The W.A.S.P.

Volume 58 Issue 1 January 2026

The Warren Astronomical Society Publication

Happy New Year!

Left to Right: Jonathan Kade(1st VP), Diane Hall (President), Vatshalya Dandibhotla (Publication), Charles Strackbein (Secretary), Jeff MacLeod (Outreach), Riyad Matti (2nd VP).

From the 2026 WAS Board

The WASP

Published by
Warren Astronomical Society, Inc.
P.O. Box 1505
Warren, Michigan 48090-1505

Dale Thieme, Editor

2024 Officers

President	Diane Hall	president@warrenastro.org
1st VP	Jonathan Kade	firstvp@warrenastro.org
2ndVP	Riyad Matti	secondvp@warrenastro.org
Secretary	Charles Strackbein	secretary@warrenastro.org
Treasurer		treasurer@warrenastro.org
Outreach	Jeff MacLeod	outreach@warrenastro.org
Publications	Vatshalya Dandibhotla	publications@warrenastro.org
	Entire Board	board@warrenastro.org

The Warren Astronomical Society, Inc., is a local, non-profit organization of amateur astronomers. The Society holds meetings on the first Monday and third Thursday of each month, starting at 7:00 p.m.

First Monday meeting:	Third Thursday meeting:
Cranbrook: Institute of Science	Macomb Community College
1221 North Woodward Ave	South campus, Bldg. E, Room 208
Bloomfield Hills, Michigan	14600 Twelve Mile Rd.
	Warren, Michigan

Membership and Annual Dues

Student	Individual	Senior Citizen	for families
$17.00	$30.00	$22.00	add $7.00

Astronomical League (optional) $9.00

Send membership applications and dues to the treasurer:

c/o Warren Astronomical Society, Inc.
P.O. Box 1505
Warren, Michigan 48090-1505

Pay at the meetings

Also via PayPal (send funds to treasurer@warrenastro.org)

- Among the many benefits of membership are
- Loaner telescopes (with deposit). See 2nd VP.
- Free copy of each WASP newsletter.
- Free use of Stargate Observatory.
- Special interest subgroups. See chairpersons.

The Warren Astronomical Society Publication (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.

In This Issue

About the Cover

Our traditional group photo of the current year's board. As the President and 1st VP couldn't attend the banquet, a picture was taken the evening they were elected to office as the whole board was present.

From left to right:

1st VP	Jonathan Kade
President	Diane Hall
Publications	Vatshalya Dandibhotla
Secretary	Charles Strackbein
Outreach	Jeff MacLeod
2nd VP	Riyad Matti

Congratulations to all.

Field of View

Stuff of Stars / Stuff of Life

I watched COSMOS as a young man and remember being astounded at the concept that the elements that make up everything we see and touch around us were formed by processes within stars, billions of years ago.

Years ago, I mentioned that one of the things that amazes me most about astronomy is the fact that the cosmos is a vast chemical factory, and that many of the building blocks of life have been found pretty much everywhere we care to look: interstellar space, meteorites, comet tail dust, asteroid samples…

And then in 2023, the OSIRIS-REx mission returned its asteroid sample to Earth, and after finally getting the sample cover removed, researchers were able to analyze those samples, and they found the simple sugar ribose!

"All five nucleobases used to construct both DNA and RNA, along with phosphates, have already been found in the Bennu samples brought to Earth by OSIRIS-REx," said Yoshihiro Furukawa of Tohoku University. "The new discovery of ribose means that all of the components to form the molecule RNA are present in Bennu."

Read that last sentence again, and let it sink-in. BLOWN AWAY again! There's a NASA site discussing these OSIRIS-REx findings - with a video too.

Teaching Astronomy

Back in the 1970's, I took an astronomy class in high school from my favorite science teacher, and *hated it*. The only thing I remember is that I calculated the distance from the Earth to the Sun using a Venus transit and a ton of math. This was NOT what I was expecting, and I've heard similar stories from club members - *recently*!

When I was in high school, I knew enough about astronomy to know that the wonders of the cosmos, and some mind-blowing concepts were simply NOT being covered… it's no wonder people get turned off of astronomy when it's taught that way!

Off the top of my head, there's some Astronomy-WOW! concepts:

- Light has a speed; when you look out into the night sky, you are looking into the past.
- Space is BIG, *really BIG*; light from the nearest star takes over four years to reach us.
- The universe is ancient.
- The Sun is a star - if you traveled to the nearest star and looked back, the Sun would look like the rest of the stars in the sky.
- We live in a "Sea of Stars" - there are stars *everywhere* around us, *billions* of them. When you look at the Sagittarius star cloud, there are so many stars - it literally looks like a cloud.
- Stars have a life cycle, and during that life cycle, heavier elements get created.
- When a star like the Sun reaches the end of its life, it sloughs-off its outer atmosphere, creating a planetary nebula - arguably some of the most beautiful objects in the cosmos.
- Stars can explode - several different ways (not the Sun, no worries).
- Stars form out of the interstellar medium - which includes the leftovers from previous stars.
- Most of the stars in the sky can't be seen with your naked eye (red dwarfs).
- More than half of the stars in the sky are part of a multiple star system.
- Our Sun is one of hundreds of billions of stars that make up the Milky Way galaxy - a flattened disk of stars with a central bulge, about 100,000 light years across.
- As the Sun orbits the Milky Way's core, it passes up and down through the galaxy's disk.
- It is estimated that there is at least one planet per star in the Milky Way
- The Milky Way has about 150 Globular clusters - *beautiful*, massive balls of stars all orbiting a common center of gravity, and themselves orbiting the core of the Milky Way - often passing through the galaxy's disk. And you can see them in your telescope!
- Galaxies can merge with other galaxies; the distances between stars is so great, collisions between stars have a very low probability.
- There is a supermassive black hole at the core of most galaxies.
- The universe is expanding.
- Light from stars contains an amazing amount of information (spectroscopy).
- Enceladus and its geysers hint at a subsurface ocean and hydrothermal activity… not to mention it's a prime location for the search for life.
- The stuff of life has been found in asteroids, comets and meteorites.

I could keep adding to this list *well* into the new year - the point is that there's a LOT of amazing concepts in astronomy that can be taught *first* - keep the math for the more advanced classes.

Hmmmm… I wonder if I just outlined a new lecture?

Bob Trembley,
2025 President

2025 Awards Banquet

Another awards banquet is in the rear view mirror. And it was a delightful affair. The Ukrainian Cultural Center was up to their usual excellent standard of fare (one attendee reported the chicken piccata to be quite tender and tasty) and their hospitality outstanding. Attendance was also up from the last two years, which is encouraging.

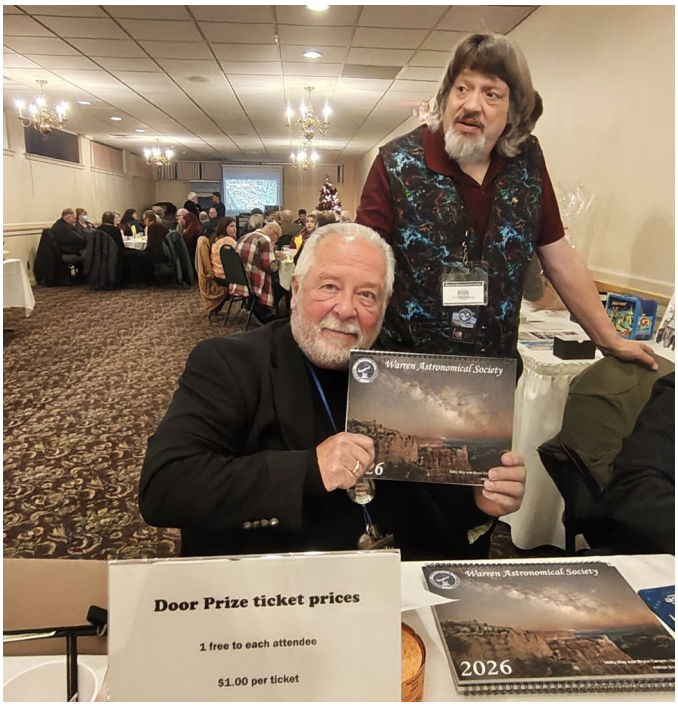
A big thank you is extended to the sponsors of the raffle: Celestron, Oberwerk and Sky & Telescope. Special thanks

Mark Kedzior and Dave Baranski ready to check in the attendees

go to members Dale Partin (2" 27mm Televue eyepiece), Tina Wong (*Apollo to the Moon*), Mark Kedzior (Gift basket), Bob Trembley (Space Cadet Lunch Box, Vatican Observatory Lens Cleaning Cloths), Glen Swanson (*Inspired Enterprise*) and Dale Thieme (*2026 Observer's Handbook* - a.k.a. "The Book of All Knowledge") for the additional prizes donated. And, I understand a few more prizes walked in the door with fellow members, so thank you as well.

The guest speaker, Glen Swanson, took us down the history of the unusual relationship NASA had with the producers of Star Trek, and the influence they had on the TV series. He also donated his book, *Inspired Enterprise*, to the door prize table. After all the proceedings, he also autographed his book for those who purchased one at the banquet.

