The W.A.S.P.

Vol. 54, no. 7 Winner of the Astronomical League's 2021 Mabel Sterns Award July 2022

The Warren Astronomical Society Publication

Kudos

to Adrian Bradley

In the recent astrophoto competition for the RASC General Assembly, Adrian won first place for the category of images that highlight light pollution and it's effects with the image attached showing a faint Milky Way rising over Lake Huron and a rocky coastline.

The bigger surprise was, in a loaded and stacked field of landscape astrophotographers doing widefield and nightscape shots, he came in runner up for having the most detailed Milky Way core image in a nightscape (shown above.) This image was a composite of a single tracked two minute capture for the sky and an untracked 2 minute capture for the ground at Lake Hudson Dark Sky Preserve. Adrian entered 3 of the 6 categories available for astrophotos and placed in two of those three categories. Well done!

The WASP

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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:
Cranbrook: Institute of Science
1221 North Woodward Ave
Bloomfield Hills, Michigan

Third Thursday meeting:
Macomb Community College
South campus, Bldg. J, Room J221
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.

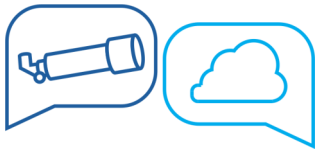
Articles for inclusion in the WASP are strongly encouraged and should be submitted to the editor on or before the end of each month. Any format of submission is accepted. Materials can either be transmitted in person, via US Mail, or by email (publications@warrenastro.org)

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.

Snack Volunteer Schedule

The Snack Volunteer program is suspended for the duration. When it resumes, volunteers already on the list will be notified by email.



Discussion Group Meeting

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

When: Thursday, July 28, at 6:30pm.

Where: 3219 Woodside Ct. Bloomfield Hills, MI

Amenities and Refreshments:

Laura Wade will serve supper food. People attending can bring drinks or other snacks of their choice.

In This Issue:

President's Field of View

Half of 2022 is history and as we slide into the second half of my fifth (!) year as your President, the remainder of the year is looking like a lot of fun. First up, Discussion Group is back up and running as of July 28th, with social stalwart Laura Wade opening her doors to W.A.S. members for light supper and conversation. Members must be vaccinated to attend. If you would like to host an event, Discussion Group Captain Jeff MacLeod will be happy to sign you up.

Then at the end of summer we have our in-person Picnic at Wolcott Mill's pavilion on August 27th (dinner at 5PM, bring a dish to pass) followed by an in-person Astronomy at the Beach on September 16th/17th at Island Lake State Recreation Area, and the board is now looking into plans for this year's annual banquet. All of this is a hard-won "normalcy" that could be overturned by the next variant of a virus that is very, very far from done with us humans. The Board recommends that everyone get vaccinated and boosted and observe masking and distancing in social situations. Life has simply changed and we will continue to strive to make our events safe, accessible, and livestreamed whenever feasible.

In the meantime, my observing partner Jonathan dusted off the 10" secondhand Dob we bought in our first flush of aperture fever 15-odd years ago and scanned the dark skies over Alcona County this past weekend. We took in the familiar sights of early summer-- M3, M4, M96, M106, and other Things That Aren't Comets, then closed out with a peek at the beautiful double star Albireo, a star so meaningful to us that Jonathan commissioned a song in its honor from a favorite Michigan songwriter. It's good-- and fraught-- to be back. All this can shift beneath our feet so quickly here on Planet Earth.

Diane Hall,
President

Join the Astronomical League!

Only $7.50 (membership starts July 1)

- Get the Reflector
- Participate in the Observing Program
- Avail yourself of the League Store
- Astronomy Books at a discount

alcor@warrenastro.org

Save the Date

Warren Astronomical Society Annual Picnic & Open House

Saturday, August 27
5:30 PM
Stargate Observatory, Ray Twp., MI
Camp Rotary Pavilion

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

Service animals allowed, otherwise, no pets.

ALCON 2022

July 28 – 30

EMBASSY SUITES HOTEL

1000 Woodward Pl. NE
Albuquerque, New Mexico 87102
https://alcon2022.astroleague.org/
(Website available by January 14, 2022)

Hosted by:

The Albuquerque Astronomical Society

www.TAAS.org

DETROIT PUBLIC LIBRARY

Business, Science & Technology

PRESENTS

Tuesday, July 12 6:00-7:30 PM EDT

Webb Satellite First Images Expert Panel

About this event

The James Webb Space Telescope has launched and deployed, and the cameras are calibrated. The first scientific images are being released to the public Tuesday, July 12.

NASA's Goddard Space Flight Center and the Space Telescope Science Institute will host an expert panel to talk about the first images and answer questions.

Zoom link will be sent to registrants before program.

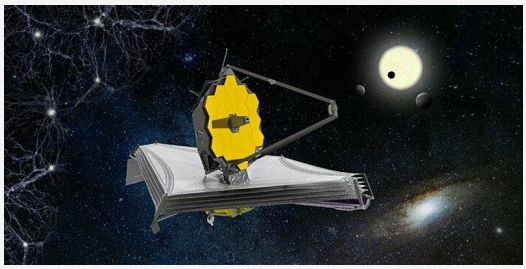


Image from jpl.nasa.gov

Register

Saturday, July 16, 3:30 PM EDT

Webb Satellite First Images Expert Panel

About this event

The James Webb Space Telescope has launched and deployed, and the cameras are calibrated. The first scientific images are being released to the public Tuesday, July 12.

This is a second expert panel sponsored by NASA's Goddard Space Flight Center and the Space Telescope Science Institute to talk about the first images and answer questions.

Zoom link will be sent to registrants before program.

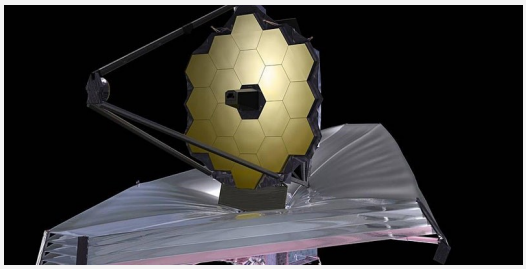


Image from jpl.nasa.gov

Register

Tuesday, July 26, 6:00-7:30 PM EDT

False Color Imaging and Visualization of Astronomical Images

About this event

As we approach the release of astonishing new images from the Webb Space Telescope in the infrared, join Michigan native Russ Carroll to explore how images in the invisible Universe are visualized.

Russ is a former X-ray astronomer and is the creator and donor of the Dan Zowada Memorial Observatory at Wayne State University. DPL continues partnering with WSU's planetarium on these talks related to astronomy.

Zoom link will be sent to registrants before program.

The Crab Nebula in Visible Light. Courtesy Russ Carroll, Dan Zowada Memorial Observatory WSU

Register

Main Library
5201 Woodward Avenue
Detroit, MI 48202
313/481-1391

Observing Reports

GM Ross

2 June

The Sun. Four widely spaced small groups from 8 spots to 1. Two groups with penumbra, all minor.

Transparency excellent, seeing excellent

5-cm. refr. @ 45X, sub-dia. mylar filter.

2-3 June

Var. stars, Cygnus & Sagitta. In deteriorated sky from twilight. Limiting mag. truncated. U Geminorum and Mira class. No star vis.

Transparency fair. Seeing fair.

16" Borr II Schm.-Cass. @ Veen Obs'y.

3 June

The Sun. Widely scattered: 4 small groups w/ de minimis spots.

Transparency excellent, seein good (despite wind)

5-cm. refractor, 45X

3-4 June

Var. star & Jupiter/ Mars. Hesitation in locating RZ Del from unfamiliar eye-piece. Ident. made easier by yellow star near max. Jupiter at horizon in astro. twilight, brilliant. Could be mistaken for Venus. Ganymede near greatest E. elongation. To W. was close conjunction of Callisto-Europa, uncharacteristically = approx. magnitude. Low altitude? Only strong North Eq. Belt seen on ball because bad seeing. Immed. to his left was Mars, tiny strongly gibbous.

Transparency good.

16" Borr II @ 130X

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COMMENTARY: With 1st view of Jupiter this apparition, likely to continue with very active N.E.B. vs. pallid southern Eq. Belt.

7 June

The Sun. No spots. Limb areas inspected closely.

Transparency excellent, seeing excellent.

5-cm refractor @ 45X, sub-dia. mylar filter.

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COMMENTARY: This result given wide activity, less than week. Per Tapping's small scale graph (OBS. HAND. 2021) Activity Cycle 24 peak = ca. 2014. Trough in '20. Graph employs 10.7 cm. flux, not sun-spot #. Is this bare Sun reasonable in present year and modest activity at best? Observer thinks so, for now.

