



Celebrating Sixty Years of the Warren Astronomical Society

The W.A.S.P.



Vol. 53, no. 10

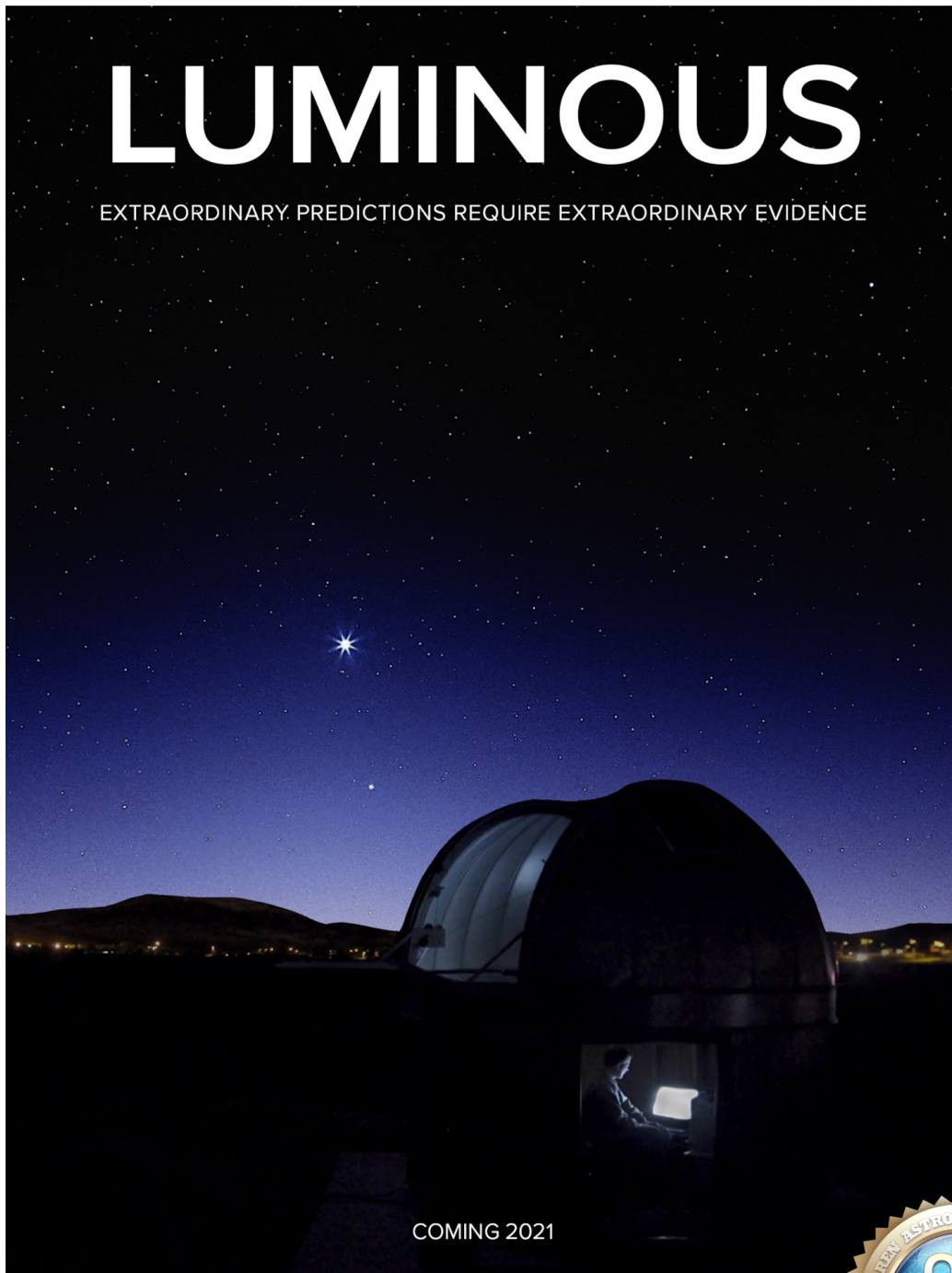
Winner of the Astronomical League's 2021 Mabel Sterns Award

October 2021

The Warren Astronomical Society Publication

LUMINOUS

EXTRAORDINARY PREDICTIONS REQUIRE EXTRAORDINARY EVIDENCE



COMING 2021

Special W.A.S. Screening
See page 16, this issue



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 7:30 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.

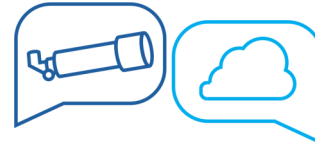
The Warren Astronomical Society Publication (WASP) is the official monthly publication of the Society. Articles for inclusion in the WASP are strongly encouraged and should be submitted to the editor on or before the end of each month. Any format of submission is accepted. Materials can either be transmitted 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.

Snack Volunteer Schedule

The Snack Volunteer program is suspended for the duration. When it resumes, volunteers already on the list will be notified by email.



Discussion Group Meeting

Come discuss the latest in astronomy, space news,



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President's Field of View

The element of “astronomizing” that keeps one in a club like this august society year after year, decade upon decade, isn't the wealth of original presentations we offer as our slate of programming. Presentations are a key part of the W.A.S., of course, but these days a surfeit of such material is available at the click of a keypad, including presentations from our own members. It's not just Stargate, for as fabulous as the Kalinowski-Khula and the Big McCullough Dob are as instruments, Stargate's skies are far from the best Michigan can offer. The material, the tools, the physical structures of buildings and the abstract structure of meetings and discussions are the framework by which we as astronomers come together and form the social bonds that make a club a living institution. I wasn't joking when I used to say snack break was the most sacrosanct part of a meeting.

After eighteen months of existing in a virtual space, those spontaneous human moments in the snack line or at the telescope are sorely missed; the Warren Astronomical Society was never meant to be a means of passive entertainment, and that's what experiencing the W.A.S. via YouTube and WebEx can feel at times.

I have an immediate solution to that sense of contemporary alienation from the craft! Join the Board of Officers. Forge tight-knit bonds with six other W.A.S. members doing their part to carry the fire. Be the person who opens the Stargate dome, who gives the thumbs-up or thumbs-down to an outreach event. Be the person who summons the team or orders the parts to make the club happen in real time. Command the presidential podium. Work out a crisis in the war room. Celebrate the successes we help create. We have a hundred and eighty-four members on paper and require a mere seven of those one hundred and eighty-four to keep the society viable in concept (and many more than that to enable it to thrive!).

Stand for office at our November meeting (email firstvp@warrenastro.org to sign up). Make new friends and chart a course for the W.A.S. in 2022. We are, and must be, more than the contents of our livestream... and we need YOU to make that reality.

Employment Opportunities



PlaneWave Instruments manufactures telescopes for astronomical use, scientific inquiry, aerospace needs and laser communication ground stations. PlaneWave has been in business since 2006 and is the industry leader in remotely controlled robotic telescopes.

Most of the manufacturing occurs in Adrian and Deerfield MI. The job offerings here are for our headquarters location in Adrian, MI.

Optical Technician

PlaneWave Instruments is looking for optics technicians to join our company. We require well motivated individuals who would find it exciting to make surfaces 1000x better than CNC machines can make. The job uses computerized optics machines and optical testing hardware both designed by PlaneWave. The job is hands-on and requires some lifting when moving optics. The job also requires being comfortable with computers. Having some basic math is also helpful. Optics are measured in either microns, nanometers or fractions of a wavelength of light. No experience in optics is required as PlaneWave will provide training, but having an attention to detail is a must.

Electrical Technician

PlaneWave Instruments is looking for electrical technicians. The job entails the following:

- Building up wiring harnesses
- Assembling wiring harnesses into telescopes
- Wiring coils in the stator of telescope drive motors built and assembled at PlaneWave
- Programming firmware into custom boards that drive the telescope systems

Proficiency in soldering, being comfortable around computers and having an attention to detail is required. Experience in soldering is preferred.

Competitive salary and benefit package

Observing Reports

From G.M. Ross

31 August—1 September

The Moon. Waning crescent, high @ astron. twilight.

First looked for the "shining mts." ~ Grimaldi and Orientale Basin, and surprised to find both.

Much suppressed. *OBS. HAND.* illustrates mediocre libration for that limb, but none the less. "False" Shining Mtn. to the N. very low, a casual observer oblivious. Shiller, a prominent black dagger but rough southern floor still visible. Pointing at Schickard, whose two-toned floor still vis. despite solar angle. Most notable on the S. terminator was Hainzel, walls brilliant, trapezoid. Deep. Per Rukl, crater is a complex of 3, the largest 50+ km. long. Kopal's Plates 52, 53 show Hainzel well, 83 at twice scale and solar angle +/- duplicating this obs'n.. Setting illumination made possible Mee, 80+ Km. ancient ruined crater with Hainzel intruding. Not named on 80+ either Sky Pub. *MAPPA SELENOGRAPHICA.* nor N. Amer. Aviation (Lick plate) all-Moon photos. Prominent at crescent conditions..

Transparency fair. Seeing good

6-cm. f/11 refractor @ 100X

1-2 September.

R Fornacis. Long per. variable and "C" star. Near meridian. Not vis. Period over a year, so reprise of difficulty year ago. BQ Orionis: faint & near Moon. Very near "foot" of Gemini. Failed obs'n, dewed objective.

Transparency fair.

6-cm refr'r, 25X

11-12 July, reprise

COMMENTARY on SZ Cam/ N.G.C. 1502

In Kepple and Sanner "Observer's Guide", SZ one of few var. stars in head-notes for Camelopardalis. (ST, no.) K. & S. lists include "F" number in stars' data, a) the per-centage of period spent in rise from min. to max. OR b) time in eclipse. SZ is an E. V., F= 0.17. Low amplitude of brightness change makes useful visual obs'ns nearly impos-

sible. 0.3 mag. The small scale star map for SZ field illustrates relationship with the open cluster and specifically "Kemble's Cascade" asterism.

5 September

The Sun. 19 sun-spots amongst 3 So. hemisphere groups. One of moderate sized umbra. Most spots obs'd this year. W/o polarity data, uncertain if one very large groups or 2 moderate.

Transparency excellent, seeing fair. (Wind.)

5-cm. refractor @ 85X

6-7 September.

R Fornacis. Very red-orange. Unexpected for Colour Index 2.2. C4 spectrum (Ostromecki & Huziak, *OBS. HAND.* 2021). Mag. 10.3. Ends year's quest for this variable.

Transparency good, seeing fair. (Low)

17" Newtonian, magnif. unknown.

COMMENTARY: Estimates of red stars ~ unreliable from Purkinje effect in vision.

9 September.

The Sun. Highly active photosphere. Four groups (likely), one very large.

Most sun-spots in years per this Observer.

Transparency excellent, seeing fair + clouds.

5-cm. refractor, 60X + sub-dia. mylar aperture filter.

11-12 September

Waxing crescent Moon. Precisely on terminator, Theophilus well positioned:

entire rim lit but all else in shadow, except very tip of central peak.

Altai Mts. bright in early sun-light. Does not look like mountains, but a scarp, possible alternate nomenclature. Very near tip of S. crescent, but not at its point, a bright feature, small. From extreme fore-shortening, impossible to identify feature.

Transparency poor.

6-cm. f /11 refractor @ 65X

15 September

The Sun. No sun-spots.

Transparency excellent, seeing good.

50cm refractor @60X

16 September

The Sun. No sun-spots.

Transparency excellent, seeing good

5-cm. refractor @ 60X

18 September

The Sun. No sun-spots.

Transparency excellent, seeing excellent.

5-cm. refractor @ 60X. Sub-dia. mylar filter.



Kemble's Cascade, or Kemble 1, is an asterism located in the northern constellation Camelopardalis, the Giraffe. Photo by Andy Weeks.

(Continued on page 5)

(Continued from page 4)

COMMENTARY: Out-break of photosphere activity, supra, properly the brief of solar physicists. Prediction for return to minimal by Observer.

18-19 September

68 (Delta-3) Tauri. Could not split A/ B. Per Hirschfeld & Sinnott 1.4 arc-sec (1958) 4.2 mag./ 7.5 mag.

Close examination = suspicion of a 3rd star confirmed by H & S: 77 arc-sec. away 8.7 star. Note [24]: There is a wide faint pair . . . [position angle] 320. 68 potted as double on *CAMBRIDGE* and *POCKET ATLASES*.

80 Tauri. Could not split. No separ. datum (1959) No P.A. either in H & S.

5.7/ 8.0 mag.

Transparency excellent, nearly full Moon-set.

6-cm refractor @ 65X

26-27 September

The Moon. 3 d. before L.Q. Terminator put floors of Eudoxus and Aristoteles in full shadow. Twilight band across Mare Serenitatis. The subtle dark arc along the Mare's S. margin was visible even at such low sun angle. No shadow. Not the ridge on the floor along the "shore". (In shadow here.) This "eye-brow" along the floor of the plain is from material which does not respond to gross changes in illumination. This faint marking is on several of Alter's Plates in chapter on Appenines, but not well. Cassini in later afternoon: quite two dimensional despite fascinating physiography featuring two small craters inside the mother feature raised above datum. Crater well shown on Kopal's Plates 17-19 all be it small scale. Sharp relief from solar angles. Did not examine Lunar Orbiter pictures.

Transparency poor. Seeing fair.

6-cm refr'r @ 100X

COMMENTARY: Alter's 1963 *ATLAS* patently obsolete, but contains fine Plates of use for even observers with large telescopes. The quality of pictures, notable given the large format, cheap paper-back version not withstanding.

27-28 September

The Moon. "Shining Mountain" vis. on limb just S. of Grimaldi latitude.

Libration that date for west limb not specially favoured per *OBS. HAND.* (p.

115). Feature = obvious.

Transparency poor. (moving light clouds)

6.cm. refractor @ 100X

28-29 Sept.

The Moon. "Shining Mountain" more pronounced under noon-time sunlight at limb. Very sm. bright peak at centre, resembles occultation of a star.

"False Shining Mountain" also seen on limb immediately to N. On Plato floor, a peak made long shadow spear protruding far in to major axis of the crater. Commonly observed + bright mountain producing the shadow on crater wall. Immediately adjacent (S.) is "ghost" Plato. Makes "figure 8".

Brilliant Pico part of the "ghost" oval, long shadow going to terminator.

Ghost likely not a real feature: chance irregularities with exception of Pico. Small scale Lunar Airforce Chart made from Lick photographs shows it.

Transparency excellent, seeing excellent.

70X, 100X

29 September

The Sun. 2 large groups sep. by about 100 deg. in longitude. 26-29 spots total.

Transparency good. Seeing good.

5-cm. refractor with sub-diameter mylar filter. 60X.

29-30 September.

