



March , 2018

Next Meeting on April 20th

The Milwaukee Astronomical Society will hold its next General Meeting on **Friday, April 20th**, at 8 PM at the Observatory.

We will be exploring the Solar System using the interactive ToolKit provided by the Night Sky Network that MAS is part of. The toolkit includes hands-on activities to show the structure of our Solar System, including models for sizes and distances, and to connect what is seen in the sky with where the planets are in relation to Earth.



It provides a fun way to learn about the planets and specifically recommended for those members who are planning to participate in public outreach activities such as Open Houses or school group visits.

The meeting will be preceded by a Board Meeting from 7 PM that is open for everybody who interested in organizational and Observatory related issues.

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Public Nights 2018

The start of the Public Night season is just around the corner. Dates and times have been finalized, and listed below:

May 11 Friday, 7:00-10:00 PM

June 23 Saturday, 4:00-8:00 PM (The Sun)

August 17 Friday, 8:00-11:00 PM

September 7 Friday, 7:00-10:00 PM (Ice Giants)

October 12 Friday, 7:00-10:00 PM (Constellations & Asterisms)

We are still seeking a speaker for the August public night. There is no assigned topic, it will be determined by the presenter.

If you are interested to be a speaker please contact Sue Timlin Open House Committee Chair, or any Officer or Board Member. Thank you for your kind contribution that would make the nights successful.

Observatory Report

The solar Scope has been back in use for a month and has been working good.

I met with Jason Doyle at his employer, Wago Corporation to pick up eight very nice office chairs to use in the control room. Thank you Jason and the Wago Corp.

B-Scope has a new focuser installed, a motorized control should be here in 6 to 8 weeks.

The gear motors that drive the Z-Dome have had the oil changed as part of the regular maintaining of the dome.

Due to the increasing amount of light pollution at the Observatory there has become a need for better filtering to combat the siege of brightening skies. The F-scope, due to the fast-focal ratio has lost much of its edge in imaging since being installed several years ago. But there is hope, narrow band filters are available that will mount into the Canon T3i which is used on F-Scope that will eliminate the light pollution's effect and expand the use of the scope on moon lit nights. Needed are three filters, a Hydrogen-Alpha, Oxygen-III, and Sulfur-II all of which are produced by Astronomik with a retail cost of \$190 each. Gene Hanson has stepped forward and graciously donated the \$570 needed to buy the filters! An order for them has been placed with OPT Telescopes and we should have them shortly. I know I speak for the members of the MAS with thanking Gene for this generous donation that helps keep our observatory a great place for astronomy.

Respectfully Submitted,
Paul Borchardt, Observatory Director

Treasurer's Report

\$6,035.08 <i>Starting Balance as of 02/14/2018</i>	
	<u>Expenditures</u>
\$5.25	PayPal fees
\$334.03	Periodic expenses
\$18.86	Observatory expenses
\$130.44	WE Energies
\$488.58	TOTAL Expenditures
	<u>Revenue</u>
\$150.00	Membership dues
\$720.00	Other revenue
\$870.00	TOTAL Revenue
\$6,416.50	<i>Ending Balance as of 03/14/2018</i>

Respectfully Submitted,
Sue Timlin, Treasurer

Meeting Minutes

The meeting was held on March 16th at the MAS Observatory, and was called to order at 7:03PM by Tamas Kriska President.

Minutes, Treasurer's Report, Observatory Director's Report, and Membership Committee Report were electronically submitted ahead of the meeting. Membership application of Jason Robe, Joe Wilcox, and Pam Ryan were approved.

Old Business – Public Nights: Speakers are needed for June and August.

New Business – Narrow band filters for DSLR camera (F scope and B scope): The Club has a set of filters (Ha, OIII, and SII) thanks to Gene Hanson's generous donation. A motion was made and carried to allocate \$130 to purchase also an Hb filter to complete the collection. **Starlight Festival:** Will be organized on the ground of Yerkes Observatory on May 26-27. The MAS will not officially participate due to a \$300 registration fee for nonprofit exhibitors. **New keyholder:** Russ Blankenburg's application for a full key was approved. **"A" dome slit:** has always been and still is a problem, which has to be professionally fixed at some point.

