



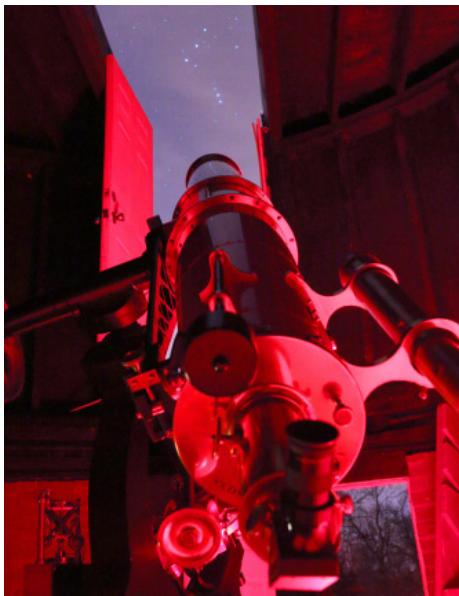
the Skyscraper

vol. 50 no. 9
September 2023

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

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**Seagrave Memorial
Observatory
Open Nights**
Saturdays in September
@ 8pm

Observing Satellites by Rich Nugent Saturday, September 2 at Seagrave Memorial Observatory

In-person and on Zoom (Contact Linda Bergemann (lbergemann@aol.com)
for the Zoom link.

6 PM: Socializing

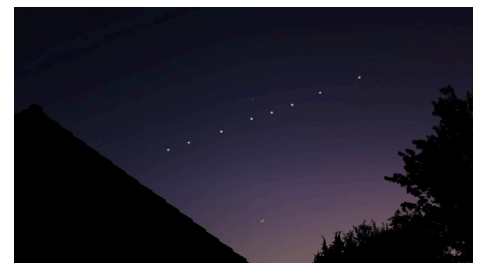
7 PM: Business Meeting & Presentation
TOPIC: "Observing Satellites"

SPEAKER: Rich Nugent, Amateur Telescope Makers of Boston (ATMoB)

Ever since October 4, 1957 thousands of man-made objects have been circling the Earth. From tiny cube sats to the International Space Station, satellites can be observed nightly from almost anywhere. This presentation gives a brief overview of their history, orbits and visibility, and showcases fascinating examples of satellites visible with the unaided eyes, binoculars and telescopes. While no homework will be given, internet resources will be provided for those interested in observing these amazing objects!

Rich Nugent has been enjoying amateur astronomy since the mid-1960's. His first serious telescope was an 8-inch reflector he acquired in 1969. Rich earned degrees in chemistry from Framingham State College and Northeastern University. He spent

23 years at New England Nuclear before transitioning to teaching in the Framingham Public School district. Rich joined the Amateur Telescope Makers of Boston in 1992 and served as the club's President from 2020-2022. He is also the club's outreach committee chairperson and is a member of the observing and clubhouse committees. Rich is an experienced, visual observer who enjoys exploring a wide range of objects through his many telescopes. Having retired in 2016, Rich spends most of his time spoiling his grandchildren, tinkering with his astro gear and spending time under the stars.



Clean Up Day - Help Needed

Saturday September 9, 9am

Astroassembly is just around the corner and we want to look our best for members and guests.

We will be doing brush cutting, interior building cleanup and sanding / painting the benches and railing by the meeting hall.

No need for any special skills, just a willingness to help out for a few hours. More details to come. A pizza lunch will be provided.

Star Party Night

Saturday September 9

Despite a period of not so good weather, we haven't given up yet! Please join us on the evening of September 9 for another member star party. Bring your telescope, your binoculars or just your eyeballs. Share views of many different objects and compare eyepieces, telescopes and more!

Setup time will be 7 to 7:30 at Seagrave Observatory.

Let's hope for some clear skies this time!

President's Message

by Linda Bergemann

September has arrived and AstroAssembly will occur at the end of the month on Saturday, September 30th. This day-long event of speakers and networking will be preceded by an informal Astro Eve on Friday evening, September 29th.

Planning for AstroAssembly began this year in January. A small team met to review last year's event and to make plans for this year. Based on comments received from last year's attendees, we felt the need to address two things: dinner and the astrophotography contest.

While many would like to see us return to an off-site banquet and evening program, our experience indicates that this is not feasible; both from the standpoint of logistics and cost. So, instead, this year we will try a new approach. We will take a break from the program in the late afternoon for a bite to eat and time to socialize. Lite food (pizza and snacks) is included with registration. This will be followed by our raffle and astrophotography awards. The day will con-

clude after one final speaker.

It was clear to us that the digital astrophotography contest introduced during COVID should be abandoned and that a return to print photography was appropriate. We also agreed that more emphasis needed to be put on the contest and showcasing the entries. This year, we will have a display tent dedicated to the Astrophotography Contest. The tent will house a newly purchased frame to display all of the entries, so attendees can view and vote at their leisure. Submissions must be presented at the astrophotography tent between 9 AM and noon on Saturday. Voting by attendees will take place in the afternoon. Following AstroAssembly, our plan is to hang some or all of the photos on a new gallery wall in the meeting hall. Guidelines for entry can be found on our website.

We hope that our changes help to improve the overall experience. Please plan to attend (register at: <http://www.theskyscrapers.org/astroassembly2023>) and let me

New Member
Welcome to Skyscrapers
Robert Leonard
of Reading, MA

know your thoughts, negative or positive.

Lastly, please consider joining next year's AstroAssembly team. We are always seeking new ideas and more hands.

See you there!

 **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 **September 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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Observing Events:

Open Nights

Sept. 2, 8-10 PM

Sept. 16, 8-10 PM

Sept. 23, 8-10 PM

Sept. 30, 8-10 PM

Star Parties*

Sept. 9 at Seagrave, 8-11 PM

Sept. 15 at River Bend Farm,
8-9:30 PM

*Members are welcome and appreciated at all of these events

Workshop

Sept. 16, Deep Sky

Astrophotography with
Conrad Cardano, 1 PM

Astrophotography Workshop

September 16, 6pm-10pm

Skyscrapers is happy to announce a workshop for astrophotography hosted by member Conrad Cardano. Designed for beginners, the program will include a lecture and outdoor, hands-on experience (weather permitting).

