The W.A.S.P

M63 Sunflower Galaxy
27 million light-years from earth
Bill Beers 5-6-17
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

June 6........Cranbrook.......Ken Bertin
June 15.......Macomb..........Riyad Matti
July 7.........Cranbrook.......Alan/Cheryl Kaplan

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.

June Discussion Group Meeting

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

The Discussion Group for **June 22**, at **7:30pm 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.

Cheap red will be supplied, bring junk food, and your own folding chair or stool.

In this issue:

3 Astronomical League Renewal
5 President's Field of View
6 Discussion Group Report
7 Presentations
8 From the Program Chair
9 Astrophotography
10 Over the Moon
11 Object of the Month
12 Stargate Observatory
13 Stargate Officer's Report
14 Outreach Report
16 History S.I.G.
17 Meeting Minutes
19 Treasurer's Report
20 GLAAC
21 NASA Space Place
23 For Sale

Space Pirates

Tune in to Captains Marty Kunz and Diane Hall for live radio Wednesday nights at 9:00pm ET
Our Astronomical League membership list is due at the end of June. Please let us know immediately if you’d like to join the Astronomical League or renew your membership.

A membership for the whole year (through next June) costs only $7.50. Membership nets you their quarterly magazine, The Reflector, and participation in their observing clubs - a great way to encourage yourself to observe. (They even have online leaderboards!)

Beyond these fun programs, you also get the right to attend their annual convention for a reasonable fee, not to mention full voting rights at the convention.

If you would like to join or renew, and your W.A.S. dues are paid up for 2017, please:

immediately let me know at alcor@warrenastro.org

AND

pay our treasurer, Ruth Huellmantel, at a meeting this month

OR

send a check for $7.50 to:
Warren Astronomical Society
22712 Nona St.
Dearborn, MI 48124

OR

send $7.50 via PayPal to treasurer@warrenastro.org with a note that it’s for the AL membership.

Thanks!

Jonathan Kade
Astronomical League Coordinator
Warren Astronomical Society
The Astronomical League helps members explore the wonders of our universe—maximize your membership!

**Observe Clubs.** Just about everyone has heard of the nearly 30 AL Observe Clubs. These are a group of **nationally recognized** observing lists and activities. Some are suitable for novices, some are for intermediates, while others are strictly for advanced amateurs. These clubs provide a low stress way to view the many wonders of the night sky.

**League Awards.** The Astronomical League wants to recognize those dedicated individuals who make astronomy happen. Every year, the League gives awards in several different areas: the Mabel Sterin Newsletter Award, the Webmaster Award, the National Young Astronomer Award, the Jack Horkheimer Young Person’s Service Award, and others. People really appreciate the recognition!

**Reflector Magazine.** Every member receives this full color quarterly magazine that’s published for League members by League members. Members are encouraged to submit articles and images for our national readership of over 16,000 amateur astronomers. The magazine also puts members in touch with dozens of Star Parties located all over the country and features columns from other professional groups.

**League Store.** We have a great League Sales Office, run by a dedicated and talented staff. Our astronomical handbooks are low cost and very popular — another of the many benefits of League membership. League Sales is vastly expanding its inventory, has gone to a color catalog, and now has an online, credit card capability.

**Book Service.** Searching for that special astronomical title in print? Separate from League Sales, the League provides a 10% discount on astronomy books with no shipping charge.

**National Convention of the Astronomical League.** At our National and Regional meetings, members rub shoulders with, among others, research astronomers, astronauts, authors, magazine editors, university professors, equipment manufacturers, as well as officers of the League. This is your chance to talk shop with those in-the-know.

**National Voice.** The League gives amateur astronomy a national voice on important issues, such as local, regional and national levels to fight light pollution and advance astronomical research.

Contact: [alcor@warrenastro.org](mailto:alcor@warrenastro.org)
Last month I had the pleasure of addressing our comrades to the west, the Grand Rapids Astronomical Association. The members who turned up at Schuler Books and Music that evening proved a good mix of familiar and new faces across a wide range of ages, and when chatting to members at their version of post-meeting “gastronomy” I learned quite a few of them hadn’t even been part of the GRAAA the last time I’d presented over there. We had a wonderful time discussing science fiction (yes) and I went back to my base of operations at Kissing Rock Farm thinking that the GRAAA, with its revamped website and its institutional partnerships, was positioning itself to make sure the venerable twin domes of the Veen Observatory remained in good hands for the future.

