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

Apr 3..........Cranbrook.......Joe Tocco
Apr 20.........Macomb..........Dale Partin
May 1..........Cranbrook.......Ralph DeCew

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.

March Discussion Group Meeting

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

Joe Tocco will host the April Discussion Group on Thursday, the 27th:

MCMI Corporate Office
6540 Diplomat Drive
Sterling Heights, MI 48314

joetocco0921@gmail.com
586-634-6240 cell

WiFi
HD Projector with 5.1 Sound System
Water, coffee, and selection of sodas and snacks provided

Adult beverages are welcomed BYOB

Office is located just south of M-59 and just East of Mound Road.
Email or call for directions...or ask Siri
Park in the lot behind the building and enter back door next to the large roll-up door.

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Space Pirates

Tune in to Captains Marty Kunz and Diane Hall for live radio Wednesday nights at 9:00pm ET
Juno is a NASA space probe orbiting the planet Jupiter. It was built by Lockheed Martin and is operated by NASA’s Jet Propulsion Laboratory. The spacecraft was launched from Cape Canaveral Air Force Station on August 5, 2011 (UTC), as part of the New Frontiers program, and entered a polar orbit of Jupiter on July 5, 2016 (UTC), to begin a scientific investigation of the planet.

However these plans were derailed when mysterious signals emanating from the planet were first detected by 8888 88 88888 8 888. Shortly after, the first in a series of 8888 88 88888 8 8888 88 88888 8 888 were discovered in orbit around the planet. Initial images have revealed evidence of 8888 88 88888 8 888 but scientists are still baffled. The structures 8888 88 88888 8 888 but there is also evidence that 8888 88 88888 8 888. Currently, are being trained for 8888 88 888888 8888, will attempt to make 888888 888888 88888. Radio signals continue to 8888 88 88888 8 888 by amateur radio astronomers. This has stirred deep unrest within the scientific community. Despite protests, NASA has denied all allegations. Under pressure from , NASA has agreed to 8888 88 888 and prepare Juno for a series of new observations.

Infrared and microwave instruments will measure the thermal radiation emanating from deep within , which were described by some as “profoundly unsettling.” One source said it seemed “totally alien and unknowable.” At press time, NASA did not offer any speculation on the purpose of these 8888 88 88888 8 888 or whether they pose a threat to human civilization. There are reports that 8888 88 88888 8 888 but nothing confirmed.

On April 1st, NASA released a statement insisting “this was all just a misunderstanding,” and “probably some sort of stupid joke.”
Well, spring is here for observers in Michigan, with the promise of warmer weather and galaxy season. We had some great clear skies for opportunistic viewing in February and March but generally lousy weather for our official events at Stargate (the full tale of woe is to be found in the Observatory Chair’s report). For April we’re hoping for a Grand Slam of fair weather for our major events, beginning with State-Wide Astronomy Night (SWAN) on the 7th, followed by Yuri’s Night aka World Space Party on the 12th, and wrapping up on the 29th with International Astronomy Day. If you’ve taken a winter break from outreach events, now’s the ideal time to get back in the action. Check out the full listing of events in Bob Trembley’s Outreach Report, sign up at the clipboard at either Cranbrook or Macomb, or shoot an email to outreach@warrenastro.org. Remember you don’t have to know all the Messier objects by heart to excite the public at outreach; with Jupiter reigning over the evening sky, there’s a surefire hit object to keep in the ‘scope, so even if you’ve never done outreach before it’s the perfect opportunity to give it a whirl.

Above all, keep your fingers crossed for clear skies, because I think our Observatory Chair is about fed up with dismal gray Open House nights!

Diane Hall
President
Dr. Dale Partin and David Bailey present Colonizing Mars

Colonizing Mars has for a long time been the stuff of science fiction. We are on the threshold of this becoming reality. Elon Musk founded SpaceX to get people to Mars. The Europeans think we should colonize the Moon first to gain experience. There are many challenges to be dealt with to live on Mars, such as living in reduced gravity, cosmic rays, growing food on Mars, etc. These and related issues will be discussed. Let’s go to Mars!

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.