Back in the early 1970's, I tried my hand at astrophotography with film, a DLSR camera, and a 6" telescope on a motorized Edmund Scientific equatorial mount. You would have to expose the whole roll of film (a 20 or 36 exposure roll), take it to a "drug" store to be processed, wait a week, and then see the results. Did I say it was frustrating? Oh, yes it was. Many things could go wrong: maybe the mount jiggled and blurred the image, maybe an airplane flew across the image and ruined it, maybe it wasn't in good focus, maybe the drug store lost your roll of film.

Today, astrophotography has never been better; however, there is more to learn than

in the 1970's. This presentation "Intro to Astrophotography" is meant for people who have never tried astrophotography but would like to.

Topics to be covered: The Camera Sensor: CMOS and CCD, Sensor size, Pixel size, well depth, and bit depth, Color vs Monochrome, Types of Cameras: DLSR, Smartphones, and Dedicated Astro Cameras

Mounts: Stationary Camera tripods, Motorized mounts, Camera Tracking mounts, Goto, Laptops vs Desktops Computers, Techniques: Focus, How long an exposure, How high the gain, The "dark frame," The "Flat" frame, Capture Software, Processing Software, Free vs \$\$\$, The future?

I hope you will join me for this practical and informative workshop. Anyone interested in attending should send an email to Michael Corvese at corvesemichael@gmail.com. Thanks and I look forward to seeing you there!

Star Party Reports

Starry Nite at Chase Farm Park Wednesday, August 23, 2023 by Francine Jackson

Wednesday, August 23, was the annual Starry, Starry Night at Chase Farm, Lincoln. President of the Friends of Hearthiside Kathy Hartley, who arranged our night, was amazed this year again to learn we will be doing the program twice that night, plus she had a waiting list.

After a PowerPoint presentation on the sky, the guests were led up to the hill where telescopes had been set up by Jim Hendrickson, Ron Zincone, Heidi Morgan, John Kocur, and Francine Jackson. In addition to the first quarter Moon, Saturn was visible for the first time this season, and everyone was thrilled to see it.

This program has become so popular that Kathy mentioned a person who came this time has already reserved a spot for next year.



Skylights: September 2023

by Jim Hendrickson

September brings a notable change of season in the sky. Besides the autumnal equinox, when the Sun lies directly on the celestial equator, 0° declination, giving equal times of day and night, the visible star patterns in the night sky are also indicating some changes.

Arcturus, the bright beacon of spring that has been a fixture in the evening sky for the past six months, is getting lower in the west with each passing night. Along with it, the big bear, Ursa Major, is beginning to stand upright on the northwestern horizon. A sweep with binoculars beneath the Big Dipper reveals the asterism the Three Leaps of the Gazelle darting along the horizon, to the right of Coma Berenices and towards the north.

Spica, another springtime star, disappears from view during September, and just as twilight fades, the heart of the Milky Way lies due south, indicating that the summer star patterns of Scorpius and Sagittarius will also be leaving the sky soon.

The Summer Triangle, made up of the stars Vega, in Lyra, Deneb in Cygnus, and Altair in Aquila, are high overhead and will be with us for quite a while longer.

Low in the southeast, almost directly below Saturn, we welcome the return of Fomalhaut, the 18th brightest star in the sky, and the most southerly first magnitude star visible at our latitude.

Towards the east and northeast, the familiar star patterns of autumn are now fully visible. Pegasus, Andromeda, Cassiopeia and Cepheus will be prominently positioned in our evening sky for the next several months.

Early morning observers will welcome the entirety of the Winter Hexagon and its associated constellations high in the southeast before dawn. If you enjoy exploring this part of the sky but can't bear the cold temperatures associated with viewing it when it is visible in the early evening, September mornings are your best time to experience the winter sky under late summer climate conditions.

The first sunset that occurs before 7:00pm happens on September 13. The Sun will continue to set earlier than 7:00pm until March 22.

After having spent the past 37 days traversing Leo, the Sun enters Virgo on September 17.

The Sun crosses the celestial equator, moving southward, at 2:50am EDT on September 23, marking the autumnal equinox.

The Moon begins the month in its waning gibbous phase, passing Neptune on the 1st. Last quarter occurs in Taurus on the 6th.

On its way to its new phase on the 14th, it passes 3.0° north of open cluster M35 in Gemini on the 8th, 2.8° southeast of Pollux (beta Geminorum) on the 10th, 3.0° north of the Beehive Cluster (M44) in Cancer on the 11th, and 3.9° northeast of Regulus, in Leo, on the 13th.

On the waxing side, the 1.7-day crescent appears just 1.0° southeast of Mars on the 16th, and passes 2.6° east of Spica on the 17th. On the 20th, the 5.5-day Moon is 4.8° west of Antares.

First quarter Moon occurs in Sagittarius on the 22nd.

Late in the evening of the 26th, the waxing gibbous Moon is 2.7° south of Saturn.

The Full Harvest Moon occurs at 5:58am EDT on September 29. The Moon rises at 6:25pm on the 28th, seven minutes before sunset. It sets at 6:43am the following morning.

Mercury reaches inferior conjunction on the 6th, and then appears in the morning sky for a very favorable apparition throughout the remainder of the month. It reaches greatest elongation on the 22nd, when it will be 18° east of the Sun, and at a near vertical angle with respect to the horizon, and will rise 90 minutes ahead of the Sun.

This is a great time to observe the rapidly changing phases of Mercury with a telescope, morphing from an 8% illuminated crescent on the 12th, to a "quarter Moon" phase just 10 days later.

Venus, likewise, is also in a favorable position in the morning sky, and is going through its crescent phase throughout September, though it takes nearly two months to undergo the same progression of phases as Mercury does in under two weeks.

During the first week of September, Venus lies within 2° of the open cluster M67 in Cancer. It shines as bright as magnitude -4.8 on the 19th, when it reaches its maximum brilliancy, and moves into Leo on the 24th. In early September, Venus rises at 3:15am EDT, and by the end of the month it is visible just after 3:00am.

