



The W.A.S.P.



Vol. 54, no. 12

Winner of the Astronomical League's 2021 Mabel Sterns Award

December 2022

The Warren Astronomical Society Publication

APOLLO XVII



DECEMBER 7 - 19, 1972

50 yrs.



The WASP



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

Dale Thieme, Editor

2022 Officers

President	Diane Hall	president@warrenastro.org
1st VP	Bob Trembley	firstvp@warrenastro.org
2ndVP	Riyad Matti	secondvp@warrenastro.org
Secretary	Mark Kedzior	secretary@warrenastro.org
Treasurer	Adrian Bradley	treasurer@warrenastro.org
Outreach	Kevin McLaughlin	outreach@warrenastro.org
Publications	Dale Thieme	publications@warrenastro.org
Entire Board		board@warrenastro.org

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:

Cranbrook: Institute of Science
1221 North Woodward Ave
Bloomfield Hills, Michigan

Third Thursday meeting:

Macomb Community College
South campus, Bldg. J, Room J221
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

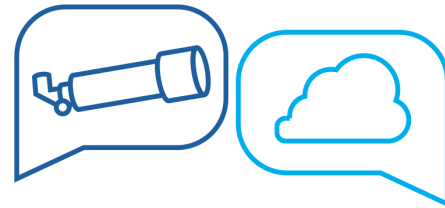
- Loaner telescopes (with deposit). See 2nd VP.
- Free copy of each WASP newsletter.
- Free use of Stargate Observatory.
- Special interest subgroups. See chairpersons.

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.



Discussion Group Meeting

Come on over, and talk astronomy, space news, and more!



In This Issue:

President's Field of View	3
About the Cover.....	3
In Memoriam	4
Observing Reports	6
Letters	7
Occultation of Mars.....	8
For Sale	9
Lunar Eclipse Images . . .	10
Astro Images . . .	11
And a Dinosaur.....	12
C.W. Observatory	13
Northern Cross Observatory.....	14
Presentations	15
Skyward	16
Over the Moon	17
Sneezing's Greetings!	18
Excessively Argumentative Astronomers	19
Deployment of Blue Walker 3	24
History S.I.G.	26
Book Review	27
Cranbrook Monthly Sky Chart	28
Calendar	29
Stargate	30
Stargate Officer's Report	31
Treasurer's Report	31
Astronomical events	31
Meeting Minutes	32
GLAAC	35
NASA Night Sky Notes.....	36
Last Word	37



President's Field of View

As Mars approaches opposition, Jonathan's been setting up the telescope on our sidewalk again, the way we did often back in the first flush of love with astronomy, when suburban light glow and patches of Michigan Nebula were no reason not to try and see something. We're sending out Facebook blasts to our neighbors, inviting them to take a look. Sometimes they come. Sometimes they bring the kids or the grandkids and I get to see Jonathan fall back into a joyful mode of presentation as the kiddos see bright planets for the first time. I stick my hands in my coat pockets and pace a bit, because my back and my ankles hurt. As Jonathan explains that Mars won't look this good for another decade, I wonder how much my eyes will be able to take in come 2033.

Time under the wandering planets passes by at an astonishing speed. Saturn's rings are tilting away again. What year was it when we saw the rings on-edge, all the little moons in view? I'd have to look it up. Mars is in the middle of the Winter Hexagon again, outshining Aldebaran and Betelgeuse. What year was that when it made a twin to Betelgeuse in the center of the polygon? I can't remember anymore.

The kids go home for the night and I sit on our battered stepladder and see Mars for myself. It's nice. There's a glimpse of surface detail, a hint of frost. It's nice. Comforting, in a way. Definitely worth dragging out the Dob on a marginal night. The window, after all, is fleeting.

-Diane Hall,
President

About the Cover

Apollo 17 (December 7–19, 1972) was the final mission of NASA's Apollo program. Commander Gene Cernan and Lunar Module Pilot Harrison Schmitt walked on the Moon, while Command Module Pilot Ronald Evans orbited above. Schmitt was the only professional geologist to land on the Moon, selected in place of Joe Engle with NASA under pressure to send a scientist to the Moon. The mission's heavy emphasis on science meant the inclusion of a number of new experiments, including a biological experiment containing five mice carried in the command module.

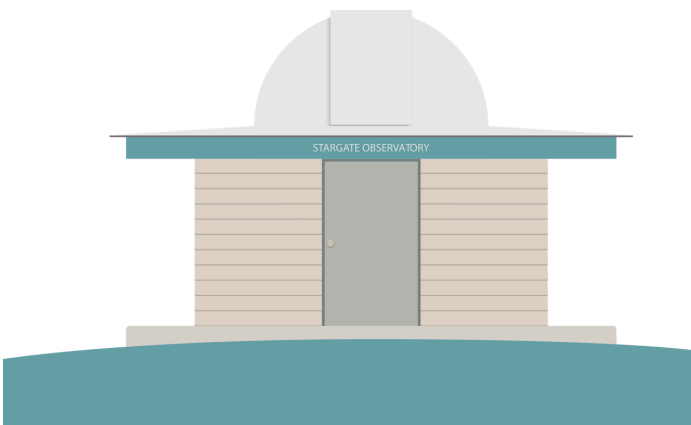


Taurus-Littrow, where formations that had been viewed and pictured from orbit were thought to be volcanic in nature, was selected for the landing site (the two primary goals of the mission: sample lunar highland material older than Mare Imbrium and investigate the possibility of relatively recent volcanic activity.)

The insignia's most prominent feature is an image of the Greek sun god Apollo (looking forward to the future) backdropped by a rendering of an American eagle, the red bars on the eagle mirroring those on the U.S. flag. Three white stars above the red bars represent the three crewmembers of the mission. The background includes the Moon, the planet Saturn, and a galaxy or nebula. The wing of the eagle partially overlays the Moon, suggesting humanity's established presence there.



Apollo 17 space-flown silver Robbins medallion (image)



In Memoriam

Lee Hartwell

1938—2022

It is with great sadness that we learned of the passing of WAS member Lee Hartwell on November 25, 2022. One of our star outreach participants, Lee presented at our Stargate Open House events, scouting programs, libraries and schools.

Bob Berta writes:

WAS member Lee Hartwell passed away on Friday November 25th. Lee was very active prior to Covid in the Outreach program of WAS. When I was the Outreach Chair, Lee volunteered to assist at most of the presentations. Lee retired from GM where he was a teacher of computer drafting. After retirement, his love of astronomy inspired him to return to college where he obtained a Masters in Astronomy.

In addition to astronomy Lee was a fine singer and was a member of the GM Choir and also in his church choir. He also was an actor and belonged to the actors union.

He and I became good friends and we carpooled to various club meetings along with Brian Klaus and Angelo DiDonato. He had a great sense of humor and he and I enjoyed exchanging puns and jokes as

well as the latest news in astronomy which was always our topic during our carpooling to WAS meetings.

The club lost a terrific member with his passing, and I will always remember Lee as a wonderful friend and fellow astronomy buff.

From W.A.S.

In 2010, Lee received the inaugural Larry F. Kalinowski award: "Lee Hartwell has displayed his commitment to the education of others, particularly young people, in the wonders of astronomy. When called upon to display his considerable knowledge and comprehensive charts, photos and graphs to the public he has always been available. The result of his efforts has surely resulted in adding members to our roles. Both the public and the club have benefited from his dedication to spreading knowledge about astronomy."

This editor believes that if we had the "Happiest Astronomer" award, Lee would have won it hands down every year. Clear skies, my friend.



Above: Doing outreach at Stargate's open house while waiting for the sun to set. Above right: letting his outreach partner, Bob Berta (facing camera) to field some Q&A. Below left: getting ready for some stargazing. Below right: group photo, Lee is 5th from left, front row.





Want to keep track of W.A.S. meetings and exciting astronomical events next year?

Order your 2023 Warren Astronomical Society calendar now!

These beautiful calendars feature W.A.S. member astrophotography photos, including:

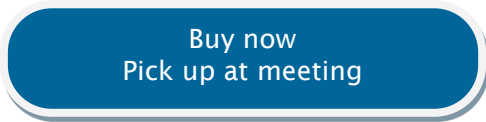
- Bill Beers - M33 - Triangulum Galaxy
- Bob Berta - Pelican Nebula
- Doug Bock - IC434 - Horsehead Nebula
- GM Ross - Aurora from Pellston, MI in 1982
- Dale Hollenbaugh - Saturn
- Jeff Charles - Moon Craters
- Ken Heilig - Ready for solar observing outreach
- Gary Klein - Geminid Meteor Streak
- Ken Meloche - M42 - Orion Nebula
- Fred Pompei - Lunar Eclipse Meteorite Strike
- Steven Tennenberg - M8 - Lagoon Nebula
- Mike Young - Faint Milky Way between the trees

And Milky Way Over the Lake by Adrian Bradley on the front cover.

Two Ways to get Your Calendar

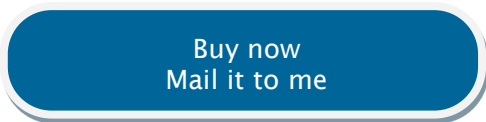
1 If you can pick up your calendar at a Cranbrook meeting, you can [pre-order on PayPal](#) or pay by check or cash at the meeting for \$20 each (email publications@warrenastro.org beforehand that you are getting a calendar so we know how many are available).

The button below will take you to the PayPal payment page.



2 If you need your calendars mailed, then the cost is \$20 + \$5 flat rate shipping per order (regardless the calendar count) via [PayPal](#) or by sending a check to Treasurer, Warren Astronomical Society, PO Box 1505, Warren MI, 48090 (Again, email publications@warrenastro.org ahead of time.) Be sure to include your mailing address so we can get them to you.

Use the button below, shipping is added when you check out.





Observing Reports

1-2 November

CZ Orionis. In out-burst, "12s". Is this U Gem in unusually heightened activity?

Transparency fair, seeing good. (high fog?)

16" f /10 S-C. @ 160X

2 November

The Sun. Back to photospheric activity, at least distribution. 4 groups, 3 in S. hemisphere. With exception of widely spread, but thin, group near Central Meridian, all low count. Two spots in S. hem. have penumbrae.

Transparency good, seeing good

5-cm. refractor @ 30X, Mylar aperture filter.

7 - 8 November

The Moon. Eclipse fiasco in western Michigan, contrary to predictions. No occultation timings performed. Alto-stratus from west obscured most of sky, minimally 3 hrs. before mid-totality. Occasional breaks of no advantage.

4" f /10 refractor @ 80X, Veen Obs'y.

7 November

The Sun. 2 or 3 groups across N. hemisphere. A small group departing at W. limb, but massive array well on disc from E. Difficult to disentangle whether one immense group or two. Polarity data needed therefor. All three concentrations exhibit large spots with penumbrae. Most considerable array obs'd this Activity Cycle.

Transparency good.

5-cm. f /11 refractor + Mylar aperture filter.

10 November

The Sun. Northern hemisphere arrayed with sunspots, three with multiple umbrae. With the activity now around Central Meridian, now suspect one super-group, all though the spread in latitude allows lingering doubt. If all = one formation, largest Observer has seen in years.

Same.

Same.

9-10 November

29 Hydrae. Plotted as triple, ATLAS COELI, but two stars obs'd. Observer saw two members ~ 220 deg. position angle. Per Hirschfeld and Sinnott: multiple system is 7.3 - 7.3 - 11.8 mags. 7s separ. = 0.2 arc-sec. (1907). 3rd star 11.8 mag. @ 11 arc-sec. (1878), position angle 175 degrees. Definitely did not split principal pair, and P. A. estimate for "C" star grossly off. Shift of position understandable since late 19th century, or Observer error.

27 Hydrae. Could not split. H & S list A star as 5.0, B star 7.0 @ 230 deg. P.A. (1823)

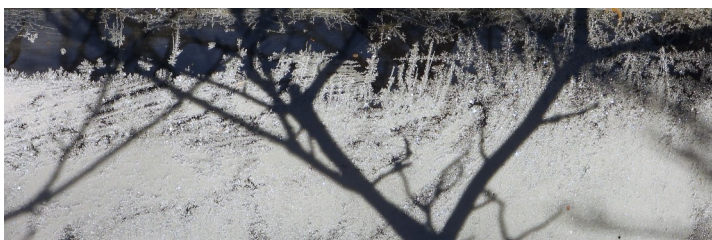
A 1342 Hya. Could not split. 7.3-7.3, separ. 0.1 arc-sec. (1959) H & S. Comment: "close. quadrant uncertain" Two position angles in their entry. P.A. 27 deg. above date and 240 deg. "close".

Transparency fair (Moon), seeing good.

16" f /10 S-C, Veen Obs'y, 100X

COMMENTARY. Data for 1342 confusing. In Becvar's *ATLAS CATALOGUE*, P. A is 0.0 and separ. = 0.2". (1964). Compilers' error doubtful.

(Continued on page 7)



Above: **Seasonal Transition**

Date Taken: November 22nd, 2022

Submitter: Ray Bosshard

Not only was there frost on the glass, but the outline of leafless trees reminded me that winter arrives early in Michigan.

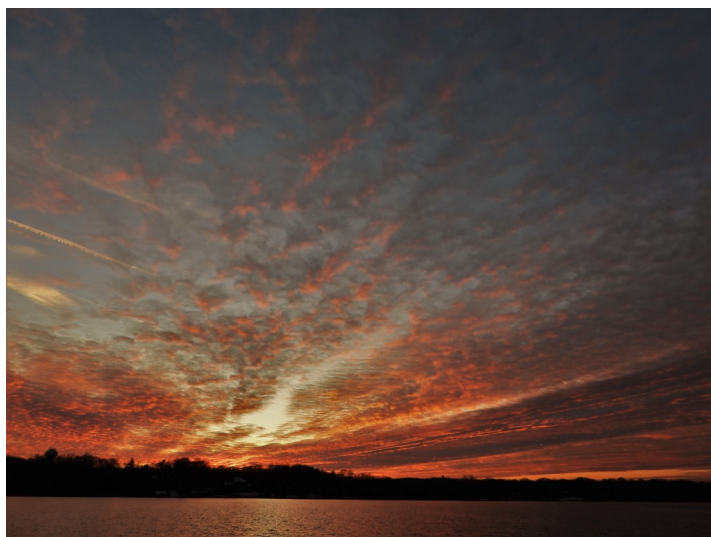
Right: **Pre-Thanksgiving Sunset**

Date Taken: November 22, 2022

Submitted by: Ray Bosshard

The sunset prognosticator predicted a slightly above average sunset for this date. I think that the sunset turned out to be more than slightly above average.