During the the gastronomy session longterm GRAAA President David DeBruyn asked me about the leadership structure of my home club. He was surprised to learn that the WAS has enforced term limits for all officers and joked that when he retired from his post at the end of this year, the GRAAA might well do the same. While sending officers through an ever-revolving door (or sometimes through a round of musical chairs) ensures that new ideas arrive at the Board’s meeting table on a regular basis, it does present the challenge of filling seven positions every year. Thankfully 2017 is not one of the years in which all current officers are ousted via term limits, but three key positions will need to be filled in November’s election: Second Vice President and all that comes with it at Stargate Observatory, Outreach and its constantly-booked calendar, and the Presidency itself.

Dear friends and fellow members, it is not too soon to consider yourself in one of these positions. Come down to one of our 6:30 Board meetings prior to a Cranbrook meeting, volunteer for the club picnic this July, and feel free to announce your intentions to the current officers so we can fill you in on what you need to know. We will be calling on you in the very near future, because the far-off future of the WAS will depend on it.

Diane Hall
President

Astronomical Events for June 2017

<table>
<thead>
<tr>
<th>Day</th>
<th>EST (h:m)</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>01:45</td>
<td>Moon at Perigee: 365983 km</td>
</tr>
<tr>
<td>01</td>
<td>22:58</td>
<td>Aldebaran 0.4°S of Moon</td>
</tr>
<tr>
<td>02</td>
<td>11</td>
<td>Mercury at Perihelion</td>
</tr>
<tr>
<td>04</td>
<td>06:01</td>
<td>NEW MOON</td>
</tr>
<tr>
<td>04</td>
<td>11</td>
<td>Earth at Aphelion: 1.01675 AU</td>
</tr>
<tr>
<td>06</td>
<td>22</td>
<td>Mercury at Superior Conjunction</td>
</tr>
<tr>
<td>07</td>
<td>18:33</td>
<td>Regulus 1.8°N of Moon</td>
</tr>
<tr>
<td>08</td>
<td>20:41</td>
<td>Moon at Ascending Node</td>
</tr>
<tr>
<td>09</td>
<td>05:08</td>
<td>Jupiter 0.9°N of Moon: Occn.</td>
</tr>
<tr>
<td>10</td>
<td>18</td>
<td>Venus at Perihelion</td>
</tr>
<tr>
<td>11</td>
<td>19:52</td>
<td>FIRST QUARTER MOON</td>
</tr>
<tr>
<td>11</td>
<td>23:13</td>
<td>Spica 5.6°S of Moon</td>
</tr>
<tr>
<td>13</td>
<td>00:24</td>
<td>Moon at Apogee: 404272 km</td>
</tr>
<tr>
<td>16</td>
<td>00:11</td>
<td>Saturn 3.4°S of Moon</td>
</tr>
<tr>
<td>19</td>
<td>17:57</td>
<td>FULL MOON</td>
</tr>
<tr>
<td>23</td>
<td>02:49</td>
<td>Moon at Descending Node</td>
</tr>
<tr>
<td>26</td>
<td>18:00</td>
<td>LAST QUARTER MOON</td>
</tr>
<tr>
<td>27</td>
<td>06:25</td>
<td>Moon at Perigee: 369659 km</td>
</tr>
<tr>
<td>27</td>
<td>16</td>
<td>Delta-Aquarid Meteor Shower</td>
</tr>
<tr>
<td>29</td>
<td>05:53</td>
<td>Aldebaran 0.3°S of Moon</td>
</tr>
<tr>
<td>30</td>
<td>10:55</td>
<td>Mercury 0.3°N of Regulus</td>
</tr>
</tbody>
</table>

If Daylight Saving Time is in effect, add one hour to the times listed.
“Party discipline might be bent, but never broken”.
-- from We the Living.

24th of May, instant.

Harriet Ross house, Royal Oak

Cultural elitism ruled. The wisest of men and women exchanged data and ideas over the elegant Turkish table cloth as the side-board groaned with junk food and cheap red. Comrade Tocco thought it advisable to proffer two litres of soda to diversify. “Maui Jon” brought the best thing, oatmeal-raisin cookies.

[REDACTED], of the Fox Valley Astronomical Society and North-West Suburban Astronomers (Ill.) did not show up on a flimsy excuse, which I suspected might be from a coming drone strike, but said nothing to forestall panic. He was denounced as a Trotskyite.

