The Warren Astronomical Society concluded the year with a bang-up finale, accompanied by an impromptu drum line. Booming drums aside, it was a delight to see new faces in the group. Plus, Jeff MacLeod managed to work in a bit of juggling.

The prize table, once again, had a desirable selection of prizes, a choice one being a Vixen telescope which went to our president-elect, Jeff MacLeod. The way he clutched it, you could almost hear him whispering, “My Precious.” Many thanks to the product sponsors for the event: Apache-Sitgreaves Research Center, Celestron Corporation, Oberwerk Corporation, Sirius Astro Products, and Sky and Telescope Magazine, along with the many generous donations from our own members.
Society Meeting Times

Astronomy presentations and lectures twice each month at **7:30 PM**:

**First Monday** at Cranbrook Institute of Science.

**Third Thursday** at Macomb Community College - South Campus Building J (Library)

Note: for the summer, we are meeting in room 151, lower level of the library.

Jan 8 Cranbrook Dale Partin
Jan 18 Macomb Jerry Dunifer
Feb 5 Cranbrook Mike O’Dowd

If you are unable to bring the snacks on your scheduled day, or if you need to reschedule, please email the board at board@warrenastro.org as soon as you are able so that other arrangements can be made.

January Discussion Group Meeting

**Tuesday, January 23 from 6:30 - 8:30 PM**

**22275 Michigan Ave.**

**Dearborn, Michigan**

Coffee and cookies provided (donations requested), bring snacks and drinks to share.

A new community marketplace in Dearborn offered to host discussion group this month. They have a large, comfortable seating area, as well as gifts and food products for sale, made and/or sold by local businesses.

More info: https://www.facebook.com/MadeMetroCollective/

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17 GLAAC
18 NASA Space Place
As always, Gus Povirk treated us with piano music during the pre-dinner mingling (and for the conclusion of the evening). Following dinner, the main speaker, Dr. Emily Rauscher, gave us insight into her field of exoplanet studies.

After the talk, Diane Hall presented the awards for this year: The Bob Watt award went to Connie Trembley for her efforts in astronomical education; The Blaine McCullough award, to Pat Brown, recognizing his outreach efforts; Jon Blum received the Larry F. Kalinowski award for his contributions and aloha spirit; Riyad Matti was the recipient of this year’s E. John Searles award owing to his involvement with Stargate Observatory, and a Lifetime Membership awarded to Rik and Dolores Hill for, well, everything they mean to this club. Hearty congratulations to all.

Dale Thieme,
staff reporter
Make Astronomy great again! Well, not really, I believe Astronomy is already great and this is especially true of the Warren Astronomical Society. I hope it would not surprise you when I say this club means the world to me or perhaps the Sun and the Moon. I don’t believe I hide my passion for Astronomy, this club, its members, or sharing all that with the public. But it may surprise some of you just how much I credit this club and its members for the path my life has taken. I was fortunate to find the Warren club just when I needed it. Almost every long-term friend I had left Michigan for one reason or another, my engagement did not end in marriage, and the company I worked for owed me thousands in unpaid wages.

The transit of Venus in 2012 had reawakened my urge to observe but it wasn’t until I made a meetup account that I found the Warren Club. I was told about meetup and was looking for adventure type social groups, I think the first one I went to was for ultimate frisbee. At some point meetup suggested other interests and astronomy was one of the categories, so I added it and out popped the Warren astronomical society. Ever since then this club has been an unyielding source of knowledge, friendship, and support.

This organization and its members are the singular reason I am currently a physics major at Wayne State, a Solar System Ambassador for NASA, and now President. It is a responsibility I accept with much excitement and anxiety. Let’s be honest the club ran like a swiss watch under Diane’s leadership, she is an impossible act to follow and I’ve followed some pretty amazing acts before, you think I’m a good juggler? My main goal for the club is for it to still be here a year from now, but I have some more lofty goals in mind that I think we can also achieve. I would like to have more members after the year, specifically I would love to see some younger regulars, where did they all go? The walkway around stargate is so high on my priorities if it was moving 17,000 miles an hour it would be in orbit! I really wanted to get this taken care of

### Astronomical Events for January 2018

Add one hour for Daylight savings.

