



the Skyscraper

vol. 49 no. 9
September 2022

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

In This Issue:

- 2 President's Message
- 3 45th Anniversary of Voyager
- 4 Skylights: September 2022
- 5 Star Party Update
- 8 NASA Night Sky Notes:
The Summer Triangle's
Hidden Treasures
- 9 Planetary Nebula in Aquila:
NGC 6751
- 11 The Sun, Moon &
Planets in September
- 12 Astrophoto Gallery
- 14 Starry Scoop

Pluto Strikes Back

A presentation by Dr. Scott Kenyon
Saturday, September 3 at Seagrave Observatory
& via Zoom, 7:00pm EDT

Meeting presentation will also be conducted over Zoom. Contact Linda Bergemann (L.Bergemann@aol.com) for Zoom Meeting link and information.

6 PM: Socializing

7 PM: Presentation, followed by short business meeting

Together with its four small satellites, the Pluto-Charon binary planet provides fascinating insights into the origin and early evolution of the solar system. It is also an interesting testbed for theories of circum-binary planet formation. After describing the system architecture as revealed by HST [Hubble Space Telescope] and New Horizons, Dr. Kenyon will summarize a suite of numerical simulations designed to constrain satellite masses and to test models for satellite formation.

About Dr. Kenyon:

Dr. Kenyon is (primarily) a theoretical

astrophysicist who studies the formation and evolution of stars/planets, hypervelocity stars, and interacting binary systems. He wrote the book on Symbiotic Stars. With Lee Hartmann, he constructed flared disk models for newly-formed stars and showed that FU Orionis objects are accretion disks. With Jane Luu and Ben Bromley, he developed numerical simulations for the formation of planets and debris disks. These calculations were the first to build Earth-mass planets out of ensembles of km-sized planetesimals and to demonstrate that debris disks are the remains of newly-formed planetary systems.

**Seagrave Memorial
Observatory
Open Nights**
Saturdays, 8pm

AstroAssembly
Saturday, October 1
[www.theSkyscrapers.org/
astroassembly2022](http://www.theSkyscrapers.org/astroassembly2022)



**Pluto
Strikes
Back**

President's Message

by Linda Bergemann

Yesterday (Sunday) I stopped by the observatory to drop off the sky maps for September. When I pulled into the driveway, I noticed a car parked on the road, in front of our property. Once I unlocked the gate and dropped the chain, the couple from the vehicle approached and asked if I was a member. I introduced myself, and engaged in conversation with them.

As it turns out, the woman had visited Seagrave as a child in the 1970's, when her father was an active member of the Society. She and her husband had walked around the property before I arrived and she recounted memories that it evoked. She specifically remembered her father building a telescope and grinding a mirror, with the help of the late Ed Turco. She told me her father's name. Before leaving, she informed me that she planned to return with her sister on an open night later this month.

When I returned home, I tried unsuccessfully to recall the gentleman's last name. So, I turned to the history of Skyscrapers in "75 Years of Skyscrapers: 1932 – 2007", hoping I would see his name and remember. I searched through the list of past presidents and past speakers; again, no luck. But, then, I went "down the rabbit hole".

I started to look at all the speakers that we have had through the years. Many jumped out at me: Cecilia Payne Gaposchkin in 1933, a British-born American astronomer and astrophysicist who

proposed in her 1925 doctoral thesis that stars were composed primarily of hydrogen and helium; Dr. Fred Whipple in 1934, American astronomer, who worked at the Harvard College Observatory for more than 70 years, whose his achievements include asteroid and comet discoveries, and the "dirty snowball" hypothesis of comets; Dr. Harlow Shapley in 1935, an American scientist, head of the Harvard College Observatory; Dr. Bart Bok in 1941, best known for his work on the structure and evolution of the Milky Way galaxy; Dr. Clyde W. Tombaugh in 1987, an astronomer noted for his discovery Pluto in 1930; Al Nagler in 1992, an optical engineer from The Bronx who designed simulators used in the Apollo program and projection lenses for large projection-screen televisions, but is well known in the astronomy community for its products (eyepieces); Sergei Khrushchev in 1998, an engineer and son of the Soviet Premier Nikita Khrushchev; and astronauts Sherwood "Woody" Spring in 1986 and Story Musgrave in 2005. These are just a few of many notable names on the list.

Without me boring you with what I read next, this all reminded me that Skyscrapers has a long and proud history. I encourage everyone to take a virtual journey through our history by reading the two books that capture it for us: "[A Quarter Century of Skyscraping: 1932 – 1957](#)" and "[75 Years of Skyscrapers: 1932 – 2007](#)". Both books con-

New Members

Welcome to Skyscrapers

Ethan Caffrey
of Foster
(Junior member)

Jay Baccala & family
of Johnston

Linda Pease
of Providence

Faye Flam
of East Greenwich

Scott Hammond of
Coventry

Xzavier Hammond
of West Warwick
(Junior member)

tain stories of events and people, and are available for browsing on our website.

My gratitude goes to all those Skyscrapers, past and present, who made this wonderful organization what it is today. And, please be on the lookout for the daughters of the member from the 70's whose name I can't recall.



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, 1 Sunflower Circle, North Providence, RI 02911 or e-mail to jim@distantgalaxy.com.

E-mail subscriptions

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

President

Linda Bergemann

1st Vice President

Edward Walsh

2nd Vice President

Francine Jackson

Secretary

Angella Johnson

Treasurer

Laura Landen

Members at Large

Steve Brown

Michael Corvese

Trustees

Bob Janus (Senior)

Steve Hubbard

Richard Doherty

Observatory Committee Chairperson

Steve Siok

Program Committee Chairperson

Michael Corvese

Outreach Chairperson

Linda Bergemann

Librarian

Dave Huestis

Assistant Librarian

Weston Ambrose

Historian

Dave Huestis

Editor

Jim Hendrickson

Astronomical League Correspondent (ALCor)

Jeff Padell

Upcoming Events

Sept. 3 - 8:30 PM Public Observing at Seagrave

Sept. 9 - 7:00 PM Observing at River Bend Farm

Sept.10 - 8:00 PM Public Observing at Seagrave

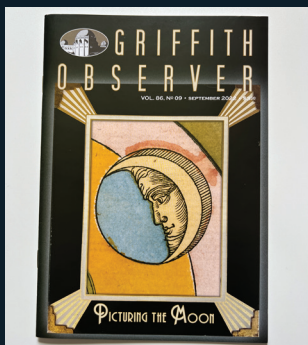
Sept. 15 - 7:30 PM Observing at WaterFire Arts Center

Sept. 16 - 7:45 PM Jesse M. Smith Memorial Library Star Party

Sept. 17 - 8:00 PM Public Observing at Seagrave

Sept. 24 - 8:00 PM Public Observing at Seagrave

Sept. 30 - 7:00 PM AstroAssembly Eve at Seagrave



Congratulations to Francine Jackson for receiving an Honorable Mention in the 2021 Joan and Arnold Seidel Griffith Observer Science Writing Contest! Her article "Picturing the Moon" can be found in the September 2022 issue of Griffith Observer, her 22nd article for the publication.

45th Anniversary of Voyager

by Francine Jackson

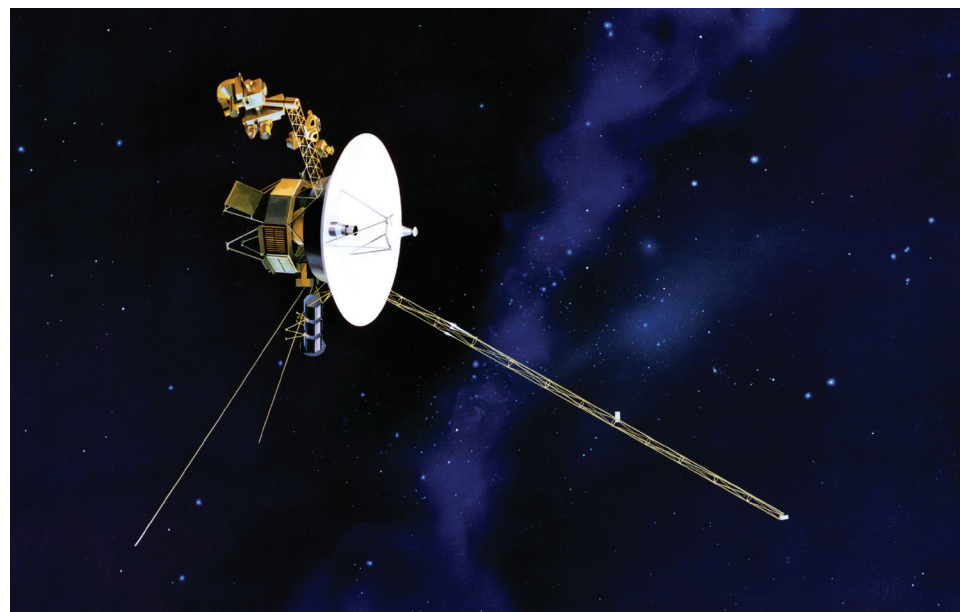
Many of you know that I have a giant of a 1977 green Ford LTD. Surprisingly, it still runs, but with having to garage it away from my house, and the fact that it only runs on premium gas, it's not on the road a lot. But, I still take care of it; plus, a person who lives in its neighborhood takes it for a stroll every few days, so it should last for a long time.

