Astrophotography at Stargate Observatory

pg.10
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

May 1.........Cranbrook.......Ralph DeCew
May 18........Macomb...........Bob Berta
Jun 6...........Cranbrook.......Ken Bertin

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.

May Discussion Group Meeting

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

The Discussion Group for **Wednesday, May 24th**, at **7:00pm Eastern**, will be hosted by Gary M. Ross at his home in Royal Oak.

**1828 North Lafayette, Royal Oak**

Four houses north of Twelve Mile Road in the N.W. quadrant formed by 12 Mile and Main St., Royal Oak. A green light in the porch lamp.

Bring junk food, and your own folding chair or stool.

In this issue:

3 Letters
4 Presentations
5 Astrophotography
6 Over the Moon
7 Objects of the Month
8 May Sky Chart
9 Stargate
10 Outreach Report
12 Observatory Report & Special Report
13 History SIG
15 Meeting Minutes
16 Treasurer's Report
17 GLAAC
18 Astronomical League
20 NASA Space Place
21 For Sale

Space Pirates

Tune in to Captains Marty Kunz and Diane Hall for live radio Wednesday nights at 9:00pm ET
“I take no credit . . .”, what my friend Clayton V. Carey e-mailed me in July. Clayton is a member of the Grand Rapids Association, and whom I call the Man of a Hundred Computers and a Thousand Software Packages. A humble fellow, he will call it exaggeration.

What he takes “no credit” for is a task I put to him after hearing of a fascinating contest on “All Tech Considered”, National Public Radio. There was a contest at Dartmouth to see if computers could write poetry, at least in English, and the radio show gave an illustration: flawless grammar, complete sentences or at least coherent sentence fragments, nice wording, actually pretty . . . and utter balderdash.

N.P.R. sent out a request for sonnets, one of which was read on air. CAROLINE WEINROTH produced a hum-dinger, and Clayton (or a “friend”) found it. I have taken minor liberties with structure, but not order nor wording, the poetess deserving deference.

Adjust my aperture towards the deep sky.  
Behold the gems of heaven on this world.  
Pray my gaze will not be sullied by the light  
From the strip and the street malls and suburbs.  
Discover in the glass the Pleiades, those sisters.  
Seven sapphires in the dark glow pretty,  
Keen with visibility,  
The celestial beings who guide my heart.

But through the other micro lens  
I see an eye for science, an iris clear-blue,  
More stirring than the Whirlpool Galaxy,  
Much brighter than the craters of the Moon.  
Which lens could I look through for a longer time,  
Observing each vast creation sublime.

G. M. ROSS

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### Astronomical Events for May 2017

<table>
<thead>
<tr>
<th>Day</th>
<th>EST (h:m)</th>
<th>Event</th>
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<tbody>
<tr>
<td>02</td>
<td>20:27</td>
<td>Moon at Descending Node</td>
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<tr>
<td>04</td>
<td>14</td>
<td>Eta-Aquarid Meteor Shower</td>
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<tr>
<td>05</td>
<td>23:14</td>
<td>Moon at Perigee: 357828 km</td>
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<tr>
<td>06</td>
<td>14:30</td>
<td>NEW MOON</td>
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<tr>
<td>08</td>
<td>03:21</td>
<td>Aldebaran 0.5°S of Moon</td>
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<tr>
<td>09</td>
<td>10</td>
<td>Mercury at Inferior Conjunction</td>
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<tr>
<td>13</td>
<td>12:02</td>
<td>FIRST QUARTER MOON</td>
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<tr>
<td>14</td>
<td>02:06</td>
<td>Regulus 2.3°N of Moon</td>
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<tr>
<td>15</td>
<td>04:30</td>
<td>Jupiter 2.0°N of Moon</td>
</tr>
<tr>
<td>15</td>
<td>15:39</td>
<td>Moon at Ascending Node</td>
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<tr>
<td>18</td>
<td>09:07</td>
<td>Spica 5.1°S of Moon</td>
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<tr>
<td>18</td>
<td>17:06</td>
<td>Moon at Apogee: 405934 km</td>
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<td>21</td>
<td>16:15</td>
<td>FULL MOON</td>
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<td>22</td>
<td>06</td>
<td>Mars at Opposition</td>
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<td>22</td>
<td>16:59</td>
<td>Saturn 3.2°S of Moon</td>
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<td>29</td>
<td>07:12</td>
<td>LAST QUARTER MOON</td>
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<tr>
<td>29</td>
<td>23:45</td>
<td>Moon at Descending Node</td>
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<td>24</td>
<td>23:13</td>
<td>Mars 4.9°S of Moon</td>
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<tr>
<td>25</td>
<td>14:28</td>
<td>Saturn 3.3°S of Moon</td>
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<tr>
<td>27</td>
<td>08:51</td>
<td>Mars 4.8°N of Antares</td>
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<tr>
<td>28</td>
<td>03:14</td>
<td>Mercury 3.0°S of Pleiades</td>
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<tr>
<td>29</td>
<td>22:29</td>
<td>LAST QUARTER MOON</td>
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</tbody>
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If Daylight Saving Time is in effect, add one hour to the times listed.

