Once again, the WAS membership, past and present, friends and family gathered together for our seasonal “hurrah!” An unofficial count had us at more than 60 attendees, a fine turnout.

Current treasurer Joe Tocco and treasurer-elect Ruth Huellmantel greeted the incoming attendees. The door prize table well stocked with drool-worthy items. A big thank you to Orion, Celestron, Cranbrook Institute of Science, Sky and Telescope magazine, Kalmbach Publishing (Astronomy Magazine), Star Guy, the Astronomical Society of the Pacific, Sirius Astro Products, National Coney Island and, of course, the many donations by our own members.
As we mingled, waiting for dinner to be served, Gus Povirk entertained as always with his pianistic skills. Following dinner, Dr. Rajib Ganguly spoke to us about the Hubble Space Telescope and the many papers (including his) it has helped generate for researchers.

We concluded the affair with the presentation of awards and the distribution of the door prizes. The first award mention went to the posthumous addition of Bill Whitney, long time member (one of the first WAS members) to the Honor Roll Board at Stargate. Then, Diane Hall presented Dr. Dale Partin with the Larry Kalinowski Award, recognizing his many contributions to the club over the years, both as a member and as an officer. Then, a dual Blaine McCullough awarding went to Parker Huellmantel (for participating in our public outreach efforts) and his mother, Ruth Huellmantel, for unflagging support of his participation. Then, in a surprise move, departing a second time from normal procedure in recent years, the Board saw fit to present Dale Thieme with the E. John Searles Award, for making the club a big part of his personal life and helping the club any way he could. Congratulations to all.

Dale Thieme,
staff reporter
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.

**Snack Volunteer Schedule**

Jan 2........Cranbrook.........Penny Wayne  
Jan 19........Macomb.............Jeff MacLeod  
Feb 6.........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

Come on over, and talk astronomy, space news, and whatnot!

The January Discussion group will be held at Ruth Huellmantel's home in Royal Oak, on **Tuesday the 24th**.

613 James Circle  
Royal Oak, 48067

We are in the Condos at Irving Avenue. I have room for 2 cars to park in my driveway; additional parking is on Irving Ave. The streets in the condo area, are NO parking, by the city of Royal Oak, and you will be ticketed. My condo is a short walk from Irving; we are the 3rd condo in, on James Circle. (Middle street, there are only 3). I will have snacks and soft drinks. But if someone wants something stronger to drink, they should bring... oh, and Tuesday the 24th is good.

Ruth Huellmantel, Treasurer

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Space Pirates

Tune in to Captains Marty Kunz and Diane Hall for live radio Wednesday nights at 9:00pm ET
2017 is going to be the year of the Great American Solar Eclipse, during which W.A.S. members will fan out from Oregon to Deep South in hopes of seeing the first total solar eclipse to grace the Lower 48 in many a long decade. 2017 might-- MIGHT-- be the year in which the northern hemisphere finally sees a knock-the-socks-off comet. Let’s keep our fingers crossed, anyway. Here on the ground, your new Board is hoping 2017 is the year in which we get the long-anticipated expansion of Stargate off and rolling, including a new home for our treasured legacy telescopes and a warming room to make those winter Open Houses a little less brutal. We’re also plotting new outreach events at Belle Isle and for a dark sky site Up North that can take advantage of the state’s new official dark sky preserves. On a more mundane plane of experience, the Board is embarking on a project to make participation as an officer less intimidating for members, so that this august society can continue to be the most vibrant amateur astronomical society in our corner of the world. Here’s to 2017-- we have places to go, wonderful things to see, and a lot of work ahead of us.

