MILWAUKEE ASTRONOMICAL SOCIETY

FOCAL POINT

November, 2019

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December Meetings

Traditionally, the Milwaukee Astronomical Society does not have Board/ Membership meeting in December. We will resume the regular schedule in January. The program of the next meeting will be announced in the December issue.

However, the **First Wednesday** How To Meeting is still on and will be held on **December 4th** at 7:30 PM. The agenda is open, just show up and ask your question.

The **PixInsight Focus Group** also will gather in December, the meeting will be on Wednesday, **December 11th** at 7 PM.

As always, the Observatory is open on Saturday nights, and also when posted on the Google Group.

Annual Holiday Party

Don't miss the 2019 Christmas Party organized on Saturday, **December 7th** starting at **4:00 PM** at the Observatory, New Berlin.

Pizza and soda will be served. Donation of $5/person or $8/family is appreciated. Please bring along a side dish or dessert to share.

Please join us with your family or a friend. Let's celebrate the Winter Holidays and the New Year together!

Membership Renewal

There is still time to renew your membership if you have not already done so. If you prefer to do it online just follow this link: http://www.milwaukeeastro.org/sendmsg/onlineRenew.asp. The renewal form can also be printed out and send it back along with a check made payable to The Milwaukee Astronomical Society.

If you are wondering whether you need to renew your MAS membership, simply look for your name on this list: http://www.milwaukeeastro.org/membership/ membersRenewed.asp. If your name is there, your membership is active through 2020.

Thank you for being a member of the Milwaukee Astronomical Society.

Astronomy Calendar Sale

As every year, the Club is selling the Astronomy Magazine's Wall Calendar for MAS members for a discounted price of $10 (the retail price is $12.99). The calendar contains beautiful astrophotos and tons of interesting astronomical information. It is also perfect as a holiday gift.

The preordered calendars can be picked up at the Holiday Party, on any scheduled meetings, Saturday members nights, or you can ask for alternative arrangement.

Observatory Report

The only change at the Observatory in the last month has been the installation of a hot water heater in the south restroom. It will be a real pleasure being able to wash hands in warm water rather than ice cold water. Thank you, Mike Wagner, for making this project happen.

Since this is the last Observatory Director's report for 2019, I would like to thank all of the members who came out and donated their time and energy to help keep the observatory looking good.

Also, my thanks go out to all of the members who participated in the Observatory private tours. Without their help those tours would not be possible.

Respectfully Submitted,
Paul Borchardt, Observatory Director

Treasurer's Report

$4,553.85	***Starting Balance as of 10/16/2019***
	Expenditures
$24.68	PayPal fees
$208.94	Periodic expenses
$86.14	WE Energies
$319.76	TOTAL Expenditures
	Revenue
$29.00	Private donations
$1,214.00	Membership dues
$343.00	Public donations
$1,586.00	TOTAL Revenue
$5,820.09	***Ending Balance as of 11/13/2019***

Respectfully Submitted,
Sue Timlin, Treasurer

Membership Report

Since the last Report we received 12 renewals and 5 new applications. We welcome Tate Wilson & Family, Maureen Gallagher, Stephen Zodrow & Family, Dennis Abere & Family, and Matthew Gottsacker. The total number of active members is 187.

Respectfully Submitted,
Jeff Kraehnke, Committee Chair

Meeting Minutes

The meeting was held on November 15th at the MAS Observatory, New Berlin and was called to order at 7:00PM by Tamas Kriska President.

Minutes, **Treasurer's Report, Observatory Director's Report, and Membership Committee Report** electronically submitted ahead of the meeting were approved. Membership applications of Kathy Vasquez, the Wilson family, Maureen Gallagher, the Zodrow family, and the Abere Family were approved.

Old Business – *Maintenance*: The 2019 Maintenance projects were completed with a remaining of $368.84.

Solar camera: More information will be collected regarding the acquisition software that the Blackfly 5 camera uses.

Snow plowing: An offer of $60/plow arrived. We will get another quote next week.

Hot water heater: The new heater was installed in the handicapped bathroom.

New Business – None.

Announcement – Tamas met Sherry Shaffer from the Development Dept. of the Lowell Observatory, Flagstaff AZ on October 14th. She offered sharing fundraising contacts when needed.

