



the Skyscraper

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July 2022

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 Night**
Saturdays,
July 9 & June 23

**International
Observe the Moon
Night**
Friday, September 30

AstroAssembly
Saturday, October 1

Caught in the Cosmic Web

A presentation by Margaret Geller
Saturday, July 9 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.

Dr. Geller's talk, "Caught in the Cosmic Web", and will describe her adventures in mapping the universe throughout her career. She will discuss the initial discovery of the cosmic web and the HectoMAP project that she is now leading to survey the middle-aged universe. This survey uses data from two of the largest telescopes available to provide the redshift and other spectroscopic data to determine distances to more than 100,000 galaxies. Dr. Geller show how we use these studies to understand structure in the universe and to lay the foundation for future even larger maps extending deeper into the universe.

Margaret J. Geller is a pioneer in mapping the large scale structure of the universe. Her maps have provided a new view of the enormous patterns in the distribution of galaxies like the Milky Way --- the largest patterns we know.

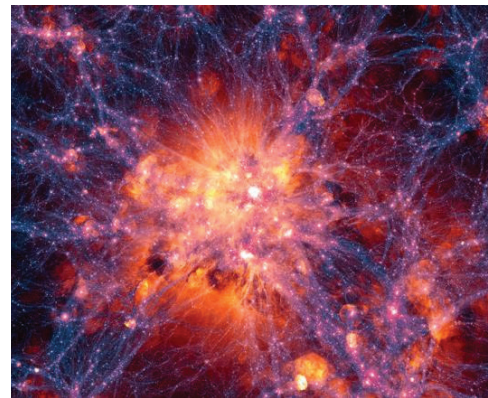
Dr. Geller's long-range scientific goals are to discover what the universe looks like and to understand how it came to have the rich patterns we observe today. To put the pieces of this grand puzzle together her research projects range from the structure of our own galaxy, the Milky Way, to mapping

the distribution of the mysterious, ubiquitous dark matter in the universe.

Dr. Geller's current main research interests are:

Mapping the distribution of the mysterious, ubiquitous dark matter in the universe.

Mapping the middle-aged universe to understand how clusters and large-scale structure evolve. She leads a project called HectoMAP.



Combining redshift surveys and weak lensing to understand how galaxies trace the dark matter in the universe

Dr. Geller completed her Bachelor's degree in Physics at the University of California, Berkeley in 1970,

and her Ph.D. in Physics at Princeton in 1974. Dr. Geller is a member of the National Academy of Sciences and of the American Academy of Arts and Sciences. She received a MacArthur Fellowship in 1990. Other include the Newcomb Cleveland Prize, the Klopsteg Memorial Award, the James Craig Watson medal, the Russell Lectureship, the Lilienfeld Prize, the Magellanic Premium, the Karl Schwarzschild Medal, the Library Lion of the New York Public Library, and seven honorary degrees.

President's Message

by Linda Bergemann

I am writing this message on the solstice, the first day of summer, the longest day of the year and when the sun is the farthest north. We selected Saturday, June 18 for our public Solar Observing Day due to its proximity to the solstice. But, as we have become accustomed, the weather did not fully cooperate.

The mostly cloudy afternoon meant catching views of the sun between the clouds. Although we had fewer than a dozen visitors stop in to look through the six solar telescopes, watch Jeff Padell's talk on the sun, and tour the observatory, they all were quite appreciative. Thank you to all those who brought a telescope and helped to educate the public.

Following solar observing was time for members; a telescope workshop and an informal bring-your-own dinner. We had two members bring their telescopes for assistance. Both had go-to scopes that they were unable to use. Several of our knowledgeable

and experienced members dove right in to diagnose the problems and make recommendations. I watched various controllers and mounts come and go from storage as more people engaged in solving the problems.

I counted 23 members in attendance. In spite of the weather, I had a wonderful time visiting with fellow members and interacting with our visitors. We should do this more often!

Oh, one more thing. To end the day on a high note, we had an expected visitor from western Connecticut who was willing to adopt our 20" Dobsonian telescope and give it a good home. He left happy and pledged to visit us in the future. The Trustees were happy to free up space in the anteroom. And, we were all happy to add \$700 to our treasury!

We didn't get to observe the night sky, but, overall it was a good day!

Upcoming Events

July 6 - N. Scituate Library. Observing night in the field across from the library (rain date, July 7)

Contact: Bob Janus

July 9 - 7pm "Caught in the Cosmic Web" by Dr. Margaret Geller, CFA Harvard (by live video)

Contact: Ed Walsh

July 9 - 8:45-11:00pm - Seagrave open for public observing

Contact: Steve Siok

July 21 - 8:30-9:00pm - WaterFire Arts Center rooftop observing

Contact: Francine Jackson

July 22 - 8:30-9:00pm - River Bend Farm, 287 Oak St., Uxbridge, MA. Public observing

Contact: Francine Jackson

July 23 - 8:45-11:00pm - Seagrave open for public observing

Contact: Steve Siok

Volunteers are always needed and welcome. Please reach out to the contact person for volunteer opportunities.

New Member Welcome to Skyscrapers

Cristopher Llopiz
of Providence

Cover image: A computer model of the large-scale structure of the universe using the Illustris simulator. This image depicts the dark matter and gas involved in forming galaxies and galaxy clusters, as well as the filaments connecting them. Credit: [Illustris](#)



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 **July 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.

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Jeff Padell

Two Motions to be Presented to Members

by Linda Bergemann

At the June 27th meeting of the Executive Committee two motions were made and passed that will be presented formally to the members of Skyscrapers at our July 9 meeting. The business meeting will follow the presentation of “Caught in the Cosmic Web” by our guest speaker, Margaret Geller. Motions will be made and the proposals described on July 9. Any discussion and votes will take place at the August meeting.

Motion #1: Memorial Garden, \$600 Sponsor: Linda Bergemann

Description: Last year, Skyscrapers member Bob Horton undertook a project to add a memorial garden on the grounds of Seagrave Memorial Observatory in remembrance of all of the members who have passed on. With the help of others, the garden was planted in the courtyard and surrounded by a stone border. The garden was dedicated during AstroAssembly 2021. No

monies have been spent on this project to date. To complete the project, additional plants are needed and a small plaque identifying it as a memorial garden. We have a quote of \$ 413.20 for a 4” x 6” bronze plaque as shown below, with a 24’ long stake. Ad-



ditional plantings are estimated to be under \$200. Monies raised through the sale of books and magazines will be used to fund this project.

Motion #2: Radio JOVE Equipment, \$400 Sponsor: Edward Walsh

Description: Our May speaker provided us with an overview of Radio JOVE 2.0. Radio JOVE students and amateur scientists from around the world observe and analyze natural radio emissions of Jupiter, the Sun, and our galaxy using simple, easy to construct radio telescopes. Several of our radio enthusiasts have expressed interest in this “cloudy weather” astronomy. More information can be found at: <https://radiojove.gsfc.nasa.gov>. The radio receiver and dual dipole antenna kit is available from NASA for \$232. Additional materials for completing the assembly (masts, coax cable, misc. hardware, etc.) are estimated at about \$150. Software is available at no cost. We expect to be able to use an existing Society-owned Windows computer, or borrow one. Monies raised through the sale of books and magazines will be used to fund this project.

Skyscrapers’ Library Catalog & Borrowing Procedures

by Weston Ambrose & Dave Huestis

Skyscrapers members,

Now that we have returned to Seagrave Observatory, we will have our lending library open to the membership at every meeting. You may peruse the inventory of seven star charts/atlasses, 144 electronic media (audio, VHS, DVD) and 232 book titles at your leisure:

1) On the Skyscrapers Google Drive at Skyscrapers Library Catalog, or

2) In a list in the meeting hall in proximity to the bookcases, or

3) Browse the bookcase shelves.

Our vast collection of DVDs includes recordings of past meetings/speaker programs.

Once you choose an item, ask librarian Dave Huestis or assistant librarian Weston Ambrose to retrieve it from the bookcase during a monthly meeting held at Seagrave and sign it out.

Borrowed items should be returned at the next meeting unless other arrangements are made.



Scan for library catalog



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>

NASA's Astrophoto Challenges

by Linda Bergemann

NASA's Astrophoto Challenges include two challenges: the MicroObservatory Challenge and the NASA Data Challenge. Enter either challenge — or both! — and the MicroObservatory and NASA's Universe of Learning team could select your work as a standout entry for feedback from NASA scientists!

MicroObservatory Challenge

For this challenge, you will need to process astronomical image data that you collect yourself from MicroObservatory telescopes. Submit your processed images to the challenge, and your work may be selected as a standout entry to receive feedback from NASA scientists!

Capture your own real-time telescope image of the Carina Nebula, and process it with MicroObservatory's JS9-4L tool. Then consider how the image of the Carina Nebula that you processed compares to an

image of the Carina Nebula processed by NASA.

NASA Data Challenge

In this challenge, you will be able to process real NASA astronomical image data. Submit your processed images to the challenge, and your work may be selected as a standout entry to receive feedback from NASA scientists!

Select any of NASA's images of Eta Carina & the Carina Nebula, and process them with MicroObservatory's JS9-4L tool. Use all the techniques you've learned with MicroObservatory to process real NASA data and create your best image.

NASA's Astrophoto Challenges will end on July 31.

MicroObservatory is a network of automated telescopes that can be controlled over the Internet. The telescopes were developed by scientists and educators at the Har-

vard-Smithsonian Center for Astrophysics and were designed to enable youth nationwide to investigate the wonders of the deep sky from their classrooms or after-school centers. They are located and maintained at observatories affiliated with the Center for Astrophysics, including the Harvard College Observatory in Cambridge, MA and the Whipple Observatory in Amado, AZ.

The MicroObservatory remote observing network is composed of several 3-foot-tall reflecting telescopes, each of which has a 6-inch mirror to capture the light from distant objects in space. Instead of an eyepiece, the MicroObservatory telescopes focus the collected light onto a CCD detector (an electronic chip like that in a digital camera) that records the image as a picture file with 650 x 500 pixels.

For more information on MicroObservatory: <https://mo-www.cfa.harvard.edu/OWN/index.html>

Woonsocket Astronomy Club Update

by Mark Munkacsy

I just wanted to give you a quick update on our Astronomy Club activity up in Woonsocket.

