Year in Review: 2025

Inside this issue:

Renew your Membership for 2026.

Click here to check if you're renewed, and then quickly pay online if not yet.

MAS Plans for Ottawa Lake Recreation Area

After a flurry of activity from our MAS Observatory Committee and our MAS Board of Directors in November to apply for grants and approve plans, Santa read our Christmas lists and dropped off an anonymous $10,000 donation, which puts us on track to break ground on our roll-off-roof observatory plans for the Ottawa Lake Recreation Area in 2026!

Pictured here, the Club 2 Model, from Backyard Observatories, is what our proposed 16'x24 roll-off roof annex will look like, with some modifications.

Read more on the background, plans and next steps in this edition on **page 14**.

Hosting the 2027 North Central Region of the Astronomical League (NCRAL) Meeting

In spring of 2027 it will be 80 years since the Milwaukee Astronomical Society founded the North Central Region of the Astronomical League (NCRAL), and we are pleased to welcome astronomers from all over the six state region of NCRAL to Southeastern Wisconsin as the MAS plans to host this annual regional meeting.

Earlier this year, our Board of Directors sent two officers, Matthew Ryno and Lee Keith to NCRAL in Minnesota to represent the MAS at this annual voting meeting. They returned, with positive feedback and interest from area societies in us hosting a future event.

Throughout 2025, our new Publicity Committee Chairman, Andrew Payant, worked with new standing publicity committee members to present a plan to host this event in 2027 on the weekend of May 15th. The Board of Directors reviewed this plan, and asked the committee to notify to NCRAL our intent to host, and to continue with planning.

Read more on **page 18**.

2025 Year in Review

By Matthew Ryno, Milwaukee Astronomical Society President

The Milwaukee Astronomical Society (MAS) has experienced a year of significant growth, critical infrastructure improvements, and strong financial stability. More importantly, the MAS has grown together as a team of volunteers, united in a common purpose to bring astronomy to more people, educate others, network and collaborate on projects bigger than one particular goal or initiative.

We started off the year with a bang in 2025, hosting the largest astrophotography gallery I can read about ever being hosted in the state with 80 pictures hung, printed and displayed, and made it on the news with a promotion of the event! View the video here to jog your memory—that was not even a full year from now. And we continued to build as a team on the success, and our Board of Directors approved the idea to take our digital gallery from this astrophotography gallery back home to the MAS on display permanently in the Quonset Meeting Hall, available for a fresh batch of pictures whenever members wish to add them.

In early spring, we hosted our annual Yerkes Observatory March outreach event. We plan to do this again in this spring, so save the date for mid-March 2026.

In Spring, members showed up for a hearty cleanup and we reached out to Wolf Electric for contracted work to repair our infrastructure, and eventually a major project was approved and completed to repair wiring between buildings B and D, install GFCI protection, and trench new circuits for the "C" building and parking lot.

Later on, the D shed received new carpeting, thanks to the work of volunteers to glue new carpet down as well.

We then gained another telescope, a Meade 14" f/8 RCX400 donated by Ray Jamieson March 2025 in memory of daughter Reagan ("R" Scope), received by Michael Bauer, who helped initially set up the telescope. Then a team led by then Observatory Committee Chair Steven Smith, constructed an AstroGazer observatory tent for temporary use and evaluation for two seasons. Although we could explore this option, we have bigger plans for the Meade telescope, and the observatory tent has since been dismantled.

Following our first Yerkes Open House of the year, regular open house season began with a nice full Quonset Meeting Hall, and we hosted 5 busy open houses this year, with an additional sold out open house for the Osher Lifelong Learning Institute membership, which we will again continue in 2026. I have also added one more open house this year for the Wisconsin DNR's OutWIGo field trip program, allowing Wisconsin residents to get to know the Milwaukee Astronomical Society via a night open house and programming.

Overall, we prioritized membership engagement in multiple community events (even a Bar Mitzvah!) and in our outreach to the community. This year saw three membership picnics at the MAS. As a Board, we invested in tents and food for members to enjoy at the events, and I would say our Christmas Party was a success, despite unfortunately having snow nights before!

On that note, infrastructure improvements continued with a snowblower serviced twice and we have finally secured a plow service for the observatory in winter which should help us maintain consistent openings and avoid snow pile up and inaccessibility. I want to especially thank Russ Blankenburg and Raymond Albarelli for taking on more of the lawn mowing duties as Brian Ganiere is no longer able to be our only weekly mower or snow remover. We could still use more members for these roles of snow removal and lawn mowing—so if you want to enjoy rolling around in this Cadillac of lawn mowers, step up and become a regular mower for us, or snow clearer. But without this work, our grounds would not be in the great shape it was for over 1,500 open house visitors and members.

We have also begun to reach people in new ways, sponsoring a stardate.org astronomy education show on community radio, WMSE 91.7, as a new method to reach new audiences not only those who discover us online or frequently attend our community events. It is that kind of flexibility that I think has made us resilient as a small non-profit that has refused to succumb to the trends of declining membership in local astronomical societies.

2025 was not without its challenges as well, and leaned into using our Google Group more frequently for posted announcements, articles and shares in our Google Group, which is our default communication platform, as the publishing of the *Focal Point* Newsletter transitions to more of a journal of activity than current events. So please do make sure you can login to groups.google.com and browse messages and receive at least an abridged summary of

news, and you can always milwaukeeastro@googlegroups.com to post any questions to the MAS membership as a whole.

I am pleased to say that we now have a Programming Committee, and active plans to bring monthly speakers to our grounds and plan for NCRAL 2027 in tandem with the Publicity Committee. So while our challenges as a volunteer organization ebbs and flows, and we have been resilient in our commitment to bettering the grounds and our reach. You will read about some of our other news events for the year in this newsletter, as this intro gives you a flavor for the community that is ongoing.

Overall I would especially like to thank my four Committee Chairs for stepping into roles that can keep our organization thriving, by rallying teams of volunteers to organize, plan and bring to our MAS Board Meetings discussions that are focused / strategic and helpful to accomplishing much more. These standing committees are extensions of the everyday volunteer work MAS officers may do, which is essential to our operations—and anyone can be a part of this. You will read about two of these initiatives in the newsletter, NCRAL 2027 and our Ottawa Lake Observatory. Please come join us at standing meetings indicated in this newsletter and become a part of making the MAS what you would like to see.

And by the way, on something I have been advocating for and supporting, the MAS had yet another youth community service award winner in 2025! In fact, Jericho Kuehl spoke at the national Astronomical League Conference in 2025, and if you missed it, please go listen in to a similar talk Jericho has given to the Astronomical League via their Live programming (link is here). I have been impressed with what our members are doing, and I do hope we can award another service award to a youth member of the MAS for four years in a row — which includes some prize money! So parents and students, please read up on the youth awards offered by the Astronomical League here and get in touch with me before March: www.astroleague.org/astronomical-league-awards. As you'll see when you attend our January 19th talk later this month, featuring two of our past national youth award-winners, we are all a part of what makes the MAS great, for our generation and those to come. Congratulations as well to all of our essay contest winners as well, who got a free telescope at this year's holiday party by Lee—you'll be able to read more on this later in the newsletter!

As volunteer leaders, we can read resources such as the Twin City Amateur Astronomical Society's Guide to Recruiting and Retaining Astronomy Club membership, offered by NCRAL, to help us get a sense of trends. But honest direct feedback on how we're doing is always the best to receive ideas and input. If you would like to provide feedback on the future of the MAS in less of a meeting setting, and to our Board of Directors, then I invite you to always email me at mattryno@gmail.com with comments, questions or ideas, and we will try to spread that input to the appropriate volunteers at our group.

Have a happy new year, and let's make 2026 an incredible year ahead!

On the next page, your Observatory Director and I have compiled a few more highlights for the year. We've done a lot in a short amount of time!

Here's a scene from our Holiday Party 2025 — thank you Programming Committee for planning a good one!

Notable 2025 Observatory Enhancements

As we approach the new year, here are just a few highlights from the MAS for 2025. Brian O'Connor and Jeff Blank will be joining the ranks of the Keyholders starting in January. Mike Wagner is named Assistant Observatory Director. Other notable improvements as listed by Lee Keith and Matthew Ryno:

- Installed new underground electrical wire and electrical work to safely supply power to the C shed once again, as well as our front garage. We also added GFCI outlets elsewhere, fixed wiring between B/D sheds, garage lights / underground wire from power pole in front
- 18" Obsession in E shed recoated and installed. Board-approved second Obsession recoating.
- Meade 14" RCX400 donation (known as "R" scope for donor's daughter Reagan)
- Carpeting in D shed installed
- Donation of Dwarflab 3 smartscope by Gary Haas
- Acquisition of a ZWO SeeStar30 smartscope donation courtesy of ZWO partnership
- Junior member Rheyanna Markum has chosen an Orion 127mm Mak-Cass telescope on an equatorial mount in the MAS Telescope Giveaway to take to college with her.
- Larry Grabski has donated an 8" f/6 homemade dob with Parks optics; sold to Madison Astro. Society
- Bob Purtock has donated a Celestron 4.5" equatorial Newtonian (for giveaway to junior member) and an Orion 8" Dobsonian (Ottawa Lake Observatory?).
- Added a second intermediate loaner scope, a Celestron 114mm NexStar GT Newtonian GOTO scope, which was a donation.
- Blake Bigelow and Andrew Myagmar are the latest winners in the MAS Telescope Giveaway. Andrew picked the Meade ETX-90 equatorial GOTO Maksutov and Blake picked the Meade DS-90 EC GOTO refractor.
- Rehab on our MAS Ball Scope completed (thanks Mike and Mag1 Instruments), and trialed a $600 Pi Finder for the Ball Scope on loan for 2025 (thanks to Matt for arranging this vendor trial!)
- Brought back a 6 panel digital gallery of MAS astrophotography to share member photos.
- We increased our Canon camera offerings by seeking them on donations, as well as some more planetary camera donations to try out for projects.
- Adding sun tents to our open houses and outreach events, allowing for some coverage for volunteers and during picnics (thanks Programming Committee). We also have a table / gallery display table, partially used for Yerkes Observatory table this year.
- Added a QHY camera on loan for the scope in E for the summer, and this December I just received a one-shot color astro cam we'll try there next year (not yet installed). We also added a new laptop and tablet for control of the E scope refractor, as well as some tablet upgrades.
- Purchased a Celestron Star Sense auto-align system to trial for our Celestron GoTo mount to prioritize ease of use for the go-to system (not yet installed)
- Fixing B dome wheel rotation and movement.
- Funding for the new Ottawa Lake Observatory was received from an anonymous donor!
- Plow Service for 2025/26 season!

National 2025 Youth Service Award Winner

I'm pleased to announce that MAS member, and High School Junior, Jericho Kuehl, has been announced the winner of the Astronomical League's 2025 Horkheimer/D'Auria Youth Service Award!

Terry Mann, Vice President of the Astronomical League, noted to Jericho, "Congratulations, again, on this recognition of your outstanding service to your club and your community." ... "This was a competition involving 10 excellent nominations. This award comes with a large plaque, publication of your award in the September issue of Reflector, and a cash prize of $1,000."

This year I was pleased to nominate Jericho Kuehl, and worked with him on a number of citizen science missions over the years with our Unistellar eVscope Smart Telescopes and have been appreciative to have his enthusiasm around to promote our Unistellar eVscopes at the MAS, and assist with observatory duties above and beyond what is the norm. Jericho is a volunteer at the Horwitz-DeRemer Planetarium, writer for the Focal Point, and remains a committed citizen science researcher submitting over 100 citizen science data observations to date. Specific examples of his research include 16 hours of T CrB observations since the fall of 2023, tracking main-belt asteroids for 3D modeling endeavors, recording the telescope's video of near-earth asteroids, and more than ten fully detected exoplanet transits. Lately I find Jericho leading the charge in our global network of citizen scientists, chatting with their researchers and going after an increasing volume of targets and learning a bit more about each target each time he does.

I was happy to introduce him as the service award winner as a featured Open House speaker, and he proceeded to tell an interesting presentation on exoplanets and rich science topics. You can see some of his observations hanging up on the wall in the Imaging Control Room as well. Jericho went on to speak at the Astronomical League's 2025 convention in Bryce Canyon this year on how he uses smart telescopes for science and what has inspired him to observe, and he gave a talk virtually for the AL here at this link. We hope to hear more about the adventures in our future newsletters.

This is now the fourth year in a row the Milwaukee Astronomical Society has won one of the Astronomical League's major youth awards, since I've been nominating amazing youth members at the Milwaukee Astronomical Society! It goes to show all of our members can inspire great achievements, and members of all ages can achieve them - so if you'd like to help a youth member work toward a milestone next year, get in touch with me and let's see what we can do together.

Have a look at our recent youth winners:

2022 - William Gottemoller - Horkheimer/Smith Youth Service Award

2022 - William Gottemoller - Horkheimer/Parker Youth Imaging Award

2023 - Dhruva Kalyani - Horkheimer/Parker Youth Imaging Award

2023 - William Gottemoller - Horkheimer/D'Auria Youth Service Award

2024 - Dhruva Kalyani - Horkheimer/D'Auria Youth Service Award, Horkheimer/Parker Imaging Award

2025 - Jericho Kuehl - Horkheimer/D'Auria Youth Service Award

-Matthew Ryno, President

Telescope Giveaway Contest Winners

Our Observatory Director, Lee Keith, once again hosted an Essay Content for MAS Members aged 10-17-years-old for a chance to get a telescope. Questions were: What would you like to do in astronomy in the future? What objects do you most like to observe? What have you done in astronomy up to now?