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<thead>
<tr>
<th>Day</th>
<th>EST (h:m)</th>
<th>Event</th>
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<tr>
<td>01</td>
<td>15</td>
<td>Mercury at Greatest Elong: 22.7°W</td>
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<td>01</td>
<td>16:54</td>
<td>Moon at Perigee: 356566 km</td>
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<td>01</td>
<td>21:24</td>
<td>FULL MOON</td>
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<td>03</td>
<td>01</td>
<td>Earth at Perihelion: 0.98329 AU</td>
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<td>Beehive 2.3°N of Moon</td>
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<td>15</td>
<td>Quadrantid Meteor Shower</td>
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<td>Moon at Ascending Node</td>
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<td>02:24</td>
<td>Regulus 0.9°S of Moon</td>
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<td>17:25</td>
<td>LAST QUARTER MOON</td>
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<td>09</td>
<td>01</td>
<td>Venus at Superior Conjunction</td>
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<td>11</td>
<td>00:59</td>
<td>Jupiter 4.3°S of Moon</td>
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<td>11</td>
<td>05:03</td>
<td>Mars 4.6°S of Moon</td>
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<td>13</td>
<td>03</td>
<td>Mercury 0.7° of Saturn</td>
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<td>14</td>
<td>21:10</td>
<td>Moon at Apogee: 406461 km</td>
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<tr>
<td>14</td>
<td>21:13</td>
<td>Saturn 2.6°S of Moon</td>
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<td>02:24</td>
<td>Mercury 3.4°S of Moon</td>
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<td>21:17</td>
<td>NEW MOON</td>
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<td>Moon at Descending Node</td>
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<td>Venus at Aphelion</td>
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<td>04:54</td>
<td>Moon at Perigee: 358995 km</td>
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<td>02:19</td>
<td>Beehive 2.3°N of Moon</td>
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<tr>
<td>31</td>
<td>08:27</td>
<td>FULL MOON</td>
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<td>31</td>
<td>08:30</td>
<td>Total Lunar Eclipse; mag=1.315</td>
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<tr>
<td>31</td>
<td>13:46</td>
<td>Moon at Ascending Node</td>
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while I was observatory chair, but alas winter and some other variables worked against us and it will have to wait. Perhaps I’ll tell the whole story in my last field of view. Joe is now back in charge of the observatory and our liaison to the Metropark, Joe is on it I assure you, he’s the best. While I am talking about Joe, I would also like to talk about my board. I struggle to think of a more qualified group of people I could have helping me, passed presidents, others returning or staying in position, and I would venture to guess there’s even a future president in there. Aside from me looking at my school trajectory and thinking it’s now or never, Jonathan and Diane agreeing to board positions was the deciding factor in me taking on the role of president. I’d also like to specifically thank Ruth Huellmantel and Brian Thieme for staying on another year and not aborting as soon as I was nominated president. To Parker Huellmantel, good luck! Secretary is about as tedious and thankless as it gets, did Joe not tell you that? I know you’ll do great. I’m looking forward to working with everyone on the board and all our members as we continue to grow the club and our impact within the greater community. As with every small step, a giant leap.

Jeff MacLeod
President

Warren Astronomical Society Board Pictures

2017 Board

Left to right:
Joe Tocco, Secretary
Jeff MacLeod, 2nd VP
Ruth Huellmantel, Treasurer
Bob Trembley, Outreach
Diane Hall, President
Mark Kedzior, 1st VP
Brian Thieme, Publications

2018 Board

Left to right:
Parker Huellmantel, Secretary
Joe Tocco, 2nd VP
Jonathan Kade, 1st VP
Ruth Huellmantel, Treasurer
Jeff MacLeod, President
Diane Hall, Outreach
Brian Thieme, Publications
Main presentation: “2017’s Biggest Astronomy News” by Ken Bertin with Diane Hall, Jeff Macleod, Bob Trembley, Jerry Dunifer, and Jonathan Kade

Each of the assistant presenters will share our personal biggest astronomy story of 2017 as a 10-minute short talk, and Ken will give a quicker overview of five runners-up.

Short presentation: “Pulsar 1913+16 and the Nobel Prize” by Jerry Dunifer

The 2017 Nobel Prize in Physics, announced October 3, 2017, was awarded to Rainer Weiss, Barry Barish, and Kip Thorne for their direct detection of gravitational waves using LIGO. But that wasn’t the first Nobel awarded for detection of gravitational waves! There was another Nobel Prize, awarded 24 years earlier (in 1993), for an indirect detection of gravitational waves. This is the story of that discovery.

The earlier Nobel Prize was given to Joseph Taylor and Russell Hulse, both of Princeton University, for their detection of the first binary-pulsar system and their measurements showing the system was losing energy at exactly the same rate expected for the generation of gravitational waves as predicted by Albert Einstein’s General Theory of Relativity. The binary pulsar, now known as Pulsar 1913+16, had an orbital period that was decreasing at the rate of 75 microseconds/year, which agreed within 0.5% of the value calculated from the General Theory of Relativity. This presentation will give a brief description of the work of Taylor and Hulse and the nature of Pulsar 1913+16.