Program – Angela Van Sistine research associate scientist and Casey McGrath graduate student at the Center of Gravitation, Cosmology, and Astrophysics, Department of Physics, UW



Milwaukee gave a talk entitled: **Alien Messages and Earth's Space Invasion of the Proxima Star System: The Breakthrough Initiatives.**

Respectfully Submitted
Agnes Keszler, Secretary

Membership Report

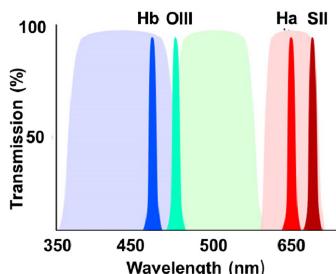
Since the last Report we received four new membership applications and would like to welcome Jason Robe, Joe Wilcox, Pam Ryan, and Matthew Miranda. We now have 153 active members.

Respectfully Submitted,
Jeff Kraehnke, Committee Chair

Observatory News

New Narrow Band Filters for the F-scope

As it was already described in the Reports on page 2, we are about to win a battle in our long lasting fight against the ever increasing light pollution.



Narrow band filters mounted into the DSLR camera would allow us to capture detailed images under our heavily light polluted environment or even in moon shine. Four filters: Ha, OIII, SII, and H_b have been

acquired, and currently, they are being tested with F-scope. The filters also could be used with DSLR cameras piggybacking on the B-scope.



Image taken with Astronomic 12 nm clip-in Ha filter (8x5 min subframes) combined with unfiltered RGB image (12x20 sec subframes).

Z-Scope Mirror

As part of fundraising to invest in new equipment the Board has decided to sell parts of the retired Z-scope, including the 26" mirror with the secondary mirror and other reusable elements. The heavy mirror has been safely removed from the dome, cleaned, and placed into its box. It is now ready to be picked up by the new owner.



Website Update

What's New in the Showcase?

On March 4th, I added the 500th image to our website showcase. It was Jeff Kraehnke's image of the moon. I know that because we are now placing all the imaging information in an Access database and the Showcase images are rendered from there. In the past we were restricted to the pre-defined galleries: Solar, Lunar, Planets, etc. Though images could be replicated, this always creates updating problems if changes are needed. A good example is a wide field image of the Trifid (M20, a nebula) which also contains M21 (an open cluster.)



The 500th image

The database entry for a single image has:

- Name of the object
- Type of object
- MAS Equipment utilized
- Image type
- Filter used
- Imager(s)
- Processor(s)
- Image Description
- Secondary Object
- Secondary Type of Object
- Tertiary Object
- Tertiary Type of Object

	Planets Customize image selections: Equipment: All Equip ▾ Exclude: <input type="checkbox"/> Conjunction <input checked="" type="checkbox"/> Landscape Images/Page: 25 ▾ Sort by: Date ▾ Order: D ▾ Display the Planet Gallery
	Emission & Dark Nebula Customize image selections: Equipment: All Equip ▾ Filtering: <input checked="" type="radio"/> Both <input type="radio"/> LRGB <input type="radio"/> Narrowband Images/Page: 25 ▾ Sort by: Date ▾ Order: D ▾ Display the Nebula Gallery
	Planetary Nebula & Supernova Remnant Customize image selections: Equipment: All Equip ▾ Filtering: <input checked="" type="radio"/> Both <input type="radio"/> LRGB <input type="radio"/> Narrowband Images/Page: 25 ▾ Sort by: Date ▾ Order: D ▾ Display the Planetary / Supernova Gallery
	Galaxies Customize image selections: Equipment: All Equip ▾ Filtering: <input checked="" type="radio"/> Both <input type="radio"/> LRGB <input type="radio"/> Narrowband

What are the advantages? Rendering at the time of display allows the user to choose from the following options:

- Number of images to be displayed per web "page"
- Sort Sequence (Date, Imager, Object)
- Order of display (Newest, Oldest)
- Where the image was taken (MAS Observatory vs. non-MAS Observatory images)
- Type of filters used (LRGB / narrowband)

Website Update

Another important tag is the MAS Equipment field. We can now display images taken or not taken with our instruments. But, also, because of this tag that identifies the telescope, I've added gallery images to the individual observatory pages. For example, here is our Toeller Observatory / F-Scope:

We have galleries for all the telescopes except the Obsessions.

