



The W.A.S.P.



Volume 55 Issue 7

July 2023

The Warren Astronomical Society Publication

W.A.S. Annual Picnic & Stargate Open House

5:30 PM July 29th at Camp Rotary Pavilion

Wolcott Mill Metropark
20505 29 Mile Rd,
(1.8 miles east of Romeo Plank Rd)
Ray, MI 48096

STARGATE OBSERVATORY

Hot dogs, hamburgers and pop will be provided.
Please bring a dish to pass!

Service animals allowed, otherwise, no pets.

The WASP

Published by

Warren Astronomical Society, Inc.

P.O. Box 1505

Warren, Michigan 48090-1505

Dale Thieme, Editor

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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 7:30 p.m.

First Monday meeting:	Third Thursday meeting:
Cranbrook: Institute of Science	Macomb Community College
1221 North Woodward Ave	South campus, Bldg. J, Room J221
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) \$7.50

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.

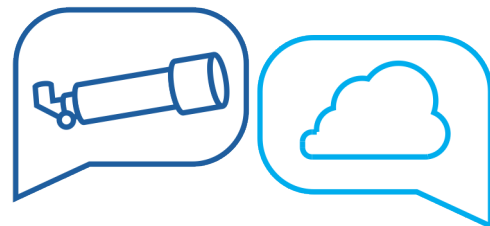
Articles for inclusion in the WASP are strongly encouraged and should be submitted to the editor on or before the end of each month. Any format of submission is accepted. Materials can either be transmitted in person, via US Mail, or by email (publications@warrenastro.org)

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.

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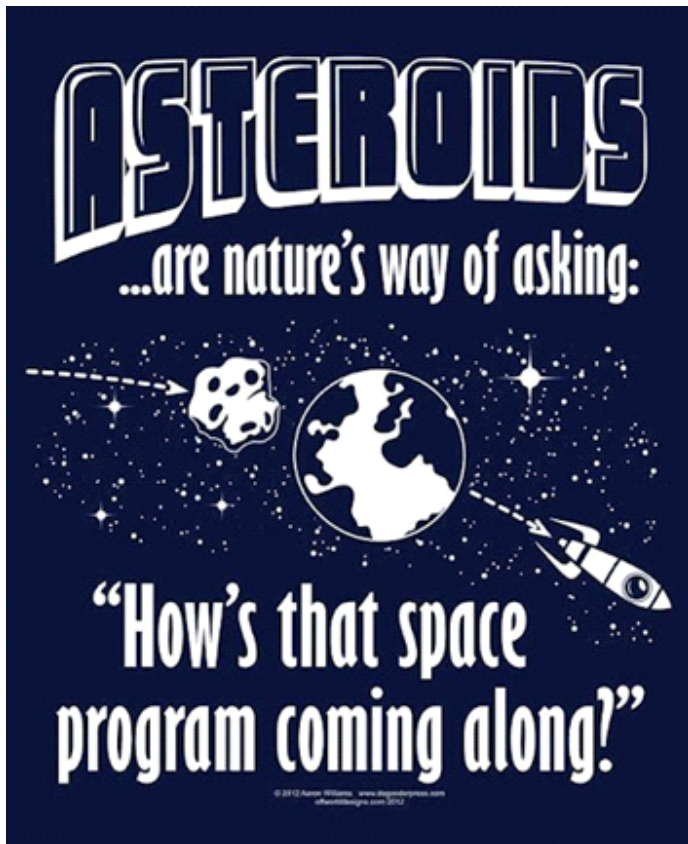
Discussion Group Meeting

Come on over, and talk astronomy, space news, and what-not!





Field of View



June 30th is the anniversary of the [Tunguska impact event](#) of 1908 - which flattened 80 million trees over an area of 2,150 square kilometers. [AsteroidDay](#) is now a UN-sanctioned global awareness campaign occurring on this date, with outreach events happening globally. One of the goals of AsteroidDay is to raise awareness of the threat of asteroid impacts, and they've done a pretty good job of that.

Another goal of AsteroidDay was to see the development of asteroid deflection technology, and with the success of NASA's [DART mission](#), we're doing well in that department. The next step would be to do a repeat of DART, and develop a rapid response and deployment deflection spacecraft.

Yet another goal of AsteroidDay is an increase in asteroid detection and follow-up observations - here's where we could be doing a LOT better. Granted, the [detection rate](#) since the 1990's looks like an exponential curve, but with the number of potential NEOs out there, it's simply not enough... not by a long shot. I'm hoping that increased use of [AI and machine-learning](#) might help with this.

I have to admit we're a *LITTLE* better now in 2023 than we were in 2013, when the NASA administrator at the time said the only thing we could do if we discovered an imminent impactor would be to "pray."

In other [jaw-hits-the floor news](#), researchers looked at pulsar timing variations, for years, and discovered universe-spanning gravitational waves with wavelengths of tens of light-years - literally a cosmic gravitational-wave back-

ground. I can't remember seeing anything explode onto [social media](#) and get hyped quite like this announcement. JWST discovering oxygen in an exoplanet atmosphere might get the same treatment - that remains to be seen. *Interesting times indeed.*



Image: Artist's interpretation of an array of pulsars being affected by gravitational ripples produced by a supermassive black hole binary in a distant galaxy. (Image credit: Aurore Simonnet, NANOGrav collaboration)

As I was writing this, I saw a [post](#) stating that the Ingenuity Mars Helicopter has finally reestablished contact with the Perseverance Rover following two months of radio silence. The communications dropout was expected due to a hill that stood between the helicopter's landing location and the Perseverance rover. If Ingenuity's health checks out, Flight 53 will occur within the next couple of weeks. Not bad for an original design spec of 30 days and 3-5 short flights.

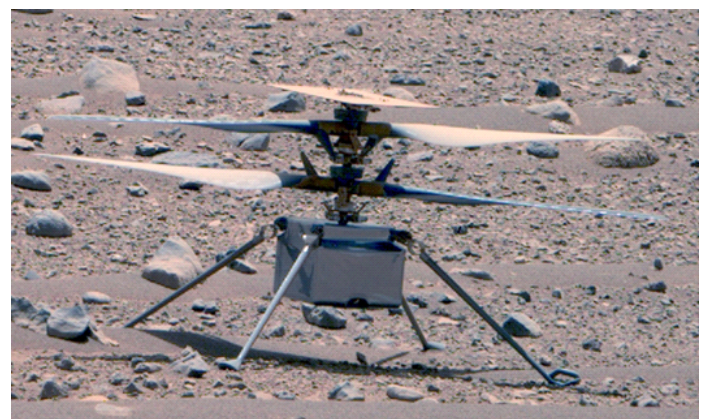


Image credit: NASA/JPL-Caltech/ASU/MSSS

**-Bob Trembley,
President**

In Memoriam

Robert S. Franks

1950 - 2022

A past longtime WAS member, Robert S. Franks (known in the club as Steve Franks) passed away last December. He was an active astronomer in the club, encouraging others to take up the hobby and join the club. He also contributed many articles to our publication, the WASP.

Services will be private. Arrangements in care of Jowett Funeral Home, 1634 Lapeer Avenue, Port Huron.

To view the obituary and share memories, visit www.jowettfuneraldirectors.com

To send flowers or a memorial gift to the family of Robert S. Franks please visit the Sympathy Store.

A small memorial gathering is planned on Monday, July 3rd at 10am in the park next to the Riviera Restaurant. A few words will be said and his ashes will be spread in the Saint Clair River. Lunch will be at the Riviera restaurant after the ceremony.

Riviera Restaurant
475 S Water St
Marine City, MI 48039

To send flowers or a memorial gift to the family of Robert S. Franks please visit our Sympathy Store.

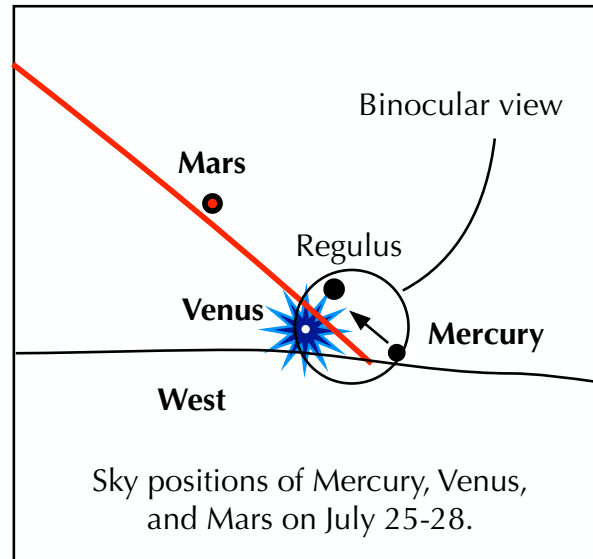
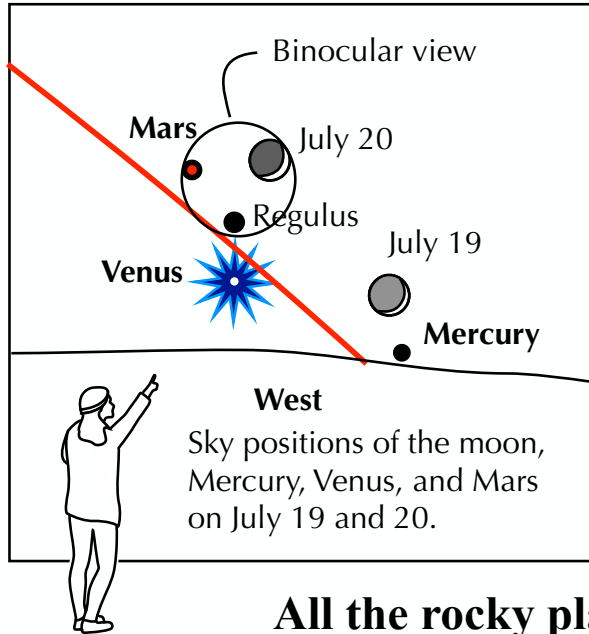


WAS PRESENTATIONS

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firstvp@warrenastro.org.



