



December, 2018

January Meetings

The MAS will hold its next **General Meeting** on **Friday, January 18th**, at **8 PM** at the Observatory. **Jeff Kraehnke** will give an overview on the recent **Mars Missions** with the focus on interesting but less known aspects of these missions. It will be preceded by a Board Meeting from 7 PM that is open for everybody who is interested in organizational and Observatory related issues.

The **Observatory Committee** will meet on Saturday, **January 5th** at **4 PM** at the Observatory to discuss an equipment rearrangement plan to improve both visual and imaging capabilities of the Club in order to increase the use of the Observatory. Every interested member is welcome.

As always, the Observatory is open on every Saturday Member's Night and when it is announced on the Google Group. However, there will be **NO First Wednesday Meeting** in January.

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Program Chair Wanted

We are looking for a member who is interested in filling the Program Chair position. The duty of a Program Chair is finding and arranging speakers for monthly Membership Meetings from January through May and then following the summer brake from September through November.

If you are interested please contact Tamas Kriska (tkriska@mcw.edu) to receive a much detailed description and all the help you might need to get started.

Lunar Eclipse

On **Sunday, January 20th** starting at 21:30 PM Milwaukee time there will be a Total Lunar Eclipse that we will be able to see from start to finish. The Moon will be fully eclipsed by 10:41 PM, and this will last for over an hour before the Earth's shadow starts moving away from the Moon.

The Observatory will be open for a Moon party. The eclipsing Moon will be next to the Beehive cluster!

Mark up your calendar, this Total Lunar Eclipse will be the last one until May of 2022.



Membership Renewal

It is still not too late to renew your MAS membership! There are several renewal methods you can choose from. If you prefer to do it online just follow this link: <http://www.milwaukeeastro.org/sendmsg/onlineRenew.asp>. The renewal form can also be sent 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 2019.

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



As we turning the page on 2018 we can proudly look back at all the events and great achievements of the year. Let's summarize them:

Our membership continued to grow. We welcomed 47 new members and by the end of December the membership number reached 190. Two new Directors were elected into the Board. All the officers were re-elected to their current positions.

The MAS Google Group was extremely active, kept the membership informed about the upcoming events, status of the observatory equipment, and exhibited the latest astrophotos taken by members.

During the year we hosted five Public Nights, several Observatory Tours and invited five guest speakers for Membership Meetings. We appeared on the TMJ4 Channel for an interview and in the PBS program Wisconsin Life.

The Club organized a Star Party on Harrington Beach, a Summer Picnic, and a Christmas Party. Sadly, we could not attend the traditional star party for Yerkes Summer School the first time in decades because the Yerkes Observatory significantly scaled back its astronomical programming during summer and cease operations in October.

We helped young members to complete their elementary and high school Science Projects.

Our member's astrophotos received awards from the APOD community and the Astroimaging Channel.

The remodeling of the Observatory continued this year. The Z dome's rotation was automated that allowed us to synchronize the dome slit position with the G-scope. A manual control was also installed on the wall of the dome.

We replaced the leaky SkyShed Pod dome on the Solar Observatory with a new NexDome, that finally made the place waterproof.

In the B-dome slit opener system was repaired.

Both A- and B-domes received a complete overhaul. The building walls were repaired and repainted both inside and outside. Vinyl flooring was installed in A-dome while B-dome's floor was recoated, and a new shelf installed. The slow motion control of the A-scope was rebuilt.

The exterior of the Quonset and Z-building were pressure washed and painted. The Quonset received three coats of rubber roofing paint.

The trees that obscured the western sky from the Z-dome were cut along with the shrubs at the back garage.

The asphalt driveway was repaired and sealed.

The old yard hydrant together with the rusted water line were replaced. A new pressure tank was installed inside the A-building.

The Z-scope was taken apart, the mirror was cleaned and sold, and all the metal parts were scrapped.

New chairs for the Control Room, and a projector for the Quonset were donated. A dehumidifier was installed into the Quonset to keep it dry during the summer.

The old Z-scope fork was permanently immobilized and painted to matching color with a newly constructed bridge and riser. The G-scope set up was reinstalled on the new AP GTO1600GTO mount.

Thank you everyone for all the contributions and for being a member of the Milwaukee Astronomical Society. We wish all of you a Happy New Year!

ChristMAS Party

The 2018 Holiday Season celebration took place on Saturday afternoon of December 8th. Just like in previous years close to 40 members gathered in the decorated Quonset Hut. Longtime and new members enjoyed each other's fellowship and the excellent food. Many of us stayed late after the party to take advantage of the moonless clear night.