Scenes from the banquet



We still have a few calendars available for sale.

Here, Mark is showing off his Mirror Grinding Award button (Larry Kalinowski made these to hand out at meetings) which features a photo of Bob Watt at work on shaping a telescope mirror.

The Warren Astronomical Society

Wishes to thank our 2025 Awards banquet contributors:

SKY & TELESCOPE®

CELESTRON®

OBERWERK®
High-Performance Optics for Earth & Sky

And our W.A.S. Members for their contributions to the Door Prize table

2026 Award Recipients

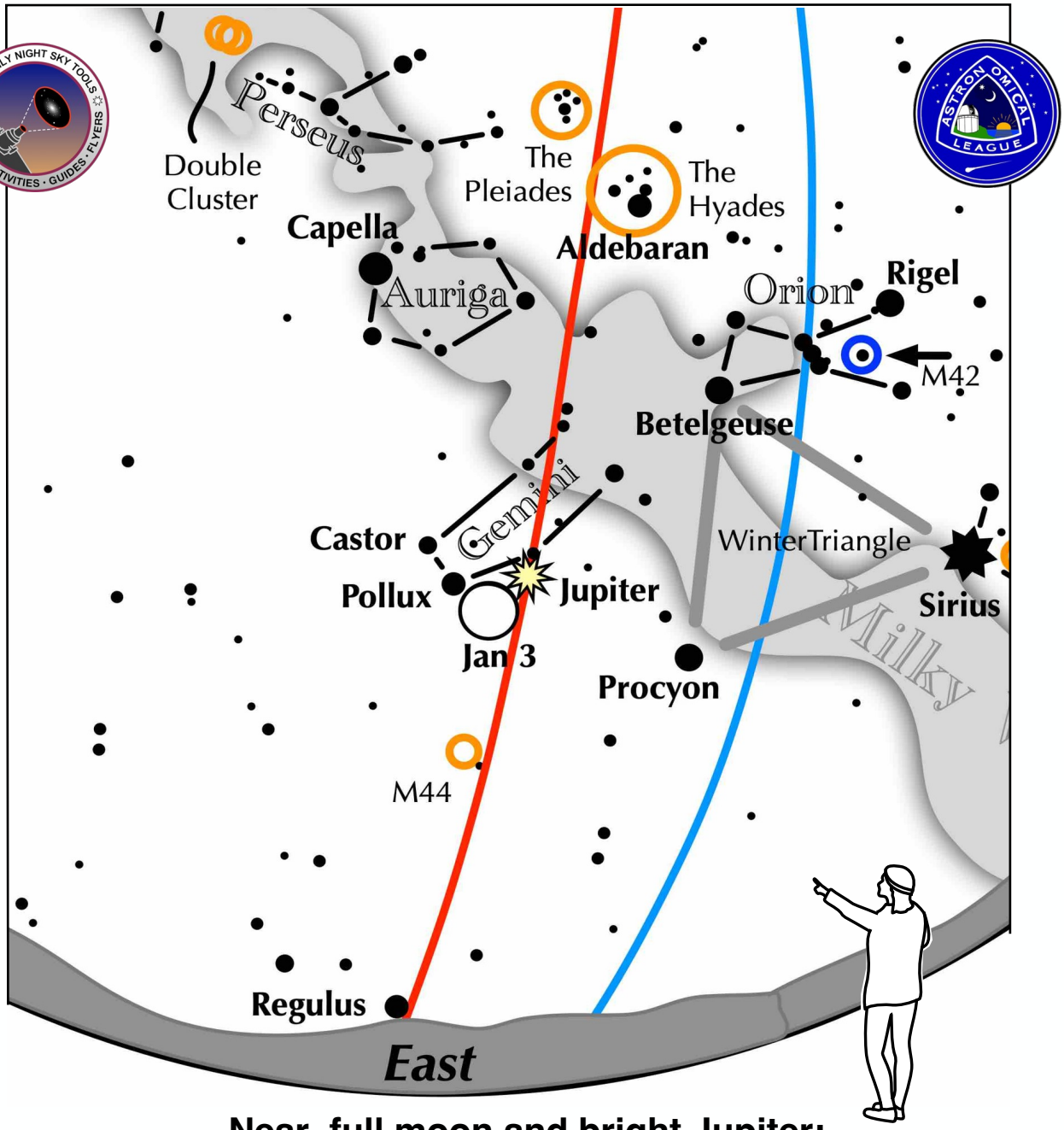
Two Blaine McCullough Awards went out this year, one to Marija Bognar, for her enthusiastic participation in WAS outreach events and open houses.

The other Blaine McCullough award goes to Dave Noble for his participation in outreach. Even as a new member, he demonstrated skill and knowledge while helping at the WAS table.

Mark Kedzior won the Bob Watt award for the technical help he gave in repairing telescopes of members and assisting them in learning to use the scopes.

A special Service award goes to Ken Lord for the assistance he gave with wrangling our Big Dob, shown here at right during the 2025 Astronomy at the Beach event.

An observing activity for this January 3.



Near–full moon and bright Jupiter: What can you see in the moon glow?

In the evening of January 3, look for Jupiter to the upper right of the moon.

• How well can you see -2.7 magnitude Jupiter just 4° away from the moon?

Look at stars further from the moon.

• Can you spot these luminaries?

1.1 mag. Pollux, 3° away followed by 1.6 mag. Castor 7° away,
0.4 magnitude Procyon 20° away,
1.7 mag. Alnilam, Orion's middle Belt Star, 40° away,
and the much dimmer Pleiades, 55° away.

WAS Apparel Price List

T-SHIRTS

Black – Navy – Gray (Pink or Yellow if desired) – one imprint

Small – XL $15.00
2XL $18.00
3XL $19.00

LONG SLEEVE T-SHIRTS

Black – Navy – Gray - one imprint

Small – XL $19.00
2XL $21.00
3XL $22.00

CREW NECK SWEATSHIRT

Black – Navy – Gray - one imprint

Small – XL $22.00
2XL $24.00
3XL $25.00

HOODIE W/Pockets

Black Only (at this time) – one imprint

Small – XL $27.00
2XL $33.00
3XL $34.00

IMPRINT LOCATIONS:

Front left chest (3 ¼" logo)

Front or back (9" or 10" logo)

Back (12" logo for jackets or sweater)

Combination front left chest (3 ¼" logo) and back (9", 10" or 12" logo) – add $7.00

Choose when placing order

LOGO COLOR SCHEMES:

Black background with gold/yellow artwork and lettering

Black background with blue lettering and gold/yellow artwork

Choose when placing order

HOW TO ORDER:

Place order at the Cranbrook meeting on the first Monday of month –
Select garment type - color of garment – logo imprint and color scheme –
Pay in full for order to be placed –
Your order will be ready for pickup at next Cranbrook meeting –
(Your order may possibly be ready for the Macomb meeting following the Cranbrook meeting of that month – you will be notified if that is the case)
Contact Mark Kedzior @ bazonga952@hotmail.com with any questions

---

IMPRINT ON YOUR OWN CLOTHING ITEM: Logo + Imprint Charge

3 ¼" Logo - $8.00 **9" – 10" Logo – $12.00** **12" Logo - $15.00**

LOGO COLOR CHOICES

Gold/Blue

Gold-3D

Legacy

By-Laws Vote

We missed taking a vote during the December meeting, our next opportunity is the January 5th Cranbrook meeting. Please take time to read the proposed amendment (mostly adding the section 7.05b.)

By-Laws Amendment Proposal in Section 7.05

Current section:

Section 7.05.

Compensation of Employees.

The Directors of the Corporation shall serve as such without salary, but the Board may authorize the payment of reasonable expenses incurred by Directors in the performance of their duties and reasonable compensation for special services rendered by any Director. Except as provided in this Section no Officer or Trustee of the Corporation shall receive directly or indirectly, any salary, or other compensation from the Corporation.

Proposed Amendment:

Section 7.05.

Compensation of Employees.

The Directors of the Corporation shall serve as such without salary, but the Board may authorize the payment of reasonable expenses incurred by Directors in the performance of their duties and reasonable compensation for special services rendered by any Director. Except as provided in this Section no Officer or Trustee of the Corporation shall receive directly or indirectly, any salary, or other compensation from the Corporation.

Section 7.05a

Waving of Directors Membership Fees

In recognition of the time, effort, and services rendered by members of the Board of Directors in carrying out the purposes of the Corporation, the Corporation shall waive the annual membership dues for each Director during their term of office. This waiver shall be considered a form of reasonable, non-monetary compensation for services rendered, consistent with Section 2.02 of these By-Laws and applicable provisions of Section 501(c)(3) of the Internal Revenue Code. Such waiver shall not affect any other rights or privileges of membership, and Directors shall be considered members in good standing for all purposes of these By-Laws.

Don't Forget-

We Still Need a Treasurer!

If you are willing to serve or know of someone, please let the board know.

