Spring, 2023

2023 Spring Has Sprung, Solar Max is Here

As May flowers rise, we welcome back our members and we have already have hosted one full, successful open house and a dark sky party at the Yerkes Observatory, thanks to all of our volunteers for putting it together. We have upgraded the F-Scope mount, started on upgrading the Tangney observatory for easy astrophotography, and have added a brand new telescope, a Unistellar eVscope 2 Smart Telescope, to our observatory! There has also been a strong astronomical start to the year. We also enjoyed watching Comet c/2022 E3 ZTF do a close pass by the observatory this winter in color; caught a Kp 7 / 8 Aurora in nearby counties, and witnessed a Jupiter and Venus conjunction. Enjoy a recap of some of the key events this year in 2023 for the MAS.

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Open Houses!

May 12

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c/2022 E3 ZTF, Arun Hegde

Aurora Borealis, April 23, Chad Andrist

Quarterly Publishing

We are thankful to have a very active Google Group, where MAS activity is regularly posted and communicated, as well as a growing MAS Facebook community. Our website has been upgraded to allow us to post meeting minutes and files online as well. If you have not already updated your Google Group preferences in your membership profile, to receive at least a digest of news from the MAS, I'd encourage you to do so. The MAS Newsletter is moving to quarterly editions tied to the seasons, and the look and feel will match the new digest format, to help avoid repetition of information in multiple mediums for more efficient communication.

Upcoming Meetings

An in person **General Meeting** was held on **Monday, May 15,** at the **Quonset Meeting Hall.** The **Board Meeting** started at **7pm**. A virtual meeting was available.

The **First Wednesday** meetings continue to be held in person at the Observatory grounds at **7:00 PM**. New members are especially encouraged to attend these meetings. 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 the **second Wednesday monthly**. Mark Astrophotography in your member profile for an invite.

Treasurer's Report

$15,166.64	***Starting Balance as of 04/15/23***
	Expenditures
$22.15	PayPal / Stripe fees
$4,139.10	eV2 Telescope
$118.88	WE Energies
$973.19	Periodic Expenses
$5,253.32	TOTAL Expenditures
	Revenue
$704.00	Membership dues
$209.22	Private Donations
$12	Other Revenue / Grants
$925.22	TOTAL Revenue
$10,838.54	***Ending Balance as of 05/13/23***

	Revenue	Expenditures	Net
September	$1,363.02	$1,111.15	$251.87
October	$2,589.95	$6,936.59	-$4,346.64
November	$3,522.00	$1,201.29	$2,320.71
December	$4,552.44	$1,518.09	$3,034.35
January	$8,103.00	$6,802.68	$1,300.32
February	$1,412.85	$1,260.71	$152.14
March	$511.00	$684.10	-$173.10
April	$2,869.15	$1,920.84	$948.31
May	$925.22	$5,253.32	-$4,328.10

Membership Report

With acceptance at the May 15 meeting, the Milwaukee Astronomical Society currently has 253 active or pending memberships, after accounting for non-renewing memberships in February.

Since February, we have welcomed Christopher Bub; Vikram Khatri; Lauren Groeschel; Nancy Stanford; Janine Jome; Jacob Harris; David Tarantino; Glenn Sarlitto; Trever Johnson; Chris Kuehl; Seth Olsen; Christa Ancelet; L. Marie Blacksher; Mason Mitrovic; Vicki Jensen; Carol Lewandowski Kristin Occhetti; Serena Messer; Will Pedriana; Michael Aschenbrenner; Joy and Kevil Roll; Margaux Veilleux; Deborah Hernandez; David Gates; Althea Sixty; Cameron Kobishop; Richard Hawthorne; Evan Heyden; Nicholas La Joie; Tom Petri; Natasha Heinlein; Robert Livingston; Michel Montie; Neal Nygard; Sean J. Burke; Todd Stair; Stephan M Breutzmann; Joe Higgins; Adam Mason; Josep Alvarez.

Observatory Notes

Installing the Astrophysics Mach I mount on the F has been completed and the mount has been polar aligned using a Astrophysics RAPAS. I will want to do some drift aligning to further refine the alignment.

Lee Keith has placed Messier, Caldwell cards and Moon maps to the B, C, D & Z2 buildings for references to be used by the members. These are nice waterproof, easy to read references. He has also upgraded the A-Scope ladder, and added QR codes and labels to eyepieces. Jill Roberts has added letters to the domes.

Wi-Fi access inside the Quonset established, outdoor routing to take place in summer. Matthew Ryno has posted Wi-Fi information.

Mike Wagner replaced the Quonset Hut thermostat with a Honeywell RTH8580WF1007 thermostat.

Installation continues on the Astrophysics Mach I mount that was donated to the society in the Tangney Observatory. There are still some parts that will be needed to complete the installation of the 12" Meade LX200 OTA on the new mount, including a cradle to mount the OTA to the mount's saddle. Aiming to be ready by June.