Dave Bailey is well-known in this organization for giving challenging and sometimes speculative presentations with some physics content. This is a major activity of his - some might even wonder if it borders on an addiction! Dave says that he was in astronomy before he was born, as his parents met as graduate students at the Yerkes Observatory in the 1930s. He also studied under Carl Sagan and other leading astronomers at Harvard.

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 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!

WAYNE STATE UNIVERSITY PHYSICS AND ASTRONOMY

The Department of Physics and Astronomy is honored to present the 2017 Vaden Miles Memorial Lecture!

Tuesday, April 11, 3:00-5:00 p.m. Refreshments start at 3 p.m.; there will be some awards to physics department students starting at 3:30 p.m.; and the actual talk itself begins at 4:00 p.m.

Go to the website http://physics.clas.wayne.edu and click on the Vaden Miles Lecture listed under Events on the right side of the page. This will take them to a page with more information, including the abstract of the talk, and a button to click on to RSVP for the talk, which is necessary to attend the talk.
DISCUSSION GROUP REPORT, 23rd of March

“It was the best of times. It was the worst of times”.
-- Charles Dickens.

Mainly the worst, a debacle of proportions, but less than heroic from minimal attendance. The fete ended in general acrimony when, at approximately 02h 05m Co-ordinated Universal Time the rapporteur, the Master of the Table, to wit myself, presented the assembly with their coats by announcing, more or less, la séance ajourner. He also quoted his dear mother: “Don’t let the door hit you in the ___ on the way out”.

DINING ROOM: Charts and lunar maps spread over the elegant Turkish table cloth. The Book of All Knowledge, Observer’s Handbook, was at ready and referred to. Discussion was vigourous and free-ranging: the application of horizontal but minimal impulse to overcome the co-efficient of standing friction for a disproportionately large mass/ electromagnetic ground discharges from aurorae or even meteors/ observations of the Leonids in 2001 and ‘02/ very recent observations and photography of Comet 41-P in Ursa Major/ the possibility of large scale pollution from lunar colonisation/ the magnitude of Rhea/ observing major features in the vicinity of Oceanus Procellarum/ alleged observations of gas in Alphonsus by Kozerev in 1958/ the social psychology of mankind and inability to embark on inter-planetary exploration.

LIVING ROOM: In direct contravention of norms, cacophony concerning a person referred to as “Hillary”, presumably some ball-player/ incoherent furore about health care in which the individual purchase thereof was the equivalent of taking a trip to Hawai’i, absurd non sequitur, the number of American deaths avoided by the atomic bombing of Japan, gross over-estimation/ what some ditz on MSNBC said, or might have said, or what credence-significance there might be -- or something/ the word “Trump” was frequently uttered, but not in the “last trump”, an Elizabethan abbreviation for “trumpet”. “Astronomy” or “telescope” or “sky” or even “science” did not find their way into the ozone.

The Master of the House -- but not “watering the wine” per Les Miserables -- saw the members out to the driveway, explaining the lack of a stair light to the construction of the house during the presidency of Woodrow Wilson, when people did not need such vanities. It was on that driveway two nights before when he attempted observations of the difficult new comet with merely a 5-cm refractor. The living room cohort was too consumed with Fox News to think, much less ask, about such natural phenomena. He announced that they had attended the last Discussion Group in that building, which was greeted with astonishment, even protest. A motion was filed for reconsideration.

The host (or victim) thought of attacking the bottle of cheap red to think the whole thing over. There was plenty left. He chose, however, to have a big soothing mug of tea before repairing to bed and continue with Constantine, Paul Stephenson, 2009.

He fell asleep upon his cot,

But Camelot

This certainly was not.

In the wee hours the nightmare came . . .

G. M. ROSS, sine die, 24th of March 2017 C.E.
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.
More cracks in the moon

The Tucson Rock, Gem, Mineral and Fossil Show (the world’s largest) is over and after 3 weeks of being a geologist/paleontologist, I’m ready to get back in the astronomy saddle and shake off this virus I caught from some far-flung corner of our planet!

