



the Skyscraper

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

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Pulsating Variable Stars at the Junction of Amateur and Professional Astronomers

A virtual presentation by Dr. Eric Hintz, Brigham Young University, Department of Physics and Astronomy on Saturday, February 4 @ 7:00pm

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

Unlike other sciences, astronomy has always had a unique place. Amateur astronomers play a much larger role in new discoveries in astronomy and the line between amateur and professional can sometimes be blurred. The study of variable stars has benefited greatly from the data gathering skills of many people who work in many professions. These can be visual observations all the way to modern digital photometry. Of particular interest are short period pulsating stars that can complete an entire cycle of brightness changes in under 1 hour. We will discuss the nature of some of these stars and how small telescopes can be used to provide the time coverage needed to more fully understand

the nature of these stars. The configurations of 6 robotic telescopes on the BYU campus, used for variable star studies, will also be discussed.

Eric Hintz is currently the associate chair of the Department of Physics & Astronomy at Brigham Young University. He is also the section leader for Short Period Pulsating Stars at the American Association of Variable Star Observers (AAVSO). He began studying pulsating variable stars approximately 35 years ago while an undergraduate student. He also still enjoys running telescopes at public star parties and for students in descriptive astronomy classes.



**Seagrave Memorial
Observatory
Open Nights**
February 11, 18, 25 @ 7pm



President's Message

by Linda Bergemann

Telescopes! Telescopes! And, more telescopes!

The past two weeks I have been ruled by telescopes. It all began with an email from the Astronomical League informing me that the 4.5-inch Orion StarBlast telescope that we won last summer from the Horkheimer Foundation was on its way. I have modified more than a dozen of these telescopes for local libraries, some donated by Skyscrapers, some only modified by us. As is my nature, I check my supplies and purchased the remaining materials needed to harden the telescope for the Woonsocket Harris Public Library, its destination. The telescope arrived and rested comfortably in my foyer.

Next, I was notified by the Coventry Public Library that the finder on one of their two Library Telescopes (which we maintain) was not working. Bob Janus "borrowed" the telescope and confirmed that the red-dot finder was not working. Aha! I will borrow the finder from the new-

ly-arrived scope, and take it to Bob while I order a replacement, I thought. This adventure revealed, that while these telescopes were on backorder, Orion had changed the design of the finder and its attachment to the tube. Not only that, but they completely changed the mounting of the primary mirror and all of the fasteners modified for library telescopes. So much for my advance preparations. None of the hardware or tools I had readied were usable on the new design. More trips to the hardware store!

Lastly, I received an email from a gentleman who wanted to donate two Dobsonian telescopes. After consultation with the Trustees, we decided to accept his donations. Off to Seagrave I went to accept delivery of two like-new telescopes, a 6-inch and an 8-inch; and to deliver a new finder to Bob for the Coventry telescope.

All of this is to say that you have no excuse for not observing night sky objects through a telescope. In addition to the four permanently-mounted telescopes at Sea-

New Members
Welcome to Skyscrapers

Lawrence Caffrey
of Foster, RI

Peter Deerie & Savitri
Handayani
of Oakdale, CT

grave Memorial Observatory, Skyscrapers has a variety of portable telescopes that may be borrowed by our members. For members and non-members alike, thirteen (soon to be 14) RI libraries have telescopes available for loan, just like a book.

Please take advantage of these amazing resources. Stop by the observatory on an open night. Take a telescope home to try it out. Or, visit your local library. Help Skyscrapers achieve our objective "to educate the membership and general public on matters pertaining to astronomy".

Clear skies!



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 **February 15** to Jim Hendrickson at hendrickson.jim@gmail.com.

E-mail subscriptions

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

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Telescope Loan Program

by Dan Fountain

Over the last several years, numerous individuals have generously donated their no-longer-used telescope to Skyscrapers for our use. We have been selective with what we have accepted; many have been declined.

Some of these telescopes have seen the sky at our public open nights. Others have taken up residence in the basement. The Trustees, in conjunction with the Executive Committee, have decided to dust them off and make them available for borrowing by our members.

There are nine telescopes that will eventually be available for borrowing. We will

start with a pilot program of three telescopes (shown below), suitable for a beginner/casual user. These telescopes are not suitable for observing the sun and are so labeled.

Any member of Skyscrapers in good standing may check out one of these three telescopes at our monthly meetings. There is no fee; however, the borrower must provide identification and agree to replace any equipment that is returned in an unacceptable state or missing. Eyepieces will be included.

This program will be under the purview

of the Trustees. Daniel (Dan) Fountain will be the Equipment Manager, responsible for check out and return of telescopes. To reserve a telescope, contact Dan at deano-fountino@gmail.com. Dan will have the telescope available for you to pick up at the next regular meeting of Skyscrapers. The duration of the loan is one month, unless alternate arrangements are made with the Equipment Manager.

Depending on member interest and the success of the pilot program, other beginner telescopes and more advanced telescopes in our inventory will be added to the program.



Astronomers Without Borders OneSky 4-inch Tabletop Reflector w/ Stand



Orion SkyView 6-inch Reflector on Equatorial Mount



Orion SkyQuest 8-inch Dobsonian Reflector

Help Save The Dark!

by Steve Hubbard

January 19, 2023, Science magazine:

“Researchers announced a startling study of Globe at Night data that light pollution has grown globally at almost ten percent per year over the past decade.”

I’m sure like me, that you’ve noticed how much brighter the night sky is just in even the last few years at Seagrave Observatory as well as your own homes.

In December, our speaker, Kelly Beaty spoke on light pollution and the urgent need to combat it. We can fight this, but

not alone. If we love the night sky and want to preserve any semblance of darkness, we ALL need to join the International Dark Sky Association (IDA).

IDS has tons of materials to help in our fight and does all that they do with limited staff and budget. It’s the ONLY entity trying to fight the rapidly worsening effects of light pollution and is the voice of OUR community.

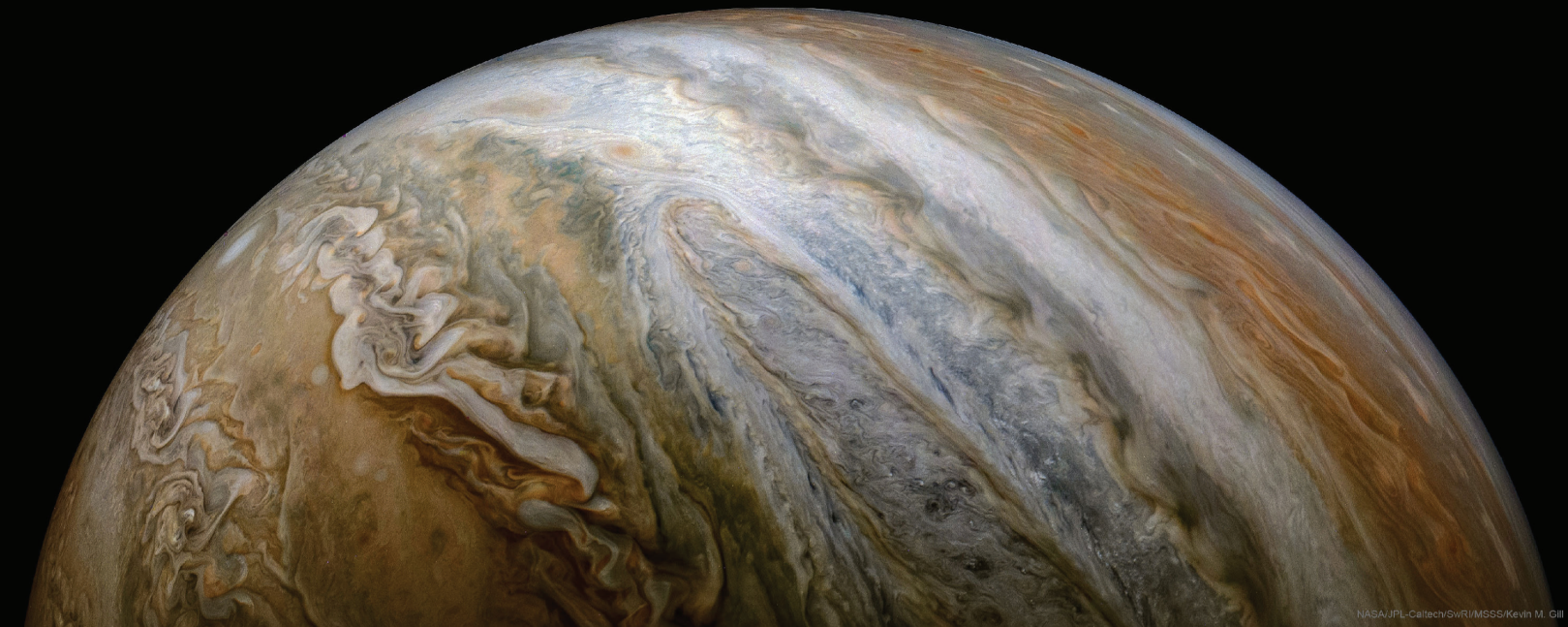
It survives primarily through the contributions of people like us.

As lovers of the night sky, it is even more incumbent upon us to [support IDA](https://www.darksky.org) and not just accept Light Pollution without a fight.

If you truly love the night sky, I urge you to join NOW.

After Kelly’s talk, I went to www.darksky.org and joined up. There are yearly memberships and even convenient monthly memberships starting at only \$5 per month.

Please join me in becoming a member of IDA today.