Presentations

Cranbrook
7:00 pm, January 5, 2026

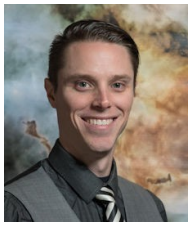
Pizza Party & Astro Quiz

Emceed by Jeff MacLeod

Come enjoy a pizza party! Pizza and pop will be provided free. Bring a side dish (cookies, etc.) if you are so inclined.

This will be followed by an astronomy quiz led by Jeff MacLeod. Come and see how much you know and don't know. No one else needs to find out how you do on the quiz unless you tell them. But bragging is allowed! There may be some hilarious moments. Come give it a try, and enjoy.

About the Emcee



Jeff MacLeod is a former WAS president, Observatory Chair, and now Outreach Chair. During his time at Wayne State, he was a presenter in their Planetarium while getting a bachelor's in physics and another in astronomy. Jeff recently started work in the aerospace sector simulating missiles (the rest is classified). Nowadays most of his free time is spent working on his spaceflight simulator, a life size recreation of a Gemini spacecraft you can actually fly in.

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.

Macomb
7:00 pm, January 15, 2026

Note: We're back in E-208

Feature

Eyepieces: What We Need to Know

By Gordon Hansen

Typically, both newbies and experienced astronomers in search of their first or next telescope spend a lot of time considering a host of decisions. The decisions can be daunting. Only when it's home and assembled do we think about what we're going to insert into the hole in the focuser! Once we gain experience with our hobby two maladies quickly make themselves known: aperture fever (bigger is always better) and why does the person next to me have a suitcase filled with eyepieces and I only have two?

This talk explores the characteristics of an eyepiece to understand how they work and interact with the rest of the optical train and understand the various eyepiece specs and why they are important.

About the Speaker

Gordon has a BS in Metallurgical Engineering and a Master of Business Administration, with Thirty-six years in Product Engineering at Ford.

As a paperboy in Brooklyn NY (1960) he won a cardboard tube Newtonian on a wobbly mount. He looked at the moon and tried a couple of stars, with less than stellar results. Gordon got reacquainted and hooked on astronomy ~2000 when his niece insisted he take a telescope gathering dust in her bedroom. A bunch of telescopes, a case with eyepieces, astro cameras and a backyard dome observatory later is history.

Gordon joined the Ford Amateur Astronomy Club in 2000 and served multiple terms as President, Vice President, and Treasurer over the years and continues to participate with the club's board. He became interested in astrophotography about twenty years ago. Gordon participated in the Ford Club's Astrophotography special interest group which transitioned into the Plymouth Astrophotography Club. He currently coordinates this group's in-person and on-line monthly meetings.

Next Month

Cranbrook

Main Talk

Telescope Interferometry - Stars and Exoplanets

Short Talk

TBD

Macomb

In the News 2025

David H. Levy

Friends with a Comet?

Can you be friends with a comet? Yes! Of course. I like to imagine that I can. Of the 241 comet friends I have observed since I first spotted Comet Ikeya-Seki in October of 1965, Comet 3I/ATLAS has got to be one of my favorites. More than a mere comet, it is a friend with a personality, a beating heart, and a soul.

Comet Atlas was the highlight of the wonderful observing session 25074AN2, held on the night of 18 November 2025. That session included a check on the brightness of my favorite variable star, TV Corvi, plus a morning check on the field of the soon-to-erupt recurring nova T Coronae Borealis. I wanted to see this particular comet badly, but I was uncertain if it would be bright enough, and condensed enough, to sight. I was wrong. On the previous night Tim Hunter took a beautiful picture of the comet, that appeared at about tenth magnitude. It sported a small tail, and a second anti-tail in the opposite direction. I set up Eureka, my 12-inch diameter reflector telescope, and I began searching for comets in the region where I thought this comet would be. I passed by an almost invisible fuzzy object that I assumed was probably NGC 4697, a spiral galaxy with a bar crossing it. It may be a twin of our own Milky Way galaxy. But because the galaxy was just rising in the southeast I could hardly notice it. I searched a few fields to the north and west.

Suddenly it was there. It was an obvious, approximately 9.5 magnitude bright spot. I did not make out either tail, but the coma was there. And the comet smiled at me.

Of all my friends, Comet Atlas is by far the oldest. Not only is it older than I, but it may also be almost as old as our galaxy itself. Its age has been estimated at between 7.6 and just over 13 billion years old; if it is anywhere near that old it is older than our solar system and possibly as old as the galaxy itself. (Our galaxy is probably about 13.6 billion years old.) This comet was a leftover part of the birth of a solar system far away, maybe as far as a system on the other side of our galaxy. Wandering through empty space for possibly all these billions of long years, this comet carries with it the wisdom of much of our galaxy.

What it could teach us! But actually, it can offer us nothing. It may carry wisdom, but cannot utter a word of it, has no understanding, no knowledge. My live human friends and my family, for the brevity of their lives, offer much more salient hints, humor, and understanding of our lives and existence.

As Comet Atlas surges away out of our system, in my imagination it will witness the political world in which humanity lives. Our different beliefs and customs, legal interpretations, even our religious faiths, will lie layered upon its icy surface. Perhaps some day it will encounter another world, with intelligent life, and in its mind's eye it would share what it has learned about us. But for a quarter of an hour on a mid-November morning, it was my friend.

There is a frivolous idea that the comet is not a comet but an alien spaceship. It is not, but the idea is the subject of much humor these days. When I went inside and enjoyed a Star Trek Voyager episode before heading for bed at 0630 that morning, I imagined me and the comet trading jokes (not the crew of the spaceship but the comet itself.) I have studied comets since I was a teenager, and I imagine that each of the comets I have seen has had a cometary personality of some sort. Comet Atlas and I are friends, talking with each other, joking around, and celebrating our mutual love of the infinite space of which we both are a part. This, whether it be a comet or a human being, is what defines friendship.

Tim Hunter took this month's picture of the interstellar comet ATLAS a couple of nights before I spotted it.

Sketching the NGC Catalog

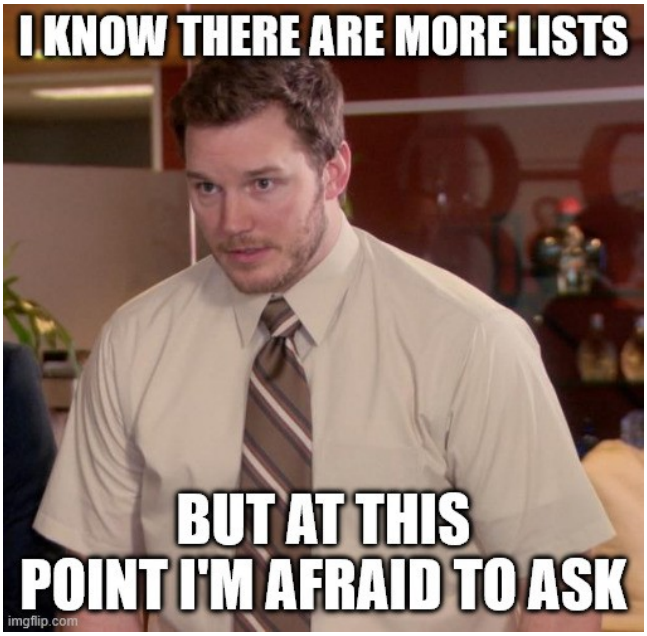
By Brad Young, Astronomy Club of Tulsa

Author's note – though this article is about my experience with the New General Catalog, I hope you will use some of the ideas for when you finish an observing program, or, perhaps, need to take a break from one. Or, if you have no observing plans, it may save you from boredom (by giving you ideas), or insanity by dissuading you from embarking on an enormous list that seemed to never end.

Well, I have finished my project to visually observe all the NGC objects. In November, I visited Australia again for the OzSky Alumni Star Party (my third one of those and seventh trip overall). My intent was to sketch all the NGCs, although I decided not to try to sketch the very complicated central portion of the Large Magellanic Cloud. Speaking to one of the Australians, he had spent a year in the LMC. With these star parties lasting only a week, I backed off this requirement and was happy with sketching all the rest, 98% of the total.

If you're interested in more details of this journey, there are example sketches, object counts and a checklist at my website. There is also an explanation of which objects I included in the list, based on Steve Gottlieb and others' work on the NGC / IC Project. Unfortunately, I did not get to meet Steve on this trip; it seems like we are always in Oz at different times. I also just finished writing "Sketching the NGC Objects" (about the subject at hand) and "Extreme Astronomy". That book is another anthology of recent articles and has original material that examines how to see just a bit more than what you are supposed to be able to. Both new books are available now on amazon.com.

> *Now we've come to the end of the road, still I can't let go,*
>
> *It's unnatural…*
>
> "End of the Road", Kenny "Babyface" Edmonds / Daryl L. Simmons / Antonio M. Reid, performed by Boyz to Men



Since I wrote a whole book about it, I won't go into the details of doing the NGC project here but instead look at the present situation that I've gotten myself into. As many know, finishing a big observing program is rewarding but can lead to an empty feeling. You had that accomplishment to strive for and now that it's finished, if you're like me, you may have a problem with motivation. Don't get me wrong, I was thrilled to finish. The guys I observed with said I showed visible relief once done. But now, I don't have that list to drive me and must search for new reasons to get out in the cold and dark. Of course, many of the same reasons that were there before are still around, including outreach, temporal events like comets, conjunctions and the like. And there are still plenty of other deep sky objects besides the NGCs for me to see in my 22-in Dobsonian. But having operated from a list for so long, now what?