After judges carefully weighed the entries, it was too close to tell a winner! So at our MAS Holiday Party, we announced two telescope winners:

- Blake Bigelow chose the Meade DS-90 EC GOTO refractor.
- Andrew Myagmar chose the Meade 90mm ETX equatorial GOTO telescope.

Treasurer's Reports

Please see our Google Drive for this year's Treasurer Reports shared and discussed at our monthly Board of Director's meetings **at this folder link**. Each month's report is available online.

- **See our final Fiscal Year 25/25 Final Treasurer's Report**
- As stated in our Moneyminder Software Evaluation Notes, we have adopted a new system for tracking monthly expenses and accounting.

As noted in our Treasurer's Report Highlights presented to the Board of Directors each month for the completion of FY2024 (Sept 1—Aug 31, 2025):

- Our income includes $3768 worth of non-cash donations, so all income totals include that amount.
- Our revenue exceeded budget by $4842. This includes the $3768.
- Expenses were $5482 less than budgeted.
- The budget for FY2425 was based on actuals from the prior fiscal year.
- Our cash assets increased by $8392.

Summary points from the year, as noted from our monthly reports -

Asset Growth: The organization's total funds increased to a closing balance of $125,148 in Dec 2025.

Operating Efficiency: Total expenses for the year were kept under budget, reflecting a disciplined approach to maintenance and project management.

Endowment Strength: The society's annuity/endowment fund remains healthy. The original principal remains untouched, interest from this fund provides a stable ~$5,000 annually toward general income.

Successful Public Outreach: Public engagement remains high, with donations tallied in October 2025 alone reaching $1,067 (which included $590 from a hosted tour).

Refurbishing Key Equipment: Using a generous donation from Sue Timlin, the society has moved forward with the refurbishment of the Obsession (Dobsonian) telescope. We have also refreshed our 12.5in Mag1 Instruments Ball Scope featuring a Carl Zambuto mirror.

Rising Operational Costs: Property and liability insurance for our eight buildings saw a 35% increase this year. We will need to monitor these fixed costs closely in the 2026 budget.

Project Prioritization: With he new committee system, a new, structured annual project planning process has been introduced to ensure that member and financial resources are allocated to the most critical needs before the start of the next fiscal year in September.

Expense Tracking: Moneyminder software allows us to collect digital expense reports and tracking of mileage and other expenses. We have also deployed this technology for a digital art storefront which has allowed us to collect donations for astrophotography prints.

Meeting Minutes

Members can find the full repository of 2025 documentation here: **2025 - MAS Meeting Minutes Folder**

Monthly Minutes Quick Links, documented by MAS Secretary, Brian Ganiere

January Board Minutes | February Board Minutes | March Board Minutes

April Board Minutes | May General Meeting Minutes | May Board Meeting Minutes | June Board Minutes

July Board Minutes | August Board Minutes | September Board Minutes

October Board Minutes

Membership Meeting Speakers and Recap for 2025:

January: Charles Bracken, author of the Astrophotography Planner, The Visible Universe, Deep-Sky Imaging Primer, presented virtually on what Signal to Noise ratio means for Astrophotographers, and how to take quality pictures of deep sky images. He also presented the MAS with a custom version of his Astrophotography Planner set for our observatory longitude/latitude. This guide was professionally printed by Matthew Ryno ahead of the meeting and bound in a binder next to the control computer for G Scope in the Z Dome Control Room, where it may be used by imagers.

February: Aparna Venkatesan from the University of San Francisco, who Aparna Venkatesan, astronomer at the University of San Francisco Department of Physics and Astronomy, spoke about earth-orbiting space debris and how it affects space launches and earth-orbiting satellites, and to the consequent deterioration of the night sky and to scientific observations.

March: As preparation for the Yerkes Observatory Messier Marathon Open House scheduled for 3/22/2025, Matthew Ryno described techniques and resources for taking part in Messier Marathon observing programs, such as: NCRAL online; https://ncral.wordpress.com/observing/ and Larry McNish's Messier Marathon Planner; https://calgary.rasc.ca/darksky/messierplanner.htm

March: Messier Marathon at Yerkes Observatory, with Matthew Ryno speaking on the topic

April: The April 21, 2025 general membership meeting of the Milwaukee Astronomical Society was held at the University of Wisconsin - Milwaukee Manfred Olson Planetarium, 1900 E. Kenwood Blvd., Milwaukee WI. Planetarium Director Dr. Jean Creighton gave a presentation of "The Life of Stars" from 8:00 - 9:00 pm.

— Spring/Summer Open House Season —

October: No speaker, open session

November: Adam McCulloch, Education and Outreach Manager for Geneva Lake Astrophysics and STEAM attended in person at the Quonset Meeting Hall and discussed some of the programs his group is working on this year, including how the team is 3D printing asteroids for visually disabled observers and bettering the experience for observers with disabilities. Members were able to hands-on experience some of the teaching tools used for star magnitude and radio wave teaching, including some craft projects to help simulate experiences without vision in the field of astronomy.

December: Holiday Break

Membership Report

We finished the membership count entering the 2025 season with our second overall count of memberships at the start of the year, but face a membership renewal challenge still, with just about 50% still due to renew. This is a rising trend as we have been picking up new memberships at a larger pace since promotions picked up following 2020/21 years, but we have also been dropping a larger percentage. The MAS has been focusing in on programming, committee work and observatory improvements in recent years as well to counteract this drift. We do not yet have auto renewal systems.

Renewals help us keep up our all volunteer programming and observing running smoothly as our main source of community financial support, even if you have not been out to the MAS in some time.

To check if you need to renew, please go to **www.milwaukeeastro.org/renew** and the website will guide you through renewing if necessary after entering your email.

Note that the above chart compares March end-of-year to January end-of-year numbers. We are still accepting renewals through the months of January and February, so let's aim to make history still and surpass 2025's starting count by March!

Total Active Memberships in 2025, as of Jan. 2: 191

Family Memberships: 227 (57.76%)

Non-Family Members: 166 (42.24%)

Total Memberships Needing to Renew for 2026: 192 (48.85%)

If you are paying by check annually, please note the new address for our treasurer John Koors and mail to **5022 Citation Dr., Racine, WI 53402**.

Membership Talk this January 19

Board Meeting and Presentation
Early Career Astronomers by William Gottemoller and Dhruva Kalyani
Wondering what a couple of our award-winning MAS Members have been up to since heading off to their undergraduate adventures? Come listen to the latest research and work in astronomy in this co-presentation after our board meeting at 8pm in the Quonset Meeting Hall and virtually by Google Meet.

William will cover gravitational wave research and Dhruva will talk about the radio telescope work he has been doing as an intern at the Green Bank Observatory, among many other interesting topics.

Monday January 19 at the Quonset Meeting Hall:
- Board Meeting Monday at 7:00 – 8:00pm
- Talk at 8:00pm – 9:00pm

Google Meet Video call link: **meet.google.com/dnu-yaqa-bke**

William will also be hosting an Astronomical League Live talk virtually on Friday, January 23rd, at 6pm CT, now our third presenter from the MAS within the last year.
William's AL Live talk will be on "New Challenges to our Model of the Universe." The join link is:

Monthly Standing MAS Meetings

We meet more than just every Saturday Night! Please save these monthly meeting reminders/links:

First Wednesday Ask Anything: 6:00pm — Quonset Meeting Hall, great for all kinds of members!

First Thursday Publicity Committee: 6:30pm — meet.google.com/oxp-qqua-qko

Second Tuesday Programming Committee: 7:00pm — meet.google.com/gfq-rjcn-cbd

Third Monday Board / Membership Meeting: 7pm—9pm Quonset Meeting Hall and Virtually by Google Meeting link at **meet.google.com/dnu-yaqa-bke**. Talks announced in advance!

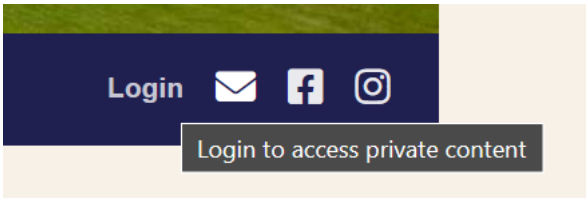
Third Wednesday Observatory Committee: **7:00pm — Quonset Meeting Hall** and Virtually by Google Meeting link at meet.google.com/ffs-bgca-sxd

Last Thursday Membership Committee: 7:00pm — meet.google.com/qin-gwyj-uxe

Our Second Wednesday **Imagers Group Meeting** is an open meeting, not currently hosted. If you wish to discuss a topic then, please reach to our Google Group out prior to the Second Wednesday of each month with a topic and join a recurring meeting at 7:00pm at meet.google.com/mvr-jgwz-fft

Reminder: 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/



MAS Officers and Board Member Updates

Our annual meeting of the Milwaukee Astronomical Society was held in May, and the Milwaukee Astronomical Society Board of Directors voted to elect the following directors. The next month, Tim Mills was also invited and selected to join the Board of Directors in his first term:

- Jeff Blank (1st Term)
- William Gottemoller (2nd Term)
- Glenn Sarlitto (1st Term)
- Patrick White (1st Term)
- Tim Mills (1st Term)

2025/26 MAS Officers:

- **President**: Matthew Ryno
- **Observatory Director**: Lee Keith
- **Vice President**: Jeff Blank
- **Secretary**: Brian Ganiere
- **Treasurer**: John Koors

Lee Keith became our **Observatory Director** in 2024, when he was elected for a term of three years after his election 5/20/24, so no vote was necessary in 2025.

MAS President, Matthew Ryno, has also named the following **Standing Committee Chairs:**

- **Publicity Committee Chair: Andrew Payant**
- **Program Planning Committee Chair: William Gottemoller**
- **Observatory Committee Chair: Patrick White** (*replaces Steven Smith*)
- **Membership Committee Chair: Stephanie Razack**

Additional roles remain available, including Groundskeeping, filling in for Brian Ganiere.

Matthew Ryno continues to chair our Open House Subcommittee, media liaison and social media lead, but would welcome new members interested in supporting these roles as well.

Our Webmaster is Gene Hanson, if you are interested in helping with web work.

Please remember that the new address for checks to the MAS should be sent to our Treasurer:

John Koors

5022 Citation Dr.

Racine, WI 53402

Ottawa Lake Observatory Project Updates for 2026

By Matthew Ryno, Milwaukee Astronomical Society President

Grab a pair of construction gloves this next year, and prepare to plan some more and get to enjoy being a part of making an additional roll-off roof observatory possible out at Ottawa Lake a reality, as we're going to have a fun and busy 2026 ahead of us!

A recent $10,000 anonymous donation effectively fills the gap we had encountered in our plans after losing out on our Knowles-Nelson Stewardship Friends Grant sponsorship application this December, and we will meet on this at our next Board of Directors meeting (Third Monday of January, 7pm) to discuss further. But I would anticipate us proceeding into 2026 with the equivalent key expenditure guidelines we'd set for ourselves being met.

As background, our Observatory Committee has been working on plans, specifications, materials lists, site selection, for a roll-off roof observatory at Ottawa Lake State Recreation Area this year. This is a dark sky site location we have visited for years for star parties. Over the summer the park staff, as well as the volunteer group supporting the park, Kettle Moraine Natural History Association, came together to tour the location with Observatory Committee members and think of ways to build an observatory shed at this location as an annex, or an extension of the MAS at a dark sky site, where we can homebase our visual telescopes and conduct outreach safely in a dedicated space there as well. This also provides the park with a resource and yearly astronomical viewing events and outreach opportunities they can plan on offering to visitors.

The MAS Board of Directors reviewed the committee plans to build a roll-off roof observatory this Fall and approved spending $10,000 toward the construction of the observatory, contingent on receiving a $10,000 grant we applied to – the Knowles-Nelson Stewardship Friends Grant. And as our next step in November, we applied for sponsorship (link here to our application letter). In the linked grant letter, I include links which you can browse to learn more about the observatory project, to catch yourself up to speed with any details. We also have the plans on display at the front of our Quonset Meeting Hall.

Unfortunately at our annual members Holiday Party this December, we broke the news that the MAS application we submitted for a roll-off roof observatory did not get chosen as a project to be sponsored for a Knowles-Nelson Stewardship Friends Grant application, by the KMNHA, in favor of another good choice for the park. This put a little bit of a damper on the project momentum, since the Observatory Committee, MAS officers and Board Members have all done such an amazing job on a short timeline to build specifications and plans for this observatory to get us to this point. And in our last meeting this December, we discussed new strategies for pressing on, as park staff remain on board with this project.

But then something (almost) nobody saw coming happened: Santa stopped out early and gave us the funding we were missing! It is an incredible boost to this project and thank you to the generous gift giver who supports our organization and Ottawa Lake Recreation area in building a new asset for the community.

So you may hear from Patrick, our Observatory Committee Chair; or Lee, our Observatory Director, on more details regarding this project later this year or at the start of the next one. There will be opportunities then at our next observatory committee meeting (every month) to come on out and make this a reality / enjoy a unique experience of building another observatory site this year. But that is all ahead still. For now, enjoy some peace and family time at the start of the year and as you do, maybe this background story of Christmas gift giving, persistence and volunteerism will lighten your day and get you excited on new MAS adventures ahead of us in the new year.