Topics in no order: Meeting format of astronomy societies, and “Maui Jon’s” memberships in Hawai‘i. The August solar eclipse: where to and not to observe from and ridiculous rates just to “eat, sleep, and go to the bath-room”. Major reformation of “Astronomy At The Beach” with cost savings, from prime co-ordinatrix, Commissar Hall. Religious and environmental furores in the building of new observatories, with side analogy of Canadian native land claims. The spectacular failures of the Soviet space shuttle and Moon rockets + subsequent destruction of artifacts by weather accident. The destruction of a Titan II inter-continental missile from maintenance accident. Chicanery in software design for automobile emissions testing. Census of Housing, 1950, re indoor plumbing, see opening quote.

The members rose of own accord. I subsequently telephoned San Diego given the hour, the first of my reports about the Discussion Group awaited by the outside astronomy world.

G. M. Ross, rapporteur.

Addendum:
Jim Shedlowsky asked the assembled savants to identify the greatest astronomical hoax. There was but one reply, and correct: The 19th c. flummery by a new York newspaper which anounced the discovery of life on the Moon by John Herschel, employing his giant reflector at Cape Colony. Another candidate was shot down in flames: Mercury Theatre broadcast in 1938 about an invasion from Mars, a mere work of INTENDED fiction. It was a fine point but the respondent relented.
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!
Two new presentations have been secured for future meetings:

At Cranbrook on November 6th, we have Professor Jerry Dunifer making a return to present “Gravitational Waves and LIGO (Laser Interferometer Gravitational Wave Observatory).”

Finally, for our WAS Banquet on Thursday December 7th, we will have as our featured speaker, Professor Emily Rauscher, Department of Astronomy, University of Michigan, presenting “Peering into the Atmospheres of Strange New Worlds.” In this presentation she will “discuss the discovery of over 3,000 planets orbiting nearby stars in the last 20 years, and the incredible methods developed by astronomers to measure the atmospheric properties of some planets to give us some clues as to the physical conditions on these exotic worlds, and the current status and future of these grand endeavors.”

We look forward to Professors Jerry and Emily at these WAS events!

We do have one last Cranbrook opening on Monday, December 4th, and openings at our Macomb meetings for July through November. Please consider giving a presentation at one of these meetings to our membership and guests.

Every member in our organization benefits from the effort and research put in by our presenters to educate and inform us of the marvelous wonders of the science of astronomy, whether it be at the podium or at the eyepiece of a telescope, describing to the observer what they are seeing, also known as “Outreach”. Your participation in and support of the Warren Astronomical Society is greatly appreciated.

All the best,

Mark Kedzior
1stVP
Warren Astronomical Society

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.
NGC 6946 & Supernova 2017 eaw (marked with yellow pointers) / Photo credit: Doug Bock
Northern Cross Observatory
May 14-15, 2017
10" f/8 RC
ZWO asi071mc cooled to 0 degrees C
1 hour 36 minutes of data acquisition
Over the Moon
with Rik Hill

TAking A Dip in the Southern Sea

What we have here is a more complicated situation than the usual image. This image shows many features not seen or poorly seen under average libration conditions. But in this case, due to a favorable libration, we get a good look at these details. Because of the complicated nature of the view, I created a second annotated image under the principle that “a picture is worth a thousand words”. This is the lunar southeast limb that was imaged, as I made and effort to see the elusive Mare Australe. I was using Virtual Moon Atlas, which is usually a good reference but in this case (as in a couple others) there was an error in identification that nearly resulted in me missing the mare altogether!

Major craters are identified with Lyot, Oken and Abel being the most easily found. I thought I had found Mare Australe between Lyot and Hamilton where VMA had noted it, but it didn’t look much like a mare. I wondered if it could be the area just above Lyot, between it and Peirescins? So now it was time to go to the IAU/USGS Gazetteer of Planetary Nomenclature on the web. This is a very official atlas using imagery from a number of lunar missions all annotated. I was surprised by what I found. Mare Australe is the flat area on either side of the crater Gum, between Gum - Abel and Gum - Hamilton! It would have been better imaged the night before. The area between Lyot and Peirescins is unnamed though much more noticeable. Next I wondered what the area above and to the right of Hanno was, perhaps another sea? No! That area too is unnamed for the most part.