Our early June [June 6] meeting was dedicated to the Moon. We were able to observe the 7-day-old moon through a couple of telescopes at the start of the session (identifying a few craters from the moon maps I handed out), then shifted indoors for a video on the collision between Theia and Earth that created the Moon. We used a yardstick to create a timeline of Earth history, showing where on the yardstick the dinosaurs ruled, when the Moon was formed, and when humans appeared. We talked about the tides and their importance in life's transition from the oceans to the land.

During yesterday's [June 20] meeting we finished up talking about the Moon. We had a demonstration of moon phases, where the kids could walk all the way around our basketball Moon and see how the visible phase depended on where you stood. (It also gave us a chance to talk about eclipses and shadows and why we don't have eclipses every month.) We even had a question asked about why the Moon always keeps the same side facing Earth, which turned into a

great opportunity to talk about tides on the Moon. We did an exercise on Pluto; I had some images of Pluto from a few days ago, and the kids compared the image to a star chart -- we had a race to see who could find Pluto first! And we introduced our constellation for the month of June: Lyra. We talked about the double-double (epsilon) and how different our lives would be if our own sun was a multiple star system.

During one of our earlier discussions about homemade stuff for astronomy, I had promised more information on how 3D printing works.

So, last night I brought my 3D printer, and we talked about how it works. While the kids watched, I printed a small plastic cube with markings on its faces, and the kids stayed glued to that printer until its final beep. They were

able to hold the cube and compare its final appearance to the various motions of the machine while it was running.

The next session would naturally fall on July 4, but we're skipping that for the holiday. And so our next actual session will be July 18, and I haven't yet planned that session.

Attendance varies a lot from week to week. We have a trickle of new families showing up each week, and summer vacations keep some people away. I'm still having lots of fun.



A Part of Rhode Island History

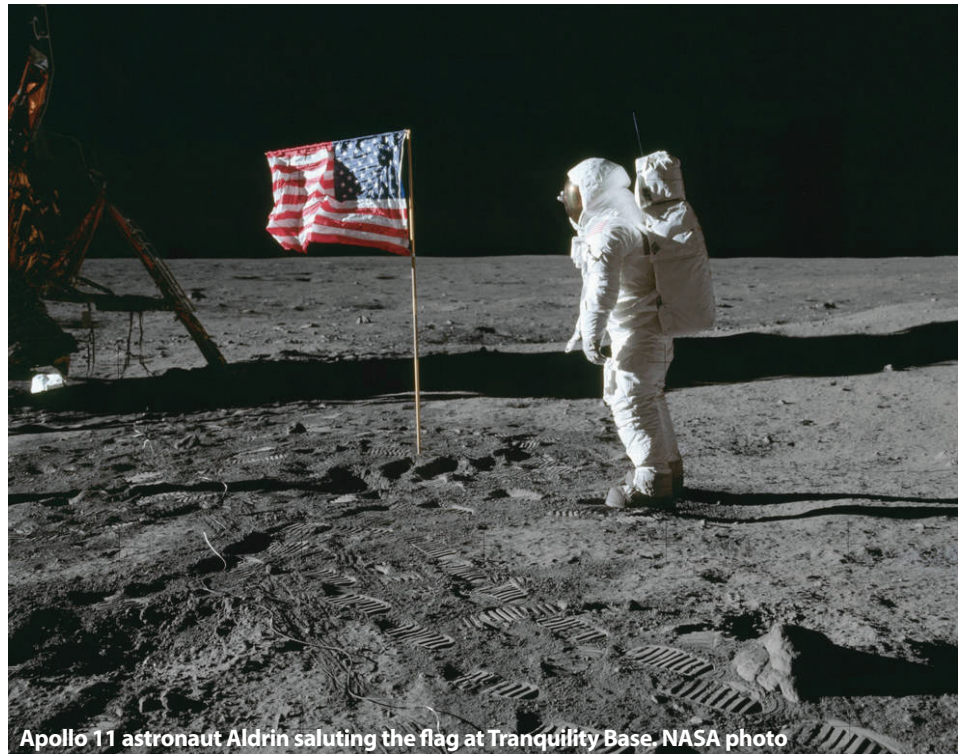
by Francine Jackson

Rhode Island as a state is loaded with history, but very few of us are really aware of how much, so, for the most part, we tend to ignore it; however, the members of the National Park Service are doing their best to introduce us to many possibly unknown stories. For example, consider the Ashton Mill, that giant, four-story building on the Cumberland side of the Blackstone River.

While only 28, Wilbur Kelly became a ship's captain in 1810. Five years later, he was given control of the Ann & Hope (yes, a real ship) to China. Months later, upon his return, he decided to stay on dry land, and got into the cotton manufacturing business. Although at first Kelly found himself losing his investment, just a few years later he did become successful with the Smithfield Cotton and Woolen Factory, eventually forming the Lonsdale Company, on the Blackstone River.

In the 1860s, the Lonsdale Company decided to expand, as textiles were becoming very profitable, especially after the Civil War. It was then that the four-story Ashton Mill was built on the east side of the River, right next to the new railroad tracks. This factory made muslin cloth until the 1930s.

In 1941, Owens Corning bought the mill, and proceeded to spin fiberglass, creating cloth, such as the curtains some of us still have on our windows. The company's research and design department also created



Apollo 11 astronaut Aldrin saluting the flag at Tranquility Base. NASA photo

a unique fiber cloth, termed Beta, which is resistant to heat up to 2,500 degrees F. This substance was like a cotton candy substance that could be spun like regular cloth. Its uses became an important part of the Apollo space program; it could be laid on control panels to limit fire breaking out in space craft. It also was used as the external layer of space suits, and was made into

a type of purse-like holder for astronauts' personal belongings. It was not the material for the entire space suits – just the outer layer.

As part of the Apollo program, NASA decided it wanted the astronauts to plant an American flag on the lunar surface. Several companies were invited to create a flag that could withstand the harsh lunar environment, among them, Owens Corning. The company had one of its Quality Control associates sew one out of red, white and blue Beta cloth, then send it on to NASA. After receiving all the entrants, NASA in essence picked one of the flags to be placed in the Apollo 11 capsule. Was it the one from Rhode Island? No one is really sure, but the possibility is there, that whenever you see videos of the astronauts on the Moon's surface, you may also be seeing a piece of Rhode Island standing right next to them.



Ashton Mill on the Blackstone River in Cumberland

Skylights: July 2022

by Jim Hendrickson

Earth is at aphelion on the 4th. At a distance of 1.521 million kilometers (1.0117 AU), nearly 5 million kilometers farther from the Sun than in January. That difference is about 13 times the average distance to the Moon, or over 4 times the distance to the Webb Telescope.

The Sun crosses from Gemini into Cancer on the 20th, and is just 1° south of the Beehive Cluster, M44, on the 30th.

The waxing crescent Moon is less than 5° from the Beehive cluster, M44, in Cancer on the 2nd. Although low on the horizon and in deep twilight, this should make a nice pair in binoculars. On the 2nd, the Moon fills in a cap in Leo's Sickle asterism to form a complete hexagon.

First quarter Moon is on the 6th, in Vir-

go, with Spica shining a few degrees to its left. The Moon appears just to the east of the star on the 7th. Early in the evening of the 9th, the Moon is less than 2° NNE of Antares in Scorpius.

July's Full Buck Moon occurs on the night of the 13th. It is the lowest full Moon of the year, culminating at just 20°24' over the southern horizon at 12:16am on the 14th. Note its position within the handle of the Teapot asterism of Sagittarius.

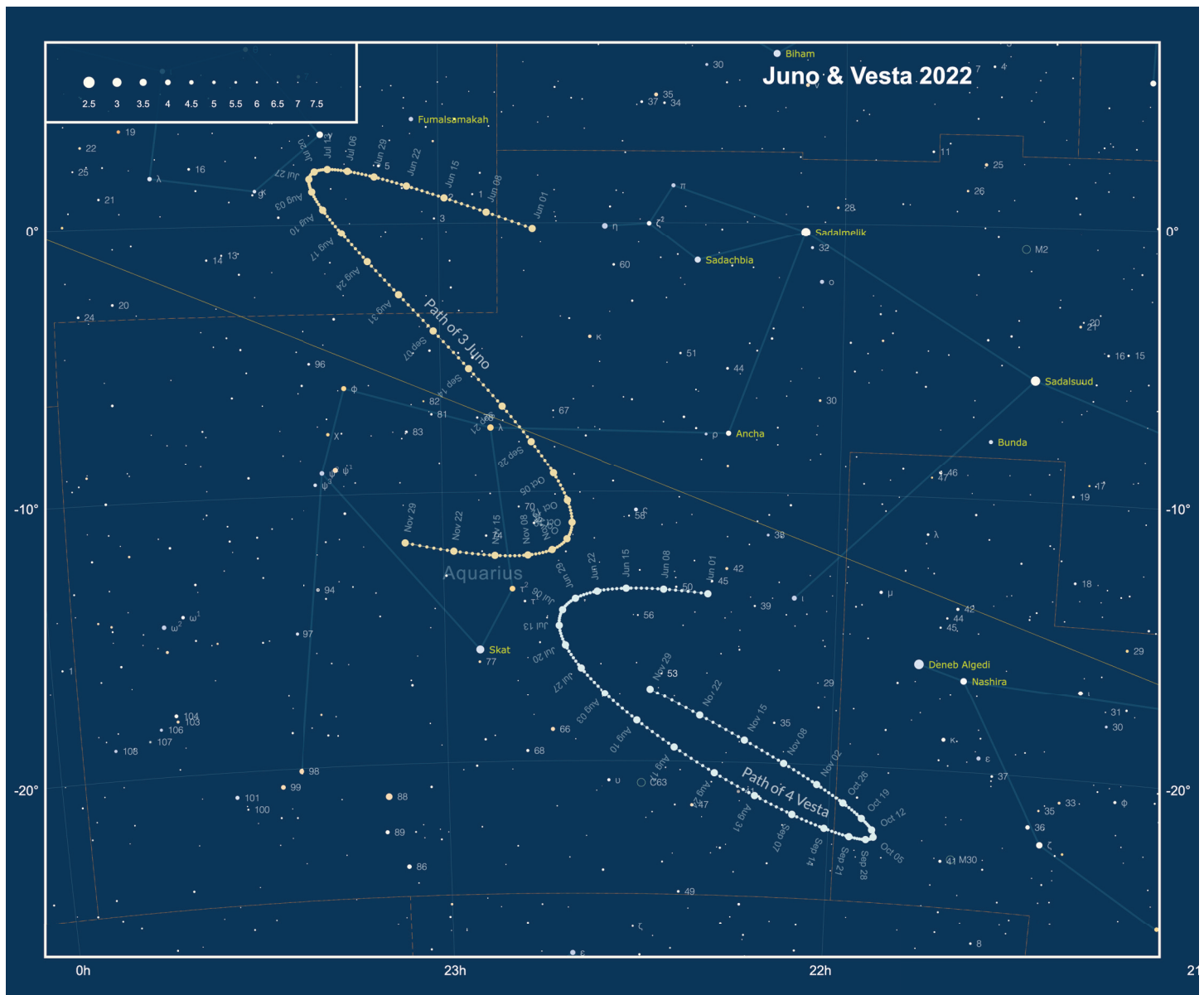
The waxing gibbous Moon passes by Saturn on the 15th-16th, and just 3° south-east of Jupiter on the 19th.

