The illustration above shows the exterior of the W.A.S. STARGATE observatory, located on Camp Rotory property off North Ave. on 29 mile road. The building contains a 12½" cassagrain telescope of 200" focal length. The use of this observatory is the privilege of all members & guests of members. The equipment within the building will allow observational astronomy to be conducted at all times, weather permitting.

Macomb Meeting Room Change This Month
Room E308 in the E Building, see map on page 3
The Warren Astronomical Society Paper (WASP) is the official monthly publication of the Society. Articles for inclusion in the WASP are strongly encouraged and should be submitted to the editor on or before the end of each month. Any format of submission is accepted. Materials can either be transmitted in person, via US Mail, or by email (publications@warrenastro.org).

Disclaimer: The articles presented herein represent the opinion of their authors and are not necessarily the opinion of the Warren Astronomical Society or this editor. The WASP reserves the right to edit or deny publication of any submission.

Stargate Observatory is owned and operated by the Society. Located on the grounds of Camp Rotary on 29 Mile Road, 1.8 miles east of Romeo Plank Road, Stargate features an 8-inch refractor telescope under a steel dome. The observatory is open according to the open house schedule published by the 2nd VP.

Library. The Society maintains a library of astronomy-related books and periodicals at the Cranbrook meeting location. See the librarian, Jonathan Kade, to check out a book.

Discussion Group Meeting

Come on over, and talk astronomy, space news, and whatnot!
This month’s meeting is Tuesday, April 23, 2019 at 7:30 pm, hosted by Gary Ross at his home in Royal Oak. Possibly for the last time, so don’t miss this one!

1828 North Lafayette
Royal Oak

“Show up ~ 19.00
Experimental pizza or two will be produced.
Open bar -- but for good, best bring your own self
No Kaplan-style veggies/fruities but extraneous junk food appreciated.
There will be NO green light.

I will not tolerate geriatric, political, or sports fan guff!”

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Snack Volunteer Schedule

Apr 1 Cranbrook Jeff MacLeod
Apr 18 Macomb Bob Trembley
May 6 Cranbrook the Kaplans

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.
As Orion slowly drifts to the west each night we say hello to spring and with it, the April showers. It’s a dreary Saturday as I type this month’s field of view. With midterms next week and finals right around the corner it’s not a particularly leisurely time for me. However, I have been doing a lot more public shows for the Wayne State Planetarium, which is so much fun I almost forget how much homework I need to do. I’ve also been getting really into rock climbing and actually participated in a competition at Wayne State. I took 11th overall, 6th in the intermediate division.

In club news a few of us had a good time at the Ford club swap meet this past weekend. I sold an eyepiece and bought a table, of all things to get at an astronomy event. Then on Tuesday we had our discussion group at the Wayne State Planetarium. It was a bit under attended but we had a good time. Jonathan would call out a messier object and we would slew the planetarium to it so we could discuss it. A very interactive discussion group this time around, Ken Bertin’s iPad was outdone by the dome.

As for upcoming events we are still getting inundated with request from libraries as part of their summer reading theme “a universe of stories”. So save Bob Trembley from going insane and volunteer for some of these great events.

Space Pirate Radio
Tune in to Captains Marty Kunz and Diane Hall for live radio
Wednesday nights at 9:00 pm ET on Astronomy.fm
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.
Last month, Doug Bock presented a talk on the history of Northern Cross Observatory. If you missed it, it’s on YouTube: https://www.youtube.com/watch?v=_ZP-6Ar0t8

Above is a recent posting to the Northern Cross Observatory Facebook page. An interesting example of what he is currently imaging. Here is a bit of his commentary about this imaging session:

Decided to do a first cut at flats for last nights images. I merely pointed at the sky which is clear and the sun is up about 15 degrees. I figured the color balance on the flats may do something weird to the final image, because I didn’t use a white sheet, etc. However, I just used what I collected, which was 30 frames at 1/1000 of a second.

M 98 - 3 hours of data collection. 36 x 300 second subs, at a gain of 300, -5C 10" f/8 RC ZWO asi071mc Losmandy G11
The Dish (2001)

To celebrate the 50th Anniversary of Apollo 11’s Moon landing, former President Diane Hall will be contributing a series of space-themed movie reviews to the WASP in upcoming months. First up is the Australian film The Dish.

Part workplace comedy, part light satire of small-town life, The Dish is a delightful look at the role the Parkes Observatory played in Apollo 11’s historic mission to the Moon. If you’re not familiar with the 64-ft Parkes radio telescope, that’s because it’s located in New South Wales, Australia; Working Dog Productions out of Melbourne brought this story to the screen.