One obvious path would be to delve further into imaging. I've written about this process many times and have also been doing remote imaging for quite some time. To stick my whole foot in the water, I bought a Seestar 50. I've only had one good night to use it before the proverbial new scope cloudiness poured in, but I was very impressed. Not only did it take me only about an hour to set things up, mess things up and then fix them, but the images on the first night were fantastic. I certainly see this little imaging scope being a big part of my near-term observing.

> *What better place than here?*
>
> *What better time than now?*
>
> *All hell can't stop us now*
>
> "Guerrilla Radio" Rage Against the Machine
>
> (When asked if they should start imaging)

As my dissipation worsens and I fall further into imaging, there are the Astronomical League Imaging programs. Not all of them can be done remotely with a large scope. Of course, not all of them can be done even adding a Seestar. At some point, I will have to add another imaging setup to do the planets and other medium-sized targets. But that's further down the road and can be done at leisure. There will still be all the citizen science stuff I've been involved with, but what else might be out there to kick start observing, even visual observing that I haven't done before? No telling what's next, but several stages of concentrating on one type of observation throughout the last 45 years have taught me to have an open mind.

When I first began, tracking the planets was best. Later, it was double stars and splitting as many as I could with my small telescope. When programmable calculators came out, I bought a great book called "Astronomical Formulae for Calculators" by Jean Meeus and began using a TI-55 to work out the positions of asteroids. With sketches from field observations, you can ID them and look at the accuracy of the orbits determined from the formulas. This was interesting but awfully tedious doing it visually especially when I heard tales from my imaging friends about how they had picked up 20 or 30 at night just by taking a few wide field shots.

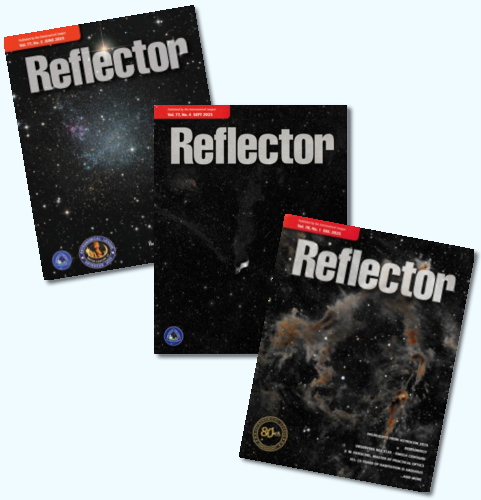
About the time I started doing AL programs in earnest, one of them caught my attention (tracking satellites) which is still a big deal for me. It's gotten rather strange with all the

Starlinks up there as you can see from my latest account at my website. I might see a few more by the end of the year, but this is probably good enough indication of where this part of the hobby is going. I still do use remote telescope imaging at Perth to catch some of the high earth orbit (HEO) satellites that are only visible from there but most of the LEO (low earth orbit) targets now are part of the mega constellations.

> *I make so many beginnings there never will be an end.*
>
> "Little Women" Louisa May Alcott.

I have a lot of unfinished projects like finishing off the asteroid occultation program and spectroscopy. One new program to look forward to is the Exoplanet Observing Program from the Astronomical League which was announced but has not been released yet. This should be both extremely difficult and very rewarding. Otherwise, I'll just keep looking at the skies and fondly remember all the very dim, small smudgy NGC items that I looked at over the past 45 years and hope that I'm looking at something brighter tonight.

Join the Astronomical League



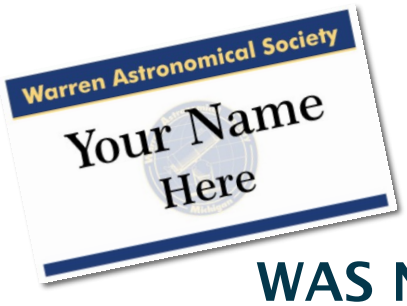
The mission of the Astronomical League is to promote the science of Astronomy. The major benefit of belonging to this organization is receiving the quarterly newsletter, The Reflector, which keeps you in touch with amateur activities all over the country.

Also:

- Participate in the Observing Program
- Avail yourself of the League Store
- Astronomy Books at a discount
- Attend Astronomical League Conventions

Only $9.00 annually,
(Membership starts July 1)

alcor@warrenastro.org



WAS Name Tags

Name tags are back. If you wish to have one and are a dues paying member, contact publications@warrenastro.org and we'll get one printed up for you.

WAS Merchandise

Available at Cranbrook and Macomb meetings

WAS Logo Stickers

$1.00 ea.
$5.00 for 7

WAS Pins

$2.50 Each

WAS Bandana

$5.00 Each

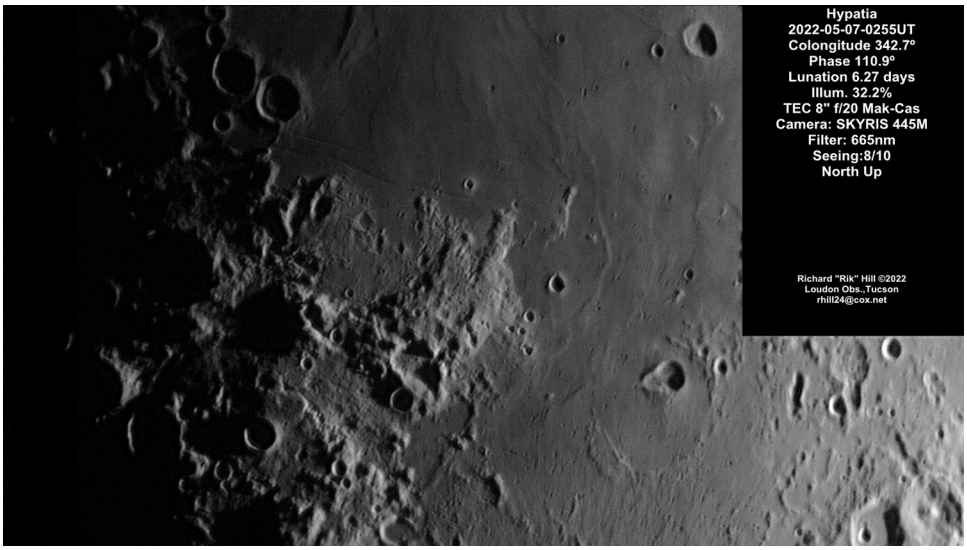
Endorsed by the Unicycle Cowboy!

Astronomical Bandanas at an astronomically low price, just $5! featuring 33 Glow in the dark constellations and a WAS logo.

Over the Moon

With Rik Hill

Hypatia

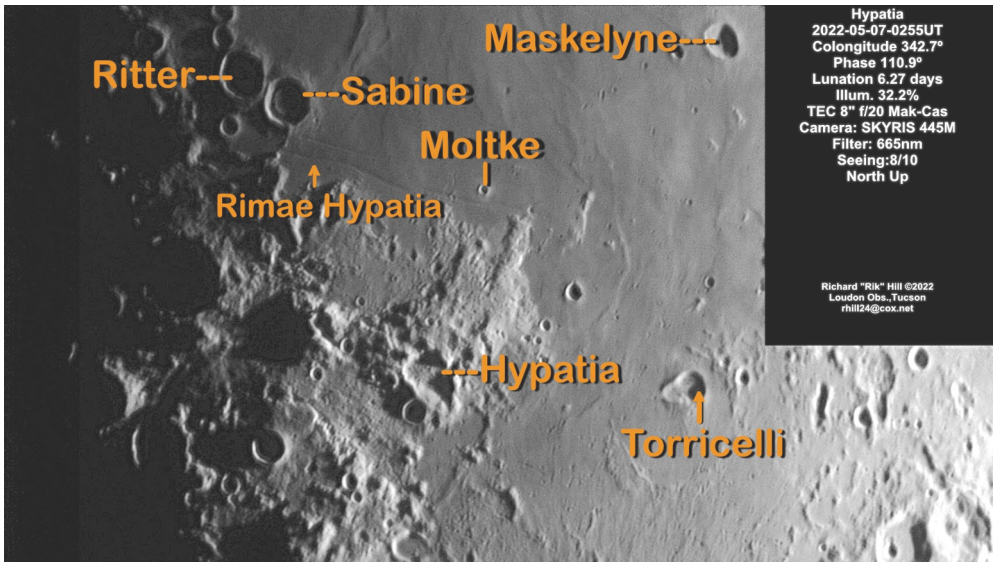


North of Theophilus is Sinus Asperitatis a flat region at the bottom of this image that contains the interesting pear-shaped crater Torricelli (23x31km) below and right of center. This crater has been a favorite of mine for many years sitting as it does on the north side of a much larger ghost crater some 75km diameter. It is the merging of at least 2 craters of Imbriam age (3.2-3.8 billion years old) filled with ejecta from surrounding impacts. On the opposite side (left) of the Sinus is another odd shaped crater that points more or less south. This is Hypatia (28x41km) also of Imbrian age, also overlain by ejecta materials. Notice the sideways "V" shaped shaft of light from sunlight streaming in through the break in the western wall. It's fun to watch these kind of light shows as they change rapidly with time.