As the MAS looks at hosting a regional astronomical league meeting in Milwaukee in 2027, and will look forward to celebrating centennial in 2032, we're definitely growing by doing good things, col-

laborating in growing committees and engaging the public. And we're fulfilling our goals to promote the study of astronomy, foster a public interest in astronomical subjects, conduct public outreach, promote astronomical research, erect astronomical observatories, and hopefully foster that spirit of fellowship among members. So well done, as an all-volunteer group this year, to make some new and astronomical ideas possible. Some may say this extra Ottawa Lake Observatory annex expansion is an important milestone for us to keep broadening our options and outreach, similar to the milestone of when our Quonset Meeting Hall renovation helped foster open houses with lecture capability and cornerstone to our New Berlin observatory. We'll need this continued drive to keep fulfilling our goals this next year, so the best is yet to come when we keep working together actively and volunteering our many talents to achieve a greater goal.

More Updates on Ottawa Lake, by Lee Keith, Observatory Director

I would like to add some more specific information about the new Ottawa Lake Observatory (Thank you, an astronomical number of times, Secret Santa!) to the general membership, as they may be wondering what exactly we are planning and where.

The bylaws of the Society state, in part:

SECTION 2: PURPOSE – The purpose of this Society shall be to promote the study of astronomy and allied sciences and foster a public interest in astronomical subjects; give and sponsor public lectures; … [and] for the purpose of erecting one or more astronomical observatories and all necessary auxiliaries thereto; …

In keeping with this mandate from the founders, the Milwaukee Astronomical Society Board of Directors has decided to build a 16'x24' roll off roof observatory at the Ottawa Lake Recreation Area north of Eagle, WI, in the Southern Kettle Moraine just south of the MAS star party location in the boat launch parking lot. (see attached map) This building could hold up to 6(!) telescopes, including an 18'' Obsession Dobsonian, a 14'' Meade RCX400 Schmidt-Cassegrain, the 9.25'' Schmidt-Cassegrain currently in C-shed and a Celestron CGEM mount that could hold several telescopes including a 12'' Meade Schmidt-Cassegrain, a 10'' Meade Schnidt-Cassegrain and since I have the same mount, my 10'' f/4.5 Meade "Deep Sky-10" Newtonian, 60mm Coronado solar scope and 180mm Maksutov-Cassegrain planetary scope could also be mounted on it. There may even be room for an 8'' Dobsonian. Note that all these telescopes, except mine, were donations and all but the scope in C shed are not currently in use. There are even plans for a few concrete pads for member scopes outside the observatory and there would be power available from the nearby covered pavilion!

Site selection, chosen by DNR / Committee Members for view and logistics.

The reasons for constructing this remote observatory are threefold:

To have an observatory in a place darker than at the New Berlin Observatory (Yes, you will be hearing that more often in the future! Wow!) and will open us up to more public outreach. Discussions on getting a darker site have been on the

minds of the Society Board for decades, and they usually have centered on buying property and moving all the observatory equipment there. (Can you imagine doing that? Domes and all!!) We almost had a widow sell us a portion of her lot but that fell through. Nobody thought it would be possible to move all our telescopes and domes to the park, which is true. But building a modest roll off on park property with a fleet of recently donated telescopes is possible, and park officials are going to help us!!!!

To offer visitors and campers at the Ottawa Lake Rec Area programs on the night sky. As the bylaws state, public outreach & education is a major function of the Society. We plan on having a few public nights at the new facility in addition to our current open houses at the New Berlin Observatory. (See? Said it already.) This is one of the main reasons they are helping us. To add astronomical programs to their offerings. Other parks have them, and they are very popular.

To make better use of the many sophisticated telescopes the Society has acquired recently that are currently languishing. What a good problem to have! We are so lucky!

Construction will start this spring and should be complete by summer. We will be announcing construction dates and are asking for volunteers, carpenters and electricians especially, but no experience needed. Bring safety glasses and work gloves. If you have hand or power tools like chop saws, drills and such, bring them. Be a part of MAS history! Get your picture in the Focal Point newsletter and possibly, website! Our Society has more active members that it has had in years so I hope this project will be completed quickly with everyone's help! I was involved in the Society's last big project, the remodeling of the Quonset meeting hall in 2017 (isn't it beautiful?) and while it was a ton of work (mostly over winter!) it was a great team building experience for everyone involved.

I am attaching specific additional information on the precise location and proposed contents and layout of the new observatory. Note that it is in walking distance of our original star party location at the boat landing parking lot and has the additional advantages of a covered pavilion with available power so programs can be presented as well as viewing through telescopes.

We may also have concrete pads or solid places for additional member telescopes nearby. These may include the parking lot directly in front of the observatory building, as this will be blocked off to minimize headlights impinging on the observatory building and observers.

Note that the small details may change or evolve over the next couple months. If you have suggestions or comments, attend the Observatory Committee meetings either in person or virtually on the 3rd Wednesday of the month.

This is a historic time for our Society coming on the heels of our hosting of the North Central Region of the Astronomical League convention in 2027 and our upcoming centennial in 2032. Imagine that!

I know it will be a Happy New Year for our Society!

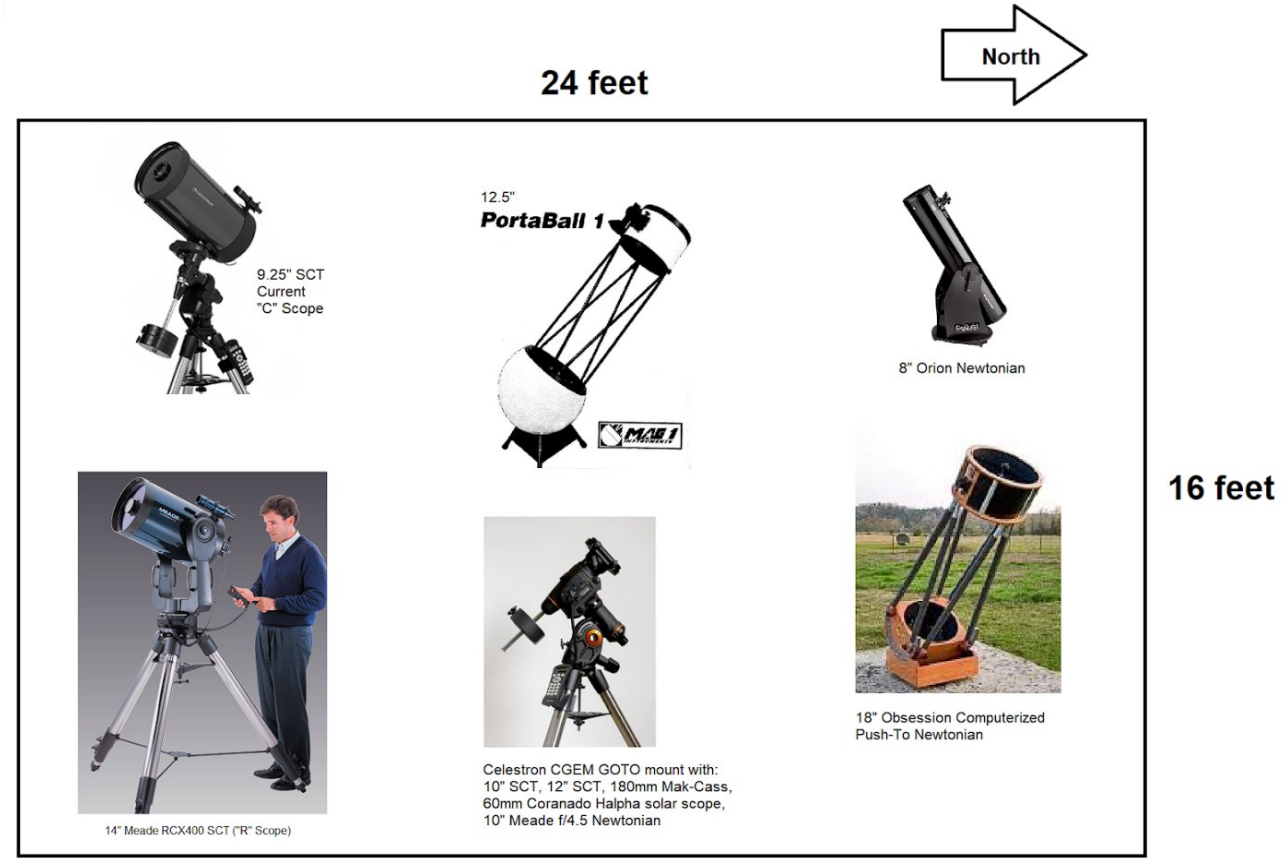
Lee Keith

Your Very Excited Observatory Director!

How Much Can You Fit in a Roll-Off-Roof Observatory?

At an observatory committee meeting, members and our observatory director plotted out the spacing of additional scopes that would be available to fit inside the observatory. Each scope does not necessarily need to be in use at all times, and the committee is planning an open floor, so tripods can remain polar aligned but not necessarily be permanently mounted pending spacing of various scopes in future years.

To start us out thinking about a shared roll off roof star party for members, this is what could all fit!



Join in on the Planning, Preparation, Building and Communication

There is a lot more to talk through, including building plans and details and it will take members with all types of skills. Our Observatory Committee Chair, Patrick White, welcomes more input and members to our monthly Observatory Committee meetings, every **third Wednesday of every month** in person at the Quonset Meeting Hall at 7pm / virtually via meeting link. There will be additional on site opportunities coming up as well, so please contact Patrick at phwhite414@gmail.com.

Getting Ready for the MKE NCRAL 2027 Conference!

By Andrew Payant, Publicity Committee Chair

The MAS board this November confirmed that we will be hosting the North Central Region of the Astronomical League's (NCRAL) annual conference for **late spring 2027**!

If you haven't attended one before, the conference is a gathering of Astronomical League members located in the Midwest, with typically a series of talks related to all things astronomy. The talks can range from professional astronomers, citizen science projects, to best techniques for getting that perfect picture. Roughly, the plan for the 2027 conference will be to have a MAS/AL Member night on Friday, a series of talks on Saturday, and a list of recommendations for the area (non-astronomical recommendations too!) for Sunday. Since this is something that we're planning, if there is something that you remember from conferences in the past that you really enjoyed, we can add it to the 2027 conference (as long as we don't need to be Mr Monopoly to pay for it)! Personally, I'm hoping for a good mix of new scientific advances in astronomy talks, as well as showcasing some of our clubs talent, I may need to get more talented so I can lead by example.

As you can imagine, planning a fun conference with many speakers takes a lot of work! Between the publicity committee and the program committee we're looking for volunteers to help! Here are just some of the tasks that we would appreciate any help in planning for the 2027 event:

- Speaker contact and selection
- Saturday Venue selection
- Website/ticketing design and management
- Contacting local SE WI astronomical (and potentially non-astronomical) groups for potential coordination of events
- Grant writing
- Merch design
- and more!

If you are interested in helping plan NCRAL 2027, please contact me at apayant@protonmail.com or William Gottemoller at wgottemoller@college.harvard.edu for helping with NCRAL speakers.
Any amount of help is appreciated!

PS. MAS was actually one of the founding member groups of the league nearly 100 years ago, so there is a deep connection between the two amateur astronomy groups!

Getting Involved:

Attend our Monthly virtual meeting, every **first Thursday of the month** via this Google Meet link: meet.google.com/oxp-qqua-qko. **Our next meeting is Thursday, February 5 at 6:30pm.**

You may review Meeting Agendas and Notes at this agenda link.

Committee members are currently scheduling hotel tours and summarizing the visits to 4 finalist hotels in the area, for committee selection on best venue. Notes are relayed via spreadsheet as we gather information.

Grants have been identified to apply for, and we could use help narrowing down and deciding on our application strategy and deadlines.

JOIN US IN CEDAR RAPIDS FOR THE EASTERN IOWA COSMIC CONFERENCE
MAY 15, 16, AND 17, 2026

The Cedar Amateur Astronomers (CAA) and the Northern Central Region of the Astronomical League (NCRAL) cordially invite you to participate in the Eastern Iowa Cosmic Conference and NCRAL 2026, which will be held in Cedar Rapids, Iowa, from May 15th to 17th, 2026.

The event will be hosted at the DoubleTree Hotel and Convention Complex in downtown Cedar Rapids, IA. The three-day conference will commence Friday evening, 5/15/2026, with a visit to CAA's observatory at the Eastern Iowa Observatory and Learning Center (EIOLC). During this visit, attendees will enjoy a catered meal, tours, trivia, games, discussions, networking opportunities, night viewing, and laser pointer events with drone photography. So, bring your laser pointer! We will also be planning a "swap meet," so be sure to bring along things you'd like to get rid of.

On Saturday, May 16, 2026, the main program will commence with the NCRAL Business Meeting. Following the meeting, presentations will be delivered by esteemed speakers, including Jasper Halekas from the University of Iowa, Allison Jaynes from the University of Iowa, Charles Kerton from Iowa State University, Charlotte Christensen from Grinnell College, Sean Walker from *Sky & Telescope*, and Ryan French from the Laboratory for Atmospheric and Space Physics (LASP) in Boulder, CO. The latter presentation will be supported by the American Astronomical Society's (AAS) Harlow Shapley Lecture Program.

We anticipate that this exceptional lineup of speakers will provide valuable insights and foster meaningful discussions among attendees. That day, we will also hold a photo contest, so be sure to bring your best work to share and possibly win a prize!

On Sunday morning, your memorable visit will conclude with a series of enriching experiences. You will have the opportunity to explore the Collins Aerospace Museum, visit the National Czech and Slovak Museum and Library to witness and listen to North America's sole astronomical clock (orloj), and choose from a variety of options, including a visit to a local National Radio Astronomy Observatory (NRAO) site or the Van Allen space laboratory at the University of Iowa Department of Physics and Astronomy.

Registration for the NCRAL 2026 event will commence in a few weeks on our official website, https://www.ncral2026.org. We will offer an early-bird registration discount to encourage early participation.

