



Election Day Total Lunar Eclipse

Don't miss the country's first election day lunar eclipse on November 8, 2022. The moon will be far to the west nearing the horizon, but you should be able to see through mideclipse time. Share your pictures with club members on our Google Group if you do, or stop by the MAS to use our pads to observe, but note the nearby tree line when planning.

Phases of the eclipse - November 8, 2022:

- 1. Start of partial eclipse: 3:09AM
- 2. Start of total eclipse: 4:16AM
- 3. Mid-eclipse: 4:59AM
- 4. Start of partial eclipse: 5:41AM

Learn more about this exciting event on our website at <u>https://milwaukeeastro.org/</u> <u>archive/LunarEclipse.asp</u>. If you miss it, you'll have to until March 14, 2025 for the next one!





It's Time to Party! Dec. 3 Christmas Party

Party with the Milwaukee Astronomical Society this December 3 for the return of our **Annual Members Christmas Party** on **Saturday, December 3**, at **4pm.**

- Bring a dish to pass, desserts are always welcome. Bring your own beer or wine.
- Pizza and drinks will be provided! A \$5 donation to cover costs is appreciated.
- Stay for our members night and viewing after the party, or catch up with members!

Upcoming Meetings

An in person **Membership Meeting** will be held on **Monday, November 21st**, at **8pm** at the **Quonset Meeting Hall** and the agenda is open-ended this month - check our Google Group for updates. The **Board Meeting** starts at **7pm**, all are welcome!

The **First Wednesday** meetings will be held in person at the Observatory grounds on **Wednesday**, **Nov. 2nd** and **Dec. 7th** at **7:00 PM**. New members are especially encouraged to attend this meeting. It is a chance to gain hands-on experience, receive tips on how to get started and/or get more involved in the Club's activities.

The Imagers Interest Group continues in an all virtual format, on Wednesday, Nov. 9th at 7:00pm. You may email <u>Kevin Shea</u> for an invitation.

Dark Sky Party on Saturday, Nov. 19th, at the MAS Observatory (Sunset 4:25pm).

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Renewal Time!

MAS Membership Renewal is Due December 31st.

<u>RENEW NOW</u> >

Observatory Director Report

Relayed via Gene Hanson (FM) on behalf of Paul Borchardt, Observatory Director, unable to attend this meeting, the Machl mount from Astrophysics is in F dome. Astrophysics is providing an adapter to hold the mount on to a flat surface and installation should begin shortly. The controller for the Obsession Dobsonion was shipped from Australia within 10 days, and Jeff Annis was able to get a replacement plastic part required for cables. Additionally, there is now a sign in desk by the MAS Quonset entry, to encourage logging visits. The log book has about 10 pages left, since 1991, and a replacement will be ordered. —Gene Hanson (FM)

Treasurer's Report

\$12,048.55	Starting Balance as of 09/17/22	
	Expenditures	
\$26.40	PayPal / Stripe fees	
\$192.47	Annual Expenses	
\$6,599.95	Observatory Expenses	
\$74.27	WE Energies	
\$7.50	Other Expenses	
\$36.00	Water/Sewer	
\$6,936.59	TOTAL Expenditures	
	<u>Revenue</u>	
\$1,118.00	Membership dues	
\$61.00	Public Donations	
\$1,399.95	Private Donations	
\$11.00	Grants / Other Rev.	
\$2,589.95	TOTAL Revenue	
\$7,701.91	Ending Balance as of 10/15/2022	

Membership Report

The total active membership is 258, with 12 members since the last report. We welcome: Joe Carlone; Justin Vavra; Christy Lewandowski; Jason Lopez & Family; Patrick Murray & Family; Renato Vargas; William Baye; Nathan Dykstra & Family; Neil Drake; John Koors; Elizabeth Schrock & Family.

Matthew Ryno, Membership Chair

Minutes

An in-person board meeting was held at the Quonset Meeting Hall, on 7:09pm by MAS President, Jill Roberts. In attendance were Sue Timlin, Jill Roberts, Matthew Ryno, William Gottemoller, Mike Bauer, Jim Bakic, Russ Blankenburg, Mike Wagner and Dennis Roscoe. **Minutes** of the prior board meeting, and **Reports** were submitted by officers for review prior to the meeting and approved; including memberships.

