



# The W.A.S.P.



Volume 55 Issue 8

August 2023

**The Warren Astronomical Society Publication**



# The WASP

Published by  
Warren Astronomical Society, Inc.  
P.O. Box 1505  
Warren, Michigan 48090-1505

Dale Thieme, Editor

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The Warren Astronomical Society, Inc., is a local, non-profit organization of amateur astronomers. The Society holds meetings on the first Monday and third Thursday of each month, starting at 7:00 p.m.

First Monday meeting:	Third Thursday meeting:
Cranbrook: Institute of Science	Macomb Community College
1221 North Woodward Ave	South campus, Bldg. J, Room J221
Bloomfield Hills, Michigan	14600 Twelve Mile Rd.
	Warren, Michigan

## Membership and Annual Dues

Student	Individual	Senior Citizen	for families
\$17.00	\$30.00	\$22.00	add \$7.00

Astronomical League (optional) \$7.50

Send membership applications and dues to the treasurer:

**c/o Warren Astronomical Society, Inc.**

**P.O. Box 1505**

**Warren, Michigan 48090-1505**

Pay at the meetings

Also via PayPal (send funds to treasurer@warrenastro.org)

- Among the many benefits of membership are
- Loaner telescopes (with deposit). See 2nd VP.
- Free copy of each WASP newsletter.
- Free use of Stargate Observatory.
- Special interest subgroups. See chairpersons.

The Warren Astronomical Society Publication (WASP) is the official monthly publication of the Society.

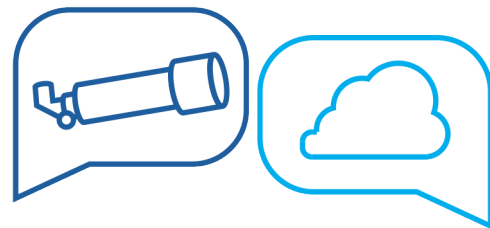
Articles for inclusion in the WASP are strongly encouraged and should be submitted to the editor on or before the end of each month. Any format of submission is accepted. Materials can either be transmitted in person, via US Mail, or by email (publications@warrenastro.org)

Disclaimer: The articles presented herein represent the opinion of their authors and are not necessarily the opinion of the Warren Astronomical Society or this editor. The WASP reserves the right to edit or deny publication of any submission.

Stargate Observatory is owned and operated by the Society. Located on the grounds of Camp Rotary on 29 Mile Road, 1.8 miles east of Romeo Plank Road, Stargate features an 8-inch refractor telescope under a steel dome. The observatory is open according to the open house schedule published by the 2nd VP.

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## Discussion Group Meeting

Come on over, and talk astronomy, space news, and what-not!





# Field of View

High atop [Mt. Horace Greeley](#) near Eagle Harbor, in Michigan's beautiful Keweenaw Peninsula, is a Cold War-Era Air Force station that was abandoned in 1988. The [Calumet Air Force Station](#) operated as part of a radar surveillance network for nearly 40 years, and now its buildings are moldering and weathered with age.

The site was recently [auctioned-off](#) - a majority was purchased by a group of Michigan Tech graduates and their families and friends, and a smaller parcel was purchased by Dale Sulak, a GT buddy of mine. GT is short for "General Technics" - they're a group of teckies, engineers and scientists that have met at science fiction conventions for decades; GT also meets up in the Keweenaw Peninsula for a weekend in late July. Br. Guy is a part of GT too!

Our GT group met at Dale's parcel for a picnic - it's surrounded by tall Ground-to-Air Transmit and Receive (GATR) antennas. A webcam was installed on one of the towers during the picnic, and I was told that Dale intends on installing an all-sky fireball camera - at 1540 ft above sea level, AND on towers above the treetops, the site could not be more perfect for that!



Image: Building and GATR Towers at Dale Sulak's parcel. Credit: Todd Johnson



I walked over to the Air Force station building where members from the [Open Skies Project](#) were congregated - those are the folks that bought the majority of the site. I met with [Ian Sorensen](#) - he told me that they had just received a grant to start cleaning the place up - they'll start with cleaning out buildings, filling up dumpsters and boarding-up windows.

Ian told me that the skies at the site are amazingly dark, and they are planning on hosting a dark sky event in a couple weeks, and more in the future. Ian was agreeable to speaking to the WAS about the project.

The buildings at the site are completely unlivable in their current state, and if you want to go through them, you have to sign a waiver; tent camping, RVs or a nearby hotel are your sleeping options. I do have high hopes that the site will be renovated and made into a more visitor-friendly historic site, and I fully expect to see the Open Skies Project apply for an IDA Dark Sky Site designation in the future.

This will be yet another reason to visit the Copper Country - beautifully dark skies at night, and countless lakes, waterfalls, beaches and ruins to explore during the day - AND you can visit the [Keweenaw Rocket Range](#) (but only if you have a beefy off-road vehicle).

**Bob Trembley,**  
President





# Observation Reports

## 4 July

**The Sun.** 4 groups, 1 in southern hemisphere, Waldmeier "G". Two of others "C".

Transparency fair, seeing excellent.

5-cm. refractor @ 45X, Mylar filter.

## 4-5 July

Just past meridian but muddy tan. No stars visible at zenith. Circum-full Moon very low on ecliptic this summer: Phase reached on 3rd, the same day as greatest Declination S. @ 27 deg. 48 min. (*OBS. HAND.*)

Transparency poor.

Naked eye.

## 6-7 July

**XX Persei.** Finally observed ~ 5 weeks after needed. 8.1 in twilight.

**Jupiter.** "Venus" of morning sky. With Callisto at western elongation, well-spaced satellite array. Io sole moon at E. In deep twilight, Callisto's blue cast suppressed. Belts approaching equal density, but N.E.B. dominant.

Transparency poor (+Moon), seeing fair.

4" f/ 10 refractor, 16" f/ 10 S-C @ 185X (Veen Obs'y)

## 7 July.

**The Sun.** Six groups, all though distribution makes some confusion in whether Old Cycle or N. S. 2nd most prominent group: near centre, Waldmeier "D". Others de minimis, "A" or "B". Remarkable is big spot near E. limb with well developed umbra/ penumbra, N. hemis. Umbra might be bifurcated. No pores or even "A" class solitaries near-by.

5-cm. f/11 refractor @ 45X, Mylar aperture filter.

## 9 July

**The Sun.** Large spot, supra, well on disc after ~ 40 hrs., less fore-shortened. Multiple umbrae. Still no minor spots in neighbourhood. 7 groups (?), a "D" and a "C", others "B" or "A". Busy photosphere but only 3-4 groups of note. Again, not easy to establish which Cycle for all groups.

Instrumentation as before.

## 9 - 10 July

**Var. stars in far southern Cyg.** Despite atmosphere, mostly long period variables, req. much time.

Transparency very turbid (+ Moon), seeing fair.

16" f/10 S-C, Veen Obs'y. 350X.

## 10 - 11 June

**Var. stars in Cyg, Oph, Sge.** Sky condition\ much improved in 24 hr. Good readings.

Transparency good before moon-rise, seeing good.

16-in. Sch. - Cass. 180X, 350X. @ Veen Obs'y.

.....  
COMMENTARY: Uneven utility in charts. Some stars much more imp. so fainter receive less attn. RX and RW Sagittae a challenge (long per. variables): Very crowded fields. Both less than 10 deg. from Galactic Aequator. Fainter comp. stars far from target, with very faint ones absent, requiring extrapolation from unrelated star charts. Photometry for chart makers lacking, hence a challenge in the field.

## 15-16 July.

**Sky condition.** At 08.30 U.T. examined situation in S.E. Kent Co. Sky seemed cloudless. Jupiter easily visible, but zenith star judging by Vega (0.0) approx. 1.0.

Transparency poor, worst in more than 10 d.

Naked eye.

## 17 June.

**The Sun.** 6 groups across the disc. Large solitary (previous) with fragmented umbra nearing W. limb, whilst on opposite limb a new group, possibly Waldmeier "D". Approx. centre: a classic "C". additionally Waldmeier "D", "B", and a "A" standing well alone and nearly missed.

Transparency good all be it low, seeing good.

Instrumentation as before.

## 18-19 June.

**Variable stars in Perseus.** Two neighbours, XX and U, both bright. Deployment on PY Per (U Germ class) foiled by twilight.

Transparency fair.

4-in. f/10 refractor @ Veen Obs'y.

## 20 July

**The Sun.** Photosphere covered, 6 groups, full taxonomy. At centre: classic Waldmeier "E". 3 "C" groups incl. specimen @ east limb possibly very extensive. 1 Waldmeier "D". 1 de minimis "A" deep in southern hemis.

Transparency fair, seeing good.

Instrumentation as before.

.....  
COMMENTARY: Last year, K. Tapping on premature predictions, declining sun-spot activity based upon Cycles 23 and 24: Are we heading for an other Maunder or Dalton Minimum? "[O]n the basis of Cycle 25 so far, that [will not] be happening this cycle, or probably the one after that". *2023 OBS. HAND.*, 185.

## 20-21 July

**PY Persei.** Below 14.2 by extrapolation. Difficult.

Transparency fair + cloud.

16" f/10 Mighty Borr II, Veen Obs'y

## 23 July

**The Sun.** Six groups distributed over disc. Straddling centre



are two prominent formations, a Waldmeier "C" and "D". What appears a "J", on east limb.

Transparency fair.

Instrumentation as before.

.....  
COMMENTARY: Solar situation is "maximum" mode. Observer can not recall last report with no sun-spots.