We eagerly anticipate your presence in May.

NCRAL 2026 will be in Cedar Rapids, Iowa

If you are curious about attending the next NCRAL convention, save the date for May 15 through May 17, for the Eastern Iowa Cosmic Conference at Cedar Rapids, Iowa. The host group is the Cedar Amateur Astronomers who will offer guests an open house on Friday, and Saturday speakers include talks from Collins Aerospace on "Connecting the Moon to the Earth", University of Iowa talks and more. View a preview of the event here at this YouTube link: youtube.com/watch?v=9NVo10CoDmI

MAS On WMSE 91.7 Community Radio

At our Board of Directors meeting last month we decided to pursue a pilot underwriting slot that will be running on 91.7 WMSE radio, which is a community station located on campus of the Milwaukee School of Engineering. More information about the station is available at www.WMSE.org, where you can also stream their shows as they air. View their pitch deck to us here.

Our primary goal is to provide astronomy education at a popular drive time of 8:40am daily, when we are supporting the airing of a Stardate program, a daily space education program put on by the public education and outreach arm of University of Texas at Austin McDonald Observatory. More info is found on www.stardate.org for a sample of the two minute features that play after a consistent "support for star date is brought to you by the MAS..." slot runs. The StarDate radio program airs daily on about 400 stations.

So, this is our underwriting slot for that program support (click here for an audio sample), featuring David Bowie's Starman which becomes apparent on the end. Script is: "*Support for StarDate comes from the Milwaukee Astronomical Society, a nonprofit organization dedicated to promoting the enjoyment and understanding of astronomy. Founded in 1932, the Society welcomes members of all experience levels, from beginners to advanced observers. Membership includes access to one of the largest amateur observatories in the country, use of a wide range of telescopes, mentoring opportunities, and monthly meetings featuring educational presentations. The Society also hosts public open house nights and supports citizen science projects. More information is available at milwaukeeastro.org*"

Then here is our MAS sponsorship slot (click here for an audio sample). I picked Pink Floyd's "Time" playing in the background, and we had some fun with it. This first sample will start airing at midnight on Saturday and every midnight until May 31, plus some additional November daytime slots. The script is similar as above but a different variation. Our hope is also that we attract people who have never heard about the MAS and want to join a society of like minded amateur astronomers, and we'll be tracking any referrals via updated sign up page. For what we get from the partnership, and their generous matching discount for a non-profit, we see this as a good opportunity.

So, I just want to share this as we try to pilot methods to increase education of astronomy and awareness in the community and hopefully a nice vibrant membership base. Many of our members may be familiar with this station, and with this partnership we also plan to leverage events awareness, fun DJ tie-in opportunities (weather reports, interview, on site support and some special project ideas too, so In excited to see some of these efforts launch as soon as Saturday.

If you want to get involved in planning and other ideas like this, please attend our standing committee meetings or MAS Board Meetings, open to all members, we are doing a lot of interesting projects.

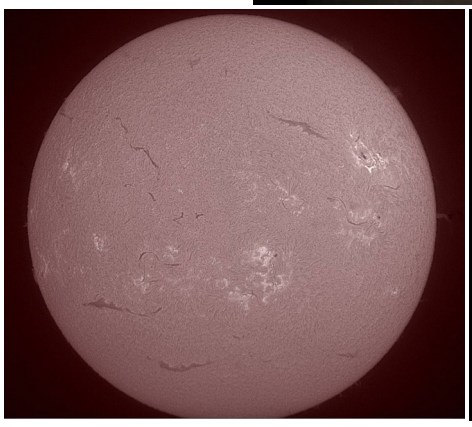
-Matthew Ryno

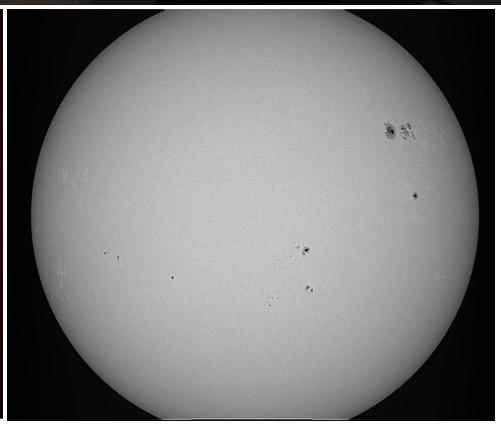
Aurora over the Milwaukee Astronomical Society

Here's a look at a KP7 November 12, 2025 Aurora seen over our own Milwaukee Astronomical Society observatory in New Berlin, taken by member Craig Endres. While not as spectacular as an earlier KP8 storm, Craig and son took advantage of a stop out to the observatory at a much more convenient time than late Tuesday, after catching a classic, Back to the Future on the big screen at the Ridge!

Our members not only photographed Aurora, but we also photographed solar activity before and after the energy from a storm reaches Earth to cause an Aurora.

Shown below in this image of the Sun taken at our solar observatory by Lee Keith on November 12, the large sunspot group from last week that sent energy toward us to trigger Auroras has now rotated across the disk from left to right side and has a circular active region around it. Take a look at the red hydrogen alpha image to see how the burning hydrogen gasses on the sun, to see more detailed activity from that same region as the large sunspot. The sun is an always exploding ball, so there's always something going on to look at.





Milwaukee Astronomical Society Open Houses

Join us for our public observing nights in 2026! This is a great way to meet community members interested in astronomy and amateur astronomy, and share the dates with curious family, friends and community members who might like it.

www.milwaukeeastro.org/openhouse

Friday, May 15 7-10:00pm – Speaker: Dennis Roscoe

Saturday, June 20 1-4:00pm – Solar Observing and Picnic Afterward

Thursday, August 27 7pm–12am Near-Total Lunar Eclipse!

Friday, Sept 18 6:30-9:30pm - International Observing the Moon Week Theme

Friday, October 2 6:30-9:30pm - Planets Observing

Friday, October 9 6:00 pm WisGo DNR Field Trip

Friday, October 23 6-9:00pm – Spooky Sky / Wisconsin Science Week

Please save the newly set Open House dates for 2026 in your calendars for assisting at our New Berlin Observatory. We also recommend blocking of time in the middle of March if you wish to participate in a Messier Marathon at Yerkes Observatory as a star party guest as well.

Our open houses take place rain or shine, and we have presentations for each event. This year, we will also have a Near-Total Lunar Eclipse open house on August 27th, as a unique offering.

We will need MAS volunteers to cover a variety of tasks, from greeting to parking, to cleaning, to showcasing objects in a telescope or helping lines from bunching up. No astronomy experience is required, and our all-volunteer team will have tasks for you to do if you arrive one hour prior to the event, or as soon as you can get there after work.

We encourage members to bring their telescopes and set them up on our pads, to share the view with visitors.

Our first speaker date of the year has been picked, Dennis Roscoe, but we will be in need of additional speakers. If you have an interest in speaking or know of someone who would, please contact William Gottemoller, our programming committee chair at wgottemoller@college.harvard.edu

We will also have additional star parties during new moon times out at Ottawa Lake Recreation Area as well in 2026 as our observatory plans develop.

More observing opportunities, updates and more will all be communicated in our Google Group.

Smart Telescope Expansion

ZWO Seestar S30 Smart Telescope

Thanks to outreach by Matthew Ryno, a partnership with an astrophotography equipment provider, ZWO, has kicked off with a donation to the MAS of a **Seestar S30 smart telescope**.

"It's incredibly encouraging to hear how actively the Seestar S30 is being used within MAS — especially that it's become a regular part of your Saturday nights and member activities." said Una Tang, a Brand Marketing Specialist for ZWO. "We're genuinely delighted that Seestar is playing a visible role in your community. Please feel free to consider the current S30 unit as a donation, so there's no need to return it to us."

ZWO has asked members share with them any photos they take with the telescope or while using it, so get in touch with me if you would like to share any thoughts on the experience or tag #zwoastrophotography when you post online. More information about the feature-packed 1.65kg Seestar S30 can be found at:

https://us.zwoastro.com/collections/seestar/products/seestar-s30-smart-telescope

Dwarflab DWARF 3 Smart Telescope

Thanks to a donation by member Gary Haas, the MAS also acquired a **Dwarflab DWARF 3 smart telescope.**

You can learn more about the DWARF 3 Smart Telescope by visiting: https://dwarflab.com/products/dwarf-3-smart-telescope

Well-known astrophotography blogger Cuiv, The Lazy Geek, has offered a review of the telescope at this link, for more information.

These telescopes join our two existing **Unistellar eVscope** and **Unistellar eVscope 2 smart reflector telescopes**, for a total of 4 smart telescopes at the MAS.

ZWO Interviews Dhruva Kalyani

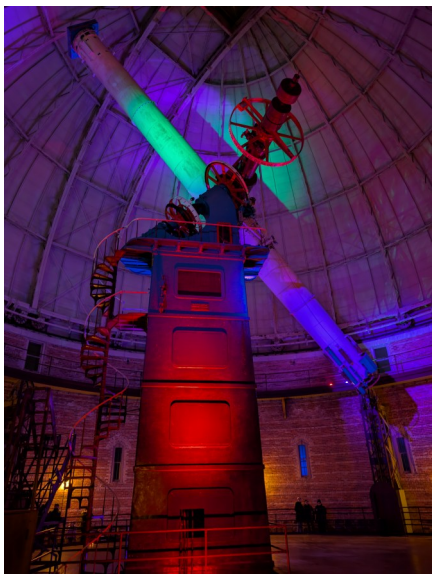
Astrophotography equipment provider ZWO conducted a video shorts interview with MAS Board of Directors Member Dhruva Kalyani, a past national youth astrophotography winner, now studying at UW Madison. Dhruva will be speaking to the MAS about his research this January after our Board Meeting as well. Check out Dhruva's interview with ZWO marketing liaison, Una Tang here: https://www.youtube.com/watch?v=qVWvXPX5sDw

Una and ZWO have expressed value in deeper engagement with the MAS and the broader Astronomical League community, and have provided the Seestar S30 smart telescope for members to use any member night. More to come, including potentially a chance to preview what's coming up with the Seestar lineup and have them as a vendor presenter at NCRAL 2027.

Yerkes Observatory Glass Tree Festival

Thank you to the volunteers who joined me at Yerkes Observatory to tend to our MAS booth in the heated holiday vendor tent this last weekend during a very cold weekend. It helped showcase a little about what amateur astronomy is all about. We welcomed 3 new memberships and raised a total of about $500 over the weekend, selling prints of various sizes and we sold out of all of our mini ornaments I made with astrophotography from various members. Prints will still be available to gift out via our web link: milwaukeeastro.org/gallery year-round.

I look forward to doing it again next year. If you enjoyed volunteering there, that is an annual event I'll need help with next year too - save the date now for early December 2026. Awareness like this takes a lot of time to build up, so if you have other ideas for fundraisers next year, please let our programming committee know during their monthly meetings. If you missed a chance to come out to Yerkes Observatory, please save the date range of mid-March for when the MAS will be hosting talks in the observatory, and a star party and messier marathon on the lawn. Often this includes a tour of the great refractor for volunteers, and we'll need speakers.



A Crafting Project...

Tying tiny red ribbons is harder than it should be… I don't often craft, but I think these are looking pretty good to offer as a holiday gift at the Yerkes Observatory holiday vendor tent for an MAS donation year after year.

These ornaments use our own member astrophotography that members have shared on our MAS showcase page and at our Schlitz gallery earlier this year. They wound up selling out, and we sold a few full size gallery prints that John Koors worked with me to provide as well.

If anyone has ideas or wants to prep for next year, please raise your hand to help us with 2026 event planning!

-Matthew Ryno

19th Annual Swap 'N' Sell

Sponsored by Sheboygan Astronomical Society
Saturday, March 28, 2026
Aviation Heritage Center
Sheboygan Airport
N6191 Resource Drive, Sheboygan Falls, WI 53085
9:00 am to 2:00 pm

Join us as we celebrate the 19th Anniversary of our annual Swap-n-sell event. Got some astronomical stuff (scopes, eyepieces, books, etc. laying around that you want to get rid of?

Here's your chance! Bring unwanted astronomy items to sell or swap with other amateur astronomers.

This is a great opportunity to meet and greet fellow amateur astronomers.

Astronomy Presentations

TBD

Door Prize

Pair of 8X42 Oberwerk Explore Binoculars.
Valued at $189.00
Donated by wiastronomy.com

Brat Fry will be held during the event.
Sponsored by Sheboygan Astronomical Society

Terms are cash, check or swap. The Sheboygan Astronomical Society is not responsible or will not be held liable for any dealings which do or do not occur.

Astronomy Travels: A Hale of a Trip

Note by Editor: Lee Keith recently took another trip with MAS Board Member Dave Leiphart to Chile in 2025, to view world-class observatories (like Gemini Observatory, Vera Rubin Observatory, ALMA, Paranal) and exceptionally clear, dark skies in the Atacama Desert and Elqui Valley. So, expect further updates as future editions of our newsletter are published. But for now, get in touch and our MAS Google Group at milwaukeeastro@googlegroups.com if you are aware of a trip, planning a trip, or would like to go with members to tour an astronomical site.

A Hale of a Trip, By Lee Keith

MAS members Matt Ryno, Scott Lancelle, my friend Tom Schultz and I all went on a "bucket list" trip through 20th century American astronomical history during the first week of November, 2024. A real geek trip for all of us!