Diane Hall
President

### Astronomical Events for January 2017

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<thead>
<tr>
<th>Day</th>
<th>EST (h:m)</th>
<th>Event</th>
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<td>00:30</td>
<td>LAST QUARTER MOON</td>
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<tr>
<td>02</td>
<td>06:53</td>
<td>Moon at Apogee: 404279 km</td>
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<tr>
<td>02</td>
<td>18</td>
<td>Earth at Perihelion: 0.98330 AU</td>
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<td>02</td>
<td>22:35</td>
<td>Spica 4.7°S of Moon</td>
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<td>13:45</td>
<td>Mars 1.5°S of Moon</td>
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<td>03</td>
<td>Quadrantid Meteor Shower</td>
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<td>18:57</td>
<td>Venus 3.1°S of Moon</td>
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<td>Saturn 3.3°S of Moon</td>
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<td>13</td>
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<td>09</td>
<td>20:30</td>
<td>NEW MOON</td>
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<td>FIRST QUARTER MOON</td>
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<td>21:16</td>
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If Daylight Saving Time is in effect, add one hour to the times listed.

E. John Searles Award - Dale Thieme

It is not customary for sitting officers to receive commendation, but a previous Board decided to buck that tradition when awarding the Searles Award to one Jonathan Kade some years back. The W.A.S Board of 2016 has been bound together by the diligence and patience of one exceptional man, who has been quietly serving the society in ways that don’t necessarily get noticed. He’s been the guy with the cart of dry goods for every snack break. He’s salvaged more picnics than you might imagine. As Treasurer, he oversaw the final stretch of activity that got the W.A.S. in order for 501[c]3 status, including a at least one genuine all-nighter. As Publications, he’s dealt with all our tardy officers’ reports and he stepped up to the role of Deputy Treasurer when the W.A.S. took over finances for the Great Lakes Association of Astronomy Clubs. He’s been the guy with the technical know-how, editing videos and recording minutes with the Latest Technology. And he’s captured and distilled the soul of the W.A.S.P, page by page, bringing back the lost voices of our forerunners and preserving them for at least another generation through his magical scanner. We now have a digital archive of the WASP, a map back to the past, in which the handwriting and doodles and scribbles of long-gone members have been faithfully rendered and preserved. I guarantee that no one person in this room knows the full scope of everything he’s achieved for this club, every hour he’s put into the society, the corners of his home that became little outposts of the W.A.S and the back pages of our very existence that he’s illuminated for years to come. To receive the Searles Award is to have it acknowledged that the Warren Astronomical Society has taken over a part of your life. In between checking the mailbox and balancing the checkbook, Dale Thieme has allowed that to happen to our inestimable gain, and his imminent departure for Florida is our loss. Treasurer, Publications Director, History SIG Chair, Man From Plaid-- we don’t know how we’ll get along without him, but starting tomorrow we’ll find out.

Larry F. Kalinowski Award - Dr. Dale Partin

Dr. Dale Partin receives the Larry F. Kalinowski aware. He has served the Board in multiple positions, including as Treasurer during a transitional period as the W.A.S. worked to regain 501[c]3 status and as a Program Chair who brought new levels of academic excellence to our calendar of programs. Even when not on the board he has served the good W.A.S. in unparalleled ways. During the reform of the society by-laws, he acted as a representative of the membership, challenging the assumptions of the officers and acting as a conscience. As a faculty member at Macomb Community College, he has strengthened the society’s ties with our host institution and was instrumental in establishing the Paul Strong Scholarship.
Blaine McCullough Award - Parker Huellmantel

Parker Huellmantel has in two short years established himself as a mainstay of outreach events. Whether it’s working with Scouts at Cranbrook or helping the kids at Camp Burt Shurly discover the sky, Parker is there with limitless enthusiasm.

Blaine McCullough Award - Ruth Huellmantel

The Huellmantels are a complimentary team effort, and Ruth deserves credit in her own right for facilitating Parker’s exploits.

WAS Honor Board at Stargate Bill Whitney

Warren Astronomical Society Board Pictures

Left to right:
Joe Tocco- Treasurer
Ralph DeCew- First VP
Jeff MacLeod- Second VP
Diane Hall- President
Bob Trembley- Outreach Chair
Dale Thieme- Publications
Dennis David- Secretary

2016 Board

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

2017 Board
From (more or less) left to right:
Stephen Greene
Dave Harrington
Doug Bock
Marty Kunz
Diane Hall
Jon Blum
Jonathan Kade
Ken Bertin
Bob Berta.