NASA/JPL-Caltech/SvR/IMSS/Kevin M. Gill

NASA Night Sky Notes:

Spot the King of Planets: Observe Jupiter

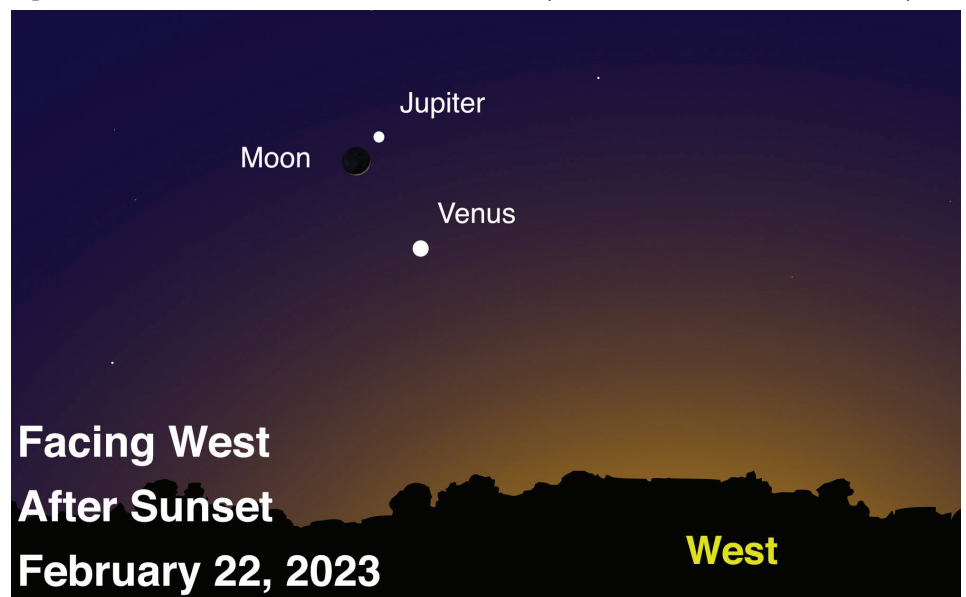
by David Prosper

Jupiter is our solar system's undisputed king of the planets! Jupiter is bright and easy to spot from our vantage point on Earth, helped by its massive size and banded, reflective cloud tops. Jupiter even possesses moons the size of planets: Ganymede, its largest, is bigger than the planet Mercury. What's more, you can easily observe Jupiter and its moons with a modest instrument, just like Galileo did over 400 years ago.

Jupiter's position as our solar system's largest planet is truly earned; you could fit 11 Earths along Jupiter's diameter, and in case you were looking to fill up Jupiter with some Earth-size marbles, you would need over 1300 Earths to fill it up – and that would still not be quite enough! However, despite its awesome size, Jupiter's true rule over the outer solar system comes from its enormous mass. If you took all of the planets in our solar system and put them together they would still only be half as massive as Jupiter all by itself. Jupiter's mighty mass has shaped the orbits of countless comets and asteroids. Its gravity can fling these tiny objects towards our inner solar system and also draw them into itself, as famously observed in 1994 when Comet Shoemaker-Levy 9, drawn towards Jupiter in previous orbits, smashed into the gas giant's atmosphere. Its multiple fragments slammed into Jupiter's cloud tops with such violence that the fireballs and dark impact spots were not only seen by NASA's orbiting Galileo probe, but also observers back on Earth!

Jupiter is easy to observe at night with our unaided eyes, as well-documented by the ancient astronomers who carefully recorded its slow movements from night to night. It can be one of the brightest objects in our nighttime skies, bested only by the Moon, Venus, and occasionally Mars, when the red planet is at opposition. That's impressive for a planet that, at its closest to Earth, is still

over 365 million miles (587 million km) away. It's even more impressive that the giant world remains very bright to Earthbound observers at its furthest distance: 600 million miles (968 million km)! While the King of Planets has a coterie of around 75 known moons, only the four large moons that Galileo originally observed in 1610 – Io, Europa, Ganymede, and Calisto – can be easily ob-



Look for Jupiter as it forms one of the points of a celestial triangle, along with Venus and a very thin crescent Moon, the evening of February 22, 2023. This trio consists of the brightest objects in the sky – until the Sun rises! Binoculars may help you spot Jupiter's moons as small bright star-like objects on either side of the planet. A small telescope will show them easily, along with Jupiter's famed cloud bands. How many can you count? Keep watching Jupiter and Venus as the two planets will continue to get closer together each night until they form a close conjunction the night of March 1. Image created with assistance from Stellarium.

This stunning image of Jupiter's cloud tops was taken by NASA's Juno mission and processed by Kevin M. Gill. You too can create amazing images like this, all with publicly available data from Juno. Go to missionjuno.swri.edu/junocam to begin your image procession journey – and get creative! Full Image Credit: NASA/JPL-Caltech/SwRI/MSSS; Processing: Kevin M. Gill, license: CC BY 2.0) <https://creativecommons.org/licenses/by/2.0/> Source: <https://apod.nasa.gov/apod/ap201123.html>

served by Earth-based observers with very modest equipment. These are called, appropriately enough, the Galilean moons. Most telescopes will show the moons as faint star-like objects neatly lined up close to bright Jupiter. Most binoculars will show at least one or two moons orbiting the planet. Small telescopes will show all four of the Galilean moons if they are all visible, but some-

times they can pass behind or in front of Jupiter, or even each other. Telescopes will also show details like Jupiter's cloud bands and, if powerful enough, large storms like its famous Great Red Spot, and the shadows of the Galilean moons passing between the Sun and Jupiter. Sketching the positions of Jupiter's moons during the course of an evening - and night to night – can be a rewarding project! You can download an activity guide from the Astronomical Society of the Pacific at bit.ly/drawjupitermoons

NASA's Juno mission currently orbits Jupiter, one of just nine spacecraft to have visited this awesome world. Juno entered Jupiter's orbit in 2016 to begin its initial mission to study this giant world's mysterious interior. The years have proven Juno's mission a success, with data from the probe revolutionizing our understanding of this gassy

world's guts. Juno's mission has since been extended to include the study of its large moons, and since 2021 the plucky probe, increasingly battered by Jupiter's powerful radiation belts, has made close flybys of the icy moons Ganymede and Europa, along with volcanic Io. In 2024 NASA will launch the Europa Clipper mission to study this world and its potential to host life inside its deep subsurface oceans in much more detail. Find the latest discoveries from Juno and NASA's missions 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:

NGC 1245: Open Cluster in Perseus

by Glenn Chaple

Magnitude 8.4, Size 2.9

The 2nd magnitude star Mirfak (alpha Persei) is the centerpiece of the sprawling naked eye cluster Melotte 20. It dominates the field of the accompanying WIKI image that serves as the finder chart for this month's Observer's Challenge. But Mel 20 isn't the Challenge object. It's the open cluster NGC 1245, which appears as a tiny smudge in the lower right-hand corner of the image.

NGC 1245 was discovered by William Herschel on the night of December 11, 1786. He cataloged it as a Class VI object (Very compressed and rich clusters of stars) and described it as "A beautiful and rich cluster of small and large stars 7 or 8' in diameter. The large stars are arranged in lines like interwoven letters." Modern studies show that the cluster is home to some 200 stars, the brightest of which shine at 12th magnitude.

Owners of GoTo scopes can home in on NGC 1245 by punching in its 2000.0 coordinates, RA 3h14m48s and Dec +47°15'11". For the star-hopper, NGC 1245 is a 3-degree trek southwest of Mirfak. I chose the latter method when I tackled NGC 1245 with a 10-inch f/5 reflecting telescope on the evening of December 13, 2022. A slight haze and resulting magnitude limit of 4.5 made for less-than-ideal conditions. At 141X, I was able to make out about a dozen cluster

members. Averted vision hinted at a dozen or so more. There was no sign of the hazy mist that the fainter cluster members would have produced had skies been darker. The cluster was hardly identifiable in a 4.5-inch f/8 reflector, with just 4 stars visible.

NGC 1245 is located some 9800 light years away and is approximately 27 light years in diameter. It has an estimated age of

one billion years. Compare that to Mel 20, which is similar in size but 16 times closer and cosmically young at an age of 50 to 70 million years.

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.



Mario Motta, MD. (ATMoB) "Taken with my 32 inch F6,5 telescope, R,G,G, and Lum filters, about 2 hours total imaging time, with ZWO ASI6200 camera. Processed in pixInsight using new BlurXtermintor plug in."

Lunatic's Corner

Crater Maurolycus

by Michael Corvese

Crater Maurolycus was named for a Sicilian astronomer named Francesco Maurolico. Born in 1494 to immigrants from Greece, Maurolico was well educated and had many accomplishments in mathematics, astronomy, and music. He became a priest in 1521 and wrote several books on optics, conics, geometry, and astronomy. He was the first to publish a proof using mathematical induction.