Although it doesn't reach superior conjunction until mid-November, Mars is becoming difficult to view in evening twilight. At the beginning of September, it sets about an hour after the Sun, and by month's end,

Events in September

- 1 Equation of Time = 0
- 1 Moon 1.4° S of Neptune
- 2 Venus Stationary
- 4 Jupiter Stationary
- 5 Moon 1.5° NNW of Uranus
- 6 Mercury Inferior Conjunction
- 6 Last Quarter Moon
- 8 Moon 3.0° N of M35
- 10 Moon 2.8° SE of Pollux
- 11 Moon 3.0° N of M44
- 13 Moon 3.9° NE of Regulus
- 14 Mercury Stationary
- 14 New Moon (1246)
- 16 Moon 1.0° SE of Mars
- 17 Moon 2.6° E of Spica
- 19 Neptune Opposition
- 19 Venus Greatest Brilliancy -4.8
- 20 Moon 4.8° W of Antares
- 22 Mercury Greatest Elongation W18
- 22 First Quarter Moon
- 23 Equinox (2:50am EDT)
- 27 Moon 2.7° SSE of Saturn
- 29 Full Harvest Moon

Ephemeris times are in EDT (UTC-4) for Seagrave Observatory (41.845N, 71.590W)

it remains in the sky for just 30 minutes after sunset. On the 4th, Mars lies 0.8° south of Zaniah (eta Virginia), a magnitude 3.8 star that is 265 light years away. Mars is just about as far from Earth as it gets, at 2.5 AU, or 21 light minutes away.

If there is one last time you should try to observe Mars this season, it is on the 16th, when the 1.7-day, 3.2% illuminated crescent Moon appears just 1.1° to its southeast.

Jupiter is still a few weeks from opposition, but it is becoming a prominent object in the evening sky in September. Rising just before 10:00pm EDT in early September, it reaches its stationary point and begins its retrograde loop through Aries on the 4th.

With your small telescope, watching Jupiter's Galilean moons change positions each night, and even over the hours, can be a fascinating experience. One peculiar alignment occurs just before 3:00am EDT on September 26, when Io, Europa, and Callisto form a nearly perfect north-south line just to the west of Jupiter. Each passing minute reveals motion of the moons, as the line quickly changes.

Saturn, having passed opposition late last month, is well-placed for observing all night throughout September. As the Sun-Saturn-Earth angle increases in the weeks following opposition, the shadow of Saturn on the backside of its rings becomes more visible, giving prominence to the three-dimensional appearance of the planet in the eyepiece of a telescope.

While Saturn is at its closest, this is a good time to explore its moons. Its largest, Titan, is visible in small telescopes, at magnitude 8.5. It orbits Saturn once every 16 days, and at maximum elongation, can appear as far as 3 arcminutes from the planet.

A slightly larger telescope will reveal some of Saturn's medium-sized moons, Tethys, Dione, and Rhea. These moons are all 10th magnitude, with Rhea being about ½ magnitude brighter than the others, and orbit Saturn in 1.9, 2.7, and 4.5 days, respectively, so their positions change dramatically on successive nights, and can even be seen changing by the hour, just as Jupiter's inner Galilean moons do. They orbit considerably closer to Saturn than Titan, so a bit more magnification is needed to watch them. A favorable elongation of both Dione and Rhea occurs on the evening of the 13th, when the two moons are near their maxi-

mum elongation west of the planet, at about 34 and 57 arcseconds from the ring edge.

A larger telescope will reveal two of Saturn's smaller, inner moons, Mimas and Enceladus. These moons, although not exceptionally dim at 12th and 11th magnitude, respectively, are challenging to see due to their proximity to the brightness of Saturn and its rings. The moons orbit in just 0.9 and 1.4 days, and are elongated only up to 7 and 15 arcseconds from the ring edge.

Finally, there is Iapetus, Saturn's bizarre outer moon that has dark and light hemispheres. The tidally locked moon is covered in darker material on its leading hemisphere, leaving its trailing hemisphere lighter, by up to two magnitudes as seen from Earth, when it is on the western side of Saturn, moving away from us and toward the back side of the Saturnian system. This moon orbits in 79 days and undergoes one

of its western elongations during the first week of September. Iapetus can be as far as 10 arcminutes from the planet at its greatest elongations.

Uranus is near the border of Aries and Taurus, and rises just a few minutes after Jupiter. At a distance of 19.0 AU, Uranus's greenish globe shines at magnitude 5.7, putting it within unaided eye visibility from a dark site, and easy to locate with binoculars even under bright sky conditions. With binoculars or a small telescope, aim for the patch of sky midway between Jupiter and the Pleiades cluster in Taurus. Look for a quadrilateral of 4th and 5th magnitude stars resembling a radio telescope, with the open end of the dish pointed south. The stars are Botein (delta Arietis), zeta, tau1 and tau2 Arietis. Uranus (magnitude 5.8) forms an equilateral triangle with the southern two stars (the wide end of the radio dish).

Early in the morning of September 5, the waning gibbous Moon is 1.5° north-northwest of Uranus.

Our most distant planet, **Neptune**, reaches opposition on the 19th, making September the best time to observe it. It can be found just a fraction of a degree from the 5.5 magnitude star 20 Piscium all month, coming within 220 arcseconds north of the star on the 12th. This location can be found rather easily by drawing a line through the eastern segment of the Circlet asterism in Pisces, from magnitude 4.1 iota Piscium, and continuing along this line about the same distance. At the end, move slightly east to find 20 Piscium and Neptune.

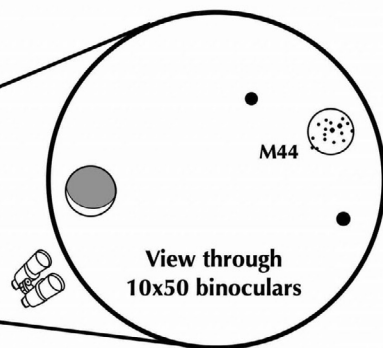
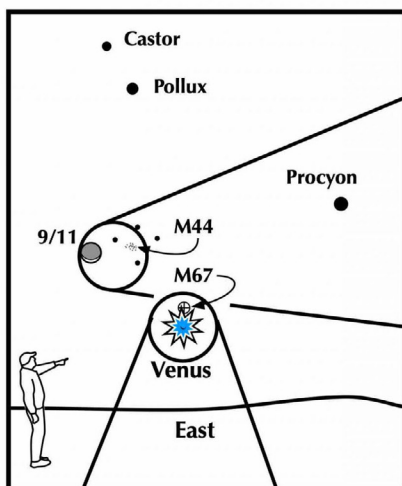
At opposition, the distant ice giant is 28.9 AU away, where its light takes almost exactly four hours to reach us. Its 2.4 arcsecond bluish globe shines at magnitude 7.7, well within range of binoculars on a dark, moonless night.