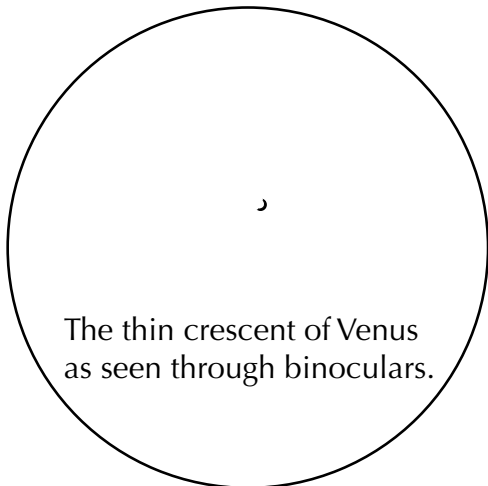
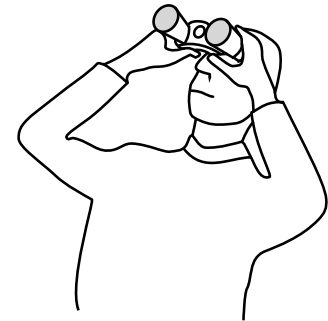
If you can see only one celestial show in the evening this July, see this one.



All the rocky planets, all at once!

On the evenings of July 19 and 20, look towards the west 30 minutes after sunset.

- Brilliant Venus will be seen as a tiny crescent in steadily held binoculars.
- On the first evening, the thin crescent moon, full with earthshine, hangs above Mercury. The little planet might be lost in the bright twilight.
- On July 20, the moon forms a triangle with Regulus and Mars. Venus sinks below them. Mars, having lost its splendor from last fall, might be difficult to spot in the bright twilight. Binoculars will help.



Mars, having lost its splendor from last fall, might be difficult to spot in the bright twilight. Binoculars will help.

• Mercury climbs somewhat higher over the remaining evenings in July. On July 28, it lies directly next to Regulus, which has dropped much closer to the horizon. Venus may lie too close to the horizon to be spotted. Because of their low altitude, very clear skies and a low horizon are needed to see this.



Observation Reports

May 31-June 1

XX Persei. End of series of fiascoes. Star observed but so imperfectly, no magnitude.

Transparency fair-poor.

6-cm. refractor @ 30X.

COMMENTARY: Low amplitude star, challenge from S. Mich. in late spring, but easier for Canadian and Europeans.

3-4 June

The Moon. Lustreless orange-red obs'd 07.50 U.T. No shadows. Principal features visible with bias toward maria.

Transparency poor.

7X binoculars.

COMMENTARY: Do not recall last time N.W.S. telephone recording predicted "haze" for night. Only star vis. naked eye = Vega near zenith. Moon very low with max. S. Declination on 6th.

4 June

The Sun. Photosphere with much activity, 6 groups. W. limb: strongly fore-shortened Waldmeier "D" or "E", likely extensive along latitude.

Centre: likely two close groups patently dominate, a solo "H" with de minimis pores too small for mangif. and seeing. To its east is a stretch "D". Others: "A"s.

Transparency fair (haze/smoke?)

Instrumentation as before.

6 - 7 June

Mars, Venus, M-44. Twilight search for planets and Beehive cluster which was hopeless. Venus very bright @ -4.4. On 2nd Mars was 5-7 arc-min. from cluster. Initial mistake was made with Mars, actually was Procyon close to the horizon, 8th brightest stellar object, 0.37 mag. (visual). The star was ruddy from very low altitude + turbid atmosphere.

Transparency poor.

5-cm. refractor at 17X.

8 June

The Sun. Six groups, entire photosphere. Two in N. hemisphere. At centre in S. a very developed Waldmeier "B"

Transparency fair, seeing good.

Instrumentation as before.

COMMENTARY: In solar rotation 2271 beginning 18th of May. Carrington numbers began in 1853.

8 - 9 June

Mars, Venus, M-44. Search in final twilight, post. Mars visible to naked eye initially. Hint of the cluster, but impossible as Mars-Cancer lowered.

Transparency fair.

Instrumentation as before.

9 June

The Sun. No new major activity on photosphere. Spot swarm Waldmeier "B" previously reported may be fading, but assessment difficult. Two N. hemis. groups previously reported are likely one feature, likely "G". Disc very active.

Transparency fair, seeing fair.

5-cm. refractor f /11 @55X

9 - 10 June

Venus, Mars, M-44. Latter 2 obs'd ~ 02.45 U.T. Mars approx. 1 degree above Plane of the Ecliptic. Cluster easily acquired by sweeping W. from Mars, all brighter stars visible despite elevation. Planet "burnt" orange from low altitude, mag. 1.6 @ 4.5 arc-sec. Disc difficult to make out from brightness..

Transparency good.

Instrumentation as before.

18 -19 June

M-3, M-27, M-92, M-11, M-4, M-80. To establish observing with current atmospheric condition. Surprisingly, both Scorpius globular cl. visible, but 4 was very vague. M-11 respectable, detailed, despite low elevation.

Transparency poor (smoke + rel. humidity), seeing good.

16-in. Mighty Borr II @ 230X

COMMENTARY: With due regard for conditions, extinction and spectral shift, possible deep sky and var. star observing with M. Christensen, Fox Valley Astro. Soc.

21 - 22 June

Variables in extreme S. Cyg. Difficult circum zenith. But conditions sufficient for work in the zenith radius of less than 40 deg.

Transparency poor, seeing fair.

16-in. Mighty Borr II @130X & 250X

COMMENTARY: Despite more favourable fugitive smoke report from J. McBride, in S.W. Mich. still serious for astronomy.



WAS Astrophotos

(Or, smoke gets in your optics)

The Orange Moon

Date taken: June 3rd, 2023
Photographer: Ray Bosshard



Moon with Earth Shine

Taken Tuesday June 20th from Lake Hudson State Park's Boat Launch. With smoke making transparency bad all over the state, I decided to use it as a filter to capture the setting crescent moon. I chose Lake Hudson as opposed to the west coast of Michigan. The image turned out pretty good when I switched to the 'wildlife' lens!

-Adrian Bradley

The camera was a Sony A7R4 and the lens was a Sigma 150-600mm contemporary lens.

ISO 1600, f/5.6, 15 sec, 200mm... on a tripod with my sky tracker. I took another untracked photo to make a composite (so the trees wouldn't be blurry).



The View From C.W. Sirius Observatory

Happy 4th of July

NGC 6946 (also known as the Fireworks Galaxy) is a face-on intermediate spiral galaxy with a small bright nucleus, whose location in the sky straddles the boundary between the constellations of Cepheus and Cygnus, and is part of the Virgo Supercluster of galaxies. Its distance from Earth is about 25.2 million light-years. Discovered by William Herschel on September 9, 1798, this well-studied galaxy has a diameter of approximately 40,000 light-years, about one-third of the Milky Way's size, and it contains roughly half the number of stars as the Milky Way.

What makes this galaxy so interesting is that ten supernovae have been observed in NGC 6946 in the last century: SN 1917A, SN 1939C, SN 1948B, SN 1968D, SN 1969P, SN 1980K, SN 2002hh, SN 2004et, SN 2008S, and SN 2017eaw. For this reason NGC 6946 in 2005 was nicknamed the "Fireworks Galaxy".

Supernova SN2017eaw was discovered on May 14, 2017 by Patrick Wiggins (USA), and at that time it was magnitude 12.8. I took this photo on June 10, 2018, over a year after it was first discovered, when it had dimmed down to a 17.6 magnitude. So you can see that SN2017eaw was a very powerful supernova that was visible for over 600 days! Added note: the letter designations of supernova are calculated using a Base 26 naming convention system, where the first discovery of a given year for example would be 1=A, then 2=B,... 26=Z, 27=aa,...etc. So that means SN2017eaw was the 3429 supernova to be discovered in 2017.



Image: Bill Beers

NGC6946 is best observed in the summer months when it is highest in the sky. With a magnitude of 9.6, using a medium to large size telescope should reveal a good portion of the galaxy, using a wide field eyepiece. But in darker sky locations and using a 12" or larger telescope, you should be able to see plenty of spiral structure. Happy hunting and Happy 4th of July!

-Bill Beers



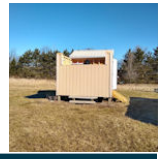
About CW Sirius Observatory

C.W. (Cadillac West) Sirius Observatory is located 15 west of Cadillac Michigan. Owned and operated by WAS member Bill Beers. The dome is an 8' Clear Skies Inc dome which houses an 11" f/10 SCT telescope, a 102mm f/7 refractor telescope, Celestron CGEM DX mount, and uses an ASI ZWO 071 color CMOS camera, as well as a QHY8L color CCD camera. The telescope can be remotely operated from inside Bill's house.

