September, 2022

Inside this issue:

MAS 90th Birthday, A Historian's Perspective

By Gene Hanson

This article to mark our club's 90th birthday is not too much about our actual history. That's because you can read all about that history as I have written an extensive account on the website

This is about my journey of learning that history so I could write about it and in many cases filling in details and correcting errors. And it deserved to be available to everyone and I could publish it on our website. As you will see, the history is always evolving so those pages may never be completely finished. Over time as I've gathered more information from the log books, the board minutes, and the collection of raw historical documents, I've gotten a clearer picture, and with every discovery the website is updated. *(Continued on Page 3)*

Renew Your MAS Membership!

Renew your membership at www.milwaukeeeastro.org/renew to get started!

Membership dues for next year are due by December 31, 2022.

With 256 active members this year, we have connected with more members than ever, but need your continued support! Our Milwaukee Astronomical Society Observatory is funded entirely by you, our members, and we would love to see you around in our meetings, our email group, and at the observatory any Saturday next year. We have **Stripe** and **Paypal** digital payment options this year to easily renew, or a check may be sent by PDF renewal form in the mail to our Treasurer. Rates remain the same as last year, at $23/yr. student, $46/yr individual, $52/yr. family, $28/yr non-resident memberships. Optional donation amounts are accepted also by form.

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

Upcoming Meetings

Two Open Houses will be held on **Friday, October 14th**, and **Friday, October 28th,** rain or shine at the MAS. Dr. Dennis Roscoe is presenting on Mars for October 14, and MAS imagers will be presenting recent Spooky Nebula photos on October 28th. Volunteers will be needed, and we expect a large public turnout.

An in person **General Membership Meeting** will be held on **Monday, October. 17th**, at **8pm** at the **Quonset Meeting Hall** and the agenda is open-ended this month - check our Google Group for updates. The **Board Meeting** starts at **7pm.**

The **First Wednesday** meeting will be held in person at the Observatory grounds on **Wednesday, Oct. 5th** and **Nov. 2nd**, at **7:30 PM**. New members are especially encouraged to attend this meeting. It is a chance to gain hands-on experience, receive tips on how to get started and/or get more involved in the Club's activities.

The **Imagers Interest Group** continues in an all virtual format, on **Wednesday, Oct. 12 at 7:00pm**. The next meeting topic is on image frame calibration, and you may email Kevin Shea for an invitation. Imagers are also welcome to an in-person tour of Dennis Roscoe's observatory on **Sunday, Oct. 15** at 4pm. Contact Kevin Shea or Dennis Roscoe for more information and directions.

Dark Sky Party on **Oct. 15th**, at Harrington Beach State Park.

Observatory Director Report

The B Dome slit has been repaired and is now working, putting B Scope back in use. The big news though is the club has purchased a used Astro Physics Mach I mount to replace the mount currently in use. The purchase price for the mount was $5900 plus $300 for shipping. The shipping ran over by $57, and the PayPal fee was $185. So. the club still owes $242 which we can pay by check, bringing the total cost to $6442. The mount came with an Eagle tripod which we don't need. Gabe has purchased the tripod for $1400 from the club. That brings the total do $5042. Net

-Paul Borchardt, Observatory Director

Treasurer's Report

$11,796.68	***Starting Balance as of 08/13/22***
	Expenditures
$27.65	PayPal fees
$592.77	Annual Expenses
$405.50	Periodic Expenses
$85.23	WE Energies
$1,111.15	TOTAL Expenditures
	Revenue
$969.00	Membership dues
$359.23	Public Donations
$29.79	Private Donations
$4.00	Grants
$440.00	TOTAL Revenue
$12,048.55	***Ending Balance as of 09/17/2022***

Sue Timlin, Treasurer

Membership Report

After two very successful Open Houses, the total active membership is 246, with an additional 19 members since the last report. We welcome: Don Swetzig; Kevin Nation & Family; Marc Bradley; Victor Fernandez Minguillon & Family; Paul Hinz & Family; Maggie Pray & Family; John Glembin & Family; Brian Skrade & Family; Emily Marriott; Doug Ulaszek & Family; Andrew Beaver & Family; Sara Perkins; Corey Steinberger & Family; Kate Unger & Family; Mark Banyon; Karen Kluczynski; Kent Primrose & Family; Sheldon Moysis & Family; Patty Read & Family.