A new focuser has been ordered for A-Scope, to utilize a Feathertouch focuser.

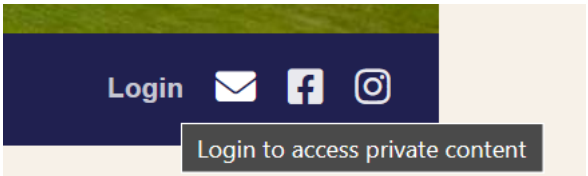
Thank you to Jeff Kraehnke for his involvement in the Member's Night Program, doing a great job of promoting and teaching the use of the Observatory to the members.

Minutes and Board Presentations

Minutes, presentations, for the following meetings were uploaded to the MAS Members documents section on the Milwaukee Astronomical Society website. Login to access, then go to members > documents.

Reminder: New Members Page Login Access

Once you have logged in to the website, click **Members** to access the members menu. From here you can scroll down the page to view the latest keyholder calendar and contact information; announcements; past *Focal Point* editions; files and much more, including the latest observatory weather and cloud predictions. Login to access the *Members* page at: https://milwaukeeastro.org/members.asp



Open House Updates

Remember to visit www.milwaukeeastro.org/openhouse for the latest Open House dates. After holding a successful open house on May 12, the MAS looks forward to a June 17 and July 15 Open House during the day from 1pm to 4pm, for solar viewing during a Solar Maximum.

Following these daytime open houses, the MAS will host evening open houses on August 18, September 22, and finally on October 20. These are packed, family-friendly events. We look forward to having all members join us in our outreach efforts this year!

May 15 General Election Results!

A May 15 Board Meeting was held at 7:08, with some members and board members electing to join via a digital meeting invite via our Google Meet account, or to attend in person. Following the board meeting, an Annual Meeting was held, with a Quorum of 20 members declared.

Congratulations to our new board member, John Koors, and our new Vice President, Lee Keith.

Board Members Dennis Roscoe, Mike Bauer, Jill Roberts are re-elected, and the board chose to appoint MAS officers: Matthew Ryno, Secretary; Sue Timlin, Treasurer; Jill Roberts, President; Lee Keith, Vice President.

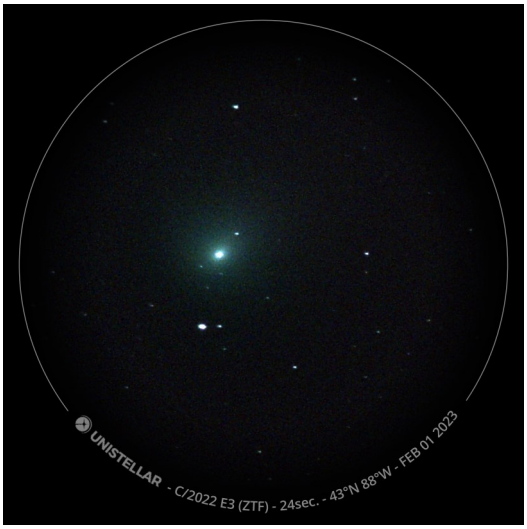
Jason Doyle completed his 2nd term as a board member, and was unable to run again this year.

The Annual Meeting came to a close at 8:40pm.

What's New at the Milwaukee Astronomical Society?

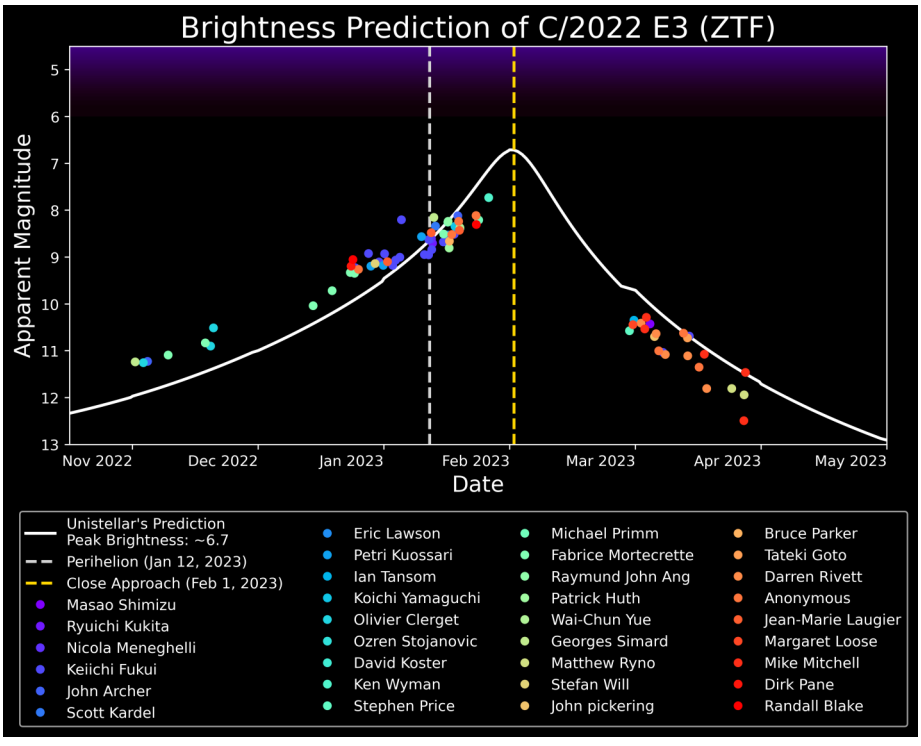
Comet Watching: c/2022 E3 (ZTF)