After midnight on September 1st, the just-past-full Moon will pass 1.4° south of Neptune, making the planet easier to locate. Neptune receives a second visit from the Moon at the end of the month when the full Harvest Moon appears 4° to its east.

At over 34 AU, distant **Pluto** dimly shines at magnitude 14.4 in eastern Sagittarius, 1.7° southwest of globular cluster M75. Early September is still a good time to hunt for Pluto, when it is at its highest in the south in the early evening, and bright moonlight isn't interfering.

Magnitude 8.9 Ceres remains visible in Virgo, but it is rapidly falling out of view, and will be difficult to see by the end of the

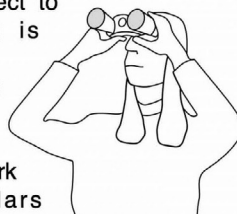
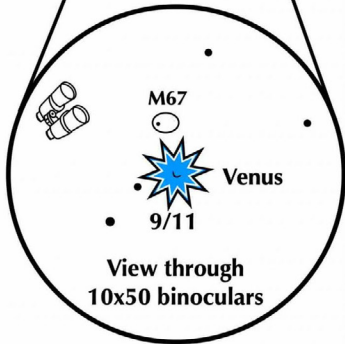
If you can see only one celestial event in the morning this September, see this one.



Moon visits M44, Venus visits M67

On the morning of Sep 11, look to the east 90 minutes before sunrise.

- The crescent moon, full with earthshine, glows left of M44, the Beehive cluster.
- M44 can easily be seen in binoculars.
- The dazzling object to their lower right is Venus.
- Just above Venus lies another star cluster, M67. If viewed from a dark location, binoculars should reveal its fuzzy presence.
- If the binoculars are securely mounted, the tiny crescent of Venus should be barely discerned amid the planet's glare.

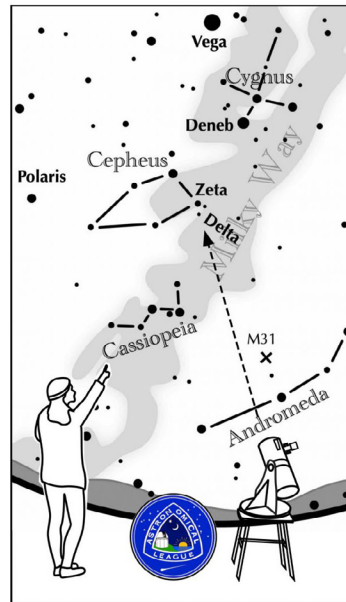


month, when it will be 3.5 AU away. During the first week of September, it is located about 8° above Spica, just over the western horizon.

Vesta becomes brighter than magnitude 8 in September, and enters northern Orion on September 6. Throughout the month, it traces a path 1° south of and parallel to the line connecting Chi1 and Chi2 Orionis, the two 4th magnitude stars that mark the top of the hunter's club.

Asteroid 3 Juno is fairly unremarkable, at 10th magnitude, but its position in early September is notable as it shares the same area of sky as Venus. Around the time that Venus is making its closest pass to the open cluster M67 in Cancer, Juno appears just 1.2° southwest of the brilliant planet. Juno then "chases" Venus, continuing to appear nearly due south of it at a distance of no greater than 4° as the pair move eastward into Leo during the latter days of the month.

ASTRONOMICAL LEAGUE Double Star Activity



Other Suns: Delta Cephei

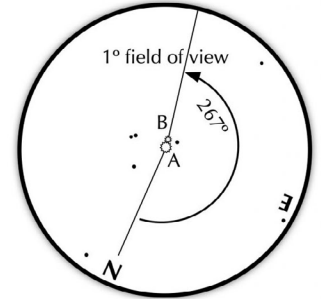
How to find Delta Cephei on a September evening

Face northeast and find bright Deneb, the northernmost star of Cygnus. It is nearly overhead. Between Deneb and the "W" shaped Cassiopeia lies the house-shaped constellation Cepheus. Find Zeta, the lower left star of the "house." Dimmer Delta shines just below it.

Suggested magnification: >20x
Suggested aperture: >2 inches

Beta Capricorni

A-B separation: 41 sec
A magnitude: 4.2
B magnitude: 6.1
Position Angle: 191°
A & B colors:
yellow, blue



Mid-Autumn Festival

by Francine Jackson

As the Moon is a symbol for family reunion, the Chinese Mid-Autumn Festival is an evening celebration where families gather together to light lanterns, eat Moon cakes, and appreciate the roundness of the Full Moon. Because this time of year marks the end of harvest time, it was a time to give thanks for all they have, and to encourage the harvest-giving light to return again in the coming years.

Mooncakes have a major importance in the Chinese culture. As roundness symbolizes completeness and togetherness, the round cakes complement the Harvest Moon during their festival.

In addition, the rabbit is an important part of this time. Not only is he considered an adorable animal, but also a selfless one that in many legends is willing to sacrifice himself for the good of many. As such, he is honored by living on the Moon. Many of us can see the bunny, made up of the Moon's surface features, during the Full Moon phase.

The Mid-Autumn Festival runs this year from September 29th to October 6th. Although the festival normally is celebrated for three days, this year's is extended to eight because of the celebration of China National Day, which begins October 1st and continues through the following week.

