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Seagrave Memorial Observatory Open Nights
January 14, 21, 28 @ 7pm

Adventures of an Eclipse Chaser

A virtual presentation by meteorologist Joe Rao on Saturday, January 7 @ 7:00pm

Contact Linda Bergemann (LBergemann@aol.com) for Zoom Meeting link and information.

For the past 50 years, Joe Rao has traveled around the world to observe total solar eclipses. He has observed the solar corona from land, sea and air, from such diverse locations as the North Pole and Antarctica, Montana, Turkey and Canada's Gaspe Peninsula. He has served as onboard meteorologist for four eclipse cruises and has coerced airlines to change their flight itineraries in order to position regularly scheduled commercial flights so as to view the Sun in total eclipse. Through 13 eclipses he has spent more than 30 minutes "basking" in the Moon's dark umbral shadow and along the way has experienced many interesting and memorable experiences which he will share in this illustrated talk.

For 21 years, Joe Rao was the Chief Meteorologist and Science Editor at News 12 Westchester. He was nominated for 8 Emmy Awards and in 2015 was voted First among weathercasters in New York State by the Associated Press. Since 1986 he has served as an associate and guest lecturer at the Hayden Planetarium. In 2009, the prestigious Walter Scott Houston Award was bestowed upon him by the Northeast Region of the Astronomical League. He is a Contributing Editor for Sky & Telescope magazine and writes a syndicated weekly column for the online news service, Space.com. Joe also pens a monthly astronomy column for Natural History magazine and provides annual astronomical data for The Farmers' Almanac.

The most recent solar eclipse visible from Rhode Island was a 72% partial eclipse that occurred after sunrise on June 10, 2021. Image taken at Conimicut Park in Warwick by Jim Hendrickson.

President's Message

by Linda Bergemann

Happy New Year!

As we begin 2023, I am thinking more about what we can do to engage the youngest members of our community in astronomy. At our last Program Committee meeting, we discussed children that attend our open nights with their families, and the lack of resources on-hand targeted at youth.

Occasionally we host scout troops, but the weather has not been cooperative lately. We provide off-site star parties associated with schools and libraries, but these do not focus on the younger attendees. Skyscrapers member Mark Munkacsy leads an Astronomy Club at the Woonsocket Harris Public Library, but we have not actively promoted it to our visitors.

So what are we going to do to educate the youngest among us about astronomy? Laura Landen and Michael Corvese volunteered to get something started, beginning with a resource sheet with information on the Woonsocket Astronomy Club and the Night Sky Network. Maybe an astronomy workshop for kids during a school vacation? We are in search of ideas and people to help put things in motion. If you have thoughts on this matter and/or would like to help, please contact me, Laura or Michael.

In closing, I must mention that the need to do more for kids was reinforced on Christmas Day, when my 2-year-old grand nephew, Charlie, climbed over me, while I was sitting on the couch, to get to the window behind me. The next word I heard from him was "MOON"! We can't start too young.

New Members

Welcome to Skyscrapers

Jonathan Gradie
of Putnam, CT

Curt & Elijah Prochowski
of Putnam, CT

Ronald & Marion Herndon
of Portsmouth, RI

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 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.

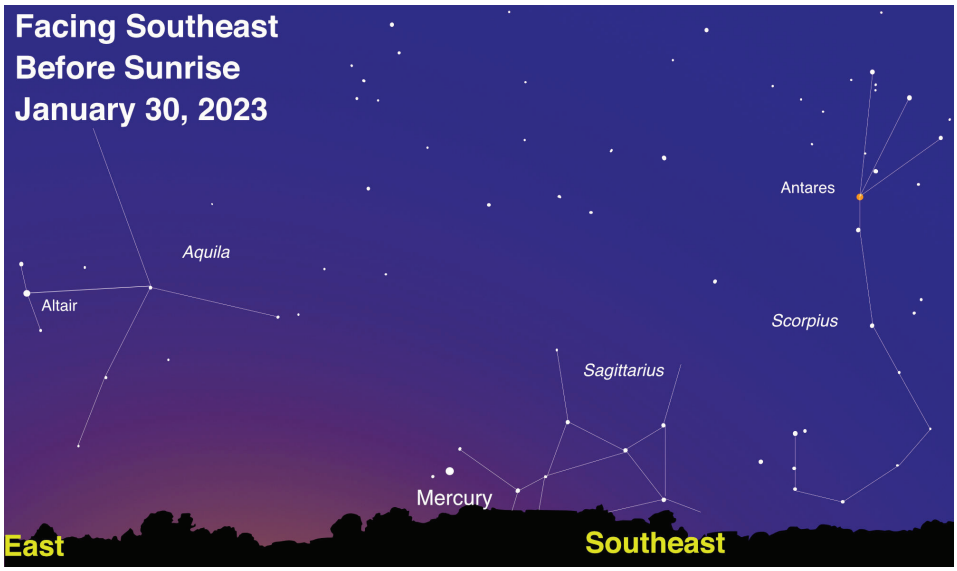
NASA Night Sky Notes:

Spot the Messenger: Observe Mercury

by David Prosper

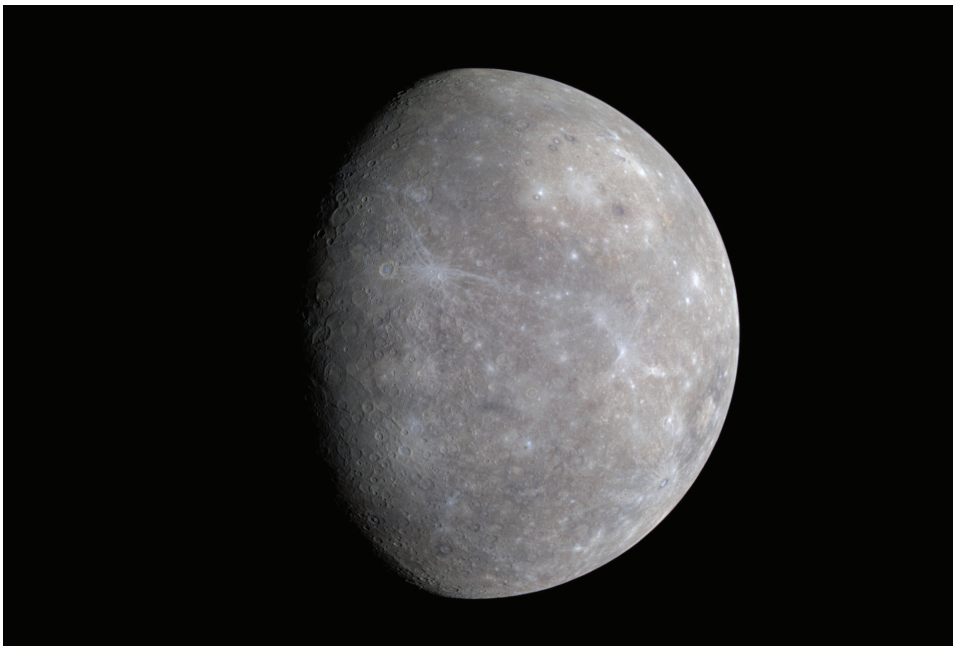
Most planets are easy to spot in the night sky, but have you spotted Mercury? Nicknamed the Messenger for its speed across the sky, Mercury is also the closest planet to the Sun. Its swift movements close to our Sun accorded it special importance to ancient observers, while also making detailed study difficult. However, recent missions to Mercury have resulted in amazing discoveries, with more to come.