Main presentation: Dr. Dale Partin will talk about the Moon, and about humanity’s relationship with it. He says: “The Moon has fascinated people from the dawn of humanity. What is it? What was its origin? And did we actually go there, or was that a hoax – a giant conspiracy? These and related issues will be discussed.”

Dr. Dale Partin is an amateur astronomer and he teaches astronomy at Macomb Community College. He has B.S. and M.S. degrees in physics and a Ph.D. in electrical engineering from Carnegie-Mellon University. Until his partial retirement, he did advanced research in the auto industry. He has over 80 scientific publications and 38 patents, and is a fellow of the American Physical Society and a member of Sigma Xi and of the American Scientific Affiliation. Until his partial retirement, he was also a member of the Institute of Electrical and Electronics Engineers, the Society of Automotive Engineers, and the American Vacuum Society. His interests include astronomy, archaeology, and biblical studies.
Over the Moon
with Rik Hill

Shoreline

Here were see the eastern (lunar) shore of Mare Serenitatis. The first feature you probably notice is at the top of this image, the grand crater Posidonium (99 km diameter) with it's floor reticulated by rimae of several different origins. Adjacent to it, to the southeast or lower right, is the crater Chacornac (53 km), its walls softened by a blanket of eject laid on it from the younger Posidonium impact. Note that some of the rimae from Posidonium cross over this crater and go beyond. Below Chacornac is Le Monnier (63 km), an embayment that formed during Serenitatis impact when an ancient crater was flooded. At the bottom of this image is the shadow filled Plinius (44 km) with Dawes (19 km) to the upper right of it and near the right edge of the image the crater Vitrihius (31 km).

Out in the mare on the edge of shadow is the north-south “Serpentine Wrinkle Ridge” Dorsa Smirnov. I find lengths listed from 135 km (Virtual Moon Atlas) to 500 km (moon-Wikispaces) for this feature with 222 km being the value used by LROC. Another ridge can be seen running from Le Monnier south almost to prominence sticking out into the mare where the ghost crater Abetti (17 km) can be found. Just above Vitrihius a row of four similar sized mountain peaks can be seen. 45 years ago this next week Apollo 17 landed just north of the second peak in from the left. This was the place where man, Gene Cernan in this case, left his last footprint on the moon and brought back 244 lbs of samples. As he boarded the Lunar Module he is reported to have said:

“I'm on the surface; and, as I take man's last step from the surface, back home for some time to come - but we believe not too long into the future - I'd like to just say what I believe history will record. That America's challenge of today has forged man's destiny of tomorrow. And, as we leave the Moon at Taurus-Littrow, we leave as we came and, God willing, as we shall return, with peace and hope for all mankind. "Godspeed the crew of Apollo 17."

This composite was made from 4 images each a stack of 500/1500 frame AVIs using AviStack2 and assembled with iMerge. Final processing was done with GIMP and IrfanView.

Rik Hill
Object of the Month: NGC 2244

NGC 2244 is an open cluster that lies at the heart of an impressive nebula/cluster complex in the constellation Monoceros. It is conspicuous and attractive in telescopes of all size, and is notable as the source of illumination for the Rosette Nebula, a large ring of ionized glowing hydrogen gas about 130 light years across and 4,900 light years away. The cluster has an integrated apparent magnitude of 4.8 and an angular diameter of about 20'. It is comprised of mostly hot O-type stars indicating that the member stars have formed very recently, perhaps within the last half million years. Both the cluster and the nebula were discovered by William Herschel and were included in his New General Catalog, although each visible region was assigned a separate catalog entry. The cluster was designated as NGC 2244, whereas the brightest regions of the Rosette were assigned the NGC numbers 2237, 2238, 2239, and 2246. The Rosette Nebula has an apparent size greater than 1° in diameter and covers an area of sky greater than four times that of the full moon, but is much fainter and more difficult to observe than the cluster.