Mach1GTO Mounts: The purchased Astro-Physics Mach1GTO Mount is currently in Fdome, and a part will be ordered to allow mounting on a flat surface. A second Astrophysics Mach1 mount may also be available for utilization through a member donation.

New Open House Sign and Lights: MAS President Jill Roberts proposed replacement of current open house signs. After an introduction, the board approved \$360 for new A frame white sign boards, and a set of two safety wands for parking cars at open houses, which were utilized at the October 28th Open House.

Obsession Nexus DSC Pro: The Astro Devices Nexus DSC Pro, for Digital Setting Circles on the Obsession Dobsonion telescope in D-Shed was trialed at the October 28th Open House.

Speakers, Promotions: MAS President, Jill Roberts, asked for members interested in promotions and procurement of speakers to contact her or any MAS officers. Any members with ideas for speakers, or topics to present are encouraged to get in touch.

Board Voting by Email: After a discussion, the board approved additions to the <u>MAS Bylaws</u> related to voting and meeting by email: Article III—Meeting of Members, Section 1 adds: "...Meetings may be held via email. Voting by email is verified by the From address matching the current email listed in the membership list..." and Article V, Section III, notes: "...Meetings may be held via email. Voting by email is allowed and verified by the From address matching the current email listed in the membership list..."

A motion to adjourn was made at 8:15 pm.

Matthew Ryno, Secretary

MAS Exoplanet Transit Observers

Exoplanets are planets that orbit a star other than our own Sun. We know of 4,000+ confirmed exoplanets and James Webb will help us learn more about them beyond size, orbit, and a rough idea on composition that we know today.

But before Webb will observe them, they need ground observations by amateurs like us to get precise times for when these exoplanets move in front of their host star. This is called a transit and when they move in front of their star, they block just a little bit of light making it just a little bit dimmer.

MAS Member Jeff Kraehnke relays his experiences with Exoplanets:

2022-11-01 05:12 (UT) HAT - P - 61bDur: 3.2h / Exp: 300.0s Filter: R Jeff Kraehnke Kranky Skies Observatory / C11 Edge f/7 / QSI690 (de-trended) 1.005 1.000 0.995 flux / 0.990 0.985 relative predicted predicted egress ingress start 0.980 $R_{\rm p}/R_{*} = 0.118^{+0.009}_{-0.006}$ $T_{\text{BJD}_{\text{TDB}}} = 2459884.7855^{+0.0011}_{-0.0010}$ O - C_{minutes} = 2.6^{+1.6}_{-1.4} 0.01 residuals 0.00 = 2.4*e* – 03 -0.01 rms_r -0.04-0.03 -0.02 -0.01 0.00 0.01 0.02 0.03 0.04 phase

A recent Exoplanet transit observation on Nov. 1, by Jeff Kraehnke, above. Telescope used for observing, left.

I started getting into Exoplanets

(seriously) about 2 years ago where I took the AAVSO course that is a semi-self-paced course that helps you learn how to capture transit data, reduce/analyze that data to produce a light curve, and then share that data with the Exoplan-



Jeff Kraehnke's exoplanet hunting rig

et community where a researcher might use it.

I've only officially had about 6 or so transits that I've submitted but I'm planning to do a lot more in the future. I participate in the European Space Agency's (ESA) Exoplanet program called Exoclock as well as NASA's program called Exoplanet Watch. Both have a Slack group that are very active and are a great resource for direct access to those programs and the teams that run them. Their whole purpose is to build a community of both professional and amateur astronomers that do land-based transit observations. In doing so, these continuous transit observations provide data to researchers but also helps refine the timing for when these transits occur which is important when seeking approval and scheduling valuable time on some of our space-based telescopes like JWST. With this community of landbased astronomers spread across the globe, we also often focus our efforts where all of us observe a specific star and exoplanet event to collect data that otherwise would not be possible because the transit lasts longer than any one person could observe from one place on Earth.