So the moral of the story is that it pays to use a couple sources when identifying tricky and more elusive lunar features!

The images used to make this 5 image montage were each a stack of 400 frames from 1200 frame AVIs using AviStack2. Further processing was done with GIMP and IrfanView and the montage was made with iMerge.

Rik Hill
June 2017

Object of the Month: NGC 5746

NGC 5746 is an edge-on spiral galaxy in the constellation Virgo. It is sometimes referred to as the “Blade and Pearl Galaxy” due to its strikingly thin profile and close proximity to a white-colored star. NGC 5746 has an integrated magnitude of 10.3, angular dimensions of 6.9’ x 1.2’, and is classified as SBbc on the Hubble Sequence, which indicates a somewhat loosely wound spiral structure that features a central bar. Since the galaxy is viewed along its edge from our perspective from Earth, little of the actual structure is directly visible. The galaxy appears as a sliver of light with a prominent central bulge. The bulge is noted by astronomers for its prominent “boxy” shape, which is likely a result of the galaxy’s bar region viewed from the side. For this reason, it has been also labeled in some sources as the “Box-bearing Galaxy”. NGC 5746 is approximately 95 million light years distant. Despite being located in Virgo, the galaxy is not a member of the famous Virgo Cluster, as it is situated well away from and nearly twice as distant as the main cluster grouping.

Locating NGC 5746 is very easy under all but the most light polluted skies, given the fact that 109 Virginis—a magnitude 3.7 star at Virgo’s northern foot—lies less than a half degree away. Once 109 Virginis is found, the galaxy can be centered in the field by only a slight move to the east. The view can be improved by positioning the field such that 109 Virginis is just outside of range, thus avoiding glare that may reduce the visibility of subtle detail in the galaxy. Although small apertures may afford a glimpse of NGC 5746, telescopes of eight inches or larger will provide the most pleasant observations. The central bulge and overall elongation of the brightest region should be easily discerned. With averted vision, a dark dust lane and an extended thin disk can be detected. Catching a sight of the “boxy” aspect of the bulge is difficult, but could be feasible with high magnification in large apertures under steady conditions. Overall, the galaxy provides a nice target that is both straight-forward and rewarding.

Chuck Dezelah
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.
May Open-House
The May Open-house was a great success; we had a sky that kept getting clearer. Jupiter was again the object of the night; guest took in a shadow transit early in the night and the red spot later. We had a sliver of a waxing crescent moon, as well as a weather balloon sighting that a few members including myself saw explode! Several members set up telescopes on the field including Brian Thieme, Bob Berta, and a few members setting up new scopes. We also had a girl scout group come out, they and others took in presentations from both Ken Bertin and Bob Berta. Turnout was around 45-50 in all.

June Open-House
The regular Open-house for June is scheduled for Saturday the 24th, one days after the new moon, we will have a crescent Moon setting at 9:46pm. Sunset is at 9:13pm with astronomical twilight ending right around 11pm. 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 at this time.

Jeff MacLeod
Second Vice President
The Michigan skies are being fussy as usual – we’ve had a few successful Stargate events, and a washed-out weekend for Astronomy Day. Our volunteers have given several presentations over the last few months, and several members were interviewed by the Detroit Free Press for article about the eclipse!

**April 2017**

**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.

**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 were on SEVERAL astronomy and space science panels at this convention; Connie was invited to be on an additional panel taking about the movie “Hidden Figures.” Bob was a “Featured Guest” this year. Bob brought his telescopes, but the skies were overcast all weekend. It’s starting to become a joke a local SF conventions… “It’s cloudy… Bob must be here with his telescopes.”
Website: https://2017.penguicon.org/

**Astronomy Day at Cranbrook**
4/29/2017  1-4 PM
Jeff MacLeod, Gary Repella, Gary Ross, Parker Huellmantel and Ruth Huellmantel attended the event - it sounds like everything was uneventful, but museum patrons did go away happy

**Astronomy Day at Stargate**
4/29/2017
Jeff MacLeod texted me while I was at Penguicon, asking if he should formally cancel the event due to weather. I replied that even with overcast skies and a little rain, people at the convention were still asking me if there would be observing… so yea, he better formally cancel it.