## Dispatch From the Front

### SECOND OUTREACH FIASCO IN MANISTEE

*"It was the best of times. It was the worst of times".*

-- Charles Dickens

The forty-fourth parallel is where southern Michigan peters out, and the Great North begins. There is some thing in the air -- or possibly less -- as the night sky unfolds with "Bortle" this or that. We canoodle about a Bortle number at my old northern Michigan venue, but in beautiful down-town Manistee, expectations are far less. Sky at best indifferent, the fall back position is "side-walk astronomy", a form of missionary service.

The auld sod: I did most of the cooking. Slept in a "room with a view" (per E. M. Forster). Bortle number *wunderbar*. Big telescopes. Million dollars (U.S.) of engineering talent in the *dramatis personae*, or if you will, the cast of characters. Movies limited to *Murders at the Observatory* by Marron. Wearisome political conservatism.

Manistee: I do some of the cooking. Sleep in the "dog room" with no view at all. Bortle sky = zip. My 6-cm. refractor, often the object of derision, even contempt. Hostess of formidable erudition *sans* a scrap of engineering talent. Tiresome vintage films by Chabrol, but good ones by other foreign directors if one chooses with care. Wearisome political liberalism.

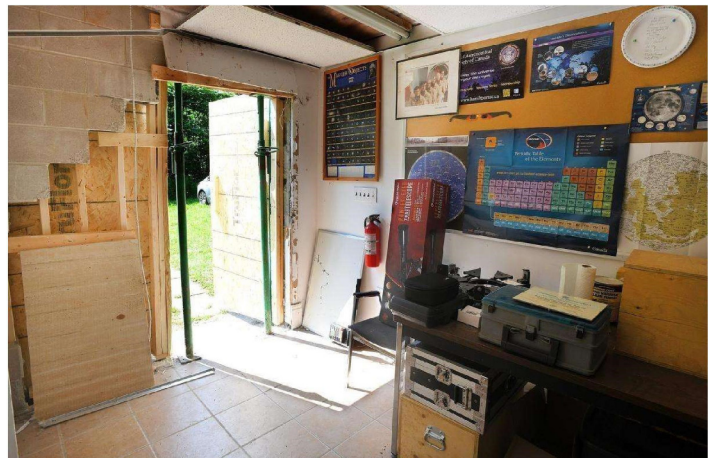
In preparation, I perused the National Weather Service website to find that window of opportunity. As my parents would say, Manistee is "not around the corner". Thought I had it "nailed". Then prospects deteriorated, so commensurately the outreach plans were nailed -- to the Cross.

Tuesday the 25th was the best shot, but the sky suffering from a) fugitive Canadian smoke, b) good old-fashioned clouds, and sank like the proverbial lead sinker. The refractor with its wonderfully modified tripod never left the car. My opportunity to play John Dobson and Bob Berta as "side-walk" *maven* was gone with the (proverbial and literal) wind. As the old saying goes, or possibly not: When given lemons, make lemonade. Next possible shot at Warren Society outreach in this burg is Orthodox Christmas. Given Michigan climate, pray for me.

**G. M. ROSS,**

Greatest Observer in Michigan and friend to Man.

# Calamity in Canada



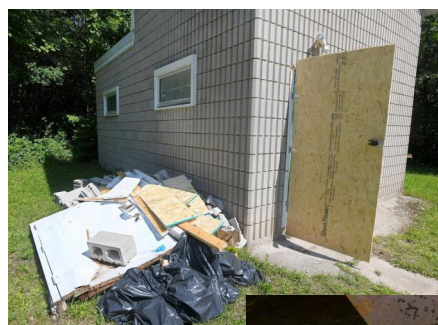
Supports hold the doorway of one of the buildings after it was severely damaged during the break-in.

Vandalism at a Hamilton observatory caused thousands of dollars in damage.

Nothing was taken, but the local chapter of the Royal Astronomical Society of Canada estimates damages to buildings and equipment - including a \$50,000 telescope will amount to more than \$150,000.

If you wish to contribute to restoration, they have set up a [Go Fund Me](#) account to raise funds for repairs.

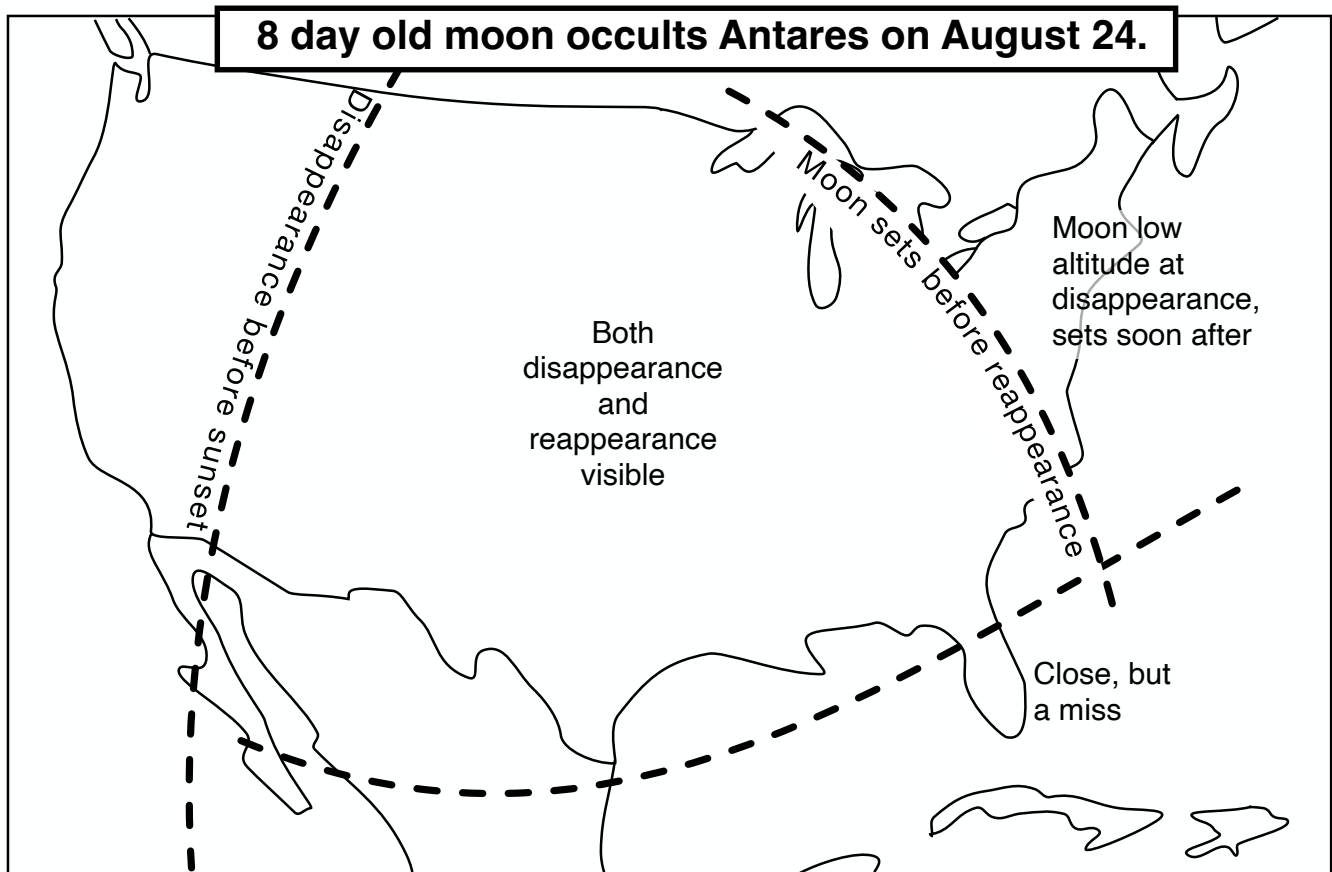
The original story appears in the [Hamilton Spectator](#).



Photos from Barry Gray / The Hamilton Spectator

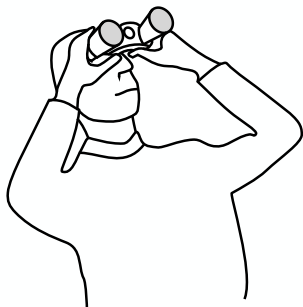


If you can see only one celestial event this August, see this one.

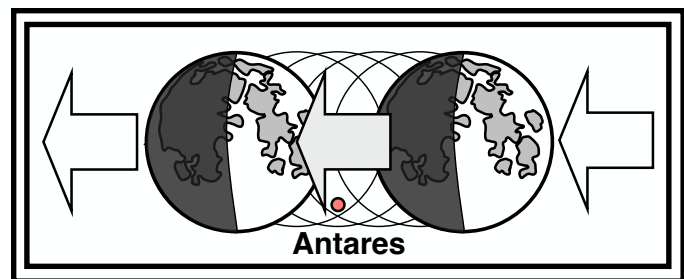
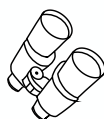


The full occultation event on Aug. 24 of Antares by the moon occurs for the central part of the US. Both coasts will not see the complete event. For disappearance and reappearance times in your area, visit the International Occultation Timing Association webpage:

<http://lunar-occultations.com/iota/bstar/0824zc2366.htm>



Start looking in the southwest shortly after sunset on August 24. Watch the moon slowly approach Antares, then suddenly block it. Binoculars will give better view.



Occultations demonstrate the moon's eastward orbital motion as Earth's rotation causes it to move in a westward arc across the night sky.

# 51 Pegasi b

By Tab Ahmad

Discovered in 1995, 51 Pegasi b is officially named Dimidium and is an extra-solar planet approximately 50 LY from Earth. It lies in the constellation Pegasus and circles the star 51 Pegasi. 51 Pegasi b was the first confirmed exoplanet to be discovered orbiting a sun-like star. 51 Pegasi is a 5th magnitude star.