It’s 1969 and the remote Parkes Observatory is among the large radio telescopes slated to receive live television transmissions from the lunar surface as well as other data sent down from Apollo 11 in transit. Fictionalized versions of Apollo-era chief scientist John Bolton and his staff are preparing for their role to back up the main Goldstone antenna in California. “Dishmaster” Cliff Buxton (Sam Neill), the film’s version of Bolton, is an avuncular pipe-smoking presence whose Received Pronunciation and moderately stiff upper lip serve as a contrast to the broad accent and broad humor of his subordinate Ross “Mitch” Mitchell (Kevin Harrington). Shy mathematician Glenn and inept security guard Rudi round out the staff at Parkes, but now NASA’s sent a regulation “steely-eyed missile man” in the form of Al Burnett (Patrick Warburton) to look over their shoulders to make sure they don’t make a botch of things.

From a space-geek perspective there’s a giant radio telescope to enjoy (I particularly enjoyed a sequence in which the Dish was deployed with “Classical Gas” as the soundtrack), not to mention the genuine Apollo 11 transmissions woven into the dialogue. The children of Parkes play with tinfoil Moons and toy lunar modules and distinguished adults light up like children themselves at the thought of hearing Neil Armstrong’s voice captured live by the Dish. It’s a true ensemble piece of oddball characters and The Dish gently skewers their pretensions from a place of deep affection. The small-town mayor with big political dreams proves as sympathetic a figure as the Parkes staff and the visiting Americans turn out to be not aliens dropped in from the other side of the globe, but fellow humans come to share this moment in history with their Australian hosts. Only a particularly dim cadet in love with the mayor’s daughter comes off as a cartoon.

Will Mitch be able to forge a functional working relationship with straight-edged Al? Will Glenn be able to ask the pretty girl who delivers meals to the Dish out on a date? Will Cliff open up about the sad secret he’s obviously concealing? Will Parkes survive the visit of the Prime Minister and the American Ambassador without being embarrassed on the world stage? The answers to all of these subplots are as foreordained as Apollo 11’s safe arrival at Tranquility Base but the joy of The Dish is in the telling, in the way director Rob Sitch constructs the small world of Parkes and so that each subplot and each small moment of characterization serves the whole. Working Dog Productions itself is a collective; several members are given credit as co-writers on the script, which perhaps lends authenticity to the nose The Dish has for how personalities meld and clash in a tight space under a deadline!

A period counterpart to The Martian in which everyone is pulling for the mission to succeed and the true antagonists are time and the elements, The Dish acknowledges that humans are quirky and fallible but we’re a fundamentally decent lot for all that and landing a pair of us on the moon is extraordinary, really.

Rating: 4.5 out of 5 Moons

Next month we’ll do an in-depth review of the feature film Apollo XI, now playing in theaters. In the meantime, GO SEE IT!
Presentations

Monday, April 1, 2019
Cranbrook Presentations

Main Talk:
“The Astronomical Cartoons of Fleischer Studios”
by Ken Bertin

You know Fleischer Studios from their many popular cartoon series: Betty Boop, Popeye the Sailor, Superman, and more. But you probably don't know about the scientific side of Max and Dave Fleischer. As shared by their nephew, Ken Bertin, you'll meet some of the first scientific filmmakers the world ever saw. Ken will share personal reminiscences, and we'll watch excerpts from their educational film about Einstein’s then brand-new theory of relativity, their science-based cartoons about trips to Mars and the Moon, “Gravity Telescopes”, and more.

Ken Bertin is a former president of the Warren Astronomical Society. He has given many biographical presentations of notable figures in scientific history, but this is the first about a relative.

Short Talk:
“Things Flat Earthers Have Told Me”
by Jeff MacLeod

We have all heard the theory that the Earth is round, but is it? Follow Jeff down the rabbit hole that is the flat earth community’s “evidence”.

Jeff MacLeod is currently a physics and astronomy major at Wayne State University. He is also the President of the Warren Astronomical Society. He recently started working at the Wayne State Planetarium. He has been obsessed with space his entire life and plans to work for NASA in the future.

Thursday, April 18, 2019
Macomb Presentation

Main Talk:
“The Apollo Program and Its Legacy”
by Bob Trembley

Our outreach director, Bob Trembley, will discuss the Apollo program, technology spin-offs from the space program, and the OSIRIS-REx asteroid sample return mission.