Here we have what is probably the most identifiable of all the Apollo landing sites. This is the region of Hadley Rille or Rima Hadley which was home for Apollo 15 from July 30 - Aug. 02, 1971. The landing site is marked with an “X” in this image. The full rima can be easily seen to the left of this marker as it snakes left around the mountainous projection named Bela. For gross orientation, the large crater at top, peeking into this field, is Archimedes. Above Rima Hadley on the other side of a low mountain chain is a system of rilles called Rimae Fresnel. They stretch 94km from Promontorium Fresnel to Palus Putredinis. Following further along the line of these rimae to the left, directly left of Rima Hadley is another great crack in the Moon, Rima Bradley this one 134km long stretching from Palus Putredinis to the shores of Mare Imbrium. Then running down the left side of Palus Putredinis are the broad Rimae Archimedes. Before leaving the area notice the field of mountains to the lower left of Archimedes are the Montes Archimedes, the remnants of once grand range that was overlain by the ejecta from surrounding impacts and flooded by the lavas of Mare Imbrium.

The two images that made this montage were each made from 500 frames of 1500 frame AVIs stacked with AviStack2, and further processed with GIMP and IrfanView.

Cheers,
-Rik
April 2017

Object of the Month: NGC 4449

NGC 4449 is an irregular galaxy in the constellation Canes Venatici. The object is part of the nearby M94 galaxy group, which lies about 12 million light years away and is one of the closest galaxy clusters to the Local Group. NGC 4449 is similar in size and morphology to the Large Magellanic Cloud (LMC), and both share the feature of having a general bar-shaped center region and numerous clusters of young blue stars. However, NGC 4449 has a very high rate of star formation, perhaps twice that of the LMC, and is considered to be a “starburst” galaxy as a result. It has an apparent visual magnitude of 9.6 and angular dimensions of 5.5’ x 4.1’ and is classified as “Irr” on the Hubble Sequence, indicating that it has a structure that does not conform to the usual spiral or elliptical categorization typically used by astronomers.

It is relatively easy to locate NGC 4449 using traditional star-hopping techniques. The galaxy is positioned about 3.0° north-northwest of Beta Canum Venaticorum (β CVa, mag. 4.2). Its location is about one-fifth the distance along a line extending from β CVa towards Gamma Ursae Majoris (γ UMa, mag. 2.4), the heel of the Big Dipper’s bowl. Some care should be taken to not mistake it for other galaxies in the general vicinity, particularly NGC 4242 and M106, both of which are reasonably bright and within about 4° of the target galaxy. An 8-inch or larger aperture is recommended for best results, although the object could serve as a challenge for telescopes that are smaller in size. As with all galaxies, light pollution levels at the observing site will be a determining factor in the overall ability to discern detail. At low magnification, NGC 4449 should be visible as a slightly elongated “faint fuzzy”. With higher magnification, the central bar should take on a conspicuously boxy appearance, with some fine structure including a mottled texture around the periphery possibly being detectable.

Chuck Dezelah

Source: Digitized Sky Survey; FoV = 0.5°

Source: Cartes du Ciel
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 for solar viewing. Come have a look through our 20" telescope! For observatory information visit http://science.cranbrook.edu/explore/observatory.

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

**Notable Sky Happenings APRIL 2017**

**Apr. 1 - 7**
- Mercury's best eve. appearance on the 1st is only 17° above the W horizon at 8:45pm. Use binoculars.
- Meteors' best eve. appearance on the 1st is only 17°

**Apr. 8 - 14**
- The Moon is 8° above the W horizon at 8:45pm. Use binoculars.
- The Moon is in the lower right of Venus in the sky.

**Apr. 15 - 21**
- Jupiter, the evening star, is in the south at 9pm.
- The Moon is 1° above the W horizon at 8:45pm. Use binoculars.

**Apr. 22 - 30**
- The Moon is in the lower right of Venus in the sky.
- The Moon is 8° above the W horizon at 8:45pm. Use binoculars.

**Apr. 3 - Apr. 11**
- First Quarter
- Full Moon
- Last Quarter
- New Moon

**Notable Sky Happenings APRIL 2017**

**Stars of the Pharaohs**

**Now Showing**

**Travel to ancient Egypt to see how astronomy was used in all of their other original spheres.**

**April 1 - 7**
- The Moon is in the lower right of Venus in the sky.
- The Moon is 1° above the W horizon at 8:45pm. Use binoculars.