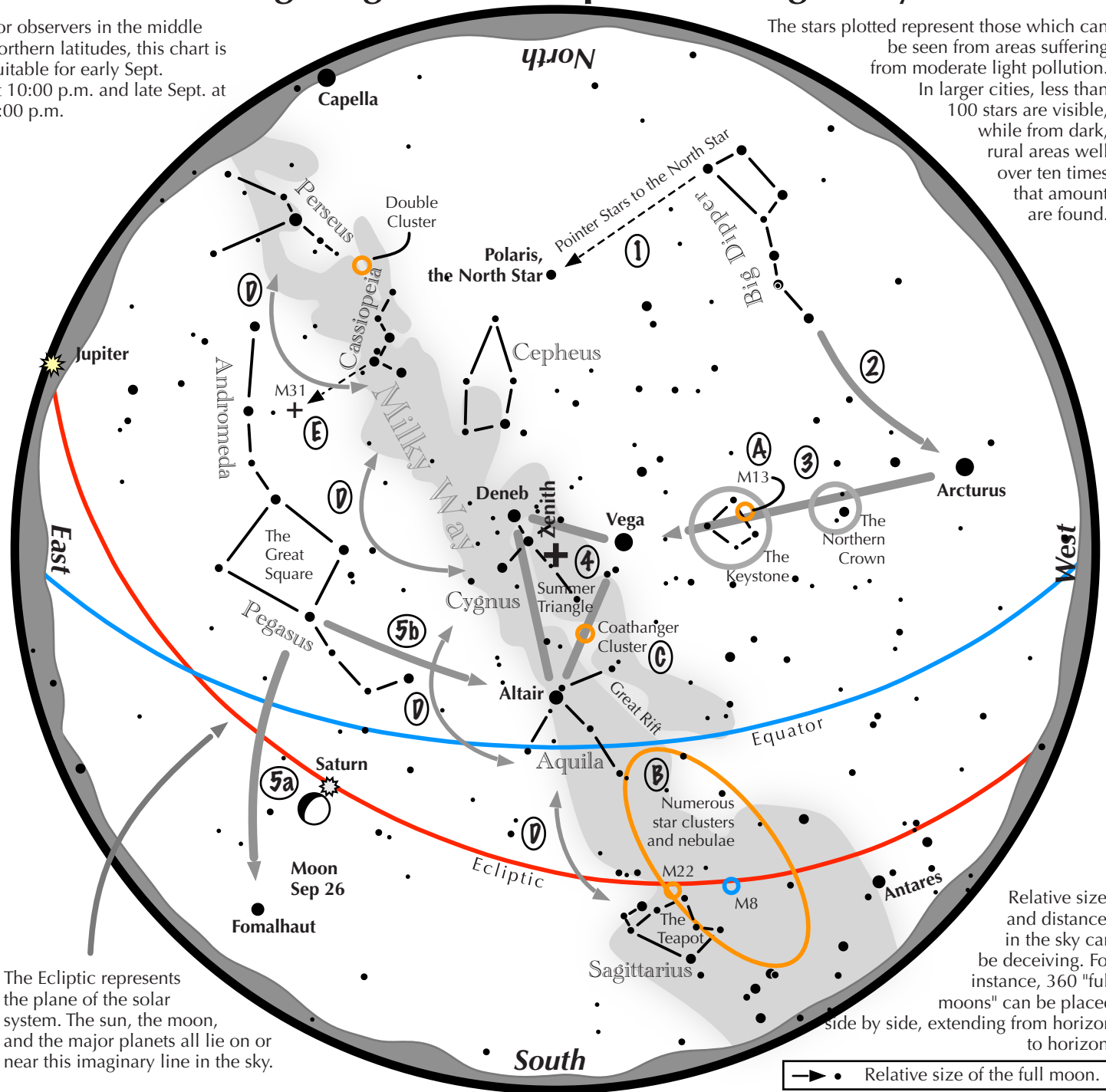


Supermoon of August 30, 2023 at 11:24 pm local time or August 31, 2023 3h 24m UT. This image was taken approximately 23 hours after Category 3 Hurricane Idalia was churning northward in the Gulf of Mexico. Fortunately, the skies cleared around 11:00pm local time and I was able to obtain this image. The ground was still wet after over three inches of rain. Amazingly, the seeing was Above Average at 6/10 while the transparency was below average 4/10 with haze and passing cloud banks. Image was taken with a Meade 60mm refractor with a 260mm focal length at f/4 piggybacked on a tracking equatorially mounted Meade 2080 Schmidt-Cassegrain telescope. Camera utilized was a ZWO ASI 178MM with an Optolong UV-IR cut filter. Aligned and stacked with Autostakkert 3.14 sharpened with Registax 6.1 and Photoshop CS4. The moon was 38 degrees above the horizon at 99.9% phase and 33'26" in size. Image by Greg Shanos

Navigating the mid September Night Sky

For observers in the middle northern latitudes, this chart is suitable for early Sept. at 10:00 p.m. and late Sept. at 9:00 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

Navigating the mid September night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the September evening sky.
- 3 Nearly overhead shines a star of similar brightness as Arcturus, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 4 The stars of the summer triangle, Vega, Altair, and Deneb, shine overhead.
- 5 The westernmost two stars of the Great Square, which lies high in the east, point south to Fomalhaut. The southernmost two stars point west to Altair.

Binocular Highlights

- A: On the western side of the Keystone glows the Great Hercules Cluster.
- B: Between the bright stars Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift.
- E: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.



Looking Beyond the Stars

by Brian Kruse

Looking up in awe at the night sky, the stars and planets pop out as bright points against a dark background. All of the stars that we see are nearby, within our own Milky Way Galaxy. And while the amount of stars visible from a dark sky location seems immense, the actual number is measurable only in the thousands. But what lies between the stars and why can't we see it? Both the Hubble telescope and the James Webb Space Telescope (Webb) have revealed that what appears as a dark background, even in our backyard telescopes, is populated with as many galaxies as there are stars in the Milky Way.