About 20-30 MAS members made the trek out to the observatory in frigid temperatures to have a look at comet c/2022 E3 (ZTF), making its closest pass to Earth on February 1, 2023, at a distance of about 26 million miles. Some spotted the comet outside in the snow-cleared paths, while most others came inside the Quonset with the heat on to see the comet in green color, projected on a tablet screen from Matthew Ryno's Unistellar eVscope 4.5" newtonion reflector telescope, outside on one of the cleared pads. After about 30 seconds of "live-stacking" the images projected onto the tablet screen, viewers could observe an emerald green color from the comet. A comet-filter, was applied to help accentuate the color data amidst the noise of a northeastern light dome in this image, which was seen that night.



Matthew Ryno, c/2022 e3 image on Feb 1.

Matthew had also been tracking the comet with the eVscope since October, and had been submitting brightness readings of the comet, peaking around an apparent magnitude of 7. His science data, taken at times from the MAS grounds, was added to this light plot, documenting the peak brightness and dimming of comet c/2022 E3 (ZTF), when combined with similar scopes from around the globe. This data is also in display in our new citizen science exhibit in the control room hallway—come have a look! Matthew Ryno will be hosting sessions on how to record scientific measurements with the new MAS eVscope 2, a newer version of the telescope which has been added to the observatory!



Overall brightness measurements from November 2022—April 2023, of the comet, including data from Matthew Ryno's eVscope. You too can learn how to take data readings such as this at the Milwaukee Astronomical Society!

Astrophotography of c/2022 E3 (ZTF)

MAS astrophotographers dusted off their comet processing routines, and spent many hours acquiring and processing photographs of the comet as it approached its closest point to the Earth, and also as it approached nearby celestial sights like Mars, in the night sky. Have a look at this assortment of photographs. Comet photography is challenging to keep the star field, and also capture the tail along with any color in moonlight or urban settings.

Top to bottom, left to right, Arun Hegde, 200mm 8" ONTC f/4 newtonion telescope; Chad Andrist, Spacecat 51 telescope; Ron Lundgren, Mars and Comet on Feb 11., Radian 61 telescope; Ron Lundgren, Jan 31, Radian 61 telescope; Matthew Ryno, Jan 31, Vixen AX103s telescope.

Star Party at the Yerkes Observatory

Amanda Bauer, Montgomery Foundation Deputy Director for Yerkes Observatory and Head of Science and Education, thanked Matthew Ryno and a team of MAS volunteers , including Lee Keith, William Gottemoller, John Koors, Jill Roberts, Jay Suthan and Dhruva Kalyani for presenting, setting up and helping make the first open house a success at the Yerkes Observatory in Lake Geneva.

"I want to say THANK YOU for all your effort in making Friday's Star Party a huge success! I heard amazing things from all our guests and I'm so impressed there were folks outside in that windy cold offering telescope views. I think we had the majority of our ~250 guests show up, but it was a steady flow in the building - never too crowded or too empty. "

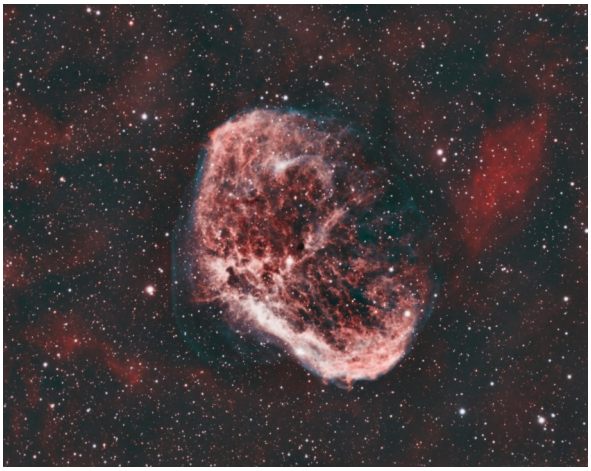
MAS volunteers coordinated well, arrived early for setup, and truly reflected the significant role of the MAS in bringing the engagement and outreach activities to Yerkes once weather became windy/cloudy, which made this event a true product of our own efforts. This combined well with other improvised indoor activities, such as the indoor planetarium on the floor next to the Giant Refractor, 3d printing, black hole, a robot, and children's room activities. It was a lot of fun as well to tour GLAS, Yerkes and meet other interesting volunteers / attendees. Catch an interview during the event here, with Space Case Sarah, a co-coordinator, NASA Solar System Ambassador and presenter at the MAS. We look forward to a promising partnership.