The Moon. Mare Orientale & environs best obs'd in 2 years. "Shining Mtn" and "False Shining Mtn" both in view. Former range's centre shows the "star" in previous rept., but very closely doubled. Given the mountains now slightly back-lit by waning crescent, the albedo must be very great with gentle slope. The difference in albedo between "true" and "false" mountains obvious. Tendrils of mare material in the Orientale super feature well presented. The Cordillera Mts. in front of tendrils not evident because of illumination angle. On RELOGLE LUNAR GLOBE (ca. 1980) the circular Mare is precisely bifurcated by "Western Limit of Moon Visible". Per that source and libration for above date in *OBSERVER'S HAND.*, the very sharp limb between crenated moonscape on both sides = middle of the Mare. (Max exposure of W. limb ~ 4 days later.) Farther in to lunar disc are small "black lakes" spots of maria reminiscent of Plato, very well seen in illumin. angle. Cruger very prominent in otherwise featureless moonscape. But adjacent Darwin not vis.

At same latitude by shore of Oceanus Procellarum is Billy, simiolar size and shading as Cruger, possibly indicating formation in same epoch. Per contra, immediate neighbour to Billy is Hansteen, same size but far different floor, no hint of dark floor. Possibly Hansteen impact later or less intense: no mare up-welling to fill crater.

Transparency good. Seeing excellent.

16-in. Veen Obs. Borr, Schm.-Cas. 275X



Visit to Air Zoo & Air Force Museum

By Ed Bas

Astronomy fans: It's time to go! I have two suggestions for you. Both are two or three hours driving.

One is 135 miles toward Kalamazoo. It's called Air Zoo. It's easy to find: take the freeway I-94 to Portage Road. It's not coincidentally, Air Zoo is on the Portage city limits. If you can Google it, the same name is Kalamazoo Air Zoo because Portage is a smaller sister city but most people knew about Kalamazoo. The "zoo" was named for the airplanes spotted with famous nicknames, like the Flying Tigers, Blackbirds, Cougars, Bearcats, Warhawks, etc.

You can fly a flight simulator to visit the red planet Mars. It has an indoor hand-painted mural "Century of Flight," supposedly the world's largest mural. You can see the brothers Orville and Wilbur Wright setting their sights to the clouds. Another favorite for me is Neil Armstrong inside his spacesuit. Don't forget your camera or your smartphone. It's a novel idea to send your photo to your (jealous!) friends and your relatives: you & Neil!

A newer 50,000-sq.ft. addition, devoted to space.

It's a treat for sitting down in comfortable theater seats to watch films, shorter or longer, kids to adults. You can see airplanes outside too, and don't forget to walk to see the "other building." It has an ongoing construction of vintage airplanes to place in other exhibits. You can see working drills and saws, real metal bending and the smell of sawdust, also!

If you really want to, it has a seasonal biplane ride waiting for you.

Air Zoo had an invitation to hear a speaker, talking about "NASA across the solar system" during the 2021-2022 inaugural. A Kalamazoo native, Norman Haynes, Director of Mars Exploration, Jet Propulsion Lab (retired) was the speaker. It's too late in past September but maybe next time?

It's a whole day for seeing and touching science and history, combined.

I went three or four times, and I will go again soon. It has exhibits from the Wright Brothers to World War One to spaceships. It's not free but the admission fee is worth it, \$13-16, discounts for police/fire/military.

Another suggestion: The Air Force Museum is FREE! The official name is National Museum of States Air Force in Dayton, Ohio. It is BIG! Four huge hangars full of authentic, original airplanes, not replicas or scale models but the real McCoys.

The museum has a formidable hangar devoted to outer space. That includes a V-2 rocket engine, the infamous World War II "vengeance weapon". It has a walk-in Space Shuttle and the Missile Gallery. It has several

flight simulators (\$10@) and it shares the air space six miles northeast Wright-Patterson Air Force Base. And don't forget, you can walk outdoors and see the Memorial Park, devoted to past wars, all heroes.

It's not really close but Dayton is 3.5 hours. The museum is located north in the city. I have to admit, it is close to my son and his family's house. And my son coincidentally works for the Air Force at another building, nearby the AF museum.

Did you know that Dayton is called the birthplace of aviation? It has bragging rights because the Wright brothers invented and built the world's first airplane.

Space? Yeah, the museum is big, I told you. But space is another idea. It had exhibits for rockets and outer space. One exhibit includes three memorable icons: Goddard, Tsiolkovsky and Einstein. I think they have more, von Braun? I thought it was fascinating!

If you're tired of watching airplanes, Dayton has the Wright Brothers National Historical Park. Did you know that the brothers were entrepreneurs-- building and selling bikes, owned a grocery store, and a printing press shop, etc.? You can see the old buildings and it reminds me of a mini-Greenfield Village in Dearborn.

Don't forget to dine in the inside cafeterias. I ordered a pulled pork sandwich in the Valkyrie Cafe in the Air Force Museum. And the Kitty Hawk cafeteria in Air Zoo has a nice second level view. Both gift shops are good, too. They have hundreds of souvenirs for aerospace. But the AF Museum has more area and more merchandise. (I visited the Kennedy Space Center last December. My god, it is more like a shopping mall, two levels, with space things! And it has clearance sales, too!!)

If you have the time, the Neil Armstrong Museum located in Wapakoneta, Ohio, not far north from Dayton and it's easy to see it on the freeway. Just another bragging Wrights (ouch!) in driving to the state. Enjoy! And be careful of the crazy drivers in the freeways!



For Sale

Description:

12-1/2" Newtonian Reflector

F.2 52". F1

Mirror may need re-aluminizing, could be a good project scope.

Moving out of state - must sell. Best offer

Ben at 313/885-0972 (Ben was a member of the WAS back in the sixties, attending meetings at Lincoln High- Ed.)



Call for Images

We are getting ready to assemble our WAS 2022 Calendar. We need your astro-images, artwork, and sketches for the calendar. Please send a high resolution JPG or TIFF to publications@warrenastro.org for consideration by the calendar committee. Deadline is November 20th.



Some examples from prior years



Letters

Letter

In re Sept. number: 1) the president should do ten "Hail Marys" for using "guerrilla astronomy" in this award winning publication edited by the urbane Scholar Thieme. 2) Comrade Bosshard ought to know, pursuant to "gastronomy", a) Redcoat Tavern charges full freight for a coffee refill in one of their lady-like cups, b) the best thing about my now discontinued Discussion Groups was the cheap red. 3) Comrade Bradley caught on to the few Perseids. At a Veen Obs. public night I opined to visitors that the legendary "summer meteors" were going in to a hiatus, possibly permanent, in absence of a blow out by mother comet.

-G.M. Ross

More Attaboys-

Congrats to Dale Thieme for getting the Mabel Sterns first place award for top club newsletter!

Got my copy of the Reflector today....saw the great news about Dale. He deserves the award for sure....but it is going to be hard for our next newsletter editor to step into his shoes! He has set a very high standard.

-Bob Berta

Thank you, but in my defense, raising the standard was completely unintentional. — Ed.



Space Pirate Radio

Tune in to Captains Marty Kunz and Diane Hall for live radio

Wednesday nights at 9:00 pm ET
on

Astronomy.fm

Hi Dale,

...
Hello from Colorado. I just got my September 2021 issue of the Reflector and lo and behold, I saw someone in there I know. Congrats on the award. Nicely done.

We love it here in Colorado, but sure miss all the astronomy gang back there.

-John Lines

Considering Cometary Remains

In re Perseid picture by Adrian, Sept. number. Out here we call him "Mister Thumb"* Nice shot, as usual. Such pictures require unequal measures of luck and git-up-'n'-go.

But the distaff: At a Veen Obs. public night I was discussing the "summer meteors" with a family. Like all men of a Certain Age, I recalled how good the Perseids were In My Day -- and they were! One recalls specifically the showers of 1961, observed in Saint Clair County, and 1969 observed in purgatorial Sterling "Hts.", freshly incorporated

Things are wearing out, how ever, me, and I believe the shower. I stopped "serious" observing over ten years ago, all though the hard lads would deem me a dabbler. The lacuna is not that Perseids have a sharp, hard to nail, appearance like the Quadrantids. *Per contra*, they enjoy a 5.0 day span from-to 1/4 strength. Think, normal dist. (*OBSERVER'S HANDBOOK 1966*) To the rapt audience: The mother comet and tiny cast-off meteors are physical objects, subject to all wear, tear, and punishment in inter-planetary space.

Vide: Inter-stellar cosmic rays, not the sissy ones coming down to us. Brutal full range u.v., not the sissy rays reaching us. Planetary gravitational effect. The sheer hot blast of the Sun at perihelion. How long can a sandy ice mountain hold up?

Hope, comrades. Possibly the comet nucleus will have a blow out from internal vapourisation under full range radiation attack. The nucleus might actually break up -- with spectacular effects annually for decades to come.

May be if we just wait . . . a century or two . . .

G. M. ROSS,
philosopher of natural phenomena.

* Not to be confused with "Tom Thumb", a very early locomotive.



Above:

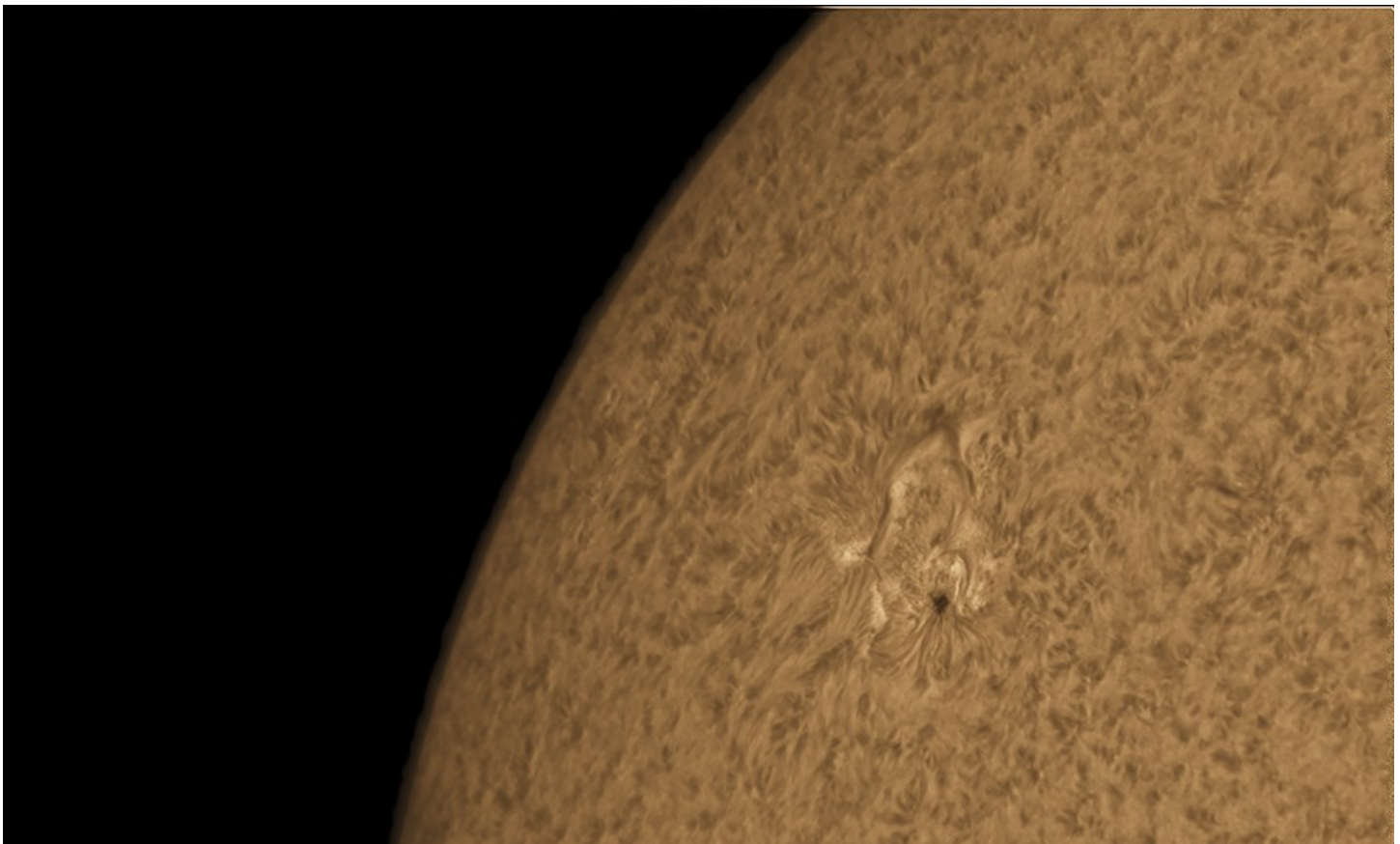
"A Romantic Astronomical Event"

by Ray Bosshard. Taken September 5th, 2021 (at sunset)

Below:

"It's all in the details"

By Bob Berta.



(Continued on page 10)

(Continued from page 9)

Bob Berta sent along this commentary with the Solar photo:

I took a photo on August 23rd. It is a solar image taken with my Ha setup of an active region (AR 2859). I have been doing a lot more solar imaging now that the sun is getting active. I also got a new mono camera that is designed for solar, lunar, and planetary imaging as it is extremely high resolution due to tiny pixel size (2.4u). I belong to an international solar astronomy group based in England. I got 96 comments back praising the image after I posted it there. I will probably submit this for our next calendar.

This was taken through my 80mm refractor using a DayStar Quark Chromosphere Ha filter. The camera is a Player One Neptune mono camera. This is a new Chinese company and the camera is cheap compared to competing cameras yet it has a lot more features like 256MB DDR memory so the camera does a lot of buffering rather than relying on the computer HD. It also has a tiltable image plane which is necessary for some Ha setups to avoid Newton Rings.

The neat thing is that getting images like this are pretty easy....the software does all the hard work. I use three pieces of software.....first SharpCap 4.0 which is a free app and it captures the images as a video. I then bring it into Stakkert....another free app to align and stack the frames and convert into a simple image. Finally I use Photo Shop to tweak it and colorize the black and white photo but you don't need PS....there are other free apps that can do the processing....I use PS as I already have it for

my night time astrophotography. The camera I use is currently for sale less than \$300.

You would think you would need a very good mount to hold everything steady...but not so. I just use my loptron ALT/AZ mount. You don't need a polar aligned mount or anything other than a basic tracking mount. That is because each individual picture is just a fraction of a second. I generally tell the software to take 2000 shots and it puts them in the video AVI format. This only takes a short amount of time....maybe a minute or two at most for 2000 shots. Each shot may look soft and not that great....but the following automated alignment, stacking, and image selection takes care of that. You end up with a very detailed and sharp photo. A mono camera is used as it has more sensitivity and resolution compared to a one shot color camera since on a OSC camera you would only use the R channel so only 25% of the sensitivity and 1/2 the resolution of a mono camera.