**April 8 - 14**
- The Moon is 8° above the W horizon at 8:45pm. Use binoculars.

**April 15 - 21**
- Jupiter, the evening star, is in the south at 9pm.
- The Moon is 1° above the W horizon at 8:45pm. Use binoculars.

**April 22 - 30**
- The Moon is in the lower right of Venus in the sky.
- The Moon is 8° above the W horizon at 8:45pm. Use binoculars.

**Also Showing**

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

When Elmo's friend, Hu Hu Zhu, visits from China, Big Bird, Elmo and Hu Hu Zhu take viewers on an exciting discovery of the stars and the universe. Viewers will discover the North Star and the Big Dipper, and learn about the Big Dipper and the North Star, and how to use them to navigate the skies. They will see the constellations of Orion, Ursa Major, and Ursa Minor, and discover the night sky's wonder.
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.
March was busy, April will be busier! I’ve got a couple events that could use some volunteers; If anyone is going to remain in Michigan for the eclipse and would be willing to do something at Stargate or another local venue, please let me know.

**March 2017**

**Starnival**
3/3/2017 - Grosse Pointe North High School
Mark Kedzior was at a table and handed out tri-fold flyers about the library telescope program, and had attendees locate an exit sign and wall clock through a telescope (the skies were cloudy). Mark handed out a total of 73 stars to students who stopped by for a look through the library telescope.

**Telescope Observing**
3/7/2017 AND 3/9/2017 - Grosse Pointe Public Library Central Branch
- Mark Kedzior has finished up the first quarter of 2017 having hosting numerous telescope viewings.

**Lunch Astronomy Lecture**
3/8/2017 Therese Oldani’s class - George Washington Carver STEM Academy in Detroit
- Jonathan Kade lectured to about 30 students.

**Astronomy Night at Endeavour School**
3/9/2017 6:30-9:30 pm
The second Astronomy night event at Endeavour School went very well... except for some technical difficulties with the school projectors, which prevented me from giving my Sun/Eclipse presentation.
- Jeff MacLeod, Ken Bertin, and Bob Berta give their presentations, several time, to good crowds.
- Connie had my meteorites at a table in the hallway, and was surrounded the entire evening.
- Matt Muzzen from Starbase One brought little robots, and had crowded tables in the library.
- The Endeavour Space Academy PC lab was PACKED all evening, and several students showed attendees how to build rockets in Kerbal Space Program; One young boy was smiling so hard, I thought his was going to break his face! I also had Universe Sandbox, Stellarium, and NASA Eyes on the Solar System running.
- The Kidzstronomy room, which used content from the NASA Space Place website, was filled to overflowing – next time, we need a bigger room!
- Bob Berta and I helped a couple students get familiarized with their telescopes.

Cloud cover prevented outdoors observing; which is frustrating because the skies were clear the day before AND after…

Connie thinks she wants to skip doing this event

**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.
in 2018, and hosting it again in 2019 - to keep the event from getting stale; it may have also been due to complete exhaustion from setting up and running the event.

Thanks to Jeff MacLeod, Ken Bertin, Bob Berta, and Pat Brown for helping!

April 2017

SWAN at Stargate
4/7/2017 8-11 pm
- Jeff MacLeod
- Parker Huellmantel
- Pat Brown
- Jonathan Kade
- Alan Madeleine
- Brian Klaus
- Diane Hall
- Ram Goswami

Yuri’s Night at Stargate
4/12/2017 8-11 pm
- Jeff MacLeod
- Parker Huellmantel
- Pat Brown
- Bob Berta
- Brian Klaus
- Brian Thieme

2017 Eclipse Lecture (option 2)
4/17/2017 7:30-8:30 pm - Grosse Pointe Audubon
- Ken Bertin (Possible)

Astronomy Night at North Hill Elementary
NEED MORE HELP!
4/26/2017 6:00-8:00 PM
(In planning stages for next spring)
Approx.: 100 5th grade students and their families.
They would like videos / presentations / telescopes / artifacts: pictures, meteorites, etc.
Contact: Renee Grenier RGrenier@rochester.k12.mii.us
- Jeff MacLeod

STEAM Team Event
NEED HELP!
4/26/2017 6:00-8:00 pm - Becky Philion at Krause Elementary School
Arrive by 3:00 for set up. We will have one large round table and one chair in our area, and our space will be labeled with our name.