NGC 2244 is positioned about 2° east of Monocerotis (mag. 4.4) and 9° east-southeast of Betelgeuse (Orionis, mag. 0.4). A convenient way to pinpoint the object is by searching the area 2° south of a point about one-third the distance along a line from Betelgeuse to Procyon (Canis Minoris, mag. 0.4). The cluster is best observed at low to medium power, with 50x magnification providing a pleasant view. However, most observers will wish to glimpse the Rosette Nebula as well—not being fully satisfied by merely seeing the central cluster of stars. This task is more difficult, unfortunately, but is certainly rewarding. The Rosette requires a very wide field of view and low power for it to stand out against the field. In fact, some observers can plainly see it in binoculars, yet find it undetectable in their telescope at any achievable magnification. It is advised to use the longest focal length and widest angle eyepiece available, ideally one with a true field of at least 2°, as well as a nebula filter if the sky contains noticeable levels of light pollution. Under ideal circumstances, a cluster of about two dozen stars can be seen residing in a central “hole” within the nebula, with numerous dark lanes, bright streaks, and other fine structure discernable with the aid of a UHC or OIII filter.
The Cranbrook Observatory is open to the public Friday and Saturday evenings from 7:30 - 10:00pm EST, and the first Sunday of the month from 1:00 - 4:00pm (EST). For observatory information visit http://science.cranbrook.edu/explore/observatory.

What is that dashed line? It's the ecliptic, the reference plane of the solar system, defined by the Sun and Earth. The major planets and the Moon can be found within a few degrees of this plane.

Notable Sky Happenings

JANUARY 2018

For astronomy information visit http://science.cranbrook.edu

Also Showing

From Dream to Discovery

Now Showing

Journey from NASA's test facilities all the way to Pluto and experience the excitement of today's space missions. Immerse yourself in the adventures and extremes of the JPL Mars Science Laboratory's Curiosity rover and experience the excitement of identifying new habitable planets and moons.

"From Dream to Discovery"

For astronomy information visit http://science.cranbrook.edu

Also Showing

When Elmo's friend, Hu Hu Zhu, visits from China. Big Bird, Elmo and Hu Hu Zhu take viewers on an exciting adventure through outer space. In "One World, One Sky: Big Bird's Adventure" viewers will follow the journey from NASA's test facilities all the way to Pluto and experience the excitement of today's space missions.

"One World, One Sky: Big Bird's Adventure"

The Cranbrook Observatory is open to the public Friday and Saturday evenings from 7:30 - 10:00pm EST, and the first Sunday of the month from 1:00 - 4:00pm (EST). For observatory information visit http://science.cranbrook.edu/explore/observatory.

What is that dashed line? It's the ecliptic, the reference plane of the solar system, defined by the Sun and Earth. The major planets and the Moon can be found within a few degrees of this plane.

Jan. 22 - 31

Jan. 1 - 7

Jan. 8 - 14

Jan. 15 - 21

Jan. 22 - 31

Total Lunar Eclipse on the 31st. Partial phase begins at 6:48am; maximum eclipse is at 7:42am, but the Moon sets at 7:47am (WNW).

The moon is to the left of Mercury with Saturn to the upper right on the 15th (ESE morning twilight).

The moon is to the upper left of Mars and Jupiter in the SSE predawn twilight.

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Monthly Free Astronomy Open House and Star Party

4th Saturday of the month!
Wolcott Mill Metropark - Camp Rotary entrance

- Sky tours.
- Look through several different telescopes.
- Get help with your telescope.
- We can schedule special presentations and outings for scouts, student or community groups.

Contact: outreach@warrenastro.org

Find us on MeetUp.com

Observatory Rules:
1. Closing time depends on weather, etc.
2. May be closed one hour after opening time if no members arrive within the first hour.
3. Contact the 2nd VP for other arrangements, such as late arrival time. Call (586) 634-6240.
4. An alternate person may be appointed to open.
5. Members may arrive before or stay after the scheduled open house time.
6. Dates are subject to change or cancellation depending on weather or staff availability.
7. Postings to the Yahoo Group and/or email no later than 2 hours before starting time in case of date change or cancellation.
8. It is best to call or email the 2nd VP at least 2 hours before the posted opening with any questions. Later emails may not be receivable.
9. Generally, only strong rain or snow will prevent the open house... the plan is to be there even if it is clouded over. Often, the weather is cloudy, but it clears up as the evening progresses.

20505 29 Mile Rd (1.8 miles east of Romeo Plank Rd)
Ray, MI 48096
82° 55'04" West Longitude, 42° 45'29" North Latitude
December Open-House
The December Open-house was not a total loss, Myself, Pat Brown and Riyad Matti keep each other company as we froze. The Moon was visible just before we arrived but the clouds came in and we lost the sky, so we added new plaques to the honor roll. I don’t want to forget any names so you will have to visit Stargate to see who has been added. As this was my last open-house as the Observatory Chair I gave a farewell speech, it was so moving, so powerful, the best speech ever. It was a shame only Pat and Riyad we’re able to enjoy it. Around 8pm we had all had enough, packed up and left.