Monday, January 9, 2017
Cranbrook Presentations

Short Presentation: Rivers in the Solar System by Bob Trembley
Bob Trembley shows how the passage of comets leave streams of meteoroid debris flowing through the solar system, and when the Earth passes through one of these streams, we see meteor showers. Bob will show this visually, using an online tool from: http://www.ianww.com/meteor-showers/


Thursday, January 19, 2017
Macomb Community College Presentations

Main Presentation: Couriers from Outer Space by Mark Jeffrey
The WAS welcomes Mark Jeffrey of the Oakland Astronomy Club and his out-of-this-world meteorite collection.

“Meteorites are frozen snapshots of nature in action. We will try to take advantage of their long journey to our planet in order to appreciate both the beauty and the science that they bring to us. Several meteorites will be available for hands-on inspection, and more will be on display.”
A Thank You Note

Every WAS Banquet I have attended as a Board member has been “on the clock”, except the last one—Joe Tocco stopped my approach to the entry table and insisted I take the night off and “schmooze” with the attendees. Perhaps an indication of what was to come?

One of my Officer duties has been to place the order for the awards and bring them to the banquet. This year, the engraver was attending and would bring them, instead. When we got to Ruth Huellmantel’s well earned award, I thought that would be it.

I was completely floored to find out that the board had seen fit to award me, the least astronomical board member, the E. John Searles Award.

I’m proud to be a member of the Warren Astronomical Society and feel it was an honor to serve on the board for the past five years. The WAS continues to be a major part of my life, even down here in Florida, as I keep in touch with my fellow board members (my term of office isn’t finished yet), and, I expect, will continue.

Thank you again, to all the board members and to the membership of a wonderful astronomical society. And, as Jack would say, “Keep looking up!”

-Dale Thieme

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.
Happy New Year!

From Bill Beers
at the
C. W. Sirius Observatory
Cadillac, Michigan
On the north end of the fat 4 day crescent moon is the stark pair of large craters, Atlas and Hercules (90km and 71km diameters respectively). They catch the eye because of the relatively featureless surroundings at that time. The larger crater, Atlas, has some wonderful detail on its floor including a ‘V’ shaped rille system with rimae 1-2 km across. Note the off center “central peak” and the cluster of other much smaller peaks below it. There is a central 2.5km crater as well. Using LROC QuickMap it was possible to see craters just under 2km on this image which was the limit since the moon was near apogee and the seeing less than ideal. In Hercules we see the 13km crater Hercules G and another off center “central peak”. There is a nice ejecta blanket surrounding each of these craters. Above Atlas and Hercules is the 34 km crater Keldysh, and between Atlas and Keldysh is Atlas E, an ancient remnant of a once great 58 km crater.

To the lower right of Atlas and Hercules are two craters that point right to the former pair. They are Cepheus (41 km) and Franklin (58 km). Then to the left of Atlas and Hercules is a crater in the shade halfway up the image. This is Burg (41 km) the youngest large crater in the image. It sits in the middle of Lacus Mortus that is much older. Below Burg are two craters mostly in shadow. These are Plana (46 km) on the left and Mason (44 km) on the right. It looks like there is a flow of material coming out of this crater to the lower right but actually this is a deformed mountain range that was overlain by ejecta probably from the Burg impact. This flow points to the crater Grove (29km) and below that on the other side of Lacus Somniorum, is Daniell (31 km) just above the northern rim of Posidonius.
January 2017

Object of the Month: NGC 3077

NGC 3077 is a galaxy in the constellation Ursa Major that is situated very near the famous M81/M82 galaxy pair. Although it does not have a popular common name, it is as bright and as readily observed as a number of Messier galaxies in the Virgo Cluster. The galaxy has an integrated magnitude of 9.8 and angular dimensions of 5.5’ x 4.2”. It is part of the M81 galaxy group and is gravitationally disturbed by other group members, the effects of which are the presence of unusual dust clouds and a diffuse outer edge. As a result, NGC 3077 is classified as “irregular” on the Hubble Sequence, which indicates a galaxy with features atypical for spiral or elliptical morphologies. It was originally considered to be a Seyfert galaxy, although it is no longer thought of as such due to newer spectroscopic evidence. However, it is often cited as “peculiar” in modern classification systems due to its unusual attributes. First reported by William Herschel in 1801, the galaxy is mostly known to amateurs for its inclusion in the H400 observing list of Herschel-discovered objects.