I gave thanks for being there, and for all the events in my life that led me to be at this exact spot, all alone, and one with nature. I was trying to capture what was put in front of me on this day and time with both gratitude and humbleness.



(Continued from page 6)

21 November

The Sun. Groups in both hemis. North: small, with one well developed spot, i.e. umbra/ penumbra. 8 spots. South: principal spot with three umbrae, 5 spots in all, a small group.

Transparency good, seeing good.

5-cm. refractor @ 45X, mylar aperture filter.

COMMENTARY: Windy conditions, but seeing unexpectedly good. "Laminar" flow?

23 November

The Sun. One group in each hemisphere. Southern: extended but sparse, 5 spots, one developed spot with umbra/ penumbra, but small. Northern: 10 spots, one (ditto). Compressed.

Transparency fair, seeing excellent.

Instrumentation as before.

25 November

The Sun. Two previously reported groups very diminished in number and longitude extent. No replacements despite search.

Transparency fair, seeing good.

5-cm. f/11 refractor with mylar aperture filter.

25-26 November

Mars. Disc large. Planet very far N. on Plane of the Ecliptic: closest bright star Al-Nath (Mag. 1.65). North Polar Cap very well seen, extensive.

Southern hemis. markings indistinct. Dioscuria & Umbra features seemingly eliminated-indistinct along margin of Polar Cap, therefore the Cap bordered by Nilosyrtis, covering at minimum 60 deg. of longitude. Attempting to reconcile Observer with small scale map in OBS. HAND. (2018) + Proctor's chart of 1867 + Antoniadi's "more modern work" in LAROUSSE ENCYC. (1958 figs. 384, 385) is very difficult. Observer impression like Proctor's hemisphere centred on latitude 270. OBS. HAND. rendition (by D. Troiani) for that Martian longitude conforms with this observation.

Various eruptive variables in Ori and Eri. Mediocre data..

Transparency fair. Seeing fair.

16" f/10 Borr II (Veen Obs'y), 200X, 160X

COMMENTARY: Mars is now 17 arc-sec. with very little added dia. until opposition early next month. Observer regards very high Declination for "aphelic" opposition inadequate compensation for size of disc over last two apparitions starting 2018.

-G M Ross



Letters

The story too hot for the Kalamazoo Astronomical Society to handle!

IN DEFENSE OF ASTROLOGY,

first presented to W.A.S., October @ Cranbrook.

G. M. Ross, Greatest Observer in Michigan Clayton V. Carey, Man of a Hundred Hard Drives

Vice-President thereof rejected, on grounds he had talked to members who showed no interest in the subject. (All two, or was it three?) Is it safe to surmise no member of the their Society had even heard of TETRABIBLOS?

We have said it before and now say it again: Grand Rapids Assoc. is Rome.

Warren Astro. is Greece. Can it be Kalamazoo is the Carolingian "false dawn"?

G. M. R. -- who once observed V1114 Cygni with "Handsome Joe" McBride.

19th of November 2022,
the two-hundred thirty-fifth of the Republic.

Next to final letter to award winning W.A.S.P.

The memorial in the Nov. issue noted. I knew of the Robinson Observatory under the *baton* of the Ford Club, but not even the name. It is not to my credit that I never made any attempt to see the facility, a sign of metropolitan provincialism: There is an "east" side, a "west" side, but not a "south" side, possibly termed "down-river". With only few exceptions, my interest in astronomy cross-communication measured from Eight Mile Road was limited to the Wayne State planetarium,.

My best excuse was the "metro" area was very big, and the years in Royal Oak were as mere colonial governor. I would urge Society members to pay more mind to the Robinson Observatory, if only on a foray. "Do as I say, not . . .".

G.M.R.

Saw a Fireball?

Report it to the American Meteor Society!



www.amsmeteors.org/members/fireball/report-a-fireball

When lists of spectacular celestial events are written, occultations never seem to make the cut. They are common occurrences, rarely visible to the unaided eye, and receive scant attention even by most observers. But on occasion, special circumstances can make them noteworthy and fascinating to observe. The December 7th occultation of Mars is one of those rare occultations.

The word occultation dates to the 15th century and is derived from the Latin word meaning to hide or conceal. It occurs when an apparently larger celestial object, like the moon, passes in front of an apparently smaller and more distant one, like a star or planet. Stars and planets typically have much larger physical sizes than our moon but are so much farther away that they appear as tiny disks or points of light. Most occultations refer to the moon, but can occur with other celestial bodies, such as Jupiter passing in front of a star. If the reverse occurs and an apparently smaller celestial object passes in front of a more distant, apparently larger one, the event is referred to as a transit. Occultations, transits, and eclipses of the sun and moon are part of a family of celestial events called syzygies. A syzygy occurs when three or more celestial objects line up. In this case, the sun, earth, moon, and Mars will form an almost perfect alignment as viewed from our area.

Occultations involving the moon and a distant star can be viewed any evening the moon is visible. The moon orbits the earth once a month, covering a 360° angle in 27.3 days, or about 13.2° every 24 hours. The moon's width measured as an angle from the surface of the earth is about 1/2°, so the moon moves eastward against the background of stars covering its own diameter every hour. Any star or planet in the moon's path will be obscured by the moon that can last from an hour to just seconds if the top or bottom of the moon just grazes the object. Occultations of bright stars are more exciting than of faint ones

but are much rarer. Occultations involving planets are rarer yet but are the most exciting especially if viewed through a telescope.

On December 7th, the full moon will occult Mars, which happens about twice a year. But most of these occur during the day or when the moon is below the horizon. On average, one that is visible locally in a dark sky occurs about every 14 years. What makes this one exceptional is that by coincidence, Mars will be at opposition while the occultation occurs. During opposition, which happens when Mars is opposite the sun as seen from earth, it appears brightest and has the largest apparent size during a two-year cycle. And even more remarkable is that it happens during the evening and not the early morning hours when most observers tend to sleep.

While this event is visible without any optical aid, a telescope will show Mars as a disk and possibly reveal some of its more prominent surface features. Being only 17.2 arc seconds wide, Mars will be 105 times smaller than the moon requiring higher resolution and magnification than a small wide angle or spotting telescope is capable of. But the view with the unaided eye or binoculars will still be impressive.

As with all celestial events, the weather will play a role in determining if the occultation can be observed. December is not an ideal month for sky watching in our area and there is only a 40% chance of seeing the occultation in a clear to partly cloudy sky. Even if the sky is mostly cloudy, it will still be worthwhile to check periodically in the hopes of seeing at least a close pairing of the moon and Mars.

The exact time of the occultation will vary depending on the location of the observer and are given for the Macomb County area.

5:00 p.m. Sunset

Since the phase of the moon is full, it rises at sunset. The moon will be near the horizon in the ENE. Mars appears about 2 1/2° to the lower left of the moon but may not be visible to the unaided eye until the sky darkens a little. The moon and Mars gradually climb higher while the gap between them narrows.

6:40 p.m. The end of astronomical twilight when no scattered sunlight illuminates the night sky.

10:19 p.m. The limb of the moon first touches the disk of Mars.

During the next minute, the moon will gradually cover Mars until it totally disappears behind the moon. Mars will noticeably fade during this time. At this time, the pair will be high in the sky, about 60° high in the ESE.

11:10 p.m. Mars begins to appear again and is totally uncovered about a minute later.

For the rest of the night, the distance between the moon and Mars widens.

Although occultations like this are not common, celestial events often happen in cycles that produce close occurrences. On January 13th, 2025, an occultation of Mars by the moon under very similar circumstances will be visible locally, occurring at 9:11 p.m. The weather is likely to be less favorable than for this event. But if you miss this one, you won't have long to wait for another try.



For Sale

MEADE 8" LX90 ACF F/10 SCT

For sale is a Meade 8" LX90 ACF f/10 SCT with tripod. Included in this package:

- AudioStar Hand Controller
- 8 x 50 Rear Focus Finder Scope
- Accessory Case w/keys
- 90 degree Star Diagonal - 2x Barlow
- Six 1.25" eyepieces (32, 26, 15, 9, 6, 4mm)
- Color Filters (#12, 21, 25, 56, 58A, 80A)
- Meade LXPS7 Power Supply
- Celestron Sky Scout
- Comes with original shipping container for OTA/Fork Mount

Retails for \$3099 – asking \$2000 – proceeds of sale will go to granddaughter in Florida (Ft. Myers) to help with costs from Hurricane Ian damage to her home.

Contact Cindy Babicz: cab8260@gmail.com or text/call 810-748-7080





W.A.S. Lunar Eclipse Images ...



Above:

Composite photo from Rik Hill

Rik says, "From our location the Moon seemed more orange than the last May's very red eclipse, but then it was much higher in the sky. It gave me a chance to make good use of my new 500mm lens."

Left:

Lunar eclipse nearing totality.

Date Taken: 11/8/22

Submitted by: Ray Bosshard



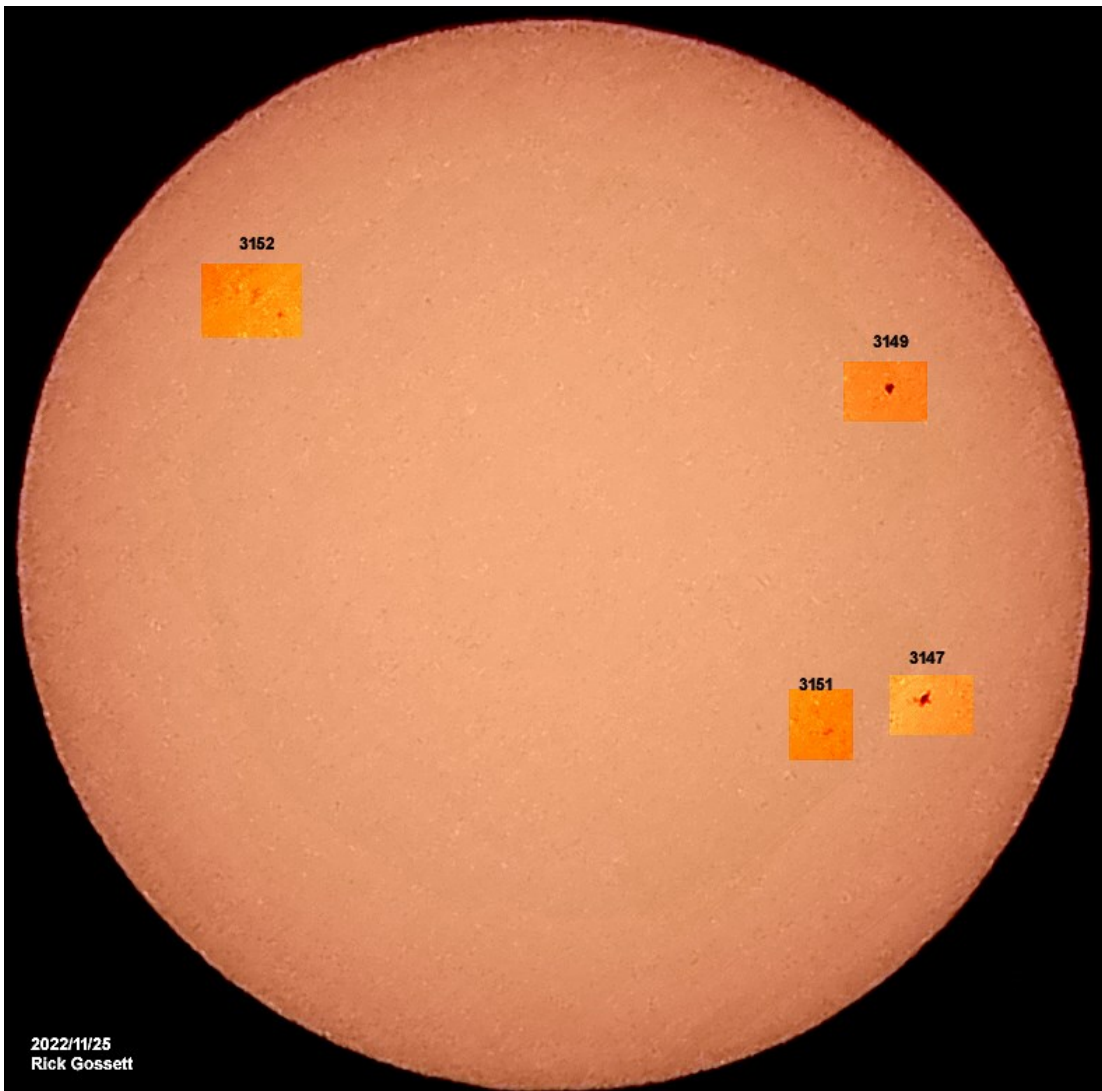
W.A.S. Astro Images ...

On Wednesday, 11/23/2022, Rick Gossett captured an image of Mars, at app. 9 pm est. The polar cap is visible at app. 2:00. There was a lot of detail visible in the 8 in. SCT, at 200x.

He also captured and annotated an image of the sun, in white light, from 11/25/2022. Rick says, "The sun has been pretty active most of November. The sunspots are heavily processed. Shot with the 80mm. refractor, and a Thousand Oaks filter."



Photo: Rick Gossett



2022/11/25
Rick Gossett

And Dinosaurs!

The Cranbrook exhibit

T-Rex at Cranbrook Museum of Science

Mike O'Dowd reports:

Some of us club members went and saw the Sue T-Rex exhibit during the club break.

On display, a complete reproduction of her skeleton and a full scale fleshed out version.

Sue was the largest and most complete T-Rex when discovered.

You have till April 30th to see her.



The View From C.W. Sirius Observatory

SH2-200 -The Bear Claw Nebula

The Bear Claw nebula, which is Sharpless 2-200, or HDW2, is located in the constellation Cassiopeia approx. 3600 light-years from Earth.

I couldn't find much information on SH2-200. It is a poorly studied object, which was initially cataloged as an H II region. Only in 1983 was its nature as a planetary nebula recognized, in a study of some nebulae of unusual appearance.