The same year as my Power Car was born, Voyagers 1 and 2 set off on some great adventures. Interestingly, Voyager 1 was launched on September 5, 1977, two weeks after Voyager 2, which lifted off on August 20. This happened because Voyager 1 was sent on a speedier trip, and arrived at their first destination, the planet Jupiter, in March, 1979, when it passed just 200,000 miles above the Jovian surface. Voyager kept imaging the region for several weeks, introducing the world to, among other surprises, the only other body with active volcanoes – the moon Io – a satellite with an incredible ice surface – Europa – and the first glimpse of the very tiny set of rings cir-

cling the giant planet. And, then, it was on its way to its next, and last, planetary adventure, beautifully ringed Saturn.

Voyager 2 arrived at Jupiter just a few months later, and continued on to Saturn, also; but, then, the two Voyagers' journeys split: Voyager 1, after leaving Saturn, turned away from the remaining planets, but it did, in 1990, create the "family portrait," where, from about 4 billion miles away, it was able to image six of our planets, leaving only Mercury, Mars, and Pluto (still a planet at that time) out of the montage. Voyager 2 continued on to Uranus and Neptune.

Both of these craft are now so far from us that it is said they are in "interstellar space," although they are still not as far from the Sun as our giant comet nursery, the Oort Cloud. However, both Voyagers have done a great job of showing us closeup images of our outer planets as never before, and, after 45 years, they, like my LTD, are still working, and are expected to continue, for at least several more years.



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>

Skylights: September 2022

by Jim Hendrickson

September brings some notable seasonal changes in our sky. The last 7:00pm sunset occurs on September 12. Sunsets will remain earlier than 7:00pm through March 22, 2023. Equinox occurs at 9:04pm on the 22nd.

The Full Harvest Moon rises 6 minutes after sunset on the 9th.

September isn't the best month for viewing Mercury. Before it passes inferior conjunction on the 23rd, it lies low in the west-southwest after sunset. During the last few days of September, it will become visible in the morning sky, overtaking Venus in altitude above the eastern horizon on the 27th. By month's end, it rises just an hour before the Sun.

Venus is now just about as far from Earth as it will get, as we are looking past the Sun to see it on the far side of its orbit. Its elongation angle decreases from 13° in early September to just 6° at the end of the month, though its steep angle with respect to the horizon should make it observable throughout most of the month. On the 5th, Venus shines just 0.6° northeast of Regulus, in Leo. By the 10th, it is rising less than an hour before the Sun, and a challenging 29-day waning crescent Moon is 2.8° northeast of Venus on the 25th.

If you haven't watched Mars in a while, September marks a great time to get reacquainted with the Red Planet. It begins the month blazing at magnitude -0.1 only 5° from Aldebaran. Note the similarity in color between Mars and Aldebaran while they are in close proximity. Outshining all the stars visible in our sky except Sirius, it continues moving eastward through Taurus, and crosses into the Winter Hexagon on the 11th. Turning a telescope on Mars reveals a gibbous disk approaching 12 arcseconds by month's end, large enough to reveal details in medium and large instruments.

Jupiter rises due east in early evening and is the most prominently bright star-like object in the sky until dawn. Having spent the past several weeks in Cetus the whale, it moves westward back into Pisces on the 1st. Through a telescope, Jupiter shows a very large 49 arcsecond globe and many of its cloud features, as well as the shadows of its moons, will appear in small to medium-sized telescopes.

Saturn continues to move westward in Capricornus. Have you noticed how far

it has moved with respect to Deneb Algedi and Nashira? It no longer makes a neat isosceles triangle with them, and will continue moving west for several more weeks. Through a telescope, it is also becoming three-dimensional again, with a bit of shadow appearing on the ring behind and to the east side of Saturn. Several of Saturn's moons can be seen with a medium-sized telescope. Besides Titan, there are, in order of distance from the planet, Tethys, Dione, and Rhea. It is notable that all four of Saturn's brightest moons appear roughly in line extending to the west of the planet on the 3rd.

Uranus, in Aries, rises just a few minutes before the Pleiades. To find it, locate 4th magnitude Botein (Delta Arietis) about 9° southwest of the Pleiades, then look 3° to the south-southwest. Uranus is the fourth "star" at the end of a shallow zigzag line with 6th magnitude stars 53 and 54 Arietis in between. Uranus is slightly brighter than these stars, and its small positional change with respect to them should make it stand out. If you need additional help finding Uranus, the waning gibbous Moon lies 2.7° to its east on the 14th. Later in the month, when bright moonlight is out of the sky, you may try to find Uranus without optical aid. Find a dark sky and wait until about 3:00am, when Uranus is high in the south.

September is the best time to observe Neptune, as our most distant planet reaches opposition on the 16th. At 28.9 AU from Earth, Neptune shines at magnitude 7.7, putting it within view of binoculars. Neptune is 5.3° south of Gamma Piscium, and about ¼ of the way between Jupiter and Saturn.

If you haven't observed Pluto yet this year, September is your last good opportunity to do so. Wait until the second half of the month when the bright Moon is out of view, and Pluto will be due south just after evening twilight. Use a 12-inch telescope to spot it visually, or take an image using a telephoto lens or small telescope to reveal the magnitude 14.4 dwarf planet about 3.2° west-southwest of globular cluster M75 in western Sagittarius.

After having been out of view for the summer, Ceres comes back into view in the predawn sky. The magnitude 8 dwarf planet can be found with a small telescope near the sickle asterism of Leo.

Asteroid 2 Pallas, at magnitude 9, is vis-

Events in September

- 3 First Quarter Moon
- 5 Venus 0.8° NE of Regulus
- 7 Mars 4.2° N of Aldebaran
- 9 Mercury Stationary
- 10 Full Harvest Moon
- 11 Moon 5.5° SW of Jupiter
- 16 Neptune Opposition
- 17 Moon 3.7° NE of Mars
- 17 Last Quarter Moon
- 22 Equinox
- 23 Mercury Inferior Conjunction
- 25 Moon 2.9° NE of Venus
- 25 New Moon
- 26 Jupiter Opposition
- 27 Venus 3.5° NE of Mercury

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

ible in Orion, just 2° north of Saiph (kappa Orionis) on the 1st, and moves southeastward through Monoceros and into Canis Major as the month progresses. It appears to move directly towards Sirius, and in early October it will pass just 1/3° to the northeast of our night sky's brightest star.

Asteroid 3 Juno spends most of September in Aquarius, just north of the ecliptic between Saturn and Jupiter, and reaches opposition on the 7th. The magnitude 7.7 asteroid lies just over 1.3 AU away

Looking to the stars beyond, we note some seasonal changes in September. The Summer Triangle is poised high overhead at the beginning of darkness, and will be part of our evening sky for the next few months, but in the southwest, Scorpius is leaving the sky earlier and earlier. By the end of the month, Antares has set by 9:00pm.

The best time to observe the clusters and nebulae of Sagittarius is now behind us, but rising high in the northeast, the richness of the Milky Way through Cepheus and Cassiopeia is waiting to be explored.

Our star that signals the beginning of spring, Arcturus, now serves as a golden beacon of autumn as it appears lower in the west with each departing evening of late summer.

To the east and northeast, Pegasus and Andromeda have come fully into view, and with them, views of our Milky Way's closest neighboring spiral galaxy, the Andromeda Galaxy, M31.

To the northwest, the Big Dipper begins to assume its proper "upright" orientation, as any imagined stardust confections or cosmic concoction within its bowl would be neatly contained without spilling out.