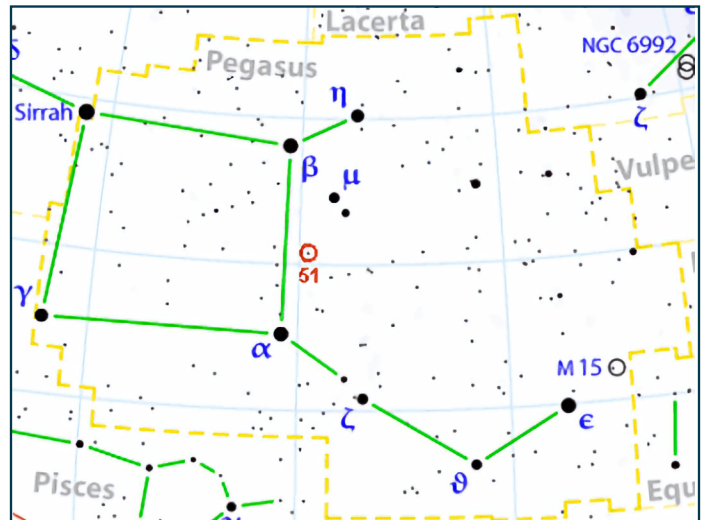
In 2019, discoverers Michel Mayor and Didier Queloz were awarded and shared the Nobel Prize in Physics. 51 Pegasi b is about 50% larger than Jupiter but with only 47% as much mass. The planet's distance from its parent star is only 4.8 million miles and the orbital period is 102 hours. So, its year lasts about 4 days. As a reference, Mercury orbits our Sun at a distance of 36 million miles.

The radius of the planet is 84,400 miles and the orbital speed is 300,000 mph.

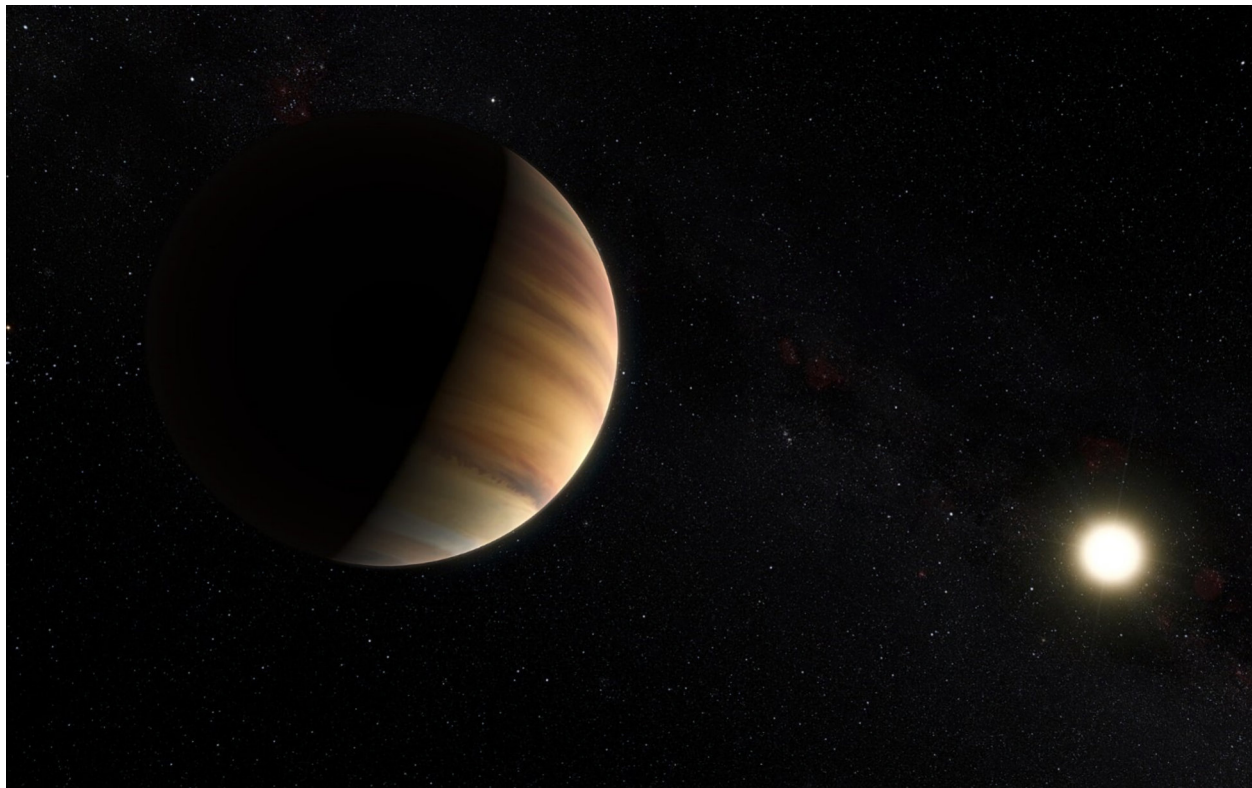
The radial velocity method was used to discover the planet.

52 Pegasi b was the first known "hot Jupiter". This is a gas giant planet that orbits extremely close to its star. Many other hot Jupiters have been discovered since. In 2017 traces of water vapor were found in the planet's atmosphere. This planet is tidally locked as are most hot Jupiter's.

*Image credits: Wikipedia*



*Sky Location*



*Artist's rendition of 51 Pegasi b with 51 Pegasi*



# Astronomy at the Beach

*Michigan's largest FREE astronomy event!*  
 MI license plate "recreation passport" required (or get one at gate for \$17)

## Look through BIG telescopes

Space images display, interactive science demonstrations,  
 vendors, local clubs

For schedule and details go to our Facebook page or [glaac.org](http://glaac.org)

**Kent Lake Beach, Island Lake State Recreation Area, Brighton**  
**September 22 & 23, 2023 4pm-midnight**

## Call for Volunteers

Put September 22-23 on your calendar. The largest public astronomy event in Michigan will bring in thousands of astronomy and space enthusiasts. **WE NEED YOUR TELESCOPE!** We've had as many as 70 telescopes at Island Lake State Rec Area (Brighton) and want to break that record. To support the "Scavenger Hunt" we'll showcase the first quarter moon, Saturn, double stars (Albireo), clusters (M11 and M13), nebulae (Lagoon and Eagle) and a galaxy (M51 or M31). As in previous years, you'll have a glow sign to tell what you are pointing at.

Newbie? Bring your scope and friendly colleagues will help you get it running smoothly.

No scope? We STILL need volunteers to point the public in the right direction, hand out Scavenger Hunt prizes, and other important tasks. (Email me if you want to volunteer.)

### IF CLOUDY

The show still goes on! Our theme this year is "Getting Ready for the Eclipse", and we have talks starting in the big tent at 7pm. Keynote speakers at 8. The popular Gemini simulator will join us again, along with astronomy club tables, Michigan Science Center live demonstrations, astropics, and a food vendor.

Here is our Facebook Event, so please hit "Going" and pass it on!

<https://fb.me/e/1qZb0uzeM>

Or if you prefer, our website:

<https://www.glaac.org/astronomy-at-the-beach-2023/>

### OBSERVING FIELD DETAILS

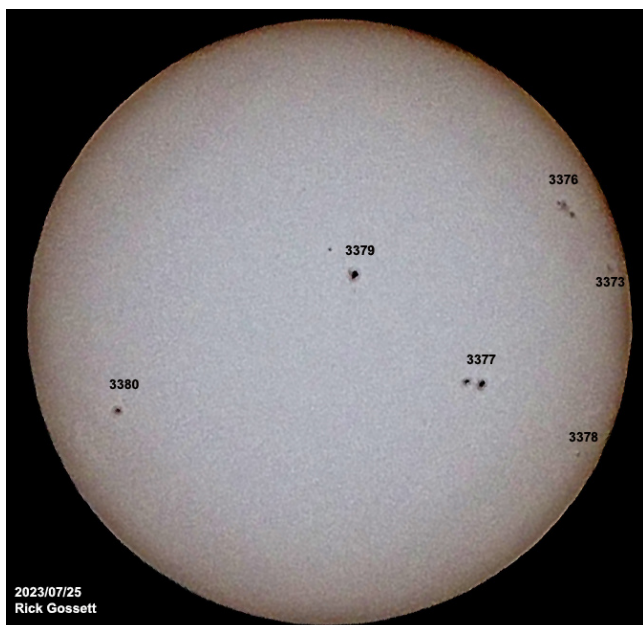
The scopes will be set up along the Kent Lake Beach, and between the beach and the parking lot. Same as in previous years. Also, you'll have to bring your own electrons, as we do not have enough plugs for dozens of telescopes. Ask me for a site map if you need one.





# WAS Astrophotos

**Venus seems to preside over last night's sunset.**  
Date Taken: July 7, 2023 (at sunset)  
Photographer: Ray Bosshard



If you are observing the Sun at all this year, July and August are excellent months to do it. The Sun has been very active this year. Rick Gossett.

## Call for Calendar Images

We are getting ready to assemble our WAS 2024 Calendar. We need your astro-images, artwork, and sketches for the calendar. Please send a high resolution JPG or TIFF to [publications@warrenastro.org](mailto:publications@warrenastro.org) for consideration by the calendar committee. Deadline is August 31st.



*A sample of past images in our calendars*

# The View From C.W. Sirius Observatory

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## Markarian's Chain of Galaxies

Markarian's Chain is a stretch of galaxies that forms part of the Virgo Cluster, in the constellation Virgo. When viewed from Earth, the galaxies lie along a smoothly curved line. Charles Messier first discovered two of the galaxies, M84 and M86, in 1781. The other galaxies seen in the chain were discovered by William Herschel and are now known primarily by their catalog numbers in John Louis Emil Dreyer's New General Catalog or NGC, published in 1888.