He described a method for measuring the circumference of the earth that was later used by Picard to measure the meridian in 1670. Maurolico made many astronomi-

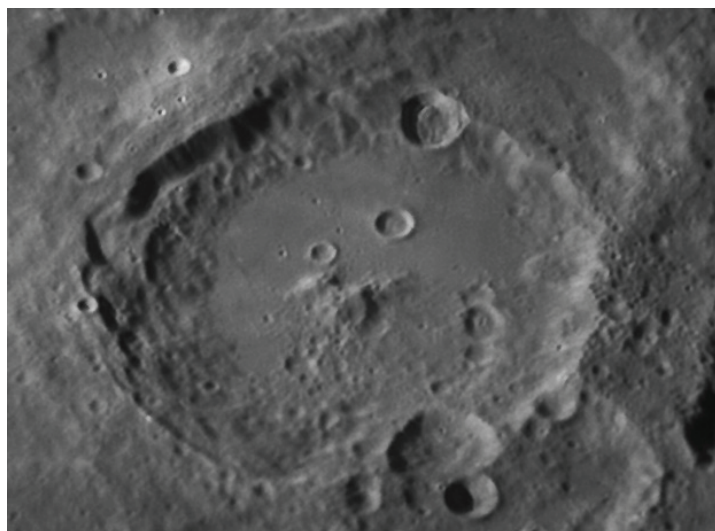
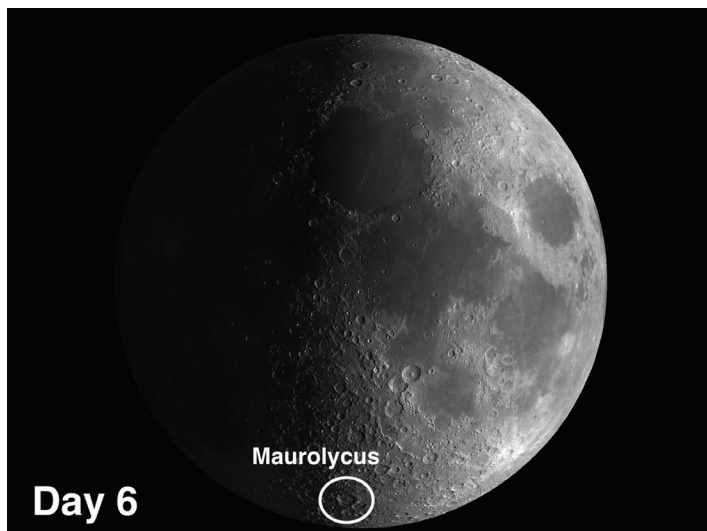
cal observations, and it was later discovered that he had observed the supernova of 1572 (Tycho's Supernova) five days before Tycho Brahe. Francesco Maurolico was a staunch believer and defender of the geocentric (earth-centered) theory of the universe. He once wrote a scathing rebuke of Nicholas Copernicus' heliocentric (sun-centered) model and suggested that he deserved a scourge or a whip rather than a refutation. He lived in Sicily most of life, with short stays in Rome and Naples and died in 1575 during an epidemic of the plague.

The crater named for him, Maurolycus, is in the southern highlands close to the limb. It is one of the largest and most conspicuous in this area. It measures about 68 miles across and contains a wide variety of lunar features. The famous 19th century lunar astronomer Thomas Elger said, "This unquestionably ranks as one of the grandest walled plains on the Moon's visible surface,

and when viewed under a low sun presents a spectacle which is not easily effaced from the mind." He goes on to correctly remark that Maurolycus, "includes ring plains, craters, crater rows and valleys – in short, almost every type of lunar formation."

Some of the most prominent features include a steep eastern wall that may reach 14,000 ft., several craters that have destroyed the crater walls in the north and south, crater rows on the floor, and central mountains with some bright peaks. It is best observed on lunar days 6-7 (first quarter) and days 18-19 (waning gibbous). For amateur astronomers, Maurolycus is one of the most spectacular craters to view and is worthy of many nights of observation. See how many features you can spot on this quite complicated crater.

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



Skylights: February 2023

by Jim Hendrickson

The mid-winter sky has much to offer during the shortest month of the year. Early evening observers can now observe the stellar and deep-sky delights residing within the constellations of the Winter Hexagon, which is bisected by the outer arms of the Milky Way. Although not as easily visible to the unaided eye as the summer Milky Way, this region of the galaxy contains some of the sky's best destinations for small telescopes and binoculars, including the Great Orion Nebula.

February's sky also shows us the begin-

nings of the transitions to spring. Over the course of the month, we have 70 extra minutes of sunlight, and as a consequence, 63 fewer minutes of astronomical darkness at the end of the month as compared to the beginning.

After twilight fades, one of autumn's most recognizable asterisms, the Great Square of Pegasus, has turned to form a diamond, and is sinking into the west. The last holdouts of summer, Vega and Deneb, are finally leaving our northwestern sky.

Over in the northeast, Ursa Major is standing on its tail, ready to roar its way into spring, and in the east, Leo and Virgo are coming into view. With Leo, Virgo, and Coma Berenices culminating high in the south just after midnight, we are entering the best time of year to explore with a

telescope the great Realm of the Galaxies beyond, located throughout these spring constellations. This is also the time of year to begin planning and practicing for the annual Messier Marathon, a March all-nighter during which all 110 objects in Messier's catalog of deep sky objects can be observed, under ideal conditions.

While many of the planets are appearing to move towards the far side of the Sun from our view, there is still much to see in the solar system in February

Perhaps you might be able to spot Saturn low in the west-southwestern sky after sunset at the beginning of February, but it will be lost in twilight through the rest of the month as it reaches conjunction on the 16th. Saturn crosses the border from Capricornus into Aquarius on the 13th, followed

by the Sun on the 16th, the same day Saturn is in conjunction.

Venus is the most prominent planet visible in the evening sky in February. The brilliant “evening star” sets 2 hours after the Sun at the beginning of the month, and 2.5 hours after sunset at the end of the month. Following Venus each night in February, you will notice it closing distance with Jupiter by about 1° per night. The two planets are at their closest on March 1, when they will be separated by just 0.5° . But before that, Venus has a conjunction with Neptune on the 15th, when Venus will appear 0.5° east of Neptune.

Venus crosses into Cetus on the 26th, then into Aquarius on the 27th. At the end of February, Venus is just over 1° west of Jupiter.

Jupiter crosses into Cetus on the 5th, and remains within the boundaries of the non-zodiacal whale through the 18th. Having dominated the evening sky just a few weeks ago, Jupiter now appears lower each evening, and will soon be out of view.

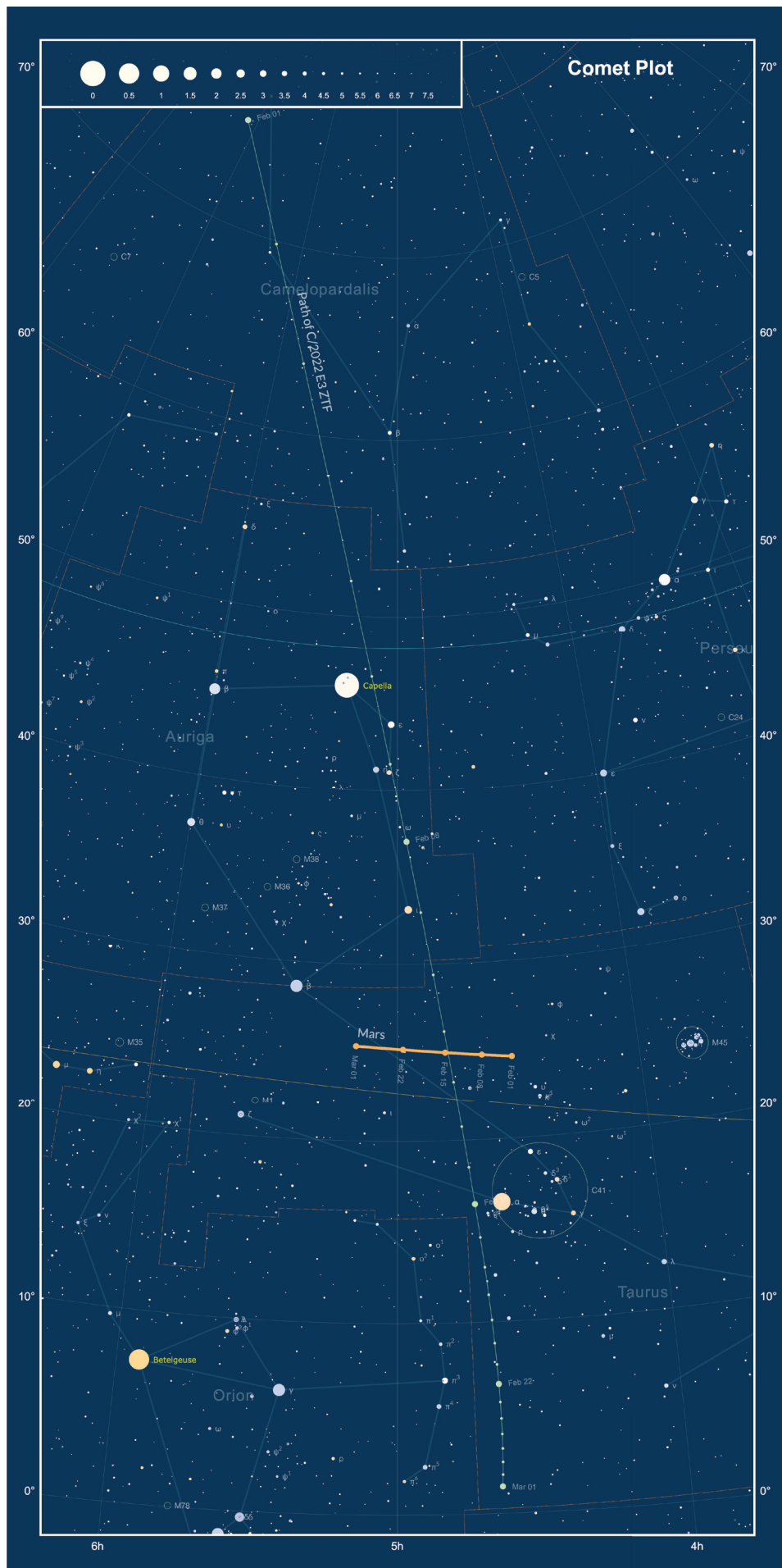
Mars continues to move eastward through Taurus in February. On the 11th-12th, it crosses back into the Winter Hexagon, through the Aldebaran-Capella segment. Fading slowly but still shining at magnitude 0, the Red Planet is now showing a distinct gibbous phase in a telescope, as its globe shrinks from 10.6 to 8.3 arcseconds through the month, due to the increasing distance between Earth and Mars. On February 14, that distance will be 1 AU.