Anyone interested in learning about astrophotography, or any questions regarding equipment, or how to take astrophotos using your iPhones, or any related questions, can contact Bill at: BEEZOL-L@AOL.COM



From the Desk of the Northern Cross Observatory



On June 22, 2022 I ran a multi-object sequence for about 4 hours. The goal was to collect data of nebula in the central part of the Milky Way. Using the William Optics 105mm f/7 Apochromatic refractor and the ZWO asi2600mc pro camera, These 3 nebula were captured in less than 1 hour of data each. This refractor has a larger field of view than my 10" RC, thus the interest in imaging these larger objects again. I also ran another set of data on a current comet C/2017 K2 (Panstarrs)

The sky conditions were good with a transparency of 4/5 and seeing 3/5 for most of the night.

Messier 20 - the Triffid Nebula - 28 x 2 minute sub frames

Messier 8 - the Lagoon Nebula - 27 x 2 minute sub frames

Messier 17 - the Omega or Swan Nebula - 24 x 2 minute sub frames

Comet C/2017 K2 (Panstarrs) - 50 x 1 minute sub frames - stacked on the comet core



-Doug Bock

Presentations

Cranbrook July 3, 2023

Main Talk

Enjoying the Inky Black Skies of Big Bend National Park, TX

By Dr. Brian Ottum

West Texas has some of the darkest skies in the lower 48. Big Bend National Park is an undiscovered treasure of desert, mountains and canyons. Brian spent nearly a month in the area, exploring, doing astrophotography and putting on evening star parties. This presentation will show lots of pictures & videos. Brian will recommend how to plan your own adventure.

About the Speaker

Brian has been a fanatical amateur astronomer for fifty years, after seeing a lunar eclipse at age 12. Over the years, he has explored many facets of our wonderful hobby, from observing to research to astrophotography. He had a remote-control telescope located in the desert, but is now focused on doing live deep sky tours using a fast camera and telescope. He lives near Ann Arbor and is a member of the Lowbrows.



Short talk

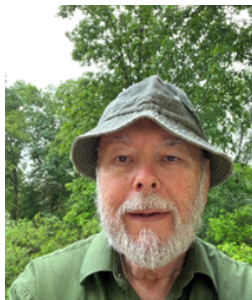
The Euclid Mission

By Dr. Dale Partin

The ESA Euclid Mission is a dedicated survey mission. It will map out galaxies over more than one third of the sky, studying galaxies whose light has been traveling toward us for up to 10 billion years. In selected areas it will go much deeper. These studies may ultimately lead to a much better understanding of dark matter and dark energy.

About the Speaker

Dr. Partin has been a member of the Warren Astronomical Society since 1998. He has been an officer for many of those years and is currently the First Vice President. He had a career in industrial research, and now teaches astronomy at Macomb Community College and is active as an amateur astronomer.



Macomb July 20, 2023

Feature

Ancient Astronomy of Central Arizona

By Ken Zoll

Ken's talk will describe his eight-year study of ancient sites that led to the discovery of several astronomical observation sites created between 1000 and 1350 CE by the ancestral pueblo cultures. This will include his three-year study of the ancient astronomical features of the Casa Malpais National Historic Landmark in Springerville, Arizona.

About the Speaker

Ken Zoll is a founder and the Executive Director Emeritus of the Verde Valley Archaeology Center and Museum in Camp Verde, Arizona. He is also a Board Member of the Arizona Archaeological and Historical Society, a lecturer for the Northern Arizona University Road Scholar Program, and an Arizona Humanities "AZ Speaks" presenter.



Ken is a researcher of ancient astronomy and a certified instructor in archaeoastronomy fieldwork. Ken has authored several articles and books including, *Sinagua Sunwatchers: An Archaeoastronomy Survey of the Sacred Mountain Basin* and *Heart of the Sky* on his discoveries and documentation of several ancient astronomical sites in Central Arizona. His latest book, released in March 2023, is *H.H. Nininger: Master of Meteorites*. All proceeds from the sale of his books go to the Verde Valley Archaeology Center. Ken's current research, in coordination with Arizona State University's Buseck Center for Meteorite Studies, is on the use of meteorites among ancient Southwest cultures.

Ken retired to Arizona in 2004 after 35 years of Federal service in Chicago and Washington, D.C. Ken holds B.S. and M.B.A. degrees from Loyola University of Chicago. He and his wife Nancy reside in the Village of Oak Creek outside Sedona, Arizona.

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A little religion, but not too much.

As an undergraduate student at Acadia University, in the Canadian maritime province of Nova Scotia, my geology professor was trying to teach us about the water cycle. Despite reams of published evidence, the best document he could come up with was this beautiful line from Ecclesiastes:

“All the rivers run into the sea,
Yet the sea is not full,
Unto the place whither the rivers go,
Thither they go again.”
--Ecclesiastes 1.7.

Dr. George Stevens’s comment had a profound impact on me. First, as a budding young scientist, it opened my mind to the relationship between the night sky and Scripture, and second, later as my passion for the arts grew, it reminded me of how ancient peoples viewed the night sky. From the “11 stars” symbolizing Jacob’s brothers, to the line in Amos about “the seven stars” of the Pleiades, to his aggressive tone with Job (9:5-8): “Who removeth the mountains, and they know it not, (possibly referring to the evolution of the Earth); Who maketh the Bear, Orion, and the Pleiades? Who shaketh the Earth out of her place (a big earthquake or a major comet impact), Who commandeth the Sun, and it riseth not (if it rises during an eclipse like the event I saw in 1999 when only a thin crescent of sunlight rose). This is not

to mention Joseph’s dream “the Sun and the Moon and eleven stars bowed down” (Genesis 37:9-10.) It must have been a very cloudy or hazy night if all he saw was 11 stars instead of the 2500 to four thousand stars he should have seen from his obviously dark location.)

After a lecture I gave in 1994 at my childhood synagogue, The Shaar Hashomayim in Montreal, the associate Rabbi pointed out how the ancient Israelites followed astrology, right from the line “And let there be lights in the heaven, to divide the day the day from the night; and let them be for signs, and for seasons, and for days and for years.” (Genesis 1.14) He went on to emphasize that these people never worshiped the stars, but they followed astrology out of interest and fun. (Full disclosure: like most people who observe the night sky, I do not follow astrology, but perhaps unlike most of them, I do appreciate that were it not for the thousands of years of meticulous records kept by ancient astrologers, we would probably have no real astronomy, nor a Webb telescope, this evening in 2023.

I did promise not too much, so I shall end here with a quotation from Psalm 19: with a new line added for fun, courtesy Peter Collins:)

The Heavens declare the glory of God,
And the firmament showeth his handiwork.
Day unto day uttereth speech,
And night unto night revealeth knowledge
(So long as the sky is clear.)”



Two of the telescopes Dave uses in the observing at Jarnac Observatory. The telescope on the right is used for astrophotography (he doesn't do much of anymore) and the telescope on the left is Pegasus. It is used for visual observation. It is the highest quality telescope he has. The mirror was made by Aleka Herring, one of the most prominent telescope makers in the last century. Picture taken by Wendee Levy.

M94 - The Lord of Two Rings

Tab Ahmad

In the constellation Canes Venatici, you'll find spiral galaxy M94 (aka Cat's Eye Galaxy or NGC 4736). It was discovered by Pierre Mechain in the year 1781 and has two ring structures.

The inner ring of M94 has a diameter of approximately 5,400 LY. The diameter of the outer ring structure is about 45,000 LY. Extremely strong star formation is found in the inner ring. The inner ring is also known as a starburst ring.

The distance to M94 is about 16 million LY. Within the M94 Group the cat's eye galaxy is one of the brightest and contains between 16 and 24 galaxies. This group lies within the Virgo Supercluster.

Why does M94 have two rings when most galaxies don't have any? The cat's eye galaxy newly formed stars in its inner ring render an unusual appearance, and provide a strong interior glow.

One hypothesis states that an elongated knot of stars known as a bar rotates inside M94 and has created a burst of star formation in the inner ring. The outer ring is fainter, different in color, not closed and relatively complex. What causes the outer ring is currently unknown.

Mid-sized telescopes (6"-8") will reveal a bright, condensed nucleus surrounded by a nebulosity that hints at spiral structure. Larger amateur scopes will reveal a bright ring around the galaxy's nucleus along with other details.

Some facts to remember:

- ✓ The best time of year to observe M94 is during the Spring, more specifically in May.
- ✓ M94 is estimated to contain 40 billion stars.
- ✓ The outer ring appears to us as a ring but actually is a structure of two spiral arms that look like an unbroken ring, when seen from Earth.
- ✓ The outer ring is active and produces around 10% of the new stars in the Galaxy.
- ✓ The inner starburst ring is a site of intense star formation. This region contains numerous clusters of young, blue stars, revealed in long exposure photographs.
- ✓ M94's class is (R)SA(r)ab, LINER.
- ✓ There is little to no dark matter.
- ✓ Apparent Magnitude +8.99.
- ✓ Red shift of 0.001027.