9 June

The Sun. One tight group of four small spots, well on disc.

Transparency excellent, seeing excellent.

5-cm. f /11 refractor @ 45X.

11 June

The Sun. One group of four spots, all small. Group is evenly linear.

Evidence of plage close to limb.

Transparency fair, seeing excellent.

5-cm. refractor @ 45X

12 June.

The Sun. Possibly one group, 6-7 spots, all very small exept one with bifurcated umbra.

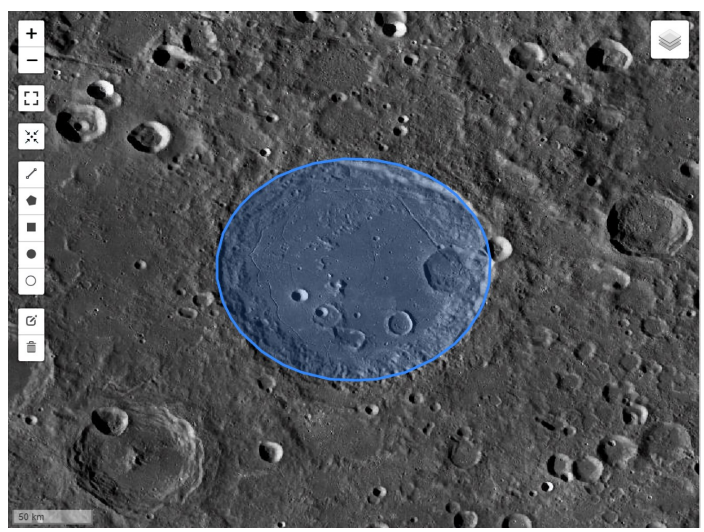
Transparency excellent, seeing good.

5-cm. refractor, f /11 @ 45X and sub-dia. mylar filter .....

COMMENTARY: As yester-day's group moves on disc, small spot is "behind" and close to limb. Observer suspects a trailer of a larger formation.

14 - 15 June

The Moon at 1 d. past full. 1) Gauss. Given proxim. to terminator and limb, initially not easy to identify even given a size subtending 34 deg. North lat. to 38 deg. (From Rukl atlas.) Under period of obs'n, with Sun very close to setting, full extent and interior features more plain. A central ridge over much the length of Gauss hinted at by Rukl air-brushing. 2) la Perouse well seen with shadow climbing far wall (11 deg. South lat.) Req'd Kapteyn and Barkla craters for "pointers" to be sure of la Perouse position.



***Gauss**, from the LROC imaging (which has a much better view of the formation than us mortals.) Image from the IAU Gazetteer of Planetary Nomenclature.*
https://planetarynames.wr.usgs.gov/Feature/2120

It and Gauss are very difficult to observe, unavailable at waxing crescent phase, so must observe ~ Full.

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(Continued from page 6)

3) On S. limb, Leibnits Mts. well displayed despite no advantageous libration. (Req'd high magnif.) 4) The Shining Mountain(s) not visible near Grimaldi.

Transparency fair, seeing fair.

16" f /10 Borr II telescope @ 230X

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COMMENTARY: Alter's (1963) photographic atlas does not label Gauss on the multi-page lunar mosaic. In add'n little else on that plate near limb. Very small scale Mappa Selenographica (1926) does show Gauss, how ever.

Unsurprisingly, Kopal's *NEW PHOTOGRAPHIC ATLAS* does not list it in index, but neither does *ATLAS AND GAZETTEER OF NEAR SIDE* (N.A.S.A. 1971). Observer deems this lacuna odd since definitely on "near" side and large feature.

15 June

The Sun. At least five groups, but only one spot of any note with penumbra. 2 groups with many small sun-spots. Groups all across disc. Difficult w/o polarity diagram to establish group structure.

Transparency poor, seeing fair.

5-cm. f /11 refractor @ 45X.

16 June

The Sun. At least four groups, five possible. Whole disc covered with modest but extensive groups. 3 spots of note with penumbrae, but all minimal. Possibly most groups in this Activity Cycle.

Transparency excellent, seeing good (despite wind)

5-cm. f /11 refractor @ 45X.

17 June

The Sun. Continued 4 or 5 groups distributed across disc. One large group ~ 13-15 spots incl. a primary with umbra might be Old Cycle. No large spots but many individuals some only pores.

Transparency excellent, seeing excellent.

(Continued on page 8)

And a Letter

LETTER TO AWARD WINNING W.A.S.P.

ARTICLE I -- Methinks I smell conspiracy!

Barnard's Star in N.E. Ophiuchus has become the Golden Fleece of Handsome Joe, William the Conqueror, and my own self in recent months. As reported in the award winning W.A.S.P., the first attempt to "nail the coon's skin to the wall" (per L.B.J.) was in early spring. It failed given comical (?) misreading of finder charts in Burnham (1978) Vol. 2. To-day, 6th June, I went to the Veen Observatory library, and extracted three sources, to -wit: the sainted *Burnham, ATLAS ECLIPTICALIS,* and Tirion's *ATLAS 2000*. Out back, I spread out these great works on the bonnet of the Little Dave Deremo's huge Newtonian's trailer.

WHAT confusion. I did not just fall off the turnip truck, but the different scales and magnitude representations make one's head crack in collating. *ATLAS 2000* takes Barnard's Star seriously, with two tiny insets on Chart 15. All though faint, I was interested to see whether *ECLIPTICALIS* even plotted it, since that mighty work goes into the "9s". After much eye strain and gum sucking, a shocking conclusion: One of the Tirion insets is wrong! There is a line of progress through the stars, 1900-2100, as delineated by "tick" marks. It is wrong per Burnham's two finder charts based upon photo-plates from 1960. One does not lightly accuse *ATLAS 2000* of error, but I will go with photo-tracings -- unless Burnham is the source in error, entirely possible.

Wherefore, I preach a Crusade. "I'm mad as hell, and I'm not going to take it any more"! Barnard's Star is now that undiscovered country. I will start with one of my modest telescopes, but if I have to Make Astronomy Great Again, repair to the mighty Borr at Veen Observatory.

ARTICLE II -- Pleasantry, for a change.

I sent my brother a fine birth-day card. It is b&w, showing Comet Halley in 1986 and 1910, that photograph taken at Yerkes by E. E. Barnard. T. rang to thank me, and we got to talking about comets, and how the premier comet picture maker in Michigan (and tri-state?) is Doug Bock. He can hunt up every faint invader of the inner Solar System, and incidentally is one of THREE men I know who have two observatories. A Man to Reckon With.

G. M. Ross,
I do these things so you won't have to.

(Continued from page 7)

5-cm. refractor @ 45X, mylar filter.

17 - 18 June

Barnard's Star. Prev. assessment of "yellowish" withdrawn. Possible effect of rising Moon.

73 Ophiuchi. AB stars not split. No separation datum given in Hirschfeld and Sinnott for 1960. Stars 6-7 mags. *ATLAS 2000* plots double, but they list 12.6 mag. C component.

Beta 637 Ophiuchi. AB stars not split. 7" separ. 5.7-11.7 mags. Double on *ATLAS 2000* but H. & S. list 10.0 mag. C star @ 104" in 1924.

74 Oph. AB stars not split. 5th-11.5 mag., 28" separ. Observer incorrectly cited blue "companion" @ ~ 270 Position Angle. *ATLAS 2000* plots double, but 12th mag. C @ 58" distance.

61 Oph (reprise). Bright white "cat's eyes, AB stars both A0, 6.2 - 6.6 mag. western star easy to discern as the A. Observer called P. A. @ 90 deg. Hirschfeld & Sinnott: 93. 20.5 arc-sec. (1968) ATLAS plots double, but a C star: 12.5 mag. with 96" separ. (1912).

Transparency good, seeing excellent.

4" f /15.4 refractor, 50X, 90X

18-19 June.

Barnard's Star. Yellow, no. "Greyish" orange?

Transparency fair. (returning cirro-stratus [+ smoke?])

4" f /15.4 refractor @ 50X.

19 June

The Sun. 3 groups. A group of single unit w/ penumbra, small, centre of disc, Linear formation near W. limb ~ 10 units. Add'l group near centre, an oval spray of small spots/ pores.

Transparency good but gathering cirrus.

5-cm. refractor @ 45X

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COMMENTARY: Activity Cycle 24 in action.

20-21 June

Delta Equulei -- "Split" with bluish companion, wide, at approx. 0 Position Angle. But reference in Becvar's *ATLAS CATALOGUE* = 5th. mag. stars @ 0.3" separation. Obs'n error.

Gamma " -- Could not split. Becvar's = AB of 4.8 /11.0, 2.4" separation.