The Moon reaches last quarter on the 20th, with an occultation of Mu Piscium occurring just after midnight. The star will disappear behind the Moon's illuminated

Events in July

- 01 Venus 4.1° N of Aldebaran
- 04 Earth Aphelion
- 06 First Quarter
- 13 Full Buck Moon
- 15 Moon 5.4° SE of Saturn
- 16 Mercury Superior Conjunction
- 18 Moon 2.8° SE of Jupiter
- 18 Moon 3.7° SE of Neptune
- 20 Pluto Opposition
- 20 Last Quarter
- 20 Venus 1.5° S of M35
- 21 Moon 3.5° W of Mars
- 22 Moon 0.7° E of Uranus
- 28 New Moon
- 29 Moon 2.4° N of Mercury
- 29 Jupiter Stationary

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



limb at 12:45am, and reappear from the darkened limb at 1:43am.

On the 21st, the waning crescent is 3.3° west-southwest of Mars, and on the 23rd it joins the Pleiades and Hyades clusters in Taurus. On the 26th, the 27-day-old crescent appears just above Venus in the pre-dawn sky.

The planet parade that has marched through the morning sky since the beginning of the year is finally extending its way into the evening sky, as Saturn and Jupiter are now above the horizon before midnight in July.

Saturn, which rises at 11pm in early July and 9pm at the end of the month, is moving westward through eastern Capricornus. Its 0.5 magnitude pale yellow glow makes a neat little triangle with Deneb Algedi (Delta Capricorni) and Nashira (Gamma Capricorni), which changes perceptibly on a nightly basis..

Appearing between Saturn and Jupiter in our sky are three solar system objects that are seldom observed, but fairly easy to find using optical aid, and well worth your time to explore.

First is the brightest asteroid in the night sky, 4 Vesta. The 550km wide asteroid brightens to 6th magnitude in July as its distance from Earth closes to within 1.3 AU by the end of the month. It can be easily seen with binoculars moving through Aquarius, about 15° north of Fomalhaut.

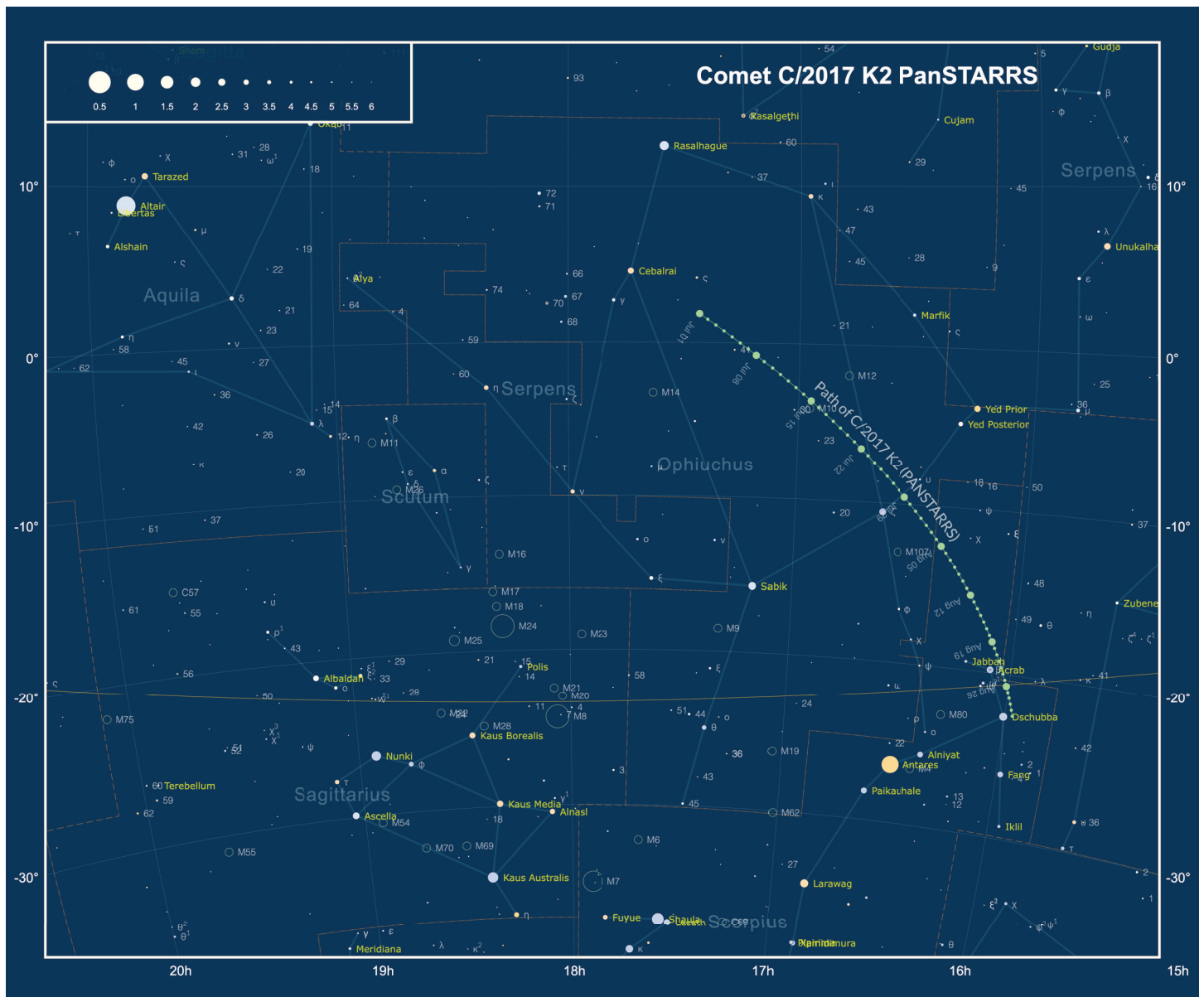
Just a bit farther out is another of the first asteroids to be discovered, 3 Juno. Juno ranges from 2.0 to 1.6 AU, and brightens from magnitude 9.5 to 8.8. You'll need large binoculars or a small telescope to find Juno, which can be found by drawing a line through the western edge of the Great Square of Pegasus, and continuing south about the same distance, to the vicinity of 3.7 magnitude Gamma Piscium.

And finally, the eighth planet Neptune shines as a tiny pale blue 7.7 magnitude point in southwestern Pisces. It can be found by drawing a line south through the easternmost pair of stars in the Cirlet asterism, or, it can be found just a little over ¼ of the way along a line connecting Jupiter and Saturn.

The king of the planets, Jupiter, rises at 12:30am at the beginning of the month, and two hours earlier at the end of the month.

Venus begins July in Taurus, located just a few degrees north of Aldebaran and extending the northern leg of the “V” asterism of the Hyades cluster. It continues moving eastward and passes within 1/2° north of the Crab Nebula (M1) supernova remnant on the 13th.

Venus then passes through Orion from July 16th-18th, and over the next two mornings is within 1.5° of the open star cluster M35 in Gemini. The 27-day-old waning



crescent Moon appears nearby on the 26th.

Mercury rises 45 minutes before the Sun in early July, but rises later each day as it moves closer to superior conjunction on the 16th. It will become visible in the evening sky again at the end of the month, with the 1-day-old crescent Moon appearing 2.5° north of it on the 29th.

Pluto comes to opposition on July 20th, when it will be 33.550 AU from Earth, and shines at a pale 14.3 magnitude. To observe it visually, you'll want to use a 12-inch or larger telescope, and wait for the Moon to be out of the sky. After having spent the last 14 years in Sagittarius, this will be the last full year that Pluto will reside fully within the constellation, as it crosses into Capricornus in March 2023.

If you're a deep sky hunter, Pluto will be

easy to locate, as it lies within 2° west-southwest of the globular cluster M75. There are many digital star atlases that can be used to give accurate positions for Pluto on a specific date, such as SkySafari.

If you don't have access to a large telescope, but have a camera and tracking mount, and a small telescope or telephoto lens, you will most likely be able to capture an image of Pluto. The best way to accomplish this is to image the same area of sky on successive nights, or a few nights apart, then "blink" the images to find the object that moved. Having M75 nearby will aid in framing, as well as give a point of interest to this year's Pluto images.

In early July, the last stars of the Winter Hexagon, Pollux and Castor, drop out of our evening sky, and the prominent spring

constellation Leo can be seen descending into the west at the end of twilight. To the south, Antares, in Scorpius, is transiting the meridian, and high in the northwest, the Big Dipper has assumed its familiar summer position, with the pointer stars nearly due west of Polaris.

The core of the Milky Way lies due south during late evening this month, and the Summer Triangle is high overhead, making this the best time to observe the celestial wonders within this region of sky.

Comet C/2017 K2 PanSTARRS is visible in the evening sky, crossing through Ophiuchus, and is expected to brighten to 8th magnitude. The comet's closest point to Earth, at 1.81 AU, occurs on July 14, and it reaches perihelion on December 19 at 1.797 AU.

Star Party Update

by Jim Hendrickson

River Bend Farm

Uxbridge, MA

Friday, June 10, 2022

The first 2022 night sky event at River Bend Farm in Uxbridge took place under hazy but mostly clear skies on Friday, June 10. Francine Jackson and Jim Hendrickson set up their small refractors on the edge of the field overlooking the canal pond.

We had learned recently that there were late personnel changes at the Department of Conservation & Recreation (Mass DCR) and that our point person from last year was no longer there. The new ranger didn't seem to have much knowledge or enthusiasm for the night sky programs, and this week's program hadn't even been adver-

tised. He did as much as bring out two of the park's small reflecting telescopes, which were not needed or used, and then left to conduct his own business elsewhere.