During September, the pointer stars of Big Dipper also align with the cardinal points of the clock, making it one of the four times in the year when the Big Dipper itself can be used as a simple clock. At about midnight local time, the two pointer stars, Merak and Dubhe, which point to Polaris any time of the night and year, are aligned due north, directly below Polaris. If you can imagine them as an hour hand on a 24-hour clock, they are due east of Polaris at 6:00am, and if you could see them at noon, they would be directly overhead. At 6:00pm, they would

be due west.

And while the Big Dipper's pointer stars are telling you that it's midnight, follow the pointers back up to Polaris, and continue across the zenith and into the southern sky. You will find that the pointer stars line up with the western edge of the Great Square of Pegasus, and all the way south, to Fomalhaut, in the Southern Fish, Pisces Austrinus.

As the midnight sky rolls on into the AM hours, Auriga and Taurus begin to bring up the stars of the Winter Hexagon. Orion is fully visible at about 2:00am, and Sirius, at

the southernmost point of the hexagon, is visible a little over an hour later.

If you're out early in the AM, before dawn, you will even see the stars of spring making their comeback already, with Cancer, Hydra, and Regulus, in Leo, making their appearance low in the east before the onset of twilight. And if you're still observing at this hour, turn to the northwest to see Cygnus assuming its Northern Cross orientation, and look again to the northeast to note the position of the Big Dipper's clock hand as the time approaches 6:00am.

Star Party Update

Seagrave Observatory Night Saturday, August 8, 2022

By Linda Bergemann

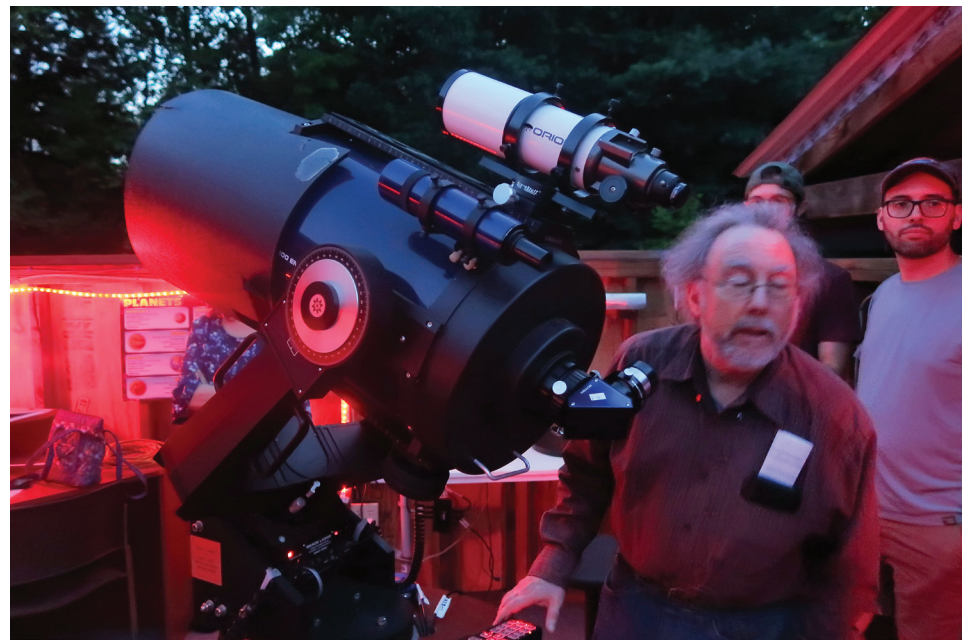
The 8-inch Alvan Clark and 12-inch Meade SCT were open, as well as two portable reflectors in the courtyard. Operators were busy until 11 PM.

River Bend Farm Friday, August 12, 2022

By Jim Hendrickson

After having no participation or promotion for our June and July nights at River Bend, Francine contacted Molly Cardoza, the Director of Volunteer & Community Engagement with the Blackstone Heritage Corridor, to see what could be done to improve the exposure for our many-years-running night sky events originally begun by Kent Cameron.

Molly responded immediately and we saw the event advertised in the Blackstone



Heritage Corridor's weekly e-newsletter, and she informed us that she had found

three additional volunteers to participate: William Nawrocki, Abigail Epplert, and Raindrop Fisher.

The volunteers used the park's 6-inch Newtonians while Skyscrapers members Bob Janus, Francine Jackson, and Jim Hendrickson brought their own telescopes: Bob's 6-inch SCT, Francine's 4-inch refractor, and Jim's 3-inch refractor.

Additionally, one of the guests, Michael, set up and used a 4-inch Newtonian.

We arrived early enough to explore the part of the canal walk adjacent to the observing field.

As is often the case at River Bend, a bright and colorful sunset preceded the evening's viewing. The top of a distant thunderstorm billowed over a broken layer of clouds to the southeast, as the setting sun painted it in a vivid sequence of yellow, orange, red, and violet. We could see several flashes emanating from the thunderstorm



as the sky darkened, and we waited for anything bright enough to point the telescopes at to show through the thickening cloud layer above us.

The receding thunder clouds gave way to intermittent views of Saturn, for many of us, our first telescopic views of the ringed planet in 2022.

When twilight faded away, the underside of the cloud shelf that kept covering Saturn was being illuminated by the nearly full Moon, though we couldn't yet see the Moon itself.

Not many other objects presented themselves through about 80% cloud cover. We caught glimpses of the Summer Triangle, and Saturn came and went.

By about 9:30pm, conditions hadn't improved and we started putting away our telescopes. Suddenly, a bright spot appeared to the right of the light patch behind the clouds indicating where the Moon would be. This spot, appearing 42° horizontally to the west of the Moon, quickly brightened and began to show distinct color. It turns out that we were treated to a rather rare sighting of the paraselenae, or moondogs. The fleeting phenomenon evolved into a faint halo before disappearing entirely within about two minutes, followed shortly after by the Moon itself penetrating the edge of the cloud, giving us one final spectacle to observe before concluding.

In total, about 25 participants gathered to enjoy the views and each other's company for this month's River Bend night sky event.

Plum Beach Club Monday, August 15, 2022



By Jim Hendrickson

For the second consecutive year, we were invited to participate in a night sky event to coincide with the Perseid meteor shower at the Plum Beach Club in Saunderstown. The event was originally scheduled for Thursday, August 11, which, due to clouds, was delayed to Sunday, the 14th, and postponed a second time to Monday, the 15th, for what appeared to be a more favorable forecast.

Francine Jackson and Jim Hendrickson arrived and set up right before sunset. The weather was mild but not humid, with little to no wind, and the fresh smell of the seashore permeated the air. Clouds covered about 30% of the sky.

Francine gave a presentation including topics ranging from constellations and planets visible tonight, the Moon phase, meteor showers, and current happenings

in space and astronomy including Event Horizon Telescope, Webb Telescope, and the upcoming Artemis 1 launch.

As the sky darkened, partly cloudy conditions gave way to mostly clear. A few fireflies flickered away in the brush to the southwest of our observing site. Saturn rose over the horizon just to the right of the Newport Bridge and was the primary target for the evening. Francine's 4-inch and Jim's 3-inch refractors provided steady views of the ringed planet, despite it being quite low. Later on, as the sky became dark, the Milky Way became visible, and we moved to M11 in Scutum, Alberio in Cygnus, and the Coathanger asterism in Vulpecula.

In total, about 35 guests came to enjoy a pleasant evening under the stars at Plum Beach. There were many good discussions about telescopes, the Milky Way, and meteor showers. A couple of guests even mentioned seeing a dim meteor, though we're not sure if it was a Perseid.

We concluded the night with discussions of the possibility of returning for a night in December to coincide with the Geminids.

Seagrave Observatory Night Saturday, August 20, 2022

By Linda Bergemann

For the first time, we showed introductory videos for our visitors. Included were three short videos: The Solar System, What's Up for August, and Saturn. Eight members were present to attend to our visitors. The 8-inch Clark was trained on Saturn and the 12-inch Meade SCT was used for deep-sky objects. Plus, we added a new family to our membership roster.



WaterFire Arts Center, Providence

Thursday, August 18, 2022

By Francine Jackson

Thursday, August 18th, Curtis, Fred, Jim Hendrickson and Francine finally were able to return to the WaterFire Arts Center for its Troop Top Thursday celebration. It was our first clear Thursday since May.

As we began at 7:30, before dark, we first aimed our telescopes at the neighboring trees, the Independent Man, and a nearby tower; however, soon, Saturn came from behind the next-door building, and we all moved to it.