Apollo astronauts brought back about 842 pounds of samples from the Moon - those samples are still being studied today. This year, a robotic NASA probe is surveying an asteroid, and will gather samples from its surface in 2020, and return them to Earth; the 60 gram sample will be the largest U.S. sample return since the Apollo missions.

Bob is a lifelong amateur astronomer, a volunteer NASA/JPL Solar System Ambassador, and the 2019 outreach officer for the Warren Astronomical Society. Bob works for the Vatican Observatory Foundation, where he writes about astronomy and space science on their blog, as well as webmastering, social media, creating newsletters and other media, and whatever else gets thrown at him.

Bob is fantastically interested in asteroids and near-Earth objects (NEOs), a HUGE fan of Kerbal Space Program, and recently became interested in the educational potential of virtual reality. Bob is determined to improve the teaching of astronomy and Space History throughout Michigan, and the U.S.
Stuck Between

Areas between the more fantastic lunar formations, get ignored and the contain some very interesting features that deserve attention. This region is between Plato, seen peeking in the right edge of this image and Sinus Iridum in the lower left corner.

First are the beautiful mountains at the bottom of the image. The longer range in the middle are the Montes Recti or the “Strait Mountains” some 90x20km in size with peaks 1.8km high with what appear to be craters on each end. The western (left) crater seen with the on line LROC Quick Map is actually just a chance positioning of some mountain peaks but the eastern crater, Montes Recti B, is a real fairly recent 7km crater. Neither seem to be volcanic in origin. The mountains in the lower right corner are the Montes Teneriffe, taller than the previous mountains by over half a kilometer. The isolated peak to the northwest of these is unnamed.

Over on the left we see a point of land pointing down. This is Promontorium LaPlace even higher than the M. Teneriffe by 200 meters, and one of the sentinels at the entrance to Sinus Iridum. Nestled in the vertex of this promontorium is the tortured crater Maupertuis (48km dia.) from the pre-Nectarian age nearly 4 billion years old. Above Maupertuis is another similar sized crater La Condamine (37km) around half a billion years younger. The whole region to the east (right) of these two craters is pockmarked with much oddly shaped secondary cratering and ejecta scars probably from the Imbrium impact but possibly one of the smaller impacts like Iridum. Above this is the western end of Mare Frigoris, the longest of the mare in terms of longitude.

This image was made from a two AVIs stacked with AVIStack2 and further processed with GIMP and Irfanview.
Object of the Month: NGC 5053

NGC 5053 is a globular cluster in the constellation Coma Berenices. Although it lacks a common name familiar to amateur astronomers, it is notable for its proximity to and contrasting morphology with the well-known Messier cluster, M53. The pair can be viewed simultaneously in a wide-field eyepiece at low power, although each object benefits from the more detailed examination that is possible at higher magnification. NGC 5053 has an integrated visual magnitude of 9.0, an angular size of about 10', and a Sawyer-Shapley concentration class of XI, signifying a very low degree of concentration at the cluster’s core. This classification gives the cluster a very loose overall appearance—especially alongside M53, which is Class V and clearly contains a dense mass of stars at its center. The two clusters are nearly the same distance from Earth and are separated by only about 1°, which corresponds to an actual separation of 2,000 light years. Evidence suggests that there has been gravitational interaction between them in the past.

Pinpointing the location NGC 5053 is not difficult when the level of light pollution allows for the visual identification of signpost stars. However, it can be a little bit of a challenge to distinguish the cluster from the background sky glow in smaller apertures or where conditions are poor. From α Comae Berenices (α Com, Mag. 4.32), NGC 5053 is a short jaunt eastward by about 1.5°. M53 lies about 1° to the northeast of a Com and will likely be encountered crossing the edge of the field of view during star-hopping. It is important not to confuse the more readily apparent Messier cluster for its fainter cousin; additional searching is probably required for the intended target to come into view. Low magnification (30-50x) may be helpful in spotting NGC 5053, as its diffuse glow will be concentrated into a smaller area, becoming more easily spotted. The use of higher power, though, will provide more spectacular views, as the resolution of a few of the brighter member stars may become possible at 80-130x. Comparison of these two objects, either in the same field or at higher power by moving back and forth, is both worthwhile and intriguing, especially for fans of globular clusters.
April 1969

The second issue of the WASP, fifty years ago. As pointed out before, the lads responsible for bringing this publication to light were Gene Francis, Frank McCullough, Martin Butley, and Dave Ther. Martin and Gene provided the content for this issue (or the only ones admitting to it.)