This nebula was first discovered by astronomer Stewart Sharpless in 1959 using photographic plates taken at the Palomar Observatory. He included it in his Sharpless catalog of HII regions under the name SH2-200. In 1983, SH2-200 was included in the HDW catalog of possible planetary nebula by the astronomers Herbert Hartl, Johann Dengel, and Roland Weinberger. In 1987, further narrowband observations by Hartl and Weinberger detected a large faint outer halo extending further than the central shell. However, it wasn't confirmed to be a true genuine planetary nebula until 2017 when spectra was taken as part of professional observations.

Despite being very old and highly evolved, low surface brightness planetary nebula such as the Bear Claw, contain very hot and energetic central stars, which are the remnant cores of the progenitor star that died and ejected its outer gaseous layers. The energy output of some planetary nebula central stars is so massive that it is capable of ionizing unrelated gas in the surrounding vicinity causing it to glow.



According to a study by Weidmann and Gamen, who have examined the central stars in different planetary nebulas, the central star of SH2-200 is a binary star which could have helped produce the bear claw structure from a multiple explosive event.

Even though the Bear Claw nebula is very faint to observe visually, I wanted to add it into this month article just to show the very unique structure formation resembling a bear's claw. I took this image last month through the 11" SCT telescope, with a total of 9 hours of exposure time, using my ZWO 071 color camera and a narrow band filter. To observe this one visually will take a very large aperture telescope, 20" or greater. I would also recommend using an OIII narrow band filter over your lowest power eyepiece. This is very faint so a dark sky location is highly recommended. Happy hunting the Bear Claw!



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 Bill at: BEEZOLL@AOL.COM





This past month, I put the 10" f/8 RC back on the mount in the observatory, to work on some galaxies and comets, with a nebula thrown in there for good measure. This telescope has a focal length in the range of 2000 mm, so its field of view (FOV) is about 40 x 27 arc minutes, with the camera I use, which is the ZWO asi2600mc PRO.

I typically collect data all night using the automation I set up 6 years ago. This allows the system to not rely on a human using Sequence Generator PRO, PHD2, and FocusLock to manage the acquisition, guiding and focusing automatically.

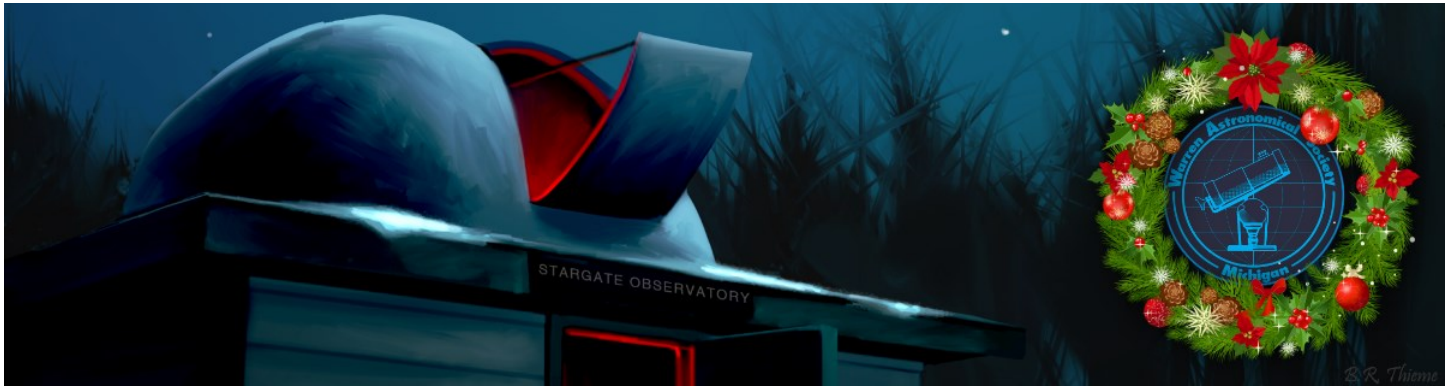
The objects this month are:

- NGC 2146 – November 26, 2022 – 52 x 120 second frames
- M 74 – November 23 and 26, 2022 – 173 x 120 second frames
- NGC 7814 – November 1, 2022 – 51 x 300 second frames
- NGC 7331 – October 28, 2022 – 49 x 300 second frames
- NGC 147 – October 29, 2022 – 51 x 300 second frames
- M 78 – October 29, 2022 – 21 x 300 second frames
- Comet C/2020 v2 – November 2, 2022 – 4 x 120 second frames
- Comet c/2020 v2 – November 23, 2022 – 3 x 120 second frames



During this next few months there may not be much in the way of clear nights, but will endeavor to capture some winter objects, if not too cold.

-Doug Bock



Monday, December 5, 2022

Special Cranbrook Awards Meeting

Program

- 7:30PM** Year in Review - followed by Service Awards & Introduction of 2023 Officers
- 8:00PM** Snack Time
- 8:15PM** Door Prize Drawing - both attendees and those attending via Webex get ONE chance in the drawing. If they will be attending in person or virtually, each person will be assigned a number. The winning numbers will be selected at random. As each prize comes available, we will match it to the list of persons in the drawing. As for the prizes, Mark Kedzior will draw them from the jar before the winning number is chosen.
- 8:30PM** **Presentation - Two Eyed Seeing**
by Karim Jaffer
- 9:30PM** Meeting Dismissal

Two-Eyed Seeing

The night sky we enjoy as astronomers and hobbyists isn't ours alone but shared by cultures throughout the world - both now and in the past. Take a tour through some of the stories & legends from Indigenous and Ancient cultures, with an appreciation for the science, observations and connections to nature captured within these tales.

About the Speaker:

Karim Jaffer is the Public Events Coordinator for the RASC Montreal Centre (since 2016), helping re-establish the I. K. Williamson Astronomy Library and coordinating both public events and outreach activities throughout the Montreal area.



In addition to his volunteer position in the RASC Montreal Centre, Karim is a member of the National RASC Education and Public Outreach Committee, pioneering a new program - named Creation Station -- to encourage youth to embrace their imagination and interest in space and astronomy. Since co-hosting Global Star Party XLV for International Astronomy Day 2021, Karim has continued to present topics at subsequent GSPs and is excited to be an Explore Alliance Ambassador.



This program will **not** be streamed on YouTube.



As I get older and older, the list of people who depart gets longer and increases with a greater frequency. But now I find myself writing, for the third month in a row, about the loss of someone who meant a lot to me and without whom I do not know how I will continue my own journey through the night sky.

Constantine Papacosmas introduced himself to me the first night I entered the old observatory of the Montreal Centre of the Royal Astronomical Society of Canada. The young observer had just completed a truly fabulous 8-inch reflector which we used once or twice. At that time he was brilliant, creative and inspiring. Within a few years we had become great friends and we spent a lot of time together. One afternoon while walking down a hill to my junior high school classes, a car passed me, then slammed on its brakes about 300 meters away. Putting the car in reverse, the driver screeched backward until it reached me. "Hello David!" It was Constantine.

You might have read a few months ago the story of how I got my own 8-inch reflector, Pegasus. It was a loaner scope. By the time David returned from college, Constantine suggested that my parents buy me the telescope. We gathered in our living room and my parents listened carefully as Constantine explained why they should make such an expensive purchase for me, and not for any of my siblings. He correctly persuaded them that I was never about to lose my passion for the night sky. By the end of that day my parents agreed to buy the telescope for \$400, (which would, in 2022, amount to \$3761). More important than that, that afternoon gave Dad a chance to form a genuine bond with Constantine that he never forgot.

In 1978, while resting in our home, Dad walked in and inquired how Constantine was doing. I had had a mild falling out with him, but I simply replied we hadn't been in touch for a while. Dad had something to say about that. "You can count on the fingers of one hand the number of close friends you have

had since your youth. You just cannot afford to lose those precious friends." The minute he left the room I telephoned Constantine, and we picked up where we had left off.

By 1984, my Dad was dying from Alzheimer's disease. He could barely recognize Mom, let alone me. But he remembered Constantine. The two began talking.

"Constantine, do you know what is happening to me?"

"Yes, I am sorry, but I am afraid I do know."

"Constantine, I can't live like this. I wish.... I wish I were dead." Constantine told me that story many years later.

Those of us who knew the older Constantine may not appreciate the skill, the intelligence, the humor, and the talent of the younger amateur astronomer. But they remembered him well enough to present him the Centre's highest medal for excellence, the Charles Good award. His clock that I received shortly before his death now tells Montreal time. It is the Constaclock.

Farewell, Constantine, and thank you for enriching my nights under the stars.



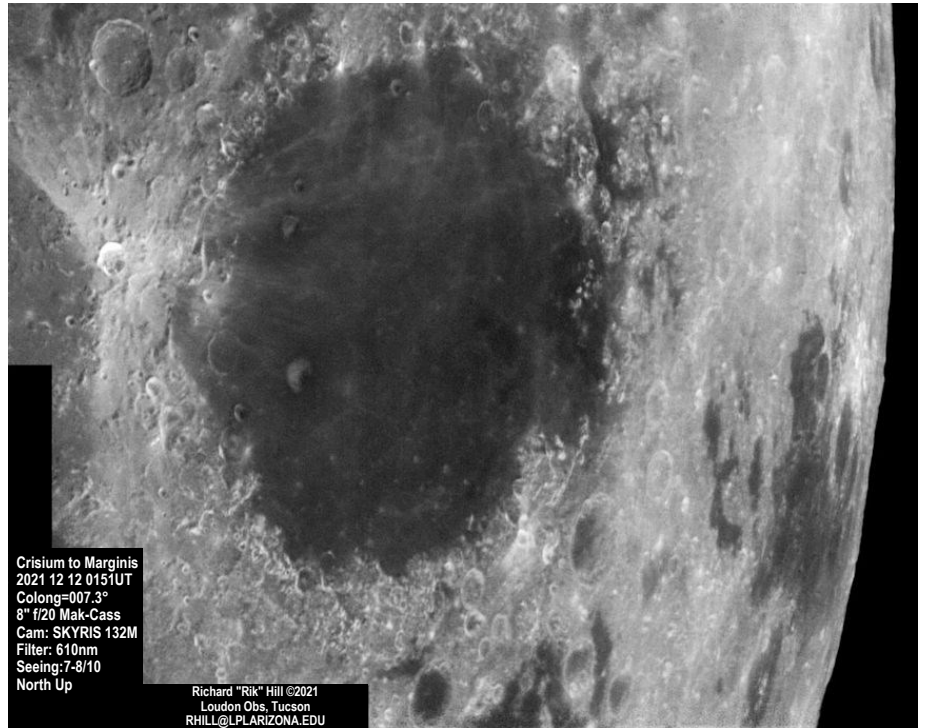
The photograph shows (left to right) me, Constantine Papacosmas, and Bill Strople at a Stellafane meeting.



Mare on the Edge

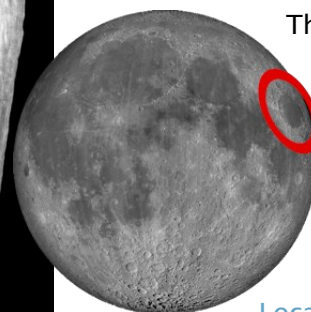
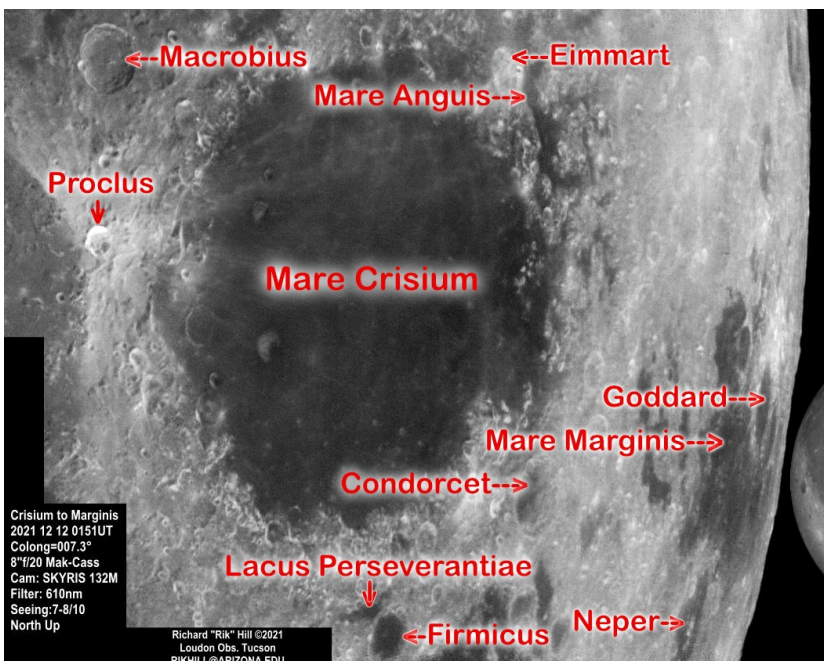
First visible just 3 days after New Moon, Mare Crisium (638km dia.) is one of the earliest naked eye features that can be spotted every lunation. It's the big quasi-circular dark area that dominates this image. If you look carefully, you'll notice it's actually a rough hexagon. The bright crater on the west (left) side is Proclus (29km) and as you might expect from all the bright ejecta, is young, of Copernican age (less than 1 billion years old). Notice the rays and the bright fan north and south of the crater. While the brightness may be caused from ejecta made of a lighter colored rock, more likely it's finely pulverized which would by itself increase the albedo (reflectivity) of the material.

Directly above Proclus is the large crater Macrobius (66km). Moving east, the bright crater on the north-east (upper right) edge of Crisium is Emmart (48km) and it sits on the northern edge of a strange mare feature Mare Anguis, shaped like a sideways "W" with Emmart B (12km) on it's southern end. Moving down the eastern edge of Crisium there is a large crater on the southeast edge of Crisium with dark mare material on the west side of its floor. This is Condorcet (77km) and it leads to a crater at the bottom of this image with a fully dark floor. This is Firmicus (58km) and just above this crater is a small dark flat area



that is a separately named feature, Lacus Perseverantiae (15x70km). To the right of Firmicus are patches of mare material that are the northern reaches of Mare Undarum.

Further east (right) is another large area of mare patches, Mare Marginis. Various sources give it's "diameter" as 358 to 371 km but it is anything but round. The Mare is bounded on the south edge (at the very bottom of this image) by the large crater Neper (144km) partly cut off by the edge of this image and then above the Mare is a circular dark area that is the large crater Goddard (93km). We can see these features here because of the libration at the time of this image where this edge of the Moon was tilted towards the earth a little more than usual allowing a peek around the edge so to speak. Learn what the libration is on different dates and you will be able to view up to 59% of the Moon's surface!