There are only two more difficult tasks for solar imaging than night time imaging. Since you are using high magnification aiming the setup is a bit more difficult....I use a solar finder on the scope to center the scope. The other difficulty is seeing the laptop screen in daylight. At first I used a dark cloth to hold over my head and computer but that quickly proved a pain and it got hot under the cloth. I then found a foldable laptop tent on Amazon designed specifically for use of a laptop in the sun. Many versions are available but the one I got has a silver outer surface and black inside so it keeps the laptop and me cool. It works really well and I love that it folds up into a nice flat package for transport and storage.

W.A.S.P. Photo and Article Submissions

We'd like to see your photos and articles in the W.A.S.P. Your contribution is ESSENTIAL! —

This is YOUR publication!

Send items to: publications@warrenastro.org

Documents can be submitted in Microsoft Word (.doc or .docx), Open Office (.ods), or Text (.txt) formats, or put into the body of an email. Photos can be embedded in the document or attached to the email and should be under 2MB in size. Please include a caption for your photos, along with dates taken, and the way you'd like your name to appear.

The View From C.W. Sirius Observatory

The Ghost Nebula

For the October WASP, I wanted to post my favorite Halloween-themed image. This is SH2-136, the Ghost Nebula. Ghostly figures appear to arise out of the nebula, which is at the edge of the Cepheus Flare molecular cloud complex. You can see from the cropped close up photo how this object gets its name.

Sh2-136, also known as vdB 141, is a reflection nebula in the constellation Cepheus. It is 1470 light-years away, and 2 light-years across.

The eerie ghost-like globule shapes are cosmic dust clouds faintly visible in dimly reflected starlight. There are several new stars embedded in the nebula itself which give it a brownish color. In astronomy, reflection nebulae are clouds of interstellar dust and gas which might reflect the light of a nearby star or stars. The energy from the nearby stars is insufficient to ionize the gas of the nebula to create an emission nebula, but is enough to give sufficient scattering to make the dust visible, and thus a reflection nebula.

The Ghost Nebula is a very dim object. I imaged this through my 11" SCT telescope using a ZWO one-shot color camera.



This is 15 hours of integration time. I am pretty proud of this photo because it won the "Top Pick" award on the Astrobin photography site a few months ago.

This one is virtually impossible to see visually unless you have a really large telescope in really dark skies. But a camera in your telescope should reveal some structure after a 5 minute exposure. Longer exposure times will help.

Wishing you a happy and ghoulish Halloween from the CW Sirius Observatory!



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 Bills 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



From the Desk of the Northern Cross Observatory



During the 2021 Great Lakes Star Gaze we managed 3+ clear nights, and I took the observatory system mobile to that location for the week. This takes about 2 hours to remove from the observatory and pack into the truck.

I ran the ZWO asi2600MC PRO on the 10" RC.

September 10, 2021: I worked on the Cocoon Nebula or IC 5146 is a reflection/emission nebula and Caldwell object in the constellation Cygnus. The NGC description refers to IC 5146 as a cluster of 9.5 mag stars involved in a bright and dark nebula.



Data collection information:

10" f/8 RC telescope

ZWO asi2600MC PRO camera, at gain 100 (Unity), and Temperature set to 0C

Losmandy G11 mount

20 x 600 second light frames

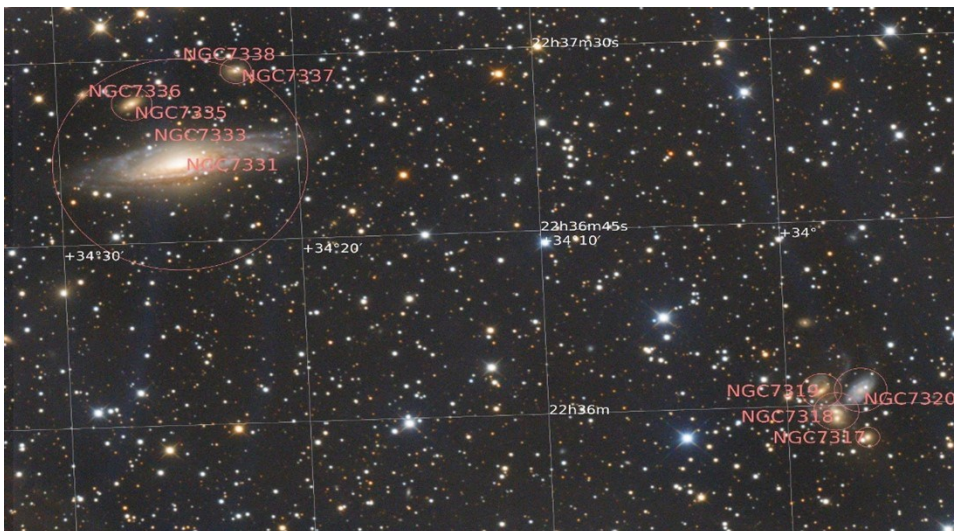
24 dark frames

50 flat frames

(Continued on page 13)

(Continued from page 12)

September 8, 2021: I worked on the Deer Lick group and Stephan's Quintet. NGC 7331 Group (upper left corner) is a visual grouping of galaxies in the constellation Pegasus. Spiral galaxy NGC 7331 is a foreground galaxy in the same field as the collection, which is also called the Deer Lick Group. It contains four other members, affectionately referred to as the "fleas" The NGC 7320 group (in the lower right corner) is known as Stephan's Quintet.



Data collection information:
10" f/8 RC telescope
ZWO asi2600MC PRO camera, at gain 100 (Unity), and Temperature set to 0C
Losmandy G11 mount
41 x 600 second light frames
24 dark frames
50 flat frames

(Continued on page 14)

(Continued from page 13)

On **September 9, 2021**: an experiment with the core of the Andromeda Galaxy with the 10" RC telescope. **From Wikipedia:** The Andromeda Galaxy also known as Messier 31, M31, or NGC 224 and originally the Andromeda Nebula (see below), is a [barred spiral galaxy](#) approximately 2.5 million [light-years](#) (770 [kiloparsecs](#)) from Earth and the nearest large galaxy to the [Milky Way](#). The galaxy's name stems from the area of Earth's sky in which it appears, the [constellation of Andromeda](#), which itself is named after the [Ethiopian \(or Phoenician\) princess](#) who was the wife of [Perseus](#) in [Greek mythology](#).

The [virial mass](#) of the Andromeda Galaxy is of the same order of magnitude as that of the Milky Way, at 1 [trillion solar masses](#) (2.0×10^{42} kilograms). The mass of either galaxy is difficult to estimate with any accuracy, but it was long thought that the Andromeda Galaxy is more massive than the Milky Way by a margin of some 25% to 50%. This has been called into question by a 2018 study that cited a lower estimate on the mass of the Andromeda Galaxy, combined with preliminary reports on a 2019 study estimating a higher mass of the Milky Way. The Andromeda Galaxy has a diameter of about 220,000 ly (67 kpc), making it the largest member of the [Local Group](#) in terms of extension.



Data collection information:

10" f/8 RC telescope

ZWO asi2600MC PRO camera, at gain 100 (Unity), and Temperature set to 0C

Losmandy G11 mount

37 x 300 second light frames

24 dark frames

50 flat frames

(Continued on page 15)

(Continued from page 14)

I also picked up a William Optics Zenithstar 105mm APO refractor at the swap meet, which I put on the G11, at home, and did some testing on September 18, 2021. With a reducer on, I got bad corners on this 5 hour and 37 minute run, so I'm going to take that off and try it native. Photo 1 is with the focal reducer/flattener straight through. Photo 2 is without the flattener, but with the On Axis Guiding port which will be how it will be used in the future. The ONAG gives me autoguiding and autofocusing capabilities. Photo 3 is the results of the first night testing with the reducer (5 hours 37 minutes). The corners are not flat, so I don't have it configured correctly, but maybe in the future. This is M31, M32, and M110.



-Doug Bock

Presentations

Monday, October 4, 2021
Virtual Presentation



Feature:

Screening of “Luminous”

Presented by Sam Smartt

Luminous tells the story of the first astronomer in history to publicly predict the near-future explosion of a star – if he’s right, 2022 will see the closest thing to a supernova in the skies of earth in 400 years, and every school kid in the northern hemisphere will know it. Luminous, follows Larry’s journey to test his unprecedented prediction, knowing that its success or failure will unfold squarely in the international spotlight.

About the Presenter:

Sam Smartt is an award-winning documentary filmmaker and associate professor of Film & Media at Calvin University in Grand Rapids, MI. He earned his MFA in documentary filmmaking from the Documentary Film Program at Wake Forest in 2013. His short, Wagonmasters (2013) won a College Television Award. He enjoys telling stories about characters who defy our categories and challenge our expectations.



About the Screening:

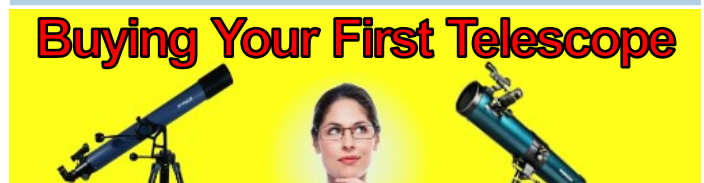
We are doing things a bit different this month. Since this is a private screening, there will be no livestream on YouTube. Instead we’re asked to register for the event (your email address will not be used for ads, it is simply to notify you when the documentary goes public.) Registration links will be provided in our email announcements and during the Webex session.

You can pre-register at:

https://watch.showandtell.film/watch/luminous_warren-astronomical-society

Once registered, you will get an email with a link to the showing.

Thursday, October 21, 2021
Virtual Presentation



By Jonathan Kade

Soon it will be open season on telescope shopping—the holidays are approaching. While you consider what to get that budding astronomer, Jonathan will share a list of telescopes that will give beginners a good experience and won’t completely break the budget. We’ll look at notable telescopes from many prominent brands, and then talk about some options if you’re willing to think outside the telescope box.

About the Speaker:

Jonathan Kade, a W.A.S. member since 2008, has worn many hats in service of the society: 2 terms as secretary, 2 terms as treasurer, 2 terms as President, 2 terms as 1st VP, and 1 term as publications director, attended innumerable outreach events, and almost single handedly dragged the club into the 21st century, technologically speaking.

His first purchase after he paid off his student loans was an Orion SkyQuest XT-8. His telescope collection’s size has plateaued, at least temporarily.



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

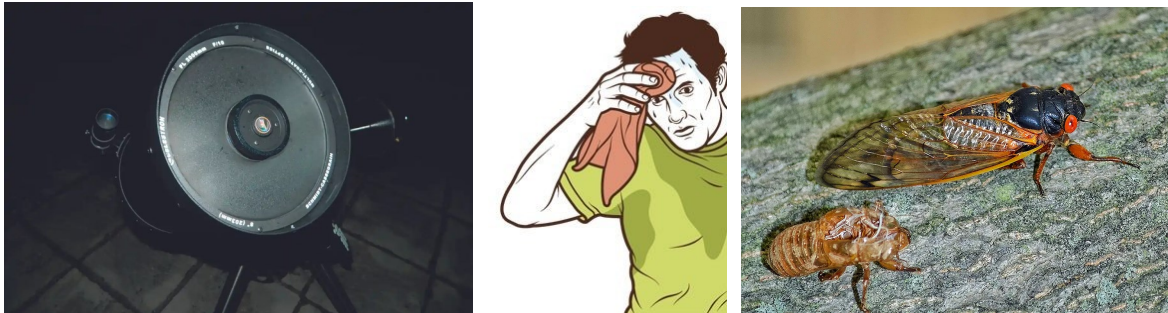
So, You Want a Night Off to Observe?

By Brad Young

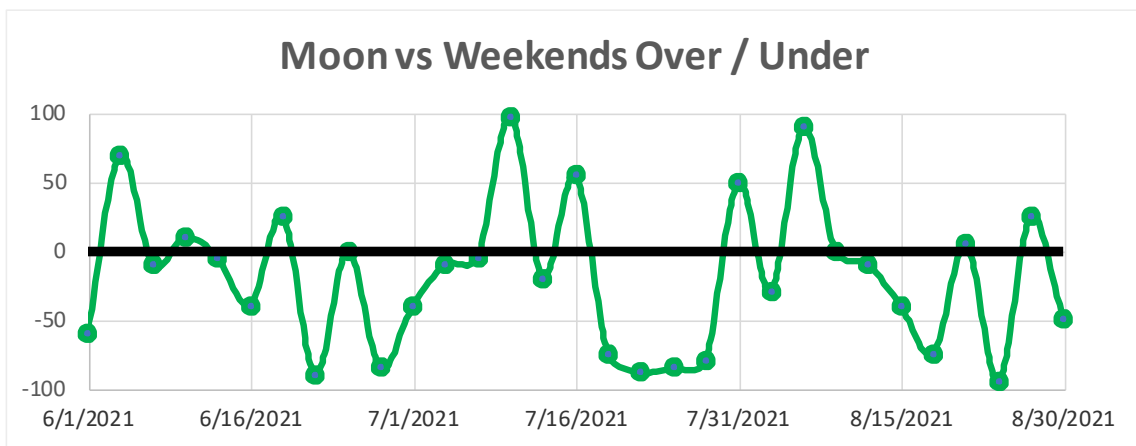
In one of my previous funny (to me) articles, I provided a somewhat fictitious view of Spring in Oklahoma [on page 9 of this article](#).

This summer has not been funny. After last year's problems, it looked like 2021 might be a great summer for astronomy, maybe with other people. Unfortunately, a few factors foiled our expectations.

Of course, here in the South, we have come to accept that it's going to be very hot and humid during the summer, and that you really can't do anything until midnight. I didn't include the heat index, dew, cicadas, or other summer issues in this analysis.



We have an ancient nemesis, the Moon. She has a familiar ally, workdays. Although some of us are not affected by work schedules as much as others, the weekends are still when most people have time to observe. It's always interesting to see how the moon and the weekends line up during summer. Note that this year Memorial Day fell near Full Moon. I don't count the 4th of July because of the fireworks and smoke (foreshadowing). As I write this, on the Friday of Labor Day weekend, it's clouding up.



The moon / weekend graph was very busy, so instead I made one that is an over-under version of the Moon versus weekend time available. In each case, the "push" is zero. To explain more fully, the dates above the black line represent a good combination of no moon and weekend time. A look at the calendar showed that the first couple of weekends of each month this summer, we had a small Moon.