January Open-House
The regular Open-house for January is scheduled for Saturday the 27th, a few days before full Moon. Rising at 2pm it will be out all night for us. I don’t know about you but I wouldn’t mind seeing the Moon these days. Sunset is at 5:40pm with astronomical twilight ending right after 7pm. Please arrive just after sunset (or sooner if you plan to set up a scope or do solar observing). A friendly reminder to be courteous if you arrive after dark, dim your headlights upon entry to the park, and no white light flashlights please. If you are setting up a large scope or have a lot of equipment to set up then you are permitted to park on the observing field, with your vehicle lights pointed away from the observatory and other telescopes.

Observatory update
As stated above 5 members have been added to the honor roll plague at Stargate, Its Joe’s house now! Oh and all the bridges on 29 mile road are back in operation so no more detours.

Jeff MacLeod
President

W.A.S.P. Photo and Article Submissions
We’d like to see your photos and articles in the W.A.S.P. Your contribution is ESSENTIAL! — This is YOUR publication!

Send items to: publications@warrenastro.org

Documents can be submitted in Microsoft Word (.doc or .docx), Open Office (.ods), or Text (.txt) formats, or put into the body of an email. Photos can be embedded in the document or attached to the email and should be under 2MB in size. Please include a caption for your photos, along with dates taken, and the way you ’d like your name to appear.
Doing public astronomy outreach can be a very rewarding experience. The Warren Astronomical Society has several members who regularly help with outreach events – from events at Cranbrook and Stargate Observatory, to manning telescopes at the Astronomy at the Beach event, and even solo events at schools and other venues. We’re always looking for additional volunteers to help with outreach events!

Cranbrook could use some help with a couple events in the next months, and scout troop 1489 would like to reschedule for Saturday February 10th:

December 2017

12/2/2017 - The group scheduled to be at Stargate failed to show, but Bob Berta and Angelo DiDonato hosted a group of Boy Scouts who were camping at the park.

12/8/2017 – 6-8 pm – Diane Hall and Ken Bertin helped out with the Tiger Cub Scouts “The Sky is the Limit” event at Cranbrook. Four groups of scouts & parents cycled through to look at the light-boxes through both reflectors and refractors. Good questions asked - Ken & Diane had a good time.

January 2018

1/26/2018 – NEED HELP! (Friday) 6-9 pm – All Scout Astronomy. Contact: Ruth Smigielski RSmigielski@cranbrook.edu

February 2018

2/9/2018 – NEED HELP! (Friday) 6-8 pm - Tiger Cub Scouts “The Sky is the Limit” at Cranbrook.
Contact: Ruth Smigielski RSmigielski@cranbrook.edu

2/10/2017 – NEED HELP! (Saturday) – Troop 1489 at Stargate.
Contact: Brian Milligan BMilligan@bcbsm.com (Note: rescheduled from 12/12/2017)

March 2018

Contact: Ruth Smigielski RSmigielski@cranbrook.edu

Future Outreach Requests:

Wilder Branch of the Detroit Library
The library would like to have a regularly-scheduled astronomy event: talk, workshop, observing, whatever. Days/hours: Wed. till 8 PM, Thur. till 6 PM, Sun. 1-5 PM.
Contact: Jennifer Dye jdye@detroitpubliclibrary.org

Bob Trembley
**Meeting Minutes**

**BOARD MEETING - December 4th**

Present: Diane Hall, Mark Kedzior, Joseph Tocco, Robert Trembley, Brian Thieme

Meeting convened at: 6:34 PM

**Officer's reports**

President - Diane notified the Board that she was prepared to use her time to turnover the gavel to the incoming President, Jeff MacLoed. Jeff was absent from the meeting and Diane sighed with disappointment and moved on to the 1st VPs report.

1st Vice President - Mark mentioned that he was in the process of securing dates for the Jan/Feb Macomb Meetings and also mentioned that the Library at the South Campus will be unavailable from May until December of 2018. The College is looking for an alternate space for the club to meet in the in-term; more to follow.

2nd Vice President - Jeff was absent to his report can be found in the current issue of the WASP.

Treasurer - Ruth was absent and her report is also to be found in the current issue of the WASP.

Secretary - Joe noted that the meeting minutes are published in the current issue of the WASP.

Outreach - Bob detailed the outreach report which is published in the WASP and expressed a need for outreach volunteers to assist in two upcoming events in the near future, both of which are in his report published in the current issue of the WASP.

Publications - Brian delivered the Banquet programs which he worked on into the evening prior to make sure they were properly printed and ready for the event. He also noted that the WASP is on-line!