All event volunteers, pictured in front of GLAS, Geneva Lake Astrophysics and STEAM. More pictures here.

Good Luck Award Nominees!

Matthew Ryno and William Gottemoller submitted three nominations for the Astronomical League's Youth Awards categories, including the Horkheimer/Parker Youth Imaging Award, and the Horkheimer/Smith Youth Service Award. The Jack Horkheimer Youth Service Awards are presented to any Astronomical League member who is under the age of 19 on the date of the application.

Dhruva Kalyani was nominated for the Youth Imaging Award, for his image of the Jellyfish Nebula, taken in SHO (astrobin link), and William was also nominated for his image of the Crescent Nebula, right below (Astrobin link).

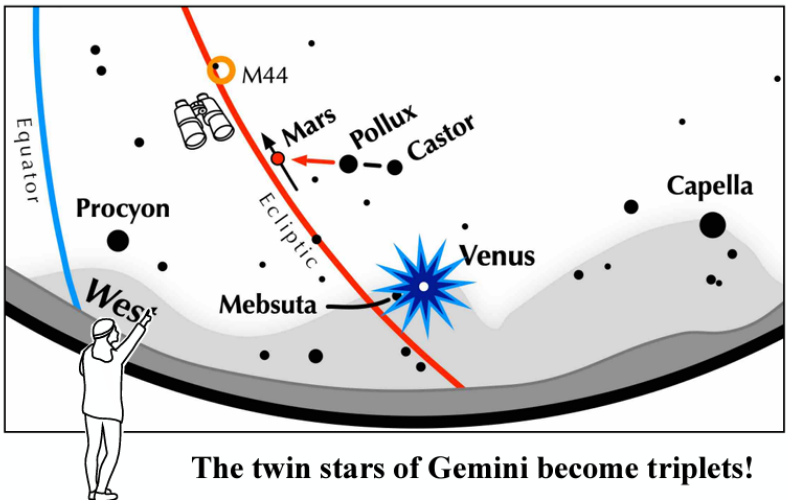


William was also nominated for the Service Award, for the second consecutive year for his mentorship on G-Scope and service for the Milwaukee Astronomical Society and surrounding organizations. He was won both service and imaging awards in 2022 with a nomination from the MAS as well.

Look West-Northwest 90min after Sunset!

Courtesy of the Astronomical League, don't forget to look to the west-northwest 90 minutes after sunset. The twin stars of Gemini, Castor and Pollux will be forming a horizontal bar. Red Mars, sporting a brightness mid way between those two stars, rises nightly, eventually sliding directly to their left. On May 16, the three luminaries form a straight line, effectively creating another member of Gemini, the Triplets! Later in May, watch mars approach M44, the Beehive cluster.

If you can see only one celestial event in the evening this May, see this one.



The twin stars of Gemini become triplets!

Venus/Jupiter Conjunction

On March 1, Venus and Jupiter reached a conjunction, where they were the closest to each other for the year in the sky. The event coincided with clear skies, which created quite a surprise for commuters driving West, to see two extremely bright objects so close to each other. MAS members were ready and waiting with all kinds of photos to document the event!

Top left to bottom, (Row 1) Matthew Ryno, Nolan Zadro, (Row 2) Pamela Strunk, Jim Bakic, Nolan Zadro, (Row 3) Paul Blomeyer, Mark Banyon, Mike DeChant.

Solar Maximum, Aurora Hunting Season Begins

The sun is estimated to reach the peak of its current activity 2024, or potentially even 1 year ahead of official predictions! After peak, it will remain in an active state for at least the next five years.

For everyday amateur astronomers, this means Aurora hunting is back in full swing, as is sunspot monitoring and solar imaging. The MAS will be hosting two back-to-back Open Houses in 2023 this year on June 17 and July 15, to take advantage of this activity. Already many members are discovering trips to Harrington Beach State Park to be successful when other members alert them of KP 7 or KP 8 class storms during clear skies.

2023-2024 has also been declared a Big Year for Heliophysics by NASA researchers collecting data, as between October 2023 and December 2024 when two solar eclipses will occur in North America near solar maximum and the Parker Solar Probe will make its closest approach to the sun.

We hope you'll join us at the MAS, and the following stories and images tell the tale of what we've experienced so far at the start of the year!

My story: The Craziest School Night of my Life

By William Gottemoller

Prior to last night, I had never seen the northern lights, but as with many of you who haven't, they were at the very top of my bucket list. I had my fair share of "near misses"--that is, the G2 or G3 geomagnetic storms where the lights are just a bit too far north. I once spent, for example, a night at Newport State Park during a G2 geomagnetic storm, and unsurprisingly, I saw nothing, only for them to be visible in the same place only a few days later.