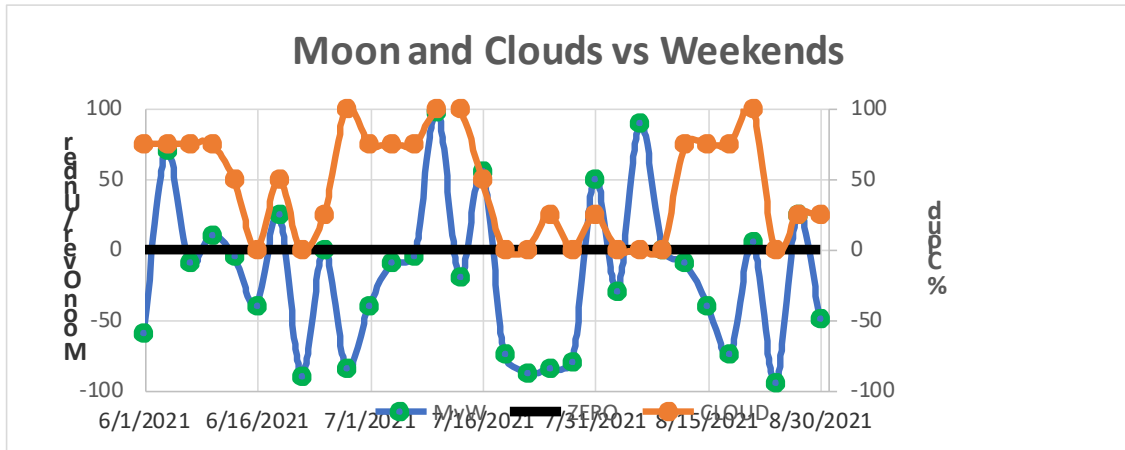
So far everything looks familiar. Some summers line the moon and weekends up better, but this one was about average. No problem so far.

Of course, the other bane of every astronomer is cloud. In summer, Oklahoma can go for weeks without a cloud or drop of rain, but that certainly did not happen this year. Below is a busy graph that shows that same

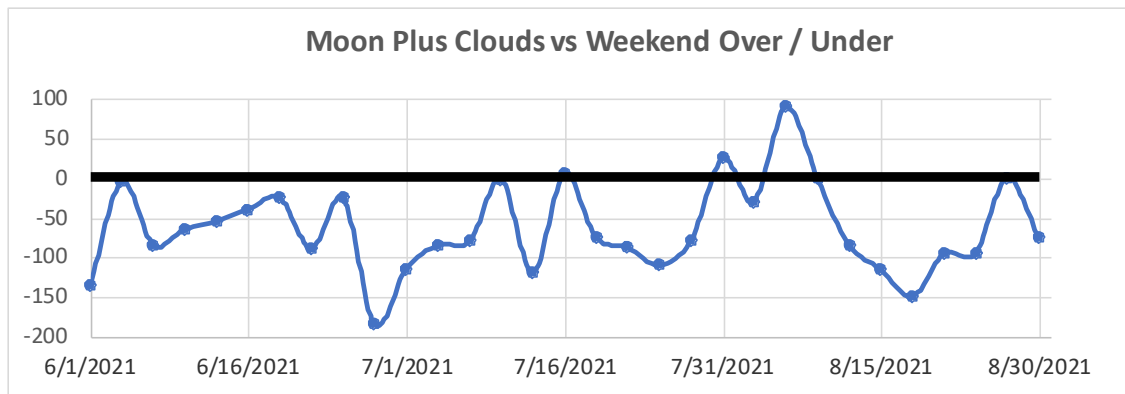
(Continued on page 18)

(Continued from page 17)

graph of moon and weekend over / under (above), with the cloudiness overlaid on top of it throughout the summer.

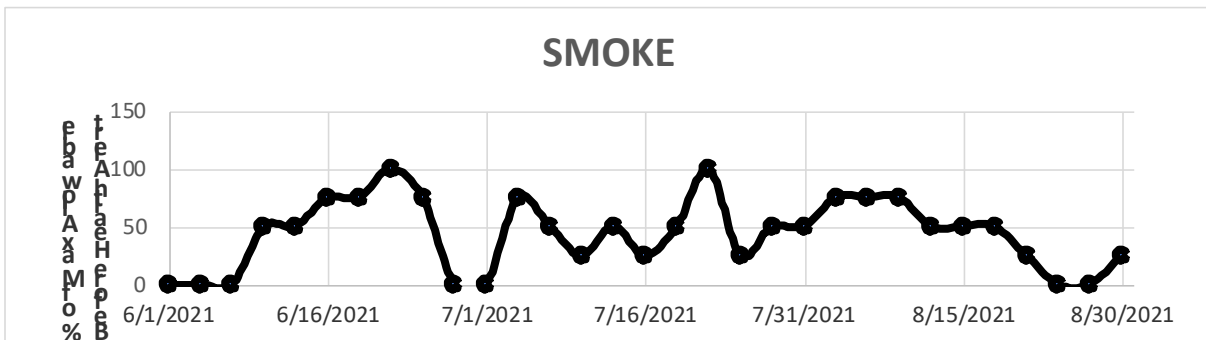


It's awfully complicated so I applied the same kind of theory as before and used mooniness plus clouds versus the weekend into an over under chart to see how that would work out.



This represents the first unique graph of 2021. In other words, all years have moon phases and weekends, in a predictable pattern, but individual years can vary greatly on cloudiness. This one certainly didn't help us

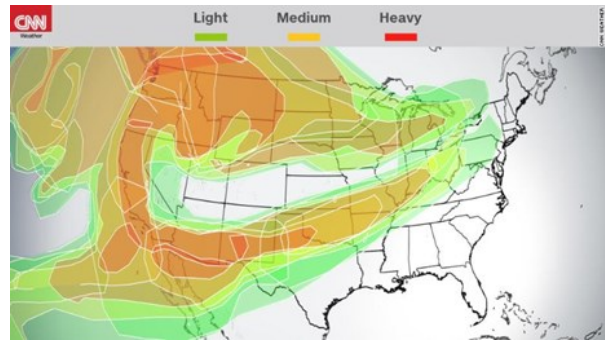
A close look shows there were still a few nights available in the beginning of August and a few iffy nights here and there throughout the early summer. Still not a wholly bad summer... but then we introduced a new enemy, smoke.



(Continued on page 19)

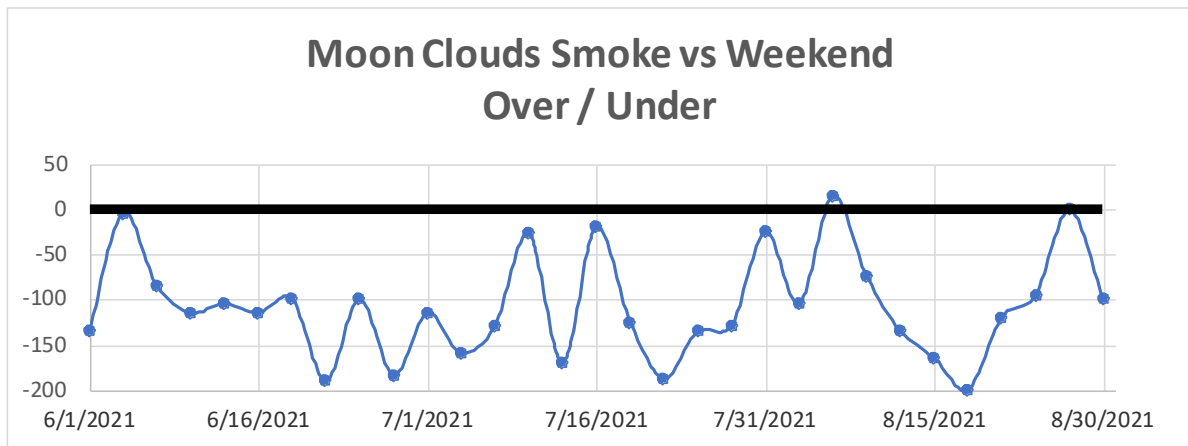
(Continued from page 18)

NOTE: I'm certainly not poking fun about wildfires; untold numbers of people and animals have lost their homes and even lives.



Smoke was prevalent throughout most of the summer and many days it was so bad that people were advised to stay inside. Smoke has a seriously negative effect on visibility of any celestial objects through a telescope or naked eye. There are many articles out there you could read describing the effects of smoke, humidity, air pollution, light pollution, etc. that would be much better than anything I could develop. The short version is that smoke is very bad for astronomy.

So, to develop the final graph I took the over under graph from above that included the effect of moon and clouds versus common free time to observe and added the effect of smoke.



As anyone who tried to observe this summer knows, this was a real punch of the nose in more way than one. We ended up with one night that was good despite all the things working against stargazing.

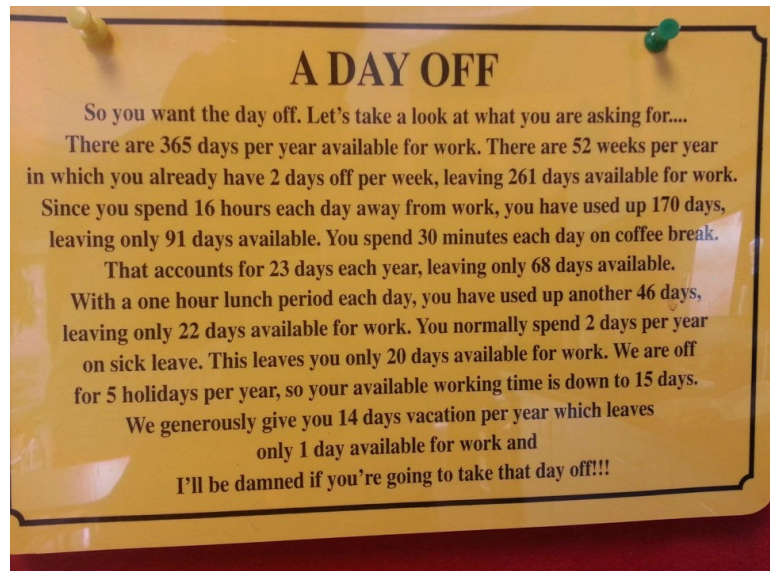
DATE	CLOUD	MOON	DOW	hi TEMP	lo TEMP	WIND	DIR
8/6/2021	0	10	FRIDAY	91	66	11	S

August 6th was clear, had a very old crescent Moon, was a Friday night with a decent wind and about average temperature. Hopefully some of you got to observe. My back went out. As the old sign says:

Well, in 2021, the universe said I had one day this summer to observe, and that wasn't gonna happen!

(Continued on page 20)

(Continued from page 19)



METHOD

An explanation of my method:

- Admittedly, I only gathered data for every 3 days, so it didn't become too overwhelmingly depressing, and the graphs are rounded for clarity
- Cloudiness was based on conditions at sunset and a scale of:
 - * Clear = 0% bad
 - * Fair = 25% bad
 - * Partly Cloudy or Hazy = 50% bad
 - * Mostly Cloudy or Fog = 75% bad
 - * Cloudy or Rain = 100% bad
- I assigned subjective effects to smoke – if you look at the NOAA Smoke Maps, you'll see a gradation based on particulate size and density. I just said every darker shade was 25% more smoky until the maximum bad shade was 100%.
- Moon phase is as is – so Full is 100% bad and 1st or 3rd Quarter is 50% bad
- I used normal work week such that:
 - * Monday, Tuesday, Wednesday are all 0% good
 - * Thursday and Sunday are 10% good
 - * Friday and Saturday are 100% good

All the climatic data here is real, from timeanddate.com and smoke map data is from NOAA.

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



Fond memories of Carolyn Shoemaker

One clear evening during the summer of 2019, I was using Pegasus, one of my childhood friend Carl's telescopes, at our annual Adirondack Astronomy Retreat. When my cellphone began to ring, I picked it up with some surprise. At the other end of the line was Carolyn Shoemaker. I was thrilled to hear from her, as it had been some time since our last contact. Carolyn was doing well, except for a mild loss of hearing. She had called to say that since her daughter and son-in-law had moved to New Mexico, she would be living at the Peaks, a comfortable assisted living facility in Flagstaff. My colleague Brent Archinal gave me her cell phone number. I was able to speak with her again a few months later. I wanted to find a way to increase the frequency of our conversations. "You speak with your brother Richard every Monday," Wendee commented, and suggested, "Why not call Carolyn every Monday as well?"

For the next 18 months that's what I did. Carolyn would pick up the phone and announce, "It is David. It must be Monday!" Wendee would often join the discussion as well. But when I called on Monday, August 9, no one answered. After repeated tries, her daughter Linda called to say that Carolyn had had a minor fall and was in the hospital. On Thursday evening, August 12, she went into respiratory arrest. Carolyn died the next morning at 10:40 A.M. Arizona time.

With her husband Gene and the five-year comet and asteroid program we shared, Carolyn was responsible for a very rich period in my life. In fact, virtually every article one reads about the Shoemakers will agree that the discovery and impacts of Comet Shoemaker-Levy 9 were the most significant part of our professional lives.

Carolyn began her observing project a few years after her husband Gene was disqualified as a potential astronaut because of Addison's disease. He decided to go at the problem of impacts, not from studying craters as he walked about on the Moon, but from the opposite direction of the comets and asteroids that collide with the Moon, and with the Earth. Carolyn quickly learned to become proficient at using the stereomicroscope. She would place two films into the microscope; they were identical except that the second plate would be about 45 minutes later than the first. The films were almost always identical, except that when an asteroid was moving slowly, it would appear to float above the starry background. Carolyn discovered 377 asteroids this way, each one charted until its orbit round the Sun could be determined accurately. When one included the asteroids for which orbits have not yet been deter-

mined, that number rose significantly, according to Carolyn, to about 800.

In 1983 Carolyn discovered the first of her 32 comets. When their colleague Henry Holt joined the following year, the number of new comets rose rapidly. It was only a year or two after that when she surpassed the number of comets another famous astronomer, Caroline Herschel, discovered, and *Sky & Telescope* published a news note about "Carolyn passing Caroline." I joined the team in 1989. In a sense, passing Herschel's record might have been Carolyn's golden moment, but it wasn't. That came later on a cloudy and dull day on March 25, 1993. Two nights earlier I had taken two exposures that she was scanning. Suddenly looking up, she announced "I don't know what I have, but it looks like a squashed comet." That was the discovery moment of Comet Shoemaker-Levy 9. Sixteen months later, when the 21 pieces of this fragmented collided with Jupiter, we got to meet President Clinton and chat amiably with Vice President Gore and share the world's excitement over the first collision of a comet and a planet ever witnessed by humans. It was a satisfying peak to all our careers.

After Gene died in a car accident in Australia, Carolyn continued observing with Wendee and me for several years. One evening she confided that sometimes she wished she had died with Gene. But she did not, and the world was able to enjoy her company for more than 24 more years. The weekly telephone calls began much later. I shall miss the deep friendship I enjoyed with Carolyn Shoemaker, the woman whose energy, intelligence, and terrific sense of humor brightened our lives and made the night sky a happier place.