Matthew Ryno, Membership Chair

Minutes

An in-person board meeting was held at the Quonset Meeting Hall, on Sept. 19th. The meeting was called to order at 7:00pm by MAS Vice President, Sue Timlin. In attendance were: Sue Timlin, Paul Borchardt, Matthew Ryno, Mike Bauer, Jim Bakic, Russ Blankenburg, Gene Hanson, Mike Wagner, Jeff Annis, Don Swetzig, Jim Schroeter, Lee Keith, Don Swetzig, Paul Borchardt, Dennis Roscoe. **Minutes** of the prior board meeting, and **Reports** were submitted by officers for review prior to the meeting and approved; including memberships.

F-Scope Mach1GTO Mount: Paul Borchardt said an Astro-Physics Mach1GTO Mount was found and purchased. The Mach1 mount comes with a CP4. Still needed is an adapter screw to the baseplate and screw to the adapter to get the mount on the pedestal, which was expected to be a smooth installation, thanks to Paul's familiarity with the mount. The $5,042 cost may be offset by selling the old mount.

Paypal Alternative Membership Payment: MAS Webmaster, Gene Hanson, noted that issues with Paypal payment process have continued through the year, and he will look into adding Stripe payment method as an alternative option for renewals and membership applications. Membership Chair, Matthew Ryno, noted there has been a 50% success rate in completing an abandoned transaction. Urgency on an alternative payment method, pending membership renewal season was noted.

Obsession Nexus DSC Pro: Russ Blankenburg presented options for the observatory, including E-Scope options; or use of G-Scope as a planetary telescope temporarily. A suggestion was made to purchase an Astro Devices Nexus DSC Pro, for Digital Setting Circles on the Obsession Dobsonion telescope in D-Shed. After a demonstration using a members' Nexus control unit, the Dumbbell Nebula could be found with the telescope and tracking was within two-tenths of a degree. A motion to purchase a Nexus box, for $349.95, was made and by the board.

A motion to adjourn was made at 7:55 pm.

Matthew Ryno, Secretary

Observatory News

The Milwaukee Astronomical Society is an official stop at the Wisconsin Science Festival, occurring between October 10-16th, with our upcoming October 14th Open House. We join over 500 science-themed youth and family science events taking place throughout the state of Milwaukee.

Jill Roberts, MAS President, will be at the Horwitz-DeRemer Planetarium on October 15th for Wisconsin Science Fest, offering stargazing information and awareness of the MAS. NASA Solar System Ambassador, Joyce Jentges will also offer a talk on the various stages of the Artemis mission which will return man and the first woman to the Moon.

Matthew Ryno, MAS Secretary, will be representing the Milwaukee Astronomical Society at the grand opening of Jews in Space!, at the Jewish Museum, on October 27th, by hosting a stargazing opportunity outdoors with his Unistellar eVscope. jewishmuseummilwaukee.org/jews-in-space/.

Since the September board meeting, the recently purchased Astro-Physics Mach1GTO German Equatorial Mount, has been delivered to the MAS and is delivered to F-Scope shed. There is an adapter piece needed, that will connect the mount to the pier.

The Milwaukee Public Museum Daniel M. Soref Dome Theater & Planetarium will featuring the Milwaukee Astronomical Society following its observatory shows in October, with a presentation slide about our upcoming open houses, and brochures will be available for interested parties afterward.

A Historian's Perspective *(continued)*

Background

I first became fascinated with the history of our club in 1982 when we were hosting the spring meeting of the AAVSO. It shouldn't surprise anyone that as a part of that meeting there was a tour of our observatory, as pictured on the right. Up until that tour I really took the observatory for granted. Of course we had an observatory. Every astronomy club must have an observatory. But in the days before clubs had webpages this was difficult to know. But listening to the meeting attendees who came from many different clubs and then carrying on about how great our observatory was opened my eyes to the simple fact that our facility was not ordinary. I would get another dose of this amazement in 2001 when we the MAS and the Madison club jointly hosted the spring AAVSO. Again, I heard many comments, but one in particular by a friend who said, "Telescopes, telescopes, and more telescopes."

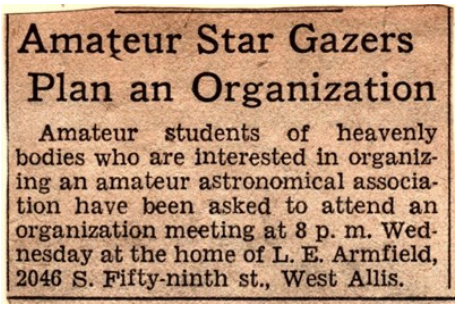
Up until that 1982 meeting I knew very little of the club's history other than Luverne Armfield was very important to the club, but with no real explanation as to why. And there was a short summary in a fundraising brochure for the Z-Scope and Z-Dome. If you went by this you'd be convinced it was all very easy!