**Old Business**

Discussion Group - December's Discussion Group will be hosted by Gary Ross at his home in Royal Oak on December 26th (Boxing Day.) There are many openings available if your interested in hosting, please contact any of the Board members.

Banquet - the Board members discussed the club's banquet in great detail. Diane summarized tasks in a to-do list so that everyone knew their responsibilities and so that nothing fell through the cracks.

Little Free Library - Joe Tocco, incoming Observatory Chairman, will pick up the task of setting up a small free library on the Farm Office located at Wolcott Mills Metropark. It is hoped that this good-will gesture will help to garner interest in the Observatory and bring additional members of the public to the Club's events.

**New Business**

Google Calendar for Club Events - A club member accessible event calendar in Google was discussed in detail. Board members could outline events and post them for members to see. The Board is pursing further details to discuss at January’s Board Meeting.
Signage for Stargate and other events - Bob Trembley brought up the need for improved signage and advertising for open-houses and club events. Several ideas were discussed and the ideas will be revisited at the next Board Meeting.

MOTION: A motion to adjourn was made by Joe and 2nd by Brian, then approved by all members.

Meeting adjourned at: 7:26 PM

CRANBROOK MEETING - December 4th

Meeting called to order at 7:30 PM by Diane Hall, President.

46 members present and 5 visitors.

Diane Hall welcomed the members and made a general announcements followed by Ken Bertin presenting In the News and In the Sky.

Board Officer’s Reports were summarized by the respective Officers which included and upcoming presentation schedule for Jan/Feb at both Cranbrook and Macomb by Mark Kedzior, 1st VP. Mark also mentioned the location change for Macomb meetings from May to December of next year and that incoming 1st VP Jonathan Kade will be notifying the membership with actual location once it’s determined by the college. Jeff McLoed, 2nd VP reported that the November open-house at Stargate was a bust with poor weather and no visitors. He’s optimistic about the 23rd of December with will include a 1st quarter moon. Treasurer, Secretary reported that their reports are currently published (in detail) in the WASP and Publications added that the WASP is up and on-line. Bob Trembley, Outreach - updated membership on upcoming Outreach activities and requests which are in the WASP - also passed around volunteer sign up sheet for Cranbrook Scout activity nights - a 2 hour program from 6-8PM. GLAAC report by Diane Hall - early review of logistics for next year's AATB

December Discussion Group night December 26th (Boxing Day) hosted by Gary Ross. Looking for host for January Discussion group meeting

Observing Reports - Jon Blum reported observing what an outstanding job Diane Hall has done as President of the WAS these past two years - all in agreement seeing the same thing. Jim Shedlowsky reported his observation of the recent “Super Moon”.

Short Talk was given by Bob Berta - “The Space Between Us”.

Snack/Break Time - Everyone assembled on stage for annual WAS group December photo op.

Main Presentation was given by Ken Bertin - “Tycho Brahe”

Meeting was adjourned at 10:00 PM

MACOMB MEETING

(no meeting in lieu of the Banquet)

Joe Tocco
2nd Vice President

If you’re shopping on Amazon, make sure to use Amazon Smile. It costs you nothing, and if you select us as your charity, Amazon will dotate 0.5% of every purchase you make to the Warren Astronomical Society.
Treasurer’s Report

TREASURER’S REPORT FOR 12/31/2017

MEMBERSHIP
We currently have 125 members, of which 33 are family memberships.

INCOME AND EXPENDITURES (SUMMARY)
We took in $1638.03 and spent $2643.82. We have $19,131.85 in the bank and $275.44 in cash, totaling $19,407.29 as of 12/31/2017.

INCOME
- 541.21 Membership/renewals
- 19.68 Snacks
- 567.42 Annual Banquet 2017
- 45.00 Astronomical League
- 253.56 2018 Calendar
- 4.19 General Fund
- 200.00 Door Prizes
- 5.00 Merchandise

EXPENSES
- 25.00 Snack reimbursement
- 1383.24 Banquet 2017 - DeCarlo’s
- 27.74 Banquet supplies
- 200.00 Banquet 2017 speaker fee
- 130.00 Tips and gift for Gus Povirk
- 187.50 Award plaques
- 43.30 Membership reimbursement
- 647.04 Calendar printing

GLAAC REPORT 12/31/2017
Beginning Balance: $4,068.47
INCOME
No activity
EXPENSES
No activity
Ending Balance: $4,068.47

Ruth Huellmantel
Treasurer

The W.A.S. Library

Come visit the breathtaking WAS library, located in the scenic rendering-server room at Cranbrook Institute of Science! In our library, you’ll find six shelves of books about:

- Observing every celestial object imaginable;
- Using and making telescopes;
- Popular and unpopular science;
- Science biography, science history, science fiction;
- Archives of our fifty-year history;
...and other stuff we can’t classify.