This image was made from parts of 3 1800 frame AVIS stacked with AVIS-tack2 and assembled with Microsoft ICE then finally processed with GIMP and IrfanView.

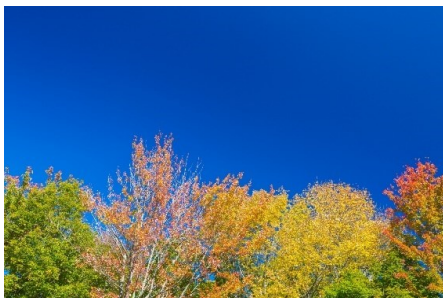
Location maps by Ralph DeCew



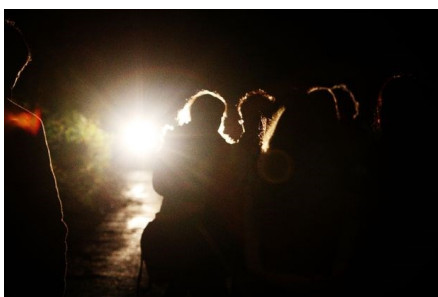
Sneezing's Greetings!

-Brad Young, Astronomy Club of Tulsa

What some call the best part of the observing year has passed us now. From the end of Dog Days on August 11th until November 11th, the period of late summer to Veteran's Day is a great season for astronomy outdoors. In Oklahoma, hot short nights short earlier in the summer can be an issue. But during the glory months of August, September, and October, we have cooler weather with clear blue skies, lower humidity, and plenty of star parties.



Then, sometime after Halloween, we get our real first cold front, often followed by dreary cold rain. Everybody catches a cold. We've all known winter was coming. Slowly each evening we noticed that first Spica and then Scorpius were no longer there in the dusk. At midnight, instead of the Summer Triangle still being up, only the Winter Cross of Cygnus stood in the northwest. Or you noticed the Sun getting lower and setting further south every night. The big jolt came with the change back to Standard Time. But this was just a reminder that we had been fooling ourselves for almost eight months. We humans decided we wanted time to be different and so we gave up sleep to have sunshine deeper into the night. Finally, around Halloween it is obvious we can no longer keep up the charade and have kids walking to school in the dark.



So, is late autumn the end of astronomy? Not necessarily. After we become acclimated to the cold, winter in Oklahoma can often be a great time to observe too. The long nights are sometimes clear as a bell with low humidity producing great transparency. You can start observing right

after dinner and be done and in bed by midnight after a long productive session. Think of it as changing from trout fishing to ice fishing. You need different clothing and equipment, but it can be just as enjoyable.

Astronomy during the winter can be a matter of waiting for the right night or looking into alternative methods. For instance, the sun can be a good target for solar astronomy during the winter during the warmest part of the day. Radio astronomy doesn't care what time of day it is. And when it's just too cloudy or frigid to be outside it's a great time to plan for when the next decent night does arrive so that you'll be prepared to make every moment count when they come. You can reflect on the season just passed and figure out what you enjoyed the most. Are there things you want to do more of next year or do more of right now? Is there any information you need to be prepared for what's next?



Sometimes, nothing beats a warm night under the stars where you can fall asleep in your lawn chair and wake up at dawn was just a slight chill. But there is something to be said for bundling up and going out under the winter sky with the brightest stars and some of the nicest deep sky sights you're going to see. Orion stands high in the south, with all the Fall constellations chock full of galaxies still visible in the West. The Milky Way passes from straight overhead down through Canis Major to the southern horizon. And if you do stay out late, you can see the Big Dipper rising again and Leo tempting you to look for more galaxies. This winter will feature Jupiter and Saturn in the evenings, and Mars at opposition right around the Holidays.



Astronomy doesn't have to be just a warm weather sport. You can get out and enjoy it even in the off season.

References:

<https://www.publicdomainpictures.net/pictures/280000/velka/autumn-trees-and-blue-sky-1538652120RIC.jpg>

<https://cosmicpursuits.com/2017/winter-milky-way-over-cathedral-rock-sedona-arizona/>

<https://www.cornwalllive.com/news/cornwall-news/video-shows-childrens-dangerous-walk-215020>

EAA - Excessively Argumentative Astronomers

a guide for visual astronomers

By Adrian Bradley,
who does it all / visual, nightscapes, some 'classic' deep sky, and sometimes, just looking up!



In the November, 2022 issue of the WASP, Amateur Astronomer Brad Young gave some pros/cons about E.A.A., or Electronically Assisted Astronomy. The impression I got was that he could do without it, but felt that it may have had value to... somebody in this great field of astronomy.

My intent of writing this article is to put EAA in as proper a perspective as I can put it. I want to discuss why a lot of old-time visual astronomers are not keen on E.A.A. (which will henceforth be known as 'the purple hammer of astronomy') and explain some ways to make both ways of exploring the night sky work for us. This article may appear in the W.A.S.P. as well as other publications (Lowbrows I'm looking right at you).

Why 'purple hammer?' Well, it's a bowling reference:

- In high level bowling, lots of complaints came out about a particular purple bowling ball that was made in the 90s by the Ebonite bowling company and is known in bowling inner circles as the 'purple hammer'. (Hammer was it's own company until it was absorbed by Ebonite International, which is now absorbed by Brunswick... but I digress...)
- Professionals who could use the purple hammer to their advantage seemed to be able to make TV shows and win them on a regular basis, regardless of the lane conditions. They all played a simple line, and it appeared to reduce the skill level needed to bowl in professional competition.
- The same complaints have been levied about lefties having more success in some tournaments, or lane conditions being too easy, thus invalidating honor scores on such conditions.



The Purple Hammer, bowling's controversial version of EAA...

(Continued on page 20)

(Continued from page 19)

Here are similar arguments about E.A.A.:

- For many years now, the ability to image objects in the night sky belonged to those who used photo plates or film. You had to get it right the first time or it was expensive to retry. The rest of the night sky belonged to those who owned visual telescopes.
- Technology has advanced to the point that digital CCD and CMOS chips can record night sky data, and there are rigs that, if aligned properly, can go just about anywhere in the visible night sky and image a target.
- Many complaints arise from the amount of light that these displays kick out, making visual astronomy difficult if not impossible around one of these setups.
- Those who do EAA may not know the night sky as much as a visual astronomer, even if both are using go-to. As a result, E.A.A. tends to point to popular bright targets.
- Visual astronomers can see some of these same targets, but it requires special filters, a very dark sky, and a large enough mirror (12" or more) to gather enough light to see the target.

In both cases... I think it's time to recognize that EAA is a popular tool, much like the purple hammer was a popular tool for bowlers who knew how to use it to shoot high scores. As such, we who do visual astronomy cast our displeasure on things that detract from our enjoyment of the night skies. EAA hits most of these distractions rather easily. So, let's talk about whether or not visual astronomers would ever find EAA useful.

THE REASON WE DO VISUAL ASTRONOMY

This is what a typical ACNO (Any Clear Night Observers) night looked like when John Causland was among us. John, we miss you!



For years, I've seen visual astronomers handle unwanted light in different ways. Most will get very grumpy if flashlights, cell/tablet lights, or any other light besides a very dim red light is shined in their direction... and for **good reason**. The ability to observe faint objects in the dark depends on that darkness staying constant so the eyes can properly adjust to the night. When they fully adjust, you begin seeing some beautiful detail in the eyepiece.

As an example, I have seen the Horsehead Nebula and Thor's Helmet with my own eyes in a 12 in. Obsession Newtonian telescope with a proper filter at the Okie Tex Star Party. Prior to that I was able to view the Helix Nebula and Eastern Veil Nebula.. without a filter at all, in an 11" SCT. I am about 99% sure that these same setups would not be able to show these things in most dark sky locations in Michigan.

EAA can show these things down through a Bortle level of .. 7 maybe? Maybe even Bortle 8? That means the need for dark skies and large aperture gets tossed by the wayside in favor of proper tracking and a clear sky that's at least dark enough to see planets and a few bright constellations. This isn't a foregone conclusion that it'll work... just as visual astronomers must collimate Newtonian scopes, or the views will not be as crisp; EAA operators must do a proper polar alignment (for equatorially mounted scopes) and/or a proper sky alignment, or they will not find their targets easily, nor be able to get a good image of it unless they invest in more things to help guiding and tracking work better. The more money an EAA operator spends, the more automated alignment can become.

A good EAA setup can zip about the night sky, looking at multiple objects as long as it only takes a few minutes to stack frames of an object to get a picture. This is nothing new to visual astronomy. You see the object right away if it's bright. To study the object, you remain at the eyepiece a little longer as your eyes adapt to darkness. Then some of the subtle nuances of an object (e.g. Ha regions in M33 or M101) begin to show themselves. The visual astronomer makes a direct connection with what these deep sky objects look like, and can choose to move on to other objects right away or stay on one object and continue to observe it. Even if your visual rig tracks the night sky, you can easily move an object back in the center of the field of view for more observation. If tracking is off for EAA rigs, you have less of a window of time to get a good image - although most rigs can do on the fly star alignment as a part of it's image stacking rou-

(Continued on page 21)

(Continued from page 20)

tine. Moving the object to the center of the eyepiece is much quicker and less disruptive than migrating an object in an EAA setup back to the center.

Overall, visual astronomy does have its value in direct night sky exploration. You see the objects directly, which can also be interpreted as those distant object's light leaves those objects many light years ago and happened to end up hitting your scope's mirror, secondary mirror, into your eyepiece, and into your eyes. EAA captures the photons and displays them on a screen. We see more 'data' than we can with our naked eyes, but the type of detail we get depends on how good a resolution the EAA live view screen has.

What's good about EAA?

As mentioned before, EAA is able to cut through some light pollution issues by imaging multiple frames in a camera. The signal is separated from the noise or other bright surrounding lights. All that's left is the object in question that we wanted to see/show the public. I still think we should be careful about sharing these advantages with many in the public - because I see the argument of 'just use EAA and you can see objects in space, no matter how much light we throw up!' being levied against our efforts to reduce the light pollution in our cities around the country and the globe.

The general public has become used to fantastic images from space observatories like the Hubble Space Telescope and the James Webb Space Telescope. They show structures in deep space objects that are not easily captured by amateur imaging rigs, if capturable at all. So they relate a little more to the images shown from EAA.

Where EAA and visual co-exist:

Visual astronomy requires adaptation to the night sky in a way that lets you see and study deep space objects using your own eyes through a telescope.

EAA requires your tool to be properly set up to find and track these deep sky objects. Night vision is not required.

Doing visual doesn't interrupt the EAA astronomer. But the EAA astronomer does interrupt the visual astronomer with any amount of light that leaks out of his/her setup.

So nothing is wrong with setting up an agreement to have EAA on one side of camp, and visual on the other side. If someone wants to do both, they should be responsible enough to cover any and all

stray light from their rigs so they can go on operating without intervention. Then the astronomer can look at objects visually and become night adapted. It is simply not a good idea to do both EAA and visual at the same time, because any time spent on EAA means the astronomer will not be night adapted and won't properly see anything in their visual setup.

UNDERSTANDING OUR GENERAL PUBLIC IN 2022

At the Okie Tex Star Party, you see just as many EAA or flat out Astrophotography rigs as you do big Dobs:



People like big bright pictures. People are perplexed by these structures that exist out in space. People don't think it's real. Even a direct visual image of Saturn in a telescope draws comments like 'that just looks like a picture to me.'

Astronomers... we need to regain the touch of our general public and understand what we are dealing with these days. We are dealing with people who will doubt science, but will accept just about anything their smartphones tells them is true. This hasn't changed, but for years and years, the way to see what was in the night sky was to either (a) look up, or (b) look through a telescope. Now they have (c) look online for pictures or (d) look at an EAA rig.

People love color. In an unofficial study of images I've put together where I manage to get a real sky color and an image that mirrors what we might see with our own eyes, I get more likes when I up the saturation and leave slightly exaggerated colors and slightly oversharpened structures in my photos. I had to realize this when I wanted to yell at a YouTube photographer who decided to take copies of the JWST's first five images and edit them with his

(Continued on page 22)

(Continued from page 21)

own presets to 'make them look better'. Also, he likened the JWST to simply 'a big camera in space.' As much as I disliked his approach to those outstanding images, He highlighted a point that rings true - our public likes big bright shiny things and loves technology.

For visual astronomy, it was through learning the night sky and seeing objects with our own eyes that brought us an appreciation and respect of the night sky in general. When we see EAA users that don't know where to find 'good targets' we roll our eyes because we realize that not everyone who uses EAA actually knows where any of the DSOs are in the sky. That's why you see very similar targets from EAA Displays: The Lagoon Nebula. The Rosette Nebula. The Orion Nebula. The Eagle Nebula. The Andromeda Galaxy. The Pinwheel (Triangulum) Galaxy. The Heart and the Soul Nebulae. The Whirlpool Galaxy. And the aforementioned Horsehead Nebula.

But visual astronomers, we aren't necessarily free from shame! During outreach, we tend to point at the same bright objects again and again. Yes there is a reason for it; only those bright objects look good in the eyepiece at the Bortle Zone we are in, but the public may not know this. We have often worn out all planets and Messier 13, the Hercules Cluster. Our views of Messier 27, the Dumbbell Nebula, range from looking like an apple core to the 'football' shape. But EAA folks will swoop in and show them colors as well, and we lose that battle. We can show them the Ring Nebula, M57. Imagers may find it too small depending on their setup. At least we hope they find it too small, because if they don't, the colors and central star will put EAA up in the public's eye, 2 scores to nothing.

What about NGC 7293, the Helix Nebula? Visual astronomers can show it in less than dark skies with the proper filter, letting one study the outer shell. At a dark site the filters aren't necessary as long as you have enough mirror aperture. EAA users may not be able to find it at all because it is not in an easy to find location in the sky. But if they do find it because go-to is working, then they'll show just as much detail in a lesser Bortle zone than we can in amazingly dark skies. EAA still wins the public choice.

This one-sided battle assumes something important - pretty pictures are more important than the science behind it. We wish this wasn't true, but go to a star party and see which gets the most oohs and aahs in an eyepiece. Will it be The Blue Snowball, or will it be Saturn?? Will it be NGC 7331, or M31 the Andromeda

Galaxy? Will it be M13, or M22? (Now wait that one *will* be a close battle!)