Our trip background has a Wisconsin connection and actually starts in the late 19th century with a gentleman named George Ellery Hale. He was a sort of child prodigy who did chemical and optical experiments as a young man in his south Chicago neighborhood. His main interest, however, was the Sun and its physical properties. His well-to-do father supported his son in many ways, by buying him equipment to fill his home laboratory and eventually, a 12" refractor in their backyard, called the Kenwood Observatory, which became the first telescope associated with the fledgling University of Chicago. He could be considered the father of American solar astrophysics and was a founding member of the California Institute of Technology, or Caltech for short.

Now the story picks up. Hale was a force of nature and managed to convince Chicago businessman Charles Yerkes to bankroll the 40" (1 meter) refractor at Yerkes Observatory in Williams Bay, Wisconsin, the largest refracting telescope in the world, in 1897. This was Hale's first "largest telescope in the world" project.

In the basement below the 40-inch, the glass for a telescope of revolutionary size and design, provided by his father, lay awaiting the funds that would eventually place it in its mounting in the mountains of southern California. It would be eleven more years before the 60-inch reflector of the Mount Wilson Observatory would become reality.

While it was convenient for astronomers from the University of Chicago to take the short train ride to Yerkes Observatory with all the other tourists, southern Wisconsin was not a good place for an observatory. So, in 1904, Hale went to southern California with its better weather and established the Mt. Wilson Solar Observatory in the mountains overlooking the small town of Los Angeles. The first telescope there was the Snow Solar Telescope, brought in from Yerkes Observatory. The 60-foot tall and 150-foot tall solar telescopes followed.

While the Sun was Hale's main personal interest, he also wanted to promote American astrophysics. With funding from the Carnegie Institution, the 60" telescope was finally constructed and had first light in 1908 at Mt. Wilson Solar Observatory. This was Hale's second "largest telescope in the world" project and

A Hale of a Trip (*continued*)

the telescope we got to use on the night of November 3, 2024.

Even before the construction of the 60-inch telescope began, John D. Hooker, a prominent local businessman and friend of Hale, offered to pay for the production of the mirror for an even larger instrument, an 84-inch. Hale jumped at the opportunity, and his enthusiasm prompted Hooker to raise the ante. Hale would have his mirror, but it must be 100 inches in diameter. $45,000 was pledged for the glass disk, the building for the shop, and the equipment necessary to shape the glass into a mirror. Hale wrote to Hooker that the new telescope, with a light-gathering ability almost three times that of the 60-inch and six times that of the largest telescope currently existing, would "enormously surpass all existing instruments in the photography of stars and nebulae…"

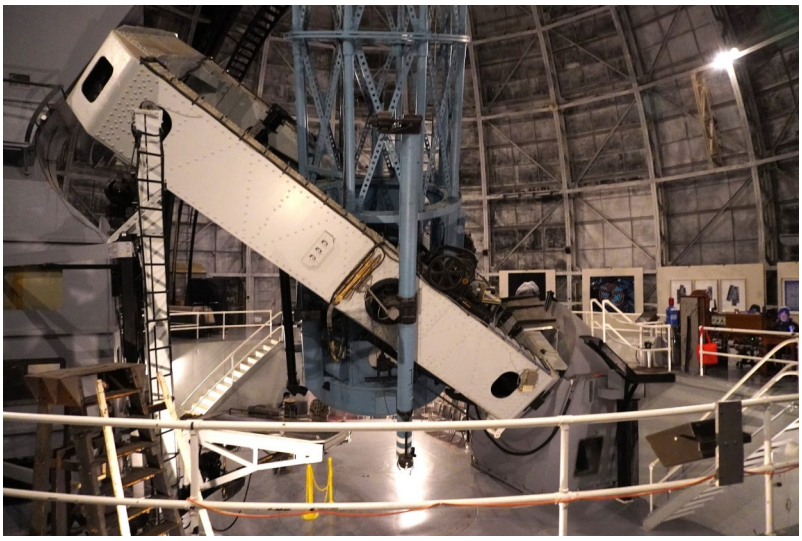
While the telescope was largely a technology demonstration of silver on glass mirrors instead of speculum metal and precision mountings with pressurized mercury bearings, it is historic because it is the instrument that Harlow Shapley in the 1910's discovered that the Sun is not the center of the universe as was believed. Yes, up until then the Sun was believed to be at the center of the Milky Way and that the Milky Way was all that there was in the universe! Not that long ago!

The 100" (2.5 meter) Hooker telescope was placed only 500 feet from the 60" on Mt. Wilson. We did get to see, but not look through, the 100" Hooker telescope. It was completed in 1917 at the renamed Mt. Wilson Observatory. This was Hale's third "largest telescope in the world" project in only 20 years!!

It is with the 100" telescope in the 1920's that Edwin Hubble and his assistant Milton Humason found that the Andromeda Nebula (what galaxies were called then) was not a part of the Milky Way, but far outside it, making it just one of many "island universes" in the sky. We now call all the "white nebulae", galaxies, acknowledging their identity as separate from the Milky Way and that our galaxy was comparable in size to others.

With the amazing success of the 100" telescope, and $6 million from the Rockefeller Foundation in 1928, Hale orchestrated the planning, design, and construction of a 200" (5.1 meters) telescope, but with the project taking 20 years he did not live to see its commissioning. The 200" Hale telescope was groundbreaking for its time, with twice the diameter of the second-largest telescope, and pioneered many new technologies in telescope mount design and in the design and fab-

200 Inch Telescope, Palomar

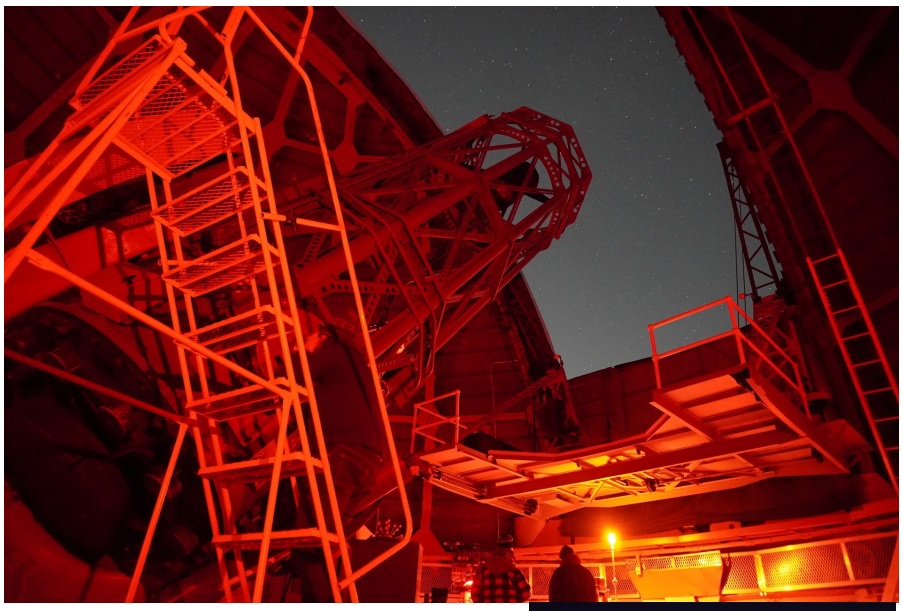


100 Inch Telescope, Mt. Wilson

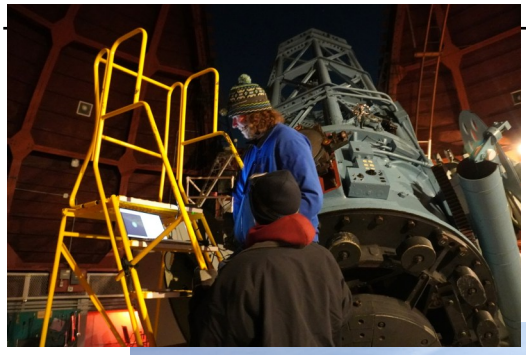
A Hale of a Trip (*continued*)

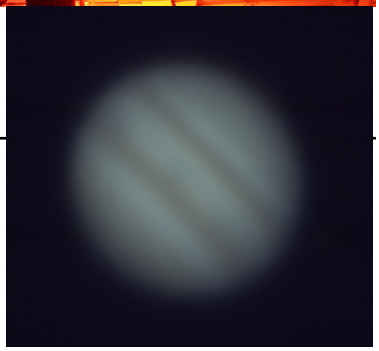
rication of its large aluminum coated "honeycomb" low thermal expansion Pyrex mirror. It was completed in 1949 and is still in active use. This was Hale's fourth and last "largest telescope in the world" project.

The Hale Telescope represented the technological limit in building large optical telescopes for over 30 years. It was the largest telescope in the world from its construction in 1949 until the Soviet BTA-6 was built in 1976, and the second largest until the construction of the Keck Observatory Keck 1 in Hawaii in 1993.



Using the 6oin telescope at Mt. Wilson





We tried! From the 6oin

While the 60" and 100" telescopes on Mt. Wilson are not used professionally due to bad light pollution from the Los Angeles metro area, it is available for the public to look through them for a half or full night. We reserved the 60" for a full night, but due to high winds and bad "fuzzy tennis ball" seeing (red flag warnings!), we stopped at midnight. Stars looked like bloated, shimmering blobs instead of sharp pinpoints and anything dim was smeared out to near invisibility. Matt & I tried taking images of Saturn & Jupiter but they were fuzzy and did not show any details besides the rings on Saturn and the equatorial belts on Jupiter. We did look at a variety of objects, but they were disappointing. I did get to move the telescope using a few buttons. We also got a tour of the machinery that moves the 60" and saw the locker that Edwin Hubble used when at the 60" dome! I did not feel it was a

Arriving at Griffith Observatory

A Hale of a Trip (*continued*)

waste of time, as it could have been cloudy!

Besides the observatories, we did a walking tour of Caltech on Sunday morning when most of the students were asleep and all but one of the buildings we tried to enter were locked. (Heh, heh) The unlocked building was the Geology Department but had some space & astronomy offices with lots of space posters on the walls.

We also went to the Griffith Observatory and Planetarium which has its own unique history and has been featured in many movies. We got a special VIP tour of the 12" refractor in one of the domes as well as a planetarium show, called "Centered in the Universe" which featured the story of the Hale telescopes I have told you above so it was relevant to our trip.

If you really love astronomy and the history of American telescopes in the 20th century, you will love this trip. I haven't mentioned the great ethnic restaurants around LA and Pasadena, where we stayed. Hope you like avocado!

Giant Eyepiece Required!

Editor's note: This recap was created prior to devastating fires that ripped through the Pasadena area. If you wish to contribute to the Pasadena Community Foundation, visit Eaton Fire Relief and Recovery Fund: https://pasadenacf.org/fund/eaton-fire/

Telescope Dreams

Editor's Note: Get in touch and our MAS Google Group at milwaukeeastro@googlegroups.com if you are aware of a trip, planning a trip, or would like to go with members to tour an astronomical site. We are publishing this as a second article recap on a 2024 trip to Mt. Wilson as a timeless feature to enjoy and inspire our readers to explore and share some of their own stories.

Telescope Dreams, By Scott Lancelle

Make no small plans, dream no small dreams. – George Hale

Forty years ago, young dreamers had to go to the library and check out a book to look at pictures of distant nebulae and galaxies. Often these images were accompanied by at least one photograph of a giant telescope used by professional astronomers. Flipping through the pages of these books, I dreamed of someday being able to look through such an instrument myself.

The 60-inch dome at Mount Wilson Observatory

I was in middle school when the Challenger disaster and the return of Halley's Comet were big news events. I started to consume books and astronomy magazines, and my father took me to the Planetarium and to the Milwaukee Astronomical Society. I distinctly remember looking at the moon through a "giant" 12.5-inch reflecting telescope . . . can you imagine?

I got my first telescope for Christmas in 1985 – a Tasco 60mm refractor that seemed large at the time. While its aperture may have been rather modest, the window it opened to my young mind was not. That little telescope along with a copy of Carl Sagan's "Cosmos" had an "astronomical" impact on me.

Today I am fortunate to be able to say that I have been able to realize some of the astronomical dreams of my youth. Thanks largely due to my involvement with the Milwaukee Astronomical Society, in the span of a few weeks I was able to look though not one but two of George Hale's magnificent telescopes – some of the very ones that I saw in those books so many years ago.

This story is about my personal experiences observing with these significant historical telescopes. It is also a cautionary – yet hopeful – tale about "aperture fever."

When MAS Observatory Director Lee Keith asked if anyone might be interested in booking time on the 60-inch telescope at the Mount Wilson Observatory, I jumped at the opportunity! I had in recent years been able to look through the 40-inch refractor at Yerkes Observatory, and the idea of looking though a substantially larger telescope was very exciting. In fact, the 60-inch at Mount Wilson is the second-largest telescope devoted to public outreach in the world.

Amateur astronomers know that "Aperture is King," and this idea is the basis for the fever it's named for. At the same time, you may also have heard that a tank of gasoline is a better investment than getting a larger telescope. I can tell you definitively that both statements can be true – I've

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had a better view of Jupiter in my 6-inch SCT than I got in the 60-inch telescope!

That last sentence deserves some explanation, and here my experiences may be illuminating. When George Hale built the 40-inch refractor at Yerkes Observatory for the University of Chicago, it was the largest telescope in the world (it still is the largest *refractor* in the world). While the Yerkes Observatory was groundbreaking for many reasons, its limitations soon became apparent. As we Wisconsin astronomers know all too well, we don't always have the best weather conditions here. Location was certainly taken into consideration when the 40-inch was sited. The observatory was built in Williams Bay rather than Chicago to be away from city lights and city pollution. While the Yerkes site is darker than Chicago, it is still subject to Midwest weather and the thick air we move around in down at around 1,000 feet elevation. Largely for these reasons Hale's next telescope – the 60-inch – was sited atop Mount Wilson in southern California.