Credit to wikipedia.org; apod.nasa.gov and messier-objects.com

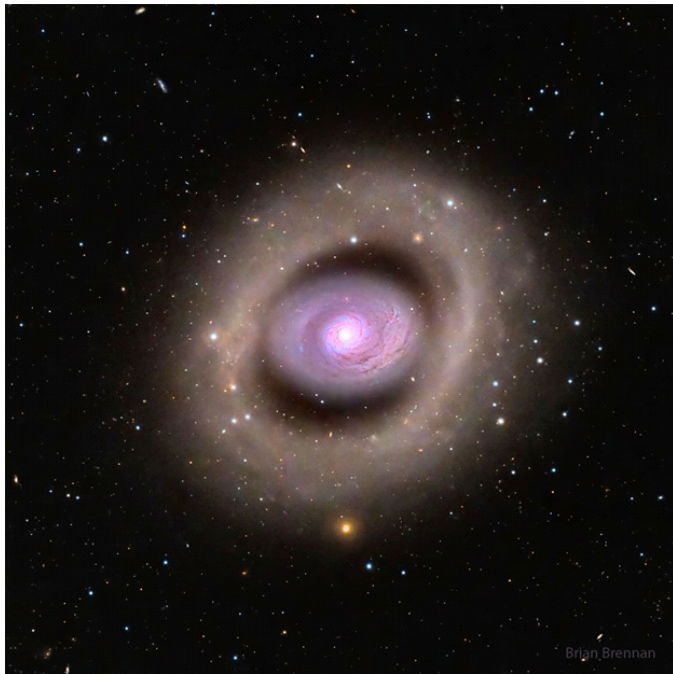


M94 nucleus

M94 Face-on spiral galaxy with two rings

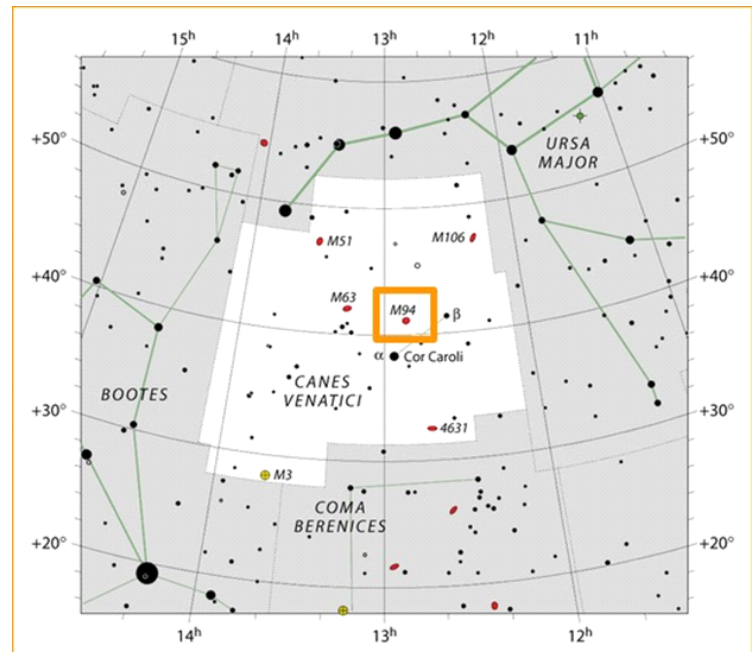


M 94 Continued



M94 showing inner and outer rings

M94 location in the sky



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.



The Future of Observing Artificial Satellites

Brad Young, Astronomy Club of Tulsa

Observing artificial satellites has been a hobby among amateur astronomers since the very beginning, with the launch of Sputnik in 1957. At first, the hobby was a well-organized citizen science effort focused on determining the orbits of what at first were seen as elements of terror and supremacy of the Soviets. Later, observations for scientific and tracking purposes were gradually taken over by Baker-Nunn cameras and radar, but the hobby aspect remained. As the 1970s ended, a small group of hardcore observers remained, and the formative years of satellite observing passed with elements and predictions sent through surface mail and later via the early Internet.

Along the way, different categories evolved. As the number of objects grew, people specialized in objects that flashed or periodically flared up to brighter than Venus's magnitude. Or an observer might specialize in tracking and reporting only those payloads that were classified and lacked any published orbital elements or predictions. Instead, predictions were made by amateur orbital analysts, based on the observations sent in by other hobbyists. This symbiotic cooperation kept things going through the 00s. Ultimately, the decision to declassify a large amount of these payloads in the 2010s made this less important to observe.

Satellites were getting smaller too, as along the way improvements were made in technology to serve the ever-present quest to reduce weight. Coupled with this, as space became privatized, the fees for launching were reduced and opened space to a wider group of consumers. Those consumers included NGOs that wanted as much space science as they could do for minimal cost, using CubeSats and Nanosats. More and more, the satellites that were launched became nearly impossible to see without optical aid, and even binoculars were not able to resolve the smaller and dimmer objects. Stricter agreements about LEO debris led to the deorbiting of rockets after the mission was complete. Although some rocket bodies remained in orbit, in general artificial satellites were becoming much more numerous but much less observable.

And then came Starlinks, OneWeb and other communication satellite megaconstellations in prototype and production missions, increasing the number of objects at a startling rate. Starlinks and others (e.g., Blue Walker 3) are, at first, quite observable right after launch. Relatively bright, they could often be seen naked eye or spotted in handheld binoculars.

Therein lay a growing problem; the new objects were so numerous and bright that it became clear that they were interfering with observations by ground-based telescopes. Although the exact effect on the science of astronomy is not yet understood, it was easy to see that with this large increase in objects the situation would become critically damaging in only a few years. The astronomy community, both professional and amateur, voiced their concerns in the media and in space situational awareness forums all over the world.

Luckily, SpaceX has made significant strides in reducing the optical brightness of their newest satellites. Although there is more research to be done, it appears that the Starlink Generation 2 satellites meet the specifications set by the IAU of a standard magnitude of 7.0 or dimmer. There are still some questions as to how well current control can be

maintained over time and whether radio frequencies are still in peril, but at least the work is being done to reduce the effect of this new source of interference.

As crucial as that development is, now even Starlinks are barely observable by amateurs. Eventually, the original Starlinks will be deorbited and only the faint ones will remain in orbit. The trend towards smaller, lighter, and less conspicuous payloads will continue, as the goal of weight minimization is still attractive economically and will remain so.

On occasional launches, especially by American and foreign governments for intelligence and security purposes, the payloads maybe similar in size and brightness to the old school launches that were seen when the hobby began. There is also an increased number of manned missions and with both the Chinese and International Space Station in operation, flights of payloads of reasonable size will continue to service and maintain those facilities. But the days of all launches being carried aloft by a large rocket that remains in orbit for years, and a single large payload that is low enough and large enough to be seen easily appear to be ending.

So, what is the amateur satellite observer to do? There are several options if one is willing to think outside the box.

- Geosynchronous satellites will at least for the time being remain large and conspicuously bright during the equinoctial seasons with their solar panels face on to the viewer.
- Listening to satellites has not changed, in fact things have gotten better on this front due to the increased number of sources that have been launched.
- There will still be the occasional large rocket body used to lift the large number of simultaneous payloads that have become commonplace today.
- If you reach beyond modest equipment into widefield photography, the prospects broaden also. Now you can integrate the dim light of smaller satellites, and capture fields full of them instead of concentrating on only one target.
- Remote imaging allows for geosynchronous satellites in longitudes that you can't see at home and will reach much dimmer objects easily. An issue there is that the commercial services available are not set up to accept satellite predictions.

All in all, satellite observing is changing again with the times. In the very beginning there were only a few objects and although they might be bright, it was very difficult to know where and when they would appear, and the equipment available amateurs was very limited usually only their eyes binoculars and perhaps a small telescope. Now, we have much more sophisticated technology to use, and it will probably be needed. The age of large satellites and rockets is over, at least in LEO. Some targets may be easy to see for just a few days after launch, but many will be invisible to anything, but sophisticated imaging equipment used by amateurs who are well-versed in how to develop spot on predictions and make it happen.

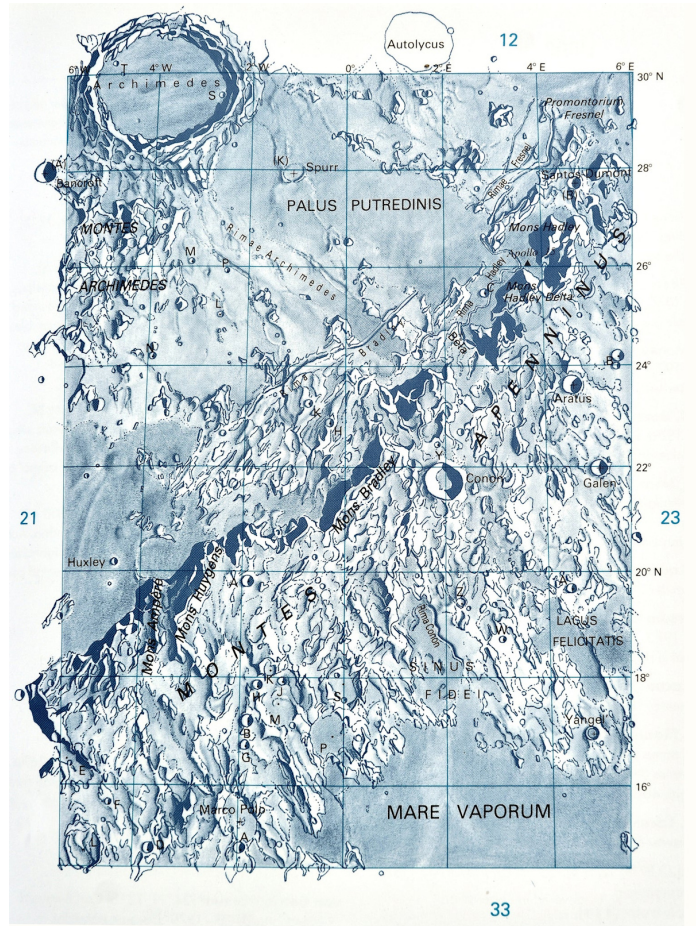
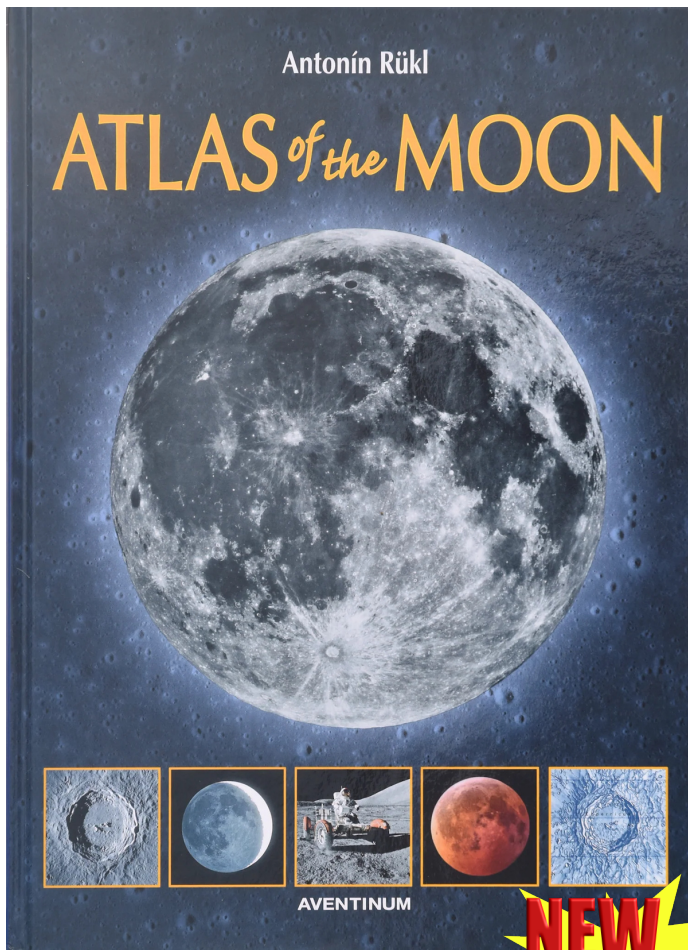