I really am fascinated with Exoplanets for obvious reasons like helping to prove we are not alone, but also because it helps combine my passion for astronomy with a purpose of helping

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MAS Exoplanet Transit Observers

to provide scientific data to researchers that might make that next discovery. To most people who see an image of a star field, it just looks like white dots. But if you carefully watch the position, brightness, and color of those dots over time, it can tell us so much about other worlds that are out there and help us better understand planet formation. I also like exoplanets because in the same night you can capture and process your data ending up with a light curve.

Surprisingly, you don't need huge expensive telescopes and other equipment to participate and observe exoplanet transits. I happen to use my Celestron 11-inch EdgeHD SCT with my QSI690 CCD camera, but many amateurs use 5-8 inch scopes and affordable CMOS cameras. In fact you don't even need a telescope at all! Microobservatory.org funded by NASA and the National Science Foundation (NSF) has been operating a completely robotic network of telescopes around the world and makes the data they collect available to anyone who wants it. They have heaps of data over the past 20 years

just waiting to be downloaded, analyzed, and the results shared.

Anyone interested in wanting to learn more about Exoplanets, I highly recommend a 24-part lecture series from Wondrium (formerly known as The Great Courses) called "The Search for Exoplanets: What Astronomers Know". It fully covers this topic in detail but in a way that is easy to understand. I also suggest joining the slack groups for Exoplanet Watch and Exoclock and participating in their regular meetings they have. Both of those programs have excellent software they've designed (and I use) to process your data and generate light curves. And finally, get out and learn to use the telescopes at MAS and graduate into imaging so you have the fundamentals for capturing transit data of your own.

NASA's Universe of Learning is giving a 3-part series webinar on exoplanets. Register for the free webinar to learn more about exoplanets and how you can contribute to science, <u>via this link</u>.

—Jeff Kraehnke

Urban Exoplanet Transit Data with a 4.5" Reflector

MAS Secretary, Matthew Ryno, relays his experiences observing exoplanets in Milwaukee:

Confirming when an exoplanet theoretically transits across its host star used to be a task you'd imagine would be done by domed observatories high in the mountains, by the smartest minds in science, who calculate every last detail with a formula. It still is; but, observing a transit can also be done in your backyard in Milwaukee,

with just a 4.5" Newtonion Reflector telescope and a camera if you know where to point and have a little help technology to make it all possible!

Like Jeff, I take advantage of NASA scientists first identifying an object of interest to begin with, and to make it even easier, I am also using a network-connected telescope with a built-in camera to take my readings, the Unistellar eVscope, which enables me to upload data to SETI Institute researchers who read my data, average the flux, and combine with others in the network targeting the



Matthew Ryno's 4.5" Unistellar eVscope Exoplanet Transit detection on XO-7b from 9/8/22 in the backyard, Cudahy, Wi.

MAS Exoplanet Transit Observers (Continued)

same object (if anyone else did that night) with the same uniform optics and camera sensor.

I pick targets from a map each month, load coordinates in my Google calendar, and hope for clear skies and free time to monitor. Once I point my telescope, set my cadence and gain settings, and painstakingly repeat every 30 minutes after reconfirming a target at the expense of sleep, the observation becomes my own. It is subject to all of the challenges of observing 5-8 hour windows of time and maintaining focus and accurate dark frames, often accounting for the temperature drops at the start, and again in the morning.

The next morning, I upload my .FITS data from the scope to researchers and see who else from the active pool of about 163 citizen scientist observers across 21 countries stayed up all night to capture the data.

Observations with such a small scope, taking 4 second exposures, are unique and leverage stacks of these exposures in groupings of about 2-3 minutes to create one data point on a graph which is a weighted average. This is then plotted against the expected model, as shown in the observation of XO-7b from September 8 (763.5 light years away) from the backyard in Cudahy.

Participation with other citizen scientists from across the globe is especially interesting. The support and encouragement from American, Japanese or French observers in our Unistellar Slack channel while we note progress on a target they may have recently observed is motivating, especially months later when we see our names on a combined observation.