The chain was ultimately named after the Soviet astrophysicist, Benjamin Markarian, who discovered their common motion in the early 1960s.

Member galaxies include M84 (NGC 4374), M86 (NGC 4406), NGC 4477, NGC 4473, NGC 4461, NGC 4458, NGC 4438 and NGC 4435. Near the center you can see the pair of interacting galaxies NGC 4438 and NGC 4435, about 50 million light-years away, also known to some as Markarian's Eyes.

At least seven galaxies in the chain appear to move coherently, although others appear to be superposed by chance. Six of the points on the chain can be marked by galaxies. The other two points are pairs of galaxies.

The 2 large elliptical galaxies M86 and M86 can be seen on the right. If you look close at the photo, you can see many, many more small galaxies in the field. Virgo is known for its huge number of galaxy fields. It's interesting that all of these galaxies appear to be close to each other, but they are actually millions of light-years apart.



I took this image back in May when Virgo was high in the sky. Using the 11" SCT and a ZWO 2600, one-shot color camera, with a total of 4 hours of integration time.

Galaxies M86 and M84 can be seen through smaller telescopes, while viewing through a larger scope in darker skies can reveal many of the "faint fuzzy" galaxies that are in the photo. So put this one on your observing list for next spring and see how many faint galaxies you can see using a wide field (low power) eyepiece.



### About CW Sirius Observatory

C.W. (Cadillac West) Sirius Observatory is located 15 west of Cadillac Michigan. Owned and operated by WAS member Bill Beers. The dome is an 8' Clear Skies Inc dome which houses an 11" f/10 SCT telescope, a 102mm f/7 refractor telescope, Celestron CGEM DX mount, and uses an ASI ZWO 071 color CMOS camera, as well as a QHY8L color CCD camera. The telescope can be remotely operated from inside Bill's house.

Anyone interested in learning about astrophotography, or any questions regarding equipment, or how to take astrophotos using your iPhones, or any related questions, can contact Bill at: BEEZOL-L@AOL.COM





# Presentations

## Cranbrook

August 7, 2023 7:00PM

### Main Talk

## The History and Science of James Lick and his Observatory

By Dr Paul Lynam

A presentation on the life and times of James Lick and how he came to establish the world's first permanently-occupied high elevation astronomical observatory. The later part of the talk will highlight some of Lick Observatory's scientific "greatest hits" and the observatory's on-going contributions to cutting-edge research and technology.

### About the Speaker

Paul Lynam is an astronomer at Lick Observatory, a multi-campus research unit of the University of California, providing state-of-the-art research facilities.



An amateur astronomer since childhood, Paul has traveled worldwide to work with forefront observatories. Educated in the UK, he investigated the effect of meteoroids on space platforms, advising operators (e.g. NASA) to modify on-orbit operations of the Space Shuttle and Hubble Space Telescope

(HST). Paul received a Ph.D in 2000 for research involving Brightest Cluster Galaxies and 'cosmic flows'. Subsequently, he worked at the Max-Planck-Institute (Germany) and then at the Very Large Telescope in Chile.

### Short talk

## Locating Apollo Landing Sites

By Jeff MacLeod

When you look at the Moon through a telescope you probably notice some pretty interesting crater/mountains/valleys etc. But you might also have some Apollo landing sites in the eyepiece, you just need to know where to look. Jeff MacLeod will break down how to crater hop your way to each Apollo landing site. In doing so, he will also discuss the limitations and difficulties of this exercise..

### About the Speaker

Jeff MacLeod is a former WAS president, current observatory chair, and a regular at outreach events as well as behind the podium. During his time at Wayne State, he was a presenter in their Planetarium while getting a bachelor's in physics and another in astronomy. Jeff recently started work in the aerospace sec-



tor simulating missiles (the rest is classified). Nowadays most of his free time is spent working on his space-flight simulator, a life size recreation of a Gemini spacecraft you can actually fly in.

## Macomb

August 17, 2023 7:00PM

### Feature

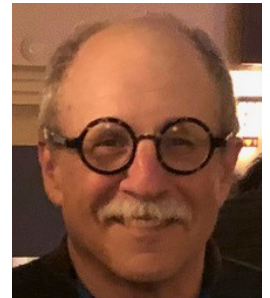
## The History of the Telescope

By Ken Bertin

Follow along as we follow the development of the telescope, tracing back to Ptolemy. The actual first telescope made by Dutch Oculist Hans Lippershey in 1608, utilized by Galileo to discover the phases of Venus and the four large moons of Jupiter, moving through the development of the reflector telescope in the late 1600s. The presentation moves right through the recent development of sophisticated land based scopes and space telescopes like Kepler and Hubble, and of course the James Webb Telescope and other newer equipment.

### About the Speaker

Ken Bertin is a hobbyist astronomer for about 70 years, Past President and VEEP of WAS, Searle Award recipient and awarded a Lifetime WAS membership. He has traveled to observe 12 Total Solar Eclipses, 4 Annular eclipses, 6 Transits of Mercury, 2 transits of Venus, and 17 Lunar eclipses. He has written over a hundred presentations (mostly about historical figures in astronomy), all of which have been presented to the WAS. He has and is also presenting to other astronomy clubs and organizations (such as senior groups, Mensa society and other type clubs), school at all levels and libraries and is currently presenting online.



## WAS PRESENTATIONS

If you would like to present either a short talk (10-15 minutes) or a full-length talk (45-60 minutes) at a future meeting, please email Dale Partin at: [firstvp@warrenastro.org](mailto:firstvp@warrenastro.org).



## NGC 663

One of the first astronomy books I ever read was John Benson Sidgwick's *Introducing Astronomy*. The book was published in 1959, a year after his death. In it was a large section in which each constellation was introduced, along with interesting things to see in each one. I particularly recall Cassiopeia, in which, between the two fainter stars Delta and Epsilon Cassiopeiae, lies the open cluster NGC 663. I first saw that cluster during the late summer of 1962. All Sidgwick had to say about it was that it can be spotted through binoculars. It didn't look like much, but I did spot it and then promptly forgot about it for more than sixty years. The other night, while conducting my search for comets, I encountered this star cluster again. This time it was one of the loveliest things I have ever seen. It moved me to tears.

I have since learned that NGC 663 is a grouping of about four hundred mostly big, bright, bluish suns. On a really dark night it might even be visible with the naked eye. An unusual feature is that the cluster happens to be positioned directly in front of a molecular cloud, which somehow blocks the background stars and allows the cluster to be even more beautiful. In a field of view already rich with stars in the Milky Way, the cluster stands out like a heavenly flower filled with diamonds.

I do have more to say about Sidgwick. In my youth I considered him a famous astronomer, but he is known mostly for the few books he wrote, especially *Introducing Astronomy*. Sidgwick enjoyed wide interests. He loved to hitchhike across the United States and Canada, and he edited a book of the shorter poems of Walter Savage Landor's shorter poems. Landor, Sidgwick's subject, had an unusual life, getting expelled both from Rugby School and from Oxford, where he allegedly shot a gun in his dormitory room. Reading about him led me to his delightful poem "The Evening Star:"

Thy star O Venus! often changes

Its radiant seat above,

The chilling pole-star never ranges—

'Tis thus with Hate and Love.

And 'tis thus I return to NGC 663, a cluster of stars that warms my heart. Where have I been for the last sixty years, religiously watching the sky, searching successfully for comets, enjoying many far-off stars and galaxies, but largely ignoring one of Nature's most wondrous splendors?



NGC 663

Image: Dominique and Gerald MacKenzie.





# Over the Moon



with Rik Hill

## Mons Rumker

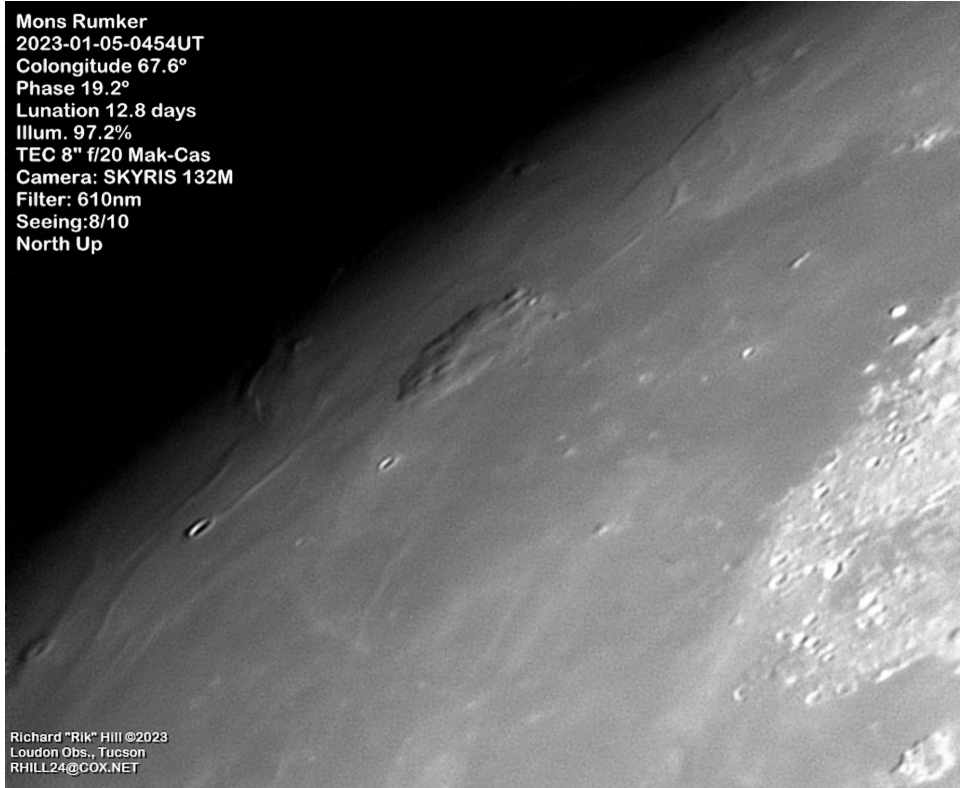
Here we have one of the more peculiar of features on the moon located in the north of Oceanus Procellarum. Looking like a blob of cheese that has dripped off of a hot pizza, it's actually several dozen blobs of solidified lava some with summit pits or craters, rather than the proverbial green cheese. The elevation of these domes (similar to shield volcanoes on the Earth) is only 1100m near the middle of the mass has a diameter of some 70 km (or 70,000m). A gentle rise indeed! As you can see here, the very highest portion is just south of center with a couple more local rises south of that. China's Chang'e-5 mission landed very near Mons Rumker on Dec. 1, 2020 and returned 1.73g of samples from Procellarum on Dec. 16.