The Armchair Astronomer

Rides Again

By Dale Thieme

edition strikes me as having the sturdiness of a well-constructed textbook, the pages open easily and generally lay flat, making it ideal for reference and study.



Reference:
Atlas of the Moon - ISBN: 978-8071512684

In Other News

Per the admonition to get our eclipse viewing gear **now** (Brian Ottum's talk at Cranbrook, June 5), I went to the Astronomy Magazine's [online store](#) and ordered some gear. I'm all set for next April.

Father's Day came early for me this year. Sky and Telescope (S&T) announced the re-issue of Antonín Růkl's *Atlas of the Moon*.

For anyone unfamiliar, *Atlas of the Moon* is a map in 76 sections of the moon, complete with up to date (as of 2009) IAU nomenclature with each section featuring a "Who's who on the Moon" containing information about the names applied to the craters. Originally published in 1991, *Atlas of the Moon* easily became the "book of all knowledge" (to purloin a phrase from Gary Ross) for lunar observers. The S&T volume currently for sale is from the 2012 7th edition. In their email that I found in my inbox, S&T stated that this edition was "revised, updated and improved with expanded text and maps". The updates include the latest names in the polar regions and other IAU revisions. Terms like "walled plains" and "ring mountains" are gone as deemed (look away, Gary!) obsolete.

While I had a PDF version that I downloaded to use for research purposes, not to mention a copy of *Luna Cognita* (some serious lunar material there, see the June 2020 WASP), when this offer came up, I just had to get my copy. Even at the plastic card melting price of \$99.95. I've never gotten in the weeds with the topic of bookbinding, but this





Over the Moon

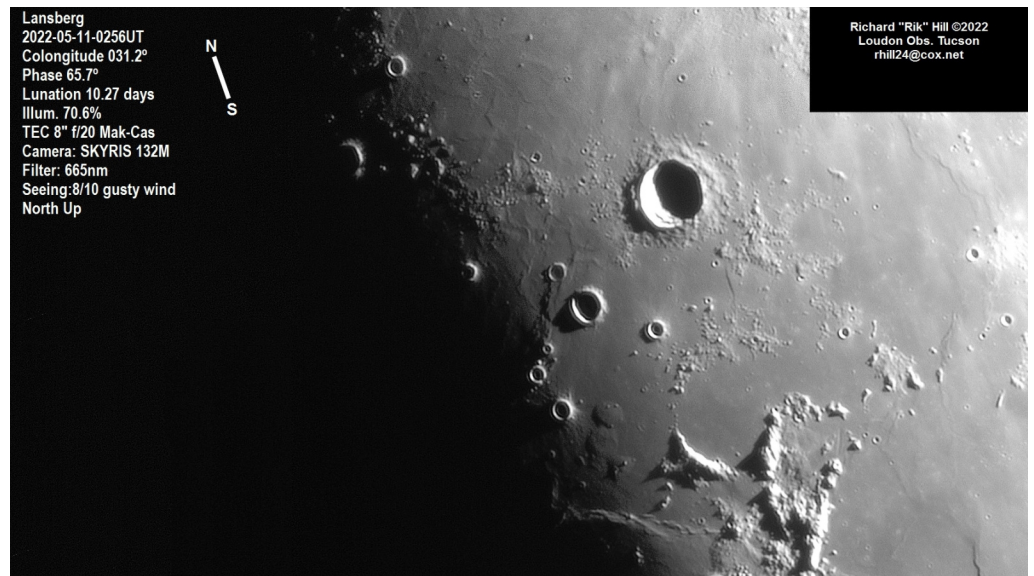


with Rik Hill

Lansberg Domes

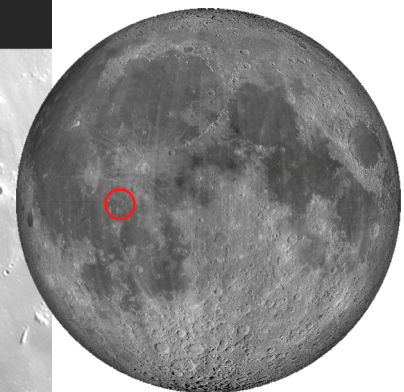
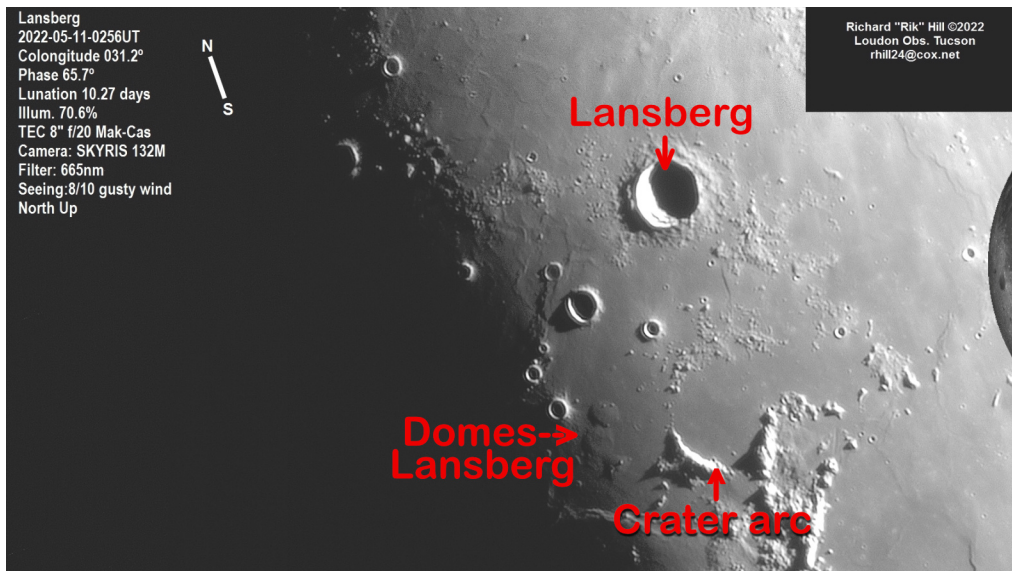
The large crater above and right of center is Lansberg (41km dia.) in a line with Copernicus and Reinhold. This area of the Moon, in the middle of Oceanus Procellarum is full of domes. This image was processed to show the Lansberg domes the best. There's a system of about six satellite craters to Lansberg just below and to the left. Farther below Lansberg is a bright arc of a crater wall that has its northern half buried in the so the arc opens to the north. Just to the left (west) of the western arc you can see the mild swellings that are Domes Lansberg. There are three of them, the larger two being easily seen but there's a third one further to the south with what appears to be a tiny central peak rather than the usual pit. There is a pit behind (west) of the peak as can be seen in the LROC Quick Map but it is in shadow in the image. This same lighting can be seen in the image on the Lunar Domes Atlas page for this dome system. The domes look like pancakes on the lunar surface. The northernmost dome is 16-20km in diameter but only 120m high, while the middle one is 19-25km in area and only 80m in height. The third one is 15-19km in size and 120m high. With those aspect ratios it's easy to understand why this low sun angle is needed to see them. As soon as the sun get higher, they disappear.

At the top of this image, directly above Lansberg, we can



see two more smaller domes. I do not find them on the Lunar Dome Atlas or the Virtual Moon Atlas so I have no information. For orientation, there's a large crater just above right and off the edge of the image that is Reinhold (49km). (The image is not aligned strictly North-South.) These kind of features, like wrinkle ridges, are best seen, often only seen, at the terminator to be sharp eyed!

This image was made from parts of two 1800 Frame AVIS stacked with AVIStack2 (IDL) and knitted together with Microsoft ICE. Final processing was done with GIMP and IrfanView.



Location Maps by Ralph DeCew

History S.I.G.