Epsilon " -- Could not split. 6th magnitude pair, 0.9" separation

(1958)

13 Delphini -- Could not split. AB of 5.6 /8.8 1.4" separation.

Xi Pegasi -- Could not split. AB of 4.3 /11.7 12" separation.

34 Peg -- Could not split. AB of 5.6 /11.7 3.5" separation (1937)

37 Peg -- Could not split. AB of 5.7 /7.0 1" separation (1950)

30 Peg -- Could not split AB of 5.4 /12.0 6" separation.

Notable but wide conjunction of Jupiter-Moon. Last quarter phase at approx. time of rising, but UNDERestimation of half disc noted by Observer, i.e. slightly crescent. Per Sidell "Moonrise" computer

(Continued on page 9)

The Planet Parade minus Uranus and Neptune unfortunately... as seen at Civil Dawn.

Photo by Adrian Bradley

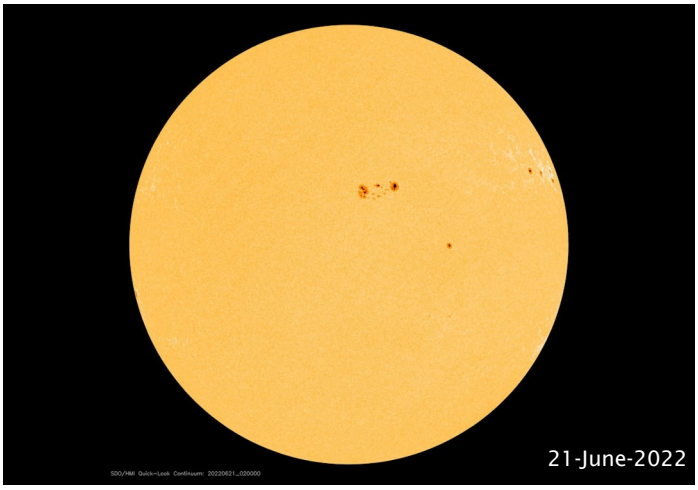
(Continued from page 8)

calendar: phase = 49% at moon-rise in western Mich. so too minor to be detected by eye. All so, Summer Solstice @ 09.14 U.T.

Transparency good, seeing good (Moon low in E. sky for last 4 obs'ns).

4" refractor f /15.4 @ 90X

COMMENTARY: Under-estimation of phase long recognised at dichotomy of Venus. In 1960's (& earlier?) Assoc. of Lunar and Planet. Obs'rs conducted project to investigate the phenomenon unrelated to geometric positions of Earth-Venus-Sun. Possible effect of straight line describing edge of very bright source?



21 June

The Sun. Five groups, one near centre, N. hemis., extensive with at least 25 spots, one spot medium sized w /penumbra development. Others small or with only one spot.

Transparency excellent, seeing good.

5-cm. refractor @ 45X

21-22 June

Jupiter. Low, but pulling away from waning crescent Moon. Very little seen on ball but prominent N. Aequatorial Belt and far lesser southern Belt. Per *OBS. HAND.* (2022) Jovian mag. = -2.3 and dia. = 40 arc-sec. Ganymede just past W. elongation, bright given her colour, whilst to E. of disc Io all most difficult to see in dawn. Callisto merged with planet?

Transparency poor, seeing fair.

4", f /15.4 refractor, 90X Bob Watt eye-piece.

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COMMENTARY: Re *OBSERVER's HANDBOOK*. Not easy to reconcile very small scale flow chart of Jupiter's satellites on p. 109 (for June) with table of "Phenomena", p. 228. Whereas the former illustrates "event" by Callisto, IV, the table enters nothing for IV in the days around 22nd. Observer concludes the sky conditions masked Callisto.

23 June

The Sun. Three groups. The recent emergent, 2 spots. The dominant extensive group has contracted but now two spots with penumbra. A group of one small spot.

Transparency excellent, seeing fair.

5-cm. refractor @ 45X

23-24 June

57 Pegasi. Could not split, but AB = 5.4/ 11 @ 32 arc-sec. 1st star obs'd, but possible dawn + altitude?

66 Pegasi. Could not split. AB = 6/ 6 @0.3 arc-sec. (1922).

52 Pegasi. " " " AB = 6.1/ 7.4 @ 0.7 arc-sec. (1956)

Jupiter. Distinctly yellowish from turbidity of warming air mass. All though well displayed with possible inclusions, the N. Aequatorial Belt exhibits no reddish cast per recent years, dark greyish. Temperate Belts difficult to discern. Well to east but not yet elongation, Callisto faint, likely from dawn.

4" f /15.4 refractor, 90X

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COMMENTARY. Data from Becvar (1964). w/o checking against Hirschfeld and Sinnott's compenium, can not say how many entries obsolete, but likely small minority.

24 - 25 June

Ho 296 Pegasi. Not split. In Hirschfeld and Sinnott separation and Position Angle not entered. AB = 6.3/ 6.8, but they report a C star (not on *ATLAS COELI* a.k.a *ATLAS OF THE HEAVENS*): 11.5 mag. @ 72 arc-sec. This companion could not be discerned in telescope at observing site.

40 Pegasi. Initial ERROR: deemed split @ P.A. ~ 90 deg., but not. 1.8 arc-sec. AB = 5.8/ 11.4 (1935, '48). Becvar (1964) entry: 2" but no Position Angle nor date of obs'n.

52 Pegasi. Initial ERROR: deemed split @ P.A. ~ 120 deg. AB = 6.1/ 7.4 mags. No P.A. or sep. data in H & S for 1845 nor 1960. Becvar's *ATLAS CATALOGUE* lists 0.7" in 1956.

Beta 383 Pegasi. Not split. 8.0/ 12.0 mags. @ 2.6 arc-sec.(1877 but no datum for 1914). ATLAS COELI does not indicate third star 12.4 mag. @ 15.6". Faint C star hopeless in telescope @ site. Becvar (1964) does not enter 383. Too faint? Colour of "k" class star obvious.

Grand lunar-planetary alignment. Failed. Heard interview with prof. at York University on C.B.C., attempt to see the dawn planetary bodies. Cited in *OBSERVER's HANDBOOK*. Observer's E. horizon not sufficient for Mercury and Venus. Moon low, earthshine maria very subdued.

Transparency good, seeing good.

4" f /14 refractor @90X and 7X35 binoculars (WOOD and STEEL) tripod.

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(Continued on page 10)

(Continued from page 9)

COMMENTARY: Lacunae in scholarly sources illustrates need for triangulation, e.g. Becvar's sources all most 60 yrs. ago incomplete.

26-27 June

M-27. At first glance, reminds of a desmid (alga), slightly rectangular with faint "hooked" extensions at one end's corners. 8' X 5' (OBJECTS [...], Birren 2002) High magnification but no texture and colourless. No central star per care-full examination. Definite impression of floating above stars.

Transparency good, seeing excellent.

17" Hawkins Newtonian (Veen Obs.)

27 June

The Sun. 2 small groups, one of only 1 spot. "Large" group with five incl. one spot with penumbra.

Transparency excellent, seeing good.

5-cm. refractor @ 45X

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COMMENTARY: Considerable change in very few days. Wondering about de minimis maximum coming.

27-28 June

Variable stars incl. 2 nova remnant-sites in Sagittarius. Given altitude/ latitude very difficult, unsuccessful. Lim mag. only 13.7

Saturn. Planet low, seeing apparently deteriorated toward twilight. Only ball feature: ring shadow on S. hemis.

Transparency good, seeing changing.

16" F /10 Borr II Schmidt-Cas. (Veen Obs.)

.....

COMMENTARY: Even with large instrument, old novae serious challenge even at better site.

(Addendum –from 26-27 June)

M-27. Shape of the nebula, previous. Per *WEBB SOCIETY HANDBOOK*, Vol. 2, (Append. 2) the description conforms to Gurzadyan's "Bd", Rectangular. "[A] meaningful classification of certain planetaries cannot be from only inner or outer nebular distribution, but must be an amalgam of both":

29-30 June

Variable stars. In Cygnus (difficult, U Gem class), Ophiuchus, Microscopium (near max.)

Neptune. Failed. Planet low and encroaching altocumuli.

Transparency fair, seeing good.

16" F/ 10 Borr II + 4" refractor thereon, various mags.

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COMMENTARY: Very small scale finder map in *OBS. HAND.* difficult to collate with *Becvar atlas*. O.H. lim. magnitude 11 and *ATLAS COELI* lim. mag. 7.75.

Must use *ATLAS 2000* or *ECLIPTICALIS*.

30 June

The Sun. Two very small groups total 3 spots. Opposite sides of disc.

Transparency hampered by clouds. Seeing excellent.