You can see this feature when the moon is but one or two days short of full depending on libration. I would urge you to put Mons Rumker on your Lunar Bucket list!

This image was made from one 1800 frame AVI stacked with AVIStack2 (IDL) and then finish processed with GIMP and IrfanView.

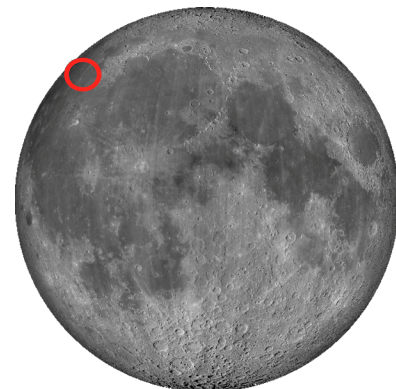
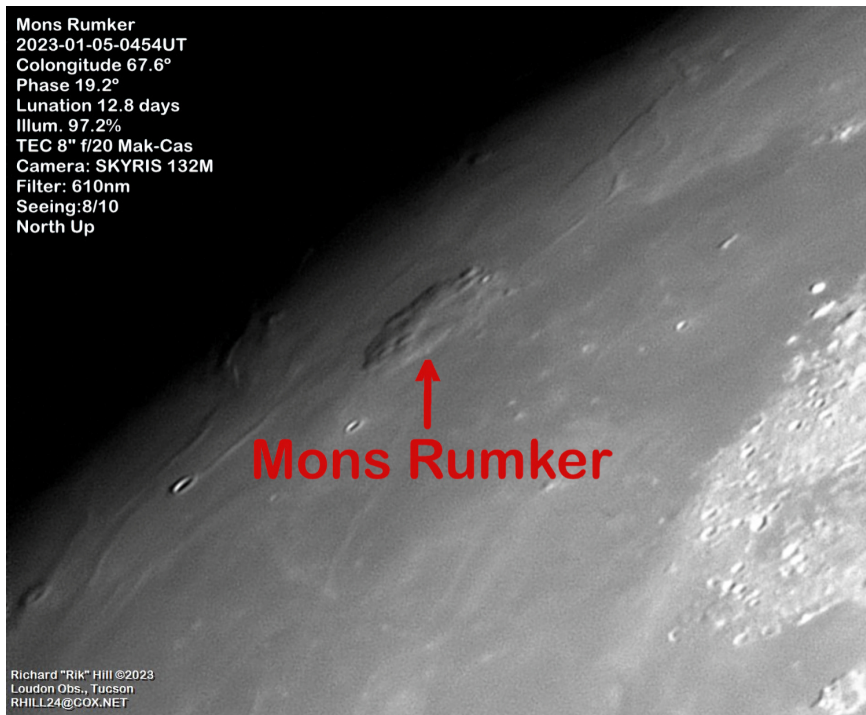
Mons Rumker  
2023-01-05-0454UT  
Colongitude 67.6°  
Phase 19.2°  
Lunation 12.8 days  
Illum. 97.2%  
TEC 8" f/20 Mak-Cas  
Camera: SKYRIS 132M  
Filter: 610nm  
Seeing:8/10  
North Up

Richard "Rik" Hill ©2023  
Loudon Obs., Tucson  
RHILL24@COX.NET



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Richard "Rik" Hill ©2023  
Loudon Obs., Tucson  
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Location Maps by Ralph DeCew

# History S.I.G.



## August 1990

The Capital Area Astronomy Club's inaugural Astroganza and Star Bowl is covered in "Astroganza Report" by Star Bowl team captain, Tom Maclaney.

Club activity is duly recorded in the meeting notes: Cranbrook: May 3, June 7; Macomb: May 17, and June 21.

"Delta Cephei" is described by R. Stephen Franks (a frequent contributor as noted in last month's memorial.)

Nancy Rowe (featured in "Chasing the Eclipse", a video Doug Bock shared with us in the June 2021 Cranbrook meeting) rounds out the issue with "The Dobsonian Telescope and The Astronomer John Dobson".

## August 2000

Once again, an online web-based issue (they tend to be rather brief, and this was no exception). Astro Chatter by Larry Kalinowski leads off this issue and New Members receive a welcome by Joe Van Poucker. We finish up with a short report on "Selfridge ANG Base Day Camp" by Joe Van Poucker, complete with some lovely pictures.

## From the Scanning Room News bulletin:



While piecing together the chronology of the WASP's publication, I came across a gap of three months in 2003 where there was no evidence of a newsletter. Based on what I found at the time, I surmised that one editor left off

doing the newsletter as he was off to college, and no one picked up the baton until three months had passed and Cliff Jones stepped in to save the day. Boy howdy, was I wrong. Now that I have yet another new printer/scanner, I sought to try it out and went back into Jim Shedlowsky's collection to a box I hadn't examined before. There I found the three missing months, edited by Cliff Jones.

In the May 2003 issue, he points out that the online version is in full color and that anyone with internet access should go to that one as it shows a full color NASA image that didn't translate that well in the black and white version mailed out. With that in mind I plan to reproduce the issue in a full color PDF.

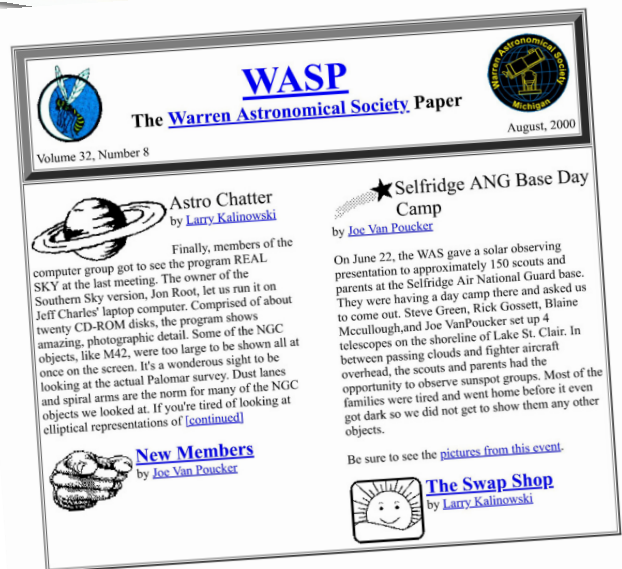
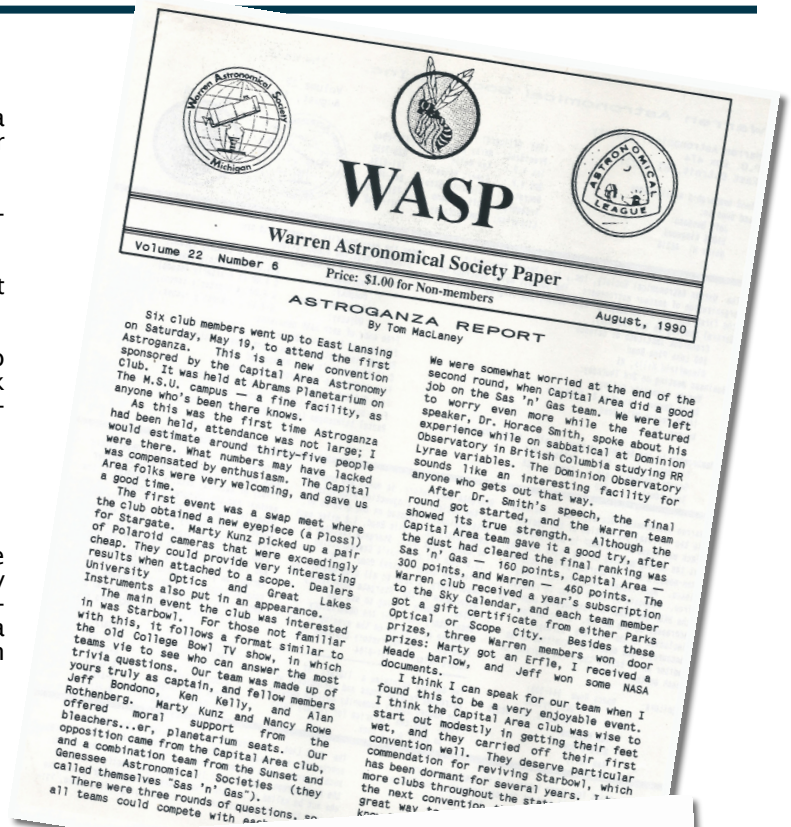
**Dale Thieme,  
Chief scanner**

### Update:

Since penning the above news bulletin, I've scanned in the May-July 2003 issues, digitized them as PDFs and uploaded them to the newsletter archives. They can be found in the [2000s directory](#) marked "New" (for the next month or so.)