But wait just a darn minute... when observing, we aren't always doing it for a star party or outreach. We may be doing it for our own enjoyment, citizen scientific project, or simply to connect to the universe. And it's precisely that - a connection to the universe - that visual astronomy has offered for many, many years.

As much as people tend to trust information on social media more than what they see in real life, it's the direct view of a deep space object that has blown people's minds for centuries. Long time visual astronomers like going after fainter targets to glimpse it's light. But the general public may swoon over seeing craters on the moon, the moons of Jupiter, or the rings of Saturn. Even light from a distant galaxy may cause an existential crisis in some members of the general public. Surely they can't doubt what they're seeing with their own eyes. It's new and different for those who have never looked through a telescope. And it offers a chance for that person to... connect directly to the universe.

People's belief systems may kick in to explain what they are seeing, but that should be expected. We who show these targets visually need only let the public see them, then they are free to form their own opinions. If the planets and the moon are enough to excite most of the general public, then the simplicity of a visual setup will appeal to them. Nothing reduces a line faster than an EAA operator who can't show a picture because for some reason, their tracking is malfunctioning, or they can't get focus. Even if tracking fails a visual astronomer, it's still enough to put the object in view and just continue to move it back to the center. The visual astronomer is not out of options, whereas an EAA operator depends on all of the technology working in order to display a picture.

Lately... people have wanted to pull out smartphones and take pictures of what is in the eyepiece. This can be an annoying reality of the visual astronomer who is doing outreach. Our job is to tell the person to simply take a look at it and enjoy seeing it, locking it into memory. The pictures are often taken in order to share with others online, be it family, friends, and social media. For them, we are better off directing them to an EAA setup. Or, if we have the patience and shield our eyes, we let them get a picture or two and then move them on to the next person in line.

(Continued on page 23)

(Continued from page 22)

IN CONCLUSION...



Observatories from Peach Mountain and Wolcott Mills Metropark. How long will it be before both are used interchangeably to image the sky rather than just visual observations?

EAA allows us to do outreach in a world where people love and appreciate pretty pictures of objects in space. It may make people want to learn more about astronomy in general.

Visual Astronomy allows people to make a direct connection with the universe by letting them see objects in space with their own eyes. This can be a more profound experience for people.

Here is my controversial statement about where I think the real problem lies. It isn't about EAA or visual astronomy itself. These are merely tools that can be used to learn the night sky. No, it's about the people and a lack of respect for one another's craft.

EAA users who do not take care of their light 'sprawl' are not concerned with ever adapting for darkness. They are out to produce images and figure that the camera sees more than they will. To them, the better an image they get, the more it reflects on them as good imagers. So for them it is not about the night sky.

Visual astronomers who have dealt with these types respond in kind by disrespecting the tools of EAA. They feel that night sky knowledge is demonstrated by using a visual telescope to see objects directly. The larger the scope, the more aperture you have, the more pride you can have in doing astronomy. This is when visual astronomy points itself back to the astronomer and forgets about the night sky objects themselves.

For amateur astronomy to survive, we should not turn our back on one or the other. We shouldn't outlaw EAA, as the bowling community outlawed certain versions of that purple hammer. We shouldn't declare that using visual telescopes is outdated and no longer needed...

...Instead we should embrace and use both for the benefit of learning about the night sky and showing it to the general public. And, we need to respect the types of environments they both need in order to work.

Visual astronomers should not be forced to deal with light sprawl from ambitious EAA users. But maybe during outreach sessions, bright objects are all that a visual astronomer needs to point to in order to captivate a general public. A little bit of sprawl shouldn't trigger obscenities from the visual astronomer to be directed at the EAA user. It certainly doesn't help to slash their tires or threaten their next of kin, either.

Meanwhile, EAA users should try harder to mind just how much light they are spreading out onto the observing field, and seek to keep it down so that those with visual telescopes can continue to observe. Steer clear of visual astronomers if it is not an outreach session. Keep stray light off of the field. That will enable the EAA user or astrophotographer to step away from his/her rig, begin to dark adapt, and enjoy the night sky directly, maybe even enjoying the view from a visual astronomer's rig and comparing what can be seen visually to what the EAA image shows. Remember, the night sky isn't just there for you to prove how great an Astroimager you are. The world doesn't care. Long time astroimagers will always have their stuff published in large magazines and shared on social media by those who determine what gets put in and what doesn't.

If we build respect between both worlds, we'll have less animosity between the two camps and understand how both can reach a general public that wants to know more about what's in the night sky.

Image credits: Adrian Bradley



Analyzing the Deployment of Blue Walker 3

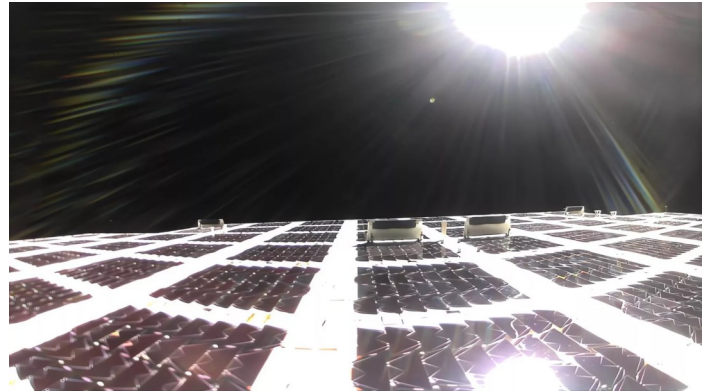
-Brad Young, Astronomy Club of Tulsa

I have the pleasure of being a member of the International Astronomical Union Center for the Protection of Dark and Quiet Skies (CPS). The main purpose of this workgroup is to monitor and advise on the megaconstellations of satellites that are being launched by several entities. The concern in the astronomical community began with the launch of the Starlink satellites. With these and other launches, the number of satellites in low earth orbit have increased dramatically over the past few years, with no sign of slowing.



The possible deleterious effect on optical and radio astronomy is alarming, in that we might be losing our ability to observe using multi-million-dollar telescopes and watch for incoming near-earth objects (NEOs). [Early results show little effect.](#) However, those results were based on the relatively faint Starlinks, [which were adapted by SpaceX for the express purpose of dimming their appearance.](#) SpaceX has been responsive to the concerns of the astronomy community, but it is unclear if other operators will be as concerned.

Lately, the focus has been the prototype Blue Walker 3 launched in September 2022 by AST Space Mobile and recently fully deployed on orbit. The deployment unfolded an antenna array that is 693 square feet, the size of a small apartment and [the largest commercial communications array in low earth orbit.](#)



(Image credit: AST SpaceMobile)

Because of the size of the array, the CPS is concerned that if the entire constellation of Blue Birds (the larger production model) is launched, which totals 168 satellites, the effect on optical and radio astronomy would be perilous.

(Continued on page 25)

TABLE ONE BRIGHTNESS CHANGE OBSERVATIONS

UTC Date	UTC Time	Magnitude	Range (km)	Phase	Standard Magnitude
10/3/2022	2:59:45	5.7	1867	128	3.31
10/4/2022	1:08:36	7.4	1110	122	6.35
10/5/2022	2:26:20	4.6	1107	120	3.63
10/7/2022	1:51:15	7.5	1006	123	6.63
10/8/2022	1:33:16	5.9	1048	125	4.87
10/9/2022	1:14:56	5.8	1125	136	4.17
10/10/2022	1:57:04	5.2	1159	138	3.40
10/23/2022	10:48:00	7.0	872	126	6.33
AVERAGE STANDARD MAGNITUDE					5.06
11/12/2022	11:22:00	1.4	644	75	2.61
11/20/2022	0:37:00	1.4	869	79	1.89
11/21/2022	0:21:00	1.8	843	21	2.89
11/22/2022	0:02:22	2.0	771	32	3.23
11/22/2022	23:42:00	2.7	990	99	2.54
11/23/2022	1:21:00	3.6	1199	122	2.39
11/26/2022	0:28:00	3.7	1336	83	3.20
AVERAGE STANDARD MAGNITUDE					2.68

All observations above by author; these calculations use a simplistic model that may be too conservative in predicting the optical behavior of the large array

(Continued from page 24)

To quantify the effect, the group has been observing Blue Walker 3 and recording its brightness before and after the deployment of the array. Several observatories and individuals across the globe have monitored the satellite before and after deployment of the array and the news is not good. The pre-deployment satellite appeared as a dim object, usually requiring binoculars to see, on a level with the post-darkening Starlinks.

After deployment of the array, the standard magnitude jumped by a factor of 9. Standard magnitude is a measure of brightness used by astronomers as a basis to compare different satellites. On a well-placed pass, this means Blue Walker 3 will typically appear as bright as a first magnitude star, with only 18 stars in the sky that are brighter. There are only a few other satellites this bright, notably ISS and CSS (the new Chinese Space Station). A [press release](#) from the IAU explains the situation further.

But the true scale of the problem is that the production objects (Blue Birds) will be even larger, therefore almost certainly brighter. And there will be 168 of them in orbit. The cell phone system will require at least two of the satellites to be always in your sky to maintain call quality. During the summer, temperate zone areas (where most professional telescopes are installed) will see these crossing the sky nearly all night, requiring constant monitoring of them to avoid ruining images. Since they are 100 times brighter than Starlinks, there is real danger of damaging sensitive CCD and other imaging devices.

Because of these critical issues, the IAU CPS has accelerated its goal to contact AST Space Mobile and find a solution. We are also involved in several other efforts to protect the night sky from what is becoming a real danger. Besides seeking a viable engineer-

ing solution to the problem, we are also engaging governments to modernize space policy and licensure to consider the effect of megaconstellations and bright objects. The effect on radio astronomy is also a major unknown, and the CPS is also working to address this issue.

Steps in the right direction include the formation of an office within the FCC (Federal Communications Commission – licensing agent for all satellites in the US) dedicated to space licensure. Previously, there had been no specific group charged with considering the effect on the night sky, only the communications concerns such as frequencies used etc.

The CPS will continue to monitor Starlinks and the Blue Walker / Blue Bird flock. We must also prepare for other systems that have been announced such as Secure Connectivity System by the EU, and Guowang by China. Lessons learned now and systems put in place to determine brightness and work within international law may help mitigate the damage.

If you would like to contribute your observations to the scientific study, consider becoming an affiliated member of the CPS by applying [here](#). Visual reports can be made via [SatHub](#) and images collected at [Trailblazer](#). Satflare.com has a [report generator](#) and [database of observations](#).

Read [my article](#) on how to observe satellites and drive their brightness to a fair accuracy. Or, if you would just like to see Blue Walker 3 for yourself, you can find its passes on [Heavens Above](#) and several other sources. If you have any questions about observing the spacecraft or what the CPS is trying to do, be sure to contact me via [my website](#).

[A video of Trailblazer passing Deneb by Kevin Fetter](#)

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



December 1988

This issue presented a bit of a puzzle in the scanning room. At first I thought we had two versions of the same issue, but, with further inspection, it turns out the years marked on the cover of this issue (1987-88) didn't match the Volume number. The correct designation should be: 1988-89. With that sorted, we note the seasonal image gracing the cover, a practice that this editor enjoys doing.

Going inside, the issue leads off with a chart, "The Moons of Jupiter December 1988". The editor then goes in the vault and pulls out an old item: "Amateur Briefs - Annual Astronomy Awards For 1978" by Robert Cox Harrington. In a more contemporary vein, Ken Kelly gives us part three of "Missing Bayer and Flamsteed Stars", following that up with:

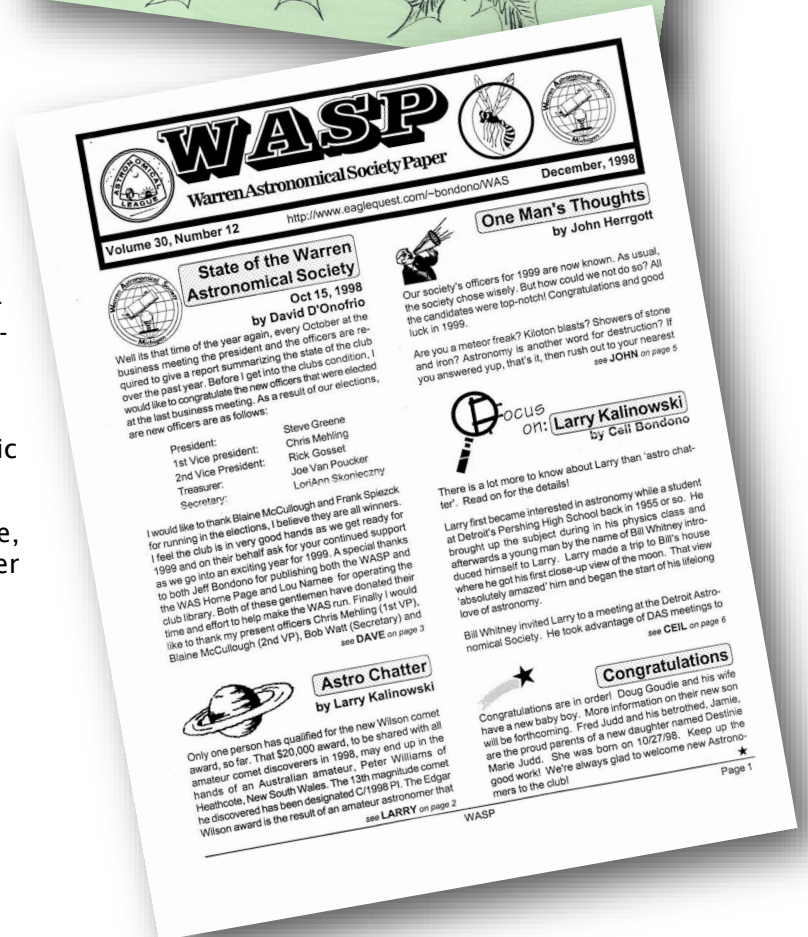
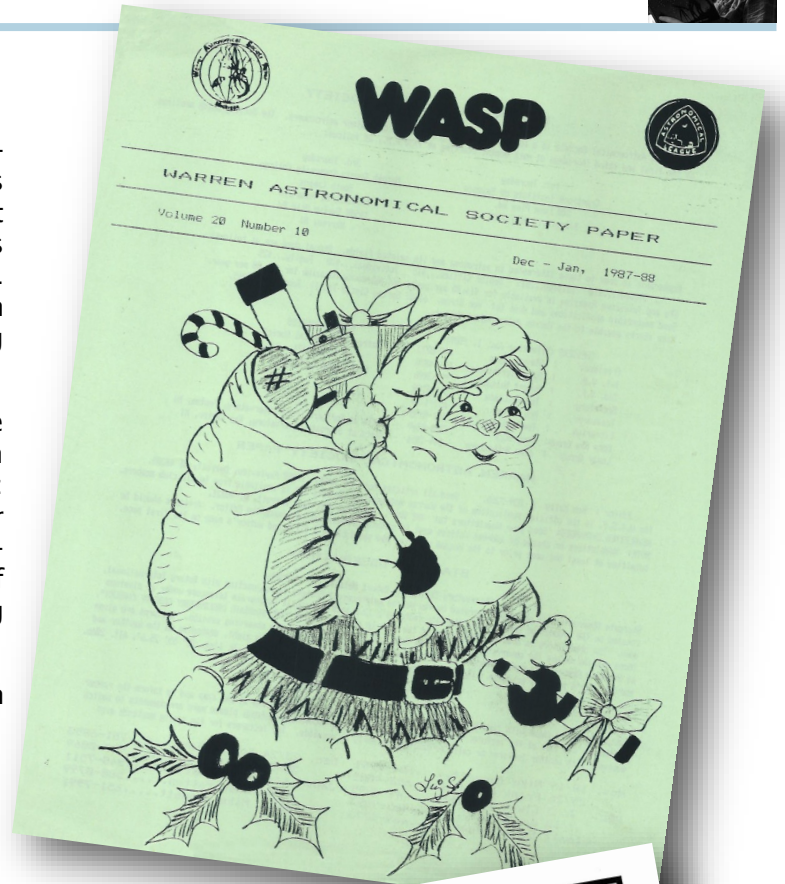
- Minor Planets for Nov. - Jan. (Calculated by Ken Kelly)
- EPHEMERIS FOR (3) Juno
- EPHEMERIS FOR (6) Hebe
- EPHEMERIS FOR (7) Iris