Mercury can be one of the brightest planets in the sky – but also easy to miss! Why is that? Since it orbits so close to the Sun, observing Mercury is trickier than the rest of the "bright planets" in our solar system: Venus, Mars, Jupiter, and Saturn. Mercury always appears near our Sun from our Earth-bound point of view, making it easy to miss in the glare of the Sun or behind small obstructions along the horizon. That's why prime Mercury viewing happens either right before sunrise or right after sunset; when the Sun is blocked by the horizon, Mercury's shine can then briefly pierce the glow of twilight. Mercury often appears similar to a "tiny Moon" in a telescope since, like fellow inner planet Venus, it shows distinct phases when viewed from Earth! Mercury's small size means a telescope is needed to observe its phases since they can't be discerned with your unaided eye. Safety warning: If you want to observe Mercury with your telescope during daytime or before sunrise, **be extremely careful:** you don't want the Sun to accidentally enter your telescope's field of view. As you may already well understand, this is extremely dangerous and can not only destroy your equipment, but permanently blind you as well! That risk is why NASA does not allow space telescopes like Hubble or the JWST to view Mercury or other objects close to the Sun, since even the tiniest error could destroy billions of dollars of irreplaceable equipment.



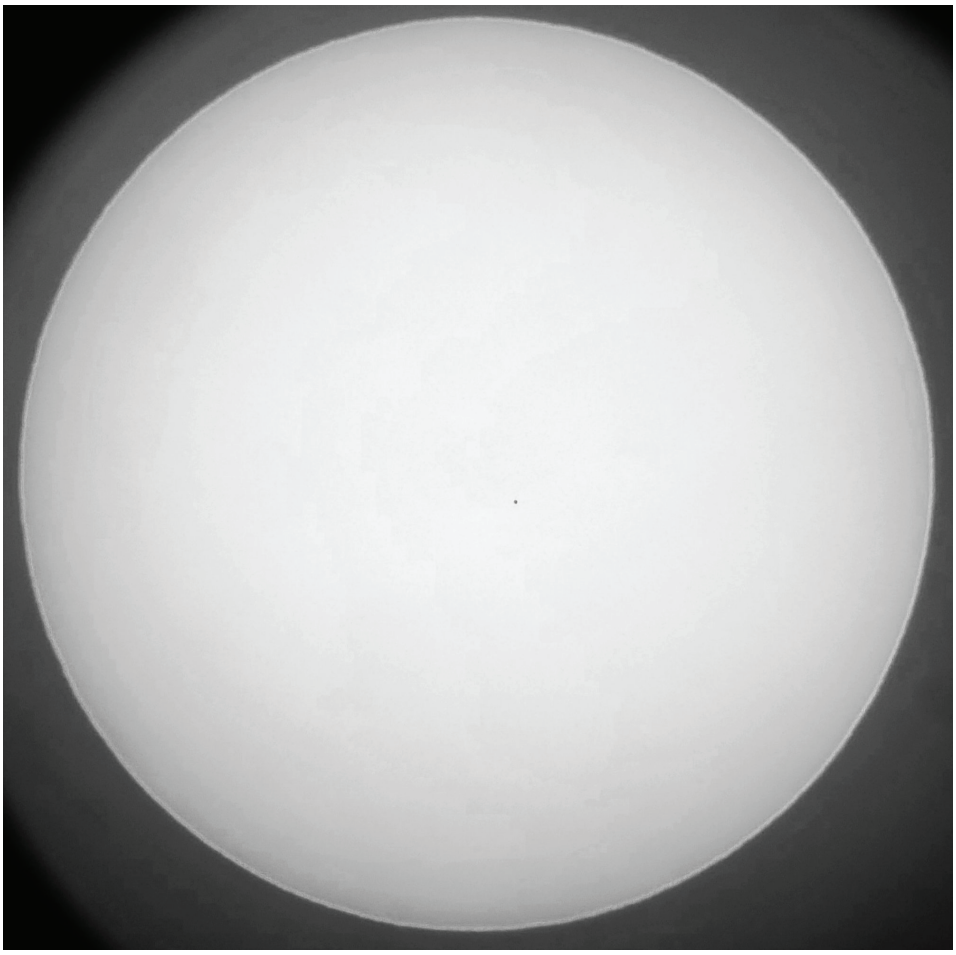
Mercury reaches maximum western elongation on the morning of January 30, which means that your best chance to spot it is right before sunrise that day! Look for Mercury towards the southeast and find the clearest horizon you can. Observers located in more southern latitudes of the Northern Hemisphere have an advantage when observing Mercury as it will be a bit higher in the sky from their location, but it's worth a try no matter where you live. Binoculars will help pick out Mercury's elusive light from the pre-dawn glow of the Sun. Image created with assistance from Stellarium

Despite being a small and seemingly barren world, Mercury is full of interesting features. It's one of the four rocky (or terrestrial) planets in our solar system, along with Earth, Venus, and Mars. Mercury is the smallest planet in our solar system and also possesses the most eccentric, or non-circular, orbit of any planet as well: during a Mercurian year of 88 Earth days, the planet orbits between 29 million and 43 million miles from our Sun – a 14-million-mile difference! Surprisingly, Mercury



Mercury is hot, small, and heavily cratered across its gray surface, as seen in this image from NASA MESSENGER. Mercury is the most heavily cratered planet in our solar system, since it lacks either a substantial atmosphere or geologic activity to erode surface features like craters - similar in certain aspects to the surface of our own Moon.
Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Source: https://solarsystem.nasa.gov/resources/439/mercurys-subtle-colors/

is not the hottest planet in our solar system, despite being closest to the Sun; that honor goes to Venus, courtesy its thick greenhouse shroud of carbon dioxide. Since Mercury lacks a substantial atmosphere and the insulating properties a layer of thick air brings to a planet, its temperature swings wildly between a daytime temperature of 800 degrees Fahrenheit (427 degrees Celsius) and -290 degrees Fahrenheit (-179 degrees Celsius) at night. Similar to our Moon, evidence of water ice is present at Mercury's poles, possibly hiding in the frigid permanent shadows cast inside a few craters. Evidence for ice on Mercury was first detected by radar observations from Earth, and followup observations from NASA's MESSENGER mission added additional strong evidence for its presence. Mercury sports a comet-like tail made primarily of sodium which has been photographed by skilled astrophotographers. The tail results from neutral atoms in its thin atmosphere being pushed away from Mercury by pressure from the nearby Sun's radiation.



On rare occasion, Earthbound observers can observe Mercury, like Venus, transiting the Sun. Mercury frequently travels between Earth and the Sun, but only rarely does the geometry of all three bodies line up to allow observers from Earth to view Mercury's tiny shadow as it crosses our star's massive disc. You can see one such event in this photo taken by Laurie Ansorge of the Westminster Astronomical Society on November 11, 2019. If you missed it, set a reminder for Mercury's next transit: November 13, 2032.