Mercury, the only planet visible in the morning sky, is in good position to be observed during the first half of February, after which it moves south of the ecliptic while closing angular distance to the Sun, leaving it difficult to spot low in twilight before sunrise. The 27.5 day crescent Moon is 7° to the right of Mercury on the 18th.

Watch the waxing gibbous Moon just after twilight on the 3rd, as it will be aligned with Pollux & Castor in Gemini. The Moon will appear just 2.9° southeast of Pollux. The Moon passes 3° north of M44 on the 4th, and the Full Snow Moon occurs on the 5th. On the 6th, the Moon rises 4.1° northeast of Regulus in Leo.

On the 11th, the Moon is 2.4° northeast of Spica, in Virgo, and last quarter occurs on the 13th.

On February 21st, a stunning alignment of the 1.9-day crescent Moon, Venus, and Jupiter occurs in the western sky after sunset. Additionally, Neptune is just 2.4° to the right of the Moon. On the following night, the Moon appears just 1.2° south of Jupiter.



Events in February

- 1 C/2022 E3 (ZTF) Closest to Earth (0.29 AU)
- 3 Moon 2.9° SE of Pollux
- 3 Uranus Quadrature E90
- 4 Moon 3.0° N of M44
- 5 **Full Snow Moon**
- 6 Moon 4.1° NE of Regulus
- 11 Moon 2.4° NE of Spica
- 13 **Last Quarter Moon**
- 15 Venus 0.5° E of Neptune
- 16 Saturn Conjunction
- 20 **New Moon (1239)**
- 21 Moon 2.4° SE of Neptune
- 22 Moon 1.1° S of Jupiter
- 24 JD 2460000
- 26 Moon 3.6° E of M45
- 27 **First Quarter Moon**
- 28 Moon 0.3° N of Mars

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

New Moon occurs on the 20th. The Moon passes 3.6° E of M45 on the 26th, is first quarter early on the 27th, and passes 0.3° north of Mars after midnight on the 28th.

Uranus, in Aries, reaches its eastern quadrature on the 3rd. This means that it is near the meridian at sunset, and sets just after midnight. While bright Moonlight will make it challenging to observe with binoculars this week, there aren't too many weeks left to try to spot it before it is too low in the sky.

Neptune, located about 14° west of Jupiter near the border of Aquarius and Pisces, is fairly low in the sky all month. It is worth looking for Neptune, however, when Venus is just 0.6° away on the 14th and 15th.

Asteroid 2 Pallas shines at magnitude 7.7 in Canis Major. It is slowly moving northward, and passes between Xi1 and Xi2 CMA on the 7th-8th. During the final week of the month, it can be found near Sirius, coming within 2.1° to the west-northwest of our night sky's brightest star on the 26th. Binoculars or a small telescope can be used to track the magnitude 7.7 asteroid, which will be about 1.5 AU away from Earth when it passes near Sirius.

Dwarf planet Ceres, in Virgo, rises at about 8:00pm at mid-month, and is high

enough to observe at midnight. The 7.5 magnitude object should be relatively easy to track in a region of sky sparsely populated by dim stars. It can be found within a binocular field west of Vindemiatrix (epsilon Virginis). Ceres reaches its stationary point on the 4th, and begins its retrograde loop through the Realm of the Galaxies.

Comet C/2022 E3 (ZTF) is closest to Earth (0.284 AU) on the 1st. The comet begins the month moving rapidly southward through Camelopardalis into Auriga, and appears just over 1° from Capella on the 5th. On the 10th and 11th, it passes Mars, being within 1.5° of the planet during these evenings. It is near Aldebaran on the 14th, then skirts its way along the western side of Orion's sword through the remainder of the month. Although bright moonlight may interfere with observations when it is at its closest early in the month, it should remain visible in binoculars under a reasonably dark sky for much of the month. A small telescope will be best to observe it though, especially when it passes by Capella, Mars, and Aldebaran.

Julian Date 2460000: A Look Back & a Look Ahead

by Jim Hendrickson

A significant milestone in astronomical timekeeping takes place this month that may pass unnoticed. On February 24, at 7:00am Eastern Standard Time (12:00 Coordinated Universal Time), the Julian Date will be 2460000.0.

The Julian Date is a system of measuring time in decimal days as opposed to varying quantities of years, months, and days. This facilitates calculations of time intervals between astronomical events by a simple subtraction of one Julian day from another. This is useful for measuring periodic events such as variable stars, where it is most commonly used.

Julian Dates roll over at 12 hours Coordinated Universal Time. This gives night observers in Europe, Africa, most of the Americas, and parts of Asia the ability to log observations under a single Julian day, rather than two separate dates, as is the case when using Gregorian calendar dates.

So, what exactly happened 2460000 days ago that set the zero point for this method of timekeeping? If we subtract 2460000 days from February 24th, we get January 1,

4713 BC. Nothing notable occurred on that date, that we know of, so why set that as the zero point?

This is just the number of days since the start of the current Julian Period, which is defined as the product of three time cycles that today are rather obscure: the 28-year solar cycle, the 19-year Metonic (lunar) cycle, and the 15-year Indiction cycle, for a total of 7890 years.

The 28 year solar cycle is derived from the interval of years before the calendar dates occur on the same days of the week as the previous cycle, accounting for leap years, but omitting century leap years.

The Metonic cycle repeats when the lunar phases occur on the same days of the year, which is equivalent to 235 synodic cycles, which happens to be almost exactly 19 years.

The Indiction cycle is a Roman-era 15-year interval used for tax assessment purposes. It was last used in medieval Europe, and would have been familiar to contemporaries of Joseph Justus Scaliger, who first proposed the Julian Period in 1583. When

the beginning of all three cycles coincided, this defined the beginning of the epoch, which was 4713 BC. This was determined to be sufficiently far in the past, that any event of recorded history could be assigned a positive date.

This brings us to February 24, 2023. While there is nothing significant about the number 2460000, it is worth noting that a 10,000 day rollover occurs about every 27.4 years, so it is a little more significant than crossing a decade rollover in our Gregorian calendar.

Since we are talking about this mainly in reference to astronomical time markers, let's consider where we were at Julian Date 2450000, and what has occurred since.

The calendar date on 2450000 was 12:00:00 UT on October 9, 1995.

The exoplanet revolution had just begun. 51 Pegasi, the first extrasolar planet orbiting a main sequence star to be discovered, was found just 3 days before (JD 2444997).

Hubble Space Telescope's famous "Pillars of Creation" image was released November 2, 1995 (JD 2450023).

Our Solar System was known to have nine planets, but the discovery of other trans-Neptunian objects had begun just three years earlier, with 1992QB1 on August 30 (JD 2448864).

The Keck 1 telescope had recently be-

come the largest operational telescope in the world. Keck 2 would come online a year later.

After a 5-year journey, NASA's Galileo probe, the first spacecraft to visit the planet since Voyager 2 in 1979, arrived at Jupiter on December 7, 1995 (JD 2450058). The mission would last for another 8 years.

Our last contact with the Pioneer 11 probe occurred on September 30, 1995 (JD 2449990).

The NASA/ESA Solar and Heliospheric Observatory (SOHO) was launched on

December 5, 1995 (JD 2450053). This indispensable solar observatory is still operational today.

The next 10,000-day interval rolls over on July 12, 2050. What fascinating astronomical discoveries will we be able to look back upon when we arrive at that date?

Looking farther ahead, the next 100,000 day rollover, JD 2500000, occurs on August 31, 2132. By then, we will have witnessed the next return of Halley's Comet, on July 28, 2061 (JD 2474033) and will be only 2 years from the subsequent one on March

27, 2134 (JD 2500572). On May 1, 2079 (JD 2480519), Seagrave Observatory will have experienced its first total solar eclipse since 1925, and the next pair of Venus transits on December 11, 2117 (JD 2494622) and December 8, 2125 (JD 2497542) will have passed.

What other remarkable discoveries and deeper understanding of the universe will we come to know in that time? Only time will tell. In the meantime, enjoy the new 10k Julian Day,

Sightings of Comet C/2022 E3 (ZTF)

by Craig Cortis

Like many of us, I became interested in this comet last year when reports about its possible predicted brightness for January into early February of this year started appearing in the magazines and various websites. I had an ephemeris and plotted the comet's position for the morning of January 17, which actually turned out to be very clear with no wind and fine sky transparency, although the Moon had risen at 2:45 a.m. and was well up above the southeast horizon by 4:30 when I went outside with a 10 x 50 binocular to give it a try. The comet was in northern Bootes a small distance west of the border with Hercules and it only took a minute or so to sweep it up, helped somewhat by two notable triangular asterisms nearby in Hercules that I used in my starhop. I noted a grayish patch of light at the right location and switched to a 15 x 70 binocular for a better look. No question that it was the comet.

My next opportunity came about on the 19th when the sky was basically clear but with a slight haze developing. No Moon to contend with at 3:35 a.m. because it would not rise until 5:18 a.m. Despite the haze, the comet was quickly evident in the 15 x 70 and seemed to be very slightly brighter than just two days before. I then used my 4.125 inch AstroScan reflector, a rich-field, short-focus Newtonian fitted with a 28mm Plossl eyepiece made by Ed Turco years ago. This gave a magnification of just 16 power, which was all I wanted on such a tough-to-aim scope. The AstroScan has a focal length of about 440mm, by the way. As seen in the scope, the comet displayed a fairly bright false nucleus but no hints of color or a tail. The shape was roughly rectangular, just a gray blotch on the background sky. I hope

I'll have more chances to see this comet by early February but I'm not banking on anything the way this weather's been lately. On

January 28, the First Quarter Moon will set at 12:05 a.m.