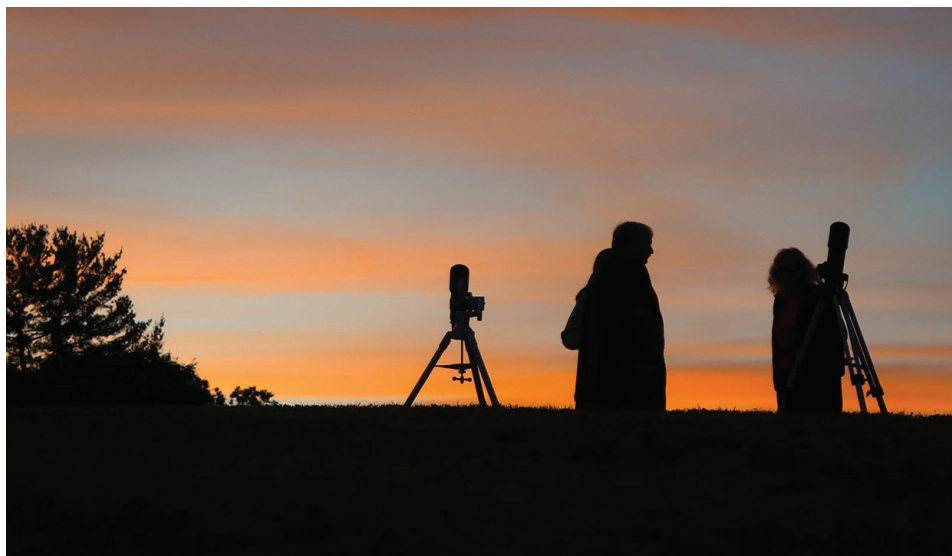
Because there was no night program advertised, we didn't get our usual visitor numbers. At our personal invitation, friends and frequent visitors to the night sky events in Uxbridge and at Seagrave Observatory, Ruth and Marc Gravel came to visit us for about a half hour. Only one other visitor came to view the Moon with us. When the ranger didn't return by 9pm, and we were by ourselves, we packed up our scopes, and theirs, and left. We're hoping to return on July 22 with better coordination.

Astronomical League Observing Challenge: Globular Clusters

by Michael Corvese

We are announcing our next challenge: The Astronomical League's Observing Challenge for Globular Clusters. It runs from July 1, 2022 through September 30, 2022. This is open to anyone, membership in the AL is not required. For more information, go to the Challenge's web page and scroll down: <https://www.astroleague.org/content/al-observing-challenge-special-observing-award>

Anyone interested in participating and/or leading a Skyscrapers group for this summer program, please contact Michael Corvese, corvesemichael@gmail.com.



Messier 54 taken with the Slooh 14" Celestron SCT, processed by Jeff Padell

Observations of the Tau Herculid Meteor Shower

by Gregory T. Shanos

Remnants of the shattered Comet 73/Schwassman-Wachmann produced a new meteor shower which peaked on May 31, 2022. Scientists were hopeful that a meteor storm might occur. This event was highly publicized on the internet to encourage as many observers as possible to witness and document this event.

Skyscraper member Greg Shanos who currently resides in Sarasota, Florida was called to duty. The moon was new and the weather conditions were less than ideal with partly cloudy skies. The radiant was near the bright star Arcturus which was located at the zenith when I started my observing session at 12:15am local time (4h 15m UT). The sky was over fifty percent cloudy with increasing cloudiness throughout the night. In spite of this I witnessed a bright mag -2 yellow colored meteor four minutes into my observation! The sky became increasingly cloudy and at 2:00am (6h00m UT) was completely overcast. I took a break and was about to call it a night. At 2:35am the sky cleared significantly and by 3:00 am it was perfectly clear! However, the radiant was much lower in the sky at only 50 degrees above the horizon. I continued my observing run and witnessed several more tau-Herculid meteors as well as sporadics. By 4:00 am (8h 00m UT) Arcturus was only 24 degrees above the horizon. I therefore concluded my observing run.

I witnessed a total of 9 tau-Herculid meteors and 4 sporadics. I took advantage of

the clear skies and later imaged the planets Venus, Mars, Jupiter and Saturn with my Meade LX200GPS 10 inch Schmidt-Cassegrain telescope.

I documented all my meteor observations on the official International Meteor Observers form. I submitted the form to Robert Lunsford director of the International Meteor Organization (IMO) and Association of Lunar and Planetary Observers

(ALPO). I encourage all amateur astronomers to get out there and observe in spite of non-ideal weather conditions, document their meteor observations and submit their findings to the IMO and ALPO.

A follow-up of the tau-Herculid meteor shower online indicated that a meteor storm did not occur however, there were several bright fireballs. This is exactly what I had witnessed.

Tau-Herculids Meteor Shower Visual Meteor Observing Form

Date: 2022 (Yr) 05 (Mon) 31 (Day) Begin: 04 h 15 ^{UT} m End: 08 h 00 m ^{UT}

Location: Long. = 82° 36' 19.0" W. Lat. = 27° 20' 57.62" N. Elevation = 3 m

Observer: Gregory T. Shanos Place: Loughat Key (Sarasota), Florida USA

Percent Cloudy: 50%@4h15m 75%@5h00m 100%@6h00m 0%@7h00m 0%@8h00m UT

Direction Facing & Altitude: SW @ 4h15m SW @ 5h00m SW @ 6h00m W @ 8h00m
240° Alt: 70° 250° Alt: 63° 235° Alt: 50° 280° Alt: 24°

Sky Conditions: Partly Cloudy 50%@4h15m Clearing 35%@6h35m UT

Incr Cloudiness 75%@5h00m Completely clear 0%@7h00m UT

Completely Overcast 100%@6h00m Completely clear 0%@8h00m UT

Breaks: 6h00m UT - 6h35m UT completely overcast. Clearing at 6h35m UT

Comments: New Moon. Bottle Scale: 647m (SQM 2082)
Limiting Magnitude: +4 End of Observation: 8h00m UT
No outlier was observed. (4:00am local time)

Number	Time UT	Magnitude	Type	Color	Speed	Train	Comments
1	4h18m	+3	S	white	swift	no	sporadic
2	4h19m	-2	T	yellow	medium	yes	bright as Jupiter fireball at zenith
3	4h49m	+3	T	white	medium	no	
4	5h15m	+2	T	white	medium	no	
5	5h24m	+2	T	white	medium	yes	
6	5h30m	+3	T	white	swift	no	
7	5h35m	0	T	white	swift	yes	bright, swift
8	5h40m	+1	S	white	slow	yes	went into radiant
9	6h46m	0	T	white	swift	yes	bright
10	6h58m	+1	S	white	slow	yes	toward radiant
11	7h10m	+3	T	white	slow	no	
12	7h21m	+3	T	white	swift	no	
13	7h59m	+3	S	white	swift	no	toward radiant

Personal Weather Station
 Ambient Weather WS-8480
 May 31, 2022 4:03am local time
 (8h03m UT)

Temp: 73.7°F
 Feels Like: 73.7°F
 Humidity: 86%
 Barometer: 30.01
 Wind direction: West
 Wind speed: 0 mph

Find Hercules and His Mighty Globular Clusters

by David Prosper

Hercules is one of the standout heroes of Greek mythology, but his namesake constellation can be surprisingly hard to find - despite being one of the largest star patterns in our night skies! Once you find the stars of Hercules, look deeper; barely hidden in the space around his massive limbs and “Keystone” asterism are two beautiful globular star clusters: M13 and M92!

Since the constellation itself is relatively dim but bordered by brighter constellations, you can find the stars of Hercules by looking between the bright stars Vega and Arcturus. They are fairly easy to identify, and we have tips on how to do so in previous articles. Vega is the brightest star in the constellation Lyra and one of the three stars that make up the Summer Triangle (June 2020: Summer Triangle Corner: Vega). Arcturus is the brightest star in the constellation Boötes, and can be found by “arcing to Arcturus” from the handle of the Big Dipper (May 2021: Virgo’s Galactic Harvest). You may be able to Hercules’s “Keystone” asterism first; this distinct pattern of four stars is traditionally shown as the torso of the great hero, though some illustrators prefer marking the Keystone as the head of Hercules. What pattern do you see in the stars of Hercules?

Globular star clusters appear “fluffy,” round, and dense with stars, similar to a

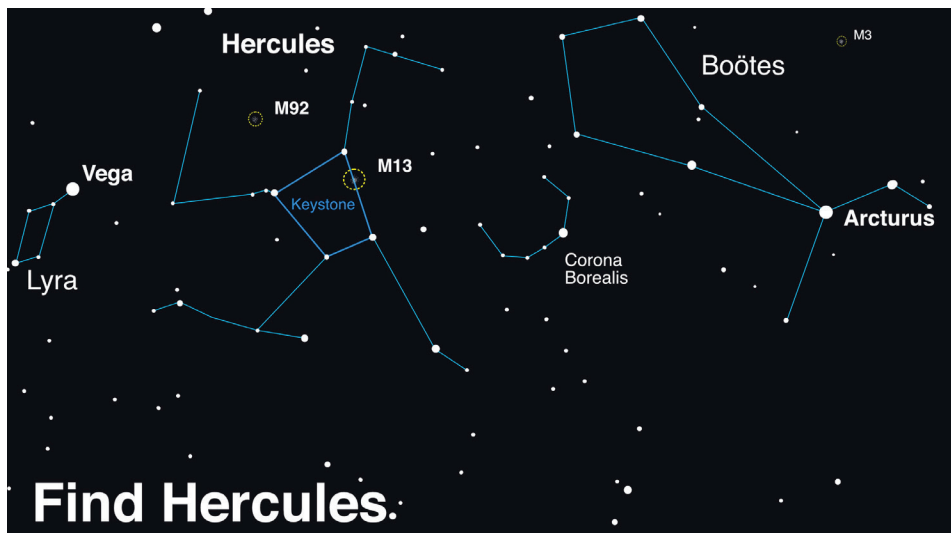
dandelion gone to seed, in contrast to the more scattered and decentralized patterns of open clusters. Open clusters are generally made up of young stars that are gradually spreading apart and found inside our Milky Way galaxy, while globular clusters are ancient clusters of stars that are compact, billions of years old, bound to each other and orbit around our galaxy. Due to their considerable distance, globular clusters are usually only visible in telescopes, but one notable exception is M13, also known as the Great Cluster or Hercules Cluster. During very clear dark nights, skilled observers may be able to spot M13 without optical aid along the border of the Keystone, in between the stars Zeta and Eta Herculis - and a bit closer to Eta. Readily visible as a fuzzy “star” in binoculars, in telescopes M13 explodes with stars and can fill up an eyepiece view with its sparkling stars, measuring a little over half the diameter of a full Moon in appearance! When viewed through small telescopes, globular clusters can appear orblike and without discernible member stars, similar in appearance to the fuzzy comae of distant comets. That’s why comet hunters Edmund Halley and Charles Messier discovered and then catalogued M13, in 1714 and 1764 respectively, marking this faint fuzzy as a “not-comet” so as to avoid future confusion.