### Up-ended Update:

Turns out the January-April issues were printed as well. OK, back to the scanner.



### Astro Chatter, continued

galaxies and nebulae, or letters and numbers where those objects should be on your planetarium programs, this is the program to have. Serious observers wouldn't be satisfied with anything else.

Here's one more mention of the upcoming Kensington, GLAAC, public star party on July 21 & 22. If this newsletter reaches you before it happens. All the astronomy clubs in southern Michigan will have some representatives and telescopes there. The WAS needs all the help it can get. If you have the free time to be there on Friday, Saturday or both days, come on over and show off your 'scope or give someone else some relief time. Comet Linear S4 is expected to draw quite a crowd. Since it'll be a third or fourth magnitude object, small telescopes and binoculars will be needed for observations.

The July computer meeting will be held at Gary Gathen's home on Thursday, the 27th. His address is 21 Elm





Gary Klein - Geminid Meteor Streak from Sterling Hgts

# August 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		FULL MOON	Moon at Perigee: 357311 km			
6	7	8	9	10	11	12
	Cranbrook					
13	14	15	16	17	18	19
Perseid Meteor Shower			NEW MOON Moon at Apogee: 406635 km	Macomb		
20	21	22	23	24	25	26
						Stargate Open House
27	28	29	30	31		
Saturn at Opposition			FULL MOON Moon at Perigee: 357182 km			

# AUGUST 2023

## Notable Sky Happenings

Aug. 1 - 7

There are two Full Moons this month; the second is called a Blue Moon. Moon is below Saturn on the 3rd (SSW predawn).

Aug. 8 - 14





Bright "star" at the lower right of the Moon on the 8th is Jupiter (ESE predawn). Perseid meteors peak between midnight and dawn on the 12th-13th. Expect 60+ "shooting stars" per hour in a dark sky.

Aug. 15 - 21

The bright "star" to the left of the Moon on the 20th \*is\* a star: Spica in Virgo (WSW evening).

Aug. 22 - 31

Moon is to the right of Antares on the 24th. It occults that star at 10:34 PM EDT (Detroit). (The star reappears at 11:37 PM, but occurs only 3.4 degrees above the SW horizon.)

Aug. 1 & 30	Aug. 8	Aug. 16	Aug. 27
			
Full Moon	Last Quarter	New Moon	First Quarter

## Now Showing

"Cosmic Mashups: Gravity, Galaxies, and Supermassive Black Holes"

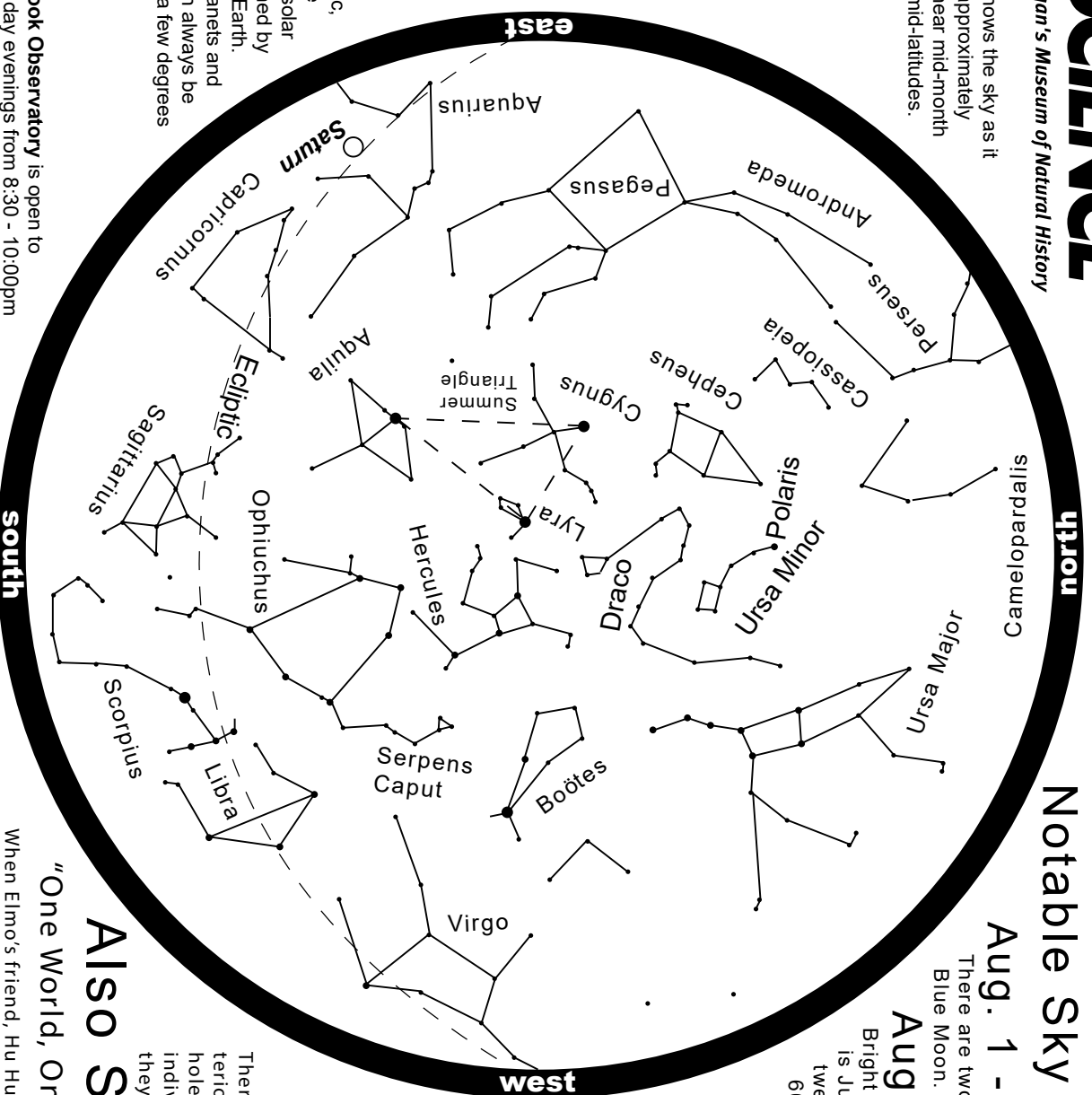
There's more to the night sky than what we see: Mysterious objects like black holes. Supermassive black holes are found in the cores of most galaxies. Massive individual stars can become black holes as well, and they're believed to be scattered throughout galaxies.

## Also Showing

"One World, One Sky: Big Bird's Adventure"

When Elmo's friend, Hu Hu Zhu, visits from China. Big Bird, Elmo and Hu Hu Zhu take viewers on an exciting discovery of the Sun, Moon, and stars. They learn about the Big Dipper and the North Star and take an imaginary trip to the Moon where they learn that the Moon is a very different place.

For astronomy information visit <http://science.cranbrook.edu>



What is that dashed line? It's the ecliptic, the reference plane of the solar system, defined by the Sun and Earth. The major planets and the Moon can always be found within a few degrees of this plane.

This chart shows the sky as it appears at approximately 10pm EDT near mid-month at northern mid-latitudes.

The Cranbrook Observatory is open to the public Friday evenings from 8:30 - 10:00pm EDT, and the first Sunday of the month from 1:00 - 4:00pm for solar viewing.

For observatory information visit <http://science.cranbrook.edu/explore/observatory>




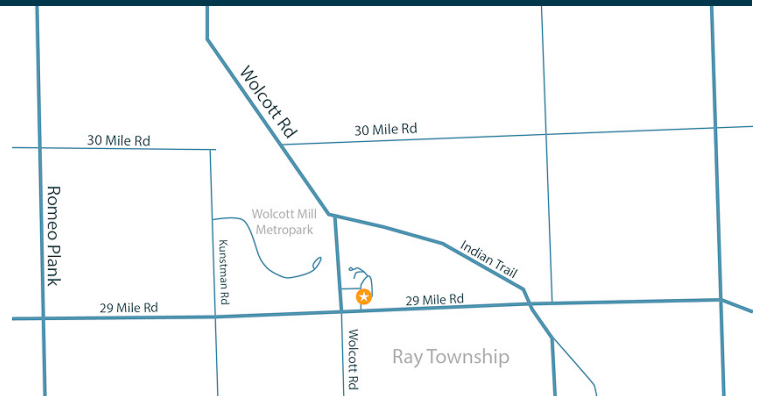


# Stargate Observatory

## Monthly Free Astronomy Open House and Star Party 8:00 PM, 4<sup>th</sup> Saturday of the Month Wolcott Mill Park - Camp Rotary Entrance

**Advisory:** Concerns are circulating in the amateur astronomy community about a possibility of COVID-19 being passed from one person to another via contact of different persons' eyes with a telescope eyepiece. Sharing telescopes may be considered by some to be high-risk due to the possibility of eyes touching eyepieces. Masks are encouraged, mandatory for children.