But I would be thwarted from learning more because soon after that I was off to Arizona where I would spend the next 31 years, only coming back to Milwaukee on average once every 3 years. When I returned to live in WI fulltime in 2013 I began to get access to some of the club's historical documents and photos, I started to get

a fuller picture and especially an appreciation for the monumental amount of effort it took for those early members to make our society what it became.

At the Beginning

Ad from the Milwaukee Journal, Sunday, Sept. 18, 1932:



Amateur Star Gazers Plan an Organization

Amateur students of heavenly bodies who are interested in organizing an amateur astronomical association have been asked to attend an organization meeting at 8 p. m. Wednesday at the home of L. E. Armfield, 2046 S. Fifty-ninth st., West Allis.

When telling a story, begin at the beginning only works in fiction because when you create a story you get to decide where it begins. Non-fiction is different because there is always something that comes before the beginning. I was recently reading the account of the formation of the Madison Astronomical Society as I had given their historian some information on their club from 1935. It is a messy story because there is contradictory evidence of when the club actually came into being. The Milwaukee Astronomical Society (MAS) on the other hand has a fairly clean beginning.

The birth of our club is pegged to the meeting at the home of Luverne Armfield on September 21, 1932. The meeting obviously went well and as a result the MAS was formed with 18 charter members. That's the version that has been cited on many occasions from several sources. I figured there had to be more. A more detailed version is Armfield started building his first scope in 1927 and finished two years later where he began observing the heavens. From then on he began befriending other amateurs to observe with him in his backyard in West Allis. So the MAS already unofficially began well before 1932. And once the MAS was officially founded, Armfield's home became the epicenter of the MAS with his backyard essentially becoming the first MAS Observatory. Between this and all he did for the MAS which included financial help, we consider Armfield to be the founder of our club.

I've learned a lot about these early years because I found a trove of old newsletters in the Z-Dome that were published beginning in January of 1934. There were also many pictures of very high quality taken starting in the previous year. Looking at these pictures I noticed that in the group pictures Edward Halbach was conspicuously absent. But he was one of the earliest members of the club. I learned that Halbach was a professional photographer around that time and found a couple of those group pictures that identified him as the photographer. He probably didn't take all of the pictures from the era between 1933 and 1937, but certainly most of them because of the high quality. Consequently, Halbach really was the earliest club historian.

This aerial picture of the then recently dedicated MAS Observatory in New Berlin, as taken by Ed Halbach from a plane.

MAS Gets an Offer of Land and Does Nothing

By the end of 1933, the membership was 130! Armfield's backyard was getting unreasonably crowded so there was a lot of talk about getting an observatory outside of Milwaukee. But amazingly, for many months after the club no one uttered a word about the possibility for fear of ridicule! They were in the middle of the Great Depression and money was nonexistent.

But then in December of 1933 (just 15 months into the club's existence) the unimaginable happened: an offer of 1.1 acres of land in New Berlin by a member, Matthew Phillips. As euphoric as they were by the offer, there was still little chance it could be utilized due to the lack of funds. The offer had two significant stipulations because the club was so new and they might not be able to come up with the money to build. Because Phillips was only donating it because he wanted an observatory for the land, construction would have to begin within 5 years, and should the club cease to exist or the land was not used as an observatory, it would go to Carroll College. They only worried about the 5 years stipulation.

So though the club unofficially accepted the offer and went through the necessary prerequisite of incorporating, we did nothing for years and MAS observing continued in Armfield tiny backyard. The 13-inch reflector that Armfield funded and largely built by the club was put into service in his backyard. Pictured next is A-Scope as it looked in Armfield's backyard.

We Must Build an Observatory

Though there is no money to build, there is an old saying, "Necessity is the mother of invention" and if you combine it with "If there's a will, there's a way," you have the simple explanation of why in late 1936 the offer of land is accepted. The reason is a divorce by Armfield meant he had to vacate his home which meant the loss of his backyard and telescopes. Although sad for Armfield, it was what the club needed: a "kick in the butt" to get them to move. In late fall they finalized the plans and surveyed the land, with the intent to start construction early the following year. They would also spend the next two winters overhauling the 13 inch telescope.

No Restrooms?