Wendee, Dave and Carolyn at Kitt Peak

Book Review: Hawking

By Ed Bas

I usually avoid comic books. Man, I am old! I used to love comics but I was 12 years old. But I surfed in an Adult Comics section in my public library. Adults, really? I can't imagine reading Superman and Batman because I am an ADULT! Maybe they meant: illustrated? Or graphic novels? I casually drifted in the books. It includes a big bag of other subjects, from anthologies to Mad magazines to Stephen King's dark stories to Japanese anime, etc. One is interesting and surely fascinating to me: the title is, Hawking.

Hawking? HAWKING! The pop-culture and still-dead Stephen Hawking, the famous astrophysicist. Of course, he wrote the popular 1988 best-seller, *A Brief History of Time*. And other books too, a sequel of *A Briefer History of Time* and *The Universe in a Nutshell*. He was a genius and an icon. He once said, I am not a genius; Einstein was a genius. Well, I don't agree. Did you see him on the sitcom *The Big Bang Theory*? Funny, and he had a clever attitude and a humorous side from this disabled-man, with his handy electric wheelchair and his artificial speech recognition.

He died March 14, 2018, with his degenerative neuromuscular disease. He lived more than the doctors predicted. He was 76.

This recent book depicted his science and him.

It is a full 288 pages (not a comic book!), and four pages of references, publications from Annals of the New York Academy of Sciences to Physics Review to Scientific American. It is not really easy to read for a weekend but the reader should concentrate and know a little bit of Hawking's knowledge.

I am not a physicist or a mathematician, hardly! It takes time to search and learn the man's brilliant mind. He dreamed of complicated algorithms or

equations, his groundbreaking work in cosmology. He wandered quantum mechanics and thus, black holes. "It turns out that the only plausible source for all that energy, and the amazingly bright quasars also discovered at the time, couldn't be chemical... or even matter/antimatter at annihilation. All that was left was gravity." Smart man!

It is interesting to see the person depicted in words and pictures.

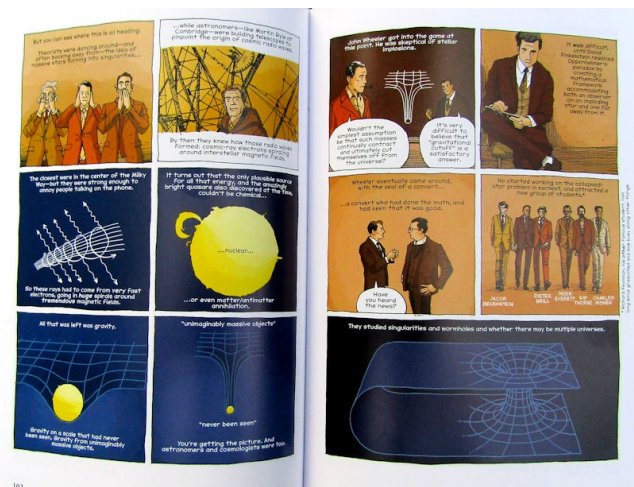
The book was readable. Excellent, too. The author by Jim Ottaviani and the artist by Leland Myrick. He delved into his personality-- a colorful (ha-ha!) human being. He likes his life, he was not speaking negatively. Most of his days or years were good. He was a good guy, not bragging or boastful, teaching lightly and he said, matter-of-fact, "I was wrong." Details! He was right, most of the time.

"So in my union of quantum theory and classical relativity, a vacuum ain't empty, and..." A picture of his lecturer's audience, they are silent, the darker image, most of them smiling, almost amusing. "... black holes ain't so black." Good observation!

And in the final scene, "But in my dreams, I remember..." he was pictured afloat in the black outer space, no space suit required. He lived in a zero-g environment, pointing his fingers to the stars, "... what this is like."

Hawking was not an astronomer. He didn't observe the planets or the stars in a telescope. He was a cosmologist and a theoretical physicist. That's good enough for me.

(Ed Bas is a Warren Astronomical Society member and former member of the Detroit Astronomical Society, ground a mirror and built his telescope when 17 years old.—Ed.)



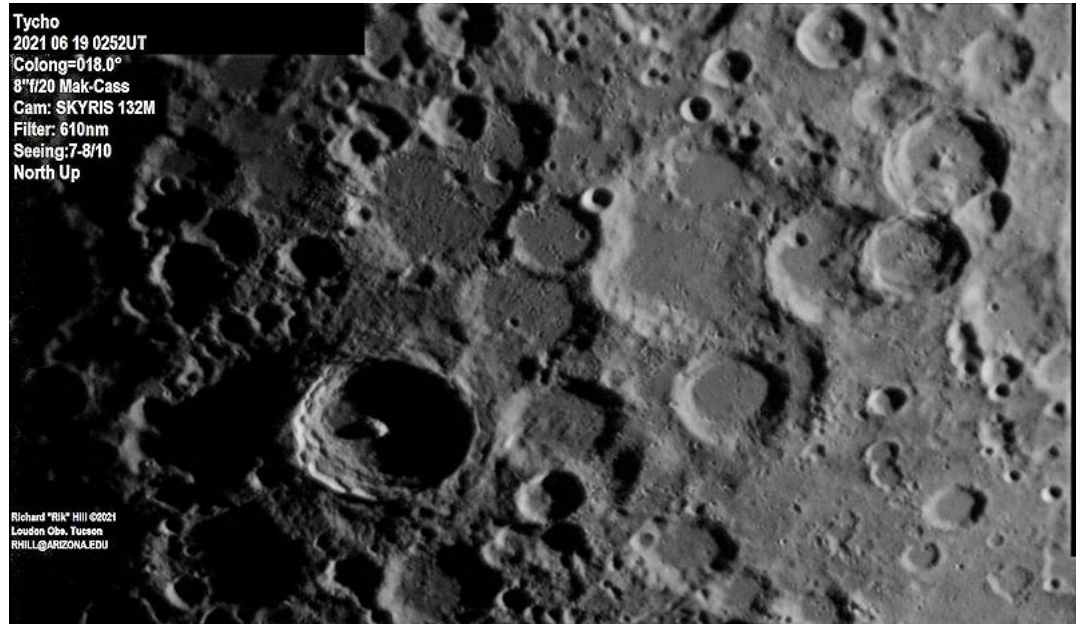


Old And New

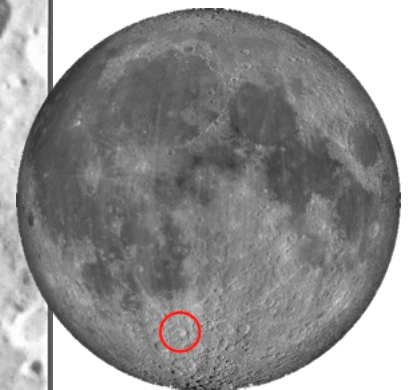
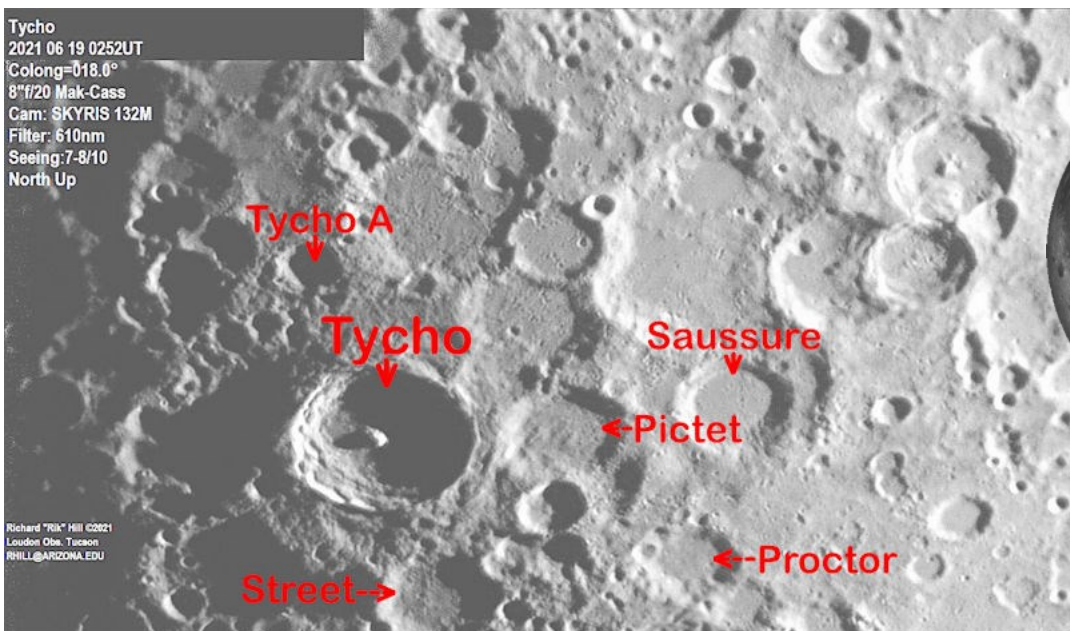
Wonderful sights on the terminator this particular night. Chief among them was the beautiful crater Tycho (88km dia.) a relatively young crater of "Copernican" age. Analysis of samples of one of the rays taken during Apollo 17 led to an age determination 108 million years. Some lucky dinosaur got to see one spectacular flash in the night sky! Notice the crisp nicely terraced interior wall and the central peak catching the first rays of the morning sun. The crater adjacent to the right is Pictet (65km) and is much older, covered in ejecta from Tycho. Farther away is a similar sized crater Saussure (56km) with less ejecta on and in it. Below is the crater Proctor (54km), a much old crater some 3.8-4.5 billion years old and it looks it with many secondary craters breaching it's walls.



Below Tycho, half in shadow is Street (60km). Above Tycho is a smaller crater in full shadow, Tycho A (31km). Between the lower wall of Tycho A and the upper wall of Tycho is the landing site of Surveyor 7. This was a highly successful mission that took over 20,000 images at 200 and 600 line modes on a vidicon. Also this spacecraft did a lot of soil analysis and imaging of rocks and landforms all around the craft. It was a great early look at our nearest neighbor.



This was made from parts of two 1800 frame AVIs, stacked with AVIStack2 (IDL) and finish processed with GIMP and IrfanView.



Location maps
by Ralph DeCew

History S.I.G.

October 1987

The cover features an armillary sphere. From the cover: "Such a sphere is used to show all of the basic circles [sic] and the relationships between the horizon, equatorial, and ecliptic coordinate systems."



Inside, we find a call to action: Public demonstrations in October, first, Astronomy at Brandenburg Park (New Baltimore), then with the Scouts at the 1987 Camp-O-Ree (at Stoney Creek campground).

Ken Kelly brings us "Constellation of The Month (PEGASUS)", and Al Vandermarliere has "Some Thoughts on Cosmology"

Interesting Minor Planets by Ken Kelly (PART III) continues with (3200) Phaethon and (433) Eros. Then these charts:

MINOR PLANETS FOR SEP. - OCT.

(Calculated by Ken Kelly)
EPHEMERIS FOR (6) HEBE
EPHEMERIS FOR (8) FLORA
EPHEMERIS FOR (3) JUNO
EPHEMERIS FOR (39) LAETITIA

EPHEMERIS FOR COMET 1987S - Bradfield

EPHEMERIS FOR COMET 1987u - Rudenko

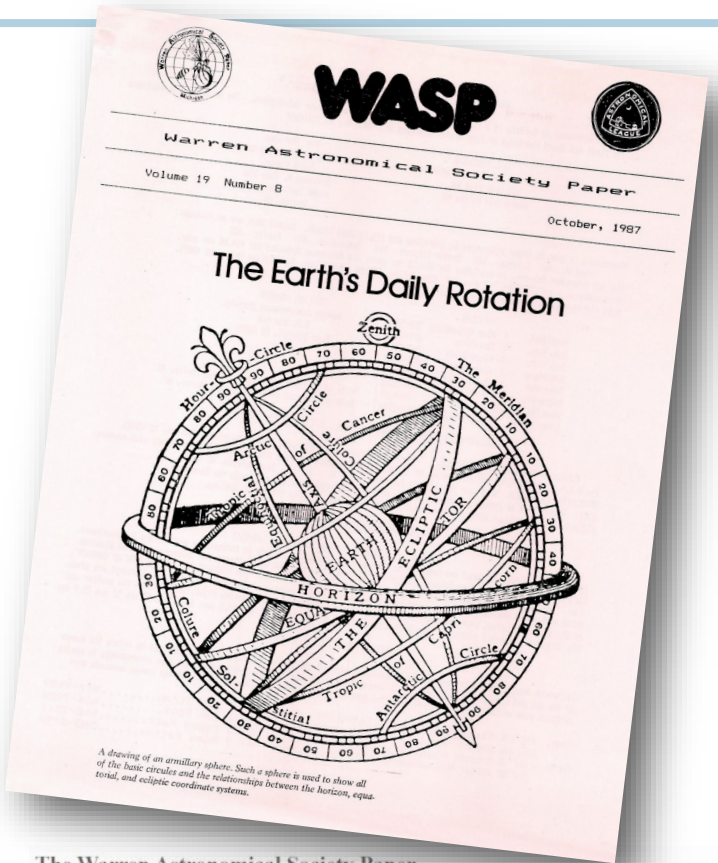
LUNAR OCCULTATIONS (STANDARD COVERAGE)
This table was supplied by Clyde Burdette

October 1997

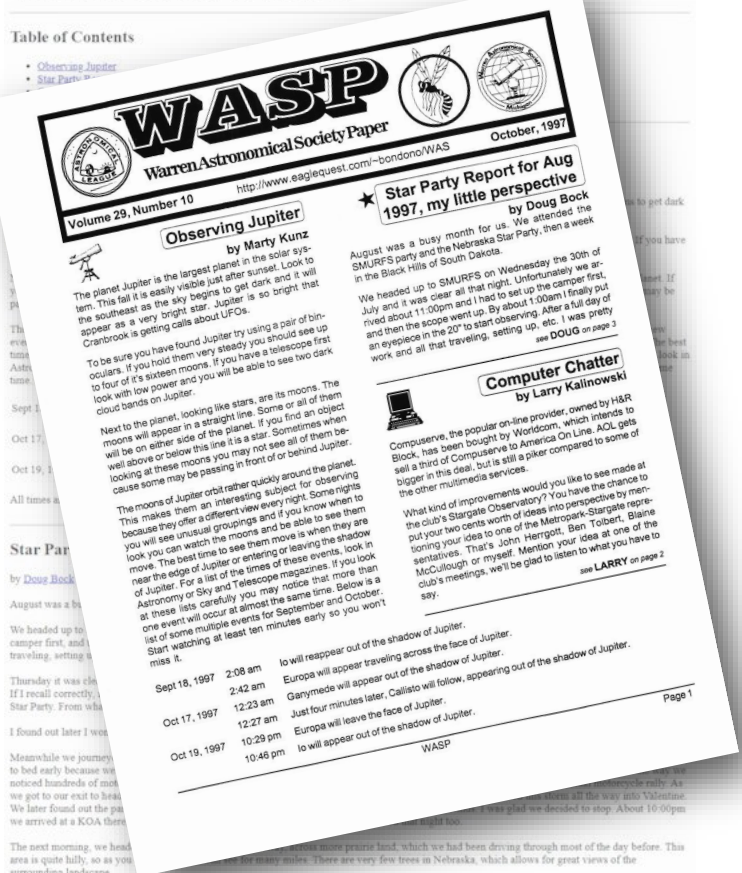
Another "split-personality" issue comprising of both a printed and web version (here, at right, the web version is hiding behind the printed cover.)