Women in Aviation at St. Clair County International Airport
NEED HELP!
4/28/2017
9:30 AM - 1:30 PM
Would like solar telescopes and lectures
Contact: Mark Muzzin / Starbase One mmuzzin@starbaseone.org 586-239-4884

Penguicon: Open-Source – Science Fiction Convention (Southfield)
4/28-29/2017
I’ve been lecturing and setting up telescopes at this convention for years now; this year, the convention has made me a “featured guest,” and asked me to be on a panel with another presenter for Astronomy 101-103 sessions! I would LOVE to see a WAS contingent attending and lecturing at this con – Science is a VERY popular topic there.
Website: https://2017.penguicon.org/ Got a programming idea / want to present? Contact: programming@penguicon.org

Astronomy Day at Cranbrook – More Volunteers might be nice
NEED HELP!
4/29/2017  1:00-4:00 pm
- Jeff MacLeod

International Astronomy Night at Stargate
4/29/2017
Sunset is at 8:30 PM
- Jeff MacLeod
- Mark Kedzior
- Brian Klaus
- Brian Thieme

Bob Trembley
Outreach
February Open-House

The March Open-house was yet another bust, and it is now ridiculous. Riyad and Jeff opened the observatory and had four visitors from the public as well as Pat Brown before closing the observatory around 8pm. Once again I’m left hoping for better conditions in the following month.

March Open-House

The regular Open-house for April is scheduled for Saturday the 22nd, Moonset is well before sunset so if you want to observe the waning crescent, do it before 4pm. Sunset is at 8:20pm with astronomical twilight ending at 10pm. 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

Jeff M, Joe T, Diane H, and Jonathan K did a fine job offloading books and equipment at the Ford club swap meet at the beginning of March. We didn’t sell everything we wanted to but we brought in a total of $265.00 from the event.

Jeff MacLeod
2nd Vice President
April 1984

We find the battle cry of the 1984 Eclipse Committee, “Where’s the Beads!”, on the cover of this issue. Was the marketing campaign of Burger King in that vein so long ago? Seems like only yesterday. I find this entry in the digitizing project very timely, given the approaching 2017 US Solar Eclipse. A good deal of charts, diagrams and illustrations relating to the May 30th Eclipse of 1984 abound in this issue. Little else, however. This doesn’t quite qualify as an actual article, but the schedule announcement of the “Observing Meeting and Star Party” at Doug Bock’s place in Fenton, MI is sure to inspire some fond memories.

Kenneth Wilson writes a short piece, “The Calculating Astronomer”, and discusses a way to get a general idea of light degradation as stellar objects are observed at lower positions in the sky.

Then Eclipse fever takes over the rest of the issue: “WARRENASTRONOMICAL SOCIETY EXPEDITION TO THE SOLAR ECLIPSE OF MAY 30, 1984 Greensboro, North Carolina” by David L. Harrington and Timothy D. Skonieczny.

From the Scanning Room

This issue became the first digitized piece from the latest batch of scans so I could get it into this month’s WASP. The best part is there are 2 copies in the collections, one in the Dyer, one in the Hill. The Dyer being quite pristine, so I could get the “immaculate scan” and no flags thrown.

I’m going to have to pick up the tempo a bit if I’m to pull this off again in May.

Dale Thieme
Chief Scanner and bottle washer
Meeting Minutes

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 passed on opening remarks to reserve more time for old and new business.

1st Vice President - Mark discussed the presentations schedule by Dave Bailey and mentioned that there a few new contacts for speakers but nothing yet confirmed. Also the April Macomb meeting will held in the basement of the Library.

2nd Vice President - March’s open-house was canceled due to weather but Riyad Matti was at Stargate and welcomed one visitors despite it. Jonathan Kade updated the draft of the Stargate Procedures written by Jeff and the Stargate Committee will meet in April to vote on them. Jeff mentioned that the April open-house is scheduled for the 22nd and hopes for clear skies.