Composite image of the dense starry core of M92 imaged in multiple wavelengths. While your own views of these globular clusters won't be nearly as crisp and detailed, you might be able to count some of its member stars. How far into their dense cores can you count individual stars? Credits: ESA/Hubble & NASA; Acknowledgment: Gilles Chapdelaine. Source: <https://www.nasa.gov/feature/goddard/2017/messier-92>

While enjoying your view of M13, don't forget to also look for M92! This is another bright and bold globular cluster, and if M13 wasn't so spectacular, M92 would be known as the top celestial sight in Hercules. M92 also lies on the edge of naked-eye visibility, but again, binoculars and especially a telescope are needed to really make it “pop.” Even though M92 and M13 appear fairly close together in the sky, in actuality they are rather far apart: M13's distance is estimated at about 25,000 light years from Earth, and M92's at approximately 27,000 light years distant. Since M13 and M92 appear so close together in our skies and relatively easy to spot, switching between these two clusters in your scope makes for excellent star-hopping practice. Can you observe any differences between these two ancient clusters of stars?

Globular clusters are closely studied by astronomers for hints about the formation of stars and galaxies. The clusters of Hercules have even been studied by NASA's space telescopes to reveal the secrets of their dense cores of hundreds of thousands of stars. Find their latest observations of globular clusters - and the universe - at nasa.gov.

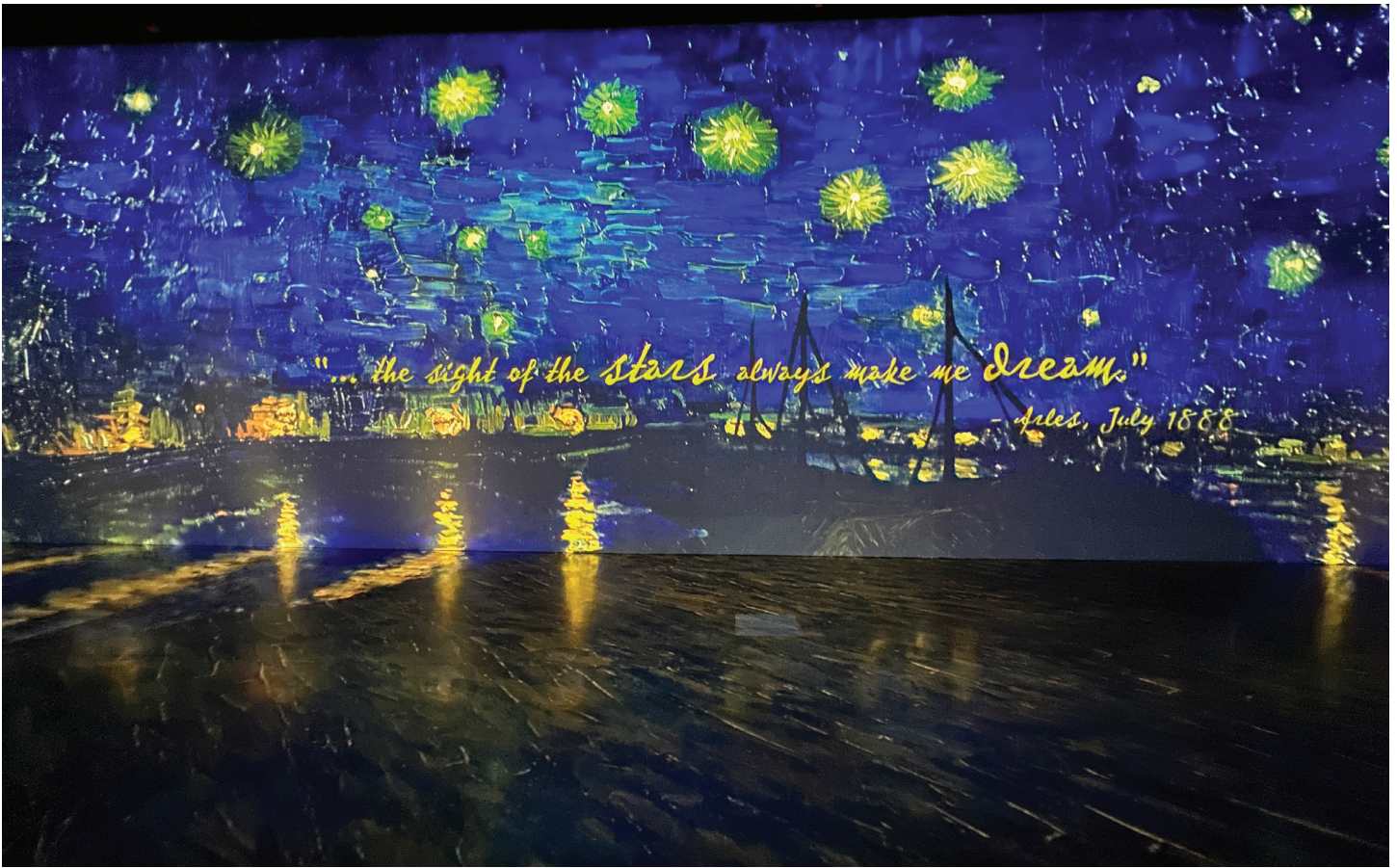


Find Hercules:

Look up after sunset during summer months to find Hercules! Scan between Vega and Arcturus, near the distinct pattern of Corona Borealis. Once you find its stars, use binoculars or a telescope to hunt down the globular clusters M13 and M92. If you enjoy your views of these globular clusters, you're in luck - look for another great globular, M3, in the nearby constellation of Boötes. Image created with assistance from Stellarium: stellarium.org



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!



Review: Beyond Van Gogh

by Jim Hendrickson

Most people may be familiar with Vincent Van Gogh by recognizing what is perhaps his most well-known work, the *Starry Night*. But most may not be familiar with many more of his 2100 works of art, many of which were produced during the last three years of his short and turbulent life. An immersive gallery currently on display in Providence provides an enlightening view of the life and art of Vincent Van Gogh.

Unlike a traditional art gallery where static works are presented around a room, *Beyond Van Gogh* immerses the viewer within the artworks in larger-than-life, living, breathing, (and winking) displays created by cleverly hidden projectors. There are no LCD screens, no color-changing theater lighting, and the display panels are rear-projected and seamless, all creating an immersive experience where the engineering and technology are cleverly hidden, and the only light you experience is from the artworks that are the subjects of the exhibition.

The self-paced walk-through exhibit is separated into three sections: the first room showcases a number of large, illuminated

panels, with excerpts of letters by Vincent, many to his brother Theo, which give a chronological autobiography of Vincent's brief and sometimes troubled life. The second room presents a continuously moving art display of streams, waves, and stars that flow from the top of the wall opposite the viewer, down, and across the floor towards the viewer, giving the impression of wading through a slowly-flowing river of Van Gogh-inspired visuals that are just so subtle as to not induce vertigo(gh). Occasionally, a self-portrait of Van Gogh briefly emerges, before dissolving back into the stream of light flowing past.

The third, and final, room is a large, open space where the four walls and two large, faceted central columns are a 20-foot high canvas onto which hundreds of paintings are presented in a sequence of scenes that cleverly animate into each other every two or three minutes. The artworks even extend to the floor all around, giving the viewer that they, and other spectators, are actually part of the scenes.

Even though the space is so large that you cannot look at everything all at once,

the scenes are repeated on opposing walls, but stitched together so cleverly that no matter which direction you face, you will not see the same scenes repeated. The entire presentation is 37 minutes long, and you'll experience a full range of Van Gogh's works, from landscapes, still-life, self-portraits, and more. Each scene is subtly animated: stars appear to rise, reflect on the water, flower petals flutter in the wind, and portraits' eyes blink.

Once you have seen the entire 37-minute sequence, you are encouraged to stay and view a few more scenes a second time, as throughout the presentation you yearn to look for more details that you may not have noticed soon after you walked into the room.

You can spend as much time as you'd like in the exhibit, and when you exit you'll have a deeper knowledge and appreciation of Van Gogh and his art.

Beyond Van Gogh is showing at the Rhode Island Convention Center through July 7.

Planetary Nebula in Hercules:

NGC 6210

by Glenn Chaple for LVAS

A majority of the non-Messier deep sky objects featured in the Observer's Challenge were discovered by the German-English astronomer William Herschel during surveys conducted in the latter part of the 18th century and early years of the 19th. One of Herschel's more notable "misses" was this month's Challenge, the bright planetary nebula NGC 6210 in Hercules. Perhaps its relatively small size (a mere 20 by 13 arc-seconds and almost stellar-looking when viewed with low magnification) was to blame. But Herschel was able to detect the non-stellar appearance of Uranus when he discovered the planet in 1781, and its disc is just 4 arc-seconds across. Whatever the reason, NGC 6210 remained undetected until stumbled upon by the German-born Russian astronomer Wilhelm Struve while searching for double stars in 1825.

NGC 6210, nick-named the "Turtle Nebula" for its appearance in astroimages and visually through large-aperture scopes, is

situated south of the "Keystone" of Hercules at 2000.0 coordinates RA 16h44m29.5s and Dec +23o47'59.5". It's about 4 degrees northeast of the 3rd magnitude star beta (β) Herculis, a good starting point for star-hoppers working with a low-power eyepiece (refer to Finder Chart B). You'll know you've hit the mark when you arrive at a thin triangle 18 arc-minutes long and comprised of two 7th magnitude stars and a slightly out-of-focus 9th magnitude object (NGC 6210).

Even the smallest of astronomical telescopes will pick up NGC 6210. I first saw it on the evening of May 27, 1978, using a 3-inch f/10 reflector. In my logbook, I wrote, "At 30X, this object is still nearly star-like. At 60X, it seems more diffuse, and at 120X is definitely nebulous." I saw no indication of color.