By way of articles, we have "Observing Jupiter" by Marty Kunz, "Star Party Report for Aug 1997, my little perspective" by Doug Bock, of course: "Computer Chatter" by Larry Kalinowski (where he takes another dig at AOL), "Astro-Facts" dug up by Greg Milewski, and, finally, the "Minutes of Meeting" (August) by Glenn Wilkins, Secretary, who noted that Frank McCullough died on July 18, 1997.

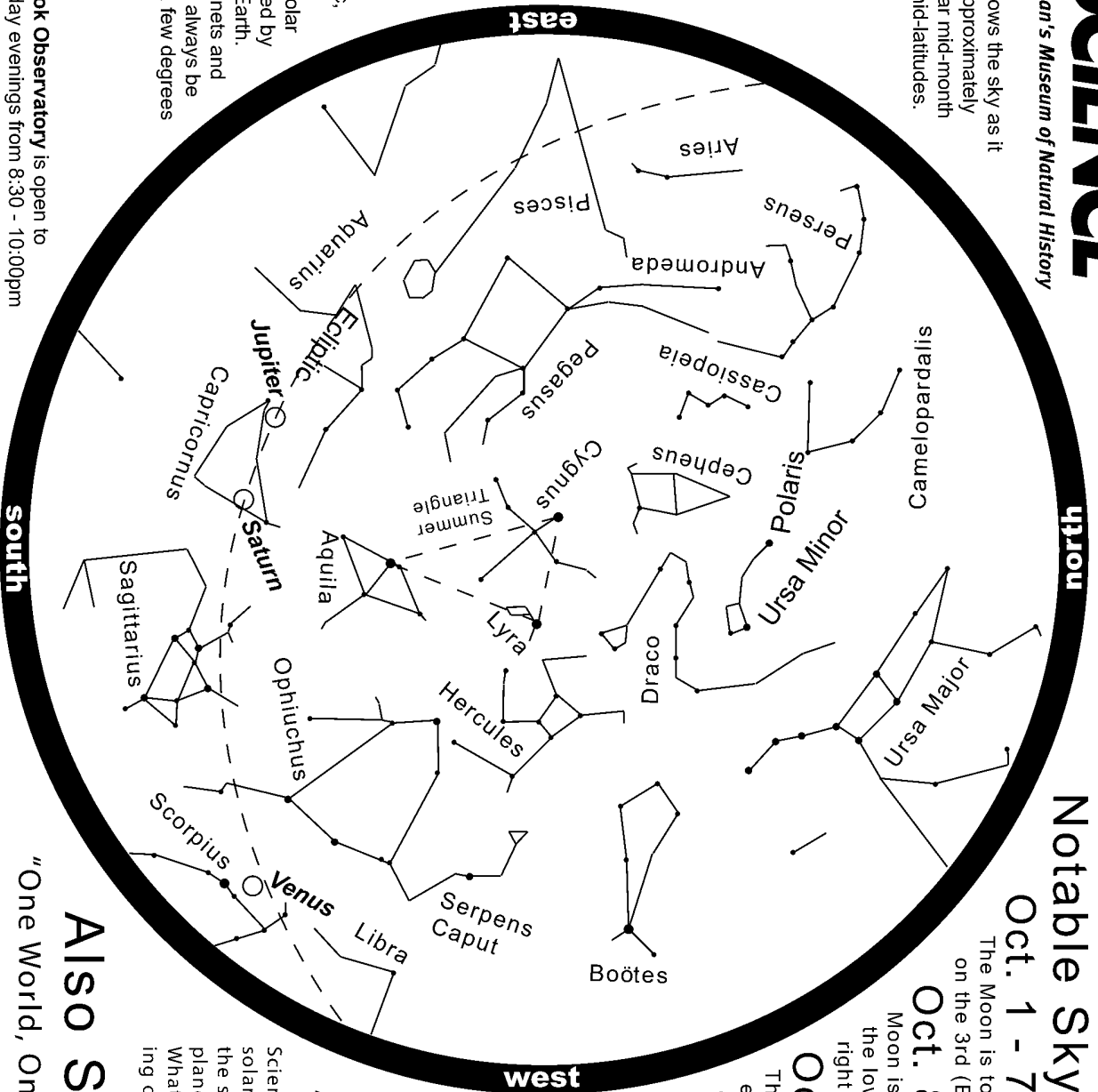
Dale Thieme,
Chief scanner



The Warren Astronomical Society Paper
Volume 29, Number 8, October, 1997



This chart shows the sky as it appears at approximately 8pm EDT near mid-month at northern mid-latitudes.



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.

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. Come have a look through our 6" telescope! For observatory information visit <http://science.cranbrook.edu/explore/observatory>

OCTOBER 2021

Notable Sky Happenings

Oct. 1 - 7

The Moon is to the left of Regulus, the "heart" of Leo the lion, on the 3rd (E predawn sky).

Oct. 8 - 14

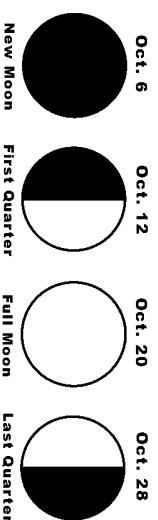
Moon is above Venus on the 9th (SW eve. twilight), at the lower right of Saturn on the 13th (S eve.) and lower right of Jupiter on the 14th (SSE eve.).

Oct. 15 - 21

The Moon is to the left of Jupiter on the 15th (SSE eve.). The Orionid meteor shower (produced by debris from Halley's Comet) peaks on the night of the 21st-22nd. The Moon interferes in 2021.

Oct. 22 - 31

The Moon is above Aldebaran on the 24th (SW predawn) and lower right of Pollux on the 27th. The "twin" star, Castor, is to the upper right of Pollux (S predawn).



Now Showing

"Birth of Planet Earth"

Scientists now believe that our galaxy is filled with solar systems, including up to a billion planets roughly the size of our own. How did Earth become a living planet in the wake of our solar system's violent birth? What does its history tell us about our chances of finding other worlds that are truly Earth-like?

Also Showing

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

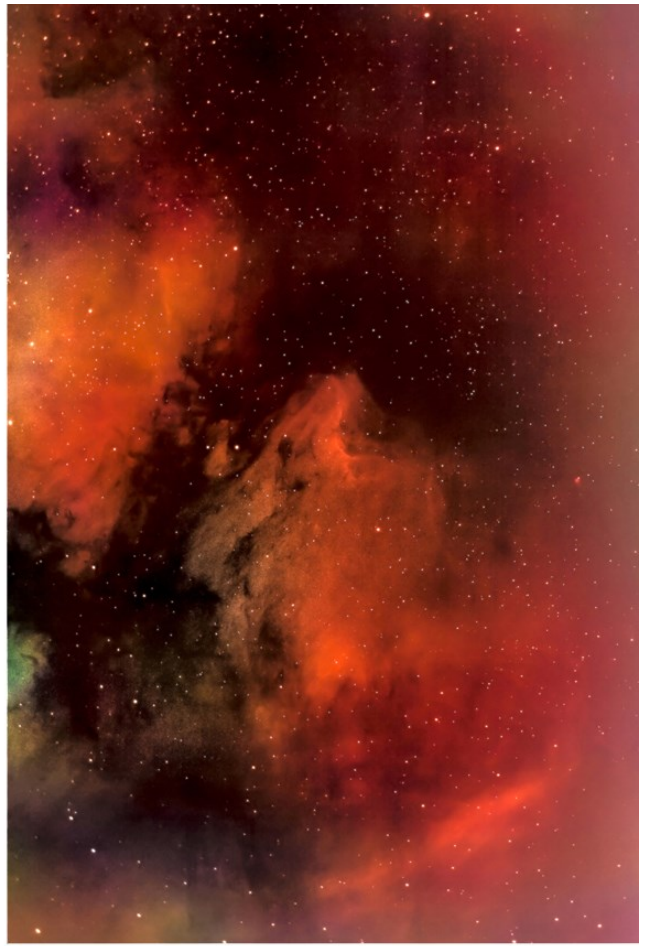
When Elmo's friend, Hu Hu Zhu, visits from China. Big Bird, Elmo and Hu Hu Zhu take viewers on an exciting discovery of the Sun, Moon, and stars. They learn about the Big Dipper and the North Star and take an imaginary trip to the Moon where they learn that the Moon is a very different place.

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





Ray Bosshard - Comet NEOWISE



Fred Pompei - IC5070 Pelican Nebula

October 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4 Cranbrook Virtual Meeting	5	6 Navratri begins New Moon	7 Draconids	8	9 International Astronomy Day
10 Southern Taurids	11 Columbus Day	12	13	14	15	16 International Observe the Moon Night
17	18	19	20 Full Moon	21 Orionids	22	23 Virtual Stargate
24	25 Mercury at Greatest Elongation: 18.4°W	26	27	28	29 Venus visible latest at dawn	30
31 Halloween						



Stargate Observatory

Astronomy Open House and Star Party

October 23!

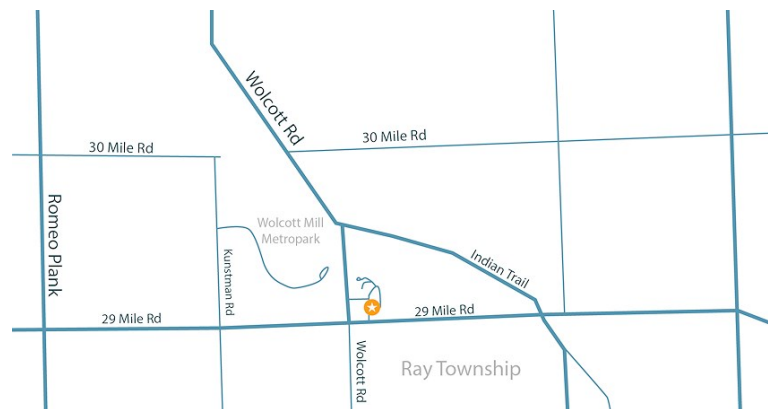
Wolcott Mill Metropark - Camp Rotary entrance

We are testing the waters this month with an onsite star party. Masking for COVID requested, mandatory for children.

The observatory will have very limited access.

Contact: secondvp@warrenastro.org

Find us on [MeetUp.com](https://www.meetup.com)



20505 29 Mile Rd (1.8 miles east of Romeo Plank Rd) Ray, MI 48096

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).
- 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

Observatory report for October 2021.

Stargate observatory and the Dob shed along with all equipment are in good condition as of September 19, 2021.

The WAS board has decided to start a trial for **in person observing on limited basis** with COVID precautions. The open house is on **October 23**.

Attendees are asked to wear masks when near other members outside the observatory and masks are mandatory inside the observatory. All children under the age of 12 and anyone not vaccinated must wear masks.

There will be a limit of one person or one family inside the observatory at any one time.

Sharing eyepieces is discouraged. There will be foam eyepiece eye-protectors available to use.

Please help us make this event safe so we can continue further in person open house observing.

In the case of bad weather, virtual observing discussion may be possible from Northern Cross Observatory (NCO) if Doug Bock is available to host it. Use the same WebEx link from last meeting to join online.

Riyad I. Matti

2021 WAS 2nd VP, Observatory Chairperson

Treasurer's Report

Current memberships: 184

Let's welcome 5 new members to the Warren Astronomical Society!

- Heather Lozier
- Mary Mutti
- Bill Slogeris
- Michael Wilson III
- Steven Stuart

Accounts as of September 28, 2021

Main \$21,251.94
 GLAAC \$3,263.95
 PayPal \$872.91

September Expenses

Main

State of Michigan Corporate renewal: 20.00
 Observatory Insurance: 1,171.00

GLAAC

reimbursement: 15.89

September Income

Memberships/renewals: 147.00
 PayPal Giving Fund: 2.00

-Adrian Bradley
 Treasurer

Astronomical Events for October 2021

Add one hour for Daylight Savings Time

Source:

<http://astropixels.com/almanac/almanac21/almanac2021est.html>

Day	EST (h:m)	Event
02	17:00	Venus at Aphelion
06	06:05	NEW MOON
07	23:00	Mars in Conjunction with Sun
08	12:28	Moon at Perigee: 363388 km
09	11:00	Mercury at Inferior Conjunction
09	13:36	Venus 2.9°S of Moon
09	14:35	Moon at Descending Node
10	01:27	Antares 4.0°S of Moon
12	22:25	FIRST QUARTER MOON
14	02:12	Saturn 3.9°N of Moon
15	04:58	Jupiter 4.1°N of Moon
16	08:24	Venus 1.4°N of Antares
19	19:00	Mercury at Perihelion
20	09:57	FULL MOON
21	06:00	Orionid Meteor Shower
23	00:45	Pleiades 4.5°N of Moon
23	06:47	Moon at Ascending Node
24	10:30	Moon at Apogee: 405616 km
25	00:00	Mercury at Greatest Elong: 18.4°W
27	15:40	Pollux 2.6°N of Moon
28	15:05	LAST QUARTER MOON
29	17:00	Venus at Greatest Elong: 47.0°E



If you're shopping on Amazon, make sure to use Amazon Smile. It costs you nothing, and if you select us as your charity, Amazon will donate 0.5% of every purchase you make to the Warren Astronomical Society.

Outreach Report

Endeavour Space Academy 2021 Launches!

Connie and I held our first meeting of our after-school astronomy and space science club, where we explained to the students what we wanted to do over the year. Several of the students were *very* interested in building and launching model rockets! *Guess I'll get those ordered!*

Only a few of the students had ever looked through a telescope, and another few had looked through binoculars - only one student in the club currently owned a telescope. So I had them *all* look through my small tabletop refractor at something on the wall - noting how the image was flipped. Everyone also looked out the window with my binoculars - that got a couple "Wows!"