NASA's Mariner 10 was Mercury's first robotic explorer, flying by three times between 1974-1975. Decades later, NASA's MESSENGER first visited Mercury in 2008, flying by three times before settling into an orbit in 2011. MESSENGER thoroughly studied and mapped the planet before smashing into Mercury at mission's end in 2015. Since MESSENGER, Mercury was briefly visited by BepiColombo, a joint ESA/JAXA probe, which first flew by in 2021 and is expected to enter orbit in 2025 - after completing six flybys. Need more Mercury in your life? Check out NASA's discoveries and science about Mercury at solarsystem.nasa.gov/mercury/, and visit the rest of the universe 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!

Observer's Challenge:

Iota Cassiopeiae: Triple Star

by Glenn Chaple

AB Magnitudes 4.6+6.9, Separation 2.9", Position Angle 230°
AC Mags 4.6+9.1, Sep 6.7", PA 117°

Backyard astronomers who favor gossamer deep sky targets like galaxies and nebulae eagerly await the dark, ultra-clear nights that bring these "faint fuzzies" to light. The same can't be said for the double, triple, and multiple star aficionado, as such evenings are also marred by poor seeing conditions which render the splitting of close stellar partnerships all but impossible.

Such is the case with this month's Observer's Challenge, the triple star iota Cassiopeiae. The separations of its three members aren't the problem. Components A and B are about 3 arc-seconds apart, while a little under 7 arc-seconds separate A and C - separations well within reach of a common 60mm (2.4-inch) refractor. The difficulty lies in the magnitude differences between these stars. The main component, Iota Cassiopeia A (magnitude 4.6), is 8 times brighter than B (magnitude 6.9) and over 60 times brighter than C (magnitude 9.1). You'll need steady seeing and a reasonably high magnification to bring all three to light.

Locating iota Cassiopeia is no problem at all. A 5th magnitude star to the unaided eye, it's found by tracing an imaginary line from delta through epsilon – both part of the Cassiopeia "W" – and extending it an equal distance beyond.

My first observation of iota Cassiopeiae was on the evening of October 18, 1971. Encouraged by the fact that I had already split several reasonably close, unequal pairs with my 3-inch f/10 reflector, I decided to give it a try. Despite its faintness, the C component was glimpsed at 60X, but B remained elusive, even at higher magnifications.

It was the Observer's Challenge that brought me back to iota Cassiopeiae early this past November. On successive evenings, first with the trusty 3-inch and then with a 4.5-inch f/8 reflector, I looked for the B component without success. Skies were clear but slightly turbulent on both occasions. On the third evening, there was the slight haze that often comes with nights of good seeing. Taking no chances, I pulled out a 6-inch f/8 reflector. The one-degree field of my 43X "search" eyepiece showed iota and two 8th magnitude stars to its east – an attractive sight. A switch to 133X did the trick – all three of iota's component stars were visible. I boosted the magnification to 200X and made an eyepiece sketch. The C component seemed slightly reddish to me, an impression later borne out when I learned that it's an extremely close binary pair comprised of a K spectral class star and a K or M class companion.

Not only is iota Cassiopeiae C a tight binary pair, but so is iota Cassiopeiae A. Each of these sub-arc-second duos was discovered through the magic of modern-day adaptive optics. This remarkable system lies some 140 light years away.

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

Seagrave Memorial Observatory featured in Scituate Preservation Society's 2023 Calendar

by Francine Jackson

Congratulations are in order to Newsletter Editor Jim Hendrickson, whose image of Seagrave Observatory was chosen for the Scituate Preservation Society's annual calendar's July picture of the month. Thank Jim for having Seagrave as a part of this calendar, which is distributed throughout the town. It may be difficult to find a copy, as these go fast, but, if you do, please keep this one, as it really places our organization in a beautiful light.

Regarding Local Light Pollution Concerns

by Francine Jackson

I live in a town, but just a few houses away from a city. For years, my town has supposedly been working to come up with new lights that would not only lower our lighting bills, but would conform to the fact that we are a town.

Finally, just a couple weeks ago, the company the town had been conferring with for so long gave me my new light. The result? It looks no different from the city's next door. This was disturbing, especially as that night, when a friend came to visit, the first words I heard was, "It looks like daylight here." Also, a neighbor two streets away hadn't known the lights were being changed, but did mention she wondered why her second-floor bedroom was so bright the night before.

Changing the lighting in my town was the main focus of my joining its Conservation Commission. My first month, I had a meeting with the then town administrator and planner, both of whom assured me they would keep me advised as to what would happen. That was my only conversation with the administrator, and the town planner spent the next several years (until he left for a position elsewhere) putting me off.

New persons are now in both positions, and neither wants to discuss the new lights. These LEDs are identical to what are visible in every city in the state, not surprisingly, as the installer is PRISM, a company that seems to have lighting contracts for every part of the state, and assumes every area desires the same product. The lights are very bright – despite the "assurance" that they can be dimmed – and, although they are supposed to be full cutoff, their brilliance spills out in all directions.

I'm not sure whether other places in the state are having their lights changed at this time, but, if so, are they the same as can be seen in local cities? Aren't there health issues with these lights? And, are they once again being a hindrance as to our sky observing? Rhode Island is fast becoming a place where the sky is disappearing with overlighting everywhere. Skyscrapers, Inc., has been talking for awhile about having a lighting committee. It seems this is the time we should seriously look into putting one together.

Geminids Meteor Shower 2022 Observing Report

by Greg Shanos

The Geminids Meteor Shower peaked on the morning of December 14, 2022. I observed the Geminids from my front yard in Sarasota, Florida on the morning of December 14, 2022 from 1:00am to 5:15am local time. My observing site had moderate light pollution with a seventy-percent wanning gibbous moon illuminating the sky resulting in a limiting magnitude of +3. I faced the northeast at the constellation of Gemini and looked up toward the zenith. There was fast moving fog throughout the morning that posed little interference.

I witnessed my first Geminid meteor at 1:01 am at a magnitude of +2. Most of the meteors were fast, white in color and moved swiftly. Most did not leave a train. The sky soon became completely overcast from 1:50am to 2:25am. I resumed observations at 2:25am when the sky was again completely clear.

Three yellow fireballs were noted: the first was a Geminid at 3:10 am at magnitude -1 emanating from the radiant while the second was a non-Gemenid (sporadic) meteor at 3:13am at magnitude -1 that headed toward the radiant. The third yellow Gemenid occurred at 5:02 am at magnitude -2. The yellow color is indicative of iron in the meteoroid. The sky once again became completely overcast at 6:00am and remained overcast until twilight thus terminating my observations.

In summary, I witnessed a total of 53 meteors from 1:00am until 5:15am. Fifty-one were Geminids, which included three fireballs that were all yellow in color, and two were sporadic meteors. The weather conditions at the close of my observations were temperature 65.1°F, Humidity 97%, Barometer 30.00 in Hg, Wind ESE at 5 to 10mph.

Overall, this year's Gemenid Meteor Shower was a success. I submitted my observations to the Astronomical League, the International Meteor Organization and the Association of Lunar and Planetary Observers for archive and research. I encourage everyone to take the time and observe one of nature's finest spectacle.