5-cm. f /11 refractor @ 45X

Addendum

Neptune. To reconcile two authorities can be trying. The Neptune chart in *OBSERVER'S HANDBOOK* is very small, bordering on useless. It alleges 11th. mag. limiting, but seemingly plots very few stars. *ATLAS ECLIPTICALIS* is large scale by comparison. Repeated examinations -- magnifying glass for the former -- leaves impression different areas of sky. Tirion's atlas next . .

-GM Ross

Call for Calendar Images

We are getting ready to assemble our WAS 2023 Calendar. We need your astro-images, artwork, and sketches for the calendar. Please send a high resolution JPG or TIFF to publications@warrenastro.org for consideration by the calendar committee. Deadline is August 31st.

Sample images from prior years

W.A.S. Astro-Images

M101 – Pinwheel Galaxy
Stellarvue SVX080T 80mm refractor
ZWO ASI2600MC Pro camera
Eight nights of imaging and 30 hours of integration time.

Photos by Dale Hollenbaugh

M92— Globular Cluster in Hercules
Stellarvue SVX080T 80mm refractor
ZWO ASI2600MC Pro camera
22 minutes of integration time.

(Continued on page 12)

W.A.S.P. Photo and Article Submissions

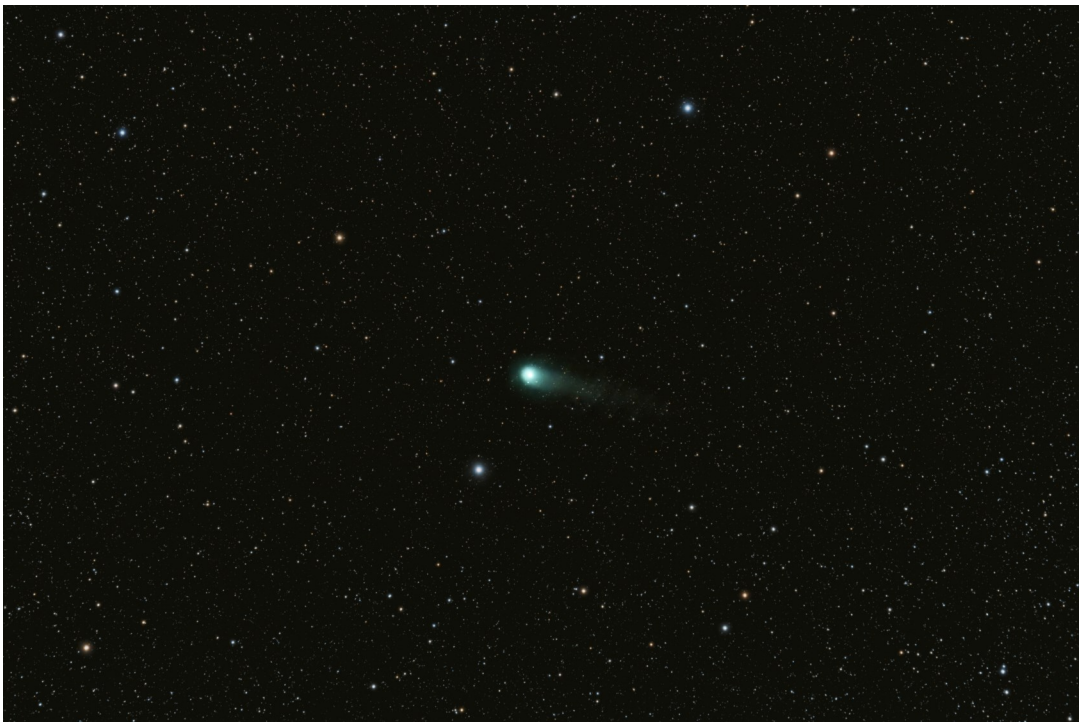
We'd like to see your photos and articles in the W.A.S.P. Your contribution is ESSENTIAL! — This is YOUR publication!

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.

(Continued from page 11)

Comet C/2017 K2 (PanSTARRS) – 06/17/2022



Stellarvue SVX080T-3SV 80mm refractor *Photo by Dale Hollenbaugh*
ZWO ASI2600MC Pro camera
32 minutes of integration time.
The comet was difficult to process since it was moving so fast. Dale basically separated the comet from the starfield and processed separately and put them back together in same image to avoid the star trails. To get an idea of how fast this comet was moving, here is a short clip from that imaging session:
https://www.astrobin.com/ovh6mc/#rB.

June full moon over Lake St Clair *Photo by Bill Beers*

About the Cover

On the cover, we mentioned that Adrian had taken first-place with an image that demonstrated the issues light pollution raises. Here is his prize winner, "Milky Way rising over Lake Huron and a Rocky Coastline"

Bonus image:

Astronomers who ply their hobby, taking equipment to remote areas, often speak of hearing strange, unsettling sounds (is that a bear?) in the night. How often do they have to deal with oncoming traffic on pursuit of that perfect shot, as Adrian Bradley does here. Yep, that is not a sunrise. *(Nice lens flare, too—Ed.)*

The View From C.W. Sirius Observatory

Happy 4th of July

Photo: Bill Beers

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.

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 Bills 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: BEEZOLL@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

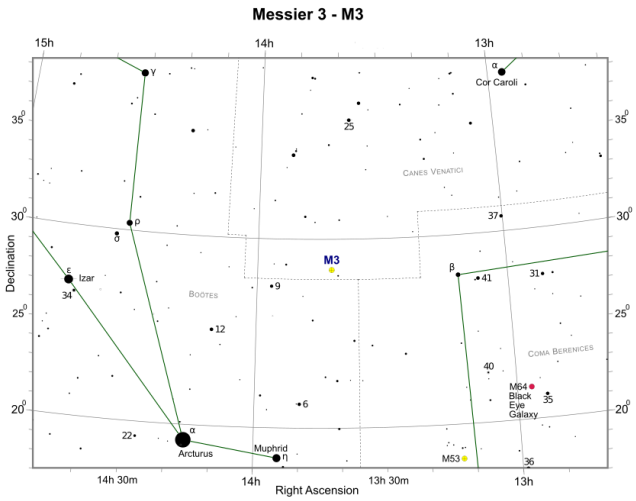
Messier 17 – the Omega or Swan Nebula – 24 x 2 minute sub frames

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

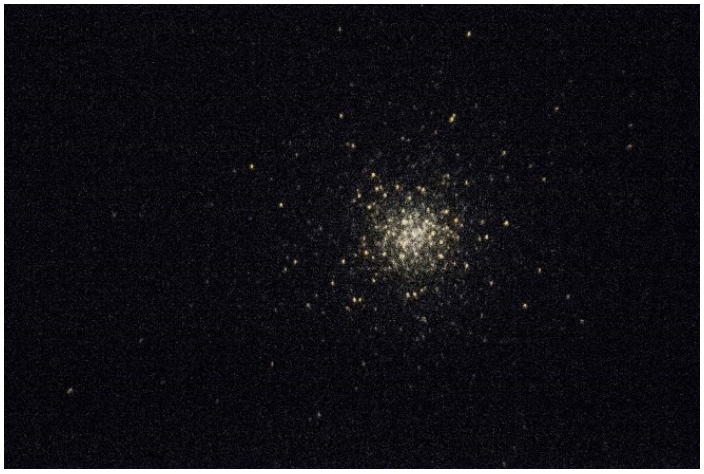
-Doug Bock

Notes from the Apache-Sitgreaves Observatory

Globular clusters are ancient, as old as our galaxy the Milky Way at ten billion years in a Universe that is estimated to be about thirteen billion. They are also quite rare in the scheme of galaxy construction. The Milky Way galaxy may only have 150 globulars total compared to tens of thousands of open star clusters or nebulae. While many associate the globular Messier 3, M3, to be in the constellation Boötes, the Herdsman, which I use Arcturus and several others of those bright stars to triangulate to its position, it happens to be just across the border in neighboring Canes Venatici, the Hunting Dogs. In July, M3 is just west of the Meridian near the zenith and therefore any viewing is through the least amount of Earth's atmosphere.



When I've observed M3 visually in the 36" telescope, I always start at 152x magnification as it is the lowest magnification. The 31mm Nagler at 152x provides a true field of view is 32 arcminutes. This equates to seeing an entire Full Moon at one time (the Moon is painfully bright, btw). One-half degree field of view, though, provides a nice framing of M3, and other globulars, too, and the most memorable thing about all the globulars is that their overall color impressions are different one to another, varying between white, to blue-ish, or orange-ish. Stars show their colors and with star counts of 100,000 stars to over one half million stars within globulars this color is evident in the 60mm refractor or C8 bolted to each side of the 36". There could be some galactic extinction causing some reddening due to the distance from earth (or wildfire smoke that may cross the nation), but generally, globulars, being comprised of old, metal-poor stars; typically F (white), G



Globular M3;
Photo credit; Apache-Sitgreaves Observatory

(yellow, like our Sun) and K type (orange) stars on the Hertzsprung-Russell (HR) diagram show their color. And, given so many stars in globulars, collisions occur and when that happens the merged pair now as a single star repositions itself in a unique location on the HR diagram off the Main Sequence, and is noticeably blue. They have now come to be known as the Blue Stragglers. These stars are remarkably obvious viewed in most sized telescopes under good skies. The next time you are under the stars, check out the brighter Messier globulars, like M3, and try to detect not just shape, symmetry (or lack of), and density profile, but also color variations between them, and, maybe find some blue stars.