Bob Horton this photo of Comet ZTF on January 18 using a Nikon 300mm F4 lens, Iso 1600 with a 3 1/2 minute exposure. This a faint comet. I still can't see it naked eye, but it is easily visible in binoculars, and was a nice sight in my 5" rich field refractor. My sky in Foster is much darker than Providence.

The Sun, Moon & Planets in February

This table contains the ephemeris of the objects in the Solar System for each Saturday night in February 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	4	21 09.4	-16 22.2	Cap	-26.8	1947.2	-	-	-	0.986	06:55	12:00	17:05
	11	21 37.4	-14 11.1	Cap	-26.8	1944.9	-	-	-	0.987	06:47	12:00	17:14
	18	22 04.7	-11 48.3	Aqr	-26.8	1942.1	-	-	-	0.988	06:37	12:00	17:23
	25	22 31.5	-9 16.4	Aqr	-26.8	1939.2	-	-	-	0.99	06:27	11:59	17:31
Moon	4	7 57.0	25 24.9	Gem	-12.5	1784.5	160° E	97	-	-	15:54	23:40	07:17
	11	13 19.0	-7 06.9	Vir	-12.3	1811.2	122° W	76	-	-	22:12	03:55	09:28
	18	19 55.9	-26 05.0	Sgr	-10.0	1966.8	33° W	8	-	-	05:57	10:33	15:15
	25	2 22.6	14 07.3	Ari	-11.2	1900.2	63° E	27	-	-	09:14	16:34	00:07
Mercury	4	19 28.0	-21 40.6	Sgr	0.0	6.3	25° W	70	0.447	1.078	05:39	10:19	14:59
	11	20 06.7	-21 01.2	Sgr	0.0	5.7	23° W	79	0.463	1.177	05:47	10:31	15:14
	18	20 48.8	-19 21.4	Cap	-0.1	5.4	20° W	85	0.466	1.255	05:54	10:45	15:37
	25	21 32.9	-16 38.3	Cap	-0.3	5.1	16° W	90	0.455	1.315	05:59	11:02	16:05
Venus	4	22 47.7	-9 14.7	Aqr	-3.8	11.4	25° E	91	0.726	1.488	08:08	13:38	19:10
	11	23 19.7	-5 45.6	Aqr	-3.8	11.6	27° E	90	0.725	1.458	07:59	13:43	19:27
	18	23 51.2	-2 09.2	Psc	-3.8	11.9	28° E	88	0.724	1.426	07:50	13:47	19:44
	25	0 22.4	1 30.3	Psc	-3.8	12.2	30° E	87	0.723	1.392	07:41	13:50	20:01
Mars	4	4 35.9	24 44.4	Tau	-0.2	10.4	116° E	92	1.603	0.903	11:43	19:23	03:04
	11	4 44.1	24 55.3	Tau	0.0	9.7	111° E	91	1.610	0.968	11:23	19:04	02:45
	18	4 53.8	25 06.9	Tau	0.2	9.0	106° E	90	1.616	1.036	11:04	18:46	02:29
	25	5 04.9	25 17.9	Tau	0.3	8.5	101° E	90	1.623	1.105	10:47	18:30	02:13
1 Ceres	4	12 49.7	10 40.3	Vir	7.7	0.7	126° W	98	2.565	1.855	20:58	03:39	10:20
	11	12 50.0	11 15.8	Vir	7.6	0.7	133° W	98	2.566	1.789	20:28	03:11	09:55
	18	12 48.9	11 57.1	Vir	7.4	0.7	140° W	98	2.568	1.732	19:57	02:43	09:28
	25	12 46.5	12 42.2	Vir	7.3	0.7	147° W	99	2.570	1.684	19:24	02:13	09:01
Jupiter	4	0 26.2	1 33.4	Psc	-2.0	35.8	52° E	99	4.951	5.500	09:06	15:14	21:22
	11	0 31.3	2 07.3	Cet	-2.0	35.2	46° E	99	4.951	5.585	08:41	14:51	21:01
	18	0 36.6	2 42.6	Cet	-2.0	34.7	40° E	100	4.951	5.662	08:17	14:29	20:41
	25	0 42.1	3 19.0	Psc	-1.9	34.3	35° E	100	4.951	5.731	07:53	14:07	20:22
Saturn	4	21 55.5	-13 57.3	Cap	0.8	15.3	11° E	100	9.827	10.791	07:32	12:43	17:54
	11	21 58.8	-13 40.4	Cap	0.8	15.3	5° E	100	9.825	10.808	07:07	12:19	17:31
	18	22 02.1	-13 23.3	Aqr	0.8	15.3	2° W	100	9.823	10.811	06:41	11:55	17:08
	25	22 05.3	-13 06.1	Aqr	0.8	15.3	7° W	100	9.822	10.802	06:16	11:30	16:45
Uranus	4	2 50.6	16 00.6	Ari	5.8	3.6	90° E	100	19.665	19.638	10:35	17:37	00:39
	11	2 51.0	16 02.4	Ari	5.8	3.6	83° E	100	19.664	19.758	10:08	17:10	00:12
	18	2 51.5	16 05.0	Ari	5.8	3.5	76° E	100	19.663	19.875	09:41	16:43	23:45
	25	2 52.2	16 08.2	Ari	5.8	3.5	69° E	100	19.662	19.990	09:14	16:16	23:18
Neptune	4	23 38.7	-3 34.9	Aqr	7.9	2.2	39° E	100	29.912	30.673	08:37	14:26	20:15
	11	23 39.5	-3 29.5	Aqr	8.0	2.2	32° E	100	29.912	30.744	08:10	13:59	19:49
	18	23 40.4	-3 23.7	Aqr	8.0	2.2	25° E	100	29.911	30.803	07:43	13:33	19:22
	25	23 41.3	-3 17.7	Aqr	8.0	2.2	18° E	100	29.911	30.849	07:16	13:06	18:52
Pluto	4	20 05.6	-22 39.5	Sgr	14.5	0.2	16° W	100	34.701	35.646	06:18	10:53	15:28
	11	20 06.5	-22 37.5	Sgr	14.5	0.2	23° W	100	34.706	35.611	05:52	10:27	15:02
	18	20 07.4	-22 35.6	Sgr	14.5	0.2	30° W	100	34.710	35.563	05:25	10:00	14:35
	25	20 08.3	-22 34.0	Sgr	14.5	0.2	37° W	100	34.715	35.503	04:58	09:33	14:09

Skyscrapers Meet in Paradise

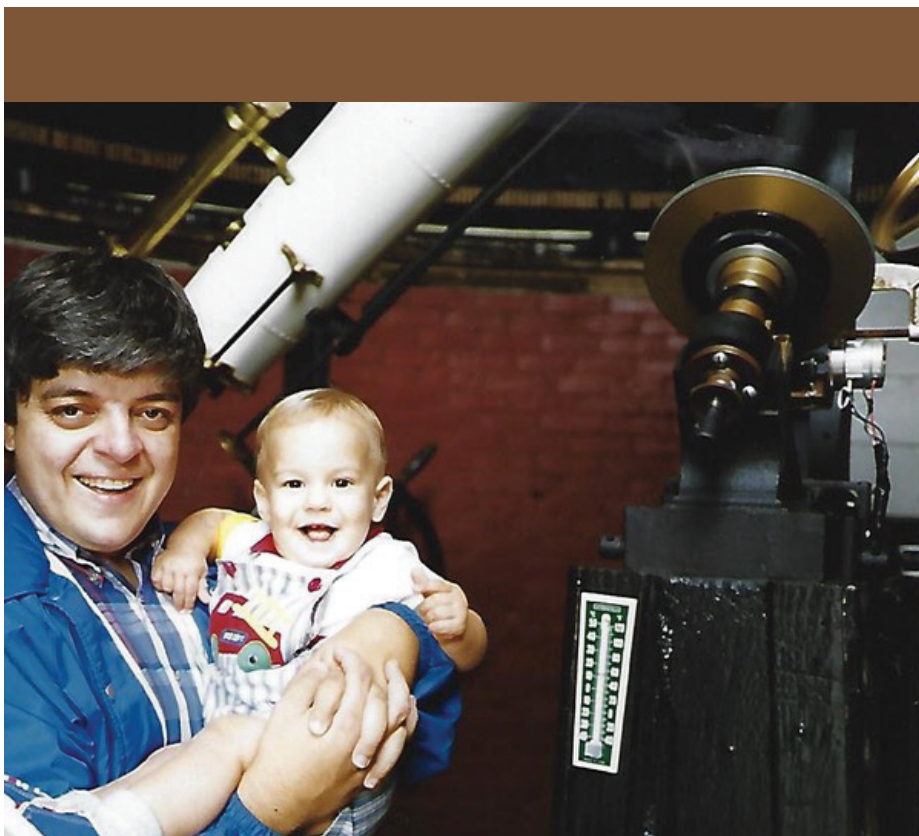
by Greg Shanos

Skyscrapers member Michael Corvese was in Port Charlotte on the west coast of Florida from January 16 through 27, 2023. Michael contacted me having been a Skyscrapers member from 1985 through 1990 and then relocating to Sarasota, Florida. Since the start of the pandemic, Greg re-established ties with Skyscrapers, became a member, and a consistent attendee of the monthly zoom lectures. Greg also attended Michael's biweekly Lunar Observing Group meetings on Monday nights.