GEMENID METEOR SHOWER

Visual Meteor Observing Form

1:00 am to 5:15 am local time

Date: 2022 (Yr) 12 (Mon) 14 (Day) Begin: 6 h 00 m End: 10 h 15 m UT

Location: Long. = 82° 36' 18.92" W. Lat. = 27° 20' 57.70" N. Elevation = 5 m

Observer: Gregory T. Skanos Place: Longboat Key (Sarasota) Florida USA

Percent Cloudy: 0 %@ 4h.00m UT 100% @ 6h.50m UT 0 %@ 7h.25m UT %@ : 100%@ 10h.15m UT

Direction Facing & Altitude: 83° facing 70° @ 4h.00m UT 250° W facing 80° @ 8h.00m UT 280° W 70° @ 9h.00m UT 280° W 50° @ 10h.00m UT

Sky Conditions: Perfectly clear @4h.00m UT Overcast, fog @10h.15m UT

Overcast w/ fast moving fog @6h.50m UT @ :

Clear resume observations @7h.25m UT @ :

Breaks: 6h.50m - 7h.25m UT (completly overcast) 9h.00m - 9h.20m UT

Comments: Hazy & Humid with a 70% waning gibbous moon illuminating the sky. Rapidly moving patches of fog throughout the night causing minimal interference. Slight constant wind throughout the night.

Number	Time UT	Magnitude	Type	Color	Speed	Train	Comments
1	6h01m	+2	G	white	slow	no	
2	6h06m	+3	G	white	slow	no	
3	6h07m	+3	G	white	swift	no	
4	6h12m	+2	G	white	slow	no	bright flash
5	6h23m	+1	G	white	swift	no	
6	6h26m	+2	G	white	swift	no	very fast
7	6h29m	+2	G	white	medium	yes	train visible
8	6h32m	+1	G	white	swift	no	
9	6h33m	+3	G	white	swift	no	
10	6h34m	+3	G	white	swift	no	
11	6h35m	+2	G	white	swift	no	
12	6h36m	0	G	white	medium	no	bright
13	6h37m	+1	G	white	medium	no	

Weather at start of observation 5h.50m UT

Temp: 66.7°F
Humidity: 92%
Dew pt: 64.4°F
Feel like: 66.7°F
Barometer 30.04 in Hg
Wind: NW @ 0-5 mph

Weather conditions at end of observations

Temp: 65.1°F
Humidity: 97%
Dew pt: 64.2°F
Feels like: 65.1°F
Barometer: 30.00 in Hg
Wind: 5-10 mph from the ESE

Number	Time UT	Magnitude	Type	Color	Speed	Train	Comments
14	6h41m	+3	S	white	slow	no	sporatic
15	6h42m	+2	G	white	fast	no	
16	7h26m	+3	G	white	medium	no	
17	7h31m	+1	G	white	medium	no	
18	7h46m	+3	G	white	medium	no	faint
19	7h53m	+2	G	white	fast	no	
20	7h53m	+1	G	white	fast	no	
21	8h05m	+2	G	white	fast	no	
22	8h06m	+3	G	white	medium	no	
23	8h07m	+3	G	white	medium	no	
24	8h08m	0	G	white	medium	no	almost simultaneous
25	8h08m	0	G	white	medium	no	
26	8h10m	-1	G	yellow	medium	yes	first Fireball
27	8h11m	+3	G	white	fast	no	
28	8h13m	-1	S	yellow	medium	yes	Fireball - sporatic toward the radiant
29	8h22m	+1	G	white	swift	no	
30	8h22m	+2	G	white	swift	no	
31	8h25m	+2	G	white	medium	no	
32	8h43m	+3	G	white	swift	no	faint
33	8h45m	+2	G	white	medium	no	
34	8h47m	+3	G	white	medium	no	faint
35	8h56m	+2	G	white	medium	no	
36	8h58m	+2	G	white	~~fast~~ swift	no	
37	9h21m	+2	G	white	swift	no	
38	9h25m	+2	G	white	swift	no	
39	9h26m	+1	G	white	swift	no	
40	9h27m	+2	G	white	swift	no	
41	9h30m	+1	G	white	slow	no	
42	9h33m	+3	G	white	fast	no	
43	9h34m	+2	G	white	swift	no	

Number	Time UT	Magnitude	Type	Color	Speed	Train	Comments
44	9h36m	+2	G	white	fast	no	
45	9h40m	+3	G	white	swift	no	faint
46	9h46m	0	G	white	medium	slight	bright
47	9h53m	+2	G	white	medium	slight	
48	9h55m	+2	G	white	medium	no	flash - coming right at you.
49	9h59m	+2	G	white	swift	no	almost simultaneous
50	9h59m	+1	G	white	swift	no	
51	10h02m	-2	G	yellow	fast	yes	Fireball - brighter than Mars
52	10h02m	+3	G	white	medium	no	faint - near radiant
53	10h14m	+2	G	white	medium	yes	Slight train visible
54							
55							
56		COMPLETLY OVERCAST					
57		UNTIL TWILIGHT					
58		AT 11h00m UT					
29		6:00 am local time					
30							
31							
32		END OF OBSERVATIONS					
33							
34							
35		Weather report was from my personal					
36		weather station: Ambient Weather model					
37		Falcon WS-8480					
38							
39							
40							
41							
42							
43							

Summary

Total meteors observed: 53
Total Geminids observed: 51
Total Sporatics observed: 2
Total fireballs observed: 3 (all were yellow in color)

Skylights: January 2023

by Jim Hendrickson

On January 4, at about 4:00pm EST, Earth is as close to the Sun as it will be all year. Known as perihelion, we'll be just 0.983296 AU from the Sun. Compared with aphelion, which occurs on July 6, we will be 0.033385 AU, or 3.29% closer. That's a difference of 5 million kilometers, 13 times the distance to the Moon, and 16.66 light seconds.

The latest sunrise of the year occurs at 7:14am on the 4th. We won't see the Sun rise before 7:00am until the final day of January, which is also the last day that the Sun sets before 5:00pm. Transiting Sagittarius through the beginning of the month, the Sun crosses into Capricornus on the 20th.

Mercury is visible low in the southwestern sky on the 1st of the month, but it quickly moves towards inferior conjunction on the 7th, then becomes visible in the southeast before sunrise, the last favorable morning apparition of the innermost planet until September. Find Mercury 3° north-northeast of the globular cluster Messier 22 in Sagittarius on the 23th, and on the 28th, the two objects are equal in elevation over the southeastern horizon, with Mercury appearing 3.8° to the left of the cluster.

During the last week of January, Mercury rises 90 minutes before the Sun, and the planet reaches its greatest elongation, 25° west of the Sun, on the 30th.

Venus is now coming into good view in the early evening sky, where its unmistakable brilliance gives it its nickname the Evening Star. It crosses into Capricornus on the 2nd, where it will spend the next three weeks, before becoming a resident of Aquarius. Venus climbs higher over the southwestern horizon each night as it moves eastward, closer to Saturn. The two planets are in conjunction, just 0.3° apart, on the 22nd. On the following evening, the 2.4-day waxing crescent Moon appears in a line with the two planets, about 7° to the east.