If you would like to present either a short talk (10-15 minutes) or a full-length talk (45-60 minutes) at a future meeting, please email Mark Kedzior at: firstvp@warrenastro.org. We have open dates at both Cranbrook and Macomb meetings. Also, if you may have any contacts of possible presenters, please send them along - that would be greatly appreciated. See you at the next WAS meeting!

Thursday, May 18th, 2017
Macomb Community College Presentations

Movie Night
2nd VP Jeff MacLeod will preside at the meeting.

WAS PRESENTATIONS

Dr. Dale Partin presents “SETI - An Update”
Dr. Dale Partin has an update for us on extra-terrestrial intelligence. He may or may not show up in an alien costume.

Dale Partin is an amateur astronomer and he teaches astronomy at Macomb Community College. He has a B.S. and M.S. in physics and a Ph.D. in electrical engineering. Until his partial retirement, he worked in advanced research and development 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.

SAVE THE DATE

W.A.S. INTER-CLUB PICNIC & DOB SHED GARAGE SALE
JULY 15TH @ CAMP ROTARY PAVILION
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.
Libration is the term that describes the apparent wobble of the moon during the course of a lunar day. This allows the observer to see about 9% more of the moon than would otherwise be available. It is usually denoted as the lunar latitude and longitude of the center of the visible disk. Most lunar observers will concentrate on the limb of the moon that is tipped towards us showing more of the “backside” of the moon. But the other limb can offer some very interesting opportunities as well. In this image we have one of those where Janssen, the large 196km diameter largely ruined crater with the beautiful system of rimae contained within. Normally this is seen as a more round feature, farther from the limb but in this image it is about as close to the limb as it can be. The crater to the immediate right of Janssen is Fabricius (80km) with the odd mountain chain in a sideways square “U” shape open to the left, on its floor. Below Janssen are two craters Steinheil (70km) overlapping the lower Watt (68km). To the left of these are another, larger pair of craters. The upper one with a nice central peak is Valcq (92km) and the lower is Rosenberger (99km).

In the very cusp or tip of this image can be seen a strongly foreshortened crater, Schomberger (88km) and down along the limb from that is a larger crater, half filled with shadow, Boussingault (134km). These are 70-76 deg. lunar latitude. Were this libration the reverse of this night, all these would be well seen.

The image capture information is on the image. Selection and stacking was done with AviStack2. Further processing was done with GIMP and IrfanView with assembly of the montage done with iMerge.

Rik Hill
May 2017

Object of the Month: NGC 4361

NGC 4361 is planetary nebula in the constellation Corvus. Objects of this type were first described by Herschel, who labeled them as “planetary” due to the fact that they presented a disc and a greenish glow reminiscent of the then recently discovered Uranus. With an apparent visual magnitude of 10.9 and an angular diameter of nearly 80", the nebula is considered large and fairly bright compared to other such objects. Aside from the most impressive examples, planetary nebulae are typically less than 30” across and fainter than 11th magnitude. It is listed as Type 3a on the Vorontsov-Velyaminov classification system, indicating that its form is disc-shaped with a very irregular brightness distribution. Although planetary nebulae frequently require steady skies and relatively high magnification, the observer is often rewarded by their wide variety of types and forms.