Recently, I returned to NGC 6210 with a 10-inch f/5 reflector. Again, low power (this time, 40X) revealed little more than a near-stellar image. A switch to higher magnification (208X) brought out a slightly bluish hue, but there was no sign of the outer extensions that form the "Turtle's" head and appendages. I also failed to pick out the 13th magnitude central star. Darker skies (mine had a limiting magnitude of 5) and/or more

aperture would have done the trick.

After giving NGC 6210 its due respect, turn your gaze to the 7th magnitude triangle member that lies 18 arc-minutes south and slightly west. This is the tight double star Struve 2094 (Σ 2094). Its magnitude 7.5 and 7.9 component stars are just 1.1 arc-seconds apart, so I recommend using a scope with minimum aperture of 4 inches and a magnifying power of at least 200X on an evening when the seeing conditions are as steady as possible. An 11.7-magnitude third component lies 25 arc-seconds northwest of the main pair.

NGC 6210 is about 6500 light years away. The bright central portion is roughly one-half light year in diameter, while the "Turtle" spans 1.6 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.





Image by Mario Motta, MD (ATMoB) taken with H alpha and O3 filters, each about 1 hour, through 32 inch scope with an ASI 6200 camera.

N

SUBJECT: NGC 6210 **DATE/TIME:** 25 JUNE 2022
10:10 pm EDT

TELESCOPE/EYEPIECE: 10-inch F/5 reflector
6mm Televue Radian

MAGNIFYING POWER: 208X **FIELD OF VIEW:** 0.3°

NOTES:
Almost stellar at 40X. Small roundish glow with slightly bluish hue at 208X. No noticeable improvement with O-III filter.

May Reports

by Angella Johnson

Minutes- Skyscrapers Executive Committee Meeting via Zoom Monday May 23, 2022 7PM

Meeting called to Order at 7:07 PM by President Linda Bergemann

Present: Linda Bergemann, Michael Corvese, Francine Jackson, Laura Landen, Steve Siok, Kathy Siok, Steve Hubbard, Bob Janus, Ed Walsh, Dave Huestis, Jim Hendrickson, Steve Brown, Jeff Padell, Richard Doherty, Angella Johnson | Total:15

Agenda Items:

Skyscrapers is now a member of the International Dark Sky Association (<https://www.darksky.org/>).

MicroObservatory Challenge: MicroObservatory is a network of automated telescopes that can be controlled over the internet. For the challenge it is necessary to process astronomical image data collected from the MicroObservatory and submit results. Images are judged by NASA scientists. Members are encouraged to participate.

Upcoming Speakers for Monthly Meetings- Ed Walsh

June- Chuck Higgins, is a Professor of Physics and Astronomy at the Middle Tennessee State University. He is the founding member of a NASA-sponsored education project called Radio JOVE which uses radio astronomy to help students, teachers, and the public get involved in science. [via Zoom]

July- Margaret Geller, Astrophysicist at the Harvard-Smithsonian Center for Astrophysics. Dr. Geller is a pioneer in mapping the nearby universe. Her long-range scientific goals are to discover what the universe looks like and understand how it came to have the rich patterns we observe today. [via Zoom]

August/September- Jeff Padell (Solar imaging)/Scott Kenyon (Astrophysicist who studies the formation of stars and planetary systems). The title of Scott 's presentation: Pluto Strikes Back

November- Andrew Knoll, Dr. Knoll is the Fisher Professor of Natural History and Professor of Earth and Planetary Sciences, Emeritus at Harvard University. He will be presenting his work on Mars rover data.

Possible future presenter: Sheperd "Shep" Doleman (suggested by Steve Siok)

Audio/Visual Team-This team will comprise a few volunteers that can assist Kathy with Zoom presentations and meeting re-

cordings. The Board of Trustees are responsible for the sound system and video connection. Ed suggested sending an email to members that are knowledgeable with A/V to be a part of the team. Rich Doherty and Dan Fountain were mentioned/volunteered and the offer was accepted. A test run will be scheduled before June 4th.

Refreshments- Volunteers are needed to set up refreshments before meetings and cleanup after. Kathy has offered to maintain the supplies and drinks. Discussion followed as to what to offer during meetings; whether there should be coffee/water and cookies or brownies. Steve H. disagreed which prompted Kathy to elaborate as to the issue with not getting sufficient support when serving and cleaning up. Issue was deferred to Ed to convene with a few members to decide on the issue.

AstroAssembly- Francine Jackson

Theme: Sun and Moon (The Idea is to stay close to home)

Tentative Presenters: Mike-Lunar program | Jeff- Solar activity-maximum | NASA Artemis recipient. It was also decided by Francine and Kathy to not have a banquet but a light meal. Also, the portion that includes raffle and/or prizes will be scaled down. Kathy suggested collecting items donated by members and using these items for prizes. Kathy will work on this portion of the event. Volunteer(s) will be needed to do registration as well.

Treasurer's Report- Kathy Siok

Kathy scheduled to meet the auditors, Tuesday (May 24th) to check the books. Treasurer's report below and also available on Night Sky Network:

Cash Flow 4/1/2022 through 5/15/2022 (Skyscrapers)

INFLOWS	
Astronomical League Membership Contrib.	30.00
TOTAL Donation	90.00
Misc Donation	90.00
TOTAL Dues	730.00
Dues: Family	180.00
Dues: Regular	300.00
Dues: Senior	250.00
TOTAL Misc Income	825.00
Sale of Items	825.00
Shipping	65.79
TOTAL INFLOWS	1,740.79
OUTFLOWS	
Uncategorized	0.98
Astronomical League Membership Expense	4.00
Misc Expenses	256.80
PayPal Fee	35.72

TOTAL Utilities	532.84
Electric	57.85
Internet	79.99
Porta-John	395.00
TOTAL OUTFLOWS	830.34
OVERALL TOTAL	910.45
Balances as of 5/23/22	
PayPal	48.02
CD @ PCU	25,269.35
Checking	10,385.72
Savings	7504.11
Total	\$43207.20

Budgeted items will be reimbursed and reimbursement form must be filled out and submitted to the treasurer.

Membership Record- Records will be transferred to the secretary once training is complete.

Program Committee- Mike Corvese

Astronomy Day took place on May 7, 2022. Despite the weather, it is estimated that there were over 200 participants. The breakdown was roughly 150 in person at the Roger Williams Park Museum (final count forthcoming) and 56 people on Zoom and at Seagrave's meeting hall. Feedback sought for ways of improving events. This event is expected to repeat next year.

Open Nights: Current goal is to have an open night every Saturday. The next open night is scheduled for June 18th. President's goal is to have a program every Saturday night. Steve Siok suggested inviting the public to participate after our June 4th meeting.

Off-Site Star Party- Number of events are in the works (volunteers needed): Daisy Scouts program on May 13, 2022 was canceled due to cloudy weather. It has now been rescheduled for Friday, June 3rd. North Scituate Library Star Party is scheduled for June 8th and led out by Bob Janus (rain date: June 9th). Water Fire in Providence is scheduled for June 16, 2022 River Bend Farms coordinated by Francine and scheduled for June 10th. Borders Farm Star Party- Bob Horton is the organizer and will announce dates accordingly

Solar Observing Day- Membership picnic (evening) and Solar Observing day (early afternoon) scheduled for June 18th. In addition to this, members desiring technical assistance/instruction on telescope setup (late afternoon) and later in the evening public observing will be available. Jeff Pedell proposed a white elephant table. Kathy query about accommodations for the picnic. Accommodations will be discussed further during the next program committee meeting.

Member Nights- Goal to have nights strictly for members to set up their telescope or get access to the telescope during a particular weeknight. Plans are in the works.

Dark Field Trips- Tentative weekend field trip in central western Maine on 23-acre property. More info to follow.

Eclipse Trip- Group (annular and total) eclipse trip was also discussed.

Trustee's Report- Bob Janus

May 14, 2022 work party was successful. The objective was to clear brush around the borders of the facility.

The Patton is now in operating condition. It will be ready for the next public night. Queried two roofers but have not received any quotations. Two more roofers will be contacted for assessment and quotes.

Meade 16" tracking problem with the declination motor discovered by Bob Napier; and Mark Munkacsy tried to troubleshoot the problem. Needs further investigation by those with a knowledge of the telescope (Bob Napier, Mark Munkacsy, Jim Crawford and Bob Horton). Bob Janus is suggesting a Zoom session with the individuals listed to discuss a corrective action

plan.

Suggestion for funding for the handicap access ramp has been submitted to the town of Scituate. Rough estimate from one company is as follows: South entrance ramp- \$15,000 | Platform with steps for the North entrance- an additional \$5,000. Steve Hubbard suggested purchasing a ramp from mason that can suit Skyscraper's needs instead of having one built. Linda reminded everyone that it is still too early to make a decision.

Jim Crawford completed the Equipment Inventory and is adding new/donated equipment to the list. As for storage, Dave Huestis suggested recycling materials (magazine/articles) that need to be removed.

Telescope Loans-Bob recommended vetting members who are interested in borrowing the telescope with emphasis on how to operate and take care of the loans. Linda suggested that the trustees put together a plan for loaner items. Steve Siok also suggested a minimum requirement of a year as a member before qualifying for a loaner telescope. Linda countered, saying that new members need loaners the most.

20" Dobsonian telescope- Steve Hubbard mentioned the drawback (heavy, cumbersome, etc.) to holding on to the 20" telescope. He recommended selling it. Steve Hubbard made a motion to sell it. All members present were in favor and the motion passed.

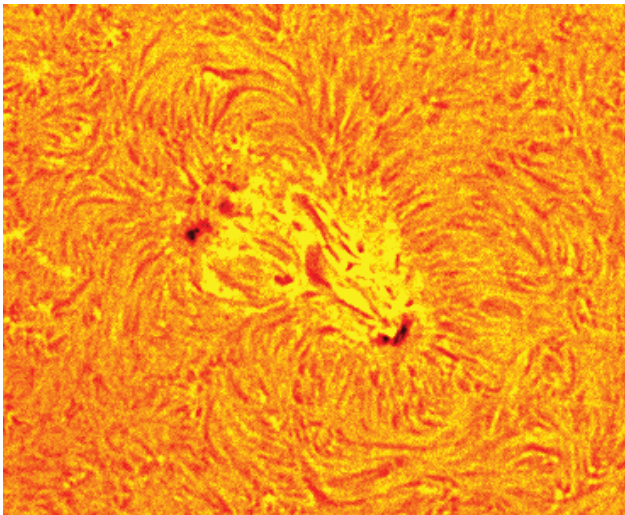
Bob also mentioned that visitors showed up too early for the last public night but this is not due to an incorrect time listed on the Skyscraper's website. For visitors that show up early, Linda suggested showing a video. Steve Siok also suggested allowing visitors to tour the observatory, and view the telescope.