The next meeting will be on Friday, January 17st, 2020.

Program – Dennis Roscoe gave a talk entitled "A Dragonfly on Titan".

Respectfully Submitted,
Agnes Keszler Secretary

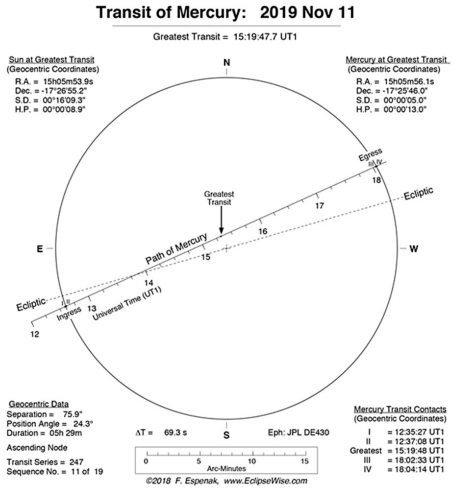
Astronomical Event

Transit of the Mercury: November 11th 2019

A transit of Mercury across the Sun takes place when the planet passes directly between the Sun and a superior planet, becoming visible against (and hence obscuring a small portion of) the solar disk. During a transit, Mercury appears as a tiny black dot moving across the disk of the Sun.

Transits of Mercury with respect to Earth are much more frequent than transits of Venus, with about 13 or 14 per century, in part because Mercury is closer to the Sun and orbits it more rapidly.

The event only happens when the Earth is aligned with a node of Mercury's orbit. Currently that alignment occurs within a few days of May 8 (descending node) and November 10 (ascending node), with the angular diameter of Mercury being about 12" for May transits, and 10" for November transits. The average date for a transit increases over centuries as a result of the longitude of the nodes of Mercury's orbit increasing by about 1.1 degree per century.



A typical transit lasts several hours. The last transit occurred on May 9, 2016, and the next can be observed in North America on November 13, 2032.

Observing the Transit in Wisconsin

The forecast for November 11 in Milwaukee was pretty bad, overcast and snow in the morning hours. Having zero chance to catch the transit, some of us braved to drive all the way to Tomah, WI hoping for a better luck. The observing conditions could be summarized best by Jeff Kraehnke's words:

"It was 16 °F and the wind was blowing like crazy, we almost froze. Tomah, WI was nice, but I don't think I ever have to go there again! You can see from the pics we were dodging between openings in the clouds. There are no details on my picture other than Mercury moving across the disc. It was so cold, I just couldn't get the tuners to turn enough to get any solar features. But figuring the next one I would have a chance to see I will be 73 years old, it was good we were successful here. "

Jeff Kraehnke: Using a Lunt 80mm double stack solar scope and ZWO ASI174MM camera

Tamas Kriska: Single shot image taken with a Canon 60D DSLR/200mm lens/solar filter

Member's Stories

Harrington Beach Star Party on November 22nd

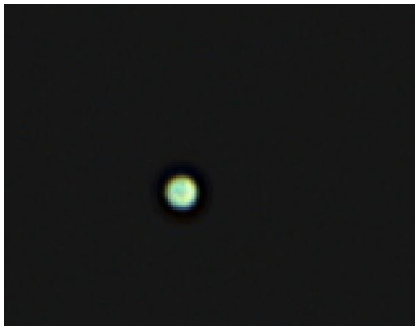
Harrington Beach was quite busy last night. It was good to see so many people out and it seemed everyone had their own targets in mind so I'm sure there's much to look forward to.

I changed from my live stacking routine to do some long 10 minute exposure imaging which was a first with this camera and this mount for that matter. I had no idea if I would get any usable data. The ASI178MC Cool tends to exhibit amp glow that I can't correct it out with my typical higher gain settings at 2 minute exposures so I had no idea what would happen at 10 minutes with no gain. None the less I took 4 hours of data on IC63 (left). I'm very happy with how it turned out for a OSC and the Orion Skyglow Imaging Filter.

by Jason Doyle

Other images taken at the star party by Arun Hegde (M45, Pleiades) and Subhendu Sadhukhan (M42, Orion nebula).