**May 2017**

**Morgan Elementary in Shelby Township**
5/10/2017 - Andelo DiDonato and Bob Berta gave presentations about the solar system, stellar sizes, distances and the possibility of ET in the cosmos to 96 students. Bob reports that: “The kids were well behaved and had great questions that showed they already knew quite a bit about astronomy.”

**Selfridge Air National Guard Base Open House**
5/19/2017 – The event was moved to different facility in the base, and our outreach volunteers were unable to attend.

**SOAR at Macomb Community College**
5/22/2017 – Andelo DiDonato, Ken Bertin and Bob Berta WOWed ‘em at a 2 hour Society of Active Retirees event at Macomb Community College. The reviews from the 40 attendees were VERY positive – one person commented: “These men were so passionate. They made topic enjoyable! This class is a perfect example of why I love SOAR!” Bob Berta reports: “We are already booked for next year’s class. SOAR is so popular they are turning away potential students as the classes fill up quickly.” In fact, the SOAR program is so popular that the college is going to fully fund it next year.”
Stargate Open House
5/27/2017: Ken Bertin reports on Facebook: “It was a very nice evening. The skies were relatively clear and just before it turned dark I gave a presentation to kids (most around ten and eleven), their parents and several other people on distance in space and the size of objects therein. There were about 40 people and I had as much fun giving the talk as they did hearing it. Then as it got dark we swung the several telescopes at many objects to show the public how very cool astronomy is. We showed them our moon, Jupiter and its moons, Io cast its shadow on its giant planet as an extra treat. We saw M 57, the ring Nebula, M13, the globular cluster in Hercules. We also looked at double stars, Alberio and Castor. A comet was also in range, so we looked at it. Before the evening ended, Saturn came into view, an object of extraordinary beauty and it wowed the crowd accordingly. I provided a tour of the skies with my laser in hand as well. The questions were numerous and our able crew provided answers to them all. As a special treat, the International Space Station flew over. All and all, it was a fun evening.”

Detroit Free Press

June 2017

St. Peters Elementary in Macomb Twp.
6/1/2017 - Andelo DiDonato and Bob Berta gave presentations to a 52 students. The session was well received and much appreciated by the teachers.

Cub Scout Pack 77 at Stargate
6/2/2017 8-11 PM – 40-50 Cubs
- Bob Berta
Could use more volunteers

Girl Scouts of Southeastern Michigan at Camp Hawthorn Hollow
6/10/2017 9 PM – Midnight - 30 - 50 girls, grades

July 2017

Stargate Open House
6/24/2017 – Sunset 9:13 PM

Stargate Open House
7/22/2017– Sunset 9:02 PM

August 2017

Eclipse Lecture - Brandon Township Library
8/2/2017
- Ken Bertin

Hobby Day event at Crosswinds Marsh
8/12/2017 9:00 AM - 1:00 PM
Introduce the public to astronomy – solar observing, maybe a W.A.S. table.
Contact: Jennifer Panek
NEED volunteers

Stargate Open House
8/26/2017– Sunset 8:15 PM

TBD / In the Works

Macomb Library for the Blind and Physically Handicapped – July 11 or 25th – Looking for someone to present to a visually impaired audience. Colombiere Center in Clarkston (Jesuit retirement community) wants astronomy lecturers.

Chesterfield Township Library is interested in a monthly Moon viewing event.

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

Bob Trembley
Outreach
**History SIG Report**  
**June 1979**

The cover on this issue is interesting. The caption reads: “Above, Centaurus/Crux region. From bottom to top: Alpha & Beta Centauri, the Southern Cross, and Eta Carinae nebula. At left, the Large and Small Magellanic Clouds. Both pictures taken from the editor’s backyard in southern Warren.” I had no idea southern Warren afforded such views of the southern hemisphere skies. Gary Ross may want to reconsider his observing sites. Mark Bieniek discusses “Binary Stars” and Loretta D. Caulley presents “Ursa Minor (The Little Bear)” featuring: Polaris.

An insert from the OSU astronomy Club, EROS, is an article on “Spectroscopy” by Brent Warner.

**June 1985**

“Mu Boötes” is the only article gracing this issue, no author given.

This next entry is a chart, rather than an article, “Location of the Sun, Moon and Planets” by Raymond Bullock, but I feel it’s worth mentioning. I don’t know if Raymond copied the chart or created it through a computer program. It is one of the few charts I recreated “by hand” (in most cases, choosing rather to use an image of the original charts) and in that process, working my way down through the planets on each day, I could almost sense their dancing through the heavens. Working on three or four charts in one week drives the choreography home.