December 1998

In this jam-packed 8-page issue, the current president of the club, Dave D'Onofrio details the past year of the club in "State of the Warren Astronomical Society", Not to be outdone, John Herrgott offers up "One Man's Thoughts". Of course, we have "Astro Chatter" by Larry Kalinowski who gets highlighted in "Focus on: Larry Kalinowski" by Ceil Bondono. Bob Watt provides copious notes in "Minutes of Meetings."

Finally, there is this apparent note to myself while scanning the issue: (this copy has a First Supersonic Flight stamp on it).

Dale Thieme,
Chief scanner



Escaping Gravity

My quest to transform NASA and launch a new space age

By Lori Garver, a former NASA deputy administrator

It's a big bag of political actions and reactions of outer space, via the unique inside overview of the agency and the democratic governmental United States of America.

If you don't like politics, don't read this book. Really. I was thinking of not recommending it but... chapter 5, "Looking Under the Hood," this author wrote: "Democracies require their citizens to participate in the electoral process." That's true. It's a huge hurdle to a step of our Republicans versus Democrats, fighting and funding that struggle. It's a crazy mess but it works.

The first 70 pages was a breeze. But it was hard to finish it. She wrote about Obama and both Clintons, Trump and Biden, the astronauts of course, the space pirates (Musk, et al), and she met and she talked about the Hollywood stars, especially Tom Hanks. She flatteringly wrote in a conversation with Gene Roddenberry, "he believed our pull to space was stronger..." This book is a pat on her back. It's more like a self-congratulatory handshake, but hey, why not?

She wrote gleefully about corralling private companies and commercial spaceflights. And the demise of the seemingly boondoggle Constellation project. It changed the name and it changed its own public face also. Though NASA will stand up, the first launch of Artemis was in November. Its mission is to land on the Moon and eventually land on Mars. Funding is the key. Billions of dollars are not simply a tip of the bill. "NASA is a national asset that if properly reformed can continue to make meaningful contributions to sustaining humanity..." she wrote.

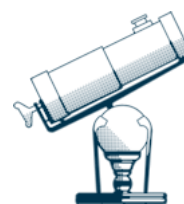
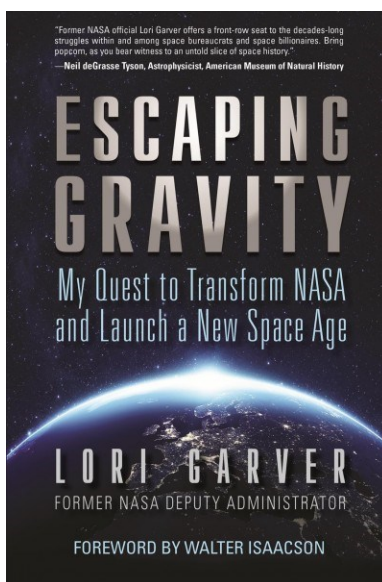
Her "new book" doesn't mention the Russians brutally invading Ukraine. Obviously it was published before the war but I was wondering about today and the future of the International Space Station.

She was not an astronomer and she didn't pretend. But she barely mentioned the Webb telescope. Her seventh chapter is Dark Matter. That was another loosely termed, without stars or galaxies. She wrote long pages about women and minorities in the space age. She writes like a politician!

I have a suggestion for her title: Escaping Gravity. We have escaped gravity since 1958, the birth of NASA. She meant the funding, not necessarily rockets and spaceships, but the holy money, thus escaping gravity. She had mentioned another alternative title to her book, Space Pirates. It's an old news but honorable subject and title. It reminds me of space opera, Edgar Rice Burroughs and John Campbell Jr. Sigh. Chasing gravity is more accurate for astronomers. We are hoping to explore outer space but specifically stars and planets, asteroids and moons. That's why we are not searching Earth (in fact she addressed and groped climate change) but always chasing gravity.

This book "is not to be an academic dissertation" or a historical text but "it is a memoir." She was opinionated, you can say yes or no. It depends on you. I have opinions also: male, white, old and Ukrainian. But I am an American taxpayer also. I love my NASA but save my money! It's a tricky thing.

She mentioned sf authors, Asimov and Heinlein, bravo to her. And she quoted sainted Sagan also. Hurray! Finally, she wrote, "We have the experience and knowledge to succeed if we can move beyond past divisions and embrace each other from a new perspective." NASA can and will climb and struggle the invisible ladder to evolve its own industrial-military partnerships and bureaucrats. You should like her viewpoint and her personal style. I agree and I recommend reading this book. Bill Nye, the Science Guy and CEO Planetary Society agreed: "... read this book."



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

DECEMBER 2022

Notable Sky Happenings

Dec. 1 - 7

Mars is at opposition on the 7th (SE eve.). It's expected to be brighter than Sirius, the brightest star in the night sky. Also, **the Moon will occult (pass in front of) Mars** this night! Mars will disappear behind the Moon at 10:19pm EST and reappear at 11:12pm EST (times are for the Detroit area).

Dec. 8 - 14

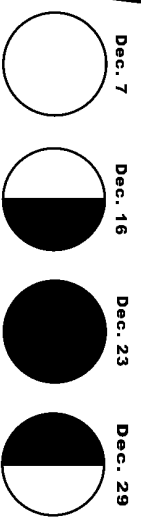
The Geminid Meteor Shower peaks the night of the 14th and continues into the morning of the 15th. It averages 60 meteors per hour, but the Moon rises after midnight on the 15th and interferes.

Dec. 15 - 21

Winter begins for the Northern Hemisphere at 4:48pm EST on the 21st.

Dec. 22 - 31

The Moon is to the left of Saturn on the 26th (SW evening), below Jupiter on the 28th (S evening) and at the upper left of Jupiter on the 29th.



Now Showing

"Mystery of the Christmas Star"

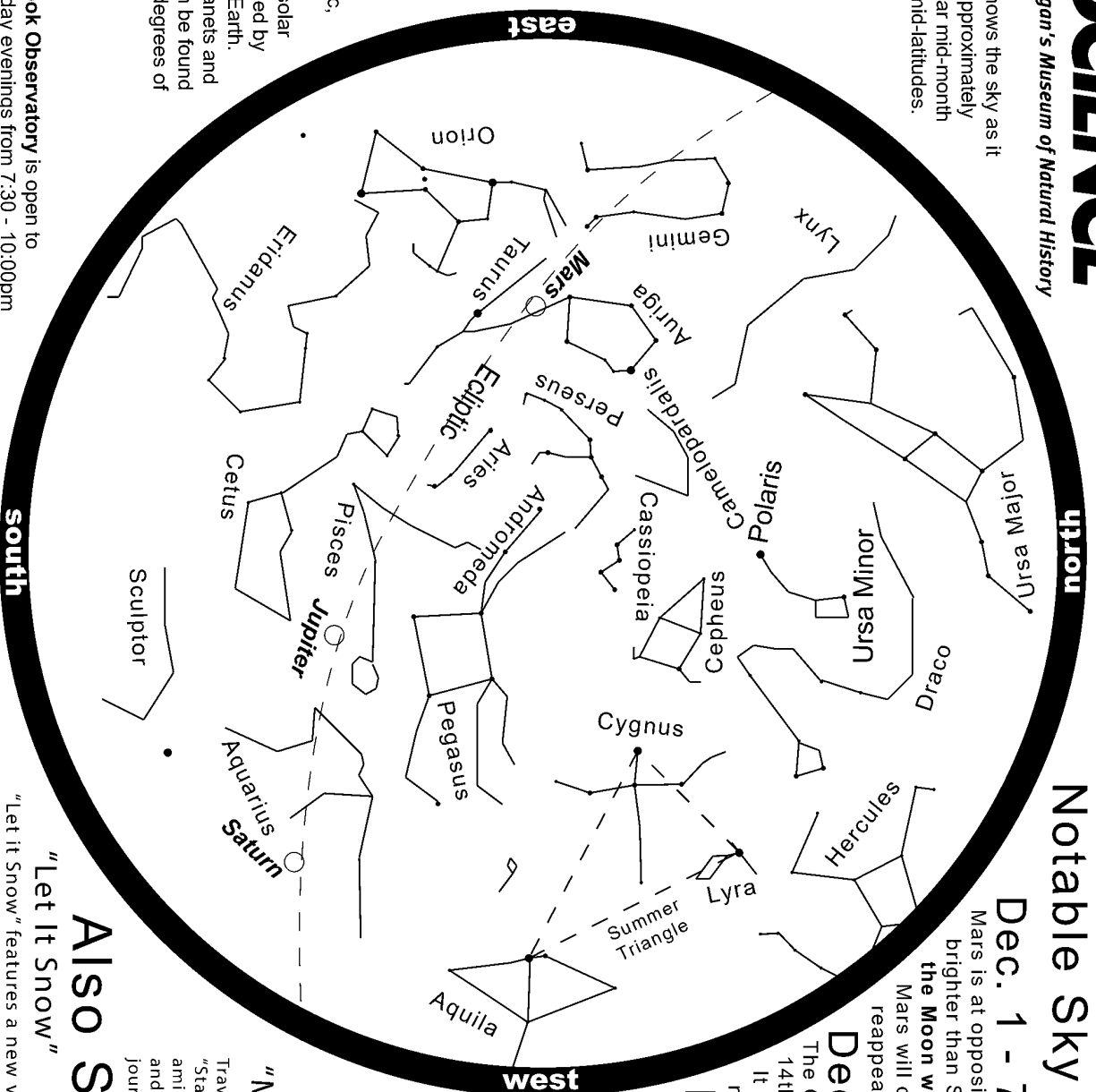
Travel back in time 2,000 years to explore the nature of the "Star" that guided the wise men to Bethlehem. We will examine astronomical events that were occurring at the time and see if any were remarkable enough to have sparked the journey. (Extra shows are presented during the holidays.)

Also Showing

"Let It Snow"

"Let it Snow" features a new variety of festive classics from Frank Sinatra and Chuck Berry to Burl Ives and Brenda Lee, and includes a finale by the Trans Siberian Orchestra. The soundtrack is visually enhanced with thematic animation and all-dome scenery. This 32-minute program is a fun and entertaining experience for all ages, especially families.

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

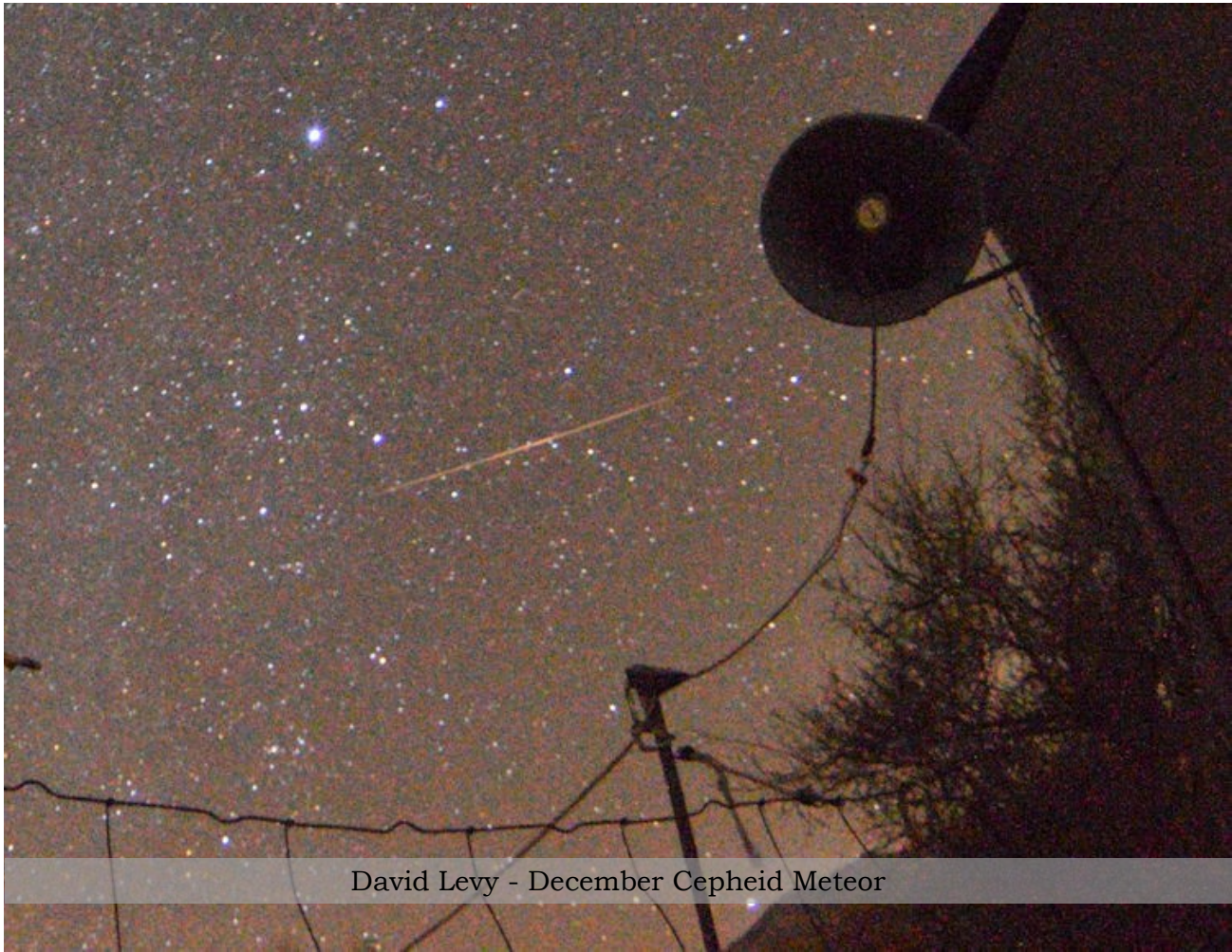


What is that dashed line? It's the ecliptic, the reference plane of the solar system, defined by the Sun and Earth. The major planets and the Moon can be found within a few degrees of this plane.