At Cranbrook, see our librarian, Jonathan Kade, at the break. To have a book delivered to Macomb, simply request a book from the library list from Jonathan. Where do you see the list? It doesn’t exist yet! Hassle Jonathan to post it.
This is the report I forgot to file back in the January 2012 issue. Time to make amends, here is my report from that month (firing up the Way Back machine):

“Happy New Year’s wishes to all. I was thrilled to see so many members of the early WAS years show up at the banquet this year. I had the great pleasure to speak with Margaret Alyea, Diane Ingrao (McCullough), Tim Skonieczny and Dave Harrington before running flat out of time.”

“Back to the WASP: In years past, many issues at the turn of the year, combined December with January in one issue, but I was able to unearth some solitary January issues for showcasing this month plus a January/February combo.”

January 1976
The cover features a photo of Percival Lowell at his telescope. Inside the issue, a color photo of Saturn is physically applied. The issue takes note of Saturn’s return (it went away?), Comet Bradfield (1975p), and observations of the Nov. 18, 1975 Lunar eclipse by Dave Harrington.

January 1977
In the temporary renaming of the newsletter to Vespa, Chris Edsall goes astronomically archaeological with an article on “The Finder Scopes of Ancient China” while Frank McCullough regales us with “A Couple of Fine Evenings at Stargate.”

January 1976
Finally, we conclude with the 1986 issue cover featuring an image of the rings of Uranus. In this issue, Observing Data for Halley’s Comet and a reprint of an article by J. Eberhart - “First Sharp Look at a Uranian Ring”.

January/February 1970
First up is the combo: January/February 1970. Riyad Matti tells me that any issues that feature telescopes on the cover are his artwork, so I’m giving him credit for this one (the initials, while blurry, look something like R.M.) Inside the issue, Frank McCullough announces a special outing to catch a “Celestial Traffic Jam” and Gene Francis shared an excerpt from “Telescopic Work for Starlight Evenings” (Open-air observing). Finally, Tim Skonieczny brings us “Taurus: The Forgotten Bull.”

January 1977
In the temporary renaming of the newsletter to Vespa, Chris Edsall goes astronomically archaeological with an article on “The Finder Scopes of Ancient China” while Frank McCullough regales us with “A Couple of Fine Evenings at Stargate.”

January 1986
Finally, we conclude with the 1986 issue cover featuring an image of the rings of Uranus. In this issue, Observing Data for Halley’s Comet and a reprint of an article by J. Eberhart - “First Sharp Look at a Uranian Ring”.

From the Scanning Room:
That report is a bit dated now, many banquets and scans since then. For this report I also switched the issue listing from the paragraph format I used then to the current list format. Currently I scanned some more 1987 and 1988 issues, ‘87 is filled except for November and ’88 is still missing Feb.-May, and Dec. April and May (see below). During my recent visit to Michigan, I garnered quite a few more issues of the WASP for scanning. The gaps are diminishing.

Dale Thieme, Chief scanner
The Warren Astronomical Society is a Proud Member of the Great Lakes Association of Astronomy Clubs (GLAAC)

GLAAC is an association of amateur astronomy clubs in Southeastern Michigan who have banded together to provide enjoyable, family-oriented activities that focus on astronomy and space sciences.

### GLAAC Club and Society Meeting Times

<table>
<thead>
<tr>
<th>Club Name &amp; Website</th>
<th>City</th>
<th>Meeting Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astronomy Club at Eastern Michigan University</td>
<td>Ypsilanti/EMU</td>
<td>Every Thursday at 7:30PM in 402 Sherzer</td>
</tr>
<tr>
<td>Capital Area Astronomy Club</td>
<td>MSU/ Abrams Planetarium</td>
<td>First Wednesday of each month 7:30 PM</td>
</tr>
<tr>
<td>Farmington Community Stargazers</td>
<td>Farmington Hills</td>
<td>Members: Last Tuesday of the month Public observing: 2nd Tuesday of the month</td>
</tr>
<tr>
<td>Ford Amateur Astronomy Club</td>
<td>Dearborn</td>
<td>Fourth Thursday of every month (except November and December) at 5:30 PM</td>
</tr>
<tr>
<td>Oakland Astronomy Club</td>
<td>Rochester</td>
<td>Second Sunday of every month (except May)</td>
</tr>
<tr>
<td>Seven Ponds Astronomy Club</td>
<td>Rochester</td>
<td>Monthly; generally the Saturday closest to new Moon</td>
</tr>
<tr>
<td>Sunset Astronomical Society</td>
<td>Dryden</td>
<td>Second Friday of every month</td>
</tr>
<tr>
<td>University Lowbrow Astronomers</td>
<td>Ann Arbor</td>
<td>Third Friday of every month</td>
</tr>
<tr>
<td>Warren Astronomical Society</td>
<td>Bloomfield Hills/ Cranbrook &amp; Warren/ MCC</td>
<td>First Monday &amp; third Thursday of every month 7:30 PM</td>
</tr>
</tbody>
</table>