Conditions at 5,700 feet up on Mount Wilson are considerably better than in Williams Bay. An inversion layer commonly traps warm air over the Los Angeles valley below, providing consistently steady air at the observatory. Prior to (and especially during) World War II, light pollution was also much less of a concern at Mount Wilson.

In the over 100 years since these telescopes were built, conditions have changed. Light pollution has increased significantly. Compared to the MAS observatory, Yerkes Observatory is still a reasonably dark site (I have taken SQM readings at Yerkes that are close to those obtained at Ottawa Lake). Unfortunately, Mount Wilson is now subjected to as much light pollution as the MAS observatory. Mount Wison still has the very significant advantage of altitude and frequently calm air, however.

Dusk at the Mount Wilson Observatory

So how do these facts relate to my experience using these instruments? When the group from MAS committed to the trip to Mt. Wilson, we naturally discussed an observing plan. One principle the group agreed on was that we wanted to see a combination of both familiar objects and unfamiliar objects. Observing familiar objects would provide a frame of reference. Jupiter and Saturn were natural choices. (Note: unfamiliar objects would be better described as "objects we could not hope to see without using the 60-inch.)
I have observed Jupiter and Saturn countless times in many different telescopes, including the 40-inch refractor at Yerkes and the 60-inch reflector at Mt. Wilson. To date, the best view of Jupiter I have ever seen was with my 235mm SCT from my back yard. Until recently, the best view of Saturn I had ever seen was with the same telescope in my front yard.

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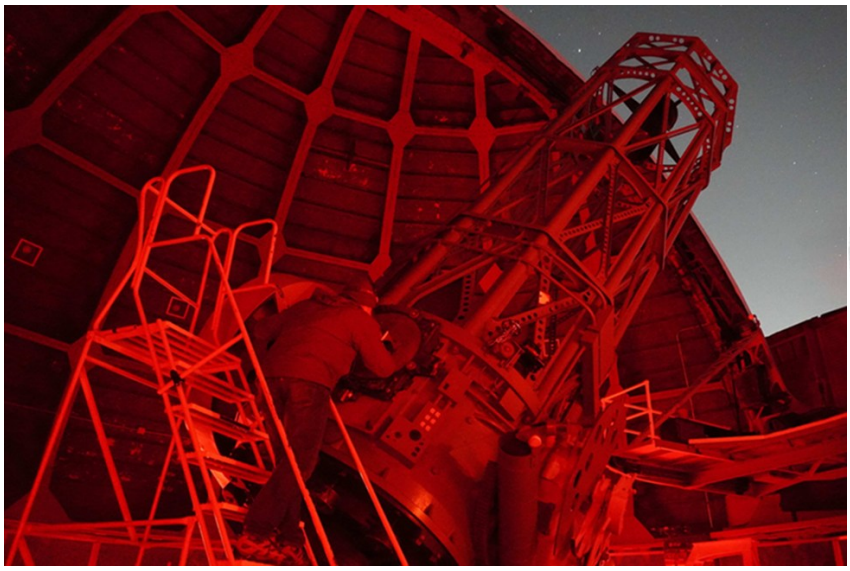
In 2023, I had the opportunity to see both Jupiter and Saturn in the 40-inch refractor at Yerkes. The planets were both very bright and the image scale was quite large compared to what I was used to, but they lacked sharpness. Only the two main (north and south equatorial) bands on Jupiter were really evident, and I could not see the Cassini Division in Saturn's rings. On the other hand, the four Galilean moons were very bright small disks, and several of Saturn's moons stood out much more distinctly than I had previously seen.

As of early of 2025, Yerkes is still using commercially available 2" eyepieces in the world's largest refracting telescope (I am told there are plans to change this). One of the eyepieces used is a Tele-Vue 55mm Plossl, which yields about 350X magnification. While this may sound great for planetary viewing, most of us amateurs have figured out through experience how much magnification we can employ with our own telescopes given the atmospheric conditions. There are accepted rules-of-thumb for magnification per inch of aperture, but others will argue that due to atmospheric effects there are practical "ceilings" regardless of aperture. (Aside – have a few hours or days to kill? Find any simultaneously contradictory answers you prefer on the internet and in lengthy discussion threads on Cloudy Nights . . .)

My best view of Jupiter to date was at 235X magnification, which in my 235mm f/10 SCT produces a 1mm exit pupil. Until recently, the best view of Saturn I had ever seen was at 336X magnification in the same telescope on an exceptionally calm night. In theory, 350X in the Yerkes telescope should be beautiful. In practice, the atmosphere above Williams Bay might not allow that on very many nights.

While my first experience seeing the planets at Yerkes may sound a little underwhelming, the views of globular cluster M2 and NGC 7009 (the "Saturn Nebula") were fantastic. In these instances the huge aperture brought out the sparkling diamonds of the globular cluster, while the planetary nebula was a very bright and intense blue. These views are still some of the best deep-sky views I have yet to see.

This experience, plus other recent opportunities to use 24-inch and 30-inch telescopes, shaped my expectations for the trip to Mt. Wilson. Our trip to Mount Wilson in November of 2024 was planned



Author's sketch of Saturn and moons as seen in the 60-inch telescope

Telescope Dreams

with hours of darkness, phase of the moon, and historical weather trends taken into consideration. A list of desired targets for both visual and imaging was drafted as befitting a full overnight session with a big scope. Reading about other's recent experiences at Mount Wilson left us with high expectations. Alas, in a story all too familiar to any eclipse chaser, aurora hunter, or meteor counter, the weather makes its own plans. While we had a window of primarily clear skies, the several days around our planned observing session were hindered by strong winds aloft and poor seeing conditions.

Of course having made no small plans, there was no way we were not going to press ahead with our observing session, even if conditions were less than ideal. It was hard to contain our enthusiasm as the huge dome creaked and groaned as it opened to the sky.
One of the first objects we viewed was familiar Saturn.

Using a huge 4-inch format 80mm eyepiece, I observed and sketched Saturn at approximately 300X magnification. The image of Saturn was fuzzy and bouncing through the turbulent air aloft, and I could discern no features on its disk. The focus was very soft, but the moons did occasionally snap into better sharpness.

Five moons were very clearly seen. A tight trio of Tethys, Rhea, and Dione really stood out. Titan was positioned below the planet and the trio of moons. It appeared noticeably larger and brighter and seemed to be resolved to a very small disk. Titan also had a distinct yellow-orange hue which further distinguished it from the other moons. A fifth moon, Iapetus, was clearly seen positioned further away from the planet.

Another example of a "familiar" object observed was M57, the ring nebula. While it appeared larger than I am used to, due to the conditions the image was very soft. Unlike an earlier observation made with a 30-inch telescope at Parmentier Observatory, I could not perceive any color. I also could still not make out the central star.

An example of an "unfamiliar" object observed was NGC 604, which is an H II nebula within the Triangulum Galaxy (M33). That makes NGC 604 an extra-galactic nebula, and this was the first time I had been able to see such an object directly with my own eye.

Due to the disappointing conditions, we made the decision to cut our observation session short

Author with the 40-inch "Great Refractor" at Yerkes Observatory

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Yerkes Observatory by Moonlight

of the full night originally planned. While the views were not nearly as good as we had imagined they would be, the experience of using the huge 60-inch telescope inside a dome set atop a mountain was a very memorable one that I would not trade. Indeed, it really was the realization of a childhood dream!

Earlier that same evening I had the chance to stand inside the dome of the 100-inch Hooker Telescope while the dome was opening and the giant telescope was slewing. A few days later I found myself looking up in awe at the 200-inch Hale Telescope at the Palomar Observatory, thus completing a tour of all of George Hale's succession of "world's largest" telescopes.

Upon returning home to Wisconsin, I spent an evening in my front yard with my 120mm refractor before making some unexpected plans. Later that night I saw that there was still an open slot on the Yerkes "Great Refractor" tour the next weekend, and on somewhat of a whim I booked it without giving it too much thought. Afterward, I recognized that the chances of the weather being favorable enough to actually use the telescope were probably not very good.

Indeed, the forecast the day before my return to Yerkes did not look promising, but as the day progressed the forecast improved and kept improving until I found myself pulling into the parking lot of the historic observatory. To my amazement and joy, the sky was clear and perfectly calm.
In stark contrast to the conditions atop Mount Wilson less than two weeks before, seeing conditions were excellent. That night, twelve of us had the chance to observe a series of objects, including familiar objects M15, NGC 7009, and Saturn among others.

In a 2-inch TeleVue 55mm Plossl providing 350X magnification, I was treated to the best view of Saturn I had ever seen. The view was very stable with just an occasional small twitch in the image, but none of the usual boiling or waves noted. Atmospheric bands on the planet's disk were clearly

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seen, with a darker brown ring in the northern hemisphere being particularly distinct. Even though the rings at this time were at a very shallow angle (only months away from being edge-on), the Cassini Division was still clearly seen. The shadow of the rings on the planet was sharp and very striking.

Though dim, Enceladus was clearly visible positioned very tight to the tip of the rings. Tethys and Rhea were also clear. Titan appeared by itself opposite the other moons and appeared distinctly larger and much brighter than the other moons. Of note was the fact that Dione was transiting Saturn during this observation. I could see neither the moon nor its shadow on the planet, casting doubt in my mind that this was even possible with the smaller instruments I have access to (at least visually).

Driving home from Yerkes that night through the wispy strata of ground fog indicative of dead calm conditions, I felt very fortunate to have had these recent experiences. My trip out to Yerkes had been impulsive and its success seemed accidental. Upon writing up the reports that I always make after observing, the intersections of aperture fever, seeing conditions, useful magnification, and other factors were on my mind. What had I learned from these recent experiences? Which mattered more – conditions or equipment? Which could I control? Was there any cure for aperture fever?

George Ellery Hale had perhaps the worst case of aperture fever in history. So severe was his affliction that he was compelled to build the world's largest telescope . . . four times in a row. To list the astronomical accomplishments made with the Yerkes 40-inch, the 60-inch, the 100-inch Hooker, and the 200-inch Hale telescopes would be to recount the history of the 20th century's advancements in astronomy. Clearly there is no denying that bigger can be better, but what does that mean for me, an amateur astronomer in the Midwest?

These experiences lead me to two somewhat contradictory conclusions. First, you should dream no small dreams. I am grateful for having been able to use telescopes like the Great Refractor at Yerkes and the 60-inch at Mount Wilson. Given the chance to use the 100-inch Hooker Telescope or other such instrument, I would take it if I were able. But I'm also not ever going to let telescope dreams keep me from actually getting out under the stars. Whenever I start to get a little aperture fever now and again, I remind myself that I still think the crescent moon looks sublime in the 102mm refractor that I have mounted on a simple camera tripod. I still think the Pleiades are stunning at 10X in a good pair of binoculars. On a clear, dark night, open clusters still amaze in a 5-inch telescope. I've looked at M13 in my 9.25-inch SCT over and over and it never grows old. One of the best views of the Orion Nebula I have ever seen was with our MAS Observatory Director's telescope under really dark skies at White Mound County Park.

We should all have our big dreams, but not at the expense of living. Your chances of getting a really great view of Jupiter is better going to the MAS Observatory every Saturday than it is using a really big telescope just once or twice, and your best bet to get a nice view of the delicate Veil Nebula is probably to meet your friends from the local astronomy club at a dark sky site away from the city.

So I'm going to have to take some exception to Mr. Hale's statement. Dream big – but start by making a small plan. Plan today to grab your binoculars, your 4-inch refractor, or your 8-inch Dobsonian and get out under the stars on the next clear and calm night. You might just get the best view you've ever seen.

Exploring the Night Sky with the Great Refractor Telescope

By Roberta and Rich Hegy

Living in East Troy and being so close to it, we had a great interest in visiting the Yerkes Observatory. We signed up on their website to receive notices of upcoming events happening there. In late summer this year, we received a notice of an event happening in November entitled "Exploring the Night Sky with the Great Refractor Telescope". It was a little pricey at $140.00 per person but considering the opportunity to a limited audience and helping to support such a great and historic place, we took the plunge.

As the date approached (November 8th), we kept our fingers crossed hoping for good weather and clear skies. Luck was with us as it wasn't too cold and the sky cooperated. There were only 12 people in the group, hosted by three young astronomers associated with the Observatory and familiar the equipment. Anyone who has visited Yerkes probably noticed numerous, strategically placed images of Albert Einstein. We were greeted by our hosts and guides at a rear entrance and waited in a lounge for all the scheduled participants before the start of the program. The program lasted approximately two hours.

Once the scheduled start time of 7PM arrived, we were led to the large dome housing the BIG 40" refractor telescope. Albert was also there to greet us. The scope is enormous. The mechanisms that drive it were interesting as they chattered and clapped into engagement when moving the telescope into position. The dome is motorized to keep the opening in line with the telescope. To allow for high declination angles of the scope, the floor encircling the scope pedestal is elevated up and down to keep observers at the correct height to use the main eyepiece and finder scopes.

Our first opportunity to look through the scope was at a portion of the Crescent Moon. The detail of the craters and the three-dimensional look was amazing. We also viewed Saturn, with its rings turning towards edge-on and soon to temporarily disappear. Neptune was a very pretty blue and the Dumbbell Nebula (M27) was another interesting observation. We were treated to other star clusters and features of the night sky. All who attended had great opportunities to gaze upon the numerous objects of the night sky.

Meeting with our hosts, other amateur astronomers, and interested people exploring the sky was an experience we will not forget. We are very fortunate to live so close to such an historical place, get the opportunity to visit it and actually view the night sky through such an amazing piece of history. WOW!