But last night, I was not disappointed.

My story began at 11:16 P.M., March 24, approximately five minutes before I planned to go to sleep. Checking the Milwaukee Astronomical Society's "SEWI Astroimagers Group" on Slack, I saw messages from member Chad Andrist reading, "Omg pillars and dancing pulses". Immediately I found my keys, entered my car, and at 11:19 PM on a school night, I headed north alone for some clear skies and a chance to see the aurora.

I must admit that I was quite nervous while flying up I-41 to the northern unit of Kettle Moraine State Forest; the entire sky was overcast, and though I thought I saw brightness to the north, it was quickly evident that my excitement was playing tricks on me (the light domes from West Bend were culpable). I managed to make it to Kewaskum--which is 26 minutes from my house--in only 21 minutes, but I still saw nothing as, with gradually clearing skies, I exited the city and continued to head north.

It was as I was driving to my intended destination--a parking lot for the Ice Age trail that I regular during the summer--that I began to see an obvious green light to my north, a scene which truly took my breath away. I simply cannot describe the emotions I felt in that first moment with words, but they'd best be described as a mix of awe, excitement and naked fear (yes, the northern lights horrified me when I first saw them). As I regained my senses (I literally could not breathe for several seconds), I texted my mother that I could see them and immediately called my closest friend, Misha (also a high schooler), at 12:02 AM on a school night. As we talked, I began to see structure in some of the aurora, and as the clouds still dominated most of the sky, I continued north.

I eventually stopped on the side of the Kettle Moraine scenic drive just north of Long Lake so that I

could get a more unobstructed view of the northern lights. As my eyes adjusted, and while I was still on call, I began to see the "pulses"--the dashing waves of light that moved from north to south. The pulses were relatively faint and sporadic without the presence of a strong substorm. Much of the aurora action was confined solely to the northern horizon, with only a bright green glow evident (with some breaking, but no structure) above the trees. It was here that I got my first picture.

As I was parked on a busy state highway, I was compelled to find a quieter spot. I found a side road off the highway with an excellent view to the north, and turned off my car to improve my view. As I watched, a police officer drove by, later turning around after realizing that, at 12:30 AM, I was standing outside of my car. As he came up, I let him know that I was looking at the aurora and asked if he wanted to take a look, to which he turned off his patrol car's lights and took a look with me (it was his first time seeing them too). It was later revealed that he was looking for a runaway cow! I had to make a rural-urban joke, being that I am from the Milwaukee area. After a few minutes of observing, he recommenced his search for the runaway cow.

I spent a few more minutes there, but as the clouds continued to push north, I was forced to drive further north. I drove for almost thirty minutes until I was north of Plymouth, WI, and found a spot to park on the side of another state road.

Less than a minute after I turned off my car, I could see a visible change in the aurora: sections were growing significantly brighter, to the point at which the lights to the north were casting faint shadows on the ground. The green grew significantly brighter, and I could even easily see red naked eye (!!), and obvious structure began to show up to the north. Shortly after that, the pulses grew to a fever pace, and a constant (and, much like the waves in a hurricane, extremely rapid) flow of light ensued. The structured auroras became evident directly overhead as the pulses continued, and the entire sky began to appear liquid, fluid, viscous, as if the waves of nearby Lake Michigan. Even directly above, the Big Dipper was being constantly impacted with the pulses. Here, I got some of my best pictures:

Much of the attention was dedicated to the substorm at 9:30-10:00 PM, perhaps because so many more were able to see the burst (which was reported as far south as Phoenix, Arizona), yet that substorm was likely substantially weaker than the one in the early morning hours (at this point, it is 1:00 AM). The measured KP value was at 8 (the second-highest value!) at this moment, leading to a G4 geomagnetic storm warning. At one point, there were waves visible in the high south from my vantage point.

As the clouds continued to close in, I moved even further north, reaching my northernmost point northwest of St. Anna, Wisconsin, near

Marytown, which is northeast of Fond du Lac and a few miles from the shores of Lake Winnebago. I spent approximately an hour here (until 2:15 AM), gazing at the auroras and slowly freezing under the frosty weather. While trying to get a nicer image with a phone that has no night mode, I began to hear noises coming from the utility poles across the street; the grounding wires or something connected to them were vibrating in the pole due to the intense magnetism! The interactions between earth's magnetic field and the particles released in the coronal mass ejection led to intense currents in the ground, which could explain why the grounding rod was likely what was making the noise. I could hear the noise, which I found to actually somewhat follow the pulses of the aurora! (All of this I will be sending to my physics teacher, by the way).