Pinpointing NGC 3077 is not difficult and is fairly simple for those who can easily locate M81 and M82 in the eyepiece. The galaxy is positioned approximately 9.5° northwest of Dubhe (α Ursae Majoris, mag. 1.8), and can be found along a line drawn from Phad (γ Ursae Majoris, mag. 2.4) through Dubhe and onward about that same distance again. It is only about 46’ east-southeast of M81 and about 70’ southeast of M82. The galaxy should be easily visible in 8-inch or larger telescopes at 40x or higher power, although as small as a 4-inch aperture can provide a view of it from sufficiently dark locations. At first glance, NGC 3077 has the appearance of a slightly elongated elliptical galaxy just a quick hop from its famous neighbors, with a central region that is fairly evenly concentrated and about 2’ across. However, close inspection and an acute eye can reveal a subtly mottled texture, particularly along the periphery. Overall, this object can provide a pleasant diversion during your next trek to visit the northerly galaxies of this region.

Chuck Dezelah

Below: NGC 3077 / Photo credit: Space Telescope Science Institute
This chart shows the sky as it appears at approximately 7pm EST near mid-month at northern mid-latitudes.

CRANBROOK INSTITUTE OF SCIENCE
OBSERVATORY

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

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 2017

Jan. 1 - 7

Jan. 8 - 14

Jan. 15 - 21

Jan. 22 - 28

Jan. 29 - Feb. 4

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

Monthly Free Astronomy Open House and Star Party

4th Saturday of the month!
Jan. 28th, Feb. 25th, Mar. 25th

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.
December Open-House
The December Open-house was not held on Saturday the 17th. Unfortunately, again, the night was a bust. Due to thick cloud cover, cold temps, and almost a foot of snow, I called off the observing around 5pm.

January Open-House
The regular Open-house for January is scheduled for Saturday the 28th, one day following the new moon. Sunset is at 5:40pm with astronomical twilight ending at 7:18pm. 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
No update for the observatory at this time. More to come next year, I greatly look forward to being your observatory chair for the following year.

Jeff MacLeod
2nd VP, Observatory

Riyad Matti, Dr. Dale Partin, and I warmed up the observatory with our analog units. Riyad and I did some tidying in the observatory and opened the floor up quite a bit. At Riyad’s urging and with Jeff’s permission, I’ve taken the 10” TV/VCR combo that I’ve never seen used in my entire time with the club, and I’m going to give it to Goodwill tomorrow. (If they’ll take it.) I also took home the 4.5” reflector I lent Jeff for the Mercury transit, at long last.

We had very special guests: Eileen, Bill Whitney’s daughter and Larry Kalinowski’s niece, and her family. She brought a treasure trove of history, including the largest collection of Detroit Astronomical Society information I’ve ever seen. She also provided copies of Larry’s comet newsletter and a DOAA newsletter with embarrassing revelations about G. M. Ross, as he was known even back then.

Beyond all that, proving the Law of Conservation of Stargate Telescopes, she donated a beautiful hand-crafted motor-driven ~3.5” refractor (with setting circles!) entirely built by Bill. It’s a little large to store assembled in the dob shed, but quite compact disassembled, and it’s very easily assembled - never having seen it before, I put it together in five minutes. In my humble opinion it’s worth keeping.

Before the family left, Riyad and I toasted with them to Larry and Bill. It was a beautiful night, even though the clouds never cleared.

Jonathan Kade
In 2016, our volunteers attended over 60 separate events including: Stargate observatory, Kensington Astronomy at the Beach, Cranbrook libraries, schools, parks; Several members set up at multiple different venues to show the public the Mercury transit. At least twice this year, while out shopping, someone has seen my WAS jacket and asked if we were the ones with the observatory at Camp Rotary?

We’re already gotten outreach requests reaching well into the first quarter of 2017 - many have already been covered by our volunteers.