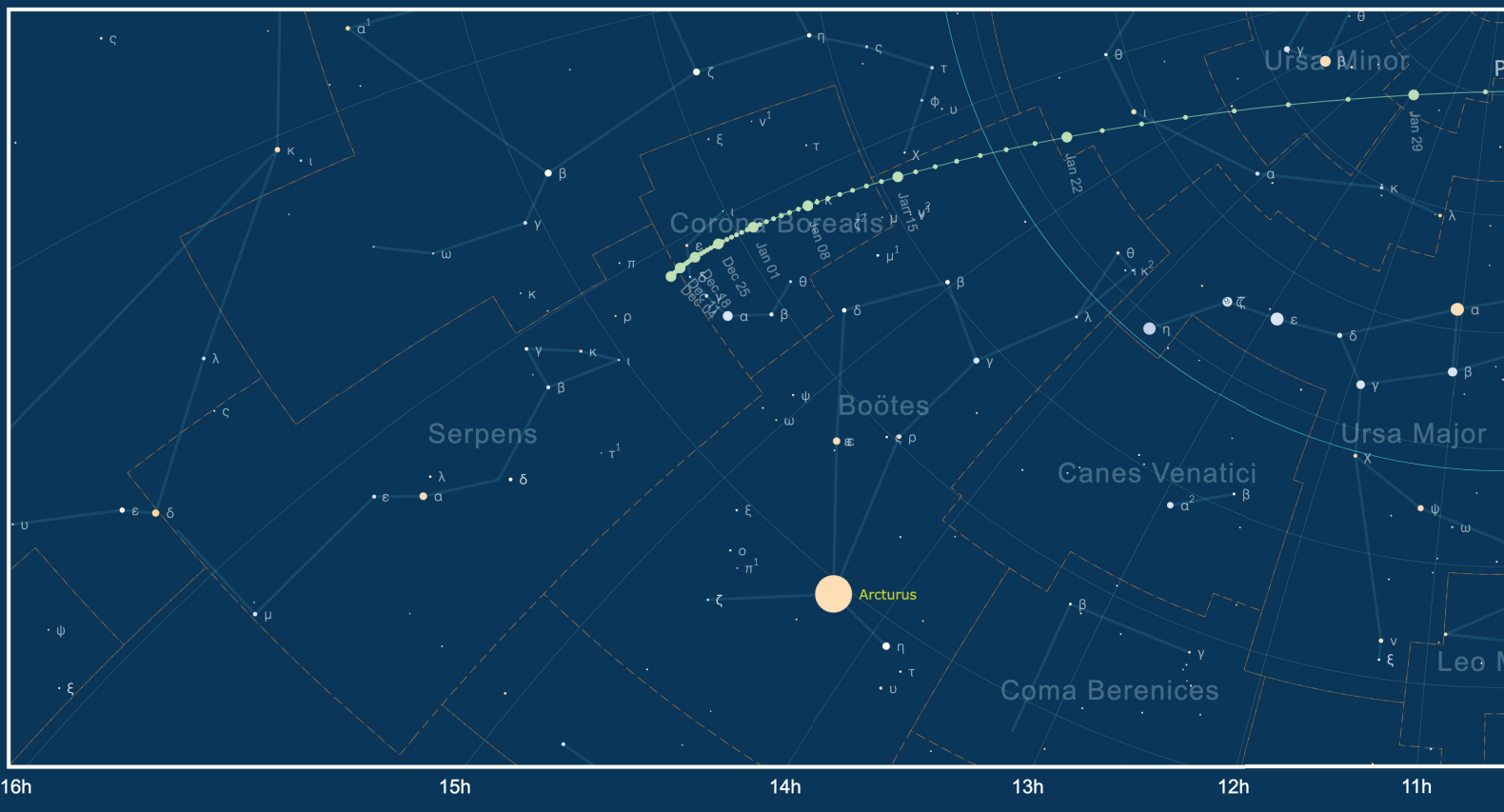
Telescopically, Venus will not appear as anything more than a brilliant white disc just over 10 arcseconds across, but as it climbs higher over the horizon, it presents keen observers with a challenge of determining the earliest date that its gibbous shape can be discerned.

Mars reaches its stationary point on the 12th, so it appears to be not moving significantly until later in the month, after it resumes its prograde (eastward) motion. It resides in Taurus, just 1.5° north of the Davis's Dog asterism, an oft-overlooked grouping of 5th-6th magnitude stars located within the same binocular field of view

Events in January

01	Moon Occults Uranus
02	2 Pallas Opposition (7.6)
03	Moon 1.8° E of Mars
04	Latest Sunrise 7:14
04	Earth Perihelion
06	**Full Wolf Moon**
07	Mercury Inferior Conjunction
07	Moon 3.0° SW of Pollux
10	Moon 4.1° N of Regulus
12	Mars Stationary
14	**Last Quarter Moon**
14	C/2022 E3 (ZTF) Perihelion
15	Moon 4° E of Spica
18	Mercury Stationary
18	Moon 1.1° N of Antares
21	**New Moon**
22	Uranus Stationary
22	Venus 0.3° S of Saturn
25	Moon 2.5° S of Jupiter
28	**First Quarter Moon**
29	Moon 0.3° NNW of Uranus
30	Mercury Greatest Elongation W25
30	Moon 3.1° SW of M45
31	Moon 0.2° S of Mars

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



as the more prominent Hyades.

Earth is rapidly retreating from Mars, causing the Red Planet to dim and shrink noticeably during January. By month's end, it will be just 12 arcseconds, and begin to once again show a distinct gibbous phase.

Although dimming, Mars still shines as bright as many of the members of the Winter Hexagon, giving a temporary, altered appearance to our winter sky's most prominent asterism. The waxing gibbous Moon is 1.8° E of Mars on the 3rd, and 0.2° south of the Red Planet on the 31st.

January is the last month to view Saturn in the evening sky before it moves into conjunction next month. Last summer you may recall that it formed an equilateral triangle with the stars Deneb Algedi and Nashira (delta and eta Capricorni), but moved out of position as it went through its retrograde motion. Having returned to prograde (eastward) motion, it once again moves past these two stars, and forms the equilateral triangle with them on the 6th.

Jupiter crosses north of the celestial equator for the first time since 2016 on January 13th. It will remain in the celestial northern hemisphere until 2028.

On the evening of the 25th, the 4.7-day crescent Moon lies 2.1° to the east-southeast of Jupiter, just before the two objects set in the west.

January is the last opportunity to view Saturn in the evening sky. After its meeting with Venus on the 22nd, it sinks deeper into twilight as it approaches conjunction in mid-February.

Uranus is occulted by the 9-day old gibbous Moon on the 1st. Ingress, which occurs at 3:33pm in the afternoon, occurs during daylight hours. Egress from the illuminated limb of the Moon, just beyond the southern edge of Mare Smythii, occurs at 4:39pm, which although still during civil twilight, should be visible through a large telescope with high magnification.

For the remainder of January, Uranus is well-paced for observation high in the south during the early evening hours. Its distant, magnitude 5.7 blue-green glow can be detected with binoculars when bright moonlight is not interfering, or even with the unaided eye from an exceptionally dark locale, just over halfway between Hamal (alpha Arietis), and omicron Tauri. Uranus reaches its stationary point on the 18th, and resumes prograde (eastward) motion thereafter.

Neptune, shining at magnitude 7.8 just 10° west-southwest of Jupiter, is best seen in the early evening hours, as it will set before 9:00pm by month's end.