As that hour--and thus my night ended--the aurora began to weaken and, tired and cold, I started my car and began driving south. I had almost no FM radio access for much of the trip home (I do not know if there was a warning about a radio blackout--plus radio blackouts tend to happen on the sunlit side of earth in during the warnings--but it was quite an intriguing moment). At 3:30 AM, I arrived home, crashed into my bed and got less than four hours of sleep before I woke up for school later that morning. Still mesmerized from the night before, I told everyone I saw at school about the aurora (including half the teachers in the high school, it seemed like). Few, unfortunately, saw them, but the northern lights were certainly the topic of the morning at my high school; before leaving at 10:10 AM (I only have one class every other day at my high school due to my college courses), I gave a short presentation to an Earth science class on what I saw last night, as well as described the causes of the aurora. After that presentation, I immediately drove home and went back to sleep, waking up at 2:57 PM for track practice.

So that is my story. I truly can say, without reservation, that last night was the best and most unbelievable school night of my entire life, and the second best night in general. I hope you all had a chance to see them last night as well! Seeing them is truly a once-in-a-lifetime experience.

Unexpected Aurora on March 24/25, 2023

I am a 75 year old amateur astronomer living in Plover, WI which is in the center of the state, just South of Stevens Point. I have an observatory in my backyard with a roll-off dome housing two telescopes, a 11 inch Celestron edge and a 190 mm Mak Newt from Skywatcher. Both these scopes are controlled from my basement which explains why I didn't know about the Aurora until about 10 PM.

At that time I went out to check everything because I was getting an unusually high level of background light on images I was auto Stacking in the North-West. Although the Aurora was never very bright or colored I did get some images with a Canon camera . It faded away about 10:30, but I checked periodically until about 1 when I discovered they were back again. This time, there were streaks of the Aurora almost straight up but the most visually interesting was the waves of excitation that swept across the Aurora that moved across the sky in about 2 seconds. I was glad my neighbors were asleep as I found myself clapping when a particularly dramatic wave would occur.

It was the best show I have seen since the big one that I saw when I lived in Waukesha about 18 years ago. I guess I

should mention that I was President of the Milwaukee Astronomical Society for 9 years. I am personally delighted at the progress the organization has made over the years since I moved up here, to be near my daughter.

- Scott Jamieson, Former MAS President (1998-2004)

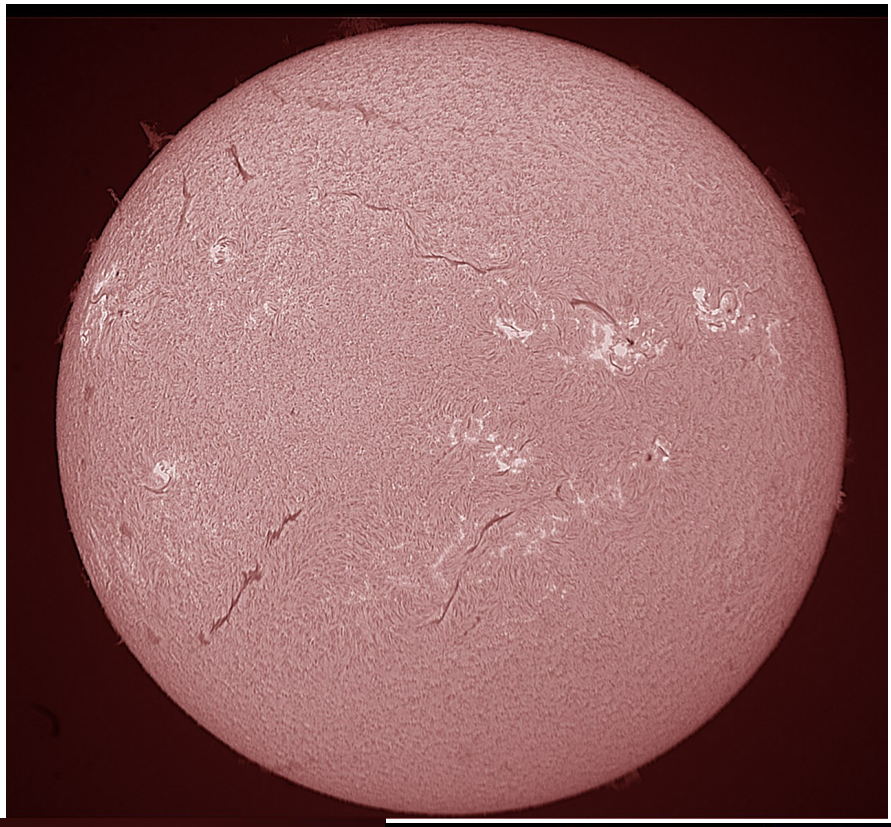
Spaceweather.com notes, "Forecasters did not see this one coming. On March 23-24, auroras spread into the United States as far south as New Mexico (+32.8N) during a severe (category G4) geomagnetic storm--the most intense in nearly 6 years. The cause of the storm is still unclear; it may have been the ripple effect of a near-miss CME on March 23rd. These developments may have been caused by the close passage of an unexpected CME. The storm cloud could have left the sun on March 20-21 when SOHO coronagraph data were unusually sparse. We didn't know it was coming. For aurora watchers, it was a welcome surprise."