Due to the abundance of signpost stars in the region, finding the location of NGC 4361 is not difficult. However, recognizing it in the field of view might prove a little tricky, since planetary nebulae tend to resemble stars at the low magnifications typically used for tracking down objects. The nebula is positioned within the conspicuous quadrilateral asterism that marks the body of Corvus the Crow, a feature that is sometimes called “The Stargate”. NGC 4361 is about 2.5° south-southwest of δ Corvi (mag. 2.94) and is about the same distance southeast of γ Corvi (mag. 2.58). Apertures of 6-inches or greater and magnifications of 80x or more are recommended for viewing the nebula, although it is certainly possible to detect it with either lower power or a smaller telescope under favorable conditions. Observers should be able to see the inner 40” diameter disc without much trouble. Some irregularity of the disc’s outer periphery may also be apparent. The central white dwarf star shines at a magnitude of 13.8 and should be conspicuous in larger telescopes. Overall, NGC 4361 provides a nice diversion from the plethora of galaxies that typically dominate springtime viewing.

Chuck Dezelah
The Cranbrook Observatory is open to the public Friday and Saturday evenings from 8:30 - 10:00pm EDT, and the first Sunday of the month from 1:00 - 4:00pm EDT, and the first Tuesday of the month from 1:00 - 4:00pm EDT. For observatory information visit http://science.cranbrook.edu/observatory. 

May 2017 Notable Sky Happenings

**MAY 1 - 7**
- The Moon is in the right of Regulus, the evening star, in the SW pre-sunset.
- With a small telescope, you can see the Moon's surface.
- The Moon is to the right of Antares, in the SSW pre-dawn sky.

**MAY 8 - 14**
- The Moon is to the right of Venus, the morning star, in the E pre-dawn sky.
- The Moon is to the left of the planet Mercury, in the E pre-dawn sky.
- The Moon is to the left of the planet Jupiter, in the E pre-dawn sky.

**MAY 15 - 21**
- The Moon is to the right of Saturn, in the SSW pre-dawn sky.
- The Moon is to the left of Jupiter, in the E pre-dawn sky.
- The Moon is to the right of Regulus, the evening star, in the SW.

**MAY 22 - 31**
- The Moon is to the right of Venus, the morning star, in the W pre-sunset.
- The Moon is to the left of the planet Mercury, in the W pre-sunset.
- The Moon is to the left of the planet Saturn, in the W pre-sunset.

**Stars of the Pharaohs**
- "Stars of the Pharaohs" is now showing at The Cranbrook Institute of Science Planetarium. Learn about ancient Egyptian astronomy and how it was used to tell time, make a workable calendar, and align huge buildings. Travel to ancient Egypt to see how astronomy was used to build the pyramids. The movie features and the end credits are narrated by Bob Sirott, ABC News Chief White House and National Correspondent, with original music by the composer of the movie, John DiDomenico. It is one hour in length. For more information on this show, visit science.cranbrook.edu/planetarium.

"One World, One Sky: Big Bird's Adventure"
- "One World, One Sky: Big Bird's Adventure" is now showing at The Cranbrook Institute of Science Planetarium. Join Elmo's friend, Hu Hu Zhu, on an exciting discovery of the world of the Moon and the stars. From China, Elmo travels to China and Hu Hu Zhu, Big Bird, and the HuHu travel into space. They visit the Moon, the Earth, and the other planets of our solar system. The show features a state-of-the-art sky theater and animation that brings the stars and planets to life. For more information on this show, visit science.cranbrook.edu/planetarium.
Stargate Observatory

Monthly Free Astronomy Open House and Star Party

4th Saturday of the month!
Mar. 25th, Apr. 22nd, May 27th

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.
**APRIL 2017**

**SWAN at Stargate**
4/7/2017: Several members showed up and set up telescopes in the field. A good crowd was in attendance.

**Yuri’s Night at Stargate**
4/12/2017: Was a complete bust! Jeff MacLeod, Bob Trembley and Bob Berta showed up, but not a single person attended the event.

**Stargate Open House**
4/22/2017: We had a good crowd; I gave my lecture on the Sun twice! I had an extended conversation with one young man about MANY different topics in astronomy.