Pluto is in conjunction on the 18th.

The Full Wolf Moon occurs early in the evening on the 6th. As we're still within a half-month of solstice, the Moon is located near the most northerly portion of the ecliptic, and, in fact, is a few degrees north of the ecliptic, so this is once again one of the highest full Moons of the year, transiting at an elevation of 74.6° a few minutes after midnight on the 7th.

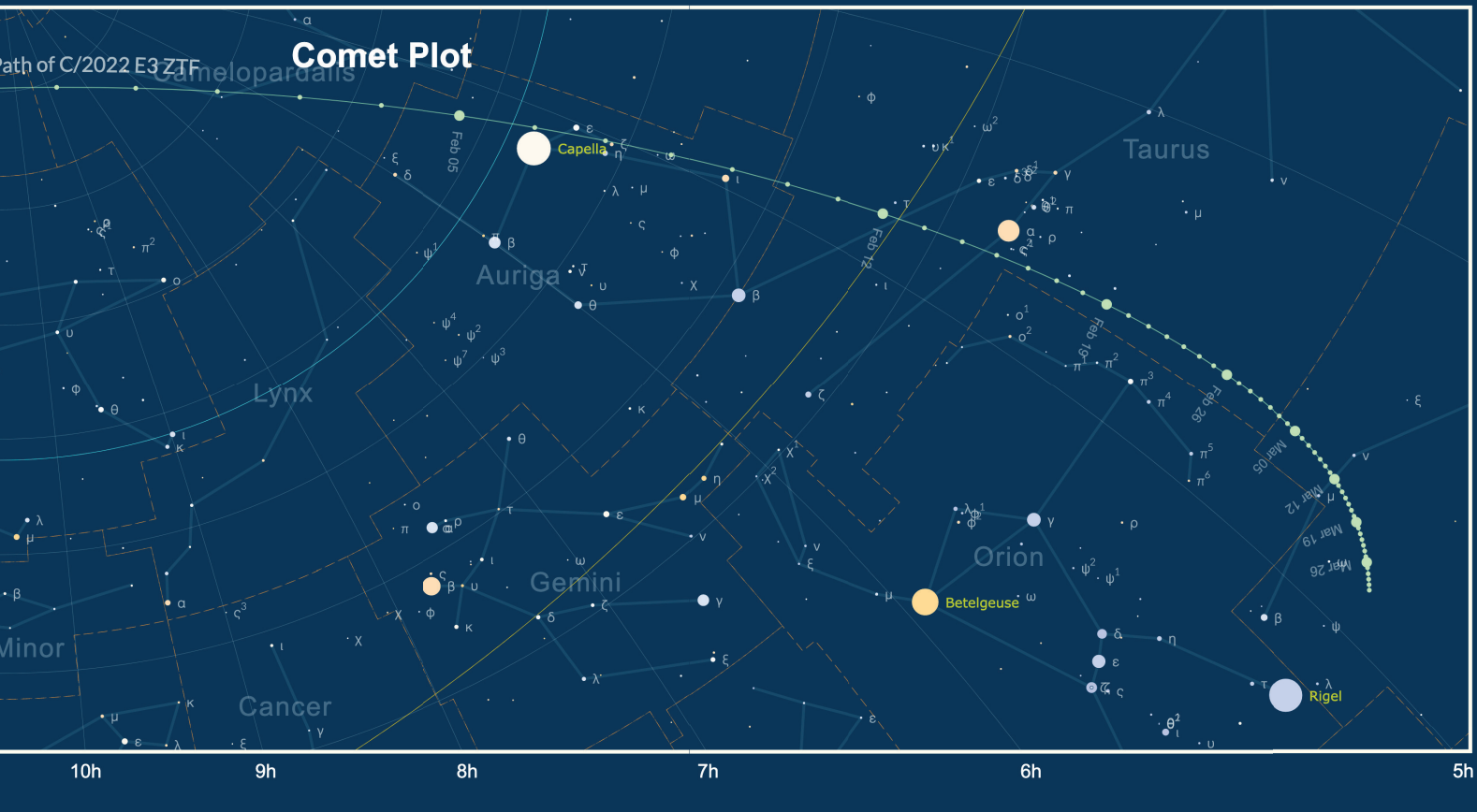
The Moon is last quarter on the 14th, new on the 21st, and first quarter on the 28th.

Asteroid 2 Pallas reaches opposition on the 2nd, in the southerly portion of Canis Major. At a declination of -32°, the magnitude 7.7 asteroid could present a challenge to observers due to its location, but it moves north as it reaches its closest point to Earth, 1.413 AU, on the 14th. It remains an 8th magnitude object as it passes north of Sirius later in February.

Dwarf planet Ceres spends January near the Realm of the Galaxies in Virgo. On the 20th, the 8th magnitude asteroid passes rho Virginis, and over the final two weeks of January, within 2° of the galaxy M60.

For the first time since Comet NEOWISE in 2020, the northern sky has a bright comet worth watching. C/2022 E3 ZTF, discovered by the Zwicky Transient Facility, a sky survey running from the historic 48" Schmidt telescope at Palomar. The comet reaches perihelion on January 14, and is closest to Earth on February 2 at 0.29 AU.

C/2022 E3 ZTF begins the year in the morning sky, rapidly approaching from within Corona Borealis, but goes circumpolar from January 19 through February 6, during which time it is expected to become as bright as fifth magnitude