December 2016
12/2/2016 Boy Scouts Astronomy at Cranbrook was cancelled due to lack of sign-ups.

12/3/2016 5 -10 PM NOEL Night at Charles H. Wright Museum of African American History
Diane Hall reports: Noel Night was as successful as cloudy-night outreach can be. Jonathan Kade and Jeff MacLeod did presentations on orbital mechanics, Astronomy 101, and the contributions of African-American scientists to astronomy while Joe Tocco, Dennis David, and Parker and Ruth Huellmantel held down the entrance with telescopes and displays. I will let one of the outside crew speak to the headcount of telescope patrons, since I was mostly inside hanging with Jeff and Jonathan. The museum was packed and we had a friendly crowd.

Special thanks to Joe Tocco for his help with all the arrangements for this event!

12/9/2016 6-8 pm Tiger Cub Scouts Sky is the Limit at Cranbrook (70 sign-ups)
No telescope needed
• Jeff Macleod
• Ken Bertin
• Parker Huellmantel

12/14/2016 6:00 pm Detroit Public Library Children’s program - Sun / solstice / general astronomy
• Mark Kedzior
• Gary Ross

12/17/2016 6 pm Final 2016 Stargate Open House (and Boy Scout Troop 84) was cancelled due to weather. Open Houses will continue to be held on the 4th Saturday of every month in 2017.

January 2017
1/5/2017 or 1/5/2017 5:00-6:00 pm Detroit Public Library
First Quarter Moon observing, with possible inside activities if cold/overcast.
• Need Volunteers

1/27/2017 6-9 pm Astronomy overnight at Cranbrook (all types of scouts)
No telescope needed
• Jeff Macleod
• Ken Bertin
• Parker Huellmantel

2/10/2017 6-11 pm Boy Scouts Astronomy at Cranbrook
No telescope needed
• Jeff Macleod
• Ken Bertin
• Parker Huellmantel

2/24/2017 6-8 pm Tiger Cub Scouts Sky is the Limit at Cranbrook
(Cont.)
• Jeff Macleod
• Ken Bertin
• Parker Huellmantel

3/8/2017 6-9 pm Astronomy Night at Endeavour School (Ray, MI)
(In planning stages)
Connie and Bob could use as much help as possible with this event again: lecturers, telescopes, “Walk the Solar System” presenters, WAS table, etc... This year, we'll be able to use the PC lab where we have 15 copies of Kerbal Space Program installed, and an equal number of PCs with Stellarium, Universe Sandbox, and NASA Eyes on the Solar System.
• Connie-Martin Trembley (Organizer)
• Bob Trembley (Presenter: probably “The Sun”)
• Jeff MacLeod (Presenter: probably something Apollo)
• Parker Huellmantel (Telescope)

4/7/2017 8-11 pm SWAN at Stargate
(In planning stages)
• Parker Huellmantel

4/29/2017 TBD Astronomy Night at Stargate
(In planning stages)
Sunset is at 8:30 PM
Bob Trembley Outreach Coordinator

WAS BOARD MEETING DECEMBER 5, 2016
Diane called the meeting to order at 6:31 with a quorum present: Diane Hall, Ralph DeCew, Joe Tocco, Bob Trembley and Dale Thieme. Jeff MacLeod and Dennis David arrived later. Also attending were the new officers elect, Ruth Huellmantel, Mark Kedzior and Brian Thieme.

Reports:
President: Diane Hall Calendar orders have been placed, but delivery may have to wait until January. Banquet program is ready for printing. Donor placards are ready to go. We are set for door prize tickets, Av equipment, door prizes. Discussion of other preparations for the banquet followed. Diane welcomed the new board members and instructed Jonathan to add them to the email list.
1st VP: Ralph DeCew reported that he had some new presentations lined up and more in the works, Mark Jeffries will speak at Macomb in January on meteorites.
Treasurer: Joe Tocco reported on our membership count and the current ledger activity, all of which are posted in the WASP. He reminded Diane that we needed to get the treasurer transfer taken care of at the bank.