In addition to our observing, the Center's rooftop had a bar, so there were a fair number of persons up there, many curious as to what we were doing. When we showed them Saturn, however, all who saw it were amazed. Many talked about a far off Astronomy class they had taken in college, others talked about how fascinated they had always been with "Astrology," and still others admitted they had a telescope in their attics that had been there for years. To all, we invited them to both Seagrave and Ladd (when it will open), and several stated they may try to come to Scituate on a nice Saturday evening.

Although the ISS wasn't available, the Chinese space station, Tiangong, made a beautiful several-minute trek across the sky. At close to -1 magnitude, it was seen and marveled by all.

This was supposed to have been the last of the Center's Thursday nights, but there does seem to be talk of possibly having another 3rd Thursday in September. All four of us heartily agreed we would come, if the sky cooperated.



Starry, Starry Nite at Chase Farm, Lincoln, RI

Thursday, August 25, 2022

By Francine Jackson

The Annual Starry, Starry Night took place Thursday, August 25th, at Chase Farm, Lincoln, a former dairy farm now owned by the Town of Lincoln, and maintained by the Friends of Hearthside. Kathy Hartley, Friends president, is the granddaughter of the original owner.

Present this evening were Francine Jackson, Jim Hendrickson, Bob Janus, Ron Zincone and Mark Munkacsy, all of whom brought their portable telescopes. After a 30-minute PowerPoint introduction to the August Sky by Francine, all the attendees were ready to run up the hill to the telescopes. Once there, we noticed there was

a sixth instrument set up. Apparently a couple had come to the previous year's program, and were inspired to buy their own telescope. As they weren't sure how to successfully use it, Jim spent time helping to set it up and aim it properly. With all the instruments present, the 40 attendees enjoyed views of Saturn, Albireo, M11, Mizar and Alcor, and the Coathanger. After we were breaking our scopes down, Jupiter was rising through the trees, and Ron gave us, plus Kathy and her staff, our first seasonal view of it.

Of all the nights the program had been done, the sky was the clearest, and everyone was happy to have come. Kathy announced that there was such a long waiting list, that she'd like to offer two nights next year. We all agreed to return for them.

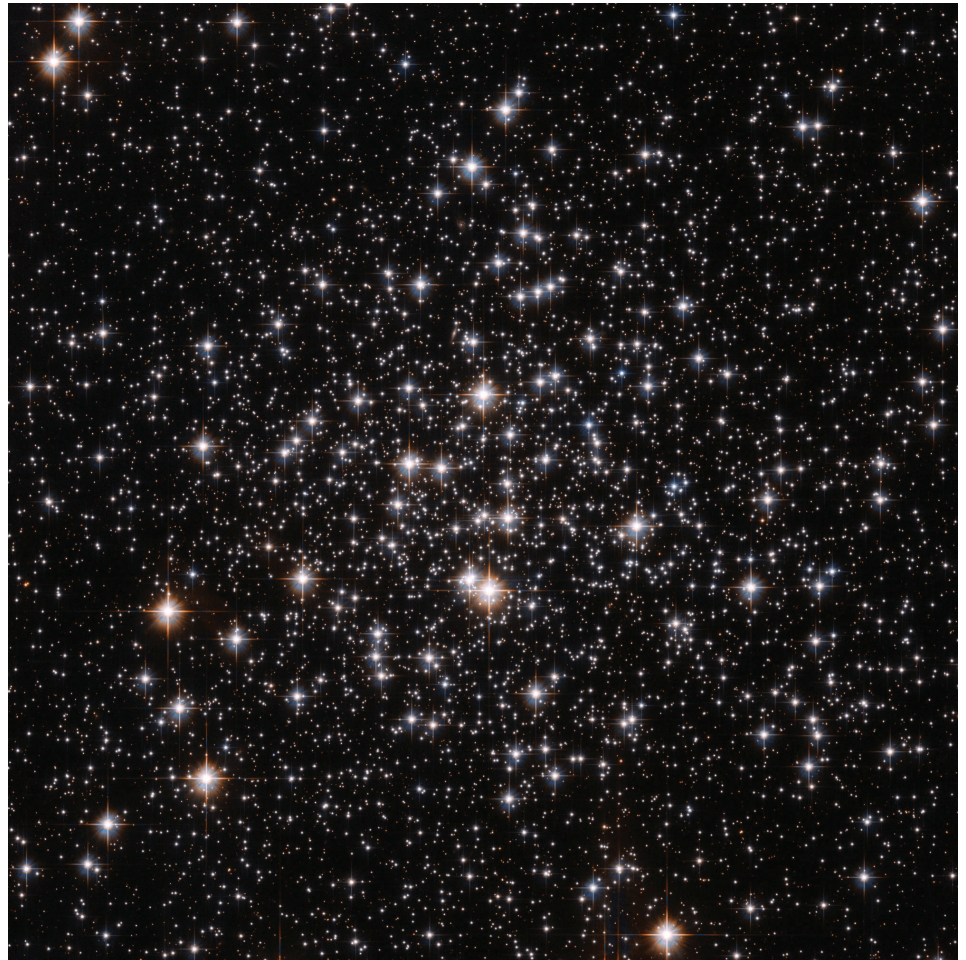


The Summer Triangle's Hidden Treasures

by David Prosper

September skies bring the lovely **Summer Triangle** asterism into prime position after nightfall for observers in the Northern Hemisphere. Its position high in the sky may make it difficult for some to observe its member stars comfortably, since looking straight up while standing can be hard on one's neck! While that isn't much of a problem for those that just want to quickly spot its brightest stars and member constellations, this difficulty can prevent folks from seeing some of the lesser known and dimmer star patterns scattered around its informal borders. The solution? Lie down on the ground with a comfortable blanket or mat, or grab a lawn or gravity chair and sit luxuriously while facing up. You'll quickly spot the major constellations about the Summer Triangle's three corner stars: Lyra with bright star Vega, Cygnus with brilliant star Deneb, and Aquila with its blazing star, Altair. As you get comfortable and your eyes adjust, you'll soon find yourself able to spot a few constellations hidden in plain sight in the region around the Summer Triangle: **Vulpecula the Fox**, **Sagitta the Arrow**, and **Delphinus the Dolphin**! You could call these the Summer Triangle's "hidden treasures" – and they are hidden in plain sight for those that know where to look!

Vulpecula the Fox is located near the middle of the Summer Triangle, and is relatively small, like its namesake. Despite its size, it features the largest planetary nebula in our skies: M27, aka the Dumbbell Nebula! It's visible in binoculars as a fuzzy "star" and when seen through telescopes, its distinctive shape can be observed more readily - especially with larger telescopes. Planetary nebulae, named such because their round fuzzy appearances were initially thought to resemble the disc of a planet by early telescopic observers, form when stars similar to our Sun begin to die. The star will expand into a massive red giant, and its gasses drift off into space, forming a nebula. Eventually the star collapses into a white dwarf – as seen with M27 - and eventually the colorful shell of gasses will dissipate throughout the galaxy, leaving behind a solitary, tiny, dense, white dwarf star. You are getting a peek into our Sun's far-distant future when you observe this object!



M71 as seen by Hubble. Your own views very likely won't be as sharp or close as this. However, this photo does show the cluster's lack of a bright, concentrated core, which led astronomers until fairly recently to classify this unusual cluster as an "open cluster" rather than as a "globular cluster." Studies in the 1970s proved it to be a globular cluster after all – though an unusually young and small one! Credit ESA/Hubble and NASA. Source: <https://www.nasa.gov/feature/goddard/2017/messier-71>

Sagitta the Arrow is even smaller than Vulpecula – it's the third smallest constellation in the sky! Located between the stars of Vulpecula and Aquila the Eagle, Sagitta's stars resemble its namesake arrow. It too contains an interesting deep-sky object: M71, an unusually small and young globular cluster whose lack of a strong central core has long confused and intrigued astronomers. It's visible in binoculars, and a larger telescope will enable you to separate its stars a bit more easily than most globulars; you'll certainly see why it was thought to be an open cluster!

Delicate **Delphinus the Dolphin** appears to dive in and out of the Milky Way near Aquilla and Sagitta! Many stargazers

identify Delphinus as a herald of the fainter water constellations, rising in the east after sunset as fall approaches. The starry dolphin appears to leap out of the great celestial ocean, announcing the arrival of more wonderful sights later in the evening.