- Sky tours.
- See different telescope types in operation.
- Get help with your telescope.
- We can schedule special presentations and outings for scouts, student or community groups.
- Contact: [outreach@warrenastro.org](mailto:outreach@warrenastro.org)
- Find us on Meetup.com 



20505 29 Mile Rd (1.8 miles east of Romeo Plank Rd) Ray, MI 48096  
82° 55'04" West Longitude, 42° 45'29" North Latitude

## Observatory Rules:

- Closing time depends on weather, etc.
- May be closed one hour after opening time if no members arrive within the first hour.
- Contact the 2nd VP for other arrangements, such as late arrival time. Call 586-909-2052.
- An alternate person may be appointed to open.
- Members may arrive before or stay after the scheduled open house time.
- Dates are subject to change or cancellation depending on weather or staff availability.
- Postings to the Yahoo Group and/or email no later than 2 hours before starting time in case of date change or cancellation.
- It is best to call or email the 2nd VP at least 2 hours before the posted opening with any questions. Later emails may not be receivable ([secondvp@warrenastro.org](mailto:secondvp@warrenastro.org)).
- Generally, only strong rain or snow will prevent the open house... the plan is to be there even if it is clouded over. Often, the weather is cloudy, but it clears up as the evening progresses.

# Stargate Report

## July Open House:

The night started very cloudy and even a bout of rain, but Riyadh kept saying 30 more minutes and eventually he was right. around 10pm the sky opened and we started observing. Waxing crescent moon, M57, M27, Alberio, were all seen before I left around midnight. Riyadh closed down the observatory for me around 2am! I believe they waited for Saturn to rise. We had 6 members and 15 visitors through the doors.

## August Open House:

Scheduled for Saturday the 26th 8pm. I should finally be able to bring the Spaceship Simulator out.

## Observatory:

the Metropark installed our new message board on the observatory, we just need to fill it with cool astronomy/club stuff.

# Treasury Report

## Treasurer's Report for July 31, 2023

### BOA account:

Balance:..... \$28,826.88  
 Received:..... 36.50  
 Expense ..... 0.00

### PayPal Account:

Balance:..... \$58.82  
 Received:..... 0.00  
 Paid ..... 0.00

### Membership

We welcome new member Zachary Seeds.

Total Paid Memberships ..... 102

### Notes from the Treasury:

The treasury continues to be steady, with one or two new members a month. Is it time to renew your membership? Every New Year, many memberships expire. Please let me know via email at [treasurer@warrenastro.org](mailto:treasurer@warrenastro.org) to verify your membership status. When you receive your membership flyer in the mail, fill it out and send it to: Warren Astronomical Society, P.O. Box 1505, Warren, Michigan 48090-1505. We strongly recommend using PayPal for faster service, but we also accept checks and cash at the meetings."

Good news for new memberships: from July 1 to the end of the year, all new memberships are good until December 31, 2024.

The process for ordering a physical copy of Sky & Telescope has changed, and prices have gone up above \$40 per

## Astronomical Events For August 2023

Add one hour for Daylight Saving Time

Source:

<http://astropixels.com/almanac/almanac21/almanac2023est.html>

Date	Time (h:m)	Event
1	13:31	FULL MOON
2	0:52	Moon at Perigee: 357311 km
3	5:21	Saturn 2.5°N of Moon
6	21:46	Moon at Ascending Node
7	19:00	Venus at Aphelion
8	4:41	Jupiter 2.9°S of Moon
8	5:28	LAST QUARTER MOON
9	7:16	Pleiades 1.5°N of Moon
9	21:00	Mercury at Greatest Elong: 27.4°E
10	13:00	Mercury at Aphelion
13	2:00	Perseid Meteor Shower
13	3:00	Mercury 4.7°S of Mars
13	6:00	Venus at Inferior Conjunction
13	16:36	Pollux 1.7°N of Moon
16	4:38	NEW MOON
16	6:55	Moon at Apogee: 406635 km
18	18:06	Mars 2.2°S of Moon
21	4:28	Spica 2.6°S of Moon
21	11:23	Moon at Descending Node
24	4:57	FIRST QUARTER MOON
24	20:29	Antares 1.1°S of Moon
27	3:00	Saturn at Opposition
30	10:51	Moon at Perigee: 357182 km
30	13:03	Saturn 2.5°N of Moon
30	20:35	FULL MOON

year for a member of an astronomy club. Please let me know via email at [treasurer@warrenastro.org](mailto:treasurer@warrenastro.org) if you would like more information.

**Adrian Bradley,**  
Treasurer

# Meeting Minutes

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## WARREN ASTRONOMICAL SOCIETY

### BOARD MEETING (VIRTUAL)

JULY 3, 2023 6:30PM

Meeting called to order at 6:32 PM. Officers present: President Bob Trembley, 1st VP Dale Partin, Secretary Mark Kedzior, Treasurer Adrian Bradley, Outreach Chair Kevin McLaughlin, Publications Chair Dale Thieme (quorum present).

#### Officer Reports:

**President's Report:** Follow-up to last month's discussion on moving start times for both the Cranbrook and Maccomb meetings to 7 PM. The new effective start time of 7 PM will be initiated at the July 20th Maccomb meeting. With the new start time the WAS Board would meet one hour before the Cranbrook meeting, but the board discussed and agreed to meet virtually the Monday before the scheduled Cranbrook meeting beginning at 7PM. The board felt that this would help provide more time to discuss business in earnest without curtailing discussion in order to start the Cranbrook meeting on time. Stargate Message Board - Bob Trembley will deliver to Stargate this week for Metro Park personnel to install on the north wall of the observatory. The WAS Library is being relocated to Marty Kunz' residence from Jonathan Kade/Diane Hall's residence and is about 50% complete in the transfer.

1st VP Dale Partin reported that speakers have been lined up to the end of the year.

2nd VP Jeff MacLeod not present for Observatory report.

Treasurer Adrian Bradley reported \$29 K in WAS account and detailed report can be found in July WASP.

Outreach Chair Kevin McLaughlin reported on a request for telescopes for an event to be held at Kensington Metropark on August 26 from 8PM to 12 midnight.

Publications Chair Dale Thieme reports the July WASP is up on line.

#### NEW BUSINESS:

WAS Annual Picnic discussion - picnic to be held Saturday, July 29, in the reserved pavilion (pavilion was unable to be reserved from the original scheduled picnic date of August 26). Officers attending are expected to arrive around 4PM and the picnic will officially start at 5:30PM. The club will provide burgers, hot dogs, condiments and sodas, while attendees are requested to bring a side dish to pass.

Bob Trembley will contact Cranbrook to provide dates for our 2024 meeting dates at their venue.

WAS Annual Awards Banquet discussion - a venue needs to be reserved for our scheduled awards banquet date on Thursday, December 7th. Mark Kedzior will inquire at the Ukrainian Cultural Center in Warren and the Polish American Century Club in Sterling Heights for availability of December dates and will report back to board via email for date approval.

WAS Jackets - Adrian Bradley will check with University Lowbrows on their vendor of choice to get WAS jackets to order for members.

Motion to adjourn by Dale Partin - second by Dale Thieme. Motion passed. Meeting ended at 7:13 PM.

Respectfully submitted,

**Mark Kedzior**  
Secretary, WAS

## WARREN ASTRONOMICAL SOCIETY

### CRANBROOK (Virtual) MEETING

JULY 3, 2023 7:30PM

Meeting called to order for Cranbrook virtual meeting at 7:30PM by President Bob Trembley. Persons in attendance: Zoom - 20 & YouTube - 6 @ 8:30PM).

#### OFFICER REPORTS:

President Bob Trembley reported on the latest astronomy news. 1st VP Dale Partin gave speaker update through end of year. 2nd VP - (for Jeff MacLeod) - Riyad Matti reported on the June Open House and Stargate visitors. Treasurer Adrian Bradley gave treasury report & Astronomical League report (both found in July WASP) - also reported on astronomical items available for purchase from the Dr. Phil Martin estate. Publications Chair Dale Thieme reported the July WASP is up on-line.

#### SPECIAL INTEREST GROUPS:

David Levy reports on his solar observation of an active sun and read a poem from John Keats. Double Star Group - Riyad Matti reported on observing selected double stars with visitors at the June Open House.

#### OBSERVING REPORTS:

Adrian Bradley reported on his recent observing/imaging attempts.

#### SHORT PRESENTATION:

Dr. Dale Partin's short presentation "The Euclid Mission", provided attendees facts and figures on the mission of this space telescope, launched July 1, 2023 on a Falcon 9 rocket. This dedicated survey telescope will measure shapes, positions, and distances over 1/3 of the entire sky, avoiding the planes of the Milky Way and the Solar System. It will be able to detect galaxies at a distance of 10 billion light years. Data collection will take place for six years, with initial data release expected in 2.5 years for analysis. Questions and discussion followed his presentation. To see his presentation in its entirety, go to:

<https://www.youtube.com/warrenastro>

#### MAIN PRESENTATION:

Dr. Brian Ottum presented "The Inky Black Skies of Big Bend National Park". A twenty-five-hour drive from metro Detroit, Dr. Brian gave a travel tour of this area in southwest Texas, complete with images of the night skies. This particular area is where he will be planning

to observe the upcoming April 8, 2024 total solar eclipse. Questions and discussion followed his presentation. To see his presentation in its entirety, go to:

<https://www.youtube.com/warrenastro>

Meeting ended at 9:30 PM.

Respectfully submitted,

**Mark Kedzior**  
Secretary, WAS

## WARREN ASTRONOMICAL SOCIETY

### MACOMB(Hybrid)MEETING

**JULY 20, 2023 7:00PM**

(54th Anniversary of Apollo 11 Moon Landing)

Meeting called to order at 7:40 PM at Macomb, Room E208, by 1st Vice President Dale Partin. Attendance - 10 - Zoom - 8 & YouTube - 7.