**Astronomy Night at North Hill Elementary, Rochester**
4/26/2017: was postponed till the fall

**STEAM Team Event Krause Elementary School, Armada**
4/26/2017: Mark Kedzior attended this event and reports that “The place was packed - I did a solar HAlpha scope outside as visitors came and went - sure could use some WAS handouts of some sort - time to design a trifold for our outreach, get some business cards out to outreach people, maybe get a large shipment of “Getting Started in Astronomy” pamphlets from Sky and Tel or Astronomy if available. Thanks Mark, and good ideas!**

**Penguicon: Open-Source – Science Fiction Convention (Southfield)**
4/28-29/2017
Connie and Bob are scheduled for SEVERAL astronomy panels and telescope sessions at this convention. Bob is a “Featured Guest” this year.
Website: https://2017.penguicon.org/

**MAY 2017**

**Selfridge Air National Guard Base Open House**
5/19/2017 9:30 AM - 1:30 PM
Would like solar telescopes and lectures
- Bob Trembley (Kerbal Space Program Hands-on Lab)
- Ken Bertin (Possible)
**Could use more volunteers**
Note: This is at the Air Base - you will need to fill out a security check form a few days beforehand, before they will issue you a pass to enter.

**JUNE 2017**

**Girl Scout Pack 77 at Stargate**
6/2/2017 8-11 PM
- Bob Berta
**Could use more volunteers**

**Girl Scouts of Southeastern Michigan at Camp Hawthorn Hollow**
6/10/2017 10 PM – Midnight
- Bob Berta
- Lee Hartwell
**Could use more volunteers**

If anyone wishes to be added to the MailChimp outreach request list PLEASE let me know!

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Bob Trembley
Outreach
April Open-House
The April Open-house was a glorious success; we had a great night, under clear skies. Jupiter was quite the object with the red spot as prominent as I have ever seen it. Several members set up telescopes on the field, Marty Kunz used the “BIG dob” to track down two comets, “I don't know how he was able to find them”. We had a Boy Scout and Cub Scout group come out during the night and a decent turn out from the public, 45-50 in all. I left Joe Tocco around midnight; he stuck around and imaged M27 with the Kalinowski-khula refractor.

May Open-House
The regular Open-house for May is scheduled for Saturday the 27th, two days after the new moon, we will have a crescent Moon setting at 11pm. Sunset is at 9pm with astronomical twilight ending right around Moonset. 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
It appears that the ball may start rolling soon on removal of the concrete apron around the observatory.

Jeff MacLeod
Second Vice President

Observing Report: Astrophotography at Stargate

The open-house was well-attended and blessed with dark clear skies. The crescent moon set in the late afternoon and the sky seemed favorable for visual observing. Jeff and Marty manned the club scopes for most of the visitors with help from a few of the usual suspects including the affable Pat Brown.

Everyone enjoyed the views and the camaraderie. As the public attendance dwindled Jeff MacLeod woke me from a nap in my van to tell me he was locking up. I took the helm from him and said good night to the remaining club members as I started setting up. Astrophotography through a telescope is still new to me. Armed with my beloved D750 Nikon and a Hotech self-centering 2” adapter I was stoked for a night of imaging; camera, shutter release and laptop in-hand.

Autoguider? Nope, but I did have access to an 8” f/12 refractor on an Astrophysics 1200
GTO Mount and that has to count for something.

The big Kalinowski-Khula telescope was not sync’d well and honestly I forgot how to re-sync it so centering an object was problematic, tedious and frustrating but if nothing, I’m stubborn so I persevered.

M27 was normally not difficult to find. I centered on a brighter star near it and manually focused for the smallest and sharpest image. A little tedious but not impossible. I moved the scope back to M27 and snapped a 15 second exposure. 30 seconds later the image displayed on my laptop...a dark field with small pin-point stars, no nebula. I slewed the big scope and snapped another photo. 30 seconds later another dark starry field. Whir, snap...nothing. Whir, snap...whir, snap...whir, snap. Finally tucked in the upper right corner of the image was a pale blue apple-core. I finally found it. I centered and snapped another image. For the next 30 minutes I played with the ISO and Shutter-speed, trying to find a sweet balance of low-noise and bright sharp images. In all I shot about 40 or more images of the nebula (only to narrow it to 6 keepers the next day.)

The Ring was a little easier to find and just like M27 I snapped various permutations of ISO and shutter-speed. Close to 45 images before I was done. 7 of these were fairly successful.

I gave up my efforts that night while trying in vain for any part of the Veil. That will have to wait for another night. I closed the observatory at the start of astronomical twilight. I crawled back into my van and slept a little more than two hours before waking and driving home in the soft pale hues of the morning sunrise.

The best results for both M27 and M57 nebulae were ISO 1600 and 30-second exposures. Anything longer than 30 seconds seem to show some tracking error. Perhaps an auto-guider would fix that easily.