The Sun, Moon & Planets in January

This table contains the ephemeris of the objects in the Solar System for each Saturday night in January 2023. 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	**7**	19 11.1	-22 26.0	Sgr	-26.8	1951.8	-	-	-	0.983	07:13	11:52	16:31
	14	19 41.5	-21 23.4	Sgr	-26.8	1951.3	-	-	-	0.984	07:11	11:55	16:39
	21	20 11.5	-20 00.6	Cap	-26.8	1950.3	-	-	-	0.984	07:07	11:57	16:47
	28	20 40.8	-18 19.5	Cap	-26.8	1948.9	-	-	-	0.985	07:02	11:59	16:56
Moon	**7**	7 18.3	26 28.4	Gem	-12.5	1782.1	175° W	100	-	-	17:00	00:56	08:44
	14	12 45.2	-2 36.5	Vir	-12.1	1805.4	103° W	61	-	-	23:15	05:14	11:03
	21	19 18.6	-27 15.3	Sgr	-8.1	1986.8	13° W	1	-	-	07:23	11:52	16:26
	28	1 52.0	10 18.4	Ari	-11.7	1895.4	82° E	43	-	-	10:48	17:54	01:12
Mercury	**7**	19 15.1	-19 37.5	Sgr	5.9	10.0	3° E	1	0.313	0.673	07:02	11:49	16:36
	14	18 41.2	-19 44.8	Sgr	2.1	9.5	14° W	15	0.342	0.712	06:03	10:50	15:37
	21	18 36.4	-20 36.5	Sgr	0.5	8.1	22° W	39	0.382	0.830	05:36	10:20	15:04
	28	18 55.8	-21 26.8	Sgr	0.1	7.0	25° W	58	0.419	0.961	05:33	10:14	14:54
Venus	**7**	20 30.5	-20 29.2	Cap	-3.8	10.6	19° E	95	0.728	1.589	08:26	13:12	17:59
	14	21 06.3	-18 13.8	Cap	-3.8	10.8	20° E	94	0.728	1.567	08:25	13:20	18:17
	21	21 41.1	-15 33.3	Cap	-3.8	11.0	22° E	93	0.727	1.542	08:21	13:27	18:35
	28	22 14.9	-12 32.1	Aqr	-3.8	11.2	23° E	92	0.726	1.516	08:15	13:33	18:52
Mars	**7**	4 24.5	24 30.0	Tau	-1.0	13.8	142° E	96	1.571	0.676	13:22	21:01	04:39
	14	4 23.5	24 27.6	Tau	-0.8	12.9	135° E	95	1.580	0.726	12:54	20:32	04:11
	21	4 25.3	24 29.5	Tau	-0.6	12.0	128° E	94	1.588	0.781	12:28	20:07	03:46
	28	4 29.5	24 35.4	Tau	-0.4	11.1	122° E	93	1.595	0.840	12:05	19:44	03:24
1 Ceres	**7**	12 36.4	9 32.7	Vir	8.2	0.6	102° W	96	2.560	2.174	22:39	05:16	11:53
	14	12 41.4	9 37.7	Vir	8.1	0.6	107° W	97	2.561	2.088	22:16	04:53	11:30
	21	12 45.3	9 50.7	Vir	8.0	0.6	113° W	97	2.562	2.006	21:52	04:29	11:07
	28	12 48.2	10 11.7	Vir	7.8	0.6	120° W	97	2.563	1.928	21:25	04:05	10:44
Jupiter	**7**	0 09.2	-0 22.7	Psc	-2.2	38.5	76° E	99	4.951	5.104	10:46	16:47	22:48
	14	0 12.9	0 02.9	Psc	-2.1	37.8	69° E	99	4.951	5.210	10:20	16:23	22:26
	21	0 17.0	0 30.9	Psc	-2.1	37.0	63° E	99	4.951	5.312	09:55	15:59	22:04
	28	0 21.4	1 01.2	Psc	-2.1	36.4	58° E	99	4.951	5.409	09:30	15:36	21:43
Saturn	**7**	21 43.2	-15 00.7	Cap	0.8	15.6	37° E	100	9.834	10.605	09:14	14:21	19:28
	14	21 46.1	-14 45.8	Cap	0.8	15.5	30° E	100	9.832	10.669	08:48	13:56	19:04
	21	21 49.2	-14 30.2	Cap	0.8	15.4	24° E	100	9.831	10.722	08:23	13:32	18:41
	28	21 52.3	-14 14.0	Cap	0.8	15.4	18° E	100	9.829	10.763	07:58	13:08	18:18
Uranus	**7**	2 50.8	16 00.7	Ari	5.7	3.7	119° E	100	19.669	19.179	12:26	19:27	02:29
	14	2 50.5	15 59.5	Ari	5.7	3.7	111° E	100	19.668	19.287	11:58	19:00	02:01
	21	2 50.3	15 59.1	Ari	5.7	3.6	104° E	100	19.667	19.401	11:30	18:32	01:33
	28	2 50.4	15 59.5	Ari	5.7	3.6	97° E	100	19.666	19.519	11:03	18:04	01:06
Neptune	**7**	23 36.1	-3 52.5	Aqr	7.9	2.3	67° E	100	29.912	30.290	10:25	16:13	22:01
	14	23 36.6	-3 48.9	Aqr	7.9	2.2	60° E	100	29.912	30.398	09:58	15:46	21:35
	21	23 37.2	-3 44.7	Aqr	7.9	2.2	53° E	100	29.912	30.499	09:31	15:19	21:08
	28	23 37.9	-3 40.0	Aqr	7.9	2.2	46° E	100	29.912	30.591	09:04	14:53	20:42
Pluto	**7**	20 01.7	-22 48.2	Sgr	14.5	0.2	12° E	100	34.682	35.645	08:05	12:40	17:14
	14	20 02.7	-22 46.0	Sgr	14.5	0.2	5° E	100	34.687	35.666	07:39	12:13	16:47
	21	20 03.6	-22 43.8	Sgr	14.5	0.2	3° W	100	34.692	35.674	07:12	11:46	16:21
	28	20 04.6	-22 41.6	Sgr	14.5	0.2	10° W	100	34.696	35.667	06:45	11:20	15:55

Star Party Reports

Stargazing at Caratunk
Thursday, December 1, 2022
By Jim Hendrickson

It has been several years since we've been invited to conduct a stargazing night with Audubon Society of Rhode Island. In early October, we were contacted about having a night before the end of the year. We selected three dates in late November to early December to coincide with the best opportunity for viewing Mars. They selected Thursday, December 1, 2022, which was the date when Mars was closest to Earth, at just 0.54 AU away.

Francine Jackson and Jim Hendrickson participated, each bringing a small refractor, and Francine giving an indoor presentation before the observing program.

Five people were registered, but only three showed up in time for Francine's 30-minute presentation, which covered the December constellations and planets, as well as pictures from recent missions, including some recent Webb images, and Earth and Moon from the ongoing Artemis 1 mission. The remaining two guests arrived after the presentation, in time for observing.

The weather was ideal. Early scattered clouds cleared away, and there was steady seeing, with no wind, and temperatures in the 30s.

We set up the telescopes in the field immediately to the east of the barn, which has a clear view from northeast to south. There was extraneous light coming from the barn, but we were looking in the opposite direction, and with bright Moonlight present, it wasn't a hindrance. Besides featuring Mars and Jupiter, a waxing gibbous Moon was present just a few degrees from Jupiter. We managed to catch Saturn just before it went behind the trees, The Pleiades and Coathanger cluster were shown, and by the end of the session, Orion had risen just high enough to get a quick look at M42.

Towards the end of the observation session, one of the guests reported seeing a bright Geminid meteor.

When it was time to pack up and leave, we contacted the caretaker, Jim, who lives next door (but was not able to attend the program) to lock up the barn after we left. It turns out he enjoyed our company and stayed and chatted with us for about an hour outside, talking about all manner of things related to science and technology.

Winman Middle School, Warwick, RI
Thursday, December 8, 2022
By Jim Hendrickson

For the third year, Winman Middle School in Warwick invited Skyscrapers to participate in a multi-faceted family night that included a night sky program. The program took place on Thursday, December 8, and was the second consecutive year that their Lantern Night coincided with a clear night and a Full Moon.

We had fairly short notice, so were only able to commit two telescopes to the event, for which we were initially informed had nearly 400 people registered. Francine Jackson and Jim Hendrickson volunteered with their small refractors.

Instead of using the soccer field adjacent to the school, we set up in a practice field northwest of the school, which was a short walk up the hill and through the woods. This was a nice setting, as it provided visitors with the experience of being in a relatively isolated area, where the only light present was that of the Moon.

We were joined by Dave, a social studies teacher who is planning to retire next year and devote more time and effort into astronomy, so we're hoping to see more of him in the future. Dave brought a 6-inch SCT that he kept trained on the Full Moon.

Cathy Hawthorne-Kocak, who coordinated the event, stayed in the field with us, and helped to guide the participants to the telescopes. About 250 guests came into the observing field in groups of 10-30. Because it was a fairly high-traffic, short-duration session, we concentrated on the bright objects, and didn't move from object to object. We observed the Moon, Mars, Jupiter and its moons, and the Pleiades.