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 revisited Mark Kedizor’s ambitious work with the Grosse Pointe Libraries has been added to the Outreach schedule of events and that he’s currently working on the events for Dinasour Hill Elementary, Endeavor Middle School and Yuri Night/SWAN and will be soliciting volunteers.

Publications - WASP was published on March 6th.

Old Business

Discussion Group - The schedule; March, Gary Ross; April, Joseph Tocco. Hosts needed for May through December of 2017. If your interested in hosting then contact any of the Board members.

Stargate - Jeff discussed that he still needs to contact the Metropark to address the concrete apron at Stargate and a request of the Metropark for an all-weather bulletin board that the club could use to post information for the public.

Mailer - Diane reported that the mailer was being updated and the mailing was coming soon.

Website - Due to other priorities there was no progress made on the website yet.

New meeting format - Mark reported that the new format for the Cranbrook meeting would roll out tonight. He is looking forward to getting some feedback on the new format from members.

New Business

Diane mentioned that we did not receive an invoice nor a letter with regard to the Paul Strong Scholarship and she is going to inquire about it so we can pay the $500 that the club committed to donate.

Jeff proposed that we purchase 100 additional bandanas for $3.75 each. Joe made a motion supporting the proposal, Bob seconded it and it passed unanimously.

Ruth proposed that we approve a second calendar order and reimburse Jonathan for $434.19. Jeff made a motion supporting the proposal, Brian seconded it and it passed unanimously.

Bob mentioned that the Solar System Ambassador program was soliciting applications for schools to participate in a 20 minute teleconference with the International Space Station.

Jonathan Kade discussed and explained his changes.
to Jeff MacLeod’s draft of the Stargate Committee document.

Motion: Joe made a motion to adjourn which was seconded by Jeff and voted on unanimously.

Meeting adjourned at: 7:15 PM

CRANBROOK MEETING

Meeting called to order at 7:31 PM by Diane Hall, President.

39 members present, 3 visitors.

Diane Hall welcomed the visitors and made a few announcements and explained the new format for the Cranbrook general meeting. Officer’s Reports were summarized by the respective Officers.

Ken Bertin presented In the News

Multiple signup sheets were circulated to the members.

Books being purged from the club library were displayed and available for purchase for a nominal amount.

Several Observing Reports were given: Jeff MacLeod commented on watching the Moon occult Aldebaran while visiting the Seven Ponds Astronomy Club where he was the main speaker. Bill Beers talked about his trip to Hawaii and how striking the Jewel Box cluster looked. Jonathan and Diane mentioned the beautiful southern sky while observing with the Ford Astronomy Club from their observing site and Joe Tocco mentioned observing the E, F and G stars in the Trapezium in M42 while on a recent visit to the 36” telescope at the Apache-Sitgreaves Research Center in Overgaard Arizona in late February.

Ken Bertin presented In the Sky

The long talk was given by Dave Bailey, Diversity of Galaxies - Part 1

Meeting was adjourned at 9:32 PM

MACOMB MEETING

Meeting called to order at 7:31 PM by Diane Hall, President

33 members present

Diane Hall, President, made announcements the general announcements and summarized the Officer’s reports from the March Board meeting.

Ken Bertin presented In the News and In the Sky

The main talk was given by Dave Bailey, Diversity of Galaxies - Part 2

Meeting was adjourned at 9:30 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 March 31, 2017

MEMBERSHIP
We currently have 68 members, of which 17 are family memberships.

INCOME AND EXPENDITURES (SUMMARY)
We took in $461.00 and spent $484.19. We have $19,816.91 in the bank and $143.92 in cash, totaling $19,990.33 as of 3/31/2017.