I know, Bill and Bob Berta are saying, “what about calibration frames?”

Dark frames - Well, sort of, they get captured in-camera with Nikon’s Long Exposure Noise Reduction feature. Is it as good? I have no idea and I should try to capture true dark frames next time.

Flat frames - Huh?

Bias frames - I don’t even know.

Both images seem too small for the sensor size on my D750, which is a full-frame sensor (35mm.) I will be anxious to try again with a 2” 2x or 3x Barlow. I’m only assuming that would be the best way to go about this.

I did some basic adjustments in Lightroom and then ran the 1/2 dozen images through Deep Sky Stacker. The end result is what is published. I am pleased with the images but I know that the K2 telescope can do much better. I just have to learn more. Back to the club experts for guidance.

Bill Beers has been indispensable and never tires of helping but there are a few others in the club who are also great teachers. I’m happy to help too but hey, I’m still learning. :-)
May 1985
This issue looks like something that came out of my old Michigan Commodore Users Group (typographically speaking) many years ago. And, if I thought last month's featured issue was slim pickins', it couldn't hold a candle to this one. Nary an article in sight. Once you get past the masthead page and coming attractions, up pops Ray Bullock's chart of the “Location of the Sun, Moon, And Planets” for May 1985.

From the Scanning Room
Since this month's issue was such a light weight, I took the opportunity to look back on the progress so far and peek ahead.
As I catalogued the four collections I've dealt with (plus two boxes from Kim Dyer that migrated down here with me to go through), I came up with a “missing issues” listing:
1969- Since the first issue was in March, January and February are right out, leaving April, June July, August and November.
1970- May, July, August.
1972- March (we have on record that the October issue never existed).
1973- November, December
1974- January (which could be part of a Dec/Jan issue), September
1977- May
1980- August
1981- June
1983- August
1987- May, June, July, October, November, and December.
1988- January, February, March, April, May, October, November, and December.
1990- January, February, March, April, May, June, July, August, October, and November.
1991- July

1992- March, April, June, July, August, September, October, November, and December.
1993- Whole year.
1994- Whole year.
1995- January, February, April, and June.

September of 1995 marks the end of the printed WASP. It was rendered in HTML format starting with one page spanning October of 1995 through May of 1996. Commencing in June, the WASP returned to a monthly issue with each month getting its own HTML page. This continued until April of 2003. There is a three-month gap, then in August of that year the WASP re-appears as PDF file and continues as such to this day. I can only assume that, unless the issues in the gap of 2003 exist on someone's hard drive, they were either never produced or are lost. Once I get back to sorting through the Kim Dyer collection, I'm confident that more gaps will get filled.

This list is also a call out to the general membership in case anyone has one of the listed copies in their attic. The History SIG appreciates all contributions.

Dale Thieme,
Chief scanner
BOARD MEETING

Present: Diane Hall, Mark Kedzior, Jeff MacLeod, Ruth Huellmantel, Joseph Tocco, Robert Trembley, Brian Thieme

Meeting convened at: 6:32 PM

Officer’s reports

President - Diane welcomed the Board, made a few comments about items to be covered under old and new business.

1st Vice President - Mark noted that there are lots of openings for presentations (including one for July) and discussed a few ideas to motivate first-time presenters to step-up up to the podium.

2nd Vice President - Jeff mentioned that the open-house was clouded over yet again and commented on the upcoming open-house. See his report for details.

Treasurer - Ruth summarized the financial standings and included that the Treasury report is in the WASP. She also mentioned the the WAS PO Box was recently renewed for another year.

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

Outreach - Bob detailed the extensive outreach that is scheduled, all of which is in his report in detail.

Publications - WASP is on-line!

Old Business

Discussion Group - Joseph Tocco is hosting the April discussion group and there a two tentative hosts volunteering for some time this summer. Nothing concrete yet so if you’re interested in hosting then contact any of the Board members.

Manuals - Dale Thieme submitted several checklists that are under review. Dale continues to be a force in support of this club (all the way from the sunny state of Florida.)

Stargate - Jeff mentioned that he has not received any reply from the Metropark on our request to have the concrete skirting/step around the observatory repaired. He will contact her again to discuss that and an all weather bulletin board for the exterior of the observatory where the club can post information to the public. Jeff also distributed a rough draft of the new Stargate Procedures manual. He discussed a few minor changes to the manual and will redistribute to the Board.