### GLAAC Club and Society Newsletters

- Warren Astronomical Society: [http://www.warrenastro.org/was/newsletter/](http://www.warrenastro.org/was/newsletter/)
- Oakland Astronomy Club: [http://oaklandastronomy.net/newsletters/oacnews.html](http://oaklandastronomy.net/newsletters/oacnews.html)
- University Lowbrow Astronomers: [http://www.umich.edu/~lowbrows/reflections/](http://www.umich.edu/~lowbrows/reflections/)

### WAS Member Websites

- Jon Blum: [MauiHawaii.org](http://MauiHawaii.org)
- Bob Trembley: [Vatican Observatory Foundation Blog](http://VaticanObservatoryFoundationBlog)
- Bill Beers: [Sirius Astro Products](http://SiriusAstroProducts)
- Jeff MacLeod: [A Life Of Entropy](http://AleofEntropy)
- Jon Blum: [Astronomy at JonRosie](http://AstronomyatJonRosie)
Snowy Worlds Beyond Earth
By Linda Hermans-Killiam

There are many places on Earth where it snows, but did you know it snows on other worlds, too? Here are just a few of the places where you might find snow beyond Earth:

Mars
The north pole and south pole of Mars have ice caps that grow and shrink with the seasons. These ice caps are made mainly of water ice—the same kind of ice you’d find on Earth. However, the snow that falls there is made of carbon dioxide—the same ingredient used to make dry ice here on Earth. Carbon dioxide is in the Martian atmosphere and it freezes and falls to the surface of the planet as snow. In 2017, NASA’s Mars Reconnaissance Orbiter took photos of the sand dunes around Mars’ north pole. The slopes of these dunes were covered with carbon dioxide snow and ice.

A Moon of Jupiter: Io
There are dozens of moons that orbit Jupiter and one of them, called Io, has snowflakes made out of sulfur. In 2001, NASA’s Galileo spacecraft detected these sulfur snowflakes just above Io’s south pole. The sulfur shoots into space from a volcano on Io’s surface. In space, the sulfur quickly freezes to form snowflakes that fall back down to the surface.
A volcano shooting molten sulfur out from the surface of Io. Credit: NASA/JPL-Caltech

A Moon of Saturn: Enceladus
Saturn's moon, Enceladus, has geysers that shoot water vapor out into space. There it freezes and falls back to the surface as snow. Some of the ice also escapes Enceladus to become part of Saturn's rings. The water vapor comes from a heated ocean which lies beneath the moon's icy surface. (Jupiter's moon Europa is also an icy world with a liquid ocean below the frozen surface.) All of this ice and snow make Enceladus one of the brightest objects in our solar system.

Enceladus as viewed from NASA's Cassini spacecraft. Credit: NASA

A Moon of Neptune: Triton
Neptune's largest moon is Triton. It has the coldest surface known in our solar system. Triton's atmosphere is made up mainly of nitrogen. This nitrogen freezes onto its surface covering Triton with ice made of frozen nitrogen. Triton also has geysers like Enceladus, though they are smaller and made of nitrogen rather than water.
The Voyager 2 mission captured this image of Triton. The black streaks are created by nitrogen geysers. Credit: NASA/JPL/USGS

Pluto
Farther out in our solar system lies the dwarf planet Pluto. In 2016, scientists on the New Horizons mission discovered a mountain chain on Pluto where the mountains were capped with methane snow and ice.

Beyond Our Solar System
There might even be snow far outside our solar system! Kepler-13Ab is a hot, giant planet 1,730 light years from Earth. It's nine times more massive than Jupiter and it orbits very close to its star. The Hubble Space Telescope detected evidence of titanium oxide—the mineral used in sunscreen—in this planet’s upper atmosphere. On the cooler side of Kepler-13Ab that faces away from its host star, the planet’s strong gravity might cause the titanium oxide to fall down as “snow.”

Want to learn more about weather on other planets? Check out NASA Space Place: https://spaceplace.nasa.gov/planet-weather