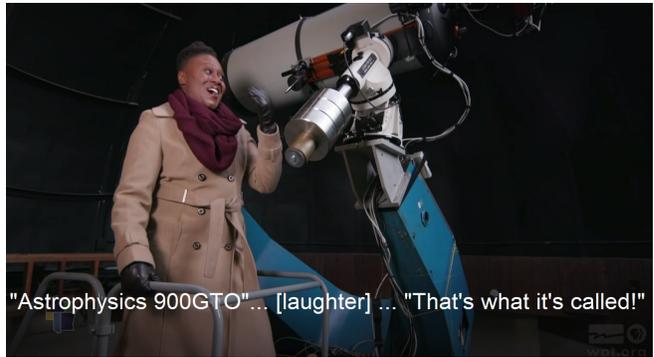


MAS in the Media



PBS program Wisconsin Life aired on December 27th was partially dedicated to introducing viewers to the Milwaukee Astronomical Society. Host Angela Fitzgerald spent a day at the Observatory recording footages and interviews with the Observatory Director, Paul Borchardt. The segment about MAS turned out to be much shorter than we anticipated but nevertheless it provided valuable exposure for the Club.

To see the whole program follow this: <https://www.pbs.org/video/telescopes-and-treble-clef-zigr9l/>



Observatory Maintenance

After finishing the bridge the G-scope was re-assembled on the new AstroPhysics GTO1600 mount.

As part of the ongoing equipment shuffle the Z2 Observatory was rearranged by replacing the 8" Celestron with the 10" LX200 scope on a CGEM mount (former F-scope) to be used for visual observation and DSLR camera-assisted imaging.

Per request of New Berlin Fire Department a metal door was installed (by Mike Wagner) to the main breaker box. The photoluminescent exit signs were replaced by a permanently glowing ones.



In the Astronomical News

Large, Strangely Dim Galaxy Found Lurking on Far Side of Milky Way

Circling our galaxy is a stealthy giant. Astronomers have discovered a dwarf galaxy, called Antlia 2, that is one-third the size of the Milky Way itself. As big as the Large Magellanic Cloud, the galaxy's largest companion, Antlia 2 eluded detection until now because it is 10,000 times fainter. Such a strange beast challenges models of galaxy formation and dark matter, the unseen stuff that helps pull galaxies together. "It's a very odd object and kind of exciting because we don't know yet how to interpret all of its properties," says Andrey Kravtsov of The University of Chicago in Illinois, who was not involved in the work.

The galaxy was discovered with data from the European Space Agency's Gaia satellite, a space

telescope measuring the motions and properties of more than 1 billion stars in and around the Milky Way. Gabriel Torrealba, an astronomy postdoc at the Academia Sinica in Taipei, decided to sift the data for RR Lyrae stars. These old stars, often found in dwarf galaxies, shine with a throbbing blue light that pulses at a rate signaling their inherent brightness,

allowing researchers to pin down their distance.

"RR Lyrae are so rare at these distances that even if you see two, you question why they are together," says Vasily Belokurov, an astronomer at the University of Cambridge in the United Kingdom and a collaborator on the discovery. When the team found three, some 420,000 light-years away, it was "an overwhelming signal" of a large cluster of stars in that location, Belokurov says. But because the RR Lyrae stars lie on the far side of the disk of the Milky Way and its obstructing veil of stars and gas, finding their companions was not easy.

Gaia data helped the team see past the foreground stars. Objects in the Milky Way's disk are close enough for Gaia to measure their parallax: a shift in their apparent position as Earth moves around the sun. More distant stars appear fixed in

one spot. After removing the parallax-bearing stars, the researchers homed in on more than 100 red giant stars moving together in the constellation Antlia, they report in a paper posted to the preprint server arXiv this week. The giants mark out a sprawling companion galaxy 100 times less massive than anything of similar size, with far fewer stars.

To explain such a diffuse galaxy, Belokurov suggests that early in Antlia 2's history, many young stars exploded as violent supernovae. This would have blown gas and dust out of the galaxy, weakening its gravity so that it puffed up. An abundance of the heavy elements that are strewn from the guts of exploding stars adds credibility to

this idea, says Shea Garrison-Kimmel, an astrophysicist at the California Institute of Technology in Pasadena. Antlia 2 could also have lost matter as stars were tugged away by gravitational tidal forces as it orbited around the larger Milky Way. Even so, its disproportionate size is hard to explain. Galaxies are thought to have formed when the gravity of



Antlia 2 (upper left), hidden on the Milky Way's far side, is as big as the Large Magellanic Cloud (lower right) but much dimmer. (A bright, artificial blue blob representing Antlia 2 was added to show its location.) Credit: G. Torrealba, Academia Sinica, Taiwan; V. Belokurov, Cambridge, U. K.; CCA New York. Based on an image by ESO/S. Brunie.

enormous clumps of dark matter drew in enough ordinary matter to fuel the birth of stars. The team speculates that Antlia 2 might have been born from a fluffier, faster-moving type of dark matter than current models hypothesize.

To Garrison-Kimmel, one example isn't enough to say the dark matter in Antlia 2 is different from that in the Milky Way and its other satellites. "There's nothing in this one galaxy that screams to me that we need to rethink dark matter," he says. "But if there are a lot of these, then we might need to take a step back and ask what's going on."

That could happen now that astronomers know how to find these big, elusive companions. "I think this object is a harbinger," Kravtsov says. "A taste of things to come."

by Adam Mann, sciencemag.org

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	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

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January Keyholders

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1/19	Tom Schmidtkunz	414-352-1674
1/26	Sue Timlin	414-460-4886



MAS Observatory

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