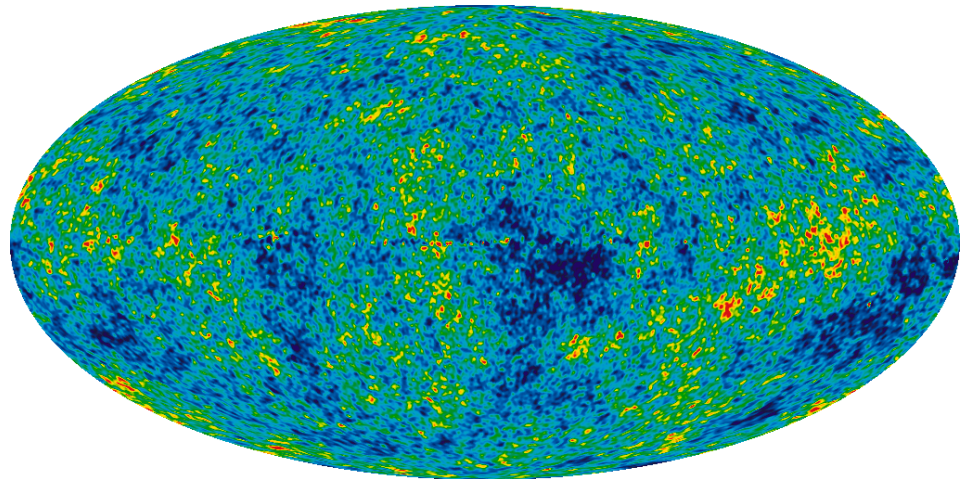
So, why is the night sky dark and not blazing with the light of all those distant galaxies? Much like looking into a dense forest where every line of sight has a tree, every direction we look in the sky has billions of stars with no vacant spots. Many philosophers and astronomers have considered this paradox. However, it has taken the name of Heinrich Wilhelm Olbers, an early 19th century German astronomer. Basically, Olbers Paradox asks why the night sky is dark if the Universe is infinitely old and static – there should be stars everywhere. The observable phenomenon of a dark sky leads us directly into the debate about the very nature of the Universe – is it eternal and static, or is it dynamic and evolving?

It was not until the 1960s with the discovery of the Cosmic Microwave Background that the debate was finally settled, though various lines of evidence for an evolving universe had built up over the previous half century. The equations of Einstein's General Theory of Relativity suggested a dynamic universe, not eternal and unchanging as previously thought. Edwin Hubble used the cosmic distance ladder discovered by Henrietta Swan Leavitt to show that distant galaxies are moving away from us – and the greater the distance, the faster they're moving away. Along with other evidence, this led to the recognition of an evolving Universe.

The paradox has since been resolved, now that we understand that the Universe has a finite age and size, with the speed of light having a definite value. Here's what's happening – due to the expansion of the Universe, the light from the oldest, most distant galaxies is shifted towards the lon-



NASA's James Webb Space Telescope has produced the deepest and sharpest infrared image of the distant universe to date. Known as Webb's First Deep Field, this image of galaxy cluster SMACS 0723 is overflowing with detail. This slice of the vast universe is approximately the size of a grain of sand held at arm's length by someone on the ground. (Image Credit: NASA, ESA, CSA, STScI) <https://bit.ly/webbdeep>



The oldest light in the universe, called the cosmic microwave background, as observed by the Planck space telescope is shown in the oval sky map. An artist's concept of Planck is next to the map. The cosmic microwave background was imprinted on the sky when the universe was just 380,000 years old. It shows tiny temperature fluctuations that correspond to regions of slightly different densities, representing the seeds of all future structure: the stars and galaxies of today. (Image credit: ESA and the Planck Collaboration - D. Ducros) <https://go.nasa.gov/3qC4G5q>

ger wavelengths of the electromagnetic spectrum. So the farther an object is from us, the redder it appears. The Webb telescope is designed to detect light from distant objects in infrared light, beyond the visible spectrum. Other telescopes detect light at still longer wavelengths, where it is stretched into the radio and microwave portions of the spectrum. The farther back

we look, the more things are shifted out of the visible, past the infrared, and all the way into the microwave wavelengths. If our eyes could see microwaves, we would behold a sky blazing with the light of the hot, young Universe – the Cosmic Microwave Background.

The next time you look up at the stars at night, turn your attention to the darkness

between the stars, and ponder how you are seeing the result of a dynamic, evolving Universe.

This article is distributed by NASA's Night Sky Network (NSN). The NSN 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:

Messier 56: Globular Cluster in Lyra

by Glenn Chaple

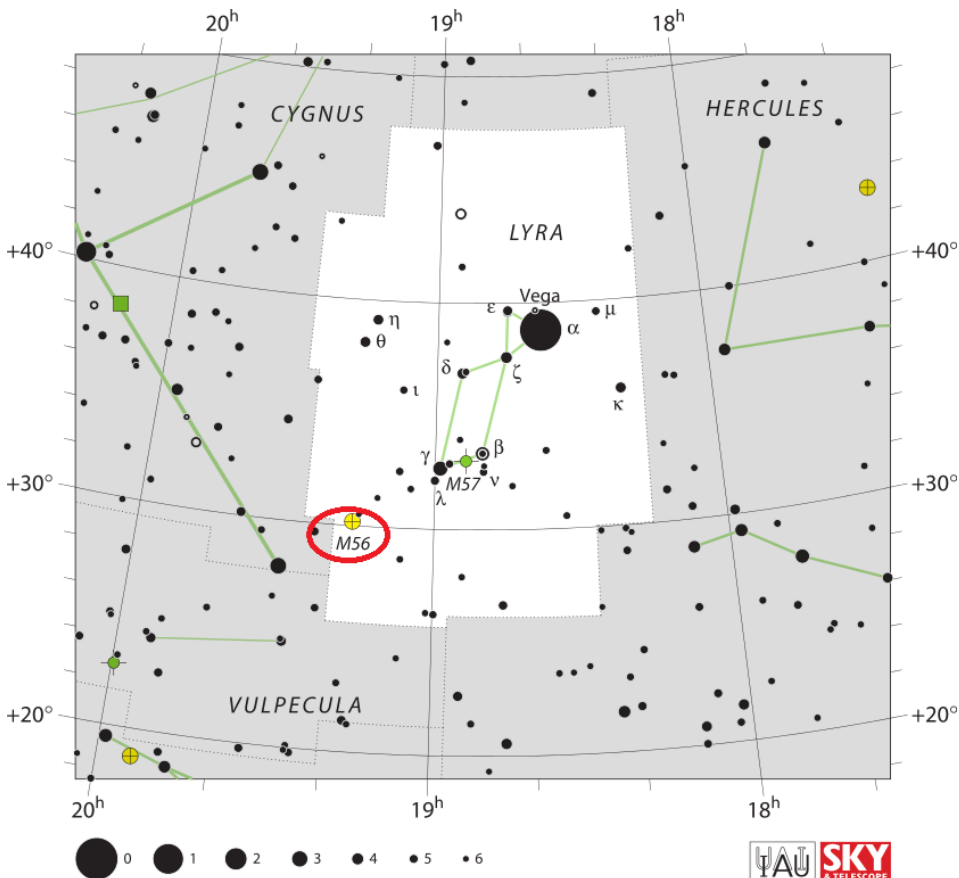
Magnitude 8.3, Size 8.8'

During an evening at the 1982 Stellafane Convention, I learned exactly why Charles Messier created his catalog of faux comets. An attendee asked if I had a star atlas, as he had spotted with his telescope a comet-like object in the area between Lyra and Cygnus. Excitement quickly turned to disappointment as the atlas identified the object as an 8th magnitude globular cluster discovered by Messier in January, 1779.