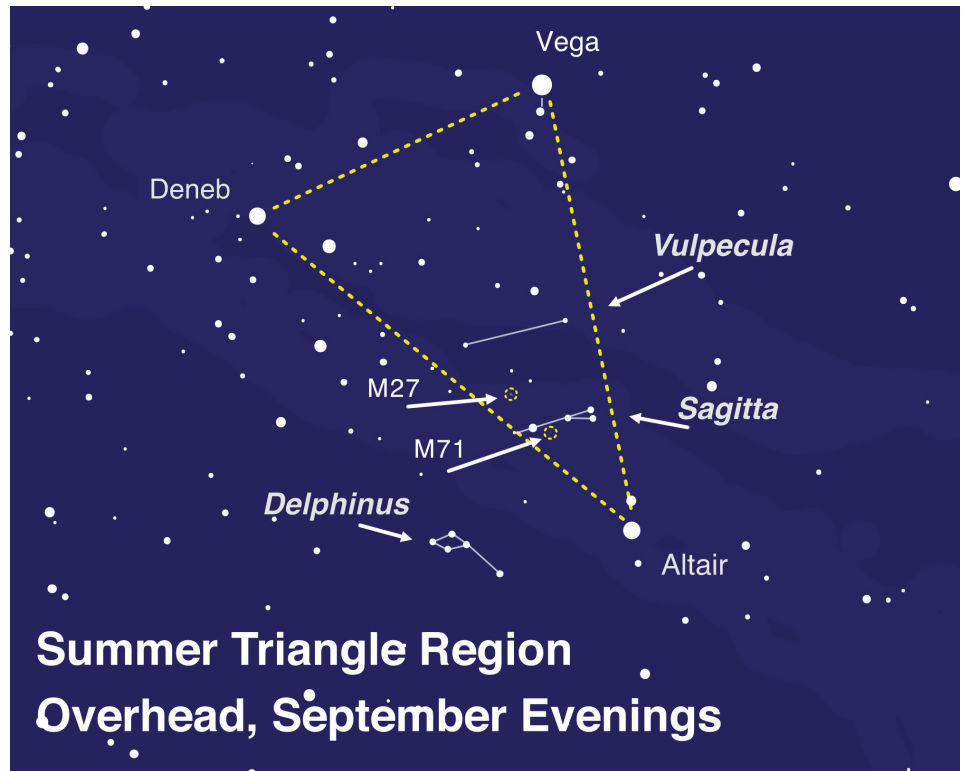
Want to hunt for more treasures? You'll need a treasure map, and the Night Sky Network's "Trip Around the Triangle" handout is the perfect guide for your quest! Download one before your observing session at bit.ly/TriangleTrip. And of course, while you wait for the Sun to set - or skies to clear - you can always find out more about the objects and science hidden inside these treasures by

checking out NASA's latest 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!

Search around the Summer Triangle to spot some of its hidden treasures! To improve readability, the lines for the constellations of Aquila, Lyra, and Cygnus have been removed, but you can find a map which includes them in our previous article, Spot the Stars of the Summer Triangle, from August 2019. These aren't the only wonderful celestial sights found around its borders; since the Milky Way passes through this region, it's littered with many incredible deep-sky objects for those using binoculars or a telescope to scan the heavens. Image created with assistance from Stellarium: stellarium.org



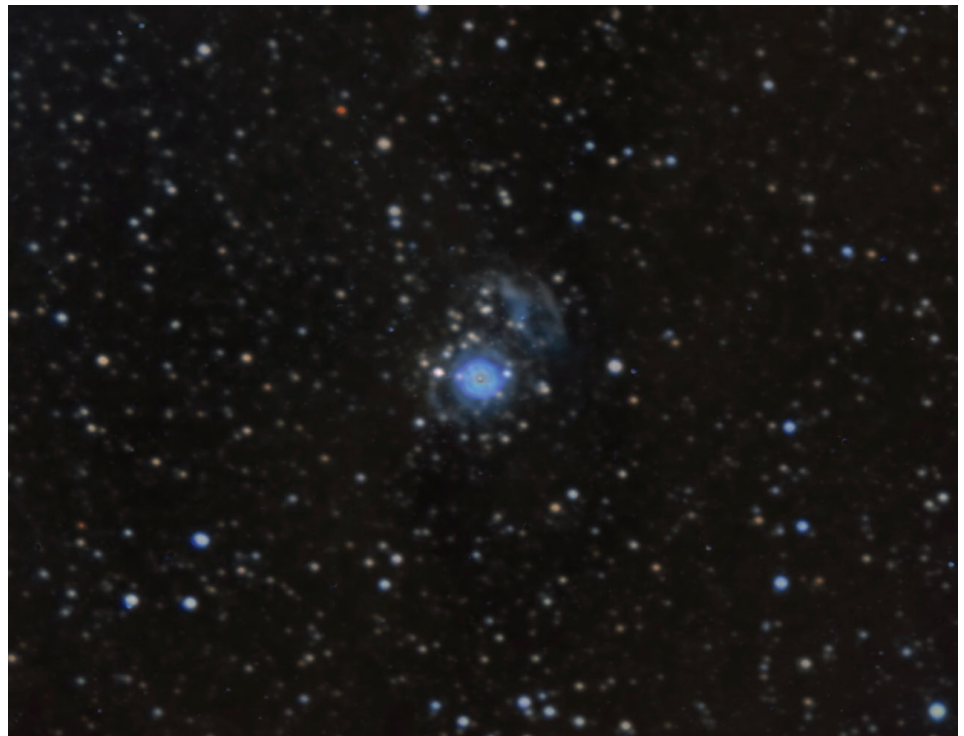
Planetary Nebula in Aquila: NGC 6751

by Glenn Chaple for LVAS

(Magnitude 11.9; Size 26")

For the third consecutive month, the Observer's Challenge features a planetary nebula. Having explored NGC 6210 (July) and NGC 6772 (August), we turn to NGC 6751. Nick-named the "Glowing Eye Nebula" or the "Puffball Nebula," NGC 6751 is located a little over one degree directly south of the 3rd magnitude star lambda (λ) Aquilae at the 2000.0 coordinates RA 19h05m55.6s, Dec -5o59'32.9". It shares the same low-power field with the ruddy-hued carbon star V Aquilae, which lies one-half degree to its northwest (refer to the accompanying Finder Charts).

As was the case with NGC 6210, NGC 6751 was another William Herschel "miss." It was discovered on July 20, 1863 by the German astronomer Albert Marth, who spotted it with a 48-inch reflecting telescope. Despite the large aperture of this instrument, NGC 6751 can be picked up with a 6-inch scope – even smaller under dark-sky conditions. Visual observers will see the bright, inner part of NGC 6751, which, at 26 arc-seconds in diameter, is approximately equal in apparent size to Saturn's disk. Im-