July 1995

Ed Watson reports on "Astroganza '95", held at the Abrams Planetarium in East Lansing featuring the "Star*Bowl". "Looking Back" is Brian Benning's contribution to the newsletter where he reminisces about getting into the hobby. Along with the meeting minutes of Cranbrook, June 1, 1995, we have "Louie the Librarian's Book of the Month" by Louis Namee in which he gives "The Universe by David Bergamini" three out of four stars. Of note is the absence in this issue of "Computer Chatter" by Larry Kalinowski, perhaps he took a summer break, picking up again in August.

July 2005

Once again, Astro Chatter by Larry Kalinowski is "front page news" plus, he runs the "Swap Shop". Inside the issue, we find this interesting article, borrowed from the San Francisco Amateur Astronomers: "Visiting Bob Berta and the Stargate Observatory" by Michael Portuesi. We continue with the Board Meeting Minutes, 6-6-05, by Bob Berta and the NASA Space Place "Moving a Mountain of a Dish" by Patrick L. Barry. Finally, a final column entry (no one can match the longevity of Computer/Astro Chatter) in "Curved Collectors" by Vince Chrisman featuring the Adler Planetarium.

From the Scanning Room

I must say, returning to a Cranbrook meeting in person finally after my sojourn in the wilderness was a delightful experience. Seeing Webex from the vantage point of the auditorium was quite a switch for me. I greatly appreciated having Vatshalya Dandibhotla handle the streaming once it was set up and going so I could sit back and enjoy the proceedings. Now that it's just a two hour drive (and not two days), I'll be popping in more often.

**Dale Thieme,
Chief scanner**



WASP
Warren Astronomical Society Paper
Volume 27, Number 7 July, 1995
\$1.00 for non-members

ASTROGANZA '95
ED. J. Watson
Each year the Capitol Area Astronomy Club hosts Astroganza, a harbinger of the summer observing season for some five years. Astroganza is held in Abrams Planetarium, on the Michigan State University campus, in East Lansing. This is a one day affair consisting of socializing with fellow astronomy buffs, a planetarium show (more about that later) and with some retailers usually making an appearance and contributing prizes to the GREAT EVENT- Star*Bowl, now a revered twenty-two years old. There is also a flea market, swap fest and astrophotography contest, altogether not a bad way to spend a Saturday in mid-May. STAR*BOVL is the focus of the event. This year three clubs attended, CAAC (Capitol Area)

Looking Back
Brian Benning
I remember getting an interest in Astronomy when I was about 12 years old. My friend had a little book entitled something like Handbook of the Heavens and we proceeded to memorize and recognize most of the constellations. We then started to locate and track the planets.
I remember the thrill of viewing one's first moon and man-made satellites also was exciting. It was also fun to recognize the arrival of particular constellations in certain seasons.
My friend's parents bought him a 60mm refractor with equatorial mount for Christmas, and Jupiter first hand. It was a pleasure to view the moon with the scope as well as a couple of the more conspicuous deep-sky objects.

Also Inside...

- Looking Back 1
- Book Reviews 2
- For Sale 2
- Summer Solstice 2
- Snacks, Snacks 3
- Welcome 3
- Speakers Wanted 3
- Calendar of Events 5

MINUTES OF MEETINGS
CRANBROOK MEETING
Thursday, June 1, 1995
The meeting opened at 7:35 p.m. with 26 members in attendance.
TREASURER'S REPORT - Balance as of May 31, 1995, \$6,165.06.
OBSERVING - Jeff and Riad were looking at Saturn just before sunrise. They were able to get it in the club 10" with just enough magnification.

The W.A.S.P. newsletter
July 2005
The Warren Astronomical Society Paper
P.O. Box 1995
Warren, Michigan 48090-1995
www.warrenastronomicalsociety.org

2005 WAS OFFICERS

President	Ken Berrin	email: syzygie@aol.com
1 st VP (program chairperson)	Norm Dillard	email: jupiter1927@yahool.net
2 nd VP (observatory chairperson)	Riyad Matti	email: riyadmatt@yahoo.com
Secretary	Bob Berta	email: biker123@cs.com
Treasurer	Vince Ch�sman	email: thexflies@hotmail.com
Director, Publications	Jim Shadrowsky	email: solarmartyk@aol.com
Director, Public Relations	Marilyn Kunz	

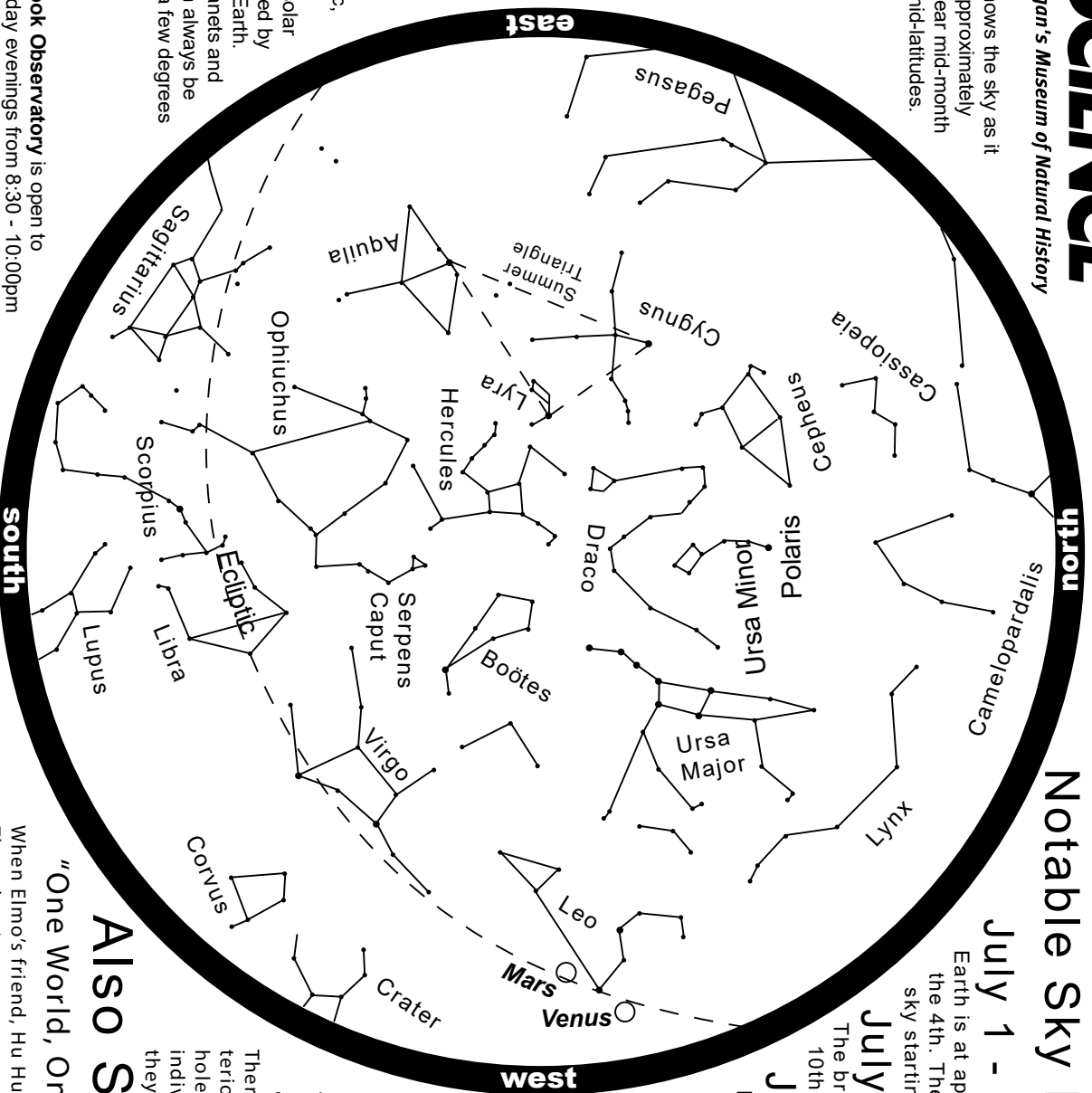
Astro Chatter
by Larry Kalinowski

It happened! Comet Temple 1 got its back scratched with a little help from NASA. Early in the morning on July 4, the plume from a small car sized probe disintegrated as it met the surface of the comet. The picture on the left shows the mother probe. Hopefully, instruments will be able to tell what the composition of the interior is like. There were many telescopes trained on the event all around the Pacific Rim. The western states had a better chance to see the comet than Michigan did because the comet was near or below the western horizon at the time. More close up shots of approach can be found on the Internet.

There was an attempt to place a 100-foot solar sail into orbit, last June 21. A Russian submarine was supposed to put the unfolded sail into a low polar orbit. Apparently, Cosmos 1 failed to make it into orbit. The launch was successful but orbit insertion wasn't. It was a joint venture between the Americans and the Russians. There was another attempt to place a fangled satellite into operation. It held promise of low cost propulsion, perhaps to the million dollars. Not outrageously expensive when you consider the costs of other satellite attempts. They say we learn by our mistakes.

In my opinion, the Clarkston Community Concert was quite successful, considering there were nearly four hundred people attending (Vince's estimate) during the poor weather. It was hot and muggy, but a slight breeze kept the grounds tolerable. After the first round of speakers gave their spiel and the

This chart shows the sky as it appears at approximately 10pm EDT 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 always be found within a few degrees of this plane.

The Cranbrook Observatory is open to the public Friday evenings from 8:30 - 10:00pm EDT, and the first Sunday of the month from 1:00 - 4:00pm for solar viewing.

For observatory information visit <http://science.cranbrook.edu/exploro/observatory>

JULY 2023

Notable Sky Happenings

July 1 - 7

Earth is at aphelion (its greatest distance from the Sun) on the 4th. The Moon will pass four planets in the morning sky starting mid-month.