The 2000.0 coordinates for Messier 56 are: RA 19h16m35.6s, Dec +30°11'00.5". I usually pick it up by aiming at a spot midway between gamma (γ) Lyrae and the beautiful double star Albireo (beta [β] Cyg-

ni) and then nudging the scope slightly towards Albireo. A low power sweep of the area will turn up a small roundish glow. No wonder Messier and my friend at Stellafane thought they had uncovered a comet!

M56 certainly doesn't get the attention that Lyra's other Messier object, the "Ring Nebula" M57, does. I've seen the Ring many hundreds of times with a variety of instruments, while I can count on one hand the number of times M56 has graced my eyepiece field. Those earlier observations of M56 were all made with small-aperture instruments, so I recently returned to M56 with a 10-inch f/5 reflecting telescope and a magnifying power of 208X. Even then, the



Mario Motta, MD. (ATMoB) "I imaged M56 with my 32 inch, in Lum, and RGB filters with my ZWO ASI 6200 camera. About 2 hours total imaging, processed in PixInsight."

cluster was barely resolved, with perhaps a dozen visible stars of around magnitude 13 to 14.

Studies indicate that M56 is about 33,000 light years from earth. It spans a diameter of some 84 light 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.

STARRY SCOOP

Editor: Kaitlynn Goulette



WHAT'S UP

The summer constellations, including the Sagittarius region, are beginning to drift to the west, taking the heart of our Milky Way with them, but remain visible for the entire month. This region of the sky is rich in deep sky objects and celestial treasures that are easily observable with binoculars and a backyard telescope.

This month, Saturn is visible in the southeast sky following sunset and moves higher along the ecliptic as the night continues. Saturn and its rings have been stunning telescopic targets, especially during its recent opposition. On September 26th, the waxing gibbous moon visits the ringed planet. Found roughly 10 degrees west of Saturn is the dim smile-shaped star pattern of Capricornus, which is a challenging constellation to find with the unaided eye. Later in the evening, Jupiter can be seen above the horizon at about 9pm and is a wonderful morning target. Due to its fast rotational period, new features are visible on its surface throughout the entire night.

Earning its name as our "Morning Star," Venus is visible for a few hours before the sun rises. This world goes through phases much like the moon, as it's an inferior planet. Mercury also appears in the morning sky and reaches greatest western elongation on the 22nd.

The September Equinox occurs on the 23rd of this month and marks the first day of fall for those of us living in the Northern Hemisphere. On this day, the sun is positioned almost directly above the equator and day and night hours are nearly equal throughout the world. The days will begin to get shorter and shorter, which is great news for astronomers as there's more time under the night sky.

Twenty years ago on September 21st, the Galileo spacecraft ended its 14-year mission by plummeting into Jupiter. Over the course of its mission, Galileo orbited Jupiter 34 times, collecting data on both the planet and its moons. The spacecraft discovered evidence of a vast ocean beneath Europa's icy crust and also carried a probe that was deployed into Jupiter's atmosphere.

SEPTEMBER'S SKY

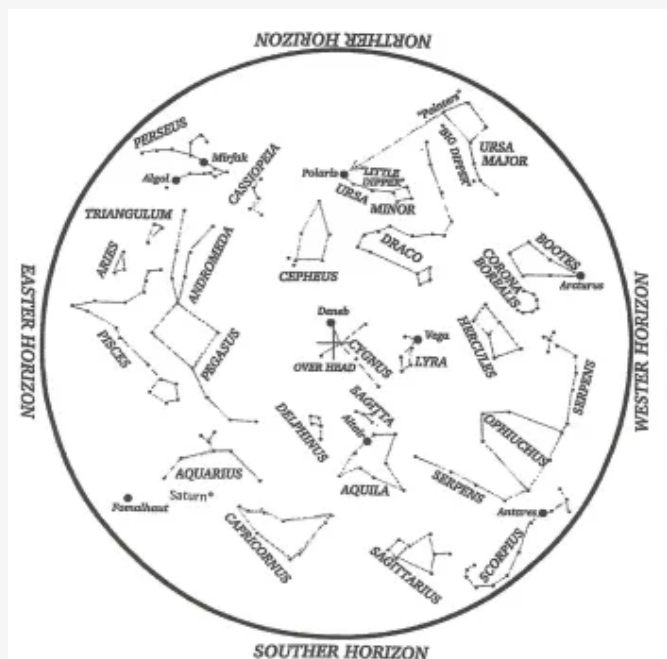
15: New Moon

19: Neptune at Opposition

22: Mercury at Greatest Western Elongation

23: September Equinox

29: Full Moon, Supermoon



Credit: Roger B. Culver

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

OBSERVATIONS

Recently, I had the opportunity to stargaze under the dark skies of the Stellafane astronomy convention in Springfield, Vermont. I participated in my 5th Binocular Observing Olympics (BOO), which included a list of objects compiled by astronomer Phil Harrington. I completed this challenge alongside my sister, father, and Jenny Powers, director of the Springfield Science Museum. This was Jenny's first Stellafane and her first time participating in the Binocular Observing Olympics.

I used my 7x35 binoculars for much of the challenge, but also utilized my tripod-mounted 15x75 binoculars to verify some of the fainter objects.