I brought up [Stellarium-Web](#) and Connie and I showed the students where to look for Jupiter, Saturn and Venus after sunset - we also showed them where to look for the constellation Orion in the morning; several of the students had never heard of Orion... *MAN! I have work to do!*



Photo: Screenshot from Stellarium-Web. Credit: Bob Trembley

Our discussions took a couple tangents, and we showed images of the comet Shoemaker-Levy 9 "String of pearls" and Jupiter impacts, and videos of the Chelyabinsk meteor impact - neither of which the students had ever heard of.

Wow! It feels great to be running this club again!

Michigan Astronomers *ROCK!*

During last week's **Astronomy at the Beach** event, a young girl and her mother joined one of our Zoom sessions; they were in upper Michigan, at a very dark sky location, with a brand new telescope that they had no idea how to use.

You should have seen all these Michigan astronomers fall all over each other trying to help this young lady - it was heartwarming. But, it proved difficult to do a first-time telescope setup via remote.

(Continued on page 30)

Someone mentioned binoculars, which they fortuitously had, so they went inside to get them! They ended up getting a remote sky tour, and I heard a couple "Wows" as someone used the binoculars!

They live in Troy; we encouraged them to contact an astronomy club for help when they got back home - I think they got something like 5 offers for help!

I'd like to thank the W.A.S. members who live-streamed night sky images, and participated in the various Astronomy at the Beach events - like I said, *Michigan astronomers rock!*



Landsat 9 launches

Landsat 9 launched on September 17th from California - it carried with it four CubeSats, including the [CuPID mission](#). CuPID will study the boundaries of Earth's magnetic field with a special X-ray camera.

Scott Manley [tweeted](#) this:

Landsat is one of the few space programs where it's easy to frame it as an investment which has a direct benefit to the US taxpayer. The imagery it gathers is used by agriculture across the US

The spacecraft will help extend the 50-year continuous record of global imagery collected by the Landsat family of satellites since 1972.

Image Credit:United Launch Alliance

World Space Week 2021 celebrates "Women in Space!"

October 4-10, join thousands of participants in over 90 countries celebrating accomplishments and contributions of women to the space sector and sciences.

World Space Week is an international celebration of science and technology, and their contribution to the betterment of the human condition. The United Nations General Assembly declared in 1999 that World Space Week will be held each year from October 4-10. These dates commemorate two events:

October 4, 1957: Launch of the first human-made Earth satellite, Sputnik 1, thus opening the way for space exploration

October 10, 1967: The signing of the Treaty on Principles Governing the Activities of States in the Exploration and Peaceful Uses of Outer Space, including the Moon and Other Celestial Bodies.

In 2020, more than 6,500 events were organized in over 60 countries under the theme "Satellites Improve Life" - <https://www.worldspaceweek.org/>



World Space Week OCTOBER 4-10



Всемирная неделя космоса 4-10 октября
世界空间周 10月4号到10号
Semana mundial del espacio 4-10 Octubre
Semaine mondiale de l'espace Octobre 4-10
الأسبوع العالمي للفضاء
٤ - ١٠ أكتوبر

www.worldspaceweek.org



@worldspaceweek
#wsw2021

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World Space Week 2021 Celebrates WOMEN IN SPACE

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PARTNERS



Great Lakes Association of Astronomy Clubs Board Meeting



September 9, 2021 - ONLINE, 7pm
<https://umich.zoom.us/j/584733345>
AATB 2021: September 24/25, 2021 until 11pm

Call to order: 7:15pm

Online:

- John Wallbank - GLAAC Vice President, Lowbrows
- Jeff Kopmanis - GLAAC Secretary, Lowbrows
- Brian Ottum - Lowbrows
- Bob Trembley - Vatican Foundation
- Bridget Harwood - MI DNR
- Adrian Bradley - GLAAC President, Lowbrows, WAS Treasurer

Announcements:

Discussion:

A list of commitments for showing the night sky and URLs if provided.

Awni Hafedh - H-alpha solar (both nights)

Jeff Kopmanis - (Saturday)

Doug Bock - dark (both nights, <https://douglasbock.my.webex.com/meet/dbock1>)

Samir Hariri - poss: "The Rocky Story of Our Solar System"

Tim Campbell - Ford (info?) - Adrian will check with Tim.

Brian Ottum - NM, (>10pm,)

On-site

BH: no problems, but would like to know approximate numbers

On-site event will not be publicized on the web page; word-of-mouth only

Nothing on-site, officially

Marketing - Brian Ottum

Who do we want to alert?

Schools

Clubs

Libraries

Teachers

Bob Trembley - Macomb county

Contact to all of Macomb County STEM

Will create - Facebook Event

John Wallbank - Livingston county

Will Blast on Monday

Michigan Science Center - has been a willing partner

September 23, 7pm - Last-Minute meeting for presenters and Board (30 minutes)

Adjourn:

Motion to adjourn by **AB**, seconded by **JK**. Approved by unanimous vote.

Meeting Adjourned at 8:10 pm

Next Meeting: **September 23, 2021 7pm - Last-Minute Meeting**

Michigan Dark Sky Update

(Edited from emails from Sally Oey)



Ann Arbor City Council unanimously passed a Lighting Ordinance on Sept. 7, 2021!

Many thanks once again to the drafting Working Group: John Mirsky (Energy Commission), Erica Briggs and Sarah Mills (Planning Commission), Mary Stewart Adams (founder, Headlands International Dark Sky Park), and our advisor from the International Dark-Sky Association, John Barentine.

Thanks to the Energy Commission for sponsoring, and to the Planning Commission for all their work on this, as well as the Lighting Ordinance modifications. Thanks to Rita Mitchell and the Environmental Commission for passing a Resolution in support; as well to the City's Student Advisory Commission led by Skyline High student Kenichi Lobbezoo for their Resolution in support, and to Gillen Brown for initiating this with the SAC.

City Planning staff Brett Lenart and Jill Thacher provided critical help and support.

We're also grateful to those of you who wrote and called in to support, including Mary Adams, Theresa Angelini, Gillen Brown, Heather Good, Michael Meyer, John Mirsky, Rita Mitchell, Nancy Schiffler, Heidi Trudell, and the SAC. Thank you to many others who provided help and support at various times, especially Ryan Farber, Karie Slavik, and Pat Seitzer. Thanks to Doug Richstone for lending his light meter. And special thanks to Barbara Lucas who started the ball rolling by connecting us to the right people!

Please thank the four City Council Members who sponsored the ordinance: Disch (Ward 1), Briggs (Ward 5), Griswold (Ward 2), and Hayner (Ward 1).

It's been a long road, but Council was very supportive and there were no concerns expressed. Council also endorsed the idea of an educational initiative to help raise awareness and compliance, as recommended by the Environmental Commission's resolution.

- **White Pigeon, St. Joseph County:** Shireen Cline presented a letter at a public hearing Aug 16 to the town council, signed by 12 residents concerned about the lighting at a new construction project. The letter simply requests that existing glare and lighting specifications are adhered to. Unfortunately the zoning administrator and council are not sympathetic, although one of the relevant property owners has given verbal assurance that he'll comply. Many thanks to Robert Parrish for supporting Shireen. She also believes that an **endangered species of bat may be affected**. Can anyone help strategize next steps?

- Bob Stencil shares an excellent IDA presentation from the National Institute of Crime Prevention on [Crime and Lighting](#). (30 min, with additional Q&A)

- Heidi Trudell shares this [Template Letter](#) to send to building/property managers to request lighting curfews during bird migration seasons (Sept - Nov and March - May). This is posted on the MIDS Google Drive under Misc.

- Mary Adams shares that Palos Preserves / Mt. Forest Island near Chicago has been named the largest Urban Night Sky Place in the world. (Jerry Hasspacher notes that this is not a real island.)

- Heidi Trudell shares three new studies on harmful effects of blue light and other effects on nocturnal bird activity, including effects from low-rise, shielded lights.

- **Sept 10** -- Astronomers: The **IAU members vote** includes [Resolution B1](#) in support of protecting radio-quiet zones and other actions to promote international radio spectrum management.

Meeting Minutes

WARREN ASTRONOMICAL SOCIETY MINUTES OF (VIRTUAL) BOARD MEETING SEPTEMBER 6, 2021 @ 7:30PM

Meeting was called to order at 7:30 PM by President Diane Hall. Board Officers in attendance: Dale Partin, Riyad Matti, Mark Kedzior, Adrian Bradley & Dale Thieme (quorum present).

OFFICER REPORTS

President Diane Hall reported that Mike Narlock of Cranbrook is seeking an individual for a part time planetarium/observatory position that has become available.

1st VP Dale Partin reported on the Swap Meet held on August 28 at the pavilion near Stargate Observatory at Wolcott Mill Metropark. Approximately 10 to 12 folks attended from 4 to 6PM to sell their astronomical items.

2nd VP Riyad Matti attended the Swap Meet to provide assistance to Dr. Dale Partin if needed. Did regular inspection of Stargate and Dob Shed – everything looked satisfactory. He did notice a small leak on the Stargate roof with some moisture on the safe. He will continue to monitor where the leak is originating so necessary repairs can be made.

Secretary Mark Kedzior reported on his visit to the Ferndale Library to talk to staff in regard to starting a Library Telescope Lending Program for their patrons. He will coordinate the modifications on the three Orion StarBlast reflectors they purchased with their staff. They would like to launch their program in October.

Treasurer Adrian Bradley reported the WAS has approximately 190 paid memberships to date. He also made payment to Macomb College for the Paul Strong Scholarship. He also reported about the Explore Scientific Star Party and the Astronomical League's Virtual Annual Convention held August 19-21. He reports that the Astronomy at the Beach website is set up for virtual observing for September 24-25, with Doug Bock sharing his virtual observing through his equipment to the virtual attendees.

Publications Chair Dale Thieme reports that the September edition of the WASP is online. He also noted that we need submissions of images for the WAS 2022 Calendar. Promotion will begin in the WASP and at all meetings. December 1st will be the last date of photo submissions and all orders for calendars must be placed by the end of the 1st week in December.

OLD BUSINESS

President Diane Hall reports that the WAS will still continue to meet virtually for Cranbrook, Macomb and Stargate open houses. Discussion on the upcoming November WAS Officer Elections – there will be vacancies for the 1st VP, 2nd VP and Outreach positions, but nominations can be made for all positions – if any WAS member would like to be nominated for a position for the election, please contact a current WAS Board member with the office you would like to run for. The WAS Virtual Banquet will be held on Thursday December 9th, following the December 6th Cranbrook Virtual Meeting. Treasurer Adrian Bradley will be the featured speaker at this year's banquet.

NEW BUSINESS

The WAS has received its annual insurance renewal to be renewed NLT October 1, 2021. The quote was for \$1,171, up from \$1,117 for 2020. Motion by Dr. Dale Partin to approve renewing insurance from current carrier, motion seconded by Dale Thieme. Motion passed 6-0 to approve.

Dale Thieme reported the October 4th Cranbrook meeting will be on WebEx only due to a private screening of a movie from Calvin University – no YouTube for this meeting – must login to WebEx. Ferndale Library Telescope Program – motion by Mark Kedzior for WAS to partner with library to provide support in training staff and providing technical support in maintenance of telescopes – supported by Adrian Bradley. Motion passed 6-0. Discussion on Galileo 130MM reflector with EQ mount that was donated to WAS. Motion by Adrian Bradley to offer Galileo reflector scope as door prize at December virtual banquet – supported by Dale Thieme. Motion passed 6-0. Will set up on line registration for door prize drawing at 7PM as done for the 2020 Banquet.

Motion by Dale Thieme to adjourn meeting – supported by Dale Partin. Motion passed 6-0. Meeting adjourned at 9:25PM.

Respectfully submitted,
Mark Kedzior
Secretary

WARREN ASTRONOMICAL SOCIETY CRANBROOK (VIRTUAL) MEETING SEPTEMBER 13, 2021 @ 7:30PM

The meeting was called to order at 7:30PM and a welcome to all by President Diane Hall. She then reviewed the ground rules, meeting format and etiquette of this virtual meeting and presentation

(Continued on page 35)

(Continued from page 34)

so as to be enjoyed by all in attendance.

(Attendance on WebEx (31) and YouTube (14) at 8:30PM). Officers in attendance: Diane Hall, Dale Partin, Riyadh Matti, Mark Kedzior, Adrian Bradley, Bob Trembley, Dale Thieme.

OFFICER REPORTS

President Diane Hall expressed her appreciation of support for the passing of her father -in-law (Jonathan Kade's father) – Swap Meet Report – stated that kid's vaccines for ages 5-12 are vital for a return to in person events – volunteers for a Calendar Committee are needed along with submissions for the calendar – WAS Service Award nominees can be submitted to the WAS Board for consideration – Nomination Committee needed for WAS Officer elections – Outreach position is term limited – all officer positions are open for nominations – Employment opportunities available at PlaneWave Instruments and a part time planetarium/observatory position at Cranbrook – the October 4th Cranbrook meeting will be WebEx only for a private screening of "Luminous" – NO YouTube for this meeting.

1st VP Dale Partin reports that Tony Licata will be presenting "The Hamburg Meteor" at the September 16th Macomb meeting – on October 4th Sam Smart of Calvin University will be presenting video "Luminous" WebEx only – still looking for presenters for 2022.

2nd VP Riyadh Matti reports the observatory and Dob Shed are in good condition but still closed due to pandemic restrictions – 10-12 persons attended Swap Meet on August 28th.

Secretary Mark Kedzior reported on the Ferndale Library Telescope progress.

Treasurer Adrian Bradley reports Stargate insurance paid to West Bend Insurance for \$1,171.00 on September 13th – contact treasurer@warrenastro.org if one desires to order AL Observers Handbooks and Calendars, also RASC Handbooks – Astronomy at the Beach will feature live views through telescopes virtually – go to www.glaac.org for live views September 24-25.

Outreach Chair Bob Trembley reports the AATB event is posted on Facebook – Adrian Bradley reports the Explore Scientific virtual event will feature "The Life and Times of John Dobson" – Ken Bertin continues with his Facebook astronomy program – if interested in presenting a zoom presentation for Astronomy at the Beach contact Bob Trembley.

Publications Chair Dale Thieme reports the September WASP is posted online.

SPECIAL INTEREST GROUPS

Solar – No report. Double Star Group Riyadh Matti suggested observing double stars in Orion. His-

tory – no report. Astrophotography – Doug Bock shared image from Great Lakes Star Graze of NGC7331 & Stephan's Quintet.

OBSERVING REPORTS

David Levy reports observing six active groups of sunspots with over 60 observed – also read poem from Canadian writer "The Cremation of Sam McGee" – Dale Hollenbaugh shared his attempts at imaging of Jupiter and its moon Amalthea.