Punta Gorda is only an hour drive south of where I reside in Sarasota. We scheduled lunch for noon Friday January 20th at a restaurant called Hurricane Charlie's. We sat outside overlooking the picturesque Punta Gorda waterfront. Michael had fish tacos while I had a grouper sandwich. Finally having met in person, we spoke for several hours and had a really good time. The conversa-

tion drifted from astronomy, to our pasts, to our families, and all things in between. Being the meteorite man, Greg gave Michael a stone NWA unclassified meteorite as a gift and remembrance of our meeting.

After lunch, we took a walk along the waterfront where the devastation of hurricane Ian, that hit in September, was still apparent. Since we both study Tai Chi, Greg performed a short Chen-style 14 movement by the waterfront. Together we practiced the Yang-style 24 movement form. People that walked by said "Don't hurt us- we come in peace". Michael and I enjoyed getting together in person after having had a virtual relationship for the past year or so. I would like to invite any Skyscraper member that is visiting the Gulf Coast of Florida to contact me to set up a visit. There is no better place to be during the winter!



Dear friends

Hope all is well.

Sadly, a couple of weeks ago, my mother passed away. She lived to 90 years old and died quietly in her own apartment and in her own bed. We should all be so lucky.

When my daughter and I were going through old photographs to display at the wake, Maria came across the attached image and asked where it was taken. I'm pretty sure it dates back to October 1991, when I gave a talk for the Skyscrapers. I'm holding my then 1-year old son, Joseph, inside the Seagrave Observatory. Is the telescope behind us familiar?

Incidentally that one-year old will turn 32 in October. He teaches High School Physics at the O'Neil School HS, which is just a stone's throw from West Point. Many of his graduating students go on to serve at "The Point."

Perhaps I will see you at NEAF or Stella-fane... All the Best!

-- Joe Rao

Astronomical Adventures in Iceland

by Jim Hendrickson

In October, 2022, several members of Skyscrapers, Inc., joined with members of the Rhode Island College Alumni Association on a weeklong expedition to Iceland.

Just hours after our arrival from an overnight flight from Boston, Reykjavik was to experience a 30% partial solar eclipse, at 9:30 in the morning, local time. Prepared with eclipse glasses, we went to a local cafe to start our day. When breakfast was finished, however, the sky hadn't cleared, and we missed our opportunity to call this an eclipse trip.

Following a very long and busy first day in Reykjavik, we were scheduled to visit Hotel Rangá and Observatory, located 90 kilometers southwest of the capital city.

Although it was raining during our visit to Rangá, we were offered a presentation in the hotel's meeting room, and a tour of the observatory by local astronomer Sævar Helgi Bragason.

The observatory contains two equatorially-mounted telescopes: a 14 inch Celestron Edge HD Schmidt-Cassegrain and a TEC 160ED APO refractor.

During the tour, we learned two interesting realities concerning astronomy in Iceland. The first is that, despite dark skies, there aren't many observatories in the country due to the prevalence of the northern lights. It is difficult to conduct any meaningful observations, particularly with sensitive imaging equipment, when the presence of aurorae will often interfere.

The second thought-provoking revelation was when Sævar informed us that

2022 was the first time that astronomers in Iceland had been able to observe Saturn in a decade. This was due to Saturn's position in the southernmost portion of the ecliptic, and Iceland's location just south of the Arctic Circle, resulting in the upper culmination of the planet being only a few degrees above the horizon. During those ten years, Saturn was either too low to observe, or the sky was in twilight all night (which is what Iceland experiences from April through August) when it was at its highest. If the sky had been clear during our visit, Saturn would have been less than 10° in elevation when due south.

Although our observatory visit was rained out, we still had more opportunities to observe the night sky. Part of our tour package included an aurora-watch cruise out of Reykjavik harbor on a whale watching boat.

The first opportunity to take the cruise was clouded out, but fortunately, weather predictions for the following night were more promising. On October 26, after dinner at a harborside restaurant, we boarded the boat under cloudy skies. The boat had two decks: a lower deck was enclosed and heated, and contained the snack bar. The open upper deck had a few benches, but was mostly standing room for the fifty or so of us that gathered up there for the sky show.

We were offered coveralls, but most from our group are experienced night sky watchers and came dressed for cold weather. The temperature hovered just above freezing,

and winds were calm.

Almost immediately after leaving the dock, skies began to clear, and no more than five minutes later, just as we had moved far enough from the lights of the harbor, the first hints of aurora became visible. A single faint band of green light arced low over the northern horizon. It soon split into two, then three bands, with fringes of red across the top, extending from Serpens in the northwest to Gemini in the northeast, covering much of Ursa Major.

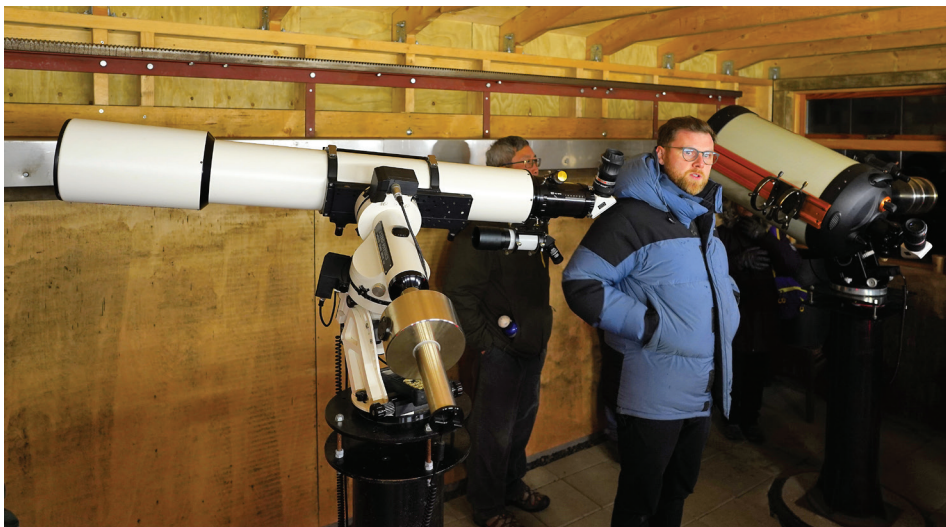
As the cruise took us farther north, and into darker skies, the detail of the aurora became more pronounced. Slowly shimmering bands and arcs would occasionally brighten and move more dramatically. A faint green band arced overhead, approximating the position of the Milky Way, with hints of red corona directly over the zenith.

Besides the aurora itself, it was also fascinating to experience the phenomenon with several dozen excited spectators, with hushed voices of enthusiasm, and so many arms extended with mobile phone cameras snapping away so many pictures that would later be shared among the group. The on-board tour guide narrated information about the aurora, from where to look, to historic information and folklore, to the scientific explanations, then someone from our group used a laser pointer to give a constellation tour.

As the boat cruised barely faster than walking pace through the relatively still water, one of the more memorable sights was seeing the reflection of the aurora in the water.

The cruise came to an end after about two hours, and we were quite excited to have experienced one of the top highlights of the entire trip. The planetary K-index, a measure of geomagnetic storm activity, was 2.67 during the cruise. As a comparison, on the rare occasion when the aurora is visible from Rhode Island, the planetary K-index is usually 7 or greater.

During the next few days, our adventures took us to Iceland's south, with a three-night stay at Hotel Katla, and daily excursions to surrounding attractions including waterfalls, geysers, glaciers, coastal cliffs, and museums. There were nightly opportunities, weather permitting, to travel less than an hour from town to view northern lights. Only the second of our three nights,



Local astronomer Sævar Helgi Bragason shows the instruments at Rangá Observatory: a TEC 160ED APO refractor and a 14 inch Celestron Edge HD Schmidt-Cassegrain.



October 28, would be favorable enough to make the expedition worthwhile.

While most in our group boarded the coach to the overlook, a few stayed and observed from the back lot of the hotel, which, while surrounded by mountains to the north, offered a relatively dark spot to observe from. The vantage point from the overlook offered a clear horizon all around, and completely dark conditions except for a small dome of light coming from the town of Vik and occasional truck traffic on the highway, over 5 kilometers to the northeast.

Weather conditions were clear and calm upon our arrival. Mars was rising low in the northeast, and several bands of bright green aurora intertwined through Auriga and Taurus, shimmered overhead, and reached towards the northwestern horizon. The northwestern position of the arc was less prominent, but occasionally flared up and became quite dynamic. Long exposure photos revealed the aurora to be bold green, but it contained little other color like we had during the cruise. The planetary K-index during our observations peaked at 4.33.

Unfortunately, within 45 minutes of our arrival, a layer of thin clouds had overtaken our observing site, but some stars and

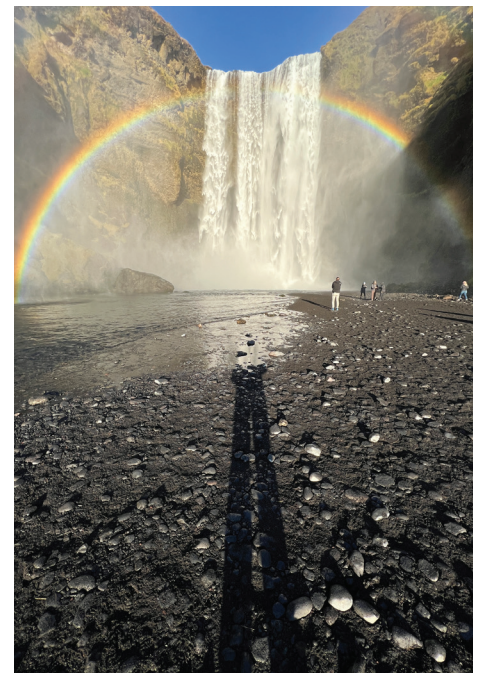
certainly the brighter bands of aurora remained visible beyond it. The clouds diffused the light from the aurora, giving an effect similar to, yet distinctly different from, when Moonlight is diffused through an overcast sky, softly illuminating the ground all around in a pale light.