July 8 - 14

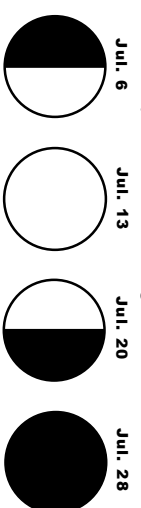
The bright star at the lower right of the Moon on the 10th is Antares, the "heart" of Scorpius (S evening).

July 15 - 21

Moon is at the lower right of Saturn on the 15th, to the left on the 16th (S predawn) and the lower left of Jupiter on the 19th (SE predawn).

July 22 - 31

Moon is at the upper right of Mars on the 21st (ESE predawn) and above Venus on the 26th (ENE predawn). The Delta-Aquarid Meteor shower peaks on the night of the 27th-28th.



Now Showing

"Cosmic Mashups: Gravity, Galaxies, and Supermassive Black Holes"

There's more to the night sky than what we see: Mysterious objects like black holes. Supermassive black holes are found in the cores of most galaxies. Massive individual stars can become black holes as well, and they're believed to be scattered throughout galaxies.

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 Sun, Moon, and stars. They learn about the Big Dipper and the North Star and take an imaginary trip to the Moon where they learn that the Moon is a very different place.

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





Ken Heilig - Ready for some solar observing outreach

July 2023


Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Canada Day (Can)
2	3 Cranbrook FULL MOON	4 Moon at Perigee: 360151 km Independence Day (USA)	5	6 Earth at Aphelion: 1.01668 AU	7	8
9	10	11	12	13	14	15
16	17 NEW MOON	18	19	20 Macomb Moon at Apogee: 406291 km	21	22 Stargate Open House
23	24	25	26	27	28 Delta-Aquarid Meteor Shower	29
30	31					

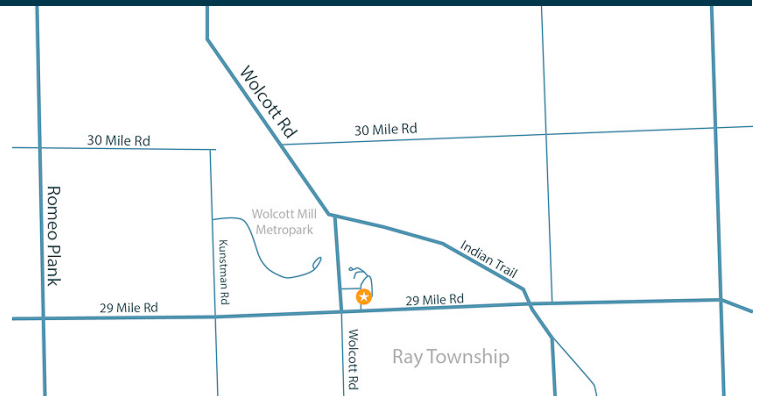


Stargate Observatory

Monthly Free Astronomy Open House and Star Party 8:00 PM, 4th Saturday of the Month 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

June Open house:

The June Open house was a slightly better repeat of May. We had mostly clear but very hazy, bright skies. Nevertheless we had two cub scout groups come through the observatory to see the Moon and get astronomy questions answered. Early in the evening just before sunset Mars and a crescent Venus were observed. The double double, M57 (the Ring), M27 (Dumbbell) were also viewed. Riyad Matti and I tried for M101 and M51 but it was pretty blank. Some members were out on the field taking astrophotos, overall we had about 30 kids and 40 adults out over the evening with the observatory closing up around 1 O'clock.

July Open house:

July 22nd 8:30pm

Observatory Update:

The Metropark has added non-slip pads to the observatory front ramp, they have also built a cement paver pad for the rear door.

Astronomical Events For July 2023

Add one hour for Daylight Saving Time

Source:

<http://astropixels.com/almanac/almanac21/almanac2023est.html>

Date	Time (h:m)	Event
1	0:00	Mercury at Superior Conjunction
1	1:00	Venus 3.6°N of Mars
1	2:20	Antares 1.5°S of Moon
3	6:39	FULL MOON
4	17:28	Moon at Perigee: 360151 km
6	14:00	Earth at Aphelion: 1.01668 AU
6	22:05	Saturn 2.7°N of Moon
9	20:48	LAST QUARTER MOON
10	0:21	Mars 0.6°N of Regulus
10	20:23	Moon at Ascending Node
11	16:18	Jupiter 2.2°S of Moon
13	1:31	Pleiades 1.7°N of Moon
16	3:05	Venus 1.7°S of Regulus
17	13:32	NEW MOON
19	3:56	Mercury 3.5°S of Moon
20	1:56	Moon at Apogee: 406291 km
20	8:53	Regulus 4.2°S of Moon
20	23:00	Mars 3.3°S of Moon
24	22:01	Spica 2.8°S of Moon
25	10:05	Moon at Descending Node
25	17:07	FIRST QUARTER MOON
28	11:00	Delta-Aquarid Meteor Shower
28	12:11	Antares 1.3°S of Moon
28	13:21	Mercury 0.1°S of Regulus

Treasury Report

Treasurer's Report for June 30, 2023

BOA account:

Balance:..... \$28,790.38

Received:..... 0.00

Expense 646.60

(Zoom annual fee, GLAAC annual donation, snacks)

PayPal Account:

Balance:..... \$29.91

Received:..... 75.48

Paid 728.41

(Stargate message board, remainder of GLAAC annual donation)

We welcome new member Brian Wezensky.

Total Paid Memberships 100

Notes from the Treasury:

The treasury continues to be steady, with one or two new members a month. Is it time to renew your membership? Every New Year, many memberships expire. Please let me know via email at treasurer@warrenastro.org to verify your membership status. When you receive your membership flyer in the mail, fill it out and send it to: Warren Astronomical Society, P.O. Box 1505, Warren, Michigan 48090-1505. We strongly recommend using PayPal for faster service, but we also accept checks and cash at the meetings."

The process for ordering a physical copy of Sky & Telescope has changed, and prices have gone up above \$40 per year for a member of an astronomy club. Please let me know via email at treasurer@warrenastro.org if you would like more information.

Adrian Bradley,
Treasurer

Meeting Minutes

WARREN ASTRONOMICAL SOCIETY

BOARD MEETING

JUNE 5, 2023 6:30PM

Meeting called to order at 6:43 PM. Officers present: President Bob Trembley, 1st VP Dale Partin, 2nd VP Jeff MacLeod, Treasurer Adrian Bradley, Publications Chair Dale Thieme (Meeting minutes recorded by 1st VP Dale Partin).

President's Report – Hudson Mills Metro Park event on June 10th – no volunteers for it yet.

1st VP Report – Things are going well but we are still in need of speakers for near the end of the year. Bob Trembley said he can do a talk on exoplanets any time. Jeff MacLeod said he can do a short (or possibly long) presentation on a simulator he built for a Gemini capsule, for October or later.

2nd VP Report – Jeff MacLeod discussed equipment issues at Stargate.

Publications Chair Report – Dale Thieme reports the WASP is up. He passed out potential meeting dates for next year.

Marty Kunz says he has gotten half of the WAS library moved to his place.

Calendars – time to start thinking about submitting photos – committee is mostly Dale Thieme, Bill Beers, and Bob Berta.

The promo video that was recently made needs to be put on the WAS website.

The message board for Stargate has been ordered. It will be installed on the north wall of the observatory. We could install a small telescope or model rocket with it. We could ask club members for donations of other things to put in there.

We discussed getting more WAS jackets to sell to people.

Adrian Bradley will make the next Macomb meeting a Zoom meeting instead of WebEx.

The Annual Picnic is scheduled for August 26th. Bob Berta has booked the pavilion in the past. The plan is that the board will show up at 4PM. Members will show up at 5PM. There will be an Open House in the evening. Bob will contact Steve to make a reservation for the pavilion.

We discussed starting the Macomb meeting at 7PM. The decision has not yet been finalized but is actively being considered.

The meeting was adjourned around 7:20PM.

Respectfully submitted,

Dale Partin
Acting Secretary
WAS

WARREN ASTRONOMICAL SOCIETY

CRANBROOK (Hybrid) MEETING

JUNE 5, 2023 7:30PM

Meeting called to order for Cranbrook meeting at 7:30PM by President Bob Trembley. Persons in attendance – 25 – WebEx – 13 – YouTube – 7 @ 8:30PM).

OFFICER REPORTS:

President Bob Trembley welcomed new visitors to meeting. WAS representation needed for GLAAC & AATB meetings. Photo submissions are requested for the 2024 WAS Calendar. The WAS will be switching to Zoom meetings instead of WebEx beginning with the June 15th Macomb meeting. Discussion on a possible switch to begin Macomb meetings at 7PM instead of 7:30PM. The 2023 WAS/Paul Strong Memorial Scholarship recipient is Alexia Fields – thanks to Dale Partin for his work on setting up the evaluation process to determine scholarship winner from applicants who applied. The Vatican Observatory will be holding a summer school with the topic “Machine Learning”.

1st VP Dale Partin requested speakers for later this year and the beginning of next year.

2nd VP Jeff MacLeod reported on the May Open House, with visitors staying until 12:30 AM. The next Open House is June 24th.

Treasurer Adrian Bradley gave the account balances of the WAS Treasury. He reported that the Stargate message board was purchased through the WAS PayPal account.

Publications Chair Dale Thieme reports the June WASP is up online.

SPECIAL INTEREST GROUPS:

David Levy read his poem (with tweaks) “Wendee Amongst the Stars”. Solar – Marty Kunz reported sunspots are increasing in number and size during his recent observations. Double Stars – Riyad Matti reports on Scouts visiting Stargate the weekend of June 2-3 to observe Venus and the Moon, and at next Open House will have a list of double stars to observe.