Linda is in the process of assigning duties appropriate to committee members' positions.

Steve Brown suggested a series of 2024 solar eclipse talks (pre and post). Linda asked Ed and Steve Brown to meet and discuss possibilities and come up with a plan.

Next Executive Committee Meeting: June 27, 2022 Adjourned: 8:34PM by Linda Bergemann

Respectfully Submitted, Angella Johnson, May 27, 2022



Solar activity on June 20

Conrad Cardano

Equipment used: Lunt 60mm H-alpha scope on Celestron AVX mount. ZWO ASI 174mm Camera

Process: 1. a 200 frame, 16 bit video was taken every 2 minute for 3 hours. Each frame was 1920 x 1200 pixels in size. 2. This produced 64 separate video files. One was unusable due to clouds. 3. Each file was processed using Autostakkert. Only 20 of the best frames were stacked and sharpened by Autostakkert. This produced 63 separate images. 4. Each image was processed in Astro Art. a. the image was cropped to concentrate just on the filament. b. From the first image, a reference point on the filament was determined. d. For the remaining images, they were shifted accordingly so that the filaments would match.

Finally, all images were strung together and colorized into a single video file using Astro Art. <http://www.theskyscrapers.org/solar-activity-june-20-2022>

Lunar Observing Group Meeting

Every second Monday at 7 PM via Zoom

New participants are welcome to join at anytime. If you are interested in participating in this program, please send an email to corvesemichael@gmail.com



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

The Sun, Moon & Planets in July

This table contains the ephemeris of the objects in the Solar System for each Saturday night in July 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	2	6 44.1	23 03.0	Gem	-26.8	1887.7	-	-	-	1.017	05:15	12:50	20:25
	9	7 12.9	22 22.8	Gem	-26.8	1887.8	-	-	-	1.017	05:19	12:51	20:23
	16	7 41.3	21 23.7	Gem	-26.8	1888.3	-	-	-	1.016	05:25	12:52	20:19
	23	8 09.4	20 06.9	Cnc	-26.8	1889.1	-	-	-	1.016	05:31	12:52	20:13
	30	8 36.9	18 33.6	Cnc	-26.8	1890.3	-	-	-	1.015	05:38	12:52	20:07
Moon	2	8 59.5	21 38.9	Cnc	-9.7	1789.7	32° E	8	-	-	08:14	15:45	23:06
	9	14 34.6	-14 59.7	Lib	-12.3	1944.9	114° E	70	-	-	16:06	21:06	01:59
	16	21 58.9	-18 31.7	Cap	-12.7	1959.8	148° W	93	-	-	22:18	03:23	08:38
	23	3 39.6	19 25.2	Tau	-11.1	1776.9	63° W	27	-	-	01:12	08:47	16:31
	30	9 36.5	18 43.7	Leo	-8.1	1791.6	15° E	2	-	-	07:11	14:29	21:35
Mercury	2	5 33.4	22 27.2	Tau	-0.8	5.9	16° W	75	0.331	1.143	04:10	11:42	19:15
	9	6 33.0	23 43.3	Gem	-1.5	5.3	9° W	92	0.309	1.265	04:37	12:15	19:53
	16	7 38.2	22 59.3	Gem	-2.2	5.1	2° W	100	0.316	1.330	05:19	12:53	20:26
	23	8 40.2	20 12.8	Cnc	-1.5	5.1	7° E	96	0.347	1.330	06:06	13:26	20:46
	30	9 34.4	16 06.0	Leo	-0.8	5.2	14° E	89	0.387	1.285	06:49	13:52	20:54
Venus	2	4 37.3	20 43.8	Tau	-3.8	12.0	29° W	86	0.725	1.410	03:20	10:44	18:08
	9	5 12.9	21 56.0	Tau	-3.8	11.7	28° W	88	0.724	1.448	03:23	10:52	18:21
	16	5 49.2	22 39.1	Tau	-3.8	11.4	26° W	89	0.723	1.483	03:29	11:01	18:33
	23	6 25.9	22 51.2	Gem	-3.8	11.2	24° W	91	0.722	1.516	03:37	11:10	18:42
	30	7 02.7	22 31.2	Gem	-3.8	10.9	22° W	92	0.721	1.547	03:48	11:19	18:50
Mars	2	1 45.6	8 57.8	Psc	0.4	7.2	72° W	86	1.382	1.292	01:15	07:51	14:27
	9	2 04.2	10 41.0	Ari	0.4	7.5	74° W	85	1.384	1.255	01:00	07:42	14:24
	16	2 22.7	12 18.4	Ari	0.3	7.7	76° W	85	1.386	1.218	00:45	07:33	14:21
	23	2 41.1	13 49.3	Ari	0.3	7.9	78° W	85	1.388	1.181	00:30	07:23	14:18
	30	2 59.2	15 13.1	Ari	0.2	8.2	80° W	85	1.392	1.143	00:15	07:14	14:14
1 Ceres	2	7 32.5	26 08.2	Gem	8.6	0.3	11° E	100	2.596	3.585	05:50	13:37	21:24
	9	7 46.2	25 47.1	Gem	8.5	0.3	8° E	100	2.593	3.595	05:37	13:23	21:08
	16	7 59.8	25 22.1	Gem	8.4	0.3	6° E	100	2.590	3.599	05:25	13:09	20:52
	23	8 13.3	24 53.3	Cnc	8.4	0.3	5° W	100	2.587	3.597	05:14	12:55	20:36
	30	8 26.8	24 20.8	Cnc	8.5	0.3	6° W	100	2.584	3.591	05:02	12:41	20:19
Jupiter	2	0 29.8	1 48.5	Cet	-2.3	40.9	93° W	99	4.963	4.812	00:25	06:34	12:43
	9	0 31.8	1 58.9	Cet	-2.4	41.8	99° W	99	4.962	4.705	23:59	06:08	12:18
	16	0 33.2	2 05.7	Cet	-2.4	42.8	105° W	99	4.961	4.600	23:33	05:42	11:52
	23	0 34.0	2 08.8	Cet	-2.5	43.7	111° W	99	4.961	4.497	23:06	05:16	11:25
	30	0 34.3	2 08.2	Cet	-2.5	44.7	118° W	99	4.960	4.400	22:39	04:48	10:58
Saturn	2	21 49.5	-14 26.2	Cap	0.6	18.1	135° W	100	9.880	9.129	22:45	03:54	09:03
	9	21 48.3	-14 33.8	Cap	0.5	18.3	142° W	100	9.878	9.053	22:17	03:25	08:34
	16	21 46.8	-14 42.5	Cap	0.5	18.4	149° W	100	9.877	8.987	21:48	02:56	08:04
	23	21 45.1	-14 52.0	Cap	0.4	18.5	157° W	100	9.875	8.934	21:20	02:27	07:34
	30	21 43.3	-15 02.3	Cap	0.4	18.6	164° W	100	9.873	8.894	20:51	01:58	07:04
Uranus	2	3 01.7	16 47.2	Ari	5.8	3.5	52° W	100	19.697	20.302	02:01	09:05	16:10
	9	3 02.8	16 51.6	Ari	5.8	3.5	59° W	100	19.696	20.204	01:34	08:39	15:44
	16	3 03.7	16 55.5	Ari	5.8	3.5	65° W	100	19.695	20.100	01:07	08:12	15:18
	23	3 04.5	16 58.8	Ari	5.8	3.5	72° W	100	19.694	19.990	00:40	07:46	14:51
	30	3 05.2	17 01.4	Ari	5.8	3.5	78° W	100	19.693	19.875	00:13	07:19	14:25
Neptune	2	23 45.1	-2 53.9	Psc	7.9	2.3	105° W	100	29.917	29.643	23:58	05:49	11:41
	9	23 45.0	-2 54.9	Psc	7.9	2.3	111° W	100	29.916	29.531	23:30	05:22	11:13
	16	23 44.9	-2 56.4	Psc	7.8	2.3	118° W	100	29.916	29.424	23:02	04:54	10:45
	23	23 44.6	-2 58.5	Psc	7.8	2.3	125° W	100	29.916	29.324	22:35	04:26	10:18
	30	23 44.2	-3 01.2	Psc	7.8	2.3	132° W	100	29.916	29.231	22:07	03:58	09:49
Pluto	2	20 01.2	-22 39.9	Sgr	14.3	0.2	162° W	100	34.556	33.586	21:31	02:06	06:41
	9	20 00.6	-22 42.6	Sgr	14.3	0.2	169° W	100	34.560	33.562	21:03	01:38	06:12
	16	19 59.9	-22 45.3	Sgr	14.3	0.2	176° W	100	34.565	33.552	20:35	01:10	05:44
	23	19 59.2	-22 47.9	Sgr	14.3	0.2	176° E	100	34.570	33.556	20:07	00:41	05:16
	30	19 58.5	-22 50.4	Sgr	14.3	0.2	170° E	100	34.574	33.574	19:35	00:09	04:43