IN THE NEWS (presented by Bob Trembley) – 1) Image of Hi Rise scarp on Mars 2) Perseverance Rover helicopter made 13th flight 3) Chinese Space Agency developing helicopter for Mars mission 4) Inspiration 4 crew - all civilian crew to travel into space 5) James Webb Space Telescope being delivered to launch site after final testing 6) LUCY mission to launch around October 16th to visit trojan asteroids around Jupiter.

IN THE SKY – Using Stellarium, shows Venus-Mercury in western sky on September 14th – moon nears Jupiter and Saturn on September 17th – lots of sunspot activity being observed – 4,16 known exoplanets as of September 16th.

SHORT PRESENTATION

Dr. Dale Partin introduced a collaboration in the recording of "Edwin Hubble's Universe" a recording of a lecture in 1945 to the New York Philharmonic – 16 years after discovering the expansion of the universe – recording discovered by Gary M. Ross, Clayton Carey acquired the recording from the New York Philharmonic, and a slideshow to accompany the recording made by Dale Thieme. Questions and discussion followed.

MAIN PRESENTATION

Dr. Dale Partin introduced 20 year WAS member Jim (one of the Skee Brothers) Shedlowsky with another of his "Shedlowsky September Cranbrook" presentations – 13 years and counting - this year's presentation is "The Giant Magellan Telescope". In his presentation, Jim explained the evolution and comparison of giant telescopes that have been constructed and the new construction of larger telescopes. The GMT has advanced level adaptive optics integrated with secondary mirrors for improved sensitivity and resolution. Proposed first light of the GMT with 3 mirrors in operation is 2029 and fully operational with all 7 mirrors in the early 2030's. Jim brought his presentation to an end with a rousing rendition to the tune of "It's Hard to Be Humble" (apologies to Mac Davis) with "The Giant Magellan Telescope Song".

Questions and discussion followed.

To see both presentations in their entirety, go to:

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

Meeting ended at 9:47PM.

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(Continued from page 35)

WARREN ASTRONOMICAL SOCIETY MACOMB (VIRTUAL) MEETING

SEPTEMBER 16, 2021 @ 7:30PM

Meeting was called to order at 7:30 PM and a welcome to all by President Diane Hall. WAS Board members in attendance: 1st VP Dale Partin 2nd VP Riyad Matti, Secretary Mark Kedzior, Treasurer Adrian Bradley, Outreach Chair Bob Trembley & Publications Chair Dale Thieme. Attendance at 8:45PM: WebEx (23) & YouTube (7).

OFFICER REPORTS

President Diane Hall reported on the August 28th Swap Meet - waiting for guidance from host institutions on return to in person meetings - 2022 Calendar - submit images to Publications - need one to three volunteers to serve on calendar committee - WAS Service Award selections - send nominations to WAS Board for consideration - Officer Elections in November - ALL positions are available for election but Outreach position is term limited - volunteers needed for nominating committee - employment opportunities at PlaneWave Instruments in Adrian, MI and also a part time planetarium/observatory position for Cranbrook - Cranbrook October 4th meeting a private screening of movie will be shown on WebEx only - NO YouTube streaming for this meeting.

1st VP Dr. Dale Partin reports that the October 4th Cranbrook meeting will have a private showing by Sam Smart of Calvin University "Luminous" - about predictions on stars exploding in universe - at the October 21st Macomb meeting Jonathan Kade will present "Buying Your 1st Telescope" - presenters needed for 2022.

2nd VP Riyad Matti reports the observatory and shed are in good shape and gave brief report on Swap Meet of August 28th.

Secretary Mark Kedzior reported on the progress of the Ferndale Library Telescope program.

Treasurer Adrian Bradley gave the account balances for WAS, GLAAC and PayPal - Insurance paid for Stargate coverage -\$500 payment made to Macomb for Paul Strong Scholarship - 183 paid memberships to date.

Outreach Chair Bob Trembley reported on the September 24-25 Astronomy at the Beach Virtual event - Doug Bock and Brian Ottum will be doing virtual observing both nights and possible virtual observing from the Southern Hemisphere may be available.

Publications Chair Dale Thieme reports the September WASP is online and looking for October submissions.

SPECIAL INTEREST GROUPS

Solar - Sunspots have subsided - Double Star Group - conditions getting better to observe especially in constellation of Orion - Astrophotography - Adrian Bradley shared images of Jupiter and Saturn with 600MM lens - Dale Hollenbaugh shared his recent images of Jupiter and moons- also was able to image moons Amalthea and Thebe - also showed image of Saturn and 8 of its moons.

IN THE NEWS - Possible impact on Jupiter observed by amateur - Inspiration 4 all civilian crew in high orbit above earth.

OBSERVING REPORTS - David Levy reports he may have seen the Jupiter impact - reports observing one sunspot but 41 prominences - read poem by Leslie Peltier from "Starlight Nights".

PRESENTATION

Dr. Dale Partin introduced Tony Licata, Co-President of the GM Astronomy Club and the Ford Amateur Astronomy Club, with his presentation on "The Hamburg Meteor". Tony took us through his journey of recovering meteorites from a bolide that entered earth's atmosphere on January 16, 2018, and with assistance from numerous individuals, were able to determine through calculations (within 14 miles of suspected area) and Doppler hits the most likely area where remnants of this meteor landed. Meteorites were found in Hamburg Township on Strawberry Lake, Hamburg Lake, and Ore Lake. One was found on land twelve days later. The meteorites were analyzed and found to be H4 chondrites - a early solar system body - black fusion crust surrounded a grey stony interior matrix of iron and nickel on found meteorites.

Questions and discussion followed his interesting presentation, which can be seen in its entirety at: <https://www.youtube.com/warrenastro>

Meeting ended at 9:37PM.

Respectfully submitted,
Mark Kedzior
Secretary



Club Member
Name Tags

Email publications@warrenastro.org for
your personalized name tag

The Warren Astronomical Society is a Proud Member of the Great Lakes Association of Astronomy Clubs (GLAAC)

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.

GLAAC Club and Society Meeting Times

Club Name & 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 Public open house—first Saturday at 11 am
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

GLAAC Club and Society Newsletters

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

WAS Member Websites

Jon Blum: [Astronomy at JonRosie](#)
 Bill Beers: [Sirius Astro Products](#)
 Jeff MacLeod: [A Life Of Entropy](#)

Bob Trembley: [Balrog's Lair](#)
 Bob Trembley: [Vatican Observatory Foundation Blog](#)

Doug Bock: <https://boonhill.org>
 Facebook: Northern Cross Observatory <https://www.facebook.com/NorthernCrossObservatory>
 Boon Hill and NCO Discussion <https://www.facebook.com/groups/369811479741758>
 YouTube channel: <https://www.youtube.com/channel/UC-gG8v41t39oc-bL0TgPS6w>



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!

Weird Ways to Observe the Moon

David Prosper

International Observe the Moon Night is on October 16 this year- but you can observe the Moon whenever it's up, day or night! While binoculars and telescopes certainly reveal incredible details of our neighbor's surface, bringing out dark seas, bright craters, and numerous odd fissures and cracks, these tools are not the only way to observe details about our Moon. There are more ways to observe the Moon than you might expect, just using common household materials.

Put on a pair of sunglasses, especially **polarized sunglasses!** You may think this is a joke, but the point of polarized sunglasses is to dramatically reduce glare, and so they allow your eyes to pick out some lunar details! Surprisingly, wearing sunglasses even helps during daytime observations of the Moon.

One unlikely tool is the humble **plastic bottle cap!** John Goss from the Roanoke Valley Astronomical Society shared these directions on how to make your own bottle cap lunar viewer, which was also suggested to him by Fred Schaaf many years ago as a way to also view the thin crescent of Venus when close to the Sun:

"The full Moon is very bright, so much that details are overwhelmed by the glare. Here is an easy way to see more! Start by drilling a 1/16-inch (1.5 mm) diameter hole in a plastic soft drink bottle

cap. Make sure it is an unobstructed, round hole. Now look through the hole at the bright Moon. The image brightness will be much dimmer than normal - over 90% dimmer - reducing or eliminating any lunar glare. The image should also be much sharper because the bottle cap blocks light from entering the outer portion of your pupil, where imperfections of the eye's curving optical path likely lie." Many report seeing a startling amount of lunar detail!

You can **project the Moon!** Have you heard of a "Sun Funnel"? It's a way to safely view the Sun by projecting the image from an eyepiece to fabric stretched across a funnel mounted on top. It's easy to make at home, too - directions are here: bit.ly/sunfunnel. Depending on your equipment, a Sun Funnel can view the Moon as well as the Sun- a full Moon gives off more than enough light to project from even relatively small telescopes. Large telescopes will project the full Moon and its phases, with varying levels of detail; while not as crisp as direct eyepiece viewing, it's still an impressive sight! You can also mount your smartphone or tablet to your eyepiece for a similar Moon-viewing experience, but the funnel doesn't need batteries.

Of course, you can join folks in person or online for a celebration of our Moon on October 16, with International Observe the Moon Night - find details at moon.nasa.gov/observe. NASA has big plans for a return to the Moon with the Artemis program, and you can find the latest news on their upcoming lunar explorations at nasa.gov.



Sun Funnels in action! Starting clockwise from the bottom left, a standalone Sun Funnel; attached to a small refractor to observe the transit of Mercury in 2019; attached to a large telescope in preparation for evening lunar observing; projection of the Moon onto a funnel from a medium-size scope (5 inches).

Safety tip: NEVER use a large telescope with a Sun Funnel to observe the Sun, as they are designed to project the Sun using small telescopes only. Some eager astronomers have melted their Sun Funnels, and parts of their own telescopes, by pointing them at the Sun - large telescopes create far too much heat, sometimes within seconds! However, large instruments are safe and ideal for projecting the much dimmer Moon. Small telescopes can't gather enough light to decently project the Moon, but larger scopes will work.

(Continued on page 39)

(Continued from page 38)

You can download and print NASA's observer's map of the Moon for International Observe the Moon Night! This map shows the view from the Northern Hemisphere on October 16 with the seas labeled, but you can download both this map and one of for Southern Hemisphere observers, at: bit.ly/moonmap2021 The maps contain multiple pages of observing tips, not just this one.



International OBSERVE
THE MOON NIGHT 2021

SATURDAY
OCTOBER 16TH



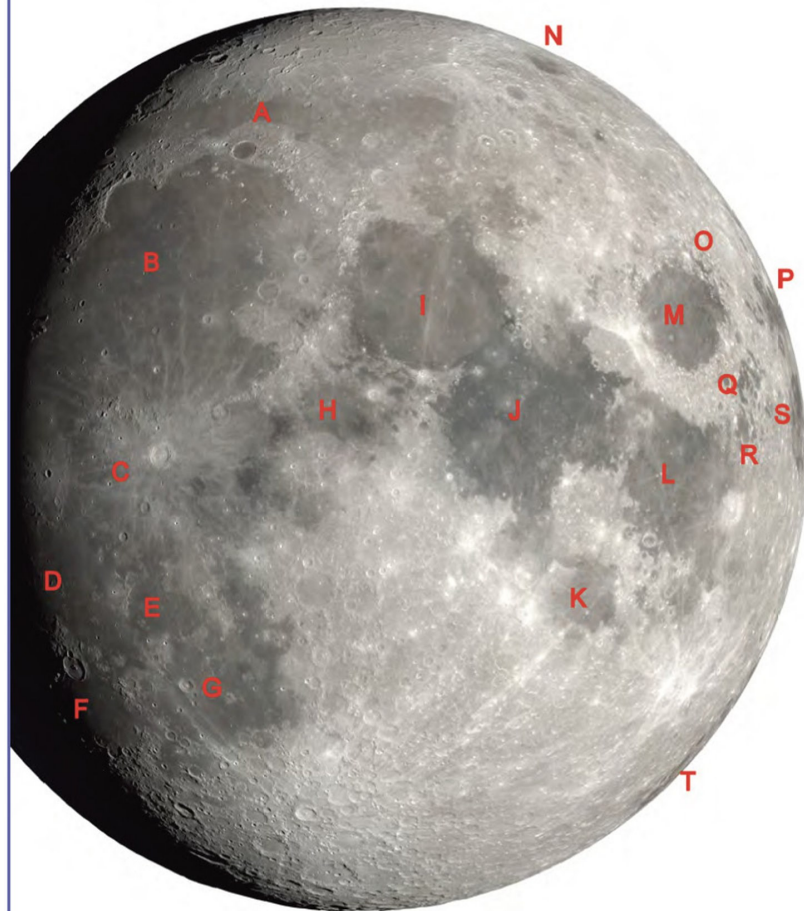
**NORTHERN HEMISPHERE MOON MAP WITH
LUNAR MARIA (SEAS OF BASALT)**

Moon Map

This map was created for International Observe the Moon Night 2021. It depicts the Moon as it will appear from the northern hemisphere at approximately 11:00 PM EDT on October 16, 2021 (3:00 AM UTC on October 17).

Lunar Maria (Seas of Basalt)

You can see a number of maria tonight. Once thought to be seas of water, these are actually large, flat plains of solidified basaltic lava. They can be viewed in binoculars or even with the unaided eye. Tonight, you may be able to identify 18 maria on the Moon. This includes four seas along the eastern edge that are often hard to see. Because of libration, a slight apparent wobble by the Moon in its orbit around Earth, tonight we get to peek slightly around the northeast edge of the Moon, glimpsing a sliver of terrain normally on the Moon's far side.



Map generated with NASA's Dial-A-Moon (<https://svs.gsfc.nasa.gov/4874>)

- | | | |
|--|--|---------------------------------|
| A. Mare Frigoris (Sea of Cold) | H. Mare Vaporum (Sea of Vapors) | O. Mare Anguis (Serpent Sea) |
| B. Mare Imbrium (Sea of Rains) | I. Mare Serenitatis (Sea of Serenity) | P. Mare Marginis (Border Sea) |
| C. Mare Insularum (Sea of Isles) | J. Mare Tranquillitatis (Sea of Tranquility) | Q. Mare Undarum (Sea of Waves) |
| D. Oceanus Procellarum (Ocean of Storms) | K. Mare Nectaris (Sea of Nectar) | R. Mare Spumans (Sea of Foam) |
| E. Mare Cognitum (Known Sea) | L. Mare Fecunditatis (Sea of Fertility) | S. Mare Smythii (Smyth's Sea) |
| F. Mare Humorum (Sea of Moisture) | M. Mare Crisium (Sea of Crises) | T. Mare Australe (Southern Sea) |
| G. Mare Nubium (Sea of Clouds) | N. Mare Humboldtianum (Humboldt's Sea) | |



[MOON.NASA.GOV/OBSERVE](https://moon.nasa.gov/observe)

#ObserveTheMoon