About the Apache-Sitgreaves Observatory

The Apache-Sitgreaves Observatory is located on the eastern edge of Overgaard, Arizona, a small town at just under 7000-foot elevation bordering the Apache-Sitgreaves National Forest in northern Arizona. The main telescope at ASO is a 36"f/4.5 Newtonian on a computer-controlled Alt-Az mount. Viewing through the 36" telescope is available to the public by appointment, as are the DSLR Workshop and Solar programs. Current astronomical research projects include the Supernovae Search Patrol of Abell Galaxy Clusters using short integrations reaching 18+ magnitude. ASO is operated by the Apache-Sitgreaves Research Center Inc. which is owned by WAS member, and former WAS president, Steven Aggas.

Education Day at the PlaneWave Campus

July 8, 2022

WHAT? PlaneWave Instruments, global leader in the design and manufacture of Observatory Class telescopes is inviting all area educators to spend the day with us on July 8th 2022. We will be hosting the founders of the online education program – The Astronomy Research Seminar, AKA InStAR – who will talk about how to conduct real scientific research with middle, high-school, and post-secondary students. Sessions will focus on double stars, telescope access, research papers, and Speckle interferometry. The day also includes a tour of the PlaneWave Arts and Science campus and our manufacturing facilities.

WHY? PlaneWave is committed to education and believes that students can be inspired by real science and in particular the remarkable universe where we live.

WHEN? July 9, 2022, from 9am-5pm

WHERE? 1375 N. Main Street, Adrian, MI 49221

COST? No cost to area educators

HOW DO I SIGN UP? Please email cmiller@planewave.com by July 1 to ensure we have a spot for you! There will be some prep work that will ensure a high-quality experience!

PlaneWave Instruments Teacher Workshop

Date: July 8, 2022

Time: 9:00-5:30

Approximate # of teachers:

Double Star Targets
RA:
Dec:

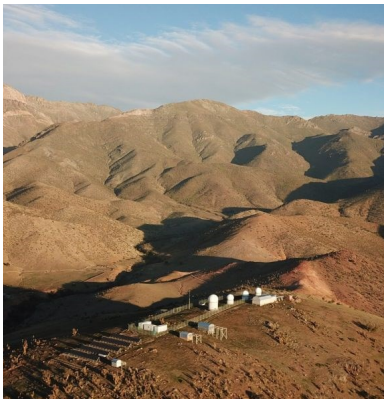
9 - 10:30 am	Tour of PlaneWave - PWI Team
10:30 - 10:45	Break
10:45 - 11:00	Introduction to the Astronomy Research Seminar (ARS) - Russ Genet
11:00 - 12:00	Double Stars - what they are, what we measure and how to select a project (WDS; Gaia; Gaia Double Star Selection tool (GDS)) - Rachel Freed, Sophia Risin
12:00 - 1:30	Lunch
1:30 - 2:45	Telescope access options (LCO, Telescope Live), FITS Files and AstroImageJ astrometry - Rachel Freed
2:45-3:00	Break
3:00 - 4:00	JDSO, sample papers, outline our research findings - Rachel Freed
4:00 - 4:15	Research Presentation - Sophia Risin
4:15 - 4:30	Break
4:30 - 5:30	Intro Speckle interferometry and other cool things - Dave Rowe

The Astronomy Research Seminar and Astronomy Research Experience

The Astronomy Research Seminars have produced over 200 published papers coauthored by some 700 high school and community college students. The Seminars focus on binary star research (please see the figure below). Managed by the Institute for Student Astronomical Research, the Seminars have amply demonstrated that undergraduate and high school student teams can, in a single semester or less, complete modest scientific research projects. Guided by an experienced instructor, teams meet on Zoom once a week. Each student team manages their own research, obtains and analyzes original data on a known or potential binary star, writes a team paper, obtains an external review, and submits the team's paper for publication. Besides participating in team research projects, students receive basic instruction in astronomical observation, binary stars, and scientific writing. As a result of their published research, many Seminar graduates have obtained admission to their school of choice, often with a scholarship.

The Astronomy Research Experiences is a follow on to the seminar that assume students already know the basics (or can learn it by themselves). The students are thrown in the deep end of the pool of ongoing research projects involving dozens or more known or potential binary stars. While the Seminars focus on teaching how it is done with a sample of one, the Experiences focus on the hard work of observing, analyzing, and reporting on dozens of binary star observations in each paper. Seminar teams are student teams guided by an instructor. Experience teams are a mix of highly experienced researchers, new or continuing student researchers, and coaches to help guide the students and answer their questions.

Both the Seminar and Experience study binary stars, first discovered by William Herschel in the late 1700s. They consist of two gravitationally bound stars that rotate around a common center of gravity. By measuring the changing position angle and separation between the two binary star components over a number of years, an orbit can be established, and its period determined. Kepler's Third Law can then be applied to determine stellar mass, a critical parameter for understanding stellar evolution.



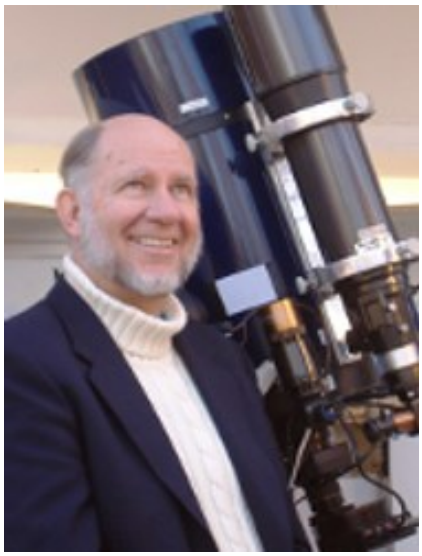
Astronomy research experience speckle interferometry observations of close binary stars are made with totally robotic PlaneWave Instrument 1.0- and 0.6-meter telescopes located at an automated observatory in the Chilean desert. Both telescopes are instrumented for speckle interferometry which takes hundreds of very short images to overcome atmospheric seeing (jitter) limitations. The Speckle Tool Box (STB, developed by Dave Rowe) is used to reduce observations via bispectrum analysis to not only provide position angels and separations, but also photometric magnitudes.

(Continued on page 20)

(Continued from page 19)

Seminar Instructor Rachel Freed is the co-founder and President of the Institute for Student Astronomical Research. She is currently finishing her Ph.D. in astronomy education. She is also a faculty lecturer in the School of Education at Sonoma State University, with a B.S. degree in Biology and an M.S. in Neuroscience. Rachel taught high school chemistry and astronomy for 10 years and has conducted research on chemistry education. She has been an amateur astronomer for over 20 years and is involved in public outreach. She is also the editor of the *Journal of Double Star Observations* and a member of the Board of the Advanced Imaging Conference. Rachel's work focuses on promoting changes in education that build on students' intrinsic motivations and interests.

Experience Coach Sophia Risin is Co-Director of the Fairborn Institute, a student at Stanford Online High School and interested in trying to understand the universe from both philosophical and astrophysical perspectives. Her current research experience includes exoplanets, double stars, and photocenter astrometry. She also serves as the logistics director for the STEAMpark teen board and tutors students locally. She is a National Center for Women and Information Technology Certificate of Distinction winner. She enjoys spending time with friends, going on walks with her dogs, and learning new things. She will be majoring in astrophysics at the University of California, Berkeley, fall 2020. Publications:
https://scholar.google.com/citations?user=xftxNskAAAAJ&hl=en



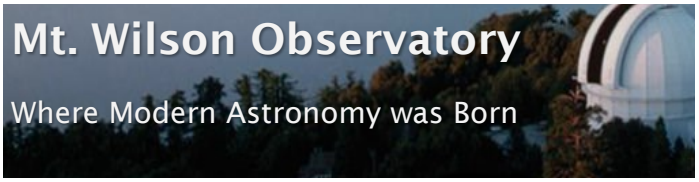
Experience Coach Russell Genet (Russ) is the Co-Director of the Fairborn Institute and a Research Scholar in Residence at California Polytechnic State University. He developed rocket guidance systems in the early days of the space age. An instrument-rated commercial pilot and instructor, he pioneered the development of networked flight simulators for training fighter pilots. Russ pioneered the development of robotic telescopes and automated observatories in the 1980s. He initiated the Astronomy Research Seminars in 2001 which, to date, have produced over 200 published papers coauthored primarily by high school and undergraduate students. Russ' research on cosmic evolution—the synthesis of physical, biological, and cultural evolution—was summarized in his 2007 book, *Humanity: The Chimpanzees Who Would Be Ants*. Russ lives in the Arizona mountains with his wife, Cheryl, who teaches philosophy and world religions. Russ has a BS degree in Electrical Engineering, MS in Acquisition Logistics, and a Ph.D. in Astronomy.