We returned to Hotel Katla to prepare for another day's excursions and another potential clear night of skywatching. After dinner on our third night at Hotel Katla, the skies were clear, but forecasts for both weather and aurora weren't favorable enough to take another trip into the remote countryside or coastal overlook, so we enjoyed about an hour of clear, but windy, conditions from the hotel back lot. A hint of auroral activity was present just over the mountain, but could only be detected photographically.

All too soon our expedition to the "land of fire and ice" came to an end, and we came home fulfilled with the satisfaction of having experienced a beautiful subarctic country with its stunning natural wonders, friendly and fascinating history and culture, incredible cuisine, and of course, celestial wonders rarely experienced for dwellers in the temperate zone.

Aurora borealis stretches across the northern sky as seen from on board the Andrea tour boat sailing north of Reykjavik harbor.

A rainbow appears in the mist of Iceland's Skógafoss Waterfall.



Reports

Minutes – Skyscrapers Executive Committee Meeting via Zoom Monday, November 28, 2022 | 7PM

The November 28, 2022 (Zoom) Executive Committee Meeting of Skyscrapers, Inc., was called to order at 7:04 P.M. by President Linda Bergemann. Also present virtually were Kathy and Steve Siok, Dave Huestis, Steve Brown, Michael Corvese, Bob Janus, Ed Walsh, Jim Hendrickson, Laura Landen, Angella Johnson, Jeff Padell, and Francine Jackson.

Open Action Items

It was determined there is a dead surveillance camera, but it will be discussed at a later date.

Re the roofing contractor (by Bob Janus): This is will be held off for the moment, as both contractors quoted about \$10,000 for the Clark roof; in addition, one would want \$7,500 for the anteroom. Of six contractors called, only two responded. It appears we should try for a grant, but will wait until spring. Dave offered to put one together. There was further discussion on various problem areas to concentrate on. Michael mentioned roofers are slowing down for the season, so this might be a good time to look into other possible quotes.

Telescope loans: Unknown if one loaned out Saturday night as planned.

Planet cards: There's been no time to look into that yet.

Arm bands are available in the library.

The insurance rider for the community center is all set.

Duties for open night volunteers: Steve has finished the descriptions, except for running the film. Linda volunteered to do it.

The holiday party information is going out in the newsletter, which should be out this week. Linda will send an email invitation as well.

AstroAssembly: There will be a meeting on it in January.

Mirror grinding workshop: This will start in January. Michael will send a note out in December, and Steve will send out information as needed.

Inventory list: This will be worked on next year. Must update the list of equipment in the meeting hall.

As per the Scituate High School yearbook, Jim found the last ad, and Laura has a check. Bob J. Is looking for the deadline. Kathy mentioned the school doesn't answer their emails very often.

The toilet is leaving in December. Bob called, but was told there was a certain billing cycle. He and Laura will check on this., but we do need it for the 10th.

Membership application online is outdated ; mailing address still listed as Seagrave.

Jim mentioned the December 7th Mars/Moon phenomenon, but there was little interest in seeing it from Seagrave. He may go up himself to Steve Hubbard's for the near closest approach, about 11:00, if the sky is clear.

Officer Reports

Ed: He is working on speakers from the AAVSO for the February and March meetings, with topics still not sure. April's speaker is Andy Case (in person). Also, there is work being done on a night concerning members' trip to Iceland, possibly in May. Laura volunteered to develop the Powerpoint.

Kelly Beatty will speak at the December meeting, which begins at 5:00. Speaker at 6:15 PM. Linda is working on the WiFi for it and Bob will get the janitor's phone number, just in case. Laura and Angella volunteered to run Zoom for the December meeting.

Laura gave a finance report. We need to pay the property insurance; the premium hasn't changed. There were two large donations: \$500 from the Sioks and \$3,000 from Charlie Moszczanski. There was talk about putting some of our money into a higher interest-bearing account. Laura recommended moving some funds to Ally Bank. Their online savings account is paying about 3% and is not restricted. EC authorized Laura to open an account with an initial deposit of \$15,000.

Angella noted we have 142 memberships, with 169 contacts.

Michael (Program committee) omitted in error.

Steve S. (Observatory Committee): He is sending a notice in December for preferred dates in January and February. Steve asked Bob for a list of who is certified to run each telescope.

Trustees (Bob): The zoom camera is working fairly well, but he will check it out for the meeting. A new one would cost about \$200. He checked on it Wednesday, but everything seems to be working all right for the December meeting. Bob replaced the wall speakers.

Unfinished Business

Radio Jove: Ed is evaluating the computer, and is waiting for approval for the antenna installation.

New Business

Mark Munkacsy mentioned the 16-inch Meade was making grinding noises, and the on and off switch was flaky. It also stopped moving at about 50 degrees. It also needs to be aligned. We need to contact someone to see if anyone can work on it. Also, Kathy Siok was named Special Events Coordinator.

Good of the Organization

Laura mentioned a young man came Saturday whose mother wondered if we had anything meetingwise for young people aged 9-10, and other general information. Kathy suggested perhaps setting up a mentor, but if he lives near Woonsocket, he could go to Mark's library program. Linda mentioned a college student is looking for a star party, as he is looking for celestial objects. Joe Rao is confirmed for January 7th.

There will be no board meeting in December; the next may be January 2.

The meeting was adjourned at 8:04 P.M.
Respectfully Submitted,
Francine Jackson

Minutes – Skyscrapers Executive Committee Meeting via Zoom Monday, January 2, 2023 | 7PM

The January 2, 2023 (Zoom) Executive Committee Meeting of Skyscrapers, Inc., was called to order at 7:08 P.M. by President Linda Bergemann. Also present virtually were Kathy and Steve Siok, Dave Huestis, Steve Brown, Bob Janus, Ed Walsh, Jim Hendrickson, Jeff Padell and Steve Hubbard. Also in attendance was Conrad Cardano who requested to address the Committee. Absent were Angella Johnson, Laura Landen, Francine Jackson, Bob Horton, Michael Corvese and Rich Doherty.

Open Action Items

Re the roofing contractor (by Bob Janus): Dave Huestis has provided the name of the contractor who last worked on the Clark building and Bob will attempt to contact in the near future.

Planet cards: There's been no action.

Duties for open night volunteers: Steve has finished the descriptions, except for running the film. Linda will provide her input this week.

Mirror grinding workshop: We are not aware of anyone other than Bob attending.

Inventory list: This will be worked on in 2023.

As per the Scituate High School yearbook: Not known if Laura sent the ad and donation. Kathy will check.

The portable toilet has departed as planned.

Membership application online: Jim H. will update by the weekend.

Transfer funds to Ally Bank: It does not appear that this has been done. Kathy will check with Laura.

Bob J. has provided the lists of qualified operators to Steve S.

Radio JOVE: If weather continues to be warm, Ed and Bob will get the antenna installed in the next month.

AstroAssembly 2023: There will be a kick-off meeting on January 16.

Member Access Committee: No action.

Officer Reports

Ed: Joe Rao will speak on January 7. Eric Hintz and Richard Roberts of AAVSO will speak in February and March, respectively. Anthony Case of Harvard will speak in April. Linda reminded Ed that April is our Annual Meeting. The topic for May is the Iceland trip.

Laura was not present. She has resigned as treasurer for medical reasons. Linda (President) has appointed Kathy Siok (immediate past Treasurer) to fill the remainder of Laura Landen's term as Treasurer until after the next election on April 1, 2023.

Angella was not present. Linda reported that we received three new members at our December meeting and another came in Friday's mail.

Michael (Program committee) was not present. Linda reported that she has reached out to the leadership of the Scituate Preservation Society about star party dates and locations.

Steve S. (Observatory Committee): The January & February schedules are out for review. Steve is still waiting to hear from many.

Trustees (Bob): A binocular mount has been donated to Skyscrapers by new member Harry Jacobson.

Unfinished Business

Radio JOVE: Ongoing.

Auditors' Findings: No progress.

Member Access: No progress.

Equipment Disposal: No progress.

Replace PTZ Camera: Linda put forth a motion on behalf of Jim Crawford to purchase a new Reolink RLC-823A to replace the old RLC-423 came at a cost of \$225. The plan was to present the motion to the mem-

bership for authorization. Conrad suggested instead, that we use funds already budgeted for the Trustees. Kathy will confirm how much has been spent by the Trustees so that Bob J. can approve the expenditure.

New Business

2023 Election: Linda appointed Dave Huestis as chair of the Nominating Committee. Steve Hubbard and Steve Brown will join him. Laura Landen will not run for a second term as Treasurer; Angella Johnson will not run again for Secretary; and Ed Walsh will not run again as 1st VP. Unknown if Francine wants to run again as 2nd VP. Linda is willing to run again for President. Dave has ideas for a Trustee candidate.

Good of the Organization

Conrad Cardano: After visiting Frosty Drew Observatory, Conrad suggested enhancements that we could make to the meeting hall and our meetings. Members were very supportive of all his ideas.

Set aside an area on one of the walls for a "photo gallery" to display submissions to the AstroAssembly Astrophotography Contest. The photos would remain up for a year and the photographers would be asked to describe their entry at a monthly meeting.

Replace the screen and projector with a large screen monitor. Steve B. mentioned he has an 85-inch at work. Steve H. expressed concern with lack of environmental control in the unoccupied meeting hall.

Develop a Powerpoint of upcoming events, member photos and other items of interest to run on a loop before each meeting.