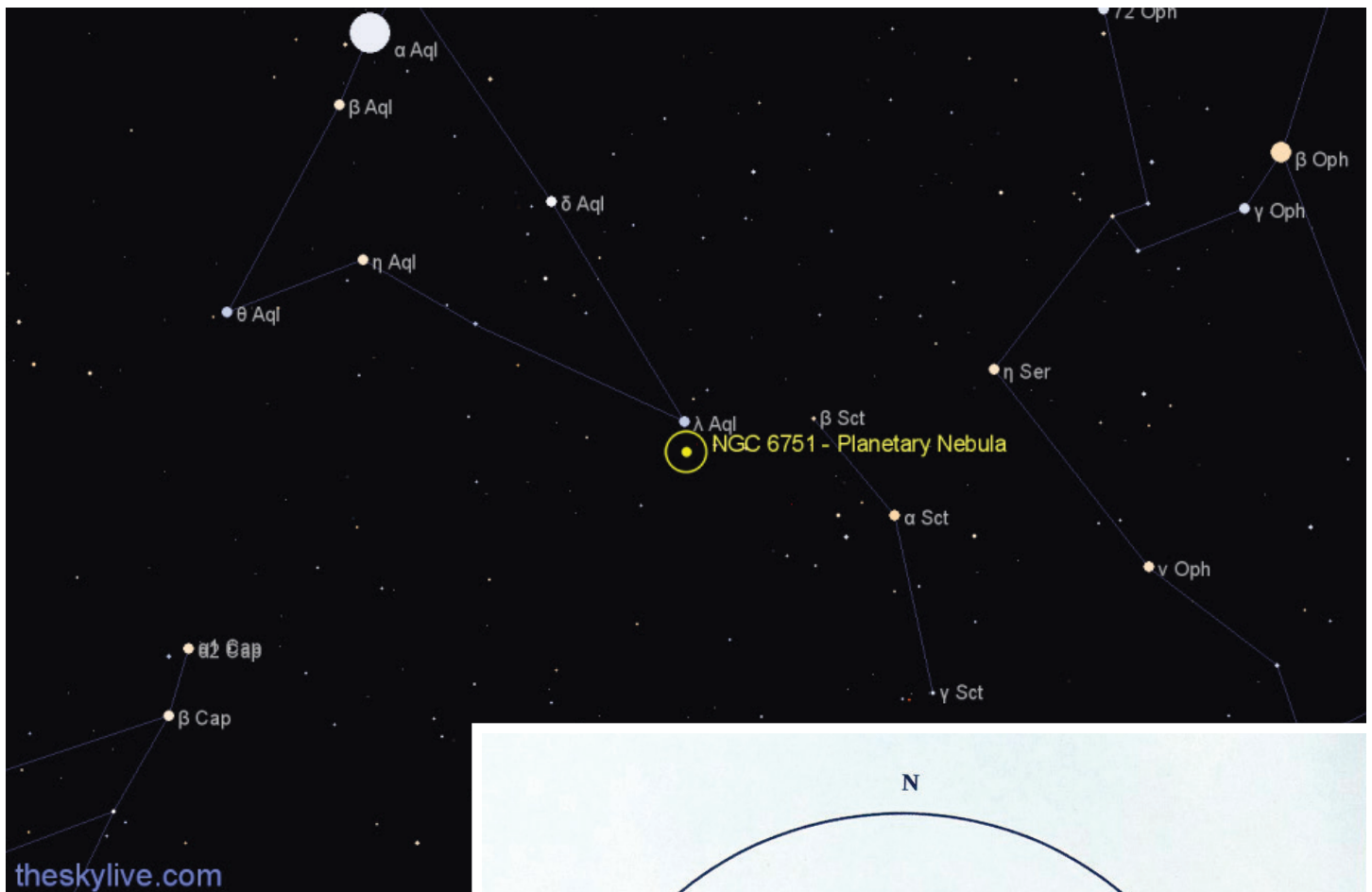


Mario Motta, MD (ATMoB) "NGC6751 was a challenge, visually small sphere, with obvious central star, easy to see. Imaging was difficult due to dynamic image range. I took this with Ha, O3, S2 NB filters, but also lum filter to include the bright central star. I noticed faint outer nebulosity in Ha and O3 images, but getting that to show without blowing out the central portion and losing the star was a challenge, A little bit of a compromise to get very faint outer nebulosity and inner bright sphere and star. Taken with my 32 inch scope, and ZWO ASI6200 camera and above filters"

agers might be able to capture a faint outer halo that spans twice that diameter.

I tackled NGC 6751 on the evening of August 24, 2022, using a 10-inch f/5 reflect-

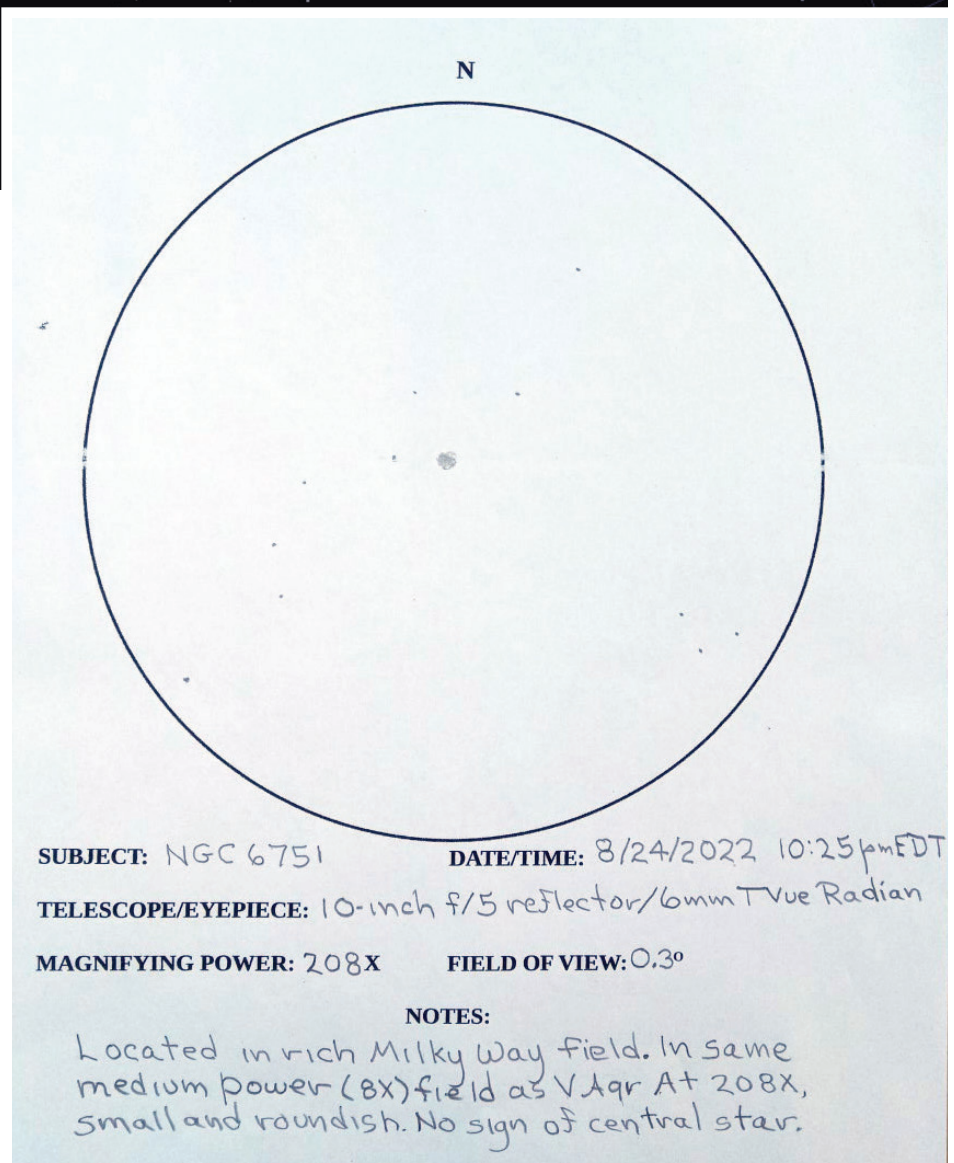
ing telescope. It took on the appearance of a 12th magnitude star at 40X. A wide-field eyepiece at 80X revealed its non-stellar nature. At 208X, NGC 6751 was small, dim,



and roundish. I was unable to glimpse the 14th magnitude central star. Switching to a 6-inch $f/8$ reflector, I was still able to pick out NGC 6751 from a rich Milky Way field. An O-III filter held between my eye and the eyepiece dimmed or eliminated the surrounding field stars, while NGC 6751 maintained its brightness.

A with many planetaries, the distance to NGC 6751 is uncertain. A NASA website cites a distance of 6500 light-years and a total diameter of 0.8 light-years.