North of this region is Mare Tranquillitatis and the site of the Apollo 11 Base. Two large craters on the left side of this are Sabine (31km) south and Ritter (32km) north. They make it easy to find the "Tranquility Base". Between these two craters and Torricelli is the small crater Moltke (7km) and between Moltke and Sabine is a large system of rilles named Rimae Hypatia. These are not the thin cracks like the Triesnecker rimae, but rather are grabens where a block of land drops down between two roughly parallel faults. In this case we have two such grabens parallel to each other. Then in the upper right corner, near the label, is the crater Maskelyne (26km) another odd shaped crater but younger than most of the other craters we have pointed out, being of Eratosthenian age (1.1-3.2 b.y.o.) and so this one is not filled in by ejecta like the much older craters.

This is a wonderful region with a lot more going on. Enjoy it for yourself when the moon is about 6.3 days old!

This image is a montage of parts of two stacked 1800 frame AVIs stacked with AVIStack2 (IDL) combined with Microsoft ICE and further processed with GIMP and IrfanView.



Location Maps by Ralph DeCew

History S.I.G.

January 1996

The main article for this issue is “A Tale of Two Comets” by various authors and compiled by Douglas E. Goudie for the WASP (spoiler alert- only one comet is talked about.) In “From The President”, John Herrgott thanked departing board members, welcomed the new ones. Oh, and announced the 22" Big Dob project. Of course there is the “Computer Chatter” by Larry Kalinowski, where the arrival of cable modems is anticipated.

An “Essay Contest” for the WASP is announced. Louis Namee reviewed New Horizons in Astronomy by Grant Fjermedal, the issue finishes with "Masterpieces Messier Missed" by Jeff Bondono: NGC 1502 at 04h08m +62 20'.

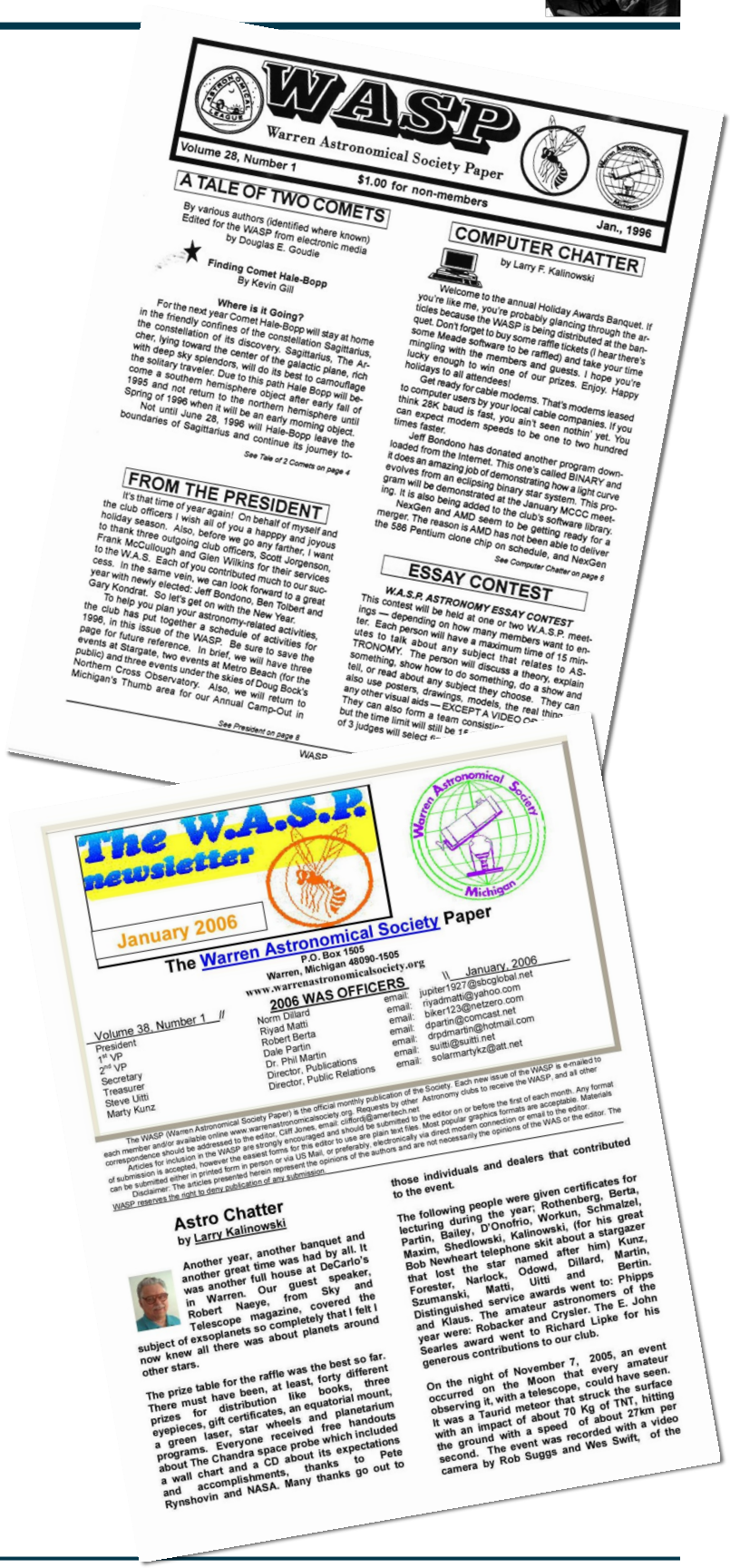
January 2006

This slim issue features “Astro Chatter” by Larry Kalinowski, where he covers the 2005 awards banquet (and provides the History SIG guy with a record of who got what award- Yay!) Also, in the issue, Larry’s “The Swapshop” and NASA Space Place: “A New View of the Andromeda Galaxy” by Dr. Tony Phillips and Patrick L. Barry.

From the Scanning Room

When I'm working on the History SIG article, I find myself reminiscing over the processes in the digitizing project. Looking at the 1996 January issue, I notice the clip art used. I think it was from the then current Word program. I, of course, didn’t have that and had to resort to selecting and clipping them out of the scans, making them clip art in the analog sense, I reckon.

The 2006 issue was easier, I found image files of the clip art on the WAS website when they were used in the online editions and was able to incorporate them in the PDF versions I was creating.



WASP

Warren Astronomical Society Paper

Volume 28, Number 1 — $1.00 for non-members — Jan., 1996

A TALE OF TWO COMETS

By various authors (identified where known)
Edited for the WASP from electronic media
by Douglas E. Goudie

Finding Comet Hale-Bopp
By Kevin Gill

Where is it Going?

For the next year Comet Hale-Bopp will stay at home in the friendly confines of the constellation Sagittarius, the constellation of its discovery. Sagittarius, The Archer, lying toward the center of the galactic plane, rich with deep sky splendors, will do its best to camouflage the solitary traveler. Due to this path Hale Bopp will become a southern hemisphere object after early fall of 1995 and not return to the northern hemisphere until Spring of 1996 when it will be an early morning object.

Not until June 28, 1996 will Hale-Bopp leave the boundaries of Sagittarius and continue its journey to-

See Tale of 2 Comets on page 4

COMPUTER CHATTER

by Larry F. Kalinowski

Welcome to the annual Holiday Awards Banquet. If you're like me, you're probably glancing through the articles because the WASP is being distributed at the banquet. Don't forget to buy some raffle tickets (I hear there's some Meade software to be raffled) and take your time mingling with the members and guests. I hope you're lucky enough to win one of our prizes. Enjoy. Happy holidays to all attendees!

Get ready for cable modems. That's modems leased to computer users by your local cable companies. If you think 28K baud is fast, you ain't seen nothin' yet. You can expect modem speeds to be one to two hundred times faster.

Jeff Bondono has donated another program downloaded from the Internet. This one's called BINARY and it does an amazing job of demonstrating how a light curve evolves from an eclipsing binary star system. This program will be demonstrated at the January MCCC meeting. It is also being added to the club's software library.

NexGen and AMD seem to be getting ready for a merger. The reason is AMD has not been able to deliver the 586 Pentium clone chip on schedule, and NexGen

See Computer Chatter on page 6

FROM THE PRESIDENT

It's that time of year again! On behalf of myself and the club officers I wish all of you a happpy and joyous holiday season. Also, before we go any farther, I want to thank three outgoing club officers, Scott Jorgenson, Frank McCullough and Glen Wilkins for their services to the W.A.S. Each of you contributed much to our success. In the same vein, we can look forward to a great year with newly elected: Jeff Bondono, Ben Tolbert and Gary Kondrat. So let's get on with the New Year.