Once again, the binocular observing program was nothing short of a masterpiece. This year, it included not only challenging targets, but also popular deep sky objects and fun asterisms. My favorite objects were Davis's Dinosaur in Hercules and the Polaris Engagement Ring in Ursa Minor, both unique asterisms. Some of the more challenging objects included NGC 6572 and NGC 188. We also spent a lot of time trying to discern NGC 604, a nebula and star-forming region, but were unsuccessful. This object was situated within galaxy M33, another target in the program. I'll be sure to revisit this object next time I find myself under clear skies.

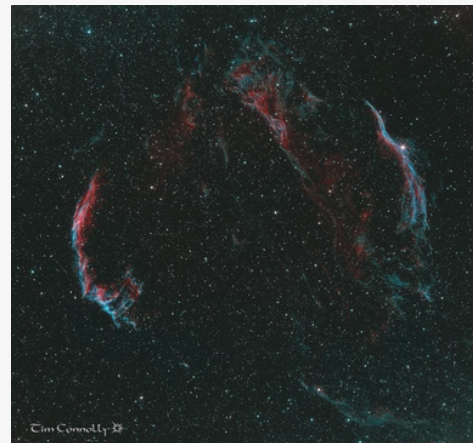


The purpose of the Starry Scoop is to communicate current astronomy and space events. If you want to share your observations or get digital copies of the Starry Scoop, contact starryscoop@gmail.com. The Starry Scoop is now on Facebook. Clear skies!

OBJECT OF THE MONTH

The featured object for the month of September is the Veil Nebula. This supernova remnant is the remains of an exploded star that was 20 times more massive than our sun. In the sky, it appears roughly six times larger than the full moon. The two brightest portions of the Veil Nebula are the Eastern Veil and Western Veil as we're viewing them edge-on. Other sections of the Veil Nebula include Pickering's Triangle and the "Funnel."

Find the Veil Nebula in Cygnus, about four degrees southeast of Epsilon Cygni. This object is best viewed with a telescope, especially with an OIII filter, which significantly helps resolve its detail.



Veil Nebula
Photo by: Tim Connolly



Stellafane - Breezy Hill



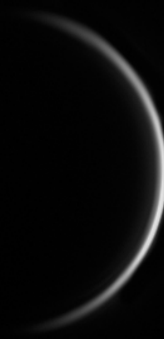
Perseid Meteor by Heidy Morgan

Captured on 8/14/23 at Frosty Drew Observatory. using Canon 6D and Rokinon SP 14mm f/2.5 lens at ISO 800.

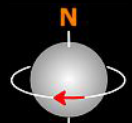
Venus in the Infrared August 4, 2023

Gregory T. Shanos Sarasota, Florida USA
Meade LX200GPS 250mm fl 2500mm f/10
ZWO ASI 290MM monochrome camera
No Barlow Protective Window Removed

Magnitude: -4.1
Diameter: 55.7"
Phase: 3%
Altitude: 20°
Seeing: 4/10 Below Ave
Transp: 7/10 Good, Clear
Resolution: 0.24"



23h 03.7 m UT
CMI: 326.3° CMII: 355.9°
Antlia 850nm IR longpass filter
Inferior Conjunction occurs on August 13, 2023



Cosmic Coffeehouse

*Informal astronomy chat room
meets on the 15th of each month at 7:00pm*

- interactive ZOOM format
- current news
- featured speakers
- equipment reviews
- observing notes
- fun 'n games

To receive your invite, send request to Astro-Geek@comcast.net



AstroAssembly 2023

Friday & Saturday, September 29 & 30

Seagrave Memorial Observatory 47 Peeptoad Road North Scituate, Rhode Island

6:00 PM AntreEve Friday Night Social Hour

7:00 PM Friday Night Short Talks
Free to attend by all

8:30 PM Friday Night Observing at Seagrave Memorial Observatory
Weather-permitting

All day Saturday

Swap Table (please bring your own table), Solar Viewing, Astrophotography Contest, Homemade Telescopes (bring yours!)

9:00 AM Registration Open
Coffee & pastries provided. Registration includes evening pizza and snacks, members: \$25, non members: \$30

10:00 AM Stephen LaFlamme, Skyscrapers, Inc.
Peering DEEP into the Andromeda Galaxy

12:00 PM Lunch
See selections below. Pre-registration required

Astrophotography Contest Noon to 4pm
See website for more information

1:15 PM Darryl Davis & Caitly Sullivan, Charles Hayden Planetarium
A Brief History of the Charles Hayden Planetarium

2:30 PM Dr. Marie Motta, ATMob & Massachusetts Medical Society
Light Pollution Effects on Human Health & Environmental Damage

3:45 PM Ed Ting, ScopeReviews
Five to Buy & Five Not to Buy - Equipment Recommendations from Ed

5:00 PM Feed/Social Hour
Pizza, snacks, soda, water & coffee

6:00 PM Raffle & Astrophotography Awards

6:30 PM Sam Walker, Sky & Telescope
Get Ready for Totality 2024

8:00 PM Observing at Seagrave Memorial Observatory
The observatory's telescopes will be available for observing, or set up your own telescope on the grounds.

Times of specific activities are subject to change. Astrophoto contest submissions must be printed and mounted or framed. For up-to-date program information, visit our website: <http://www.theskycrapers.org/astroassembly2023>

___ Registrations x \$30 each = \$ _____

___ Registrations (Skyscraper member) x \$25 each = \$ _____

___ Registrations (youth under 18) Free _____

___ Boxed Lunch * x \$15 each = \$ _____

___ Entree: Italian Deluxe

___ Entree: Turkey

___ Entree: Roast Beef

___ Spinach Pie

___ Garden Salad Dressing _____

___ Caesar Salad Dressing _____

___ Greek Salad Dressing _____

Total = \$ _____

Name(s) _____

Email (required) _____

Register online



Send completed form and check (made payable to Skyscrapers, Inc.) to:

AstroAssembly
c/o Edward Walsh
226 Maple Street
Danabon, CT 06239

* Deli lunch includes chips, drink and a cookie. Grinders come toasted with lettuce, tomato, onion and mild pepper rings. Spinach Pie comes with pepperoni, olive and mozzarella. Available dressings are Oil & Vinegar, Ranch, Italian, Greek and Honey Mustard.

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