	<p>Toeller Observatory / F-Scope Gallery</p>
	<p>F-Scope Image Gallery</p> <p>Customize the image display: Images/Pg: 25 ▾ Sort by: Date ▾ Order: D ▾</p> <p style="text-align: right;">Display the F-Scope Image Gallery</p>

The Messier Showcase Pages

Another area of the Showcase is our collection of images of the 110 Messier objects, developed by Steve Volp a few years ago. This work was unfinished because of the lack of so many Messier images. Steve now has a placeholder for every object and the implementation of the database now allows the dynamic updating of those pages. As of this writing, 52 Messier objects remain!

MAS Messier Observation List by Object Number

NGC	Messier	R.A.	Dec.	Mag.	Type	Con	Size	Assigned/Open /Submitted
1952	M1	5 34.5	22 1	9	PIN	Tau	6' X 4'	View Images Of M1
7089	M2	21 33.5	0 49	7.5	GCI	Aqr	12.9'	View Images Of M2
5272	M3	13 42.2	28 23	6.2	GCI	CVn	16.2'	View Images Of M3
6121	M4	16 23.6	-26 32	7.5	GCI	Sco	26.3'	View Images Of M4
5904	M5	15 18.6	2 5	6.65	GCI	Ser	17.4'	View Images Of M5
6405	M6	17 40.1	-32 13	4.5	OCI	Sco	15.0'	View Images Of M6
6475	M7	17 53.9	-34 49	3.5	OCI	Sco	80.0'	View Images Of M7
6523	M8	18 3.1	-24 23	5	C/N	Sgr	60' X 35'	View Images Of M8
6333	M9	17 19.2	-18 31	9	GCI	Oph	9.3'	View Images Of M9
6254	M10	16 57.1	-4 6	7.5	GCI	Oph	15.1'	View Images Of M10

NGC	Messier	R.A.	Dec.	Mag.	Type	Con	Size	Assigned/Open /Submitted
6705	M11	18 51.1	-6 16	7	OCI	Sct	14.0'	View Images Of M11
6218	M12	16 47.2	-1 57	8	GCI	Oph	14.5'	View Images Of M12
6205	M13	16 41.7	36 28	2.8	GCI	Her	16.6'	View Images Of M13

Further work remains. I am hoping to add a selection by individual imager in the near future.

Check it out!

By Gene Hanson

Astronomical League Events



NORTH CENTRAL REGION OF THE ASTRONOMICAL LEAGUE ANNUAL CONVENTION

Hosted by Door Peninsula Astronomical Society
MAY 4-5, 2018 at The Lodge at Leathem-Smith

"Dark Skies for Bright Stars"

<https://www.doorastronomy.org/ncral-2018>

ALCON 2018 COMING JULY 11-14



Our venue for the convention is the Hilton Hotel and Convenient Center conveniently located near the Minneapolis/St. Paul Airport and the world-famous Mall of America. In addition, we will also be showcasing our world-class outreach facility, Eagle Lake Observatory, with its two observatories and classroom facilities.

<https://alcon2018.astroleague.org>

In the Astronomical News

Physicists Solve 70-Year-Old Magnetic Wave Mystery

Scientists at Queen's University Belfast have led an international team to the ground-breaking discovery that magnetic waves crashing through the Sun may be key to heating its atmosphere and propelling the solar wind.

The Sun is the source of energy that sustains all life on Earth but much remains unknown about it. However, a group of researchers at Queen's have now unlocked some mysteries in a research paper, which has been published in *Nature Physics*.

In 1942, Swedish physicist and engineer Hannes Alfvén predicted the existence of a new type of wave due to magnetism acting on a plasma, which led him to obtain the Nobel Prize for Physics in 1970. Since his prediction, Alfvén waves have been associated with a variety of sources, including nuclear reactors, the gas cloud that envelops comets, laboratory experiments, medical MRI imaging and in the atmosphere of the Sun.

Scientists have suggested for many years that these waves may play an important role in maintaining the Sun's extremely high temperatures but until now had not been able to prove it.

Dr David Jess from the School of Mathematics and Physics at Queen's University Belfast explains: "For a long time scientists across the globe have predicted that Alfvén waves travel upwards from the solar surface to break in the higher layers, releasing enormous amounts of energy in the form of heat. Over the last decade scientists have been able to prove that the waves exist but until now there was no direct evidence that they had the capability to convert their movement into heat."

"At Queen's, we have now led a team to detect and pinpoint the heat produced by Alfvén waves in a sunspot. This theory was predicted some 75 years ago but we now have the proof for

the very first time. Our research opens up a new window to understanding how this phenomenon could potentially work in other areas such as energy reactors and medical devices."