1st VP Dale Partin opened meeting with latest astronomical news, then gave brief rundown on board officer reports: 2024 WAS Calendar needs submissions for publication deadline, treasury report found in WASP, WAS Annual Picnic will be held Saturday, July 29 at 5:30 PM at Wolcott Mill Pavilion near the Stargate Observatory, Astronomy at the Beach will be held September 22-23, and the offices of Publications, Secretary and Treasurer are term-limited - if interested in running for election for any of these positions, contact any board member. 2nd VP Jeff MacLeod reported next Open House is July 22nd.

### SPECIAL INTEREST GROUPS:

Solar - Bob Berta reported on recent solar activity - hopes there will be solar scopes set up at picnic. History - Dale Thieme reported on WASP Archives - most missing issues occur in the 1990's. Astrophotography - Bob Berta shared solar video images he took - also showed deep sky images he took with narrow band filter from back yard with light pollution of IC 1318 in Cygnus.

Discussion on recent auroras - 1st time visitor Charlie Strackfine (sp?) attended meeting.

### MAIN PRESENTATION:

Ken Zoll, founder and Executive Director Emeritus of the Verde Valley Archaeology Center and Museum in Camp Verde, Arizona, presented "Ancient Astronomy of Central Arizona". In Ken's presentation he described his eight-year study of ancient sites that led to the discovery of several astronomical observation sites created between 1000 and 1350 CE by the ancestral Pueblo cultures, including his three-year study of ancient astronomical features of the Casa Malpais National Historic Landmark in Springerville, Arizona.

Questions and discussion followed his very informative presentation. To see his presentation in its entirety, go to:

<https://www.youtube.com/warrenastro>

Meeting ended at 8:55 PM.

Respectfully submitted,

**Mark Kedzior**  
Secretary, WAS

## GASTRONOMICAL REPORT - WAS 2024 ANNUAL PICNIC

**JULY 29, 2023**

The Warren Astronomical Society held its Annual Club Picnic at the Wolcott Mill Metro Park pavilion near the Stargate Observatory on Saturday, July 29, 2023, at 5:30 PM. The weather was beautiful with a nice breeze to keep all comfortable. A total of twenty persons were in attendance. The WAS provided grilled burgers, hot dogs (with chili sauce and diced onion to make coney's), along with condiments and a selection of soda flavors for liquid refreshments. Attendees brought side dishes of desserts and salads to pass along to round out the meal. During the picnic, attendees were able to do solar observing through Mark Kedzior's Lunt 60MM H Alpha telescope and were able to view the latest solar activity of numerous prominences, sunspots and active regions on our nearest star. Family members of former WAS member Lee Hartwell attended and brought some of Lee's astronomical gear from his estate to display and sell to interested members (any inquiries on particulars or information regarding items being sold are asked to contact club member Bob Berta, who is assisting the family with the sale). As the picnic festivities were coming to a close, Riyadh Matti headed over to Stargate to open dome and set up the K2 Refractor for attendees to observe through.

Many thanks to Outreach Chair Kevin McLaughlin and club members Mike O'Dowd, Riyadh Matti and Ken Bertin for their assistance in either the setting up or cleanup of the pavilion for this successful event that was enjoyed by all who attended.

Respectfully submitted,

**Mark Kedzior**  
Secretary & der Grillmeister  
WAS

## Join the Astronomical League



The mission of the Astronomical League is to promote the science of Astronomy. The major benefit of belonging to this organization is receiving the quarterly newsletter, The Reflector, which keeps you in touch with amateur activities all over the country.

Also:

- Participate in the Observing Program
- Avail yourself of the League Store
- Astronomy Books at a discount
- Attend Astronomical League Conventions

Only \$7.50 annually,  
(Membership starts July 1)

[alcor@warrenastro.org](mailto:alcor@warrenastro.org)





The Warren Astronomical Society is a proud member of the

# Great Lakes Association of Astronomy Clubs

GLAAC is an association of amateur astronomy clubs in Southeastern Michigan who have banded together to provide enjoyable, family-oriented activities that focus on astronomy and space sciences.

Club Name and Website	City	Meeting Times
Astronomy Club at Eastern Michigan	University Ypsilanti/EMU	Every Thursday at 7:30PM in 402 Sherzer
Capital Area Astronomy Club	MSU/Abrams Planetarium	First Wednesday of each month 7:30 PM
Farmington Community Stargazers	Farmington Hills	Members: Last Tuesday of the month Public observing: 2nd Tuesday of the month
Ford Amateur Astronomy Club	Dearborn	Fourth Thursday of every month (except November and December) at 7:00 PM
McMath-Hulbert Astronomy Society	Lake Angelus	Board and paid members-First Sunday of the month
Oakland Astronomy Club	Rochester	Second Sunday of every month (except May)
Seven Ponds Astronomy Club	Dryden	Monthly: generally the Saturday closest to new Moon
Sunset Astronomical Society	Bay City/Delta College Planetarium	Second Friday of every month
University Lowbrow Astronomers	Ann Arbor	Third Friday of every month
Warren Astronomical Society	Bloomfield Hills/Cranbrook & Warren/MCC	First Monday & third Thursday of every month 7:30 PM

## Club and Society Newsletters

Warren Astronomical Society:	<a href="http://www.warrenastro.org/was/newsletter/">http://www.warrenastro.org/was/newsletter/</a>
Oakland Astronomy Club:	<a href="http://oaklandastronomy.net/">http://oaklandastronomy.net/</a>
McMath-Hulbert Astronomy Club	<a href="http://www.mcmathhulbert.org/solar/newsletter/">http://www.mcmathhulbert.org/solar/newsletter/</a>
Ford Amateur Astronomy Club:	<a href="http://www.fordastronomyclub.com/starstuff/index.html">http://www.fordastronomyclub.com/starstuff/index.html</a>
University Lowbrow Astronomers:	<a href="http://www.umich.edu/~lowbrows/reflections/">http://www.umich.edu/~lowbrows/reflections/</a>

## WAS Member Websites

Steven Aggas: <http://apache-sitgreaves.org/>

Jon Blum: [Astronomy at JonRosie](#)

Doug Bock:

Facebook: Northern Cross Observatory: <https://www.facebook.com/NorthernCrossObservatory>

Boon Hill and NCO Discussion <https://www.facebook.com/groups/369811479741758>

Flickr (astrophotography album): <https://www.flickr.com/photos/141833769@N05/>

YouTube channel: <https://www.youtube.com/channel/UC-gG8v41t39oc-bL0TgPS6w>

Bob Trembley:

<https://www.vaticanobservatory.org/profile/rtrembley>

[Vatican Observatory Foundation Blog](#)



This article is distributed by NASA's Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit [nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov) to find local clubs, events, and more!

## Super Blue Sturgeon Moon

Vivian White

On August 1st, catch a **full Moon** rising in the east just 30 minutes after sunset. We are seeing the entire sunlit side of the Moon as it is nearly (but not quite) in line with the Sun and Earth. The Farmers Almanac calls this month's Moon the "Sturgeon Moon", for the time of year when this giant fish was once abundant in the Great Lakes. Cultures around the world give full Moons special names, often related to growing seasons or celebrations.

As the Moon rises later and later each night, the bright sunlit part appears to get smaller or "wane" - we call this a waning **gibbous Moon**. About a week later, on August 8th, we see only one half of the Moon alight. At this phase, the Moon rises around midnight and sets around noon. Have you ever seen the Moon in the daytime? You may notice this phase towards the southwest in the morning sky. Hold up a ball or egg beside it and see how the Sun lights up the same part.

By August 16th, the Moon has gone through its crescent phase and is now only showing its dark side towards the Earth. Did you know the **dark side** and the **far side** of the Moon are different? The Moon always shows the same face towards Earth due to the gravitational pull of Earth, so the far side of the Moon was only viewed by humans for the first time in 1968 with the Apollo 8 mission. However, the dark side is pointed at us almost all the time. As the Moon

orbits the Earth, the sunlit side changes slowly until the full dark side is facing us during a **new Moon**. When the Moon is just a small crescent, you can sometimes even see the light of an **Earthshine** reflecting off Earth and lighting up the dark side of the Moon faintly.

Then as the Moon reappears, making a waxing (or growing) **crescent Moon**, best seen in the afternoons. By the time it reaches the first quarter on August 24th, we see the other half of the Moon lit up. At this point, the Moon passes through Earth's orbit and marks the spot where the Earth was just 3 hours prior. It takes the Earth about 3 hours to move the distance between the Moon and Earth.

The Moon on August 30th is referred to as a blue moon. **Blue moons** are not actually blue in color of course; it refers to the second full Moon in any month. Since it takes 29.5 days to complete the cycle from full to new and back to full, most months will see only one. But occasionally, you'll fit two into one month, hence the phrase "once in a blue moon." We see a blue moon about once every 3 years on average - next in May 2026. In addition, this full Moon appears larger in the sky than any other full Moon this year - an unofficial **supermoon**. A supermoon appears larger than average because it is closer in its slightly elliptical orbit. The difference in apparent size between the smallest and largest full Moon is about the size difference between a quarter and a nickel. Even at its largest, you can always cover the whole Moon with your pinky extended at arm's length.

Follow the Moon with us this month and keep a Moon journal if you like - you may be surprised what you discover! [moon.nasa.gov/moon-observation](https://moon.nasa.gov/moon-observation)



Image of waning crescent Moon shown next to a ball on a stick that is lit by the Sun on the same side as the Moon, with trees and a blue sky in the background. Try this with an egg or any round object when you see the Moon during the day! Credit: Vivian White



Earthshine as seen from the International Space Station with the sun just set - Astronaut Photograph ISS028-E-20073 was taken on July 31, 2011, and is provided by the ISS Crew Earth Observations Facility and the Earth Science and Remote Sensing Unit, Johnson Space Center