Publications: https://scholar.google.com/scholar?start=0&q=russell+m+genet&hl=en&as_sdt=0,3

Presentations

Monday, July 11, 2022

Cranbrook Presentations



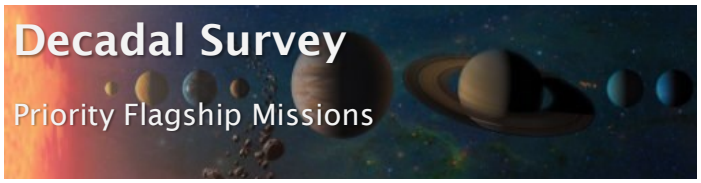
Main Talk:

By Timothy Thompson

Tim Thompson, Observatory Historian, Scientist, and Educator, shines light on the singular History of Mount Wilson Observatory, where all the right people, technology, and science came together, radically redirecting the future of the astronomical sciences.

About the Speaker:

Tim Thompson received his B.S. (1978) & M.S. (1985) degrees in physics from California State University at Los Angeles. He joined the Jet Propulsion Laboratory technical staff in January 1981, as a member of the Radio Astronomy Group, and retired from JPL in November 2008. Tim is also an amateur astronomer, and has been an astronomer at the Garvey Ranch Observatory, in the city of Monterey Park since 1975, with extensive experience in public outreach. He has been elected President of the Los Angeles Astronomical Society 12 times. Tim has been a volunteer at Mt. Wilson Observatory since 1981, and was one of the founders of both the docent & session director programs. He was elected to the Board of Trustees of the Mt. Wilson Institute in September 2015.



Short Talk:

By Bob Trembley

NASA's large strategic science missions or large strategic missions, formerly known as Flagship mis-

(Continued on page 22)

Thursday, July 21, 2022

Virtual Presentation

Feature:

Hosted by Bob Trembley

Join us as we recall the heady times of the Space Race. Triggered by the launch of Sputnik, propelled by the rocket systems developed for ICBMs, the United States and the Soviet Union embarked on a space race that culminated in the US landing on the Moon. Some of our members were around during those years and are on hand to share their experience and memories.

Panelists:

Jim Shedlowsky

Jim was a member of the student chapter of the American Rocket Society at the University of Michigan and they tried, unsuccessfully, to get Von Braun to visit us in Ann Arbor. Several of the original Astronauts were classmates of his at the U of M, including Ed White, who was Jim's Lab Partner in an Instrumentation Engineering course.

Bob Berta

A member of WAS since 2004 has served as Secretary, 2nd VP, President, and Outreach Chair. He is also a member of the Oakland Astronomy Club where he served as VP for several years, a member of the 7 Ponds Astronomy Club, and San Francisco Amateur Astronomers in California. Bob is both a Michigan Representative for the Astronomical Society of the Pacific's Night Sky Network, as well as a Solar System Ambassador for the Jet Propulsion Laboratory (JPL).

Ken Bertin

Ken Bertin is a lifetime hobbyist astronomer, past President and VEEP of WAS, observed 10 Total Solar Eclipses, 4 Annular eclipses, 6 Transits of Mercury, 2 transits of Venus, and 15 Lunar eclipses. He does our presentations of historical figures in astronomy and currently presenting online to schools and other organizations.

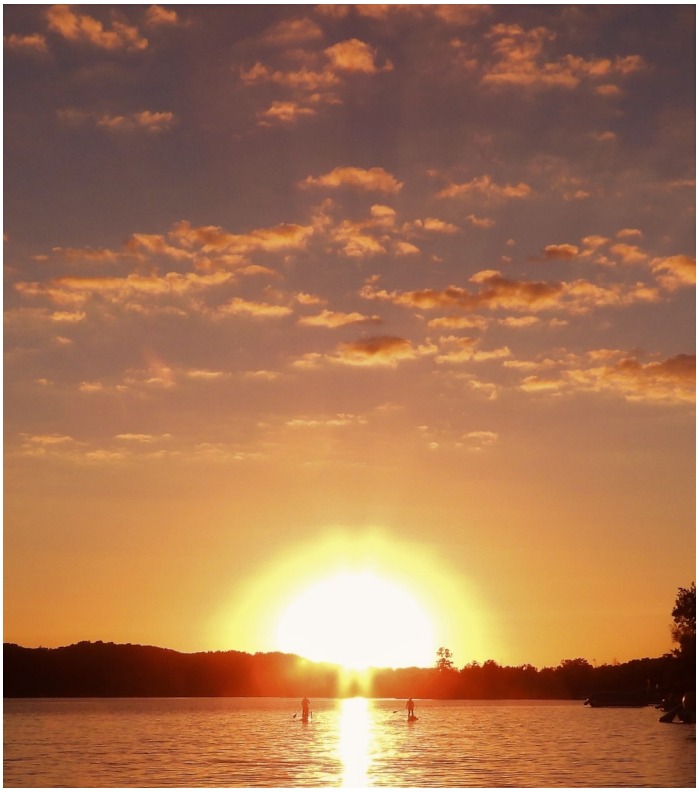
(Continued from page 21)
sions or Flagship-class missions, are the costliest and most capable NASA science space vehicles. Flagship missions exist within all four divisions of NASA's Science Mission Directorate (SMD): the astrophysics, Earth science, heliophysics and planetary science divisions.

Past Flagship missions included the Viking Missions, the Voyager missions, Galileo, Cassini, Mars (Curiosity and Perseverance), The Hubble Space Telescope, Solar Dynamics Observatory, the James Webb Space Telescope, and more.

In this session, Bob will talk about the proposed Flagship missions in the 2022 Decadal Survey.

About the Speaker:

Bob Trembley, currently first VP of WAS, Outreach Director for a total of 5 terms, is fantastically interested in asteroids, Near Earth objects (NEOs), and meteorites. Bob is a HUGE fan of educational space-related PC software such as: NASA's Eyes on the Solar System, Universe Sandbox, SpaceEngine and Kerbal Space Program. Bob and his wife Constance, a middle-school science teacher and also a Solar System Ambassador, run an after-school astronomy and space science club at Connie's school called the "Endeavour Space Academy."



Title: A Pair of Paddleboarders Proverbially Paddle Into A Paling Sunset
Date Taken: June 22, 2022 (at sunset)
Submitted by: Ray Bosshard

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 Bob Trembley at:

firstvp@warrenastro.org.

The Meteor Shower that wasn't, but not so much

On May 30 observers all across the western hemisphere were outside, hoping to see a wonderful "new" meteor shower. The shower is actually not new. It is called the Tau Herculids, and it sends us dust particles from Comet Schwassmann-Wachman III. In 1995 this normally faint comet brightened dramatically as it split into several parts, releasing huge amounts of dust into space.

On May 30, at 10 pm Mountain Standard time, the Earth plowed through the debris released in 1995. We were hoping for a possible meteor storm of hundreds of thousands of meteors. Wendee and I sat outside at Jarnac observatory, waited, watched, and waited some more. There was one bright meteor that seemed too far from the direction my camera was pointing for its lens to detect. Ten o'clock came and went, and we counted a few shooting stars here and there. Over the course of the evening, we counted 18 meteors. But a meteor storm? To use the Yiddish word that means what you think it means, we saw bupkis. Somewhat disappointed, we went indoors and completed a quiet evening.

The next day, I examined the pictures I took. I have found that it is very difficult for a camera to record all but the brightest meteors, even from the major showers. But the second picture I saw captured the bright meteor I saw just south of Corvus in Hydra, and the third frame recorded a fainter one. All in all, the camera counted five meteors, only the first of which I actually saw. And one frame displayed two meteors!

Even though these meteors were generally faint, they moved so slowly that they showed up nicely on the camera. So, this crazy little shower produced more meteors on camera than any other meteor shower I have witnessed. The experience proved to me that meteor showers, while poorly predictable, do offer surprises, and this one certainly did.