There was great interest and many questions about the planets, and we had conversations about the Moon missions, including the ongoing Artemis 1 flight.

The school already has the next Lantern Night planned, for November 3, 2023.

Astro Gallery

Town of Foster Christmas Tree with the crescent Moon on Christmas night by Bob Horton

Moon & Mars Conjunction by Greg Shanos

I heard the occultation of Mars with the moon on Dec 8th, 2022 was clouded out in Rhode Island- bummer. It was very close here in Florida, only a conjunction. See attached images taken under perfectly clear skies and good seeing conditions. Zoom in on Mars, you can see the albedo features. Happy Holidays, Merry Christmas and a Happy New Year from the "Skyscraper down under".

Lunar Conjunction of Mars
December 8, 2022

04h 17.1m UT

Gregory T. Shanos Sarasota, Florida
Meade refractor 60mm 260mm fl f/4.3
ZWO 178MM monochrome camera
Astronomik L2 UV-IR cut filter

Lunar Occultation of Mars
December 8, 2022

04h 36.8m UT

Gregory T. Shanos Sarasota, FLorida
Meade refractor 60mm 260mm fl f/4.3
ZWO 178MM monochrome camera
Baader 610nm R-IR longpass filter

January 2023 Volume 34

STARRY SCOOP

Editor: Kaitlynn Goulette

WHAT'S UP

The winter season brings not only cold temperatures, but also some of the finest stargazing opportunities of the year. At this time, mighty Orion the hunter can be found high in the southern sky. This constellation is well known both in the northern and southern hemispheres due to its location on the celestial equator. Orion resembles its namesake, displaying a club in one hand, shield in the other, and a sword hanging from his belt. This constellation is a wonderful guidepost. Its three belt stars point southeast to Sirius, the brightest star in the night sky. Sirius is part of Orion's big hunting dog, Canis Major. Northeast of Sirius lies the bright star Procyon in Canis Minor, the little hunting dog. In the other direction, the belt stars lead to the constellation Taurus the bull. Together, Rigel and Betelgeuse point northeast to the bright stars Castor and Pollux, the Gemini brothers.

Venus, shining at magnitude -3.9, is visible low in the southwestern sky with the first-magnitude Saturn found nearby. Each day, Venus appears a little higher and eventually overtakes Saturn for the celestial high ground in the later days of the month. Jupiter is located high in the southwestern sky in the early evening, and the waxing crescent moon will pass by these planets for three days, beginning on the 23rd. Shining brilliantly in Taurus, Mars remains a good telescopic target, but its apparent size steadily decreases as the month progresses.

The Quadrantid meteor shower runs annually from January 1st to the 5th and peaks on the evening of the 3rd into the following morning. This shower produces about 40 meteors per hour and is caused by Earth traveling through dust grains left behind by Comet 2003 EH1, which is now extinct. The meteors radiate from Boötes but can appear anywhere in the night sky, and are best viewed from a dark place after midnight.

Twenty years ago on January 23rd, NASA received the final radio signal from Pioneer 10. This unmanned space probe took the first close-up photos of Jupiter and made many discoveries about both the planet and its moons. Pioneer 10 was also the first spacecraft to be placed on a trajectory that carried it into interstellar space. Originally, this spacecraft was expected to last 21 months but continued to operate for 30 years.

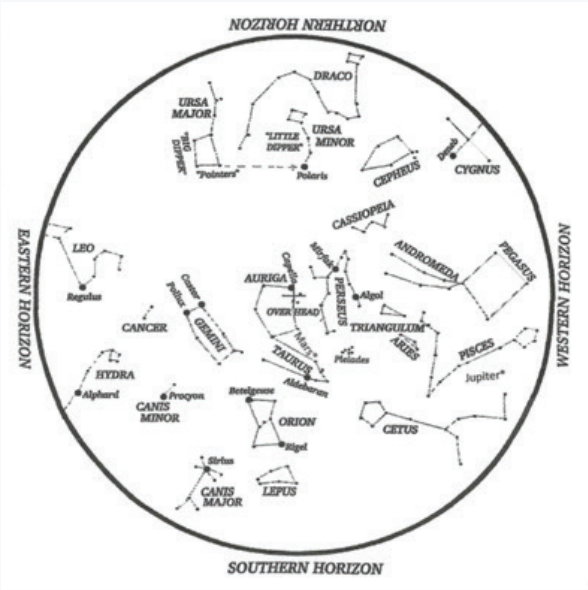
JANUARY'S SKY

3-4: Quadrantid Meteor Shower Peak

6: Full Moon

21: New Moon

30: Mercury at Greatest Western Elongation



Credit: Roger B. Culver

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

OBSERVATIONS

Recently, I've been observing quite often with my younger sister, Krystyna. Our 8-inch Dobsonian telescope was the perfect instrument to use as it was easy to set up and operate without too much heavy lifting.

On several occasions, the moon was the main target of the evening. Krystyna has been working on completing an observing program for a handful of years now, and she needed to view a few features on the moon in order to complete it. On some nights, my father and I also enjoyed holding our iPhones to the eyepiece and competed with one another to see who could get the best photo.

Mars has also been an object of interest as it reached opposition and closest approach to Earth last month. A still atmosphere on a few nights allowed for high-powered observations of this world and my best views were at 240x magnification. Much detail was apparent and the darker regions on this red-colored planet were pronounced, especially the Syrtis Major Planum region. Along with viewing the Red Planet, we pointed the telescope at the two gas giants, Jupiter and Saturn. They are always fun targets and in addition to observing the planets, we used the Sky Safari app on our phones and were systematically viewing their moons. Throughout the colder evenings, the planets have been convenient targets and allow for warm-up time between each observation.

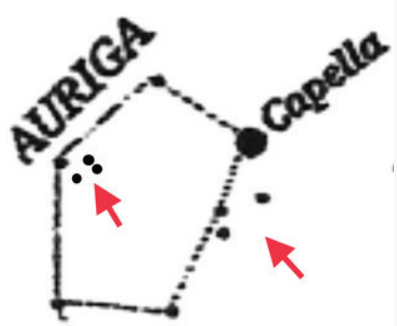
The purpose of the Starry Scoop is to communicate current astronomy and space events. If you want to share your observations or get digital copies of the Starry Scoop, contact starryscoop@gmail.com. The Starry Scoop is now on Facebook. Clear skies!

OBJECT OF THE MONTH

The featured object for January is "The Kids," an asterism consisting of three stars in a distinctive triangle-shaped pattern, found in Auriga the charioteer. This target is located near Capella, the brightest star in Auriga. Capella has been nicknamed "The Goat Star," with The Kids representing baby goats carried by the charioteer.

Use the map below to find The Kids. After finding them, be sure to look across the irregular pentagon shape of Auriga and find an upside-down, slightly smaller replica of The Kids near Theta Aurigae.

These two star patterns are visible with the unaided eye. If you are using binoculars or a telescope, be sure to explore this region of the sky as it's located along the plane of our galaxy and is fascinating to observe.



Auriga the Charioteer


iPhone Camera
Photo by Don Goulette

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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