Learning how the data processing is done is an interest of mine, which I've discussed with other MAS members before, and at the start of 2022 I joined another eVscope user I knew online, to try to understand the American Association of Variable Star Observers (AAVSO) tool, AstroImageJ. Ultimately, the tool was too technical for me, but I recall going into my first online class, seeing the Zoom backgrounds of the attendees with their giant domed observatories, and hearing crickets in the room after relaying a description of the size of the telescope I was using to capture exoplanet transit data! In time, our instructor Dennis Conti, who wrote a book on Variable Star Observing, got to know the data produced and how we average our data, and we learned quite a bit on the processing flow from each other. Months later, NASA announced the Unistellar Exoplanet Transit research program would receive grant funding to continue studying Transiting Exoplanet Survey Satellite (TESS) data, and I was enthused to see our research

method supported by scientists.

Photemetric exoplanet data from the eVscopes with high signal to noise detections, constraints on mid-transit times, part of a jointly created light curve, or with a statistically significant non-detection are published by uploading them to the AAVSO Exoplanet Database with the AAVSO Observer Code "UNIS". Currently there are 73 transit datasets uploaded to this database from eVscopes.

Although I don't need to process data for my eVscope, I like to mimic the methodologies of those handling my data, and I look forward to an easier method of processing data, such as using the HOPS tool, to also gather data on exoplanet transits with some of my other telescopes and cameras in 2023 and beyond and hope to join others at the MAS in doing so.

The demand for follow-up observations of transiting exoplanets is larger than ever. The NASA Exoplanet Archive reports 3,892 confirmed transiting planets and 3,937 project candidates yet to be confirmed by ground-based observations by the Transiting Exoplanet Survey Satellite (TESS) mission. Some estimate that over 10,000 exoplanets are predicted for discovery by TESS and there are still over 3,000 candidates (NASA Exoplanet Archive) needing follow-up from Kepler and K2 (Kepler Space Telescope's "Second Light").

-Matthew Ryno

Unistellar eVscope

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Observatory Open House Signs

The new Open House signs are A frame, white boards, which can accommodate custom print inserts on the signs and are heavy enough to resist wind.

With permission by nearby homeowners, these signs are placed on (1)Calhoun & Observatory Road, (2) Racine & Observatory Road, and (3) in front of the driveway, with signage on both sides stating: Milwaukee Astronomical Society for our Open House nights.

The old green wooden observatory signs for open houses were aging and difficult to secure into the ground.





90 Years of MAS: A Historian's Perspective (Part 2)

Continuing our earlier article from last newsletter, MAS Historian and Webmaster, Gene Hanson continues to document his experiences in telling the story of the MAS.

In this 2nd half of the historian's perspective I continue to tell more stories of my digging into the club's history. Many times it feels like I'm a

detective trying to solve a murder mystery. The club was surely not trying to cover things up, but it often feels that way.

The MAS and the Milwaukee Public Museum

An important part of our public outreach is our public open house nights and it started soon after the observatory dedication. In order to help in that regard, they tried to get an unused election commission voting booth building: 14' X 20'. But they could not directly accommodate. Instead, it was transferred to the Milwaukee Public Museum who then lent it to us on a permanent basis as long as we did public outreach. The building was known as either the Clubhouse or the Monastery.

This same thing would happen in 1955. Sometimes 100 visitors would show up for an

MILWAUKEE ASTRONOMICAL SOCIETY

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open house night and that structure was woefully inadequate. We then sought to get a city owned Quonset hut (one of many) that were sitting in Bay View. Once again, the city could not give it to us, but they were willing to transfer one to the Museum who then lent it to us. The terms were the same: we could have it as long as we did public outreach. It is unknown if after 67 years it is still an asset on their books, but we can be confident that they won't ever want it back regardless.

Why was there a flag pole?

Seen in many pictures taken between 1938 and 1951 is what looks like a flag pole at the northeast

corner of the observatory property. The picture below was taken in fall of 1938:

But no flag ever flew from that pole. It was actually placed there with another to be erected at the south end and a wire was to be strung between them to be used as a shortwave radio antenna for the <u>meteor height calculation</u> <u>program.</u> At the middle of the line a wire would come down going into the A-Dome and the radio transmitter. I tried to find any information in the log books, the minutes, and

looked closely at every photo available to find any evidence that any south tower was ever erected. That south tower is seen in the photo above, lying on the ground and painted white.