When I learned that the observatory did not have restrooms until the end of 1965, I was puzzled as to what they did before then. All the photos I had seen showed nothing. I finally stumbled on one picture that showed an unusual structure at the back of the property and technically off of the donated land: an outhouse!

Most of the early photographs don't show it as the pictures when taken obscured its existence. And then in 1941 the tool shed was assembled directly in front of it and will not appear in any future photo of the grounds. That outhouse was actually the first structure built on the grounds!

To be Continued in the October newsletter!

Moon Shadows and a Great Spot, Oh My!

By Lee Keith

When I make these posts, I like to mix a little story and a little education so this will be no different. The story begins with the knowledge that a rare double shadow will transit (cross) the disk of Jupiter on the evening of August 15th from approximately 10:30-12:30 CDT. The forecast was for clouds and they seemed pretty widespread as I went to bed early.

I woke up just around 11PM and decided to put my shorts and slippers on to check the sky. Miraculously, the south and east (where Jupiter was) were clear but a large cloud was slowly slipping closer. What can I do? There wasn't time to get to the Observatory and I felt Jupiter was too low to be seen through the trees there. It just so happened that I had at home a recently donated Celestron NexStar 5SE telescope that I had at home for (ahem!) evaluation.

So, I picked up the whole scope and tripod out of the garage and carried it out in front of my front door which faces south and has a minimal number of lights to contend with. In a few minutes I had it pointed at the King of the Planets. I put in a "high" (141x & 212x) power eyepiece and, and, well, I think I see the shadows. I focus better then watch for several seconds. The double shadows pop in and out of view! Small, but definitely there. Even my wife, Karen, came out to see the spectacle. I thought it was very cool!

I look up and that menacing cloud has receded and dissipated, though the northwestern part of the sky is still covered. Do I go to bed, happily satisfied at a quick look at such a spectacle? No!! I went back into the house and grabbed my trusty planetary camera and used it to replace the eyepiece of the small telescope and placed the laptop on my, well, lap, and started taking a long series of videos as I have for years from the observatory with the intention of creating a Magnificent Animation that I could share with the Society membership.

Picture this. I am in front of my front steps in shorts, sweatshirt and slippers with the little C5SE next to me and a little image of Jupiter with two black spots on it on my computer which is on my lap. That's amateur astronomy at its best folks!

I had taken good images with my 180mm (7.1") Mak-Cass telescope in the past decade but only 5 inches? Not only that, I did not have an essential accessory, the Atmospheric Dispersion Corrector (ADC), which is used to remove spurious color for celestial objects low in the sky which Jupiter was at the time. I did not believe I had the time to take it off my other telescope and mount it to the 5SE before the clouds rolled in. I always use it for all my imaging from the Observatory. How will it turn out without it? Is it worth the effort? The plot thickens… After nearly an hour and a half of images, you decide.

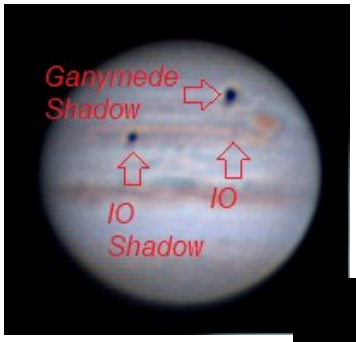
The result turned out better than I expected! I have shared some of the best images to compare and look at closely. The two moons involved in the transit are Io and Ganymede. Io's shadow transits first and Io itself shortly thereafter. Ganymede's shadow then enters the disk and we have a double shadow transit! Double shadow transits with Io and Europa are fairly common but ones with Io and Ganymede are rare as Ganymede is much farther from Jupiter than Io and its shadow is less likely to transit across the disk and much less often. I have indicated on some of the images where Io is transiting the disk. It looks like a tiny, dark speck in some images that moves more rapidly than the underlying surface features.

Now for the education part. I know many of you want to learn more about telescopes and how they work and compare so this will be useful and interesting to many Society members. I want to compare the results from the NexStar 5SE telescope that I used for these images with the "Planet Killer" "A" scope at the Observatory that I use for all my images that I have posted fairly regularly recently.

The two telescopes differ in two significant ways – aperture and focal length. "A" scope being 12.5" in diameter means it has 6.25x (12.2/52) times the light gathering power as the 5" scope and has over twice the focal length (110"/50"=2.2x). What this means is that despite "A" scope's greater light gathering power, the image intensity (surface brightness) of Jupiter with the 5SE was nearly the same as with the larger telescope due to the 5SE's shorter focal length. Think of it as the 5SE taking a smaller amount of light but concentrating it into a smaller spot making it nearly as bright as in "A" scope.