Dave Huestis: Dave proposed that we make Tommy Tse, purchaser of over \$3877 of our books and magazines, an Honorary Member. After discussion, the Committee voted to present the proposal to the members at our Annual Meeting in April.

The tentative date for the next meeting is January 30.

The meeting was adjourned at 8:10 P.M.

Respectfully Submitted,
Linda Bergemann, President

Balances (1/30/23)	
Coastal1 Credit Union	
11 Month CD (2.5%)	\$25,412.58
Business Money Market (1.05%)	\$16,507.60
Business Savings	\$115.00
Business Checking	\$8,255.67
PayPal	\$1,409.08
TOTAL	\$51,699.93

CASH FLOW Skyscrapers Inc.
4/1/2022 through 12/31/2022
Category

REVENUE

Astro Assembly Income	
Astro Assembly Income:AA Registration nonmember	800.00
Astro Assembly Income:AstroAssembly Donation	100.00
Astro Assembly Income:AstroAssembly Lunch	643.00
Astro Assembly Income:AstroAssembly Registration-member	960.00
Astro Assembly Income:Donations	25.00
Astro Assembly Income:Raffle	385.00
TOTAL Astro Assembly Income	2,913.00

Astronomical League Membership Contrib.	75.00
Donation	
Donation:Amazon Smile Donation	97.64
Donation:Donation Boxes	525.00
Donation:Misc Donation	3,760.00
Star Party Donations	100.00
TOTAL Donation	4,382.64

Dues	
Dues:Family	600.00
Dues:Junior	15.00
Dues:Regular	1,100.00
Dues:Senior	575.00
TOTAL Dues	2,290.00

Misc Income	8.00
Misc Income:Interest Inc	143.23
Misc Income:Sale of Items	3,941.99
TOTAL Misc Income	4,093.22

Shipping	215.11
TOTAL REVENUE	14,068.97

EXPENSES

Astro Assem Exp	
Astro Assem Exp:AstroAssembly Lunch Exp	479.07
Astro Assem Exp:AstroAssembly Refund	120.00
Astro Assem Exp:General Refreshments	27.69
Astro Assem Exp:Speaker Expenses	73.15
TOTAL Astro Assem Exp	699.91

Astronomical League Membership Expense	194.00
Domain Name	152.94
Misc Expenses	454.53
Outreach	340.10
PayPal Fee	224.45
Refreshment Expense	209.91
Shipping Exp	214.02

Trustee Expense:Capital Equipment	242.00
Trustee Expense:Property Maintenance	366.17
TOTAL Trustee Expense	608.17

Utilities:Electric	295.71
Utilities:Internet	1,367.65
Utilities:Pest Control	288.00
Utilities:Porta-John	1,410.00
Utilities:Propane	82.65
Utilities:Quicken	111.26
TOTAL Utilities	3,555.27
TOTAL EXPENSES	6,653.30

OVERALL TOTAL	7,415.67
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STARRY SCOOP

Editor: Kaitlynn Goulette



WHAT'S UP

The winter season offers us a look through a window to the universe that reveals some of the brightest stars and most notable constellations. A recognizable feature in this region is the large Winter Hexagon asterism. During the primetime evening hours, it dominates the southern sky, stretching from just above the tree line all the way to the zenith, directly overhead. The stars that create this hexagonal shape include Rigel, Aldebaran, Capella, Pollux, Procyon, and Sirius. These stars are all labeled on the star map below. Adding to the brilliant stars in this region is the edge-on view of our Milky Way galaxy which appears like a waterfall, running almost directly through the middle of the Winter Hexagon.

A great collection of celestial treasures can be found in the sky this month. Positioned on Taurus the bull's back is the Pleiades star cluster. Consisting of young, brilliant blue stars, it is a wonderful naked-eye target. Binoculars reveal its true beauty. In 1054 AD, stargazers noticed a brilliant "guest star" near Zeta Tauri. Eventually it faded from view but today, when we aim our telescopes at this location, we see a spectacular supernova remnant called the Crab Nebula.

Shining in the western sky at magnitude -4 is Venus, the "Evening Star," with Jupiter at magnitude -2 positioned above. To the unaided eye, they appear as the brightest starlike objects in the sky and slowly approach one another as the month progresses. The moon joins this fabulous duo on February 22nd. Located high in the southern sky is the brilliant and reddish Mars. Be careful not to confuse this planet with nearby Aldebaran, which also shines an orange-red color.

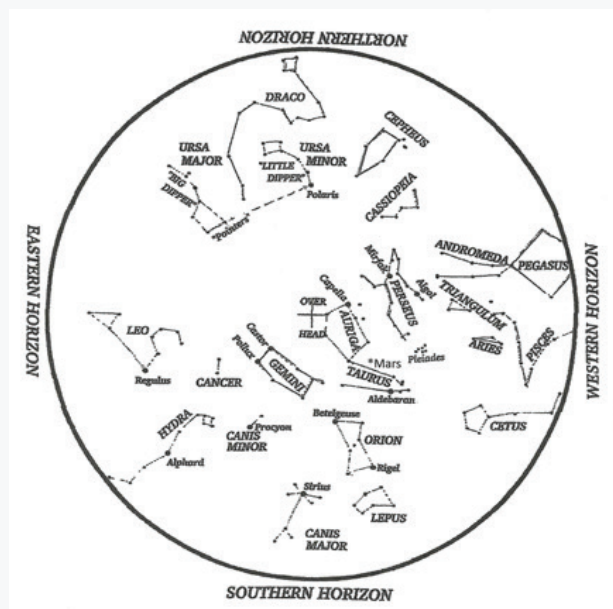
The "Green Comet," officially known as Comet C/2022 E3 (ZTF), has been a popular target for astronomers recently. Comets are very unpredictable, but it might be visible with the unaided eye for the first part of the month. If not, binoculars will reveal this celestial visitor. When viewing this comet, keep in mind that it will not be seen "blazing across the sky." Instead, it will gradually move from night to night and appear in binoculars as a fuzzy patch in the sky. This comet has an orbital period of 50,000 years, which means the last time it passed by Earth, the Neanderthals were still roaming the lands and humans were just migrating out of Africa.

FEBRUARY'S SKY

1: Comet ZTF's Closest Approach to Earth

5: Full Moon

20: New Moon



Credit: Roger B. Culver

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

OBSERVATIONS

Stargazing has proved to be a challenge lately, mostly due to the cloudy skies.

Scheduled observing events for both my high school and the grade school space and astronomy clubs were sadly cancelled.

I have had some luck observing from my driveway even on the partly cloudy nights. For quick "between the clouds" observing sessions, I often focused on double stars. As a beginner astronomer, I learned how to use my telescope and navigate the sky by viewing double stars.

My observations included Meissa, designated Lambda Orionis, which marks the head of Orion and has a separation of 4.4 arc seconds. I resolved the two individual stars at 240x. The two stars had beautiful color contrast, one shining blue and the other orange. Another spectacular orange-blue double is 32 Eridani, for which I needed 150x to resolve the components. Almach was another target of mine, which has a separation of 9.8 arc seconds. I easily resolved the components at 120x and revealed one as a deep blue and the other red.

Double-star expert Sissy Haas once compared observing double stars to viewing a rainbow or waterfall, and I absolutely agree!



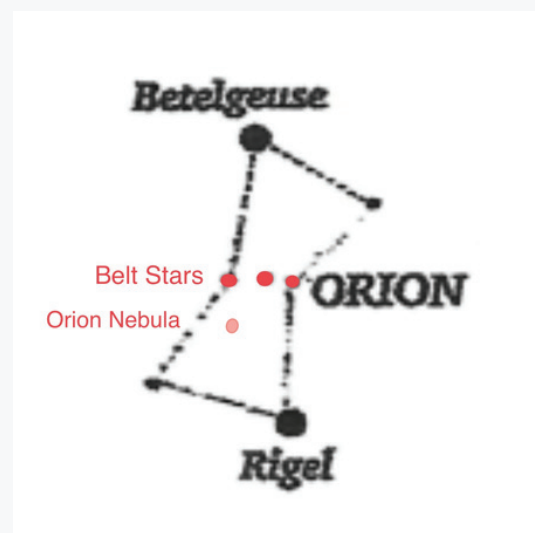
The purpose of the Starry Scoop is to communicate current astronomy and space events. If you want to share your observations or get digital copies of the Starry Scoop, contact starryscoop@gmail.com. The Starry Scoop is now on Facebook. Clear skies!

OBJECT OF THE MONTH

The featured object this month is Orion's Belt. This asterism consists of three bright stars, Alnitak, Alnilam, and Mintaka. In ancient times, they were nicknamed the Three Sisters or the Three Kings, in reference to the Bible. It's said that the arrangement of the Pyramids at Giza match the positioning of these stars. The belt stars are located on the celestial equator and are considered to be a celestial bridge as both the northern and southern hemisphere can view them.

Just below the belt is the famous Orion Nebula, the closest large stellar nursery to Earth, consisting of gas, dust, and young stars. To the unaided eye, it appears as a fuzzy star, but through a telescope it is a magnificent celestial sight.

Orion's belt can also be used as a guidepost in our sky. These three stars point southeast to Sirius in Canis Major. In the other direction, they lead to Taurus the bull's face, marked by a V-shaped star cluster, the Hyades. Aldebaran, shining brilliant orange, depicts the bull's gleaming eye.



Directions to Seagrave Memorial Observatory

From the Providence area:

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

From Coventry/West Warwick area:

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

From Southern Rhode Island:

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

From Northern Rhode Island:

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

From Connecticut:

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

From Massachusetts:

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



47 Peeptoad Road
North Scituate, Rhode Island 02857