For a long time I believed that it was never erected and they abandoned the antenna as a bad idea. But, finally, I found log book entries of them transmitting from the observatory and getting incredible results with signals being very clear out to Michigan and Ohio. But perhaps they only strung half the line – from that north tower directly to the A-Dome. However, within the last

months I came in possession of some material from a gentleman who was the executor of an estate who had some MAS material he claimed was from the 1930's. It turned out to be a relative of <u>Cornelius Prinslow</u> who was our first observatory director.

In the trove of material was an amazing aurora 10 picture collage taken by <u>Ed Halbach</u> in September of 1941. From the north tower you can see the line heading south and next to the A-Dome you can see the south tower. It was the first picture I encountered that showed it. But it got better. There were also some 5 large negatives and it showed that south tower being erected. These will be scanned and put on the website.



Read more about the 1938-1945 era here.

But the meteor program would not continue. That December the program was effectively shut down with the radio silence enforced for the duration of World War II. After the war ended, the meteor program was not resurrected. It is unknown when the south tower came down, and the north tower stood until 1953. Even today you can see some remnants of the north tower, but I have found nothing where the south tower probably stood.



No Newsletters from late 1938 thru 1958

One of the most amazing (and dismaying) things I discovered was our club had no newsletter for a twenty year period. I have not read anything that would definitively explain this! But I do have a theory. The early newsletters of the MAS were products of the efforts of Luverne Armfield. And after 1938 Armfield's involvement in the club started to wane because of business obligations and by 1944 he left Milwaukee for a job in Ohio.

Although there was a lack of any newsletter for a 20-year period which ended in January of 1959 when the first Double Dome was published. The second entry caught my attention:



An unusual and somewhat comical entry about the status of the B-Dome. At that point it had been 8 years since the whole observatory was done and supposedly in operation. But if the telescope was in there, it wasn't getting any real use. Here the log books gave me a lot of insight, which I'll come back to later—but first, the B-Dome "Cover -Up."

The B-Dome / B-Scope Cover-up

In 1945 member Ralph Buckstaff, who had a very nice observatory at this house in Oshkosh, announced that he would be replacing his 12.5 inch Newtonian reflector with a larger instrument and offered it to the MAS. His new scope was a 16 -inch Cassegrain and was completed in 1949 and soon after we were in possession of that 12.5, but had no observatory to house it.

To be clear I don't believe this is a real cover-up as it just might be a case of cleansing what happened. Several accounts have us starting the B-Dome construction in 1949 with everything finished with the scope in operation by the end of 1951. Yes, the observatory was started in 1949, but when it was actually completed with a working telescope is a very messy story. And, sadly, not a very complete story. Almost all of that story I had to gleam from examining the observatory log books and closely looking at the photographs. But there was also a letter in our archives from 1948 written to Buckstaff apologizing for their lack of action on his generous offer as he had actually offered the scope in 1946!

First of all there are many entries from Bill Albrecht in particular about the dome requiring work, especially the slit which was proving difficult to function adequately. The dome itself also had to be rebuilt at one point. But the most damning evidence is the absence of any log entries of the telescopes use.



Ralph Buckstaff's personal observatory in Oshkosh

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Then the scope itself had many problems. A clock drive wasn't installed until 1971 and took a few years for that to work properly. Before that the mount wasn't even properly polar aligned. Member Bill Collins (the grandfather of current member William Gottemoller) was so unhappy with the scope he recommended (and the Board agreed) that they should look to put a larger telescope in that dome. The result of that will be another long story which will end with the building of the Z-Scope and the Z -Dome. But the B-Scope remained there



B-Scope base lifted to achieve 43 degree latitude.

because in 1974 the scope was renovated with new setting circles and becoming what the telescope remains to this day.

I will need to add a lot of information to the history pages to account for all of it! In fact I need to write a whole webpage just like the one I <u>did for the A-Scope</u>.