Outreach: Bob Trembley mentioned a new request for an astronomy night, conflicting with our banquet. He will work with her on alternative dates. Meanwhile he is packing the calendar with other events up through April.
Publications: Dale Thieme said the WASP is more or less ready to go with the latest edits for Stargate December dates.

Old business:
Diane went over the various board member responsibilities with Mail Chimp and Meet-up. Stargate Wall of Honor Updates: Once the engraver has an original plate to work from again, he can get a plate for Bill Whitney drilled to specs and hopefully get the new plates installed by the next Astronomy day.
Dale Thieme will continue working on the Picnic review and event checklist once he is settled in down in Florida. Diane finished the presenter checklist and asked for comments. Joe Tocco is working on the Stargate checklist.
Discussion Group: Gary Ross is slated for December, Ruth Huellmantel offered to take January’s spot (fourth Tuesday was suggested).

(Cont.)
Snack list for 2017: Dale Thieme has the Excel file Ken Bertin assembled and will post to the board directory in Google Docs. Diane then led a general discussion over the retrospective of the past year, what went well, what didn’t and how to improve.

New business:
Diane mentioned that we don’t have a second, more detailed plan yet for the Stargate DOB shed expansion. That project will be on hold until more information is available.

Big DOB travel policy: it was pointed out that a concrete policy be put in place concerning the 22” Club scope.

Bob Berta told the board about the progress of the bench project by Joe Lico.

Marty Kunz reported that the Cranbrook meetings for the WAS were all scheduled with the museum.

The Board adjourned at 7:27

Treasurer’s Report

December 31, 2016: We have 146 memberships, 34 of which are family memberships. We took in $2,208.68 and spent $2,090.10. We have 101.72 in cash and 19,041.63 in the bank account, giving a total of 19,143.35.

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<tr>
<td>42.32 Scholarship</td>
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<tr>
<td>1.23 Donation- General Fund</td>
<td></td>
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<tr>
<td>300.00 GLAAC Donation</td>
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GLAAC Report for December 2016

Beginning Balance: $4,935.84

INCOME:

<table>
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<tr>
<th>Date</th>
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<tr>
<td>12/04/2016</td>
<td>Wayne State University</td>
<td>60565571</td>
<td>300.00</td>
<td>Donation for KAatB</td>
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EXPENSES

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<td>12/26/2016</td>
<td>Joseph Velez</td>
<td>996</td>
<td>493.10</td>
<td>Reimbursement for KAatB</td>
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Ending Balance: $4,742.74
I cannot remember a time when I haven't been fascinated with astronomy, the space program, and science fiction. I was a child during the Apollo era, and a young man when the original COSMOS first aired. I cut my teeth on Star Trek, Arthur C. Clarke, Isaac Asimov, and Larry Niven; Carl Sagan was, and remains to this day, my personal hero.

Now that I think about it, I started doing astronomy outreach the moment I got my first cheap telescope in 1968; I showed the Moon, Jupiter, and Saturn to the neighbors, and took it with me to summer camp. I had one of those really scary green glass eyepiece solar filters - that got used a lot more than I like to think about!

My wife gave me an 8" Dobsonian telescope for my 40th birthday, that came with a not-scary-at-all solar filter; that telescope has seen a LOT of use in 16 years - so much so, it's starting to show its age.

I joined the Warren Astronomical Society in 2011, and started to volunteer for some of their public outreach events. This was the first time I'd come into contact with large groups of citizens peering through telescopes. Every single time I've set up my telescope, someone looking through it has said "Oh WOW!" In one extreme instance, I had one young woman dancing around, flapping her arms, and yelling "Oh my God! Oh my God!" after seeing Saturn.

During the Summer of 2012, I setup my solar telescope (a 40mm Coronado PST) on Sunday mornings at New Baltimore, Michigan's, Burke Park. I had a flip book with images of the Sun, and gave hundreds of quick 1 minute "This is how cool your Sun is" spiels.

Based on the questions I've been asked repeatedly over the years, it has became apparent to me that the general public's knowledge of even the most basic aspects of astronomy is astonishingly small. Having loved astronomy since my first memories, I wanted to change that.