**From the Scanning Room:**  
I’ve gone back through previous reports and marked what newsletters made it in to the History S.I.G. reports and determined what remains. Obviously, what remains is a fluctuating number, but I’ve found a report that never made it to print. It was a January report, but I managed to miss submitting it and by the next year, forgot to. By the third year, I had established a “policy” of no January reporting because of the paucity of actual January issues. Since the issues span December/January, I think this should be a December report, so stay tuned to see if I remember to do it.

Meanwhile, back at the scanner, I had this crazy notion that scanning in and reconstructing the 90’s issues would be easier since they were obviously done on desktop publishing software. Not so fast, Bucky! The process is even more convoluted than ever. One layout trick employed was “extended wide fonts” for headers. My $25 labeler can do that, Word, which retails more than $100.00 can’t. Searching online for a suitable font proved fruitless (at least not in the free font world). I may have to resort to more image inserting, unless someone has an Arial Extended Wide they can spare. The good news? I may be able to dust off my publishing program and put it to work.

Dale Thieme,  
Chief scanner
BOARD MEETING

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

Meeting convened at: 6:39 PM

Officer’s reports

President - Diane discussed the Board positions for those who are term-limiting out. Also, Don Glaser is the new Cranbrook liaison. Diane discussed our responsibility to Don as Board members.

1st Vice President - Mark mentioned that the Macomb meeting will be in J-151 (Basement for June and July. Mark also expressed that there are many openings for talks and presentations in the near future.

2nd Vice President - The April Open-house was a pleasant success. Also, Jeff is setting up a meeting with Park Managers to discuss repairs and responsibilities for who will complete them. More to follow.

Treasurer - Ruth summarized the financial standings and included that the Treasury report is in the WASP.

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

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

Publications - WASP is on-line!

Old Business

Discussion Group - There are many openings available if your interested in hosting, please contact any of the Board members.

Membership list is updated and the club mailer is due to go out very soon.

Stargate - Jeff mentioned the meeting to discuss repairs at Stargate with the Metropark managers. Concrete skirting around the observatory is the primary concern.

MOTION: Diane made a motion to authorize Jonathan Kade $200.00 to process and send the club mailer. 2nd by Joseph Tocco, Passed unanimously.

Website - Brian Thieme is working on website style guidelines. Brian also mentioned the Wordpress will serve as the new platform.

Picnic plans were discussed and are being detailed. The picnic will include a garage sale of astronomical equipment from Stargate as well as from other members.

New Business

Alcor membership is approaching and with 90% club participation the annual fees are only $5.00 per person, otherwise they will remain $7.50 annually. See Ruth (Treasurer if you would like to participate.)

Parker Huelmantel approached the Board and expressed interest in a self-contained autoguider for Stargate. He will do further research and bring it to the Board for approval.

Diane reviewed the outreach requests and the need for additional volunteers from the general membership. See Bob Trembley (Outreach) if you are interested in getting involved.

MOTION: A motion was made by Joseph Tocco to adjourn which was seconded by Brian Thieme and approved by all members.

Meeting adjourned at: 7:26 PM

CRANBROOK MEETING

Meeting called to order at 7:29 PM by Diane Hall,
President.

47 members present, 2 visitors.

Diane Hall welcomed the visitors and made a general announcements. Board Officer’s Reports were summarized by the respective Officers. Diane also announced that a replacement for Marty Kunz was found to act as Liaison between Cranbrook and the Warren Astronomical Society. Diane also mentioned that with the loss of Marty from Cranbrook that the Solar Interest Group and Astrophotography Groups are temporarily postponed until new locations are found to host them both.

Ken Bertin mentioned observing 2 comets through the 22” DOB at stargate as well as Jupiter and the Ring Nebula.

Ask a stupid question continues to be a popular part of the Cranbrook meeting.

The long talk was given by Dr. Dale Partin, “SETI - An Update”

Meeting was adjourned at 9:59 PM

MACOMB MEETING

Macomb meeting cancelled due to water problems at the College.

Joe Tocco
Secretary

Support the Warren Astronomical Society by shopping at smile.amazon.com

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 donate 0.5% of every purchase you make to the Warren Astronomical Society.