—Gene Hanson

Have an Interest in MAS Organizational Administration?

As our organization reaches the most members it has ever had, let us know if you'd like to help play a role in helping us grow and evolve in 2023! Although we try to be out under the stars as often as possible, there's a lot of admin work to be done and we could use your help. If you have interest in promotions, program planning, public outreach, general organization administration, database work or educational programming, contact <u>Jill Roberts</u> or <u>Matthew Ryno</u> for more information.

Want to speak next year? Know of someone who'd be a great speaker? Let us know!

We're creating a Program Planning Committee, to procure a total of 13 speakers each year, supporting at least 5 open houses and 8 membership meetings annually. Our Publicity Committee is also seeking expansion, to work with our Website, Membership and Open House Committees.

	Adopter	Scope	Location
<u>1</u>	Sue Timlin/John Hammetter	18" F/4.5 Obsession	Wiesen Observatory
<u>2</u>	Steve Volp	12.5'' F/7.4 Buckstaff	B Dome
<u>3</u>	Robert Burgess	12.5'' F/9 Halbach	A Dome (Armfield)
<u>4</u>	Russ Blankenburg	9-1/4" F/10 Celestron	Albrecht Observatory
<u>5</u>	Jeff Kraehnke	14'' F/7.4 G-scope	Z Dome
<u>6</u>	Lee Keith/Tom Kraus	12'' F/10 LX200 EMC	Tangney Observatory
<u>7</u>	Colin Boynton	10" F/6.3 LX200	Ray Zit Observatory
8	Tamas Kriska	Stellarvue SVQ 100 F/5.8	Jim Toeller Observatory
9	Paul Borchardt	Solar scope	SkyShed POD

Adopt a Telescope Program - Signup Sheet

Renew Your MAS Membership!

Renew your membership at www.milwaukeeeastro.org/renew! Membership for 2023 is due by December 31, 2022.

With 268 active members this year so far, we have connected with more members than ever, but need your continued support! Our Milwaukee Astronomical Society Observatory is funded entirely by you, our members, and we would love to see you around in our meetings, our email group, and at the observatory any Saturday next year. We have Stripe and Paypal digital payment options this year to easily renew, or a check may be sent by PDF renewal form in the mail to our Treasurer.

Rates remain the same as last year, at \$23/yr. student, \$46/yr individual, \$52/yr. family, \$28/yr non-resident memberships. Optional donation amounts are accepted also by form.

If you're considering giving the gift of MAS Membership to friends, neighbors and coworkers, please visit our <u>Gift Application Form</u>, which also accepts Stripe/Paypal.

At Your Service

Officers / Staff

President	Jill Roberts	262-765-7092
Vice President	Sue Timlin	414-460-4886
Treasurer	Sue Timlin	414-460-4886
Secretary	Matthew Ryno	414-248-1455
Observatory Director	Paul Borchardt	262-993-8870
Asst. Observatory Director	Russ Blankenburg	262-938-0752
Asst. Observatory Director	Lee Keith	262-875-9103
Newsletter Editor	Matthew Ryno	414-248-1455
Webmaster	Gene Hanson	262-269-9576
Membership Chair	Matthew Ryno	414-248-1455

Board of Directors

		November/December Keynolders	
Jim Bakic	414-303-7765		
Matthew Ryno	414-248-1455	11/12 Lee Keith	414-425-2331
Jill Roberts	262-765-7092	11/19 Jeff Kraehnke	414-333-4656
Sue Timlin	414-460-4886	11/26 Tamag Krights	A1A E01 2602
Jason Doyle	414-678-9110	11/26 Tamas Kriska	414-301-3023
Dennis Roscoe	608-206-0909	12/03 Matthew Ryno	414-248-1455
Lee Keith	262-875-9103	12/10 William Gottemoller	262-442-3686
Jim Schroeter	414-333-3679		
Mike Bauer	262-894-1253	12/17 Paul Borchardt	262-202-8029
Mike Wagner	262-547-3321	12/24, 12/31: Observatory	Closed
William	262-442-3686	×	/
Gottemoller			



MAS Observatory

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<u>www.milwaukeeastro.org</u>

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