Imaging at the Observatory on November 22nd



It sounds like the Harrington star party was a hit last Friday. A few of us stayed closer to home at the observatory. And while the focus was on deep sky objects, just 1.76 billion miles away sits Uranus. Pronounce it how you want, it is easy to find and sits above 40 degrees altitude this entire season. It's easy to find as a blue-green disk in any of our telescopes with a goto computer or manual setting circle. "A scope" gives us the most magnification.
I took 2 short videos of 1000 frames each and stacked them with free software. I refocused between the two, so I don't expect any artifacts. Here's what I got.

I think those are real atmospheric features as they look similar from 2 different videos. Anyway, it's a bit more challenging than Saturn or Jupiter if you're just starting out in planetary imaging. But any of our keyholders will be able to help on a Saturday night. I'll also try to post if I'm going out on a weeknight for those who are interested in visual or photographic planet hunting. By the way, Neptune (not pictured here) is smaller and bluer, but also at it's highest in the early evening right now.

by Russ Blankenburg

Lunar Libration

Observing the Far Side: Mare Orientale

We all know that the moon always presents the same face to observers since it takes as long to turn once on its axis as it does to complete one orbit of the Earth.

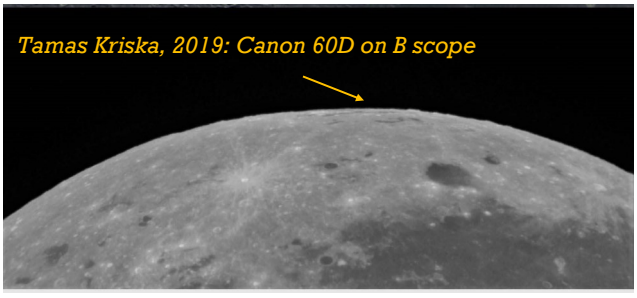
This is because the Moon in tidally locked to our planet. A crude analogy is swinging a bucket on a piece of string around your head - the bucket's opening always points to your head.

The Moon's orbit is elliptical rather than circular, so it speeds up near perigee (closest to Earth) and slows down near apogee (farthest from Earth) in accordance with Kepler's laws.

The Moon's speed of rotation about its axis remains essentially constant from month to month as a consequence of the conservation of angular momentum.

As on Earth, the position of features on the Moon are measured in Latitude and Longitude (called Selenographic Latitude and Longitude).

The lunar equator lies at 0 degrees latitude and the Prime Meridian (at 0 degrees longitude), runs from the north to south pole along the vertical running down the centre of the Moon's disk.



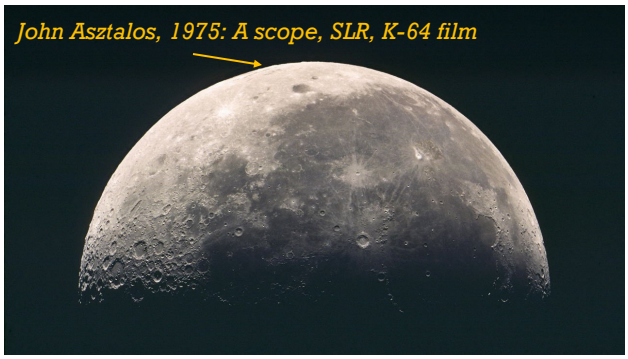
The Moon's orbit is also tilted to the ecliptic plane and to the Earth's equator by about 5 degrees.

As a consequence of these factors, the Moon appears to 'nod' from side to side and up and down during a lunar month, and it is possible to observe about 59% of the Moon's surface over a period of time, although we can only see 50% at any one instant.

The term given to this 'nodding' is "*Libration*". There are in fact three types of libration involved in the moon's motions.

Libration in latitude is due to the Moon's axis being slightly inclined relative to the Earth's. Each of the lunar poles will appear to be alternately tipped slightly toward and away from the Earth-based observer over a roughly four week cycle.

Diurnal libration is due to the observer being up to four thousand miles to one side of the Earth-Moon axis on the surface of the Earth - a significant proportion of the centre-to-centre distance. The difference in perspective between the rising and setting of the Moon appears as a slight turning of the Moon first to the west and then to the east.