Yerkes Observatory has the "Exploring the Night Sky" tours starting in the spring through to late fall of each year, visit https://yerkesobservatory.org/

From Observatory Road to Mauna Kea

By William Gottemoller

When I joined the Milwaukee Astronomical Society (MAS) in September 2020, I arrived having spent my entire life hellbent on becoming a professional astronomer. I had no research experience, knew very little about telescopes, and had never done astronomy in an organized context before. All I knew, as a fifteen-year-old fresh off binge reading Carl Sagan during the pandemic, was that I wanted to use research in astronomy as a springboard for science communication.

Needless to say, joining the Milwaukee Astronomical Society was one of the most important decisions I ever made. Not only did I learn how to use the MAS's advanced telescopes–like our 18" Dobsonian in D-shed and our 14" Celestron EdgeHD in Z-dome–but I also learned how to use the night sky as a medium for connection. Through the MAS' many outreach programs, I learned how to public speak, make complex astronomical concepts digestible, and excite crowds of many ages, creeds and interests using the night sky. While I never learned how to do research back in high school, I developed a passion for astronomy in the most natural context: I started as an amateur, indulging in the skies above New Berlin and beyond. I was, at the time, a young Ptolemy, who, in "the serried multitude of the stars… [stood] in the presence of Zeus himself and… [filled himself] with ambrosia."

After three years picking the brains of the MAS's many expert amateur astronomers and learning how to become an expert myself, I entered Harvard to pursue my undergraduate degree in astrophysics and physics. While my lack of research experience put me at odds with my peers–many of whom, with advanced research resources in their upbringing, were able to pursue university research–I found that my experiences at the MAS trained me for research far more than I expected. When I started my first research project–on strong gravitational lensing with Kim-Vy Tran at the Center for Astrophysics | Harvard & Smithsonian (CfA)–I already possessed much of the knowledge that was central to my research: A basic understanding of cosmology, the ability to communicate my research through written and spoken word, and, crucially, expertise in observational astronomy terminology and techniques–PSFs, image scales, seeing conditions, and all the like. And, with that knowledge, I was able to fill the gaps: I learned about gravitational lensing, how to code in Python, and how to use my observational knowledge to derive physical properties of astrophysical phenomena.

As I became more experienced with my research field, my goal to use astronomy research as a springboard for science communication began to fulfill itself. Last August, I was given the immense opportunity to travel to Beijing, China, to teach some of the country's most gifted students about astronomy. I taught a class that weaved the history of discoveries in astronomy with the cultures that tried to understand it. Among many other stories, we covered the measurement of the synodic month by the Aztecs; the records of star positions by ancient Kenyans; the discovery of precession by Indonesians; and the discovery of comets through "客星" (comets, or "guest stars") in ancient China.

Left image: My classroom when I was teaching in Beijing, after a short lecture on strong gravitational lensing. Right image: Me atop Victoria Peak in Hong Kong, right after finishing my teaching program in Beijing.

From Observatory Road to Mauna Kea

My students quickly warmed to the topic, and became cultural connoisseurs of astronomers themselves. For their homework, many of them unpacked complex astronomical phenomena–the motion of comets, the Twenty-Eight Mansions, the circumference of the Earth. And for their final projects, they formed in groups and presented cultural interpretations of an astronomical concept of their interest to the class. Some chalk-talked about comets while others gave detailed presentations about the Big Dipper. Despite coming from many different backgrounds–from China's wealthiest families and largest cities to its most rural provinces–all of my students embraced the same curiosity, the same desire to learn about the universe, the same excitement about the night sky that I possessed.

Confirmed in the belief that we all share that curiosity about the night sky–and, similarly, that my research could help me with science communication–I returned to the United States with the intention to do more. A lot more. Harvard, the MAS and research have provided me with countless opportunities since: An outreach position at the CfA, running the same open houses that Carl Sagan used to run when he was a professor at Harvard; writing my first-ever first-author paper, and be a co-author in several others; giving talks and teaching classes around the United States and the world; writing for Sky & Telescope (take a look at your copy in June); and, above all, the chance to use astronomy to travel the world, as an observer, a researcher, and a science communicator.

Last November, my research group received three full nights on Keck 2, a 10-meter telescope atop Mauna Kea in Hawaii, the location of America's darkest skies. In April, I will be skipping four days of class to travel to Mauna Kea to support our research mission. I will be trained (from afar) by staff astronomers on how to operate the world's second-largest telescope, all while embracing Hawaii's beautiful scenery and night skies on grant funding. In the summer, after Hawaii and after drafting my paper, I will begin a new research project in Taiwan, at the Academia Sinica Institute of Astronomy & Astrophysics (ASIA-A). There, I will be working with Lihwai Lin on using data from the Atacama Large Millimeter Array (ALMA) to understand how galaxies evolve from star-forming to quiescent.

When I joined the MAS, little did I know that my exposure there to amateur astronomy would cascade into a life full of adventures in professional astronomy. Longtime MAS member and Observatory Director Lee Keith told me that, when his daughter asked Neil DeGrasse Tyson about recommendations for becoming an astrophysicist, Tyson responded by recommending that aspiring astronomers join their local astronomical society. After amateur astronomy at the MAS thrusted me into professional astronomy, I couldn't second that more.

The W. H. Keck Observatory in Hawaii. *Credit: IPAC/Caltech via Keck Observatory Archive*

Comet 3i/Atlas Imaging

Comet watching takes patience and a creative sleep schedule. So one night this December 21, I delayed my comet watch of 3i/Atlas until a little after 5am, which I'd planned as a great time to go check out this interstellar comet high in the sky. Sometimes I find if you don't set a plan for observing, it's easy to blow through the plan when you are still asleep!

By 5am the winds had really calmed but it was extremely cold. So before I collected some scientific data on the comet along with 3 other MAS members doing this as well, I took an image of the comet from my backyard in Cudahy. Here's a look at video taken from my imaging frames, as I tracked the comet with the Unistellar eVscope for a time period of 40 minutes, and a photo is below:

See that smudge in the center of the 2min frame here? That's comet 3i/Atlas also known as c/2025 N1 (Atlas) in some listings.

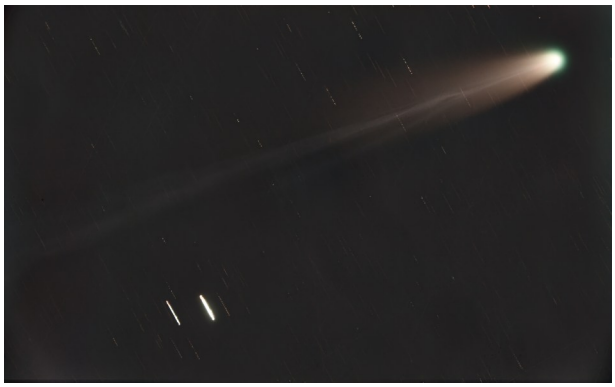
The comet nucleus is estimated to be about 3.5 miles large, but it is also about 167-170 million miles away from Earth after it's closest approach to us on December 19, and moving farther and farther away now. Currently when I took this it was in the Leo constellation and this shot was taken at about 5:20am with my own Unistellar eVscope 2 from my backyard. We have this same model telescope at the MAS, if you want to give it a try. Even if I'd used a larger telescope, it would still be somewhat of a small smudge too, it's just far away and tiny, and not as showy as some of our other comets due to its composition.

More information on this interstellar comet is available at https://science.nasa.gov/solar-system/comets/3i-atlas/3i-atlas-facts-and-faqs/

Oddly enough, aliens didn't carry me away, although my cat did think I was an insane alien for going outside out of a warm bed at 5am to capture this! I made up for it by balancing my sleep hours later in the morning then, as we all have to do for these kind of odd hours observations.

Just wanted to share our what you can expect to see if you were to use a backyard scope, especially one we have access to at the observatory.

C2025 A6 Lemmon



In comparison, back in October, Comet c/2025 A6 Lemmon had been a decent binocular target from the city - although very tough for non-binoculars users to find without a steadied telescope or binocular mount.

This is a very short stack of about 25 x 60 second exposures, aligned on the comet. When we do astrophotography for comets, we can choose to track the comet, track the star field, or do both and combine. In this case, I opted to just track the comet with my 593mm focal length telescope.

—Matthew Ryno

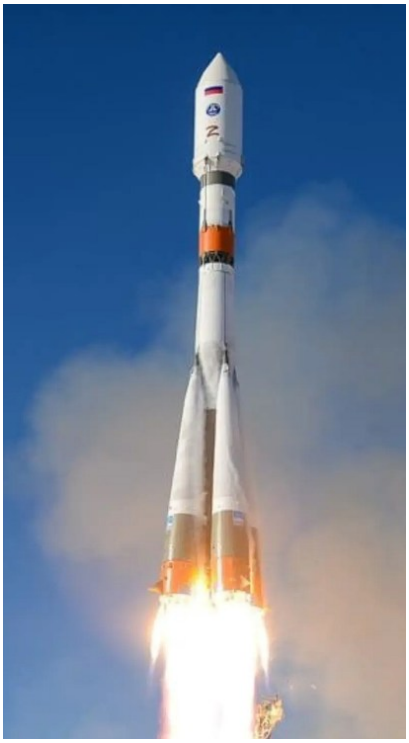
Tracking Satellites with our Telescopes

Did you know you can use either one of our two high quality Unistellar eVscopes at the MAS to track Russian Satellites?

Back in May I set up a similar model to the models we have at the club, a Unistellar eQuinox 2 smart telescope, to do some citizen science monitoring of the skies to take advantage of the clear new moon, without having to drive anywhere after a fun day in the back yard.

Have a look at the video from last night here in this video link. Stay tuned until half way in to see the satellite pass through the screen at a measured magnitude in this observation was 9.628+/-0.127!

It was pretty exciting to see the satellite go directly through the center of the observing window at the right time. I was aware of a satellite up for observation that night, Russian Satellite Cosmos 2553 (link here), (sat cat link here), which is believed to be tumbling out of control. The data gathered by observers like myself, helps scientists calculate path, trajectory and brightness. Per the article, the Cosmos 2553 satellite, launched by Russia weeks before invading Ukraine in 2022, has had various bouts of what appears to be errant spinning over the past year, according to Doppler radar data from space-tracking firm LeoLabs and optical data from Slingshot Aerospace shared with Reuters. " It is "believed to be a radar satellite for Russian intelligence as well as a radiation testing platform, the satellite last year became the center of U.S. allegations that Russia for years has been developing a nuclear weapon capable of destroying entire satellite networks, such as SpaceX's vast Starlink internet system that Ukrainian troops have been using."



Cosmos 2553 Launch from 2022

The data I gathered was also uploaded overnight to the SETI + Unistellar collaborative network, we use our telescopes to track satellites - as per their webpage: https://science.unistellar.com/satellites/ - so if you'd like to get involved, please get in touch with me and I will help you get started down this path. In the past decade, the number of active satellites in low-Earth orbit has jumped from 1,200 to 9,900. These satellites are doing everything from providing valuable insight on how our planet works to bringing the internet to the most remote regions of the world.

If you like doing citizen science, I please watch two presentations about the topic given recently to the Astronomical League Live! Series by myself and Jericho Kuehl.

- **MAS Citizen Science, then and now—by Matthew Ryno:** https://www.youtube.com/live/n-ZvBPZez7U?si=SbZf3lqt3oy5YyVo
- **Smart Telescopes in Citizen Science—by Jericho Kuehl:** https://www.youtube.com/live/3N2ZLj5qSNg?t=2634s

We are looking forward to watching William Gottemoller give a talk on the science he is doing, in his next AL Live series talk this January 23, at 6pm Central at explorescientific.com/live.

On our New Digital Photo Frames

The digital photo frame slideshow we had at the gallery has been brought back to the MAS and installed on the Quonset Wall, consisting of all member images! If you didn't get a chance to see our printed gallery of 60+ images - we now have the digital frames on a slideshow rotation.

We would like members to add photos to our showcase page whenever you share them with our group, and I'll periodically go to our showcase page to upload more photos to the frames

To upload your photos to the MAS site, for inclusion in our gallery display, just log into our site and go to: https://milwaukeeastro.org/showcase/submit.asp, then share with our group too when you take a new photo, we like to see that as well.

This gallery will turn on/off automatically every Saturday night and regular times the MAS is open during the week. Thank you to all MAS photographers, volunteers, and board members for supporting this initiative, including a thanks to the volunteers who helped set this up during cleaning day - you did a great job arranging them. A few photographs from our record gallery run at the nature center will also pop up to remind us of all the work we did.

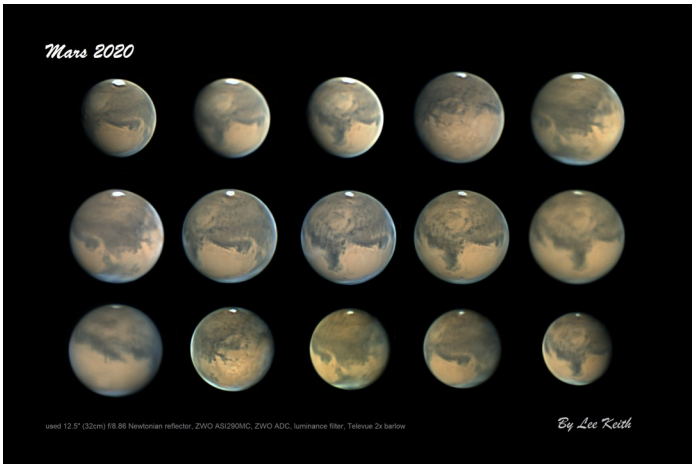
I hope you all enjoy the show and make it your own too overtime as you submit new photos to our showcase page online.

