planet outside our solar system, occurs on the 22nd. It was found orbiting a pulsar, which is a pulsating neutron star. Pulsars give off pulses of radio waves that we can detect from earth. Astronomers discovered the exoplanet because it interrupted the pulsating signal as it passed between the earth and the pulsar. Since this discovery, astronomers have found thousands of exoplanets.

JANUARY'S SKY

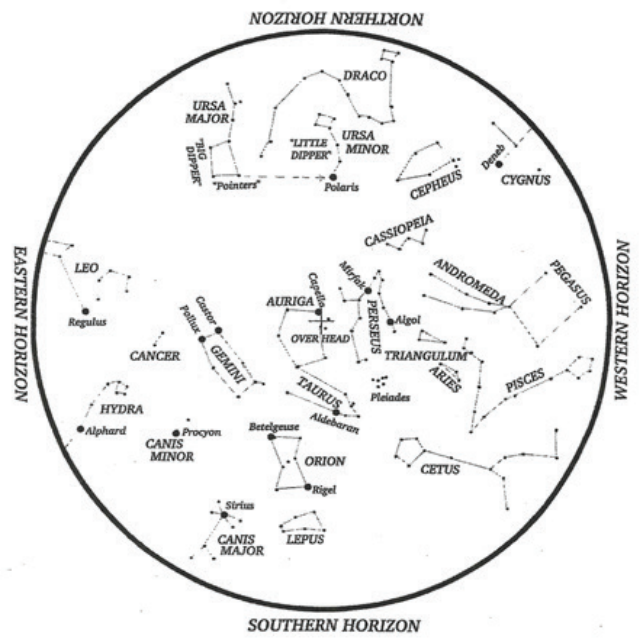
2: New Moon

3-4: Quadrantid Meteor Shower Peak

7: Mercury at Greatest Eastern Elongation

8: Venus at Inferior Conjunction

17: Full Moon



Credit: Roger B. Culver

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

OBSERVATIONS

Despite my busy schedule and Christmas shopping, I made a few attempts to observe the elusive Comet Leonard (C/2021 A1). With some promising reports of it brightening last month, I was hoping to observe it, but I had no such luck. Each outing seemed to have the recurring theme of clouds along the western horizon in the area of the comet, with clear skies overhead. These treks were not a total loss, I was able to view the bright planets through holes in the clouds, including Venus in its crescent phase, which is always a thrill.

Last month at the Springfield Science Museum's public outreach event, "Stars Over Springfield," I had my 8-inch Dobsonian Telescope set up at the entrance. Upon arrival, people enjoyed the telescopic views of Jupiter and Saturn that were visible just above the rooftops of the surrounding buildings. As the crowd was observing these planets, I heard many exclamations of excitement. For many, it was their first time viewing these planets through a telescope and a lot of them got back in line for a second view. That was the last time we will be able to observe Jupiter and Saturn from the museum's parking lot because they will soon sink behind the surrounding buildings.

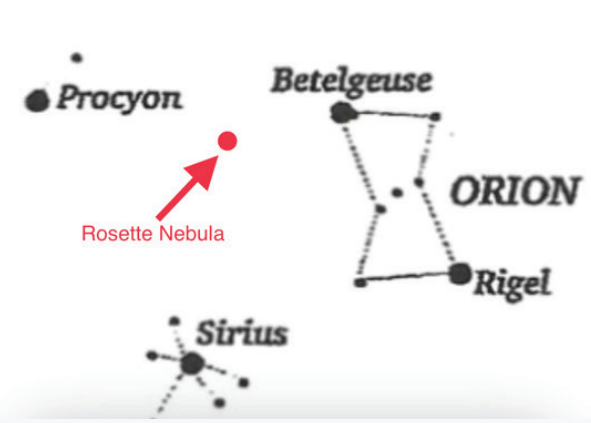
Public outreach events like this always excite me. They remind me of the first time I observed Jupiter and Saturn through a telescope, which occurred in the museum's parking lot on a night much like this. I was only five years old and was very excited to learn all about astronomy. I was amazed that I could see details on these planets through a backyard telescope. It was a memory I'll never forget.

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. The Starry Scoop is now on Facebook. Clear skies!

OBJECT OF THE MONTH

The featured object for the month of January is the Rosette Nebula. This large, emission nebula is located in the constellation Monoceros and surrounds NGC 2244, an open cluster of hot, young stars. This cluster is also known as the Rosette Cluster and was formed from the nebula's material. Both the cluster and nebula lie about 5,000 light-years away, and are roughly 130 light-years in diameter.

The Rosette Nebula is about twice the diameter of the full moon. This gas cloud requires a telescope under dark skies, but the Rosette Cluster can be seen with binoculars. You can find this nebula about 15 degrees west of Betelgeuse, a bright star in the constellation Orion. Use the star map below to help you find it. Good luck!



Rosette Nebula
Photo by Tim Connolly

Directions to Seagrave Memorial Observatory

www.theSkyscrapers.org

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.

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