I have been attending Midwest Science Fiction conventions since 1978; I saw Br. Guy lecture about meteorites at an SF convention in the mid-1980's, and he blew me away! The science content offered at SF conventions has grown over the years, and I really enjoyed seeing lectures about current NASA missions. I thought to myself: "I could do that." So I did.
In 2013 I became a volunteer NASA/JPL Solar System ambassador, and started lecturing and setting up telescopes at SF conventions, libraries, planetariums, etc. I've lectured several times at meetings of the Warren Astronomical Society held at the Cranbrook Institute of Science. I just LOVE it!

During one SF Convention in Dearborn, Michigan, one young woman, looking through my telescope at craters on the Moon said "Oh wow!" Then she asked me "How'd those get there?" I stammered for a moment, and answered "asteroid impacts," not knowing how to quickly describe: lunar formation hypothesis, hypervelocity meteoroid impacts, and crater morphology.

I looked at the Michigan K-12 Science Standards, and was completely dismayed at the brevity with which astronomy is covered, and the sparseness of content required. I asked a middle school history teacher how much of the history of the U.S. space program she was required to teach. Nothing. I asked a high school principal the same question, and was told: "If astronomy or the space program gets taught at all, it only gets taught as an elective, and only if we have a teacher who knows it." I thought to myself: "I could do that." So I am.

My wife, Connie, is a fantastic middle school science teacher, and a fellow volunteer NASA/JPL Solar System Ambassador; she and I are running an after-school club at her school this year called the Endeavour Space Academy.

Each session starts with a 10-15 minute presentation including:

- A topic in astronomy.
- A constellation, and deep-sky objects within it.
- Contributions of a noteworthy astronomer or scientist.
- A historic mission from the early space age.
- Current space mission and space news.

I've attended hour-long lectures on some of these topics; I feel like I'm just glossing-over them, but it's a good bit more than most students are getting...

After my presentation, students split into 2 groups: Connie takes one group and covers an astronomy topic in much more detail. I take a group down to a computer lab and have them run space and astronomy apps including: NASA Eyes on the Solar System, Universe Sandbox, Stellarium, and Kerbal Space Program.

My original goal was to have the students build and fly the historic mission I discussed at the beginning of the session; I spent the entire summer of 2016 developing a series of rockets replicating those missions. But after the club started, I learned quickly that "no syllabus withstands contact with the students," and also how to fly-by-the-seat-of-your-pants.
I do have some students who want to recreate and fly the missions... I have others that like to build enormous rockets with hundreds of passengers, or rockets that explode upon launch... or both. I have one student who just wants to fly jets - I really need to get him a Single Stage To Orbit (SSTO) vehicle, and see if he can get it into orbit.

In the last few weeks before the holiday season, I did have several students successfully get into orbit, and some actually make a successful reentry... and some not-so successful reentries... A few students used a Hohmann transfer maneuver and got into the sphere-of-influence of the Moon (Mun, in game). Next year, I want to get more students to this point, and then have them land on the Moon.

One constant of each session is my running from student-to-student the entire time (I don't know how Connie does it). During one session, I had a visit from Mark Muzzin, the deputy director of the local Starbase One facility, he wanted to see how the club was going; I wasn't able to speak with him! I literally had three students surround...
us, jumping up and down, saying "Mr. Trembley! Mr. Trembley! Come here! Look at this!" Mark commented that he "liked the enthusiasm!"

Check out the Facebook page for the club, I do regular updates there: https://www.facebook.com/EndeavourSpaceAcademy/

In the short term, I'd like to get several computers capable of running Kerbal Space Program and other space apps, and take them into schools as an in-school, hands-on space camp. Looking towards the future, I'd like to see this type of program replicated throughout Michigan schools, and across the country.

I don't know where this voyage is taking me, but the journey sure has been interesting!