MOTION: Jeff MacLeod made a motion to accept the draft Stargate Procedures Manual (with consideration to the verbal changes he mentioned.) Joseph Tocco seconded the motion and it passed with unanimous support.

Website - Brian Thieme, Jonathan Kade, Joe Tocco and Bob Trembley met to review a new platform and to discuss standards for the look and function of the club website. Work is in-progress.

New format for Cranbrook meeting - Mark reported that the new format was received well and as such will become a permanent change.

Diane confirmed that the Paul Strong Scholarship was renewed for 2017.

New Business

Astronomy at the Beach is officially on for 2017 and the venue is Kent Lake at Island Lakes State Park. Stayed tuned for details.

MOTION: Diane made a motion to donate $500.00 to the Astronomy at the Beach event which was seconded by Joseph Tocco and it passed with unanimous support.

Club Picnic - Diane suggested starting the picnic at
4:00 PM in order to make it easier for members to stay late for observing if the weather permits. Also, to make the picnic a Swap Meet, too, which all board members agreed was a fun and creative add to the picnic events. More to follow.

Stargate - Diane suggested a Free Library box at the Wolcot Mills Metropark to off load our burgeoning book inventory. Jeff MacLeod to contact the Park Manager.

Banquet - Reservation and $300.00 down-payment was made by Joseph Tocco at DeCarlo's for December 7th, 2017.

Brian Berta spoke with the Board to notify that his Eagle Scout Project was successfully completed. The project included window shades for the bathroom building and decorative art for the dome roller covers.

MOTION: A motion was made by Jeff MacLeod to adjourn which was seconded by Bob Trembley and approved by all members.

Meeting adjourned at: 7:29 PM

CRANBROOK MEETING

Meeting called to order at 7:34 PM by Diane Hall, President.

48 members present, 5 visitors.

Diane Hall welcomed the visitors and made a general announcements. Board Officer’s Reports were summarized by the respective Officers.

Several Observing Reports were given, including Jon Blum’s report of very early morning observing with Bill Beers on a Maui mountain top.

In-lieu of a short talk Diane resurrected “Ask a Stupid Question.” Brian Klaus started the round with something about Hawking Radiation, clearly not qualifying as a stupid question.

The long talk was given by Dale Partin, “Colonizing Mars”

MACOMB MEETING

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

30 members present, including 2 visitors and 4 of Dr. Partin’s Astronomy students.

Diane Hall, President, made general announcements; notably that Astronomy at the Beach officially has a new venue, and the Club Picnic has a new start-time and includes a Swap Meet. More to follow on that in the WASP. Diane also summarized the Officer’s reports from the January Board meeting.

The main talk was given by Mark Kedzior, “Adventures in Amateur Telescope Making”

Meeting was adjourned at 9:24 PM

Joe Tocco
Secretary

Saw a Fireball?
Report it to the American Meteor Society!

www.amsmeteors.org/members/fireball/report-a-fireball
Treasurer’s Report

TREASURER REPORT FOR APRIL 30, 2017

MEMBERSHIP
We currently have 78 members, of which 10 are family memberships.

INCOME AND EXPENDITURES (SUMMARY)
We took in $383.08 and spent $1,747.00. We have $18,450.75 in the bank and $152.50 in cash, totaling $18,603.25 as of 4/30/2017.

INCOME
290.00 Memberships/renewals
000 AL Membership/renewals
15.00 Merchandise, (bandanas)
0.00 Donations: General Fund
0.00 Donations: Stargate Fund
32.00 Donations: Paul Strong Scholarship
0.00 Donations: Amazon Smile
46.08 Snacks

 EXPENSES
 44.50 Snacks
 64.00 (PO Box renewal)
 500.00 Paul Strong Donation
 500.00 Donation for Astronomy at the Beach
 383.00 (reimbursement for bandanas)
 300.00 Banquet

GLAAC REPORT 4/30/2017
Beginning Balance: $4,520.80
INCOME
$500.00 Donation for Astronomy at the Beach
EXPENSES
none
Ending Balance: $5,020.80

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.