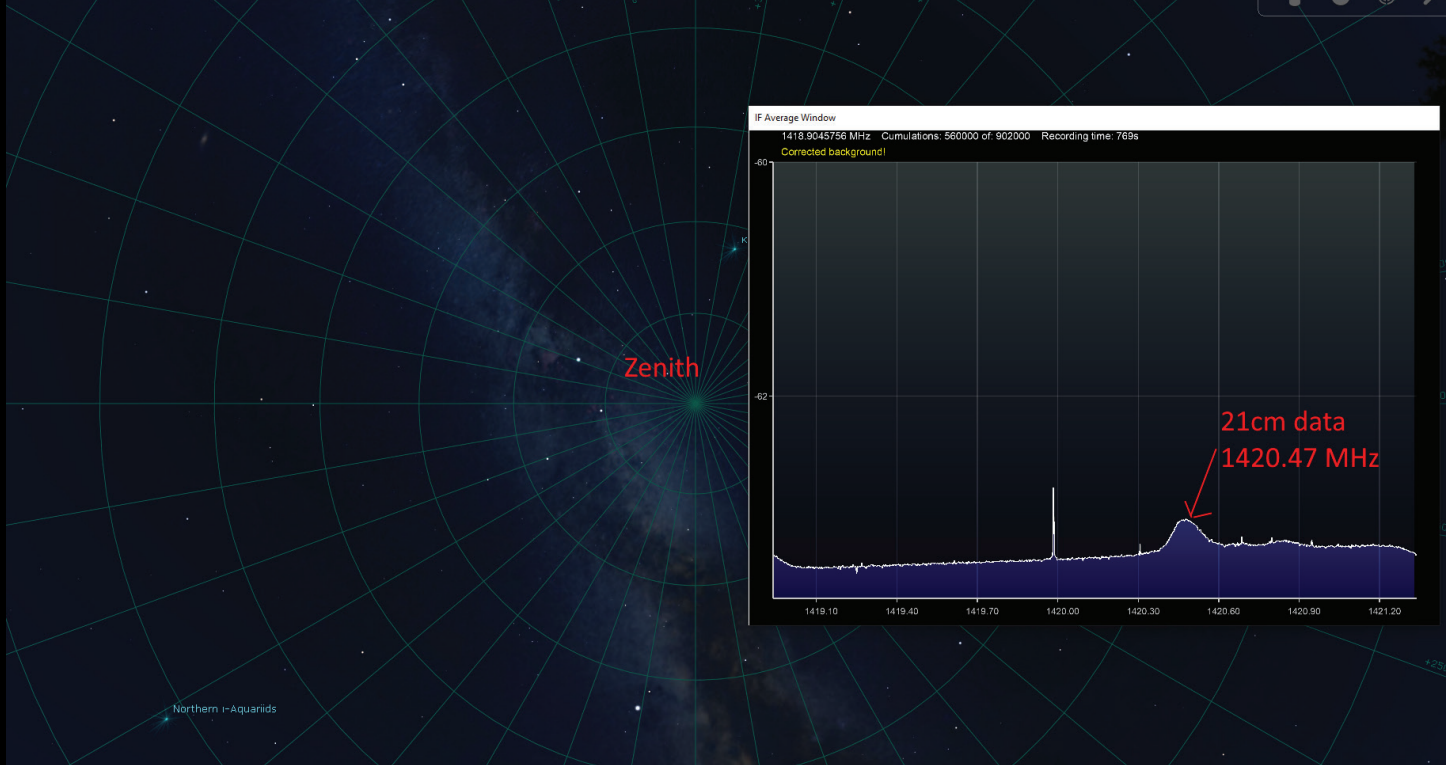
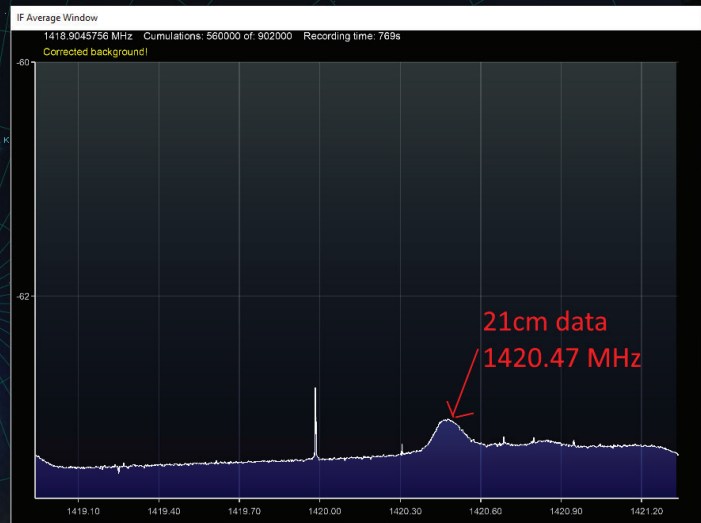
The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'll be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to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



The Sun, Moon & Planets in September

This table contains the ephemeris of the objects in the Solar System for each Saturday night in September 2022. Times in Eastern Daylight Time (UTC-4). 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	3	10 48.0	7 37.8	Leo	-26.8	1902.4	-	-	-	1.009	06:13	12:45	19:16
	10	11 13.2	5 01.3	Leo	-26.8	1905.7	-	-	-	1.007	06:21	12:43	19:04
	17	11 38.3	2 20.6	Leo	-26.8	1909.2	-	-	-	1.005	06:28	12:40	18:52
	24	12 03.4	-0 22.4	Vir	-26.8	1912.8	-	-	-	1.003	06:35	12:38	18:40
Moon	3	15 51.6	-22 26.9	Sco	-11.7	1926.0	80° E	42	-	-	14:08	18:43	23:12
	10	23 02.3	-12 04.2	Aqr	-12.7	1956.4	173° E	100	-	-	19:36	01:28	07:32
	17	4 51.1	24 12.4	Tau	-12.0	1784.9	100° W	59	-	-	22:17	06:12	14:14
	24	10 45.0	12 04.8	Leo	-9.1	1808.3	23° W	4	-	-	04:59	11:50	18:29
Mercury	3	12 19.2	-5 34.3	Vir	0.5	8.1	26° E	42	0.453	0.833	08:33	14:15	19:53
	10	12 26.4	-7 13.0	Vir	1.0	9.2	22° E	27	0.427	0.733	08:17	13:53	19:29
	17	12 17.0	-6 13.5	Vir	2.4	10.2	13° E	9	0.391	0.659	07:35	13:14	18:55
	24	11 53.8	-2 13.7	Vir	4.5	10.3	3° W	1	0.351	0.655	06:29	12:23	18:19
Venus	3	9 59.7	13 29.0	Leo	-3.8	10.2	13° W	97	0.718	1.663	05:05	11:58	18:49
	10	10 33.0	10 31.4	Leo	-3.8	10.1	11° W	98	0.718	1.678	05:22	12:03	18:43
	17	11 05.6	7 19.3	Leo	-3.8	10.0	10° W	99	0.719	1.691	05:39	12:08	18:36
	24	11 37.9	3 56.9	Leo	-3.8	9.9	8° W	99	0.719	1.701	05:56	12:13	18:29
Mars	3	4 24.2	20 19.3	Tau	-0.2	9.9	93° W	85	1.418	0.947	23:00	06:21	13:42
	10	4 39.2	20 58.9	Tau	-0.3	10.3	96° W	86	1.425	0.907	22:45	06:08	13:32
	17	4 53.2	21 32.5	Tau	-0.4	10.8	100° W	86	1.432	0.866	22:29	05:55	13:20
	24	5 05.9	22 01.0	Tau	-0.5	11.3	103° W	87	1.440	0.825	22:12	05:40	13:08
1 Ceres	3	9 32.6	20 54.0	Leo	8.7	0.4	23° W	99	2.571	3.474	04:06	11:29	18:51
	10	9 45.3	20 05.9	Leo	8.7	0.4	26° W	99	2.569	3.435	03:55	11:14	18:33
	17	9 57.8	19 16.4	Leo	8.8	0.4	30° W	99	2.567	3.390	03:43	10:59	18:14
	24	10 10.2	18 25.9	Leo	8.8	0.4	34° W	99	2.566	3.341	03:31	10:43	17:55
Jupiter	3	0 27.0	1 11.6	Psc	-2.7	48.8	154° W	100	4.957	4.031	20:17	02:23	08:29
	10	0 24.1	0 51.7	Psc	-2.8	49.3	161° W	100	4.956	3.991	19:44	01:48	07:53
	17	0 20.9	0 30.2	Psc	-2.8	49.6	169° W	100	4.956	3.965	19:14	01:18	07:21
	24	0 17.5	0 07.9	Psc	-2.8	49.8	176° W	100	4.955	3.953	18:45	00:47	06:49
Saturn	3	21 33.3	-15 54.4	Cap	0.3	18.6	160° E	100	9.865	8.911	18:23	23:26	04:29
	10	21 31.5	-16 03.2	Cap	0.4	18.5	153° E	100	9.863	8.957	17:54	22:57	03:59
	17	21 29.9	-16 11.0	Cap	0.4	18.4	146° E	100	9.862	9.017	17:26	22:28	03:30
	24	21 28.5	-16 17.6	Cap	0.5	18.2	138° E	100	9.860	9.088	16:57	21:59	03:00
Uranus	3	3 06.1	17 04.9	Ari	5.7	3.7	112° W	100	19.688	19.294	21:56	05:02	12:08
	10	3 05.8	17 03.6	Ari	5.7	3.7	118° W	100	19.687	19.187	21:28	04:34	11:40
	17	3 05.4	17 01.7	Ari	5.7	3.7	125° W	100	19.686	19.086	21:00	04:06	11:12
	24	3 04.8	16 59.2	Ari	5.7	3.7	132° W	100	19.685	18.994	20:33	03:38	10:44
Neptune	3	23 41.4	-3 20.5	Aqr	7.8	2.4	166° W	100	29.915	28.935	19:44	01:34	07:24
	10	23 40.7	-3 25.1	Aqr	7.8	2.4	173° W	100	29.915	28.915	19:16	01:06	06:55
	17	23 40.0	-3 29.8	Aqr	7.8	2.4	179° E	100	29.915	28.91	18:48	00:37	06:27
	24	23 39.3	-3 34.4	Aqr	7.8	2.4	173° E	100	29.915	28.919	18:20	00:09	05:58
Pluto	3	19 55.5	-23 00.8	Sgr	14.4	0.2	136° E	100	34.598	33.867	17:15	21:49	02:22
	10	19 55.1	-23 02.2	Sgr	14.4	0.2	129° E	100	34.603	33.96	16:47	21:21	01:54
	17	19 54.7	-23 03.4	Sgr	14.4	0.2	122° E	100	34.607	34.063	16:20	20:53	01:26
	24	19 54.5	-23 04.3	Sgr	14.4	0.2	115° E	100	34.612	34.173	15:52	20:25	00:58



The 21cm hydrogen line by Lloyd Merrill

This image of the radio spectrum from 1419 MHz to 1421.2 MHz show a prominent hump at 1420.47 MHz. This is the signature of the hydrogen line at 21 centimeters of the electromagnetic spectrum that is created by a change in the energy state of neutral hydrogen atoms.