This article was originally posted on the “Catholic Astronomer” - the blog of the Vatican Observatory Foundation on Dec. 29, 2016.
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 pro- vide 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/
Oakland Astronomy Club: http://oaklandastronomy.net/newsletters/oacnews.html
University Lowbrow Astronomers: http://www.umich.edu/~lowbrows/reflections/

WAS Member Websites

Jon Blum: MauiHawaii.org
Bob Trembley: Balrog’s Lair
Bill Beers: Sirius Astro Products

Jon Blum: Astronomy at JonRosie
Bob Trembley: Vatican Observatory Foundation Blog
Jeff MacLeod: A Life Of Entropy
Big Science in Small Packages
By Marcus Woo

About 250 miles overhead, a satellite the size of a loaf of bread flies in orbit. It's one of hundreds of so-called CubeSats—spacecraft that come in relatively inexpensive and compact packages—that have launched over the years. So far, most CubeSats have been commercial satellites, student projects, or technology demonstrations. But this one, dubbed MinXSS ("minks") is NASA's first CubeSat with a bona fide science mission.

Launched in December 2015, MinXSS has been observing the sun in X-rays with unprecedented detail. Its goal is to better understand the physics behind phenomena like solar flares – eruptions on the sun that produce dramatic bursts of energy and radiation.

Much of the newly-released radiation from solar flares is concentrated in X-rays, and, in particular, the lower energy range called soft X-rays. But other spacecraft don't have the capability to measure this part of the sun's spectrum at high resolution—which is where MinXSS, short for Miniature Solar X-ray Spectrometer, comes in.

Using MinXSS to monitor how the soft X-ray spectrum changes over time, scientists can track changes in the composition in the sun's corona, the hot outermost layer of the sun. While the sun's visible surface, the photosphere, is about 6000 Kelvin (10,000 degrees Fahrenheit), areas of the corona reach tens of millions of degrees during a solar flare. But even without a flare, the corona smolders at a million degrees—and no one knows why.

One possibility is that many small nanoflares constantly heat the corona. Or, the heat may come from certain kinds of waves that propagate through the solar plasma. By looking at how the corona's composition changes, researchers can determine which mechanism is more important, says Tom Woods, a solar scientist at the University of Colorado at Boulder and principal investigator of MinXSS: "It's helping address this very long-term problem that's been around for 50 years: how is the corona heated to be so hot."

The $1 million original mission has been gathering observations since June.

The satellite will likely burn up in Earth's atmosphere in March. But the researchers have built a second one slated for launch in 2017. MinXSS-2 will watch long-term solar activity—related to the sun's 11-year sunspot cycle—and how variability in the soft X-ray spectrum affects space weather, which can be a hazard for satellites. So the little-
mission-that-could will continue—this time, flying at a higher, polar orbit for about five years.

If you’d like to teach kids about where the sun’s energy comes from, please visit the NASA Space Place: https://spaceplace.nasa.gov/sun-heat/

Astronaut Tim Peake on board the International Space Station captured this image of a CubeSat deployment on May 16, 2016. The bottom-most CubeSat is the NASA-funded MinXSS CubeSat, which observes soft X-rays from the sun—such X-rays can disturb the ionosphere and thereby hamper radio and GPS signals. (The second CubeSat is CADRE — short for CubeSat investigating Atmospheric Density Response to Extreme driving - built by the University of Michigan and funded by the National Science Foundation.) Credit: ESA/NASA
For Sale

For sale: Handmade reflector and equatorial mount
I have a 6 inch reflector telescope that my father made in his spare time while raising and family and doing all the stuff a father does. He made his own mirror, tube, gearing and other details necessary to couple the scope to a precision motor to drive the scope. Note the timing marks on the assembly as shown in one of the photos. My father was a tool maker by profession and found the time to make this telescope.

I also have a 10 inch telescope mirror that he received from Polaris Telescope store which was on Michigan Ave. in Dearborn and relocated to Arizona sometime in the late 1970’s. He had plans to make a 10 inch scope but never got the time to design and make the scope.

I am selling the telescope as shown in the pictures and the 10 inch mirror. If there is any interest that your organization or members have in either of these items I can be reached via my email address dwarmus@comcast.net.

Dan
For sale: Fiberglass Dome
I have a 6 foot diameter fiberglass dome that I would like to sell. I am only asking $250. I live in the Oxford area. I can be contacted either by e-mail at cw41000@aol.com, or by cell. My number is 248-802-0408.

Chuck Ward