There was more. In Electronic Telegram 5125 of the International Astronomical Union, Daniel Green suggested that "a very faint glow from scattered sunlight may be visible in the sky centered … in Leo." I had no difficulty at all seeing that glow in Leo, particularly when I used averted vision, and I also noted its absence on the following night. (I saw a similar glow during the strong Perseid meteor shower in 1992.)

The best (by far) meteor shower I saw was the Leonids, from near Alice Springs, Australia, in 2001. During that night Wendee and I counted 2406 meteors. This year's Tau Herculids might have been less than stellar, but the sky was clear, the night was beautiful, and we enjoyed being outside as planet Earth raced through the emptiness of space, picking up cosmic dust on its windshield along the way.

The second of many images I took that night captured this bright Tau Herculid dropping in Hydra, just south of Corvus.

Photograph by David Levy.

The Objects That Changed Astronomy

(And How to Observe Them)

-Brad Young, Astronomy Club of Tulsa

Part Four: Sputnik to James Webb Space Telescope

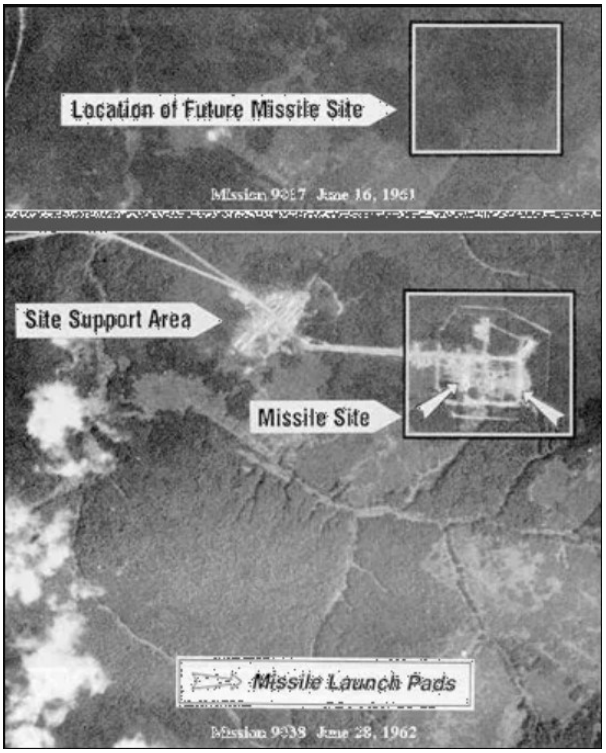
"Listen now for the sound that forevermore separates the old from the new." NBC radio announcer on the night of 4 Oct 1957, introducing the transmissions from Sputnik 1

Mankind's giant leap into space began with a beeping ball less than two feet in diameter that spooked Americans and started one of my favorite parts of this hobby, tracking satellites. But the explosion in space exploration that followed also led to space-based astronomy, and even planetary exploration.

More New Thinking

While astronomy in the visual and radio bands of the electromagnetic spectrum can be done from Earth, the other parts of the spectrum were not available, due to the atmosphere. Even visual observing was hampered by the constant changes in air movement and heat convection. Significant progress has been made in reducing these effects by locating observatories on mountains, and the invention of adaptive optics, but the ultimate solution was to get above the roiling air and into space.

As often happens, military advances due to the Cold War bred civilian advances, beginning with the need to get to space to compete with the other side. Reconnaissance missions to image foreign assets led to better photographic, and later, electronic imaging technology along with working out data transmission and linking to ground stations and "passing" data from different orbits. All these advances transferred easily to planetary probes, imaging satellites, and communications links across vast distances. So, as the space program advanced, so did the science that could be done, using the new vistas opened to us.



"Two U.S. Corona reconnaissance satellite images made a year apart—in mid-1961 (top) and mid-1962 (bottom)—revealing the construction of a new Soviet SS-7 Saddler (R-16) intercontinental ballistic missile site. Located at Yur'ya, Russia, the site was the first Soviet ICBM complex to be identified in Corona images."

Before Men on the Moon

"Flyin' mother nature's silver seed to a new home" Neil Young

Several important missions started before the manned missions culminated (so far) on the Moon. The Explorer missions, at first a cover for early U.S. spy satellites to check rival U.S.S.R., began in 1958 and Explorer 1 was the first successful U.S. launch. Missions later investigated radiation, the magnetosphere, the sun, and observed the sky in wavelengths of light blocked by our atmosphere, such as X-rays, gamma rays, UV, and IR. Explorer missions continue; the recently launched Ionospheric Connection Explorer (ICON) is a satellite designed to investigate changes in the ionosphere of Earth, the dynamic region high in our atmosphere where terrestrial weather from below meets space weather from above.

(Continued on page 25)

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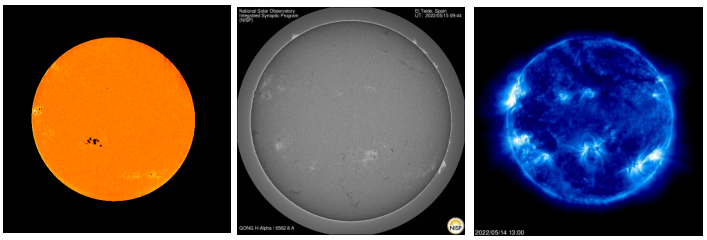
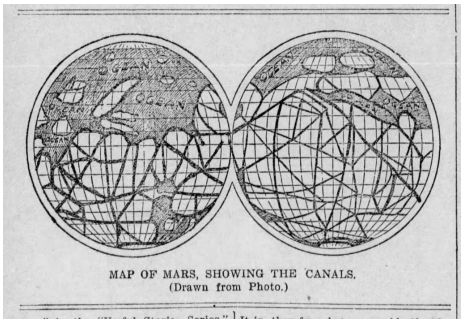
The Orbiting Astronomical Observatory (OAO) missions also began early, in 1966. 3 of the 4 launches were successful and are also still on orbit. Their focus again was on parts of the spectrum we can't see well from Earth, so it would be difficult to recreate the discoveries they made. But understanding better how the sun works, how space weather works, and what radiation threatens space travel and resources has led to planetary exploration and our modern space infrastructure. Consider this the next time you use GPS, satellite data services, or observe the sun. When you see solar activity in white light (left), or, as some amateurs and ground-based observatories do, in H-alpha (center, from GONG project), SOHO and other missions can add to the picture by observing in other wavelengths (right, extreme UV).



Planetary Exploration

"That's one small step for a man, one giant leap for mankind." Neil Armstrong (the transmission squelched, and most did not hear "a man").

However, the epoch defining advance for humans was setting foot on the Moon. This and unmanned missions to the planets, other moons, asteroids, comets, and beyond the solar system is what defines the Space Age. Now, when you explore the Moon, you can see where man's footsteps first fell there by observing where the Apollo Missions landed. When you observe any solar system object, you are enriched by knowledge gained from missions that flew by a planet (Mariner 2 was first, at Venus), crashed (Deep Impact into Comet Tempel 1), or are a Mars helicopter (Ingenuity).



One of the fundamental driving forces of exploring other worlds is the search for other life. Man has wondered about this since at least the Greek philosopher Epicurus. The story of Lowell's "canals" on Mars is well known. And consider that in 1918, Svante Arrhenius, a Nobel chemistry laureate, concluded "We must therefore conclude that everything on Venus is dripping wet" from spectroscopic studies, and therefore "only low forms of life are therefore represented, mostly no doubt belonging to the vegetable kingdom." JPL (Jet Propulsion Lab) researchers stated as late as 1963 "if Venus were covered by water, it was suggested that it might be inhabited by Venusian equivalents of Earth's Cambrian period of 500 million years ago, and the same steamy atmosphere could be a possibility." Many people held hope before Venus and Mars probes were launched that life would exist on either of these close planets (and still do).

Whether you believe life ever existed, or could be supported, by other planets or moons (such as Titan), solar system observation at any level, from eclipses, meteor showers, comets, storms, and rings is always a fascinating sight. Although we still see the planets through our fickle atmosphere, we can observe them knowing more thanks to missions like Pioneer, Voyager, Cassini and New Horizons.