First up is the “Constellation of the Month: Leo” by Gene Francis, crediting Olcott’s Field Book of the Skies as the source material. He also writes “The Illumination Sensitivity of the Eye” using Amateur Astronomer’s Handbook (J. B. Sidgwick) for his source material. Happily, neither article was lifted from the original—I checked, so no copyright infringement here. A nicely upbeat recounting of a night at Stargate is “Observational Astronomy” by Martin Butley rounds out the issue.

From the Scanning Room

About the cover. This excellent drawing of Stargate Observatory (no credit given or taken that I can find) first appeared in the February 1982. In the description below the drawing, the focal length of the telescope was given as 100”. The next month, it had grown to 200”, the “2” inked in by hand. That version was used for the remaining occurrences, complete with the handwritten “2”. In total, that cover image was used eleven times, a record in a decade when the covers were continually changing (twelve, if you count the June 2018 issue.)

Dale Thieme,
Chief scanner

WAS PRESENTATIONS

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 Jonathan Kade at: firstvp@warrenastro.org.
For astronomy information visit: hip://science.carnegiescience.edu

The moon where they learn that the moon is a very different place.

Also Showing

Dinosaurs of Dusk

Now Showing

Notable Sky Happenings

APRIL 2019

Milwaukee Museum of Natural History
Science

Cranbrook Observatory
Stargate Observatory

Monthly Free Astronomy Open House and Star Party
4th Saturday of the month!
Wolcott Mill Metropark - Camp Rotary entrance

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

Contact: outreach@warrenastro.org

Find us on MeetUp.com

20505 29 Mile Rd (1.8 miles east of Romeo Plank Rd) Ray, MI 48096
82° 55’04” West Longitude, 42° 45’29” North Latitude

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.
Stargate Report

Stargate Observatory Open House
Saturday, March 23rd

We were blessed with very clear skies and comfortable March temperatures during observing hours. About 10-15 club members were on the grounds with telescopes and binoculars of various sizes. About 50+ people came thru the Stargate Observatory to view various objects in the night sky.

Work on the inventory of eyepieces, filters at the Stargate Observatory continues.

April Open House
Next Open House is scheduled for Saturday, April 27, 2019.
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. Remember to dress warm and in layers!

Sunset: 7:27pm
Astronomical Twilight Ending: 9:15pm
Moonrise: 2:22am

David Baranski
2nd VP (Observatory Chairperson 2019)

Astronomical Events for April 2019
Add one hour for Daylight Savings Time

<table>
<thead>
<tr>
<th>Day</th>
<th>EST (h:m)</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>23:18</td>
<td>Venus 2.7°N of Moon</td>
</tr>
<tr>
<td>02</td>
<td>18:01</td>
<td>Mercury 3.6°N of Moon</td>
</tr>
<tr>
<td>05</td>
<td>03:50</td>
<td>NEW MOON</td>
</tr>
<tr>
<td>09</td>
<td>01:40</td>
<td>Mars 4.7°N of Moon</td>
</tr>
<tr>
<td>09</td>
<td>10:43</td>
<td>Aldebaran 2.1°S of Moon</td>
</tr>
<tr>
<td>11</td>
<td>14:00</td>
<td>Mercury at Greatest Elong: 27.7°W</td>
</tr>
<tr>
<td>12</td>
<td>13:08</td>
<td>Moon at Ascending Node</td>
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<tr>
<td>12</td>
<td>14:06</td>
<td>FIRST QUARTER MOON</td>
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<td>13</td>
<td>15:12</td>
<td>Beehive 0.2°N of Moon</td>
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<tr>
<td>14</td>
<td>19:24</td>
<td>Mars 6.4°N of Aldebaran</td>
</tr>
<tr>
<td>15</td>
<td>03:22</td>
<td>Regulus 2.7°S of Moon</td>
</tr>
<tr>
<td>16</td>
<td>15:00</td>
<td>Mercury 4.3° of Venus</td>
</tr>
<tr>
<td>16</td>
<td>17:02</td>
<td>Moon at Perigee: 364209 km</td>
</tr>
<tr>
<td>17</td>
<td>22:00</td>
<td>Venus at Aphelion</td>
</tr>
<tr>
<td>19</td>
<td>06:12</td>
<td>FULL MOON</td>
</tr>
<tr>
<td>22</td>
<td>19:00</td>
<td>Lyrid Meteor Shower</td>
</tr>
<tr>
<td>22</td>
<td>19:00</td>
<td>Uranus in Conjunction with Sun</td>
</tr>
<tr>
<td>23</td>
<td>06:36</td>
<td>Jupiter 1.6°S of Moon</td>
</tr>
<tr>
<td>25</td>
<td>09:38</td>
<td>Saturn 0.4°N of Moon: Occn.</td>
</tr>
<tr>
<td>25</td>
<td>10:02</td>
<td>Moon at Descending Node</td>
</tr>
<tr>
<td>26</td>
<td>17:18</td>
<td>LAST QUARTER MOON</td>
</tr>
<tr>
<td>28</td>
<td>13:20</td>
<td>Moon at Apogee: 404577 km</td>
</tr>
</tbody>
</table>