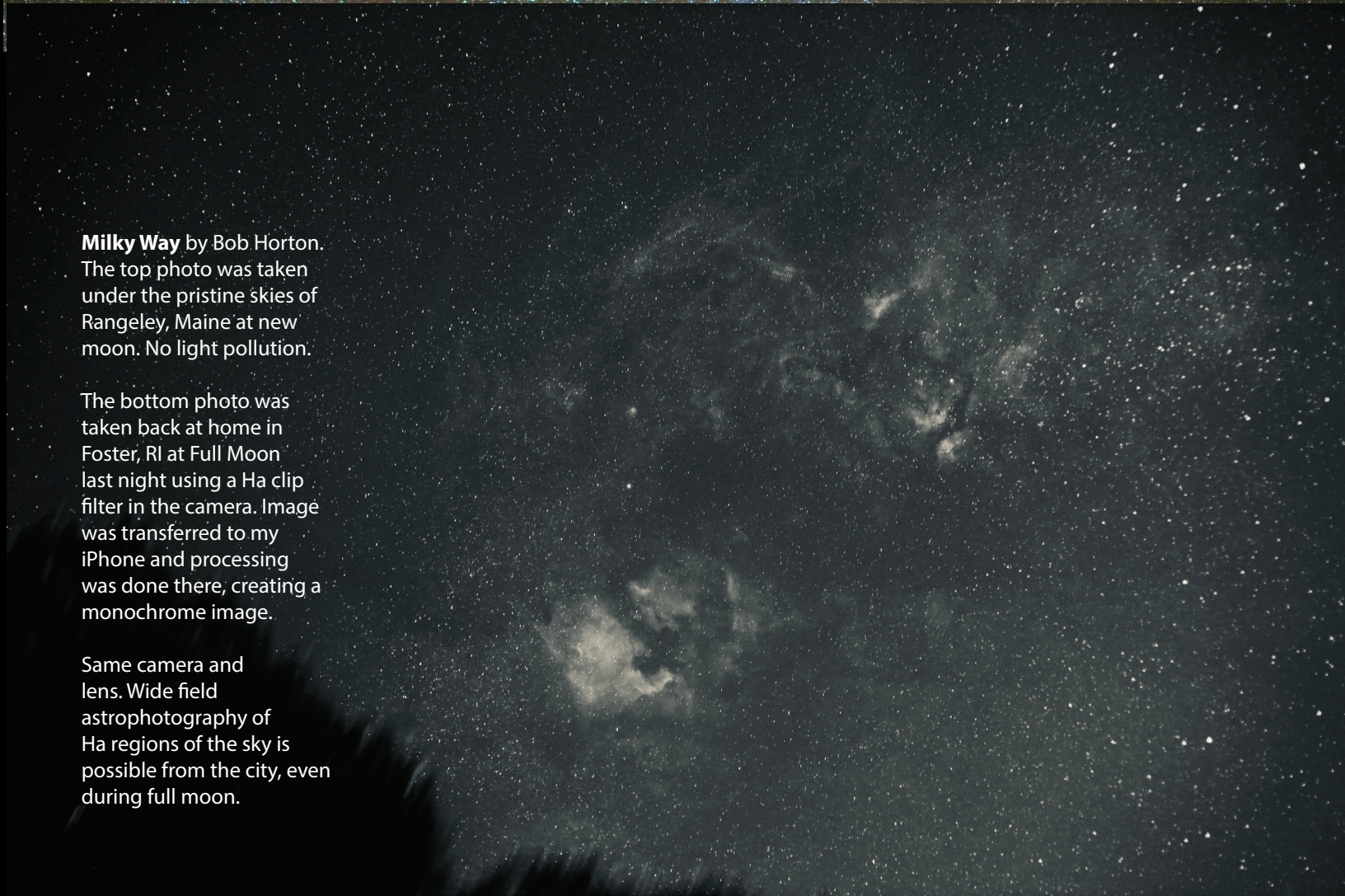


Milky Way by Bob Horton.

The top photo was taken under the pristine skies of Rangeley, Maine at new moon. No light pollution.

The bottom photo was taken back at home in Foster, RI at Full Moon last night using a Ha clip filter in the camera. Image was transferred to my iPhone and processing was done there, creating a monochrome image.

Same camera and lens. Wide field astrophotography of Ha regions of the sky is possible from the city, even during full moon.



STARRY SCOOP

Editor: Kaitlynn Goulette



WHAT'S UP

As Earth continues its journey around the sun, our window to the universe shifts over to the summer region with the spring constellations soon disappearing below the western horizon. Gazing towards the southern sky, Scorpius and Sagittarius can be found, offering stargazers a medley of deep sky targets to observe. This area of the sky is rich in nebulae, galactic clusters, and much more because it's an edge-on view of the Milky Way's central region. Along with the telescopic spectacles, both constellations feature noticeable asterisms: the "Fish Hook" in Scorpius and the "Teapot" in Sagittarius. Just above this area is Ophiuchus, a constellation filled with globular clusters which are always a pleasure to view through a telescope.

The Summer Triangle, comprised of the stars Vega, Deneb, and Altair, dominates the eastern sky. These are the brightest stars in their respective constellations and together form this asterism. The Summer Triangle is an interesting region to observe because it contains a fantastic edge-on view of the Milky Way's spiral arms.

By month's end, Saturn will be rising in the evening sky around 9pm, but for most of the month I recommend observing the planets in the morning sky. Before the sun rises, Venus, Mars, Jupiter, and Saturn span about 120 degrees along the ecliptic, which is the apparent path of the sun, moon, and planets. Watch for the moon passing through this stretch of planets, with its phase changing each night, beginning on the 15th and continuing to the 26th.

Running annually from July 12th to August 23rd is the Delta Aquarid Meteor Shower. It peaks this month on the night of the 28th and into the morning of the 29th. This shower produces up to 20 meteors an hour. Its peak coincides with the new moon, which gives us darker viewing conditions. Meteors radiate from the constellation Aquarius but can appear anywhere in the sky. For best viewing, find yourself away from light pollution after midnight.

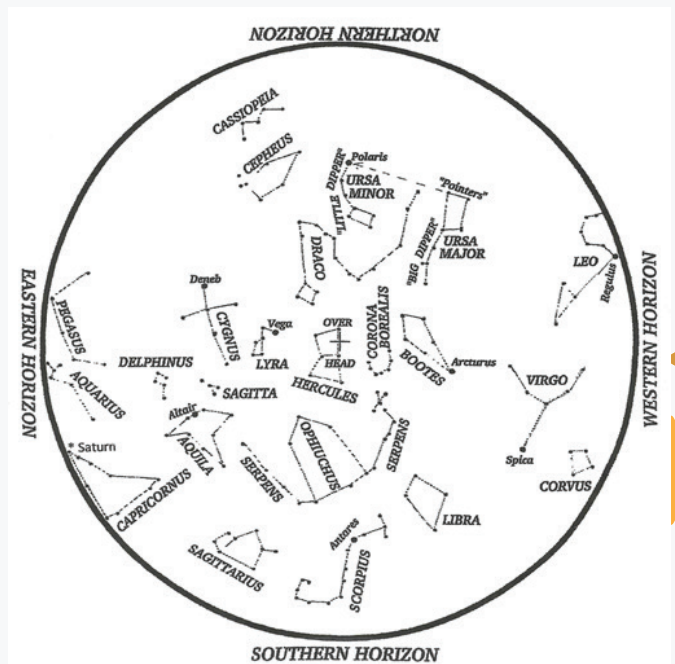
Independence Day marks the 25-year anniversary of Sojourner arriving at Mars aboard the Pathfinder spacecraft. It landed using airbags and parachutes, the first time this system was utilized. The airbags enveloped Pathfinder and were used to "bounce" the rover to a safe landing. It touched down in Ares Vallis, an ancient outflow channel, after bouncing about 16 times. Sojourner then became the first wheeled rover to be deployed on Mars. It was designed to last about a week but operated for 85 days and was considered a great success. It was cost effective and taught us about the geological and atmospheric conditions on Mars.

JULY'S SKY

13: Full Moon

28: New Moon

28-29: Delta Aquarid Meteor Shower Peak



Credit: Roger B. Culver

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

OBSERVATIONS

With school vacation upon us, my father and I took advantage of some clear evenings at the Arunah Hill Natural Science Center, where we were able to observe many interesting deep sky objects into the wee hours of the morning. Arunah Hill is a dark-sky site in Cummington, MA, that offers wonderful conditions for observing the night sky.

One night my father and I observed with our telescope alongside club member Austin Burt, who was using his 15-inch Dobsonian telescope. We observed many objects throughout the Sagittarius, Scorpius, and Ophiuchus region, along with numerous targets scattered throughout the rest of the sky. It was fun to compare the view from each telescope. We viewed many globular clusters and nebulae and with Austin's O-III filter, the contrast of the cosmic gas clouds was amazing.

Highlights of those nights included the Box Nebula (NGC6309), M22, the Eagle Nebula (M16), the Lagoon Nebula (M8), the Trifid Nebula (M20), M4, Bode's Nebula (M81), and the Cigar Galaxy (M82). My favorite target was the Swan Nebula (M17) which, through Austin's 15-inch telescope, was breathtaking at high power.

We've also been periodically heading outside before dawn to view the planets. Recently at Arunah Hill, my father and I woke up early to see these worlds lined up along the ecliptic with the crescent moon amongst them. Mercury was obscured by the trees, but we caught Venus and the moon just above the treeline. Further along the ecliptic was Mars, Jupiter, and Saturn. All five naked eye planets were visible in the same order as their distance from the sun. I hope you all got to see this rare planetary spectacle!



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!

OBJECT OF THE MONTH

This month's featured object is the Sagittarius Star Cloud, designated Messier 24 (M24). This object is a gap in the nearby interstellar dust of our galaxy that allows millions of distant stars to be seen, as if looking through a tunnel. This "window" is about 300 light-years across and allows you to see stars over 10,000 light-years away. It's the densest collection of individual stars visible with binoculars.

The Sagittarius Star Cloud is visible with the unaided eye, but using binoculars enhances the view. In dark skies, the star-patch appears about three times the size of the full moon.

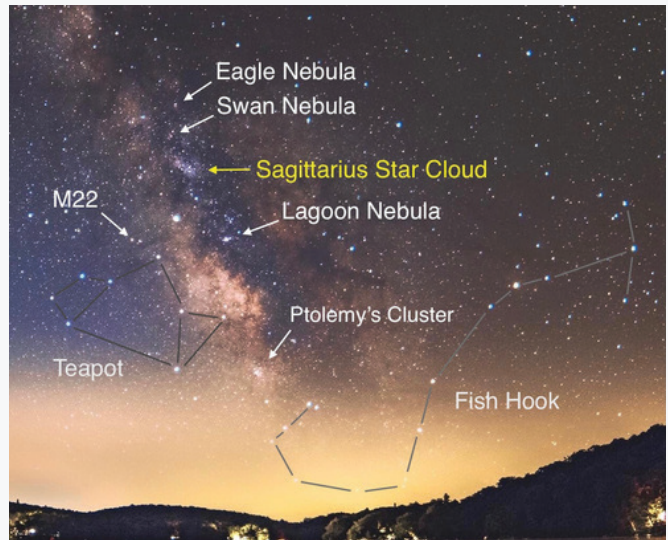


Photo by John Nardacci



The pink sunset glow projected through the earth's atmosphere, known as the Belt of Venus, and the earth's shadow rise in the east as the sun sets in the opposite direction over Arunah Hill.

Photo by Kaitlynn Goulette

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