Ken Bertin reported on the supernova in M101 that was first observed on May 19th and exploded 25 million years ago.

Bob Berta reported on an Oakland Astronomy Club event, complete with solar scopes and radio telescope, and observed a coronal mass ejection at 3:30PM during the event.

Adrian Bradley discussed a recent experience in attempting to take his astro images, and finding out he did not pack his SD cards for his camera.

SHORT PRESENTATION:

Jeff MacLeod introduced Dale Partin for his presentation on “The Challenge of Interstellar Travel”. In his presentation he presented items needing to be addressed and

developed for man to attempt interstellar travel. Questions and discussion followed his informative presentation. To see his presentation in its entirety, go to: <https://www.youtube.com/warrenastro>

MAIN PRESENTATION:

Dr. Brian Ottum, Ph.D., presented "How to Plan for the April 8, 2024 Solar Eclipse". Dr Ottum gave insight into planning your travel to observe this eclipse, along with information on taking photos of the eclipse. He also discussed April cloud amounts with a video of 44 years of images of April 8 skies/weather in the eclipse track across the US. This eclipse can be viewed in Ohio as close as Toledo and being able to see 1 minute 46 seconds of totality from that locale. Questions and discussion followed his excellent and informative talk on the upcoming total solar eclipse of April 8, 2024. To see his presentation in its entirety, go to: <https://www.youtube.com/warrenastro>

The meeting ended at 9:30 PM.

Respectfully submitted,

Mark Kedzior
Secretary
WAS

WARREN ASTRONOMICAL SOCIETY

MACOMB MEETING

JUNE 15, 2023 7:30PM

Meeting called to order at 7:40 PM at Macomb, Room E208, by President Bob Trembley. Attendance: 14 - Zoom - 13, YouTube - 7.

ANNOUNCEMENTS:

President Bob Trembley reported the WAS Picnic will be held Saturday, July 29th at the pavilion near the Stargate Observatory. The WAS Board held a discussion regarding moving the start time of the Macomb meetings to 7PM.

1st VP Dale Partin reports needing speakers for future meetings.

2nd VP Jeff MacLeod (not present) but provided report on the Open House.

Treasurer Adrian Bradley presented a brief report on WAS treasury.

Outreach requests are increasing - Cranbrook needs solar scopes for October 14th eclipse event - upcoming Metroparks events are in need of volunteers.

SPECIAL INTEREST GROUPS:

Mark Kedzior reported on the launch of the Library Binocular Lending Program at the Warren Civic Center Library and details of this opportunity for patrons at the library. David Levy told of a quote he gave on a Today Show interview on 15 July 1994 - "Comets are like cats - they both have tails - and they both do precisely what they want".

PRESENTATION:

Carl Hergenrother, Association of Lunar and Planetary Observers' Comet Section Coordinator, and observational astronomer at the University of Arizona, presented "Introducing the Association of Lunar and Planetary Observers (ALPO)". In his presentation, Carl gave the background of the ALPO, and the observations and contributions made to the astronomical community by its members. He described his work in observing comets, their description, orbits and composition. He also discussed the approaching the long period comet, C/2023 A3 Tsuchinshan.

Questions and discussion followed his excellent presentation on the ALPO and his observations and study of comets. To see his presentation in its entirety, go to:

<https://www.youtube.com/warrenastro>

The meeting ended at 9:30 PM.

Respectfully submitted,

Mark Kedzior
Secretary
WAS

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](#)



This article is distributed by NASA's Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Find A Ball of Stars

Linda Shore, Ed.D

French astronomer Charles Messier cataloged over 100 fuzzy spots in the night sky in the 18th century while searching for comets – smudges that didn't move past the background stars so couldn't be comets. Too faint to be clearly seen using telescopes of the era, these objects were later identified as nebulae, distant galaxies, and star clusters as optics improved. Messier traveled the world to make his observations, assembling the descriptions and locations of all the objects he found in his Catalog of Nebulae and Star Clusters. Messier's work was critical to astronomers who came after him who relied on his catalog to study these little mysteries in the night sky, and not mistake them for comets.

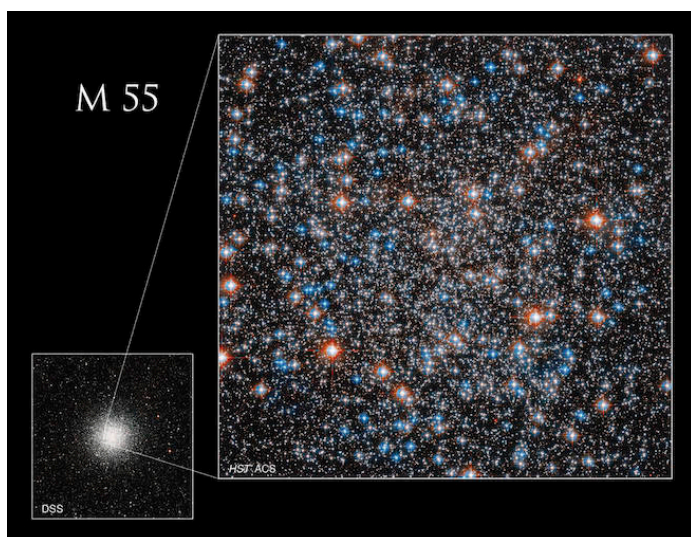
Most easily spotted from the Southern Hemisphere, this "faint fuzzy" was first cataloged by another French astronomer, Nicholas Louis de Lacaille in 1752 from Southern Africa. After searching many years in vain through the atmospheric haze and light pollution of Paris, Charles Messier finally added it to his catalog in July of 1778. Identified as Messier 55 (M55), this large, diffuse object can be hard to distinguish unless it's well above the horizon and viewed far from city lights.

But July is great month for getting your own glimpse of M55 – especially if you live in the southern half of the US (or south of 39°N latitude). Also known as the "Summer Rose Star," M55 will reach its highest point in northern hemi-

sphere skies in mid-July. Looking towards the south with a pair of binoculars well after sunset, search for a dim (mag 6.3) cluster of stars below the handle of the "teapot" of the constellation Sagittarius. This loose collection of stars appears about 2/3 as large as the full Moon. A small telescope may resolve the individual stars, but M55 lacks the dense core of stars found in most globular clusters. With binoculars, let your eyes wander the "steam" coming from the teapot-shaped Sagittarius (actually the plane of the Milky Way Galaxy) to find many more nebulae and clusters.

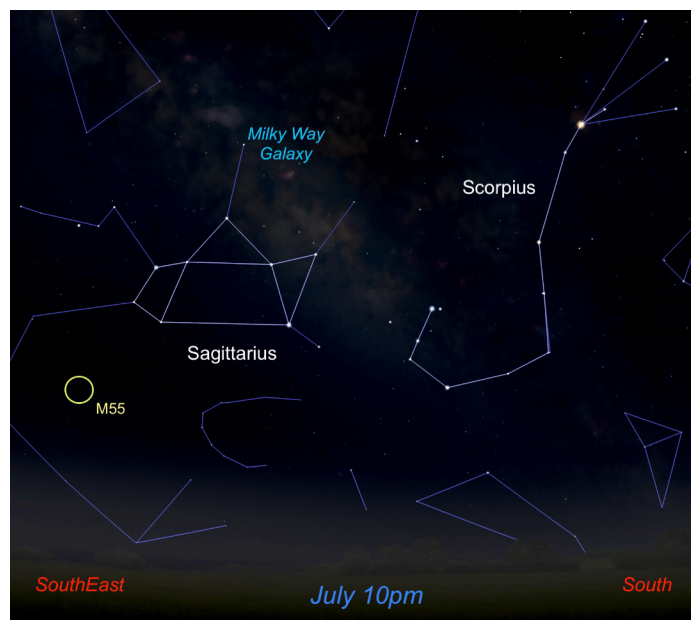
As optics improved, this fuzzy patch was discovered to be a globular cluster of over 100,000 stars that formed more than 12 billion years ago, early in the history of the Universe. Located 20,000 light years from Earth, this ball of ancient stars has a diameter of 100 light years. Recently, NASA released a magnificent image of M55 from the Hubble Space Telescope, revealing just a small portion of the larger cluster. This is an image that Charles Messier could only dream of and would have marveled at! By observing high above the Earth's atmosphere, Hubble reveals stars inside the cluster impossible to resolve from ground-based telescopes. The spectacular colors in this image correspond to the surface temperatures of the stars; red stars being cooler than the white ones; white stars being cooler than the blue ones. These stars help us learn more about the early Universe. Discover even more: <https://www.nasa.gov/feature/goddard/2023/hubble-messier-55>

The Hubble Space Telescope has captured magnificent images of most of Messier's objects. Explore them all: <https://www.nasa.gov/content/goddard/hubble-s-messier-catalog/>



The large image shows just the central portion of M55 taken by the Hubble Space Telescope. Above Earth's atmosphere, this magnificent view resolves many individual stars in this cluster. How many can you count through binoculars or a backyard telescope?

Original Image and Credits: NASA, ESA, A. Sarajedini (Florida Atlantic University), and M. Libralato (STScI, ESA, JWST); Smaller image: Digital Sky Survey; Image Processing: Gladys Kober



Look to the south in July and August to see the teapot asterism of Sagittarius. Below the handle you'll see a faint smudge of M55 through binoculars. More "faint fuzzies" can be found in the steam of the Milky Way, appearing to rise up from the kettle.

Image created with assistance from Stellarium: stellarium.org