The Cranbrook Observatory is open to the public Friday evenings from 7:30 - 10:00pm EST, and the first Sunday of the month from 1:00 - 4:00pm for solar viewing.

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





David Levy - December Cepheid Meteor

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5 Cranbrook	6	7 Mars at Opposition FULL MOON	8 WAS Banquet	9	10
11 Moon at Apogee: 405869km	12	13	14 Geminid Meteor Shower	15	16	17 Stargate Open House
18	19 Chanukah/Hanukkah (first day)	20	21 Mercury at Greatest Elong: 20.1°E Winter Solstice	22 Ursid Meteor Shower	23 NEW MOON	24 Moon at Perigee: 358270km
25 Christmas Day	26 Last Day of Chanukah Christmas day off	27	28	29	30	31 New Year's Eve

December 2022



Stargate Observatory

Monthly Free Astronomy Open House and Star Party

5:00 PM, December 17th

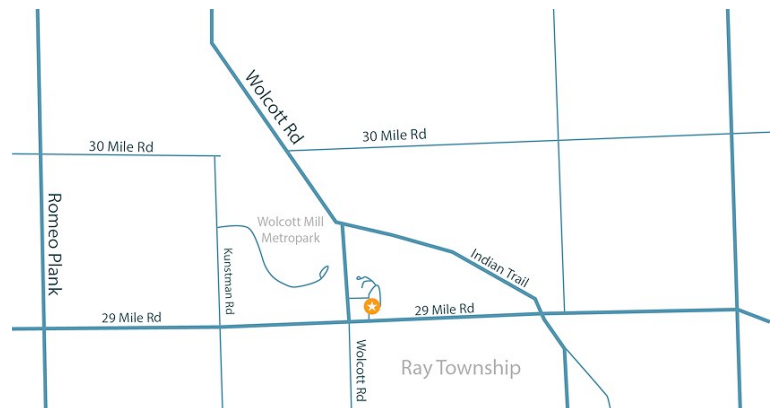
Wolcott Mill Metropark - Camp Rotary entrance

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

- Sky tours.
- See different telescope types in operation.
- Get help with your telescope.
- We can schedule special presentations and outings for scouts, student or community groups.

Contact: outreach@warrenastro.org

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



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

Observatory Rules:

- Closing time depends on weather, etc.
- May be closed one hour after opening time if no members arrive within the first hour.
- Contact the 2nd VP for other arrangements, such as late arrival time. Call 586-909-2052.
- An alternate person may be appointed to open.
- Members may arrive before or stay after the scheduled open house time.
- Dates are subject to change or cancellation depending on weather or staff availability.
- Postings to the Yahoo Group and/or email no later than 2 hours before starting time in case of date change or cancellation.
- It is best to call or email the 2nd VP at least 2 hours before the posted opening with any questions. Later emails may not be receivable (secondvp@warrenastro.org).
- 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.

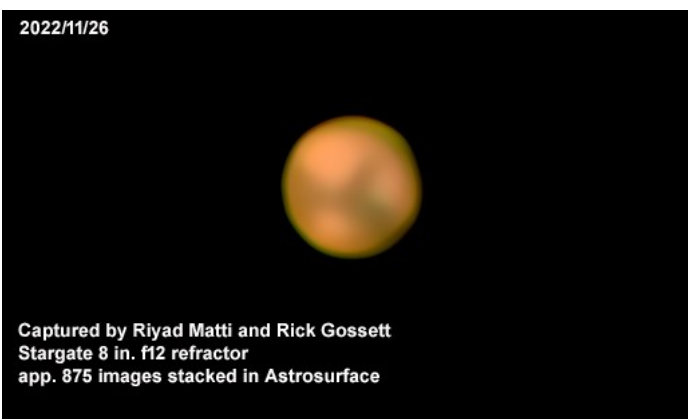
Stargate Report

November 26: The observatory was opened at 5:00 pm and the sky was mostly clear with thin haze. A number of people attended throughout the night including WAS members and the general public. We started with observations of the crescent moon low in the sky before setting, then observed Saturn, Jupiter, Neptune, and Mars. A few telescopes were set up outside to observe deep sky objects, planets, and double stars. The observing conditions deteriorated as the haze became thicker by about 10 pm. The observatory was closed at 10:30 after most visitors left.

This was one of our recent successful open house events with decent sky conditions. Next open house is scheduled for December 17, 2022.

Riyad I. Matti

2022 WAS 2nd VP. Observatory Chairperson



Treasurer's Report

Treasurer's Report for November 30, 2022

BOA account:

Balance: \$29,608.75
 Deposits (Amazon Smile): 32.52
 Expense (Webex) 15.90

PayPal Account:

Balance: \$465.91
 Received: 143.58
 Paid 7.60
 (mailing)

Total Paid Memberships..... 127

We welcome the Gruda family to our society.

News from the Treasury:

The process for ordering a physical copy of Sky & Telescope has changed, and prices have gone up above \$40 per year for a member of an astronomy club. Please let me know via email at treasurer@warrenastro.org if you would like more information.

Adrian Bradley,
 Treasurer

Astronomical Events for December 2022

Add one hour for Daylight Savings Time
 Source:

<http://astropixels.com/almanac/almanac21/almanac2022est.html>

Day	EST (h:m)	Event
01	19:52	Jupiter 2.5°N of Moon
05	07:39	Moon at Ascending Node
06	14:26	Pleiades 2.7°N of Moon
07	23:08	FULL MOON
07	23:21	Mars 0.5°S of Moon: Occn.
07	23:00	Mars at Opposition
11	02:06	Pollux 1.8°N of Moon
11	19:30	Moon at Apogee: 405869 km
14	08:00	Geminid Meteor Shower
16	03:56	LAST QUARTER MOON
18	08:37	Spica 4.1°S of Moon
19	20:36	Moon at Descending Node
21	10:00	Mercury at Greatest Elong: 20.1°E
21	16:48	Winter Solstice
21	17:43	Antares 2.3°S of Moon
22	16:00	Ursid Meteor Shower
23	05:17	NEW MOON
24	03:32	Moon at Perigee: 358270 km
24	06:29	Venus 3.5°N of Moon
24	13:31	Mercury 3.8°N of Moon
26	11:11	Saturn 4.0°N of Moon
29	02:00	Mercury 1.4°N of Venus
29	05:29	Jupiter 2.3°N of Moon
29	20:21	FIRST QUARTER MOON



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.

Meeting Minutes

WARREN ASTRONOMICAL SOCIETY

MINUTES OF BOARD MEETING

NOVEMBER 7, 2022 @ 6:30PM

Meeting called to order @ 6:30PM. Officers in attendance: Diane Hall, Bob Trembley, Mark Kedzior, Adrian Bradley, Kevin McLaughlin - (Virtual attendance) Riyad Matti, Dale Thieme - quorum present.

OFFICER REPORTS:

President Diane Hall reviewed the slate of nominees for the 2023 WAS Board Officer positions, for the election at the regular meeting to follow:

President - None

1st VP - Bob Trembley

2nd VP - Jeff MacLeod

Secretary - Mark Kedzior

Treasurer - Adrian Bradley

Outreach - Kevin McLaughlin

Publications - Dale Thieme

Still seeking nominations for Special Service Awards.

1st VP Bob Trembley reported on upcoming speaker schedule - Karim Jaffar will be our keynote speaker for December 5th Awards Meeting.

2nd VP Riyad Matti reports (read by Diane) on the October Open House - observing took place until closing at 3:30AM (report in November WASP).

Secretary Mark Kedzior reported on donations received from vendors for December 5th Awards Meeting. He also reports on procuring prepackaged snacks for the regular meetings, which will be available beginning at tonight's Cranbrook meeting (Two snacks plus bottled water for \$1.00 - extra snacks available for \$.50 each). He will transport snacks to and from meeting until regular snack schedule can be resumed in future.

Outreach Chair Kevin McLaughlin gave update on upcoming outreach events by members. He also reported on the successful Belle Isle outreach event.

Publications Chair Dale Thieme reports the November edition of the WASP is posted online.

OLD BUSINESS:

Meetup account payments will be charged to the club per Adrian Bradley. Groups.io - Adrian has set up account to pay automatic yearly dues through WAS account.

NEW BUSINESS:

Discussion on the agenda for December 5th Awards "Banquet" Meeting - President Diane Hall will begin meeting at 7:30PM with WAS Year in Review,

followed by WAS Service Awards/Recognition and Changing of Guard. Snack break at 8PM, followed at 8:15 by door prize drawing. Main presentation follows at 8:30PM with Karim Jaffar. Discussion on club donations - new location is needed to securely store items donated to the WAS. Will return to discuss at January 2023 Board meeting.

Motion by Mark Kedzior to adjourn meeting - second by Adrian Bradley.

Meeting adjourned at 7:20PM.

Respectfully submitted,
Mark Kedzior
Secretary, WAS

WARREN ASTRONOMICAL SOCIETY

CRANBROOK MEETING (w/Live Streaming)

NOVEMBER 7, 2022 7:30PM

Meeting called to order for in person Cranbrook meeting with live streaming at 7:30PM by President Diane Hall. Number of persons in attendance - 25(WebEx attendance - 19 & YouTube attendance - 8 @ 8:30PM). Meeting began with introduction of new members and visitors.

OFFICER REPORTS:

President Diane Hall reported on the format for the upcoming December 5th Awards "Banquet" in person/virtual meeting, which will be the last meeting of 2022. She also announced the return of snack time during break with prepackaged snacks and bottled water until return to traditional snack volunteer format. She also led brief discussion on total lunar eclipse which will take place early in the AM hours.

1st VP Bob Trembley gave upcoming schedule of presenters and of our December 5th keynote presenter Karim Jaffar. Diane Hall read the 2nd VP Observatory report from Riyad Matti (which can be found in November edition of the WASP).

Secretary Mark Kedzior reported there are still calendars available for purchase.

Treasurer Adrian Bradley gave the current account balances (which can be found in November edition of the WASP).

Outreach Chair Kevin McLaughlin reported on upcoming outreach events.

Publications Chair Dale Thieme reported the November WASP is up online and thanked all for their contributions to this edition.

SPECIAL INTEREST GROUPS:

Solar - Marty Kunz reports large sunspots and close

(Continued on page 33)

(Continued from page 32)

groupings can be seen on the sun. Double Star Group - selected double stars will be observed at the next open house. Discussion Group - if interested in hosting a discussion group gathering, please contact Jeff MacLeod to schedule. History - Dale Thieme reported on the 1999 issue of the WASP.

OBSERVING REPORTS:

David Levy reports he is prepared and waiting to observe the total lunar eclipse later in Arizona, and read poem about the total lunar eclipse. Dale Hollenbaugh shared his recent and excellent images taken of Jupiter and Mars, and the double transit in animation on Jupiter. Diane Hall reports her observations of the moon and Mars in her 10" reflector. Bill Beers encourages all in taking images of the upcoming total lunar eclipse in the early AM hours, with 5:30AM being the optimal time to observe totality.

ELECTION OF 2023 WAS BOARD OFFICERS:

Ken Bertin presided over the annual election, reading the WAS By-Laws in regard to the qualifications and guidelines for electing officers.

CALL FOR NOMINATIONS FROM FLOOR:

PRESIDENT - BOB TREMBLEY (nomination by Jeff MacLeod, second by Adrian Bradley) - Bob Trembley ACCEPTED nomination - no other nominations for office of President from floor.

1st VP -JEFF MACLEOD (nomination by Bob Trembley, second by Dave Baranski) - Jeff MacLeod DECLINED nomination - no other nominations for office of 1st VP from floor (no candidate nominated creating vacancy).

2nd VP - JEFF MACLEOD (nomination by Adrian Bradley, second by Diane Hall) - Jeff MacLeod ACCEPTED nomination - no other nominations for office of 2nd VP from floor.

SECRETARY - MARK KEDZIOR (nominated by Adrian Bradley, second by Jeff MacLeod) - Mark Kedzior ACCEPTED nomination - no other nominations for office of Secretary from floor.

TREASURER - ADRIAN BRADLEY (nominated by Jeff MacLeod, second by Diane Hall) - Adrian Bradley ACCEPTED nomination - no other nominations for the office of Treasurer from floor.

OUTREACH CHAIR - KEVIN MCLAUGHLIN (nominated by Diane Hall - second by Adrian Bradley) - Kevin McLaughlin ACCEPTED nomination - no other nominations for the office of Outreach Chair.

PUBLICATIONS CHAIR - DALE THIEME (nominated by Diane Hall - second by Adrian Bradley) - Dale Thieme ACCEPTED nomination - no other nominations for the office of Publications Chair.