Libration of longitude is an effect of the Moon's varying rate of travel along its slightly elliptical orbit. Its rotation on its own axis is more regular, the difference appearing again as a slight east-west oscillation.

Although the Moon always presents the same face towards the Earth, due to its rotation and revolution being locked to the same period, the combined effect of these different librations allows us over time to see some 59% of its surface.

At very favorable librations, the Moon can rotate by as much as 8 degrees in latitude or longitude, bringing features that are normally on the limb into better view.

lunarphasepro.com

In the Astronomical News

Hubble Captures a Dozen Sunburst Arc Doppelgangers

The new image from the NASA/ESA Hubble Space Telescope shows an astronomical object whose image is multiplied by the effect of strong gravitational lensing. The galaxy, nicknamed the Sunburst Arc, is almost 11 billion light-years away from Earth and has been lensed into multiple images by a massive cluster of galaxies 4.6 billion light-years away.

The mass of the galaxy cluster is large enough to bend and magnify the light from the more distant galaxy behind it. This process leads not only to a deformation of the light from the object, but also to a multiplication of the image of the lensed galaxy.

A massive galaxy cluster, about 4.6 billion ly away. Along its borders 4 bright arcs are visible; these are copies of the same distant galaxy, nicknamed the Sunburst Arc. Credit: ESA/Hubble, NASA, Rivera-Thorsen et al

In the case of the Sunburst Arc the lensing effect led to at least 12 images of the galaxy, distributed over four major arcs. Three of these arcs are visible in the top right of the image, while one counterarc is visible in the lower left -- partially obscured by a bright foreground star within the Milky Way.

Hubble uses these cosmic magnifying glasses to study objects otherwise too faint and too small for even its extraordinarily sensitive instruments. The Sunburst Arc is no exception, despite being one of the brightest gravitationally lensed galaxies known.

The lens makes various images of the Sunburst Arc between 10 and 30 times brighter. This allows Hubble to view structures as small as 520 light-years across -- a rare detailed observation for an object that distant. This compares reasonably well with star forming regions in galaxies in the local Universe, allowing astronomers to study the galaxy and its environment in great detail.

Hubble's observations showed that the Sunburst Arc is an analogue of galaxies which existed at a much earlier time in the history of the Universe: a period known as the epoch of re-ionization -- an era which began only 150 million years after the Big Bang.

The epoch of re-ionization was a key era in the early Universe, one which ended the "dark ages," the epoch before the first stars were created when the Universe was dark and filled with neutral hydrogen. Once the first stars formed, they started to radiate light, producing the high-energy photons required to ionize the neutral hydrogen.

This converted the intergalactic matter into the mostly ionized form in which it exists today. However, to ionize intergalactic hydrogen, high-energy radiation from these early stars would have had to escape their host galaxies without first being absorbed by interstellar matter. So far only a small number of galaxies have been found to "leak" high-energy photons into deep space. How this light escaped from the early galaxies remains a mystery.

The analysis of the Sunburst Arc helps astronomers to add another piece to the puzzle -- it seems that at least some photons can leave the galaxy through narrow channels in a gas rich neutral medium. This is the first observation of a long-theorized process. While this process is unlikely to be the main mechanism that led the Universe to become re-ionized, it may very well have provided a decisive push.

sciencedaily.com

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/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

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Vice President	Lee Keith	414-425-2331
Treasurer	Sue Timlin	414-460-4886
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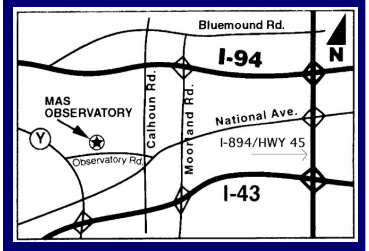
Gabe Shaughnessy	262-893-4169
Steve Volp	414-751-8334
Mike Wagner	262-547-3321



MAS Observatory

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www.milwaukeeastro.org

December Keyholders

12/07	Mike Bauer	262-894-1253
12/14	Russ Blankenburg	262-938-0752
12/21	Paul Borchardt	262-781-0169
12/28	Brian Ganiere	414-961-8745