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

www.amsmeteors.org/members/fireball/report-a-fireball
TREASURER REPORT FOR MAY 31, 2017

MEMBERSHIP
We currently have 81 members, of which 11 are family memberships.

INCOME AND EXPENDITURES (SUMMARY)
We took in $447.39 and spent $25.00. We have $18,481.48 in the bank and $223.16 in cash, totaling $18,726.64 as of 5/31/2017.

INCOME
74.00 Memberships/renewals
7.50 AL Membership/renewals
00.00 Merchandise, (bandanas)
0.00 Donations: General Fund
0.00 Donations: Stargate Fund
00.00 Donations: Paul Strong Scholarship
30.73 Donations: Amazon Smile
36.16 Snacks
299.00 Donation from U of M for Astronomy at the Beach

EXPENSES
25.00 Snacks
00.00 (PO Box renewal)
00.00 Paul Strong Donation
00.00 Donation for Astronomy at the Beach

GLAAC REPORT 5/31/2017
Beginning Balance: $5,020.80
INCOME
None
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.

Club Members
Email publications@warrenastro.org for your personalized name tag
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>Bay City</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
For Young Astronomers

This article is provided by NASA Space Place. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!

The Fizzy Seas of Titan
By Marcus Woo

With clouds, rain, seas, lakes and a nitrogen-filled atmosphere, Saturn's moon Titan appears to be one of the worlds most similar to Earth in the solar system. But it's still alien; its seas and lakes are full not of water but liquid methane and ethane.

At the temperatures and pressures found on Titan’s surface, methane can evaporate and fall back down as rain, just like water on Earth. The methane rain flows into rivers and channels, filling lakes and seas.

Nitrogen makes up a larger portion of the atmosphere on Titan than on Earth. The gas also dissolves in methane, just like carbon dioxide in soda. And similar to when you shake an open soda bottle, disturbing a Titan lake can make the nitrogen bubble out.

But now it turns out the seas and lakes might be fizzier than previously thought. Researchers at NASA's Jet Propulsion Laboratory recently experimented with dissolved nitrogen in mixtures of liquid methane and ethane under a variety of temperatures and pressures that would exist on Titan. They measured how different conditions would trigger nitrogen bubbles. A fizzy lake, they found, would be a common sight.

On Titan, the liquid methane always contains dissolved nitrogen. So when it rains, a methane-nitrogen solution pours into the seas and lakes, either directly from rain or via stream runoff. But if the lake also contains some ethane—which doesn't dissolve nitrogen as well as methane does—mixing the liquids will force some of the nitrogen out of solution, and the lake will effervesce.

"It will be a big frothy mess," says Michael Malaska of JPL. "It's neat because it makes Earth look really boring by comparison."

Bubbles could also arise from a lake that contains more ethane than methane. The two will normally mix, but a less-dense layer of methane with dissolved nitrogen—from a gentle rain, for example—could settle on top of an ethane layer.

In this case, any disturbance—even a breeze—could mix the methane with dissolved nitrogen and the ethane below. The nitrogen would become less soluble and bubbles of gas would fizz out.
Heat, the researchers found, can also cause nitrogen to bubble out of solution while cold will coax more nitrogen to dissolve. As the seasons and climate change on Titan, the seas and lakes will inhale and exhale nitrogen.

But such warmth-induced bubbles could pose a challenge for future sea-faring spacecraft, which will have an energy source, and thus heat. "You may have this spacecraft sitting there, and it's just going to be fizzing the whole time," Malaska says. "That may actually be a problem for stability control or sampling."

Bubbles might also explain the so-called magic islands discovered by NASA's Cassini spacecraft in the last few years. Radar images revealed island-like features that appear and disappear over time. Scientists still aren't sure what the islands are, but nitrogen bubbles seem increasingly likely.

To know for sure, though, there will have to be a new mission. Cassini is entering its final phase, having finished its last flyby of Titan on April 21. Scientists are already sketching out potential spacecraft—maybe a buoy or even a submarine—to explore Titan's seas, bubbles and all.

To teach kids about the extreme conditions on Titan and other planets and moons, visit the NASA Space Place: https://spaceplace.nasa.gov/planet-weather/
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

Caption: Radar images from Cassini showed a strange island-like feature in one of Titan’s hydrocarbon seas that appeared to change over time. One possible explanation for this “magic island” is bubbles. Image credits: NASA/JPL-Caltech/ASI/Cornell
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