To help you plan your astronomy-related activities, the club has put together a schedule of activities for 1996, in this issue of the WASP. Be sure to save the page for future reference. In brief, we will have three events at Stargate, two events at Metro Beach (for the public) and three events under the skies of Doug Bock's Northern Cross Observatory. Also, we will return Michigan's Thumb area for our Annual Camp-Out in

See President on page 8

ESSAY CONTEST

W.A.S.P. ASTRONOMY ESSAY CONTEST

This contest will be held at one or two W.A.S.P. meetings — depending on how many members want to enter. Each person will have a maximum time of 15 minutes to talk about any subject that relates to ASTRONOMY. The person will discuss a theory, explain something, show how to do something, do a show and tell, or read about any subject they choose. They can also use posters, drawings, models, the real thing, any other visual aids — EXCEPT A VIDEO

They can also form a team consisting

but the time limit will still be 15

of 3 judges will select fi

The W.A.S.P. newsletter

January 2006

Warren Astronomical Society Michigan

The Warren Astronomical Society Paper

P.O. Box 1505
Warren, Michigan 48090-1505
www.warrenastronomicalsociety.org

Volume 38, Number 1 // January, 2006

2006 WAS OFFICERS

President	Norm Dillard	email: jupiter1927@sbcglobal.net
1st VP	Rijad Matti	email: riyadmatti@yahoo.com
2nd VP	Robert Berta	email: biker123@netzero.com
Secretary	Dale Partin	email: dpartin@comcast.net
Treasurer	Dr. Phil Martin	email: drpdmartin@hotmail.com
Steve Uitti	Director, Publications	email: suitti@suitti.net
Marty Kunz	Director, Public Relations	email: solarmartykz@att.net

The WASP (Warren Astronomical Society Paper) is the official monthly publication of the Society. Each new issue of the WASP is e-mailed to each member and/or available online www.warrenastronomicalsociety.org. Requests by other Astronomy clubs to receive the WASP, and all other correspondence should be addressed to the editor, Cliff Jones, email: cliffordj@ameritech.net

Articles for inclusion in the WASP are strongly encouraged and should be submitted to the editor on or before the first of each month. Any format of submission is accepted, however the easiest forms for this editor to use are plain text files. Most popular graphics formats are acceptable. Materials can be submitted either in printed form in person or via US Mail, or preferably electronically via direct modem connection or email to the editor.

Disclaimer: The articles presented herein represent the opinions of the authors and are not necessarily the opinions of the WAS or the editor. The WASP reserves the right to deny publication of any submission.

Astro Chatter

by Larry Kalinowski

Another year, another banquet and another great time was had by all. It was another full house at DeCarlo's in Warren. Our guest speaker, Robert Naeye, from Sky and Telescope magazine, covered the subject of exoplanets so completely that I felt I now knew all there was about planets around other stars.

The prize table for the raffle was the best so far. There must have been, at least, forty different prizes for distribution like books, three eyepieces, gift certificates, an equatorial mount, a green laser, star wheels and planetarium programs. Everyone received free handouts about The Chandra space probe which included a wall chart and a CD about its expectations and accomplishments, thanks to Pete Rynshovin and NASA. Many thanks go out to those individuals and dealers that contributed to the event.

The following people were given certificates for lecturing during the year; Rothenberg, Berta, Partin, Bailey, D'Onofrio, Workun, Schmalzel, Maxim, Shedlowski, Kalinowski, (for his great Bob Newheart telephone skit about a stargazer that lost the star named after him) Kunz, Forester, Narlock, Odowd, Dillard, Martin, Szumanski, Matti, Uitti and Bertin. Distinguished service awards went to: Phipps and Klaus. The amateur astronomers of the year were: Robacker and Crysler. The E. John Searles award went to Richard Lipke for his generous contributions to our club.

On the night of November 7, 2005, an event occurred on the Moon that every amateur observing it, with a telescope, could have seen. It was a Taurid meteor that struck the surface with an impact of about 70 Kg of TNT, hitting the ground with a speed of about 27km per second. The event was recorded with a video camera by Rob Suggs and Wes Swift, of the

CRANBROOK INSTITUTE OF SCIENCE

Michigan's Museum of Natural History

JANUARY 2026

Notable Sky Happenings

Jan. 1 - 7

Earth is at perihelion (closest to the Sun) and the Moon is to the left of Jupiter on the 3rd (ENE evening). The Quadrantid Meteor Shower peaks on the the evening of the 3rd-4th. Moon is to the right of Regulus on the 6th (SW morning).

Jan. 8 - 14

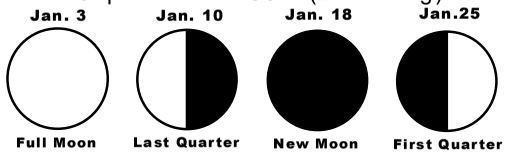
Jupiter is at opposition on the 10th and it's brightest for the year(E evening). Moon is to the right of Spica on the 10th (S morning) and to the right of Antares on the 14th (SE morning).

Jan. 15 - 21

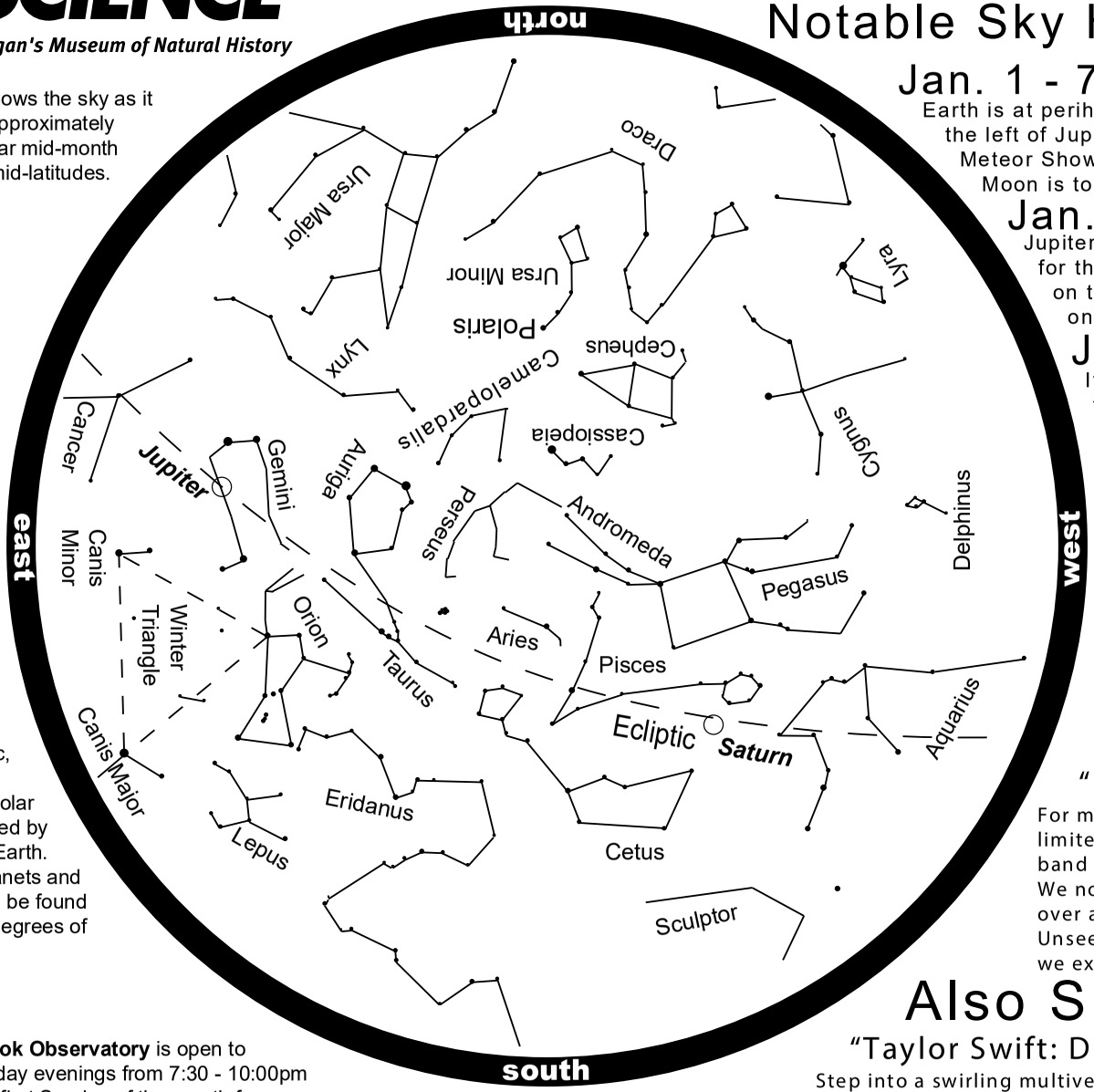
If you have a 4-inch or larger telescope, look for Juiptar's Great Red Spot the evening of the 16th. Jupiter's the bright "star" in the E.