Moon Shadows and a Great Spot (continued)

This is verified by comparing the telescope's f/ ratios, which is a measure of surface brightness of extended objects like planets and nebulae. The f/ ratio of "A" scope is f/8.8 and that of the 5SE is f/10. Not exact, but close.



In other words, the greater aperture of "A" scope was mostly compensated for by the shorter focal length of the 5SE. This resulted in nearly the same exposure times with the 5SE as with "A" scope, which is pretty short (3/1000 sec!) so this helps in the sharpness of the resulting images. Exposures in the film days could be the better part of an entire second or more! No wonder you could not get a sharp image!

But while the exposures were similar, the resolution was not. The 5SE has less than ½ (5"/12.5"=.4) the resolution of "A" scope. Fortunately, the image in the 5SE was sampled adequately. Using an average night of 2 arcsecond resolution, on the 5SE my camera (ASI462MC) samples the image at 4.2 pixels/resolution unit compared to 9.3 for "A" scope. Bigger is better and at least 3.5 is recommended and 2 is minimum. This means that I was able to capture the full resolution of the 5SE adequately. Lastly, since the focal length of the 5SE is about half of "A" scope (50"/110"=.45x) the image size of Jupiter is just under half that using "A" scope. This is why the images seem smaller than my usual ones because they are smaller.

One other detail that I should mention. Most imagers would not recommend an altazimuth mount when doing imaging. Why? Because of something called image rotation. With an altazimuth mount, its movements are parallel to the horizon, unlike an equatorial mount whose movements are parallel to the movement of the sky. Have you ever noticed the Moon is "on its side" when it rises but is "upright" when high in the south? This rotation is relative to the horizon, which you are comparing it to, not the sky. The Moon is not actually turning clockwise, it just seems to be, relative to the horizon.

Since altazimuth mounts move relative to the horizon, images do this rotation though you don't normally notice for the short time you are looking through the telescope. But my images span and hour and a half and if you have noticed, Jupiter slowly turns clockwise during this time. The turning during the minute of each video is small and I have read that the stacking software handles it just fine. So, for planetary imaging it looks like you can do it fine with an altazimuth mount. The same may not apply for deep-sky imaging. Does any member have experience with altazimuth mounts?

I think it was worth the effort to record such a stunning and unusual and rare event for Society members to enjoy and wonder at! The results were better than I could have hoped despite the short notice and modest telescope.

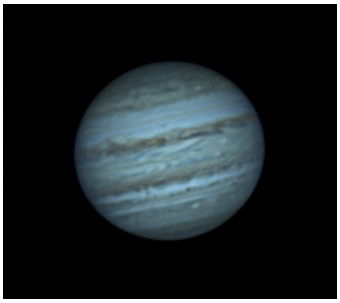
Speaking of modest telescopes, another reason for doing this was to show what could be done with very modest equipment. The 5SE telescope is one many budding amateur astronomers can afford and carry around easily. The camera I used is less than $300 but there are some for $200 (or use the MAS' cameras for free) and all the software is free and you probably already have a laptop. If you don't want to buy anything, the Society has everything you need to take stunning images, so what is holding you back? Put a message on the MAS google group stating your interest in doing this type of imaging and I will contact you and we can work out a schedule.

MAS Equipment Loan: Contact the Observatory Director, Paul Borchardt, or Assistant Observatory Directors, Lee Keith or Russ Blankenburg, and fill out the Equipment Loan Form to rent the Celestron 5SE, 12" Ball Scope or 8" Celestron Edge HD. We may ask some information on how long you plan to use the scope, and do a training session to confirm skills and comfort level prior to rental.

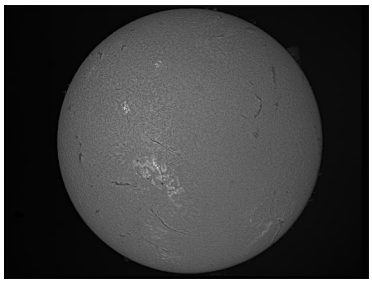
Workshops and Presentations

Planetary Imaging Workshop

On Saturday, September 24th, MAS planetary photography expert, Lee Keith hosted a Planetary Imaging Workshop during the Saturday Members Night for about a dozen interested members. Tables and laptops were set up in the Quonset hut. The workshop allowed all attendees to download drivers and software on their laptops, test the software with an imaging camera, and then take images through the steps for processing. Special thanks to new member Victor Fernandez, who offered his IT skills to help other members install Windows Operating System virtualization software on their Mac computers, to help them run the unique imaging software used in planetary photography. Jupiter and Solar images from attendee and new member, Emily Marriott, on the left.