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

www.amsmeteors.org/members/fireball/report-a-fireball
Outreach

Outreach requests from libraries continue to pour into GLAAC member clubs; you can view the GLAAC shared outreach spreadsheet here: [LINK].

Girl Scouts at Stargate – March 30th
It was a cloudy and cold evening at Stargate Saturday March 30th; Angelo DiDonato and Bob Berta gave presentations to a Girl Scout troop in one of the grounds buildings;

Attendance down at the Endeavour Astronomy Night
Attendance at the Astronomy Night at Endeavour March 12th was down because the district high school’s basketball team was playing in a state championship that evening… However, the Endeavour Space Academy PC lab was PACKED all night with people playing Kerbal Space Program. My student assistant showed 28 people a Virtual Reality-flyover of Saturn’s rings with my VR headset. For the first time we were able to set up telescopes to see the Moon - a lot of “Oh WOWs were heard! Thanks to Diane Hall and Jonathan Kade for bringing their 10” Dob, and the WAS members who gave lectures!

Upcoming Events:

Statewide Astronomy Night (SWAN)
Stargate Observatory, Fri. Apr. 12 7:00 PM
Spend an evening exploring the wonders of the universe with astronomers and experts in the field! The annual Michigan Statewide Astronomy Night (SWAN) is an exciting partnership of planetariums and observatories across Michigan, who have coordinated a special evening to enjoy the presentations and activities that reveal the secrets of our night sky.

Volunteers: Bob Berta, Angelo DiDonato, Bob Trembley, Jonathan Kade

Outreach Requests:

Warren Public Library Civic Center Branch – wants a presentation on astronomy this summer. 6:00 or 6:30 PM. Leave by 7:45 PM.
Contact: Paul Konkolesky pkkonkolesky@cityofwarren.org.
(586) 751-0770 ext. 5007

Warren Public Library System – wants a presentation on astronomy this summer
Contact: William Konkolesky beyondcosmic@gmail.com
(248) 515-9568

Warren Public Library – Busch Branch
Wednesday evenings, June 15 - July 31, 6:30 PM
Contact: Andrea Mucha amucha@cityofwarren.org
(586) 353-0580

(Continued on page 15)
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.
Meeting Minutes

BOARD MEETING – March 4th

Members present; Jeff MacLeod, Jonathan Kade, Bob Trembly, Mark Jakubisin, David Baranski, Dale Partin, Ken Bertin and Jerry Voorheis.

The meeting was called to order by Jeff MacLeod at: 6:34 PM

Officer’s reports

Jeff MacLeod gave the President’s report. He spoke about his laser slit presentation.

Jonathan Kade gave the 1st Vice President’s report. The speaker schedule is full.

David Baranski gave the 2nd Vice President’s report. Stargate was opened for the open house, but the weather was not good. There was rain at closing. The Stargate dome was discussed.

Mark Jakubisin gave the Treasurer’s report. He requested a .pdf of the WAS insurance policy. Ken Bertin said he would provide one.

Secretary – Jerry Voorheis reported that the minutes are in the WASP.

Outreach – Bob Trembly reported many requests for moon landing anniversary programs.

Old Business

The WAS survey was discussed. Discussion of getting a solar telescope was skipped. Discussion of the Monday July 8th Auburn Hills Library event. Discussion about WAS Cranbrook Library.

New Business

A new place for Gastronomy was discussed due to complaints about the Red Coat Tavern.

The meeting adjourned at: 7:29 PM

CRANBROOK MEETING – March 4th

Meeting called to order at 7:32 PM by Jeff MacLeod, President.

Roll call.

36 persons were present.

Ken Bertin presented In the News and In the Sky.

Jonathan Kade gave the 1st Vice President’s report. Presentations are needed for the second part of the year.