Jan. 22 - 31

The Moon is at the lower right of Saturn on the 22nd and above Saturn on the 23rd (WSW evening). The Moon is at the upper left of Jupiter on the 30th (E evening).



This chart shows the sky as it appears at approximately 7pm EST near mid-month at northern mid-latitudes.



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

Now Showing

"Unseen Universe"

For millions of years our view of the heavens has been limited by our eyes; allowing us to only see a narrow band of electromagnetic radiation we call visible light. We now have the technology to capture the Universe over an amazing width of the spectrum and beyond. Unseen Universe provides a stunning visual treat as we explore the latest splendors of the heavens.

Also Showing

"Taylor Swift: Dimensions"

Step into a swirling multiverse where mathematics and music collide in Taylor Swift: Dimensions—a stunning planetarium experience of breath-taking 360° visuals. From the tender acoustics of "Cardigan" to the electric energy of "Ready For It?" and the fun vibes of "Cruel Summer."

The Cranbrook Observatory is open to the public Friday evenings from 7:30 - 10:00pm EST, and the first Sunday of the month from 1:00 - 4:00pm for solar viewing.

For observatory information visit http://science.cranbrook.edu/explore/observatory

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

IC 1396 (Elephant's Trunk Nebula) — Dale Hollenbaugh

January

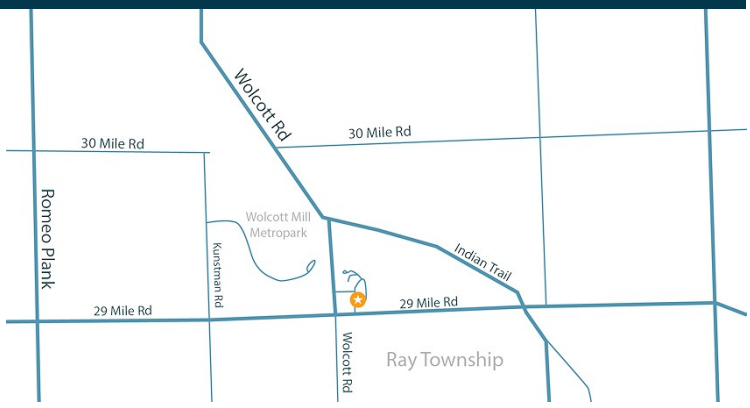
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 Moon at Perigee: 360348 km New Year's Day	2	3 Earth at Perihelion: 0.98330 AU Quadrantid Meteor Shower FULL MOON
4	5 Cranbrook	6	7	8	9	10 LAST QUARTER MOON Jupiter at Opposition
11	12	13 Moon at Apogee: 405437 km	14	15 Macomb	16	17
18 NEW MOON	19 Martin Luther King Jr. Day	20	21	22	23	24 Stargate
25 FIRST QUARTER MOON	26	27	28	29 Moon at Perigee: 365878 km	30	31

Stargate Observatory

Monthly Free Astronomy Open House and Star Party
5:00 PM, January 24th
Wolcott Mill Park - Camp Rotary Entrance

Advisory: Concerns are circulating in the amateur astronomy community about a possibility of COVID-19 being passed from one person to another via contact of different persons' eyes with a telescope eyepiece. Sharing telescopes may be considered by some to be high-risk due to the possibility of eyes touching eyepieces. Masks are encouraged, mandatory for children.

- Sky tours.
- See different telescope types in operation.
- 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:

- Closing time depends on weather, etc.
- May be closed one hour after opening time if no members arrive within the first hour.
- Contact the 2nd VP for other arrangements, such as late arrival time. Call 586-909-2052.
- An alternate person may be appointed to open.
- Members may arrive before or stay after the scheduled open house time.
- Dates are subject to change or cancellation depending on weather or staff availability.
- Postings to the Yahoo Group and/or email no later than 2 hours before starting time in case of date change or cancellation.
- 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 (secondvp@warrenastro.org).
- 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

December Open House

The Observatory opened at 4:49 pm, December 20. The sky was mostly cloudy.

Two members attended the open house. We discussed astronomy, telescopes, and observing filters. We also used a 7x50 binoculars to look at stars and M45 through a few holes in the clouds.

The observatory closed at 7:34 pm after everyone left.

January Open House

The next open house is scheduled to start at 5:00 pm on Saturday, January 24, 2026.

Riyad I. Matti
2025/2026 WAS 2nd VP,
Observatory Chairperson

Treasury Report

For December 31, 2025

BOA Checking/cash box

Balance ..... ~$20,401

Income

Memberships 105.00
Calendars 80.00
Banquet Tickets 550.00
Door Prize tickets 120.00

Expenses

Banquet tips 150.00
Award plaques 200.00
Paid off credit card 1166.21

Credit Card

Balance $0.00

Expenses

Thank you cards 11.42

PayPal

Balance $1,087.62

Income

Memberships 171.99
Calendar sales 19.01
Banquet 170.35
Door Prize tickets 5.00
Expenses 0.00

Membership

Members: ..... 129 (as of December 31)

Astronomical Events For January 2026

Add one hour for Daylight Saving Time

Source:

https://astropixels.com/almanac/almanac21/almanac2026est.html

Day	Time (h:m)	Event
1	16:43	Moon at Perigee: 360348 km
3	5:03	FULL MOON
3	12:00	Earth at Perihelion: 0.98330 AU
3	17:00	Quadrantid Meteor Shower
3	17:01	Jupiter 3.7°S of Moon
3	22:28	Pollux 3.0°N of Moon
6	6:00	Mercury at Aphelion
6	11:00	Venus at Superior Conjunction
6	11:20	Regulus 0.5°S of Moon
7	6:22	Moon at Descending Node
9	5:00	Mars in Conjunction with Sun
10	3:00	Jupiter at Opposition
10	10:48	LAST QUARTER MOON
10	18:50	Spica 1.6°N of Moon
13	15:48	Moon at Apogee: 405437 km
14	14:28	Antares 0.6°N of Moon
18	14:52	NEW MOON
21	11:00	Mercury at Superior Conjunction
21	19:03	Moon at Ascending Node
22	15:00	Venus at Aphelion
23	7:31	Saturn 4.3°S of Moon
25	23:47	FIRST QUARTER MOON
27	16:07	Pleiades 1.1°S of Moon
29	16:53	Moon at Perigee: 365878 km
30	21:31	Jupiter 3.8°S of Moon
31	8:45	Pollux 3.0°N of Moon

The WAS welcomes new members, Peter Lucaj, Jade Reeder, Richard Romano and the St. James family.

Reminder

It's a new year, don't forget to renew your membership.

Dave Baranski,
Treasurer

Meeting Minutes

Warren Astronomical Society

Board Meeting

November 23, 2025 7:00 PM

Present were Bob Trembley, Riyad Matti, David Baranski, and Vatshalya Dandibhotla.

Member present: Dale Thieme

Bob Trembley called the meeting to order at 7:05 PM

Officer Reports

President: Bob reported that he and Connie did NOT go to Windycon. he attended the last GLAAC meeting on the 2nd Tuesday…. It had been canceled. Several of them still got on and chatted. He stressed that GLAAC needs officers.

Observatory Chair: Riyad reported on the previous open house. He mentioned nearly all the loaner telescopes have been checked out. He said the $100 donation could be used for a big Dob accessory, like a finder scope. The observatory open houses start at 5:30 in Jan/Feb.

Treasury Report: Dave Baranski reported on the funds in all accounts, including a zero balance on the credit card.

Outreach Report

Jeff reported on several events in November. Nov. 8 - Macomb Reads! At the MISD. Bob T. and Dave Noble were at the WAS table. Also, the Cranbrook Outreach event was well attended.

Publications Report: Vatshalya said calendars are still available, and going!

Old Business

Elections: Bob reminded the board that the WAS needs a treasurer.

Rescheduled Pizza Party and Astro Bowl for Cranbrook will be at the Jan 2026 meeting. Dale P will pick up pizza, Bob will get pop and water, with optional sides potluck-style. This will be set up on tables outside the auditorium. We will clean up.

Need to inform the membership

By-Laws Update

Was read to the membership at the Macomb meeting

1. A written amendment to our bylaws has been submitted by Jeff Macleod to the Secretary, see below

2. The Board of Directors shall read the amendment and vote at this board Meeting

3. The amendment shall then be read to the membership at the following meeting.(Cranbrook Monday, November 3 beginning at 7 pm).

4. The Membership votes at the next meeting (Cranbrook December 1, 2025 beginning at 7 pm) and the amendment will pass with a majority approval.

I, Jeff Macleod, hereby submit a proposed amendment to the Bylaws of the Warren Astronomical Society to the Secretary, as shown below, for referral to the Board of Directors. I propose that Article VII, section 7.05a, be amended as follows.

THE BY-LAWS OF THE WARREN ASTRONOMICAL SOCIETY, INC.

ARTICLE VII FINANCIAL PROCEDURES AND RESTRICTIONS ON

TRANSACTIONS

Section 7.05. Compensation of Employees.