Late-Sept. Jupiter Image



Oct. 8, Solar Image

Membership Presentation

Dr. Dennis Roscoe, NASA Solar System Ambassador, presented during the September membership meeting on the recent findings and images from the James Webb Space Telescope.

What is Happening Around Town?

The following astronomical events are free and happening around town, as shared with the Milwaukee Astronomical Society for members to take advantage of:

Pewaukee Astronomy Club

Meetings, held in the Community Room of the Pewaukee Library, 210 Main St, Pewaukee, WI.

Oct. 8th, 7-8 pm Presentation: Galaxies: Inside the Universe's Star Cities. Speaker: David Eicher, 20 Yrs Editor-in-Chief of Astronomy magazine. Over the past 20 years, astronomers have revolutionized our understanding of galaxies, the basic building blocks of the cosmos. See the emerging picture of how these systems of stars, gas, and dust formed and evolved.

Nov. 12th, 7-8 pm Presentation: Multi-Wavelength Observing, Seeing with all kinds of light. Speaker: Alison Klesman, PhD in Astronomy, Senior Editor of Astronomy magazine. Hear how astronomers use the entire electromagnetic spectrum to view the universe. Different wavelength images can combine to reveal otherwise invisible details.

Wehr Astronomical Society

Held at the Wehr Nature Center, 9701 W. College Ave., Franklin, WI 53132

Oct. 4th, 6pm Presentation: "New Views of the Milky Way" by Professor Robert Benjamin who joined the faculty of the UW-Whitewater just as NASA was launching the Spitzer Space Telescope into space. Using this telescope and others, he has been working on understanding the structure of our Milky Way.

Oct. 21, 8-11pm, Observing: Outdoor sky viewing with telescopes at the overlook on Whitnall Park Drive on the east side of Mallard Lake just south of College Ave. Personal telescopes are welcome but not required.

Nov. 8th, 6pm Presentation: "The 2024 Total Solar Eclipse and Others" by Daniel M. Soref Planetarium Director, Bob Bonadurer. Fresh from the evening's Lunar Eclipse the night/morning before, Bob's presentation will include general eclipse information as well as highlights of the planned trip to Texas in 2024 to view the next U.S. total solar eclipse.

UWM Manfred Olson Planetarium

5th floor of the UWM Physics Building, 1900 E Kenwood Blvd #139, Milwaukee, WI 53211

Oct. 8th, Nov. 4th, 8pm: Rooftop Stargazing on the Skydeck at the UWM Physics building for free public stargazing. Gaze through telescopes at the night sky and view the Moon, planets, star clusters, and other astronomical objects.

Horwitz-DeRemer Planetarium

S14 W28167 Madison Street, Waukesha, WI

October 15th, 12pm guest presenter and NASA Solar System Ambassador Joyce Jentges explores Artemis during her educational program "Artemis: America Returns to the Moon." The Milwaukee Astronomical Society will be present to help raise awareness for stargazing opportunities nearby.

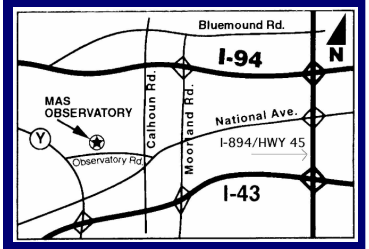
Adopt a Telescope Program - Signup Sheet

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

At Your Service

Officers / Staff

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



MAS Observatory

18850 Observatory Rd
New Berlin, WI 53146

www.milwaukeeastro.org

www.facebook.com/milwaukeeastro

Board of Directors

Jim Bakic	414-303-7765
Matthew Ryno	414-248-1455
Jill Roberts	262-765-7092
Sue Timlin	414-460-4886
Jason Doyle	414-678-9110
Dennis Roscoe	608-206-0909
Lee Keith	262-875-9103
Jim Schroeter	414-333-3679
Mike Bauer	262-894-1253
Mike Wagner	262-547-3321
William Gottemoller	262-442-3686

Oct/Nov Keyholders

10/01	Jim Bakic	414-303-7765
10/12	Mike Bauer	262-894-1253
10/15	Russ Blankenburg	262-938-0752
10/22	Paul Borchardt	262-202-8029
10/29	Brian Ganiere	414-961-8745
11/5	Steve Volp	414-751-8334
11/12	Lee Keith	414-425-2331