David Baranski gave the 2nd Vice President’s report: The Open House was not cancelled. Observatory inventory was worked on. The Open House closed due to rain. The next Open House will be March 23rd.

Mark Jakubisin gave the Treasurer’s report.

The Secretary’s report is in the WASP.

Bob Trembly gave the Outreach report. There have been many requests by libraries.

Dr. Dale Partin reported that the WASP is published.

Sandra Macika gave a presentation requesting volunteers to help with the Wayne Oakland Science Olympiad (WOSO) April 13th, 2019 at Schoolcraft College.

Marty Kuntz reported that there were no sunspots for the entire month.

Bob Trembly spoke about GLAAC.

Jonathan Kade reported that Astro League memberships were open, the WAS library was open, and that merchandise was available for sale.

The Short Presentation was given by Gary Ross - “By Dawn’s Earliest Light”.

Snack/Break Time.

The Long Presentation was given by Doug Bock - “Portal to...” (Continued on page 17)
Celebrating 50 years of the Warren Astronomical Society

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.

MACOMB MEETING – March 21st
Meeting called to order at 7:30 PM by Jeff MacLeod, President.

Roll call.
26 persons were present.
Jeff MacLeod gave the President’s Report Ford Club swap meet will be Saturday March 23rd.
Jeff MacLeod gave the 1st Vice President’s report.
Jeff MacLeod gave 2nd Vice President’s report. The Open House had 2 guests. It was cold and rainy. The next Open House will be March 23rd.
The Secretary’s report is in the WASP.
Jeff MacLeod gave the Treasurer’s report. As of 3/21 there were 79 WAS members.
Jeff MacLeod gave the GLAAC report.
Jeff MacLeod gave the Outreach report. Information about the new GM Astronomy Club was presented. There have been many requests for presentations about the 50th Apollo 11 Anniversary from libraries.
The Discussion Group will be hosted by Jeff MacLeod on April 12th at the Wayne State University Planetarium.
Observing Report: Jonathan Kade and Diane Hall brought a telescope to Endeavor Elementary School.
Ken Bertin presented In the News and In the Sky.

Mailing the Universe: So you want to build an observatory”.
Meeting was adjourned at 10:00 PM.

Treasurer’s Report

Treasurer’s Report for 3/21/2019

MEMBERSHIP
We have 79 current members

INCOME AND EXPENDITURES (SUMMARY)
We took in $1578 and spent/transferred $254 We have $22501 in the bank and $365 in cash, $22 in Checks totaling $22,887 as of 3/20/2019.

INCOME
$1,145 Memberships/renewals
$23 Astronomical League
$149 Snacks
$165 Calendars
$21 Paul Strong Scholarship

EXPENSES
$84 Snacks
$80 PO Box Fee 2019
$90 Meetup Fees 2019

GLAAC REPORT 3/21/2019
Beginning Balance: $4,931.52

INCOME
$600 donation from UofM
$50 payment from SLAARC for table rental

EXPENSES
No activity
Ending Balance: $5,581.52

Mark Jakubisin
Treasurer, 2019

Jerry Voorheis
Secretary

Action shot from the 2016 Transit of Mercury
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>
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<tr>
<td>Capital Area Astronomy Club</td>
<td>MSU/Abrams Planetarium</td>
<td>First Wednesday of each month 7:30 PM</td>
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<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 7:00 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: generally the Saturday closest to new Moon</td>
</tr>
<tr>
<td>Sunset Astronomical Society</td>
<td>Bay City/Delta College Planetarium</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: [MaulHawaii.org](http://MaulHawaii.org)
Bob Trembley: [Bailog's Lair](http://Bailog's Lair)
Bill Beers: [Sirius Astro Products](http://Sirius Astro Products)

Jon Blum: [Astronomy at JonRosie](http://Astronomy at JonRosie)
Bob Trembley: [Vatican Observatory Foundation Blog](http://Vatican Observatory Foundation Blog)
Jeff MacLeod: [A Life Of Entropy](http://A Life Of Entropy)

Doug Bock: [https://boonhill.org](https://boonhill.org)
Facebook: Northern Cross Observatory [https://www.facebook.com/NorthernCrossObservatory](https://www.facebook.com/NorthernCrossObservatory)
Boon Hill and NCO Discussion [https://www.facebook.com/groups/369811479741758](https://www.facebook.com/groups/369811479741758)
YouTube channel: [https://www.youtube.com/channel/UC-gG8v4139oc-bL0TgPS6w](https://www.youtube.com/channel/UC-gG8v4139oc-bL0TgPS6w)