NCRAL 2025 Conference Recap and Awards

In Spring 2025, Lee Keith and I carpooled out to Minnetonka, MN, for the North Central Region of the Astronomical League regional conference, of which the Milwaukee Astronomical Society is a member. As part of the weekend events, we also visited the Minnesota Astronomical Society's beautiful campus, for a "star-b-que" and after the annual business meeting at 8am the next day, we enjoyed a day of back-to-back talks from scholars and amateurs, followed by an award ceremony and keynote.

It was good to see Ingred and Alex from the Milwaukee Astronomical Society there as well, and we got in touch with Jeff Setzer from the Northern Cross Science Foundation, and John Rummel from the Madison Astronomical Society too, and a few other Wisconsin-based clubs. John later presented a talk on if you can truly see your shadow from the Milky Way, in a scientific thesis format, which was entertaining to see - maybe we could have him give the talk to the MAS?

Your own Observatory Director, Lee Keith, entered two collage photos of Mars and Jupiter into an astrophotography contest at the meeting and won "Best of Show" at the end of the night for the image he almost didn't bring, a collage of Mars photos which was well done! The same photo took second place in the planetary category. I took some of my own photos off the gallery wall we just did, and won two second places for rich wide field imagery of the Milky Way and a wide field of the Aurora, as well as a third place in Deep Sky category for the Eastern Veil Nebula from urban Bortle 8 skies.



Last year, when NCRAL was in Green Bay, I brought my Milky Way photo from Sun Valley Idaho fresh off the presses, having only printed it one time during John Koors' workshop on printing he gave at the MAS and I won the third place. This year, with a year of lessons learned on printing and trying it myself, framing, I was able to take home a second place, so the rewards were a good litmus test of trying something new for me to clean up the photo and present it better. For Lee, he doesn't enter himself in any awards. So this is long overdue for him to steal the show, take the top honor for astrophotography and get a room full of astro enthusiasts to confirm what we already know about scientific planetary imagery he does, that it is well done. Perhaps the shocker for him though was winning for Mars and not Jupiter! Although all attendees loved seeing Jupiter too, it's a nice way to get a non-biased poll of what outsiders liked a lot or felt was most unique or most difficult.

I also brought three digital frames with us to the show, to help tell the story of our unique astrophotography gallery we put on in Wisconsin to neighboring clubs. In talking to many club leaders, they were impressed with everyone's work to put on such a unique event - so it's a credit to all of our volunteers! We hung all 7 digital photo frames up at the MAS during our May 3rd Cleaning.

NCRAL 2025 Conference Recap and Awards

We lucked out to have such a clear night on Friday, and we got to enjoy some of the best seeing conditions to look through Jupiter via one of the Minnesota Astro 6-inch APO refractors with an onboard turret of eyepieces, which we all agreed was the best view of Jupiter through the night. I also enjoyed seeing m82 through their large 22inch Obsession Dobsonion "on loan", and going through the grounds to look through all of the member telescopes that were brought out by their volunteers to talk with them about their observing interests, equipment, etc. Here's Lee right as it started to get dark, as a kid in a candy shop looking for Jupiter! https://photos.app.goo.gl/cXzhi66KxDYoTE2z8 . Then here's a look at my photo album from the visit: https://photos.app.goo.gl/eyzt9FtRQr4W1LKm7

The conference ended with the Region Award this year going to Bob King, a well known voice for Astronomy from Sky and Telescope, who has been a champion of amateur astronomy for decades. Bob King was nominated by both clubs in Minnesota that he belongs to, Arrowhead Astronomical Society and the Minnesota Astronomical Society. And for me personally, after having just received the Region Award in 2024, it was an honor as well to be listed the year prior as a winner of this very same award. Even more valuable, was being able to share stories with Bob King, Chuck Allen (AL officer), Terry Mann (AL officer), and Lee for a couple hours after the conference and soak up some of that observing experience. Individual chats with John Rummel, Alex, members from the Chippewa Valley Astronomical Society, and members in Waupun, Rochester were all very rewarding as well. Here's a look at us all:

Volunteers from the MAS also brought out two solar scopes to the conference lot during the day Saturday, just before the above picture was taken, which I very much enjoyed - the opportunity to get a look at the sun on a beautiful sunny day while we were conferencing.

I should note that I also won the grand prize at the end of the night out of luck, a Celestron 90mm Refractor on an Equatorial Mount, courtesy of NCRAL (a $300 value) so this will benefit our club and be offered as a grand prize during our holiday party at the end of the year for any of our Telescope Essay Writers. So if you see Lee's ask for essay entries (0 entries so far), don't ignore it and write in at some point this year please. Although his first deadline has passed for a spring giveaway, if you're looking for a nice new telescope, you just might qualify for a brand new one at the end of the year!

Talk highlights included talks about using the large binocular telescope, game changing developments in radio astronomy, using the ICE telescope at the South Pole, and Bob King's presentation

NCRAL 2025 Conference Recap and Awards

on developments with NEO Surveyor hunting for killer asteroids. Toward the end of Bob's talk on the NEO Surveyor, I was happy to see him mention one of the citizen science projects I was involved with - tracking the impact of NASA's DART mission, and confirmation of redirecting an asteroid. Lee Keith also noted to all about how amateurs can use DeTeCt software to capture impacts of Trojan Asteroids on Jupiter. I also personally enjoyed hearing from Greg Bragg on the state of the astronomy industry, which is only a $1 bil market globally, and very susceptible to supply chain macro issues as we heard.

The conference next year will be in Cedar Rapids, and I hope to see many members there next year!

Finally, throughout the conference, as many of our attendees may have observed, I was asked nearly a dozen times by leaders and other attendees when and if the Milwaukee Astronomical Society will host a NCRAL meeting next, and historically we were actually one of the first hosts of NCRAL and a founding member 80 years ago. My answer in Spring 2025 was, "No, not yet" until we are able to gain more active officers and board members. Now my answer in 2026 is as I publish in our Focal Point Newsletter, is yes we can, and we have Andrew Payant's leadership and the forming Publicity Committee forming to prepare us for this large event in 2027—we're ready.

One final note - this June, please consider adding $9 on to your annual MAS membership to join the Astronomical League. The have 25,000 members, and offer amazing programs such as this, and a national conference as well each year, plus a magazine and about 100 observing programs you can participate in. In touring the MAS, it was refreshing to see volunteer members going for programs like the Hershel 400, and other such observing programs, and being a member of the AL allows you to do this. John Koors will make announcements in June when it is time to join, but the renewal and registration page will be at the same location it always is for members: https://milwaukeeastro.org/membership/MAS_AL_Membership.asp

Overall it was a great weekend, and a good chance to talk and meet veterans, leaders and experts in our hobby. I look forward to attending Cedar Rapids in 2026, and then offering a wonderful experience here in Milwaukee in 2027. Let's make it so.

The MAS Joins the Alliance of Historic Observatories

What does the Griffith Observatory, Vatican Observatory, Washburn Observatory and Yerkes Observatory all have in common with the Milwaukee Astronomical Society Observatory? We are all now members of the Alliance of Historic Observatories.

After applying to join the observatory for networking support, resources and collaboration, the Milwaukee Astronomical Society was unanimously voted to become a member of the alliance this fall. Our President, Matthew Ryno, will serve as our delegate for the first year. The rich history demonstrated on our history site, confirms the impact our observatory has had: http://www.milwaukeeastro.org/history

See all members of the alliance at: https://historicobservatories.org/members.html#observatories

The Alliance of Historic Observatories (AHO) is a non-profit, geographically diverse association of historic (> 50 years old) astronomical observatories that have played pivotal roles in advancing our understanding of the cosmos, today brought together by common objectives and challenges. The purpose of the Alliance is to address the needs of its member organizations and professionals working in fields related to historic observatories such as conservation of historic instruments and buildings, history research, modern research applications for heritage equipment and public education.

New Berlin Historical Status Update

MAS Board Member Tim Mills and our MAS President, met with the New Berlin Landmarks Commission in July 2025 to explore the possibility of designating our New Berlin Observatory as a historic landmark. Potential benefits include city recognition of the intent of our New Berlin Observatory space, and inclusion in multi-year planning initiatives. Other benefits include city hall event participation, and historic signage off of roads and intersections where appropriate, which would benefit us when we have events. The mission of the New Berlin Landmarks Commission is to "serve the people of the City as stewards of historic districts, and to develop historical, cultural, social, political and economic interest in our community."

New Berlin Landmark Commission members mentioned the MAS would be an optimal candidate for historical status with the city, and were open to questions, and provided information on any updates that would occur. One such clarification was that the city would find the MAS historic by nature of our organization purpose, and not the buildings themselves, showing great flexibility on how our buildings would get used in the future. These answers and next steps were presented to the Board of Directors in fall by the Publicity Committee.

The Board of Directors reviewed the findings from this meeting, and suggested further research with a real estate lawyer, for the Publicity Committee to work on. This legal consultation goal has been met pro-bono thanks to the services of a lawyer in the community. Next planned steps will involve MAS President Matthew Ryno meeting next with Carrol College to discuss the application process with New Berlin, in context of other event planning as well.

For now, this item is on hold in the Publicity Committee pending a final recommendation / completed tasks.

In Memory: Raymond Zit

August 2, 1942 - January 21, 2025

From Gunderson Funeral & Cremation Care:

COTTAGE GROVE - Raymond Emil Zit, age 82, of Cottage Grove, passed away on Tuesday, January 21, 2025. He was born on August 2, 1942, in Chicago, Ill., to Raymond and Mildred (Bejna) Zit.

Raymond graduated from a Milwaukee High School before going on to attend culinary school. He married Diane Titus on May 2, 2004, in Sun Prairie. He worked as an executive chef for the Maple Bluff Country Club, retiring in 1991.

Raymond was very interested in photography and had a passion for classical music. He would spend his free time reading and traveling, and he could often be found cooking for his loved ones when home. He also had deep love of sports cars.

Raymond is survived by his wife, Diane; sister, Sue Ellen (Richard) Johnson; niece, Heather Smart and her family; nephews, Eric and Paul; and cousin, Judy (Cecil) Butturini. He was preceded in death by his parents, Mildred and Raymond.

Private services will be held.

Memorials may be made to St. Jude Children's Research Hospital.

For more information and online condolences, please visit www.gundersonfh.com.
Gunderson Oregon
Funeral & Cremation Care
1150 Park St.
(608) 835-3515

From the Nov-Dec 2002 Focal Point, on the dedication of the Ray Zit Observatory:

The Z2 scope dedicated in Ray Zit's Name, By Gary Parson

On October 18th the Z2 scope was dedicated in Mr. Ray Zit name. Ray a former member of MAS, donated the 14.5 Newtonian scope because he no longer takes part in astronomy. He was one of our former observatory directors. He had the job for three years. Ray even hinted he might rejoin MAS. He gave a great talk to our membership at our general meeting. He commemorated about days past. His new hobby is photography. Mr. Zit we thank you for your generosity and everyone who ever uses your scope will know your name and how kind you were to our club.

NCRAL

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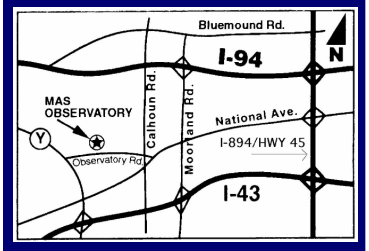

MAS Observatory

18850 Observatory Rd
New Berlin, WI 53146

www.milwaukeeastro.org

www.facebook.com/milwaukeeastro

Upcoming Keyholder Assignments

Date	Name	Phone	Sunset
01/10	Dhruva Kalyani	262-327-3792	4:37pm
01/17	Jeff Blank	720-271-9752	4:45pm
01/24	William Gottemoller	262-442-3686	4:54pm
01/31	Jayanth Suthan	262-865-2673	5:03pm
02/07	Dhruva Kalyani	262-327-3792	5:10pm
02/14	Mike Bauer	414-751-8334	5:22pm
02/21	Jim Bakic	414-303-7765	5:31pm
02/28	Lee Keith	262-875-9103	5:40pm

At Your Service

Officers / Staff

President	Matthew Ryno	414-248-1455
Observatory Director	Lee Keith	262-875-9103
Asst. Observatory Director	Mike Wagner	262-547-3321 (L)
Vice President	Jeff Blank	720-271-9752
Treasurer	John Koors	262-880-6393
Secretary	Brian Ganiere	414-745-5134
Newsletter Editor	Matthew Ryno	414-248-1455
Co-Newsletter Editor	Andrew Payant	262-844-5941
Webmaster / Historian	Gene Hanson	262-269-9576
Membership Chair	Stephanie Razack	414-356-5451
Programming Chair	William Gottemoller	262-442-3686
Observatory Chair	Patrick White	414-313-6858
Publicity Chair	Andrew Payant	262-844-5941
Social / Media	Matthew Ryno	414-248-1455
Groundskeeper	Brian Ganiere	414-745-5134

Also see: https://milwaukeeastro.org/officers_Staff.asp

Board of Directors

Jay Suthan	614-440-4328	Dhruva Kalyani	262-327-3792
Matthew Ryno	414-248-1455	Lee Keith	262-875-9103
Jill Roberts	262-765-7092	Mark Banyon	262-565-7948
Tim Mills	414-208-5771	Mike Bauer	262-894-1253
Dave Leiphart	608-212-4346	William Gottemoller	262-442-3686
Glenn Sarlitto	414-962-5454	Patrick White	414-313-6858