MAS Member Chad Andrist captured the Aurora Borealis in West Bend, Wi with a Tokina 11-16mm F2.8 CF, Canon EOS 60D camera. View his timelapse here. Additional images below:

Solar Imaging, May 10, 2023

I took a quick bike ride to the Observatory on a very sunny day to get an image of what is going on with the Sun. And wow! Is the Sun really cookin'! Dark filaments, bright active regions, fine grained details, prominences at the limb (edge) of the disk and more!

I have included a diagram showing what is what on the Sun in hydrogen-alpha (red) light as well as 2 images showing the Sun. One is exposed to show surface features and the other has the limb prominences highlighted. And so you can see how big the Sun and all the features on it are, I have included two diagrams showing how large the Earth, orbit of the Moon and Jupiter are in comparison. Wow!

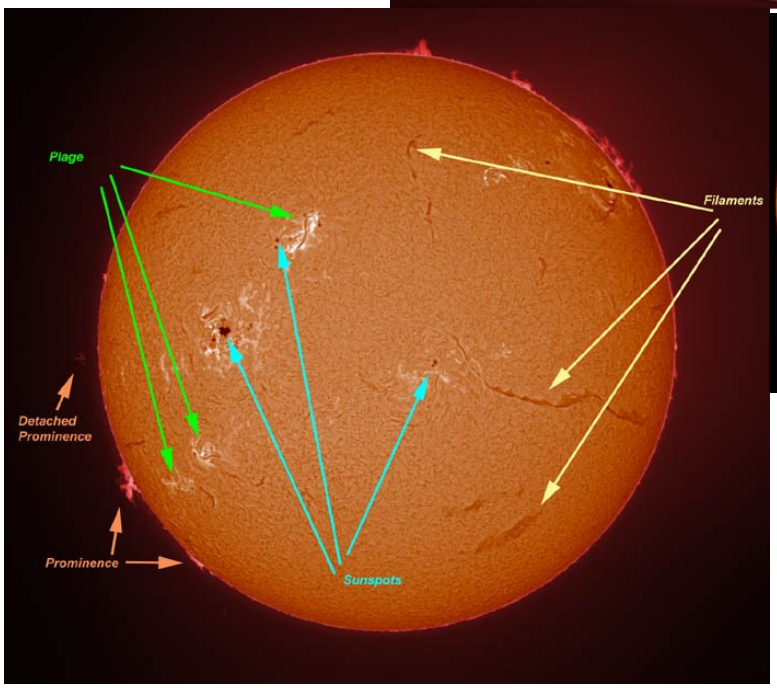


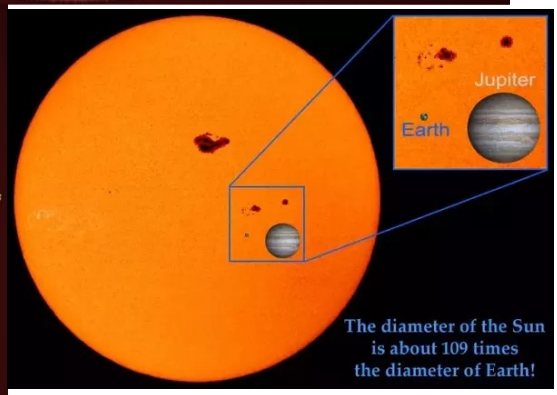
I hope to open the Solar Observatory to members on the next sunny weekend. Keep your fingers crossed, and keep an eye out for the MAS Google Group for times when the Solar Observatory may be open during the weekend.