The image is superimposed on top of a Stellarium planetarium screen showing where the antenna is pointing. The antenna is pointed to the zenith and shows the Milky Way approaching.

The radio telescope is made up of readily available parts purchased from eBay and Amazon for a cost of about \$150. All the required software is free and is simple to use.

The current configuration of the telescope is fixed and points to the zenith. As the sky rotates slowly overhead, the telescope receives varying intensities of the H 1 line.



Jupiter on August 16 by Steve Hubbard

This image is from about 1:30am. Ganymede is the bright dot to the far left, the left and bigger shadow near the red spot is from Ganymede and the shadow to the right is from Io. Taken with APM 153ED and a ZWO 224mc imager.



Earthshine July 30th, 2022 by Tracy Prell

Canon EOS 70D with Canon's EF 70-200mm f/2.8L IS II USM Telephoto Lens, Manfrotto carbon-fiber tripod. Focal length 180mm, Exposure 5 secs, Aperture f/2.8, ISO 100



Saturn at opposition by Jim
Hendrickson
Taken through the 8-inch
Clark telescope, Canon
70D/35mm f/1.4. July 20, 2022

STARRY SCOOP

Editor: Kaitlynn Goulette



WHAT'S UP

This month, our summer constellations are noticeably shifting to the west, which leaves limited time to view the heart of the Milky Way. The Summer Triangle asterism remains overhead and is comprised of the stars Vega, Deneb, and Altair, each the brightest star in its respective constellation.

The southern sky displays Capricornus the sea-goat, which is a difficult star pattern to view with its brightest star shining at only 2.8 magnitude. Following the sea-goat and found in the southeastern sky is Aquarius the water bearer. Aquarius is another elusively dim constellation but contains a noticeable y-shaped pattern of stars, which is the Water Jar asterism. Below Aquarius is the region's loneliest star, Fomalhaut, the only first-magnitude star in this area of the sky.

Pegasus the flying horse dominates the eastern sky with its "Great Square" tipped to appear more like a baseball diamond, reminding us that playoff season is approaching.

The September Equinox occurs on the 23rd this month, when the sun will appear directly above the equator. For those of us in the northern hemisphere, this date marks the start of fall, with spring beginning in the southern hemisphere. With shorter daylight hours approaching, stargazers can enjoy more time under dark skies.

Five years ago on September 15th, the Cassini spacecraft was purposely crashed into Saturn after 13 astonishing years of studying this ringed planet. Aboard Cassini was the Huygens probe, which was deployed and landed on the moon Titan. This became the most distant landing in our solar system. Cassini's mission ended because the spacecraft's fuel supply ran out. Cassini crashed into Saturn to preserve the planet's moons from being contaminated.

September 5th marks the 45-year anniversary of Voyager 1 lifting off from the Cape Canaveral Air Force Station. This spacecraft, along with Voyager 2, which ironically launched two weeks earlier, explored the outer planets of our solar system. Voyager 1 visited both Jupiter and

Saturn, as well as Saturn's largest moon, Titan. It later became the first man-made object to travel into interstellar space.

We have a great opportunity to observe the planets this month. In our early evening sky, Saturn is found in the southeast and remains a great telescopic target for most of the night. Jupiter reaches opposition on the 26th, which is when Earth is directly between it and the sun. This close approach makes the midnight hour the optimal time to view Jupiter. Its atmospheric belts and Great Red Spot are always rewarding observations. The four Galilean moons are easily spotted, and their orbital motions can be detected through a small telescope in a single evening. Mars is seen rising at about 10:30pm all month and can be most easily viewed in the hours before sunrise.

SEPTEMBER'S SKY

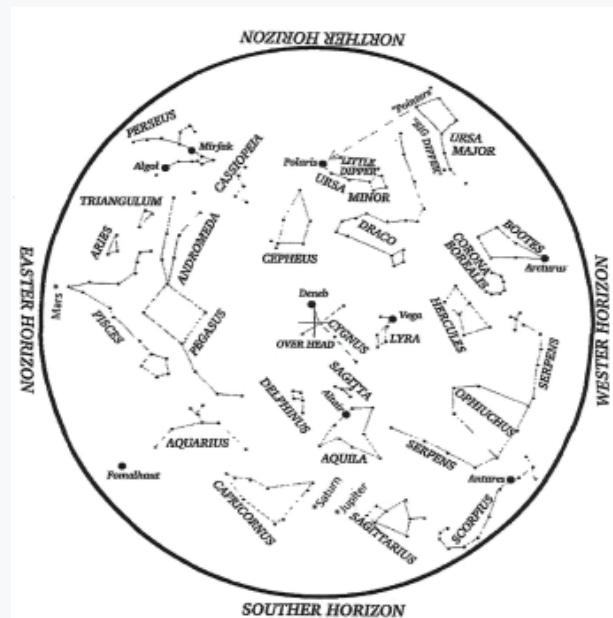
10: Full Moon

16: Neptune at Opposition

23: September Equinox

25: New Moon

26: Jupiter at Opposition



Credit: Roger B. Culver

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

OBSERVATIONS

The highlight of my recent observations occurred in Springfield, Vermont, at the annual Stellafane astronomy convention. When darkness arrived, I participated in my fourth Binocular Observing Olympics (BOO). This event features binocular observing of celestial objects from a list compiled by astronomer Phil Harrington. The objects include a great selection of globular clusters, open clusters, planetary nebulae, dark nebulae, asterisms, stars, a triple star, and even an asteroid. I used my 7x35 binoculars most of the night, but also put my tripod-mounted 15x75 binoculars to good use. After successfully observing the required number of objects, my father, sister, and I each earned a special BOO Pin.

After the binocular program, I moved on to using my favorite instrument, a 12-inch Dobsonian telescope. I participated in a second Stellafane Observing Olympics event, which featured telescopic objects. Included were the fine globular clusters M5, M10, and M92, along with the galactic clusters NGC 6633 and M11. My favorite observation was 95 Hercules. While viewing this binary star, my father and I engaged in a debate about the colors of these two stars. I saw them as orange and blue, whereas my father saw orange and white.

My friend and fellow astronomer, Colin White, joined me at the eyepiece one evening under the dark skies of Stellafane. We observed a few more objects from the Stellafane Observing Olympics list, along with some other targets in the Sagittarius region. After taking turns viewing these deep sky objects, Colin and I invited our parents to look at these celestial treasures. It's always a delight to share the night sky with new people. Stellafane is a great opportunity to observe faint objects that we can't view from our light-polluted skies at home.

During Stellafane I also visited the Andrew Simoni Observatory, which is located on Breezy Hill and contains a 1930 Cook Spectroheliometer. This telescope allows us to see the sun in hydrogen-alpha light. The view was fabulous, but the feeling that I had while using this unique scientific instrument made it surrealistic.

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. Clear skies!

OBSERVATIONS

September's featured object is the North America Nebula, designated NGC 7000. This large emission nebula is located in the constellation Cygnus the swan about two degrees east of Deneb, the brightest star in Cygnus. An emission nebula is a gas cloud that becomes ionized from nearby hot stars and glows. This nebula's name comes from its shape resembling the North America continent. It is located about 1,700 light-years away and is about 100 light-years across. The North America Nebula covers an area more than ten times that of the full moon.

The North America Nebula is visible with the unaided eye under dark skies with excellent conditions. Binoculars and small low-power telescopes provide the best views of the nebula's features and distinctive shape.



North America Nebula
Photo by Tim Connolly



Dava Sobel, the keynote speaker this year at Stellafane, with me and my sister at Breezy Hill.

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