INCOME
107.00 Memberships/renewals
15.00 AL Membership/renewals
300.00 Merchandise, (swap meet, books)
0.00 Donations: General Fund
0.00 Donations: Stargate Fund
0.00 Donations: Paul Strong Scholarship
0.00 Donations: Amazon Smile
39.00 Snacks

EXPENSES
50.00 Snacks
434.19 Merchandise (Calendar printing)

GLAAC Report for March 31, 2017

Beginning Balance: $4,719.74

INCOME
No Activity

EXPENSES
198.94: (reimbursement – audio equipment)
Ending Balance: $4,520.80

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>Rochester</td>
<td>Monthly: generally the Saturday closest to new Moon</td>
</tr>
<tr>
<td>Sunset Astronomical Society</td>
<td>Dryden</td>
<td>Second Friday of every month</td>
</tr>
<tr>
<td>University Lowbrow Astronomers</td>
<td>Ann Arbor</td>
<td>Third Friday of every month</td>
</tr>
<tr>
<td>Warren Astronomical Society</td>
<td>Bloomfield Hills/ Cranbrook &amp; Warren/MCC</td>
<td>First Monday &amp; third Thursday of every month 7:30 PM</td>
</tr>
</tbody>
</table>

### GLAAC Club and Society Newsletters

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

### WAS Member Websites

- Jon Blum: [MauiHawaii.org](http://www.mauihawaii.org)
- Bob Trembley: [Balrog’s Lair](http://balrog.org)
- Bill Beers: [Sirius Astro Products](http://www.siriusastro.com)
- Jon Blum: [Astronomy at JonRosie](http://www.jonrosie.com)
- Bob Trembley: [Vatican Observatory Foundation Blog](http://www.vaticanobservatory.va)
- Jeff MacLeod: [A Life Of Entropy](http://www.ajmacleod.com)
What It’s Like on a TRAPPIST-1 Planet
By Marcus Woo

With seven Earth-sized planets that could harbor liquid water on their rocky, solid surfaces, the TRAPPIST-1 planetary system might feel familiar. Yet the system, recently studied by NASA’s Spitzer Space Telescope, is unmistakably alien: compact enough to fit inside Mercury's orbit, and surrounds an ultra-cool dwarf star—not much bigger than Jupiter and much cooler than the sun.

If you stood on one of these worlds, the sky overhead would look quite different from our own. Depending on which planet you're on, the star would appear several times bigger than the sun. You would feel its warmth, but because it shines stronger in the infrared, it would appear disproportionately dim.

"It would be a sort of an orangish-salmon color—basically close to the color of a low-wattage light bulb," says Robert Hurt, a visualization scientist for Caltech/IPAC, a NASA partner. Due to the lack of blue light from the star, the sky would be bathed in a pastel, orange hue.

But that's only if you're on the light side of the planet. Because the worlds are so close to their star, they're tidally locked so that the same side faces the star at all times, like how the Man on the Moon always watches Earth. If you're on the planet's dark side, you'd be enveloped in perpetual darkness—maybe a good thing if you're an avid stargazer.

If you're on some of the farther planets, though, the dark side might be too cold to survive. But on some of the inner planets, the dark side may be the only comfortable place, as the light side might be in hospitably hot.

On any of the middle planets, the light side would offer a dramatic view of the inner planets as crescents, appearing even bigger than the moon on closest approach. The planets only take a few days to orbit TRAPPIST-1, so from most planets, you can enjoy eclipses multiple times a week (they'd be more like transits, though, since they wouldn't cover the whole star).

Looking away from the star on the dark side, you would see the outer-most planets in their full illuminated glory. They would be so close—only a few times the Earth-moon distance—that you could see continents, clouds, and other surface features.
The constellations in the background would appear as if someone had bumped into them, jostling the stars—a perspective skewed by the 40-light-years between TRAPPIST-1 and Earth. Orion's belt is no longer aligned. One of his shoulders is lowered.

And, with the help of binoculars, you might even spot the sun as an inconspicuous yellow star: far, faint, but familiar.

Want to teach kids about exoplanets? Go to the NASA Space Place and see our video called, “Searching for other planets like ours”: https://spaceplace.nasa.gov/exoplanet-snap/

This artist's concept allows us to imagine what it would be like to stand on the surface of the exoplanet TRAPPIST-1f, located in the TRAPPIST-1 system in the constellation Aquarius. Credit: NASA/JPL-Caltech/T. Pyle (IPAC)
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