To check out a book, you simply have to be a member in good standing. 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.
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>Dryden</td>
<td>Monthly, see club website for times</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: [Balrog's Lair](http://Balrog'sLair)
Bill Beers: [Sirius Astro Products](http://SiriusAstroProducts)

Jon Blum: [Astronomy at JonRosie](http://AstronomyatJonRosie)
Bob Trembley: [Vatican Observatory Foundation Blog](http://VaticanObservatoryFoundationBlog)
Jeff MacLeod: [A Life Of Entropy](http://ALifeOfEntropy)
To all those with rooms reserved at the Parkway Plaza Hotel:

Your hotel room(s) is still reserved, or in other words, none of you have lost your room(s).

Because of a reservation system change, some of the hotel’s reservation information is incomplete and the hotel needs everyone to contact them by May 1st to pay for the entire reservation. For most attendees staying 6-7 nights, this will be $600-$700 plus taxes. The minimum stay is 4 nights for $400 plus taxes.

Please call the hotel at 1-307-235-1777, Option 0 for reservations, and give them your credit/debit card number to pay for your room(s). Please identify that you are in the ASTROCON block of rooms.

We were aware of the May 1st deadline as part of a contract with a new owner/manager of the Parkway a few months ago. Our mistake was not informing all of you about this sooner and we are very sorry for any inconvenience this causes.

We also want to make sure that we have a correct telephone number for everyone, as a representative of the hotel owner wants to reach out in an effort to confirm everyone’s reservation.

If you have concerns after contacting the Parkway Plaza Hotel, please contact ASTROCON ASAP. We look forward to meeting all registered guests at ASTROCON!
NOAA's Joint Polar Satellite System (JPSS) to monitor Earth as never before

By Ethan Siegel

Later this year, an ambitious new Earth-monitoring satellite will launch into a polar orbit around our planet. The new satellite—called JPSS-1—is a collaboration between NASA and NOAA. It is part of a mission called the Joint Polar Satellite System, or JPSS.

At a destination altitude of only 824 km, it will complete an orbit around Earth in just 101 minutes, collecting extraordinarily high-resolution imagery of our surface, oceans and atmosphere. It will obtain full-planet coverage every 12 hours using five separate, independent instruments. This approach enables near-continuous monitoring of a huge variety of weather and climate phenomena.

JPSS-1 will improve the prediction of severe weather events and will help advance early warning systems. It will also be indispensable for long-term climate monitoring, as it will track global rainfall, drought conditions and ocean properties.

The five independent instruments on board are the main assets of this mission:

- The Cross-track Infrared Sounder (CrIS) will detail the atmosphere’s 3D structure, measuring water vapor and temperature in over 1,000 infrared spectral channels. It will enable accurate weather forecasting up to seven days in advance of any major weather events.
- The Advanced Technology Microwave Sounder (ATMS) adds 22 microwave channels to CrIS’s measurements, improving temperature and moisture readings.
- Taking visible and infrared images of Earth’s surface at 750 meter resolution, the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument will enable monitoring of weather patterns, fires, sea temperatures, light pollution, and ocean color observations at unprecedented resolutions.
- The Ozone Mapping and Profiler Suite (OMPS) will measure how ozone concentration varies with altitude and in time over every location on Earth's surface. This can help us understand how UV light penetrates the various layers of Earth’s atmosphere.
- The Clouds and the Earth’s Radiant System (CERES) instrument will quantify the effect of clouds on Earth’s energy balance, measuring solar reflectance and Earth’s radiance. It will greatly reduce one of the largest sources of uncertainty in climate modeling.
The information from this satellite will be important for emergency responders, airline pilots, cargo ships, farmers and coastal residents, and many others. Long and short term weather monitoring will be greatly enhanced by JPSS-1 and the rest of the upcoming satellites in the JPSS system.

Want to teach kids about polar and geostationary orbits? Go to the NASA Space Place: https://spaceplace.nasa.gov/geo-orbits/

Caption: Ball and Raytheon technicians integrate the VIIRS Optical and Electrical Modules onto the JPSS-1 spacecraft in 2015. The spacecraft will be ready for launch later this year. Image Credit: Ball Aerospace & Technologies Corp.
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

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

Seven Ponds Open Invitation

WAS members are invited to The Seven Ponds Astronomy Club monthly meetings.

More information about upcoming meetings, maps to Seven Ponds Nature Center, etc. are available at http://www.sevenpondsac.com

Please let John Lines know if you might attend so that appropriate plans can be made: (248) 969-2790, or jelines1@gmail.com