With no other nominations from the floor, the above individuals are hereby elected to respective offices

by ACCLAMATION, with a vacancy for the office of 1st VICE PRESIDENT. Motion by Adrian Bradley to close elections, second by Jeff MacLeod - motion passed. ELECTION OF 2023 WAS BOARD OFFICERS CLOSED.

An appointment or volunteer for the vacancy of the office of 1st Vice President will take place at next regularly scheduled meeting.

MAIN PRESENTATION:

1st VP Bob Trembley introduced (with bio) Tim Campbell, with his presentation " Spectroscopy - How It's Really Made & What's Hiding In The Light (Stellar Nucleosynthesis and Spectroscopy)". In this excellent presentation to understand spectroscopy, Tim discussed star formation, the Periodic Table, a hands on spectroscopy exercise with diffraction grating glasses to show the spectrum bands in incandescent light, hydrogen, helium, neon, color LED tower, electron energy transitions, stellar classification, Doppler Effect, the James Webb Space Telescope's science instruments, and explained the use of the R Spec Software Star Analyzer 100 w/ 1.25" diffraction grating filter(to be used with ASI monochrome camera along with 80mm refractor/500mm focal length) to analyze and record star spectra.

Questions and discussion followed his excellent presentation.

Meeting ended at 9:40PM.

Respectfully submitted,
Mark Kedzior
Secretary, WAS

WARREN ASTRONOMICAL SOCIETY

MACOMB (VIRTUAL) MEETING

NOVEMBER 17, 2022 7:30PM

Meeting called to order at 7:30 PM by 1st Vice President Bob Trembley. Officers in attendance: Riyad Matti, Mark Kedzior, Adrian Bradley, Dale Thieme (WebEx attendance - 19 & YouTube -8@ 8:15 PM).

OFFICER REPORTS

2023 Election Results: President - Bob Trembley - 1st VP - Vacancy - 2nd VP - Jeff MacLeod - Secretary - Mark Kedzior - Treasurer - Adrian Bradley - Outreach Chair - Kevin McLaughlin - Publications Chair - Dale Thieme. Seeking individual for office of 1st VP. 2023 WAS Calendars are still available for \$20 each. December 5th Awards" Banquet" meeting will have Karim Jaffer as keynote speaker. 2nd VP Riyad reported on the October 22nd Open House - the next Open House will be November 26th, and the December Open House will be December 17th. Secretary Mark Kedzior reports getting things ready for December 5th Awards Banquet Meeting door prize drawing. Treasurer Adrian Bradley gave WAS account balances. No Outreach report (but

(Continued on page 34)

(Continued from page 33)

can be seen in November WASP). Publications Chair Dale Thieme working on WAS 2023 Annual Mailer.

SPECIAL INTEREST GROUPS

Solar - Image of recent activity posted by Bob Trembley (sunspot rotating into view, h Alpha image and UV coronal hole. Hands On/Double Star Group - next open house will target Gamma Andromeda and Sirius B. History - No report. Discussion Group - contact Jeff MacLeod if interested in hosting group discussion. Virtual Discussion Group will take place next week TBA. GLAAC - GLAAC Officer openings for 2023 - if interested contact Bob Trembley or Adrian Bradley.

OBSERVING REPORTS

Astrophotography - Doug Bock (with 10" R/C scope) shared his images of Comet C2020 V2, M78 in Orion, the Deer Lick Group of NGC objects, and with his 6" SCT, his sunspot images of AR 3116 and AR 3112 taken on October 3,4 &5. Adrian Bradley shared his total lunar eclipse images of November 8th in assorted landscape/sky scenes.

MAIN PRESENTATION:

1st VP Bob Trembley introduced (with bio) Danica Re-my of the B612 Foundation, and her presentation on "Planetary Defense". Danica explained the B612 Foundation and its mission(also how named) dedicated to protecting our planet from a future asteroid impact through science, technology, advocacy and education. Along with presenting videos on the B612 mission, she discussed the advances in discovering near earth asteroids (30,000 as of today), the Vera Rubin Observatory in Chile, which will discover an estimated 200,000 near earth asteroids when it enters its first year of operation, and the efforts in continuing to accelerate asteroid discoveries in the solar system.

Questions and discussion followed her excellent presentation. To see this presentation in its entirety, go to: <https://www.youtube.com/warrenastro>

The meeting ended at 9:30PM.

Respectfully submitted,
Mark Kedzior
Secretary, WAS



Above:

Sunrise 11/9/22

Date Taken: 11/9/22

Submitted by: Ray Bosshard

Below:

Brilliant Steppingstones Across the Lake on a Misty Morning

Date Taken: 11/14/22 (shortly after sunrise)

It was hard to pick my favorite sunrise photo this morning. In spite of getting up after the sunrise, I got some gratifying shots as there was a bank of clouds low on the eastern horizon.

There was also a little fog hovering over the lake. This pic pick was unusual in that it seemed like the sun was casting brilliant steppingstones across the lake on this misty morning.

-Ray Bosshard



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: <https://www.vaticanobservatory.org/profile/rtrembley>
 Bob Trembley: [Vatican Observatory Foundation Blog](#)
 Steven Aggas: <http://apache-sitgreaves.org/>

Doug Bock:
 Facebook: Northern Cross Observatory <https://www.facebook.com/NorthernCrossObservatory>
 Boon Hill and NCO Discussion <https://www.facebook.com/groups/369811479741758>
 Flickr (astrophotography album): <https://www.flickr.com/photos/141833769@N05/>
 YouTube channel: <https://www.youtube.com/channel/UC-gG8v41t39oc-bL0TgPS6w>



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!

Binoculars: A Great First Telescope

David Prosper

Do you want to peer deeper into the night sky? Are you feeling the urge to buy a telescope? There are so many options for budding astronomers that choosing one can be overwhelming. A first telescope should be easy to use and provide good quality views while being affordable. As it turns out, those requirements make the first telescope of choice for many stargazers something unexpected: a good pair of binoculars!

Binoculars are an excellent first instrument because they are generally easy to use and more versatile than most telescopes. Binoculars can be used for activities like stargazing and birdwatching, and work great in the field at a star party, along the hiking trail, and anywhere else where you can see the sky. Binoculars also travel well, since they easily fit into carry-on luggage – a difficult feat for most telescopes! A good pair of binoculars, ranging in specifications from 7x35 to 10x50, will give you great views of the Moon, large open star clusters like the Pleiades (M45), and, from dark skies, larger bright galaxies like the Andromeda Galaxy (M31) and large nebulae like the Orion Nebula (M42). While you likely won't be able to see Saturn's rings, as you practice your observing skills you may be able to spot Jupiter's moons, along with some globular clusters and fainter nebulae from dark sites, too.

What do the numbers on those binocular specs actually mean? The first number is the magnification, while the second number is the size in millimeters

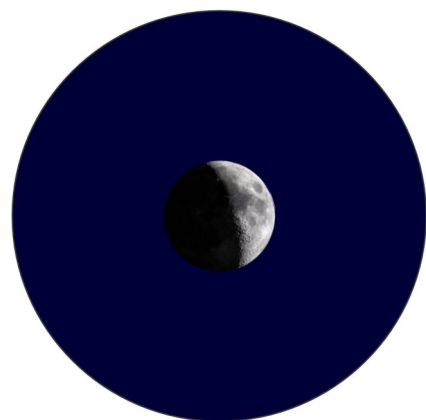
(mm) of the lenses. So, a 7x35 pair of binoculars means that they will magnify 7 times using lenses 35 mm in diameter. It can be tempting to get the biggest binoculars you can find, but try not to get anything much more powerful than a 10x50 pair at first. Larger binoculars with more power often have narrower fields of vision and are heavier; while technically more powerful, they are also more difficult to hold steadily in your hands and "jiggle" quite a bit unless you buy much more expensive binoculars with image stabilization, or mount them to a tripod.

Would it surprise you that amazing views of some astronomical objects can be found not just from giant telescopes, but also from seemingly humble binoculars? Binoculars are able to show a much larger field of view of the sky compared to most telescopes. For example, most telescopes are unable to keep the entirety of the Pleiades or Andromeda Galaxy entirely inside the view of most eyepieces. Binoculars are also a great investment for more advanced observing, as later on they are useful for hunting down objects to then observe in more detail with a telescope.

If you are able to do so, real-world advice and experience is still the best for something you will be spending a lot of time with! Going to an in-person star party hosted by a local club is a great way to get familiar with telescopes and binoculars of all kinds – just ask permission before taking a closer look! You can find clubs and star parties near you on the Night Sky Network's Clubs & Events page at bit.ly/nsnclubsandevents, and inspire your binocular stargazing sessions with NASA's latest discoveries at nasa.gov.



The two most popular types of binocular designs are shown here: **roof-prism** binoculars (*left*) and **porro-prism** binoculars (*right*). Roof prisms tend to be more compact, lighter, and a bit more portable, while porro-prisms tend to be heavier but often offer wider views and greater magnification. What should you choose? Many birders and frequent fliers often choose roof-prism models for their portability. Many observers who prefer to observe fainter deep-sky objects or who use a tripod with their observing choose larger porro-prism designs. There is no right answer, so if you can, try out both designs and see which works better for you.



A pair of good binoculars can show craters on the Moon around 6 miles (10 km) across and larger. How large is that? It would take you about two hours to hike across a similar-sized crater on Earth. The "Can You See the Flag On the Moon?" handout showcases the levels of detail that different instruments can typically observe on the Moon, available at bit.ly/flagmoon. *Moon image courtesy Jay Tanner*



Last Word

-Dale Thieme, Publisher

Next month, I start my term-limited third consecutive year. Looking back, it's been a pretty good run, from receiving the Mabel Sterns Newsletter Editor award for "Outstanding Club Newsletter" (Says it right on the plaque) in 2021, to an invitation to judge the newsletter entries in 2022 and who knows what 2023 will hold.

My relationship with the WASP goes way back, to a comment/request Jonathan Kade made in 2011 regarding a receipt of a large collection of old WASPs from Larry Kalinowski's library: Would someone like to scan these in and create digital copies? After a few years of scanning and digitizing, using MS Word and then MS Publisher, when Bob Trembley reached the end of his tenure as Publications officer (2 consecutive years was the limit then), I felt that I could tackle the "live" version, as well.

I took over the editing of the newsletter from Bob Trembley, in 2016, when the oft-stated phrase was "who could ever follow that act?". My answer was that I could lower the bar so that anyone could follow me. Easier said than done, by all indications. By fall of 2016, I found out I was going to relocate to Florida and was able to get my son, Brian, to run for Publications Chair. It dawned on me over that year "in exile" that I could edit from Florida and Brian was quite ready to turn the reins over to anyone else, despite garnering second place in the Mabel Sterns award (the bar starts going back up). Enlisting Dale Partin to run for Publications chair enabled me to resume editorial duties. Dale's time in office was followed by Jonathan Kade in the publications chair, while I happily churned out issue after issue of the WASP. Then

came COVID. Diane Hall observed that now that the officer meetings were held online now, I could hold the office of Publications chair from 800+ miles away. So that is what I did for the past two years.

Other highlights from my tenure as Editor? The 2022 October issue got an "attaboy" from Mark Kalinowski on Facebook (he liked the cover, which I enjoyed making) Another member rejoined the club, stating that the quality of the newsletter played a large role in his decision. Now that's encouraging.

In the past year, the publications chair workload has expanded: fleshing out the Meetup and email blasts throughout the month, tending the annual mailer and, in another vein, I managed to fall into the Calendar Group, another yearly production. The biggest downside to me is that I can't attend events in person, but we have able camera buffs in the club who are and provide images from said events that I can include in the WASP. A steady flow of columns, articles and officer reports ensure great content.

As I put the finishing touches on this issue, I'm already looking ahead to next month, selecting the "Over the Moon" article for Ralph DeCew to annotate, picking out a couple issues for the history SIG, loading the Astro Events table, placing the current month's calendar, and generally setting the document up for incoming material. The beat goes on.

Doug Bock once posted a picture of Frank McCullough editing the WASP and someone suggested a "Then and Now" comparison set of images. Well, here you go:

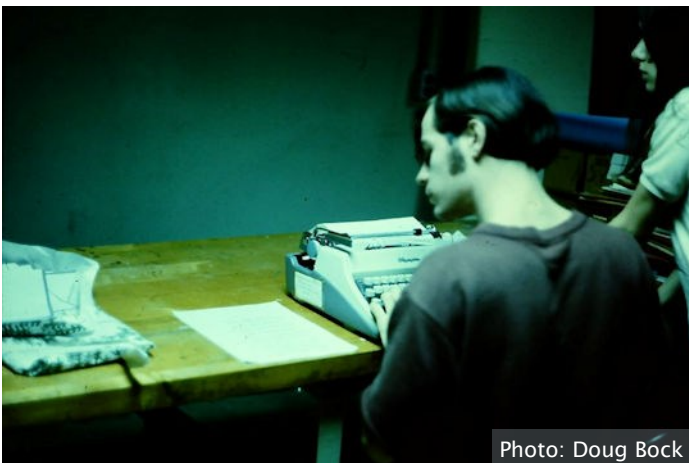


Photo: Doug Bock

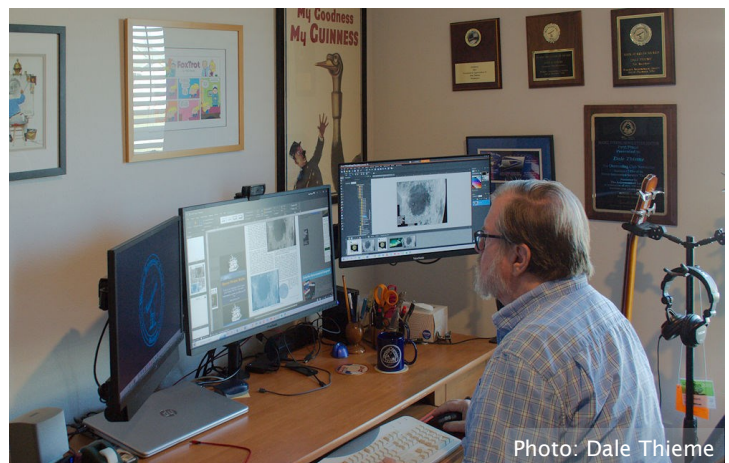


Photo: Dale Thieme

Above left: Frank McCullough. Above right: Dale Thieme, so happy to be doing this on a computer. Note the WAS and A.L. awards, serving to inspire.