Lee Keith,

Vice President,

Asst. Observatory Director



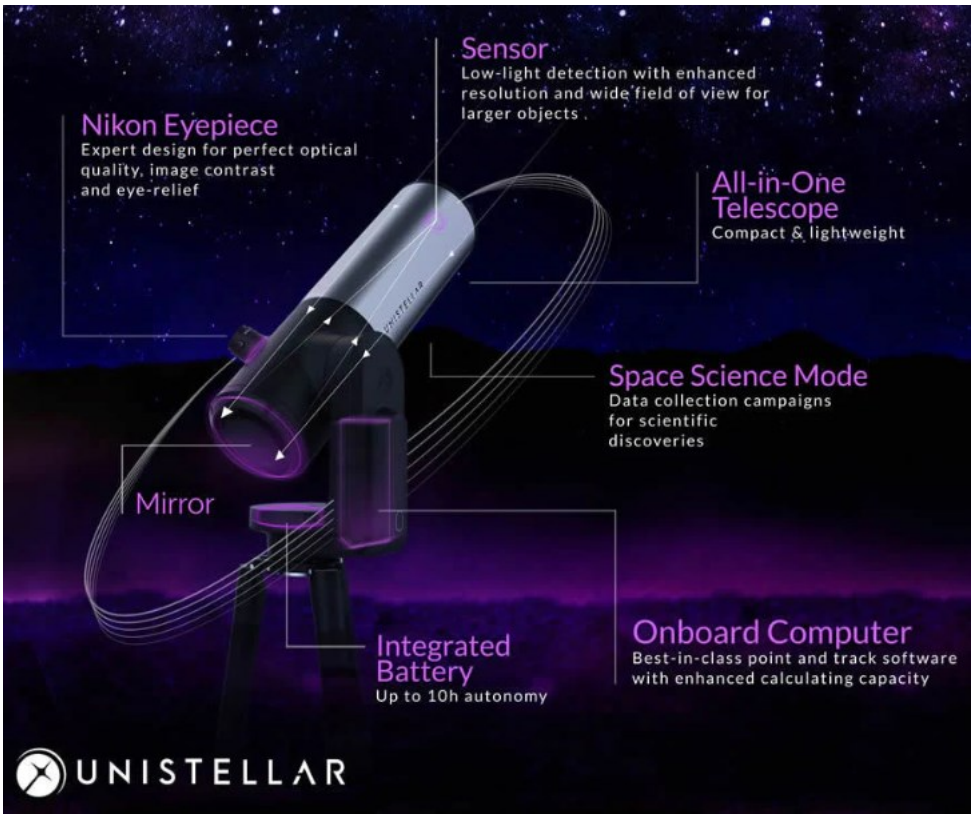


New Observatory Telescope!

Unistellar eVscope 2 Smart Telescope

Introducing the newest telescope to the Milwaukee Astronomical Society, the Unistellar eVscope 2 smart telescope—an Internet-connected robotic telescope, wirelessly controlled by phone or tablet, with an onboard computer and positioning system and camera for color deep sky images.

Matthew Ryno, board member, noted in his proposal to the Board of Directors, "I have been a proponent of this technology since its founding, and have seen many visitors to the club thrilled at the view when looking through the eVscope, which takes minutes to set up and prepare for imaging. Not only do I see this technology as eye-opening in a sky increasingly lightening with light pollution, but I also see this device as a gateway toward citizen science due to Unistellar's relationship with the SETI Institute, and their focus on employing research scientists to regularly interact with eVscope data, prepare missions for a network of global citizen scientists, and to continually present research to the international community. In contrast to other 'smart telescopes' like it, the eVscope appeals best to students, observatories and educators hoping to instill not only a wonderment of the skies in all who look through the lens, but also a curiosity for science and discovery."



Soon to follow will be training opportunities, starting first with MAS Keyholders so that we may always have the scope online during Members Nights, and increasing scope training to members interested in using the telescope at the MAS, which is incredibly easy to use as some members have already experienced. A key component of the telescope will be citizen science activities, and the MAS has begun documenting citizen science discoveries made just this year and last year with the telescope in the Control Room Hallway. We look forward to having more MAS members utilizing the telescope in the future to submit scientific data, as well as in sharing images and fun experiences with the telescope.

Thanks to interest from Dr. Franck Marchis, lead researcher at Unistellar, the MAS was able to help the observatory with this purchase. We look forward to welcoming Dr. Marchis to the MAS this fall, and more will be announced in the Focal Point and Google Group at a later date.

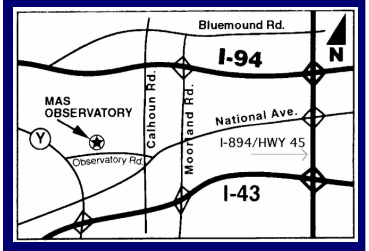
Adopt a Telescope Program - Signup Sheet

	Adopter	Scope	Location
1	Sue Timlin/John Hammetter	18" F/4.5 Obsession	Wiesen Observatory
2	Steve Volp	12.5" F/7.4 Buckstaff	B Dome
3	Robert Burgess	12.5" F/9 Halbach	A Dome (Armfield)
4	Russ Blankenburg	9-1/4" F/10 Celestron	Albrecht Observatory
5	Jeff Kraehnke	14" F/7.4 G-scope	Z Dome
6	Lee Keith/Tom Kraus	12" F/10 LX200 EMC	Tangney Observatory
7	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

At Your Service

Officers / Staff

President	Jill Roberts	262-765-7092
Vice President	Lee Keith	262-875-9103
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



MAS Observatory

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Board of Directors

Jim Bakic	414-303-7765
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Dennis Roscoe	608-206-0909
Lee Keith	262-875-9103
Jim Schroeter	414-333-3679
Mike Bauer	262-894-1253
Mike Wagner	262-547-3321
William Gottemoller	262-442-3686

2023 Keyholder Schedule

May 20: Jill Roberts 262-765-7092

May 27: Tamas Kriska 414-581-3623

June 3: Matthew Ryno 414-248-1455

June 10: Mike Bauer 262-894-1253

June 17: Russ Blankenburg 262-938-0752

June 24: Paul Borchardt 262-202-8029