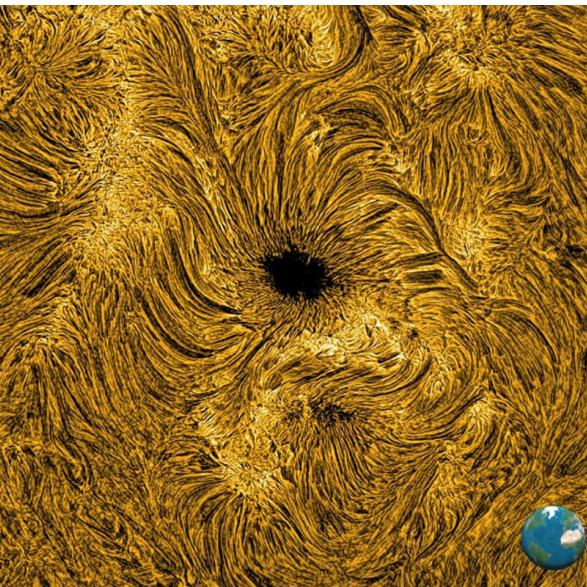
The international team included Queen's University Belfast; the Space Research Institute, Austria; Ilia State University, Georgia; the National Solar Observatory, USA; Instituto de Astrofísica de Canarias, Spain; Lockheed Martin, USA and California State University Northridge, USA.

The study used advanced high-resolution observations from the Dunn Solar Telescope in New Mexico (USA) alongside complementary observations from NASA's Solar Dynamics Observatory, to analyze the strongest magnetic fields that appear in sunspots. These sunspots have intense fields similar to modern MRI machines in hospitals and are much bigger than our own planet.

Dr Samuel Grant from Queen's comments: "By breaking the Sun's light up into its constituent colors, our international

team of researchers were able to examine the behavior of certain elements from the periodic table within the Sun's atmosphere, including calcium and iron."

"Once these elements had been extracted, intense flashes of light were detected in the image sequences. These intense flashes had all the hallmarks of the Alfvén waves converting their energy into shock waves, in a similar way to a supersonic aircraft creating a boom as it exceeds the speed of sound. The shock waves then ripple through the surrounding plasma, producing extreme heat. Using supercomputers, we were able to analyze the data and show for the first time in history that the Alfvén waves were capable of increasing plasma temperatures violently above their calm background."



A view of a sunspot on the solar surface, visible here as a dark collection of plasma with magnetic field strengths similar to those found in modern hospital MRI machines. The size of the sunspot, which is comparable to that of our own Earth gives these structures immense power and energy.

Credit: Queen's University Belfast

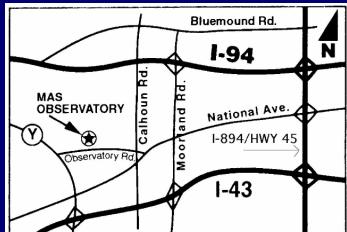
Adopt a Telescope Program - Signup Sheet

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	18" F/4.5 Obsession	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 Herman Restrepo/Matt Mattioli	8" F/11 Celestron EdgeHD	Ray Zit Observatory
8 Tamas Kriska	14" F/1.9 F-scope	Jim Toeller Observatory
9 Paul Borchardt	Solar scope	SkyShed POD

At Your Service

Officers / Staff

President	Tamas Kriska	414-581-3623
Vice President	Sue Timlin	414-460-4886
Treasurer	Sue Timlin	414-460-4886
Secretary	Agnes Keszler	414-581-7031
Observatory Director	Paul Borchardt	262-781-0169
Asst. Observatory Director	Jeff Kraehnke	414-333-4656
Newsletter Editor	Tamas Kriska	414-581-3623
Webmaster	Gene Hanson	262-269-9576



MAS Observatory

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Board of Directors

Scott Berg	262-893-7268
Russ Blankenburg	262-938-0752
Clark Brizendine	414-305-2605
Robert Burgess	920-559-7472
Jason Doyle	414-678-9110
John Hammetter	414-519-1958
Lee Keith	414-425-2331
Frank Kenney	414-510-3507
Jeff Kraehnke	414-333-4656
Sue Timlin	414-460-4886
Steve Volp	414-751-8334

April Keyholders

4/7	4/14	4/20	4/28
Tom Schmidtkunz	Sue Timlin	Tamas Kriska	Brian Ganiere
414-352-1674	414-460-4886	414-581-3623	414-961-8745