The Directors of the Corporation shall serve as such without salary, but the Board may authorize the payment of reasonable expenses incurred by Directors in the performance of their duties and reasonable compensation for special services rendered by any Director. Except as provided in this Section no Officer or Trustee of the Corporation shall receive directly or indirectly, any salary, or other compensation from the Corporation.

Section 7.05a Waving of Directors Membership Fees

In recognition of the time, effort, and services rendered by members of the Board of Directors in carrying out the purposes of the Corporation, the Corporation shall waive the annual membership dues for each Director during their term of office.

This waiver shall be considered a form of reasonable, non-monetary compensation for services rendered, consistent with Section 2.02 of these By-Laws and applicable provisions of Section 501(c)(3) of the Internal Revenue Code.

Such waiver shall not affect any other rights or privileges of membership, and Directors shall be considered members in good standing for all purposes of these By-Laws.

New Business

Banquet

2025 Beg Letters went out 2025-10-21

Email blast went out 2025-11-20

Menu/Program: Is a menu/program is needed? Dale T. suggested we not do the program printing, but if overruled, he could get a batch of 50 Following discussion. No printing was the decision.

The board then discussed potential recipients for awards this year, followed by a discussion on how to handle the banquet duties.

Date/Time: Thursday Dec. 4, 2025 at the Ukrainian Cultural Center, 6:00 Board setup, 6:30 members begin arriving

Bob T has the WAS projector as a back-up option

Bob noted that Dale Partin informed us that our room is changing at Macomb next year - Room E-208

Bob reminded officers to get reports in to the WASP

The new board members need to be invited to the December Board meeting as part of the Board turnover

7:50 PM Riyad moved to adjourn, Dave 2nd, meeting adjourned.

Respectfully submitted,

Dale Thieme
sitting in for Charles Strackbein

Warren Astronomical Society
Cranbrook Meeting
December 1, 2025

Bob Trembley brought the meeting to order at 7:00 PM with 31 present, 9 on Zoom, and 6 on YouTube. He had Jim Shedlowsky bring us up to date on the goings on with McMath-Hulbert observatory. Not much movement with the current owner who wishes to sell the facilities, which are deteriorating. Proposals for restoration are being tendered.

Officer Reports

President: Bob Trembley pointed out that the banquet was in three days and we still needed more sign-ups to reach the minimum of 35. He also pointed out that we still have calendars to sell.

1st VP: Dale Partin mentioned he still needs speakers to line up for 2026. We will start off 2026 with a pizza party and astro quiz.

2nd VP: Riyad Matti reported that the November open house was shortened by clouds, closing up by 8:00, but 12-15 or so visitors showed up, and were able to see a demo of radio astronomy. Mentioned the December open house would be the third Saturday, instead of the usual fourth.

Treasurer: Dave Baranski gave the figures in the WAS treasury, which are recorded in the WASP.

Outreach: Jeff MacLeod shared the November 15 outreach at Cranbrook was a good night, seeing the rings of Saturn at their thinnest.

Secretary: Charlie Strackbein reported that the meeting notes were in progress and posted in the WASP. Also, he was looking for more members to participate in the Observatory committee.

Publication: Newsletter is online.

Astronomy in the News

Comet ATLAS (C/2025 K1) breaks up, for information on Interstellar comet 3I/ATLAS, see NASA's site on it: https://science.nasa.gov/solar-system/comets/3i-atlas/

Asteroid Update

1,480,717 total asteroids - getting close to a million and a half

40,284 Near Earth Objects - Passed 40K

Yesterday, asteroid 2025 WE14 passed by Earth at 0.07 Lunar Distances - it's 2-8 meters in size. It was also discovered yesterday...

Exoplanet Update

6,052 Confirmed Exoplanets - up 10

7,771 Candidates - up 81

Special Interest Groups

Solar

X-CLASS SOLAR FLARE (PERHAPS THE FIRST OF MANY): We were expecting an X-flare today, but this one surprised us anyway. At 0249 UTC, a previously overlooked sunspot exploded. The X1.9 category flash is shown

GIANT SUNSPOT ALERT: Sunspot complex 4294-96 is one of the biggest sunspot groups of the past 10 years. From end to end, it measures ~180,000 km

Observing Reports / Astrophotos

Dave Noble shared his meteor photos/videos

Short Talk

Tom Hagen introduced the attendees to a brief look at "radio astronomy", featuring neutral hydrogen, aka the hydrogen line.

Main Talk

Following the break, Dale Partin introduced Buddy Stark, who gave us a biographical sketch in "Tycho and Brahe" where he focused on their personal lives and interactions.

The meeting concluded at 8:54 PM

Respectfully submitted,

Dale Thieme
sitting in for Charles Strackbein

Warren Astronomical Society
Macomb Meeting

No Macomb meeting scheduled

See the Awards Banquet pictorial on page 4

Outreach

Coming up

Dr Dale Partin will deliver "Origin of the Chemical Elements" at the Seven Ponds Club on January 17th, at 7:00 PM.

If you wish to attend, the club is located at:

Seven Ponds Nature Center
3854 Crawford Rd
Dryden, MI 48428

SEVEN PONDS ASTRONOMY CLUB

DETROIT PUBLIC LIBRARY

Penciled in:

WAS member, Jennifer Dye, informs us that a presentation Tuesday, January 27, is possible. The talk hasn't been confirmed yet, but if it takes place, it will be online only, 6:00 - 7:30PM. Check with Jennifer for updates: jdye@detroitpubliclibrary.org

For Sale

Celestron NexStar 8SE

This is a great opportunity to get started in visual astronomy with an almost new Celestron NexStar 8SE (C8SE). The telescope and accessories were purchased new in November 2024. The scope was used once to train a new user, then stored indoors. It was powered up and tested again last night to confirm proper operation. Everything works exactly as it should.

The 2" Celestron diagonal was purchased used; the optics are pristine. One of the three set screws is missing, but it functions normally and securely.

This is an excellent setup for a new visual observer and includes several essential accessories beyond the standard package. Included:

- Celestron NexStar 8SE OTA, mount, & tripod
- Agena Astro SWA 10mm eyepiece
- Agena Astro SWA 38mm eyepiece
- Celestron 2" diagonal
- AstroZap dew shield
- Aperture AC power adapter with 12V extension cord
- Cell phone camera holder
- All original documentation

The scope and all accessories are in excellent condition, pristine optics, no issues, and has been well cared for.

I'd really prefer not to ship this item. It is located in Northwest Ohio (ZIP 45895). I'm willing to drive up to 80 miles for a personal hand off.

If shipping is requested, the buyer will be responsible for full retail UPS shipping plus insurance.

Asking $1,100.00.

I accept: PayPal (with a 3% markup), Zelle, Google Pay, check (ships after the check clears), or cash (for local transactions)

Mark Casazza
http://casazza.net
Home of the Clear Sky Alarm Clock and Tonight's Sky

The Warren Astronomical Society is a proud member of the

Great Lakes Association of Astronomy Clubs

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.

Club Name and Website	City	Meeting Times
Astronomy Club at Eastern Michigan	University Ypsilanti/EMU	Every Thursday at 7:30PM in 402 Sherzer
Capital Area Astronomy Club	MSU/Abrams Planetarium	First Wednesday of each month 7:30 PM
Farmington Community Stargazers	Farmington Hills	Members: Last Tuesday of the month Public observing: 2nd Tuesday of the month
Ford Amateur Astronomy Club	Dearborn	Fourth Thursday of every month (except November and December) at 7:00 PM
McMath-Hulbert Astronomy Society	Lake Angelus	Board and paid members-First Sunday of the month
Oakland Astronomy Club	Rochester	Second Sunday of every month (except May)
Seven Ponds Astronomy Club	Dryden	Monthly: generally the Saturday closest to new Moon
Sunset Astronomical Society	Bay City/Delta College Planetarium	Second Friday of every month
University Lowbrow Astronomers	Ann Arbor	Third Friday of every month
Warren Astronomical Society	Bloomfield Hills/Cranbrook & Warren/MCC	First Monday & third Thursday of every month 7:30 PM

Club and Society Newsletters

Warren Astronomical Society: http://www.warrenastro.org/was/newsletter/
Oakland Astronomy Club: http://oaklandastronomy.net/
McMath-Hulbert Astronomy Club http://www.mcmathhulbert.org/solar/newsletter/
Ford Amateur Astronomy Club: http://www.fordastronomyclub.com/starstuff/index.html
University Lowbrow Astronomers: http://www.umich.edu/~lowbrows/reflections/

WAS Member Websites

Steven Aggas: http://apache-sitgreaves.org/

Jon Blum: Astronomy at JonRosie

Doug Bock:

Facebook: Northern Cross Observatory: https://www.facebook.com/NorthernCrossObservatory

Boon Hill and NCO Discussion https://www.facebook.com/groups/369811479741758

Flickr (astrophotography album): https://www.flickr.com/photos/141833769@N05/

YouTube channel: https://www.youtube.com/channel/UC-gG8v41t39oc-bL0TgPS6w

Bob Trembley:

https://www.vaticanobservatory.org/profile/rtrembley

Vatican Observatory Foundation Blog