Now, instead of fearing comets, we study them up close, even collecting samples from comets and asteroids, such as the Osiris-REX mission to the asteroid 101955 Bennu. *Note: I have this patch for helping (just a little) to use images returned by the spacecraft to map the landing site for the sampler.*

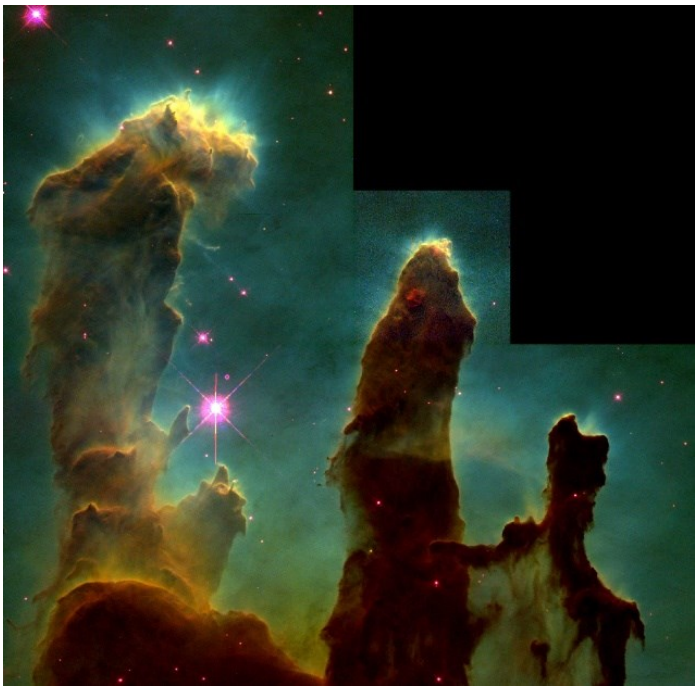
Modern Space Based Observatories

"Can you take me higher, to a place where blind men see?" "Higher" by Mark Tremonti / Scott Stapp

The use of spacecraft for lofting instruments above the atmosphere has led to the greatest discoveries yet in astronomy. It would be difficult to select the best, but a few are easy to include. The Hubble Space Telescope (HST) set the bar, at least with the public, for modern SBO's. It's first "hit", arguably the

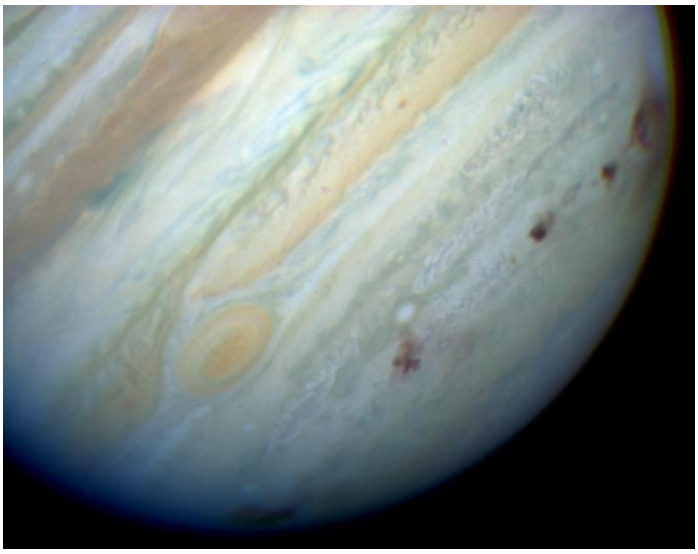
(Continued on page 26)

(Continued from page 25)
most famous astrophoto ever, is 1995's "Pillars of Creation":



This is a very magnified view of part of Messier 16, the Eagle Nebula. The top of the dark columns are incubators of new stars. This object can be seen in a moderate sized telescope or imaged easily, and, although you probably won't get *this* view, it is still a stunning object, well worth a look.

Another early hit (pun intended) for HST was it's capture of the effects of Comet Shoemaker-Levy 9's impact on Jupiter in July 1994. Although the impact was visible from Earth with a telescope, HST images helped us understand and track the effect. *Author's note: there's a regular contributor to the W.A.S.P. who can describe this event much better than I.*



I have fond memories of stopping people on the sidewalk where I lived across the street from Chapman Stadium in Tulsa and showing them this sight. We can't always predict comets (or impacts), but we can follow on the latest discoveries with scope or CCD when possible. The COBS (Comet Observation database) is a great place to report visual or imaging sightings of comets and see what current comets are up to with brightness, size, tail, etc.

Symbiosis

"As our circle of knowledge expands, so does the circumference of darkness surrounding it." A. Einstein

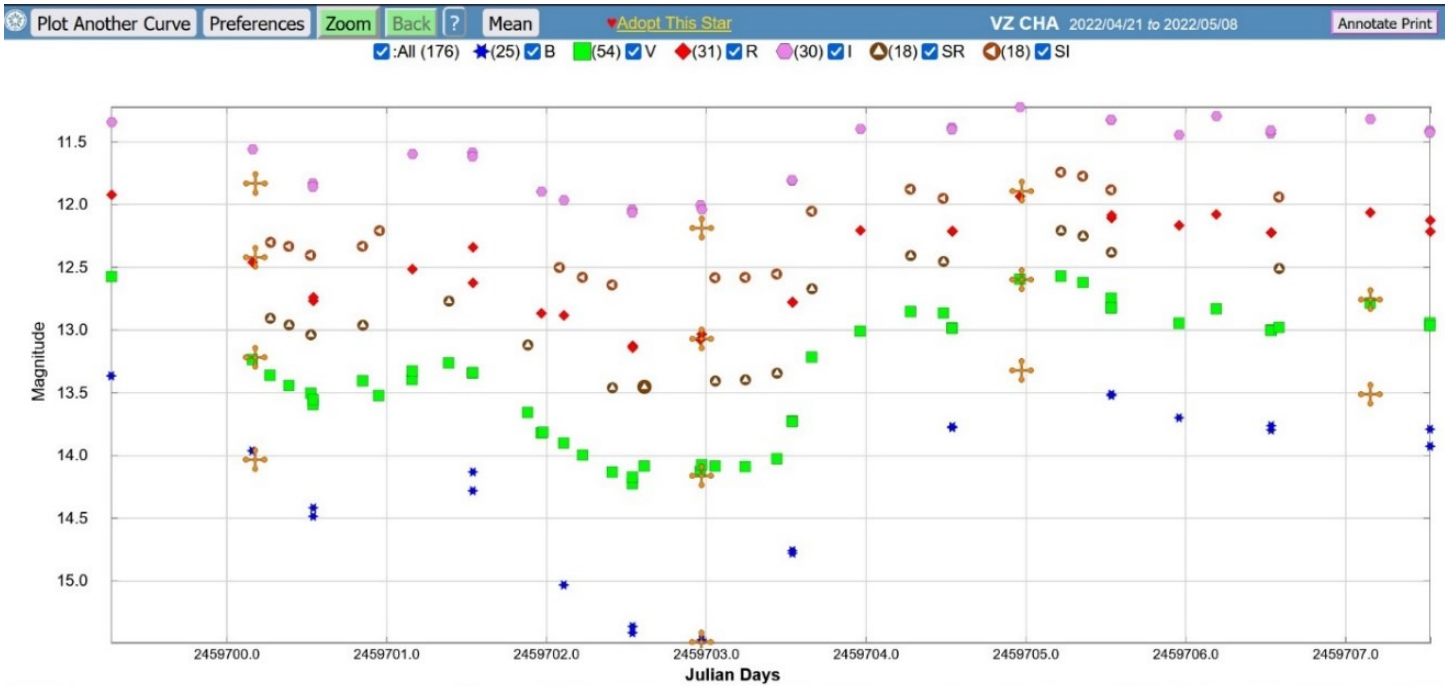
The idea of following on discoveries is the true value of SBO's and manned missions – building on what we can see here and returning material and data back to Earth for research. Moon rocks, meteorites, samples, pictures, and instrument data are what have driven the last 60 years of unparalleled growth in our understanding of astronomy, and its popularity. But, as Einstein noted, the more you know, the bigger the circle is of what you don't know. This is why we keep searching, and why astronomy will always be a fulfilling hobby: we still have so much to learn.

But we can help the process by involving ourselves in outreach, education, and citizen science. Symbiotic projects abound for those who have the time to devote to working with the data collected by SBO's. One way is to help track the darkness of the sky and supplement space-based studies is with such naked eye activities as Globe at Night. Zooniverse has many astronomy related programs that support ongoing SBO projects, most of which require no equipment at all. For imagers, Hubble Legacy Images can be downloaded and processed to check for "hidden treasure". Other projects such as the Osiris-REX mission mentioned above have searchable image sets that can help support probes and landers.

If you do have remote access or equipment of your own, you can assist with such things as HST or Transiting Exoplanet Survey Satellite (TESS) observations of strange variable stars or even exoplanet discoveries. Recently, HST observed a YSO (young stellar object), VZ Chameleontis, and asked amateurs to image it also, in different wavelengths if possible. Using a remote scope, I was able to contribute the magnitude reports shown with crosses (Next Page).

This data will be used to help explain how these objects, both protostars and pre-main sequence stars, form and mature, based on their light curves and other data.

(Continued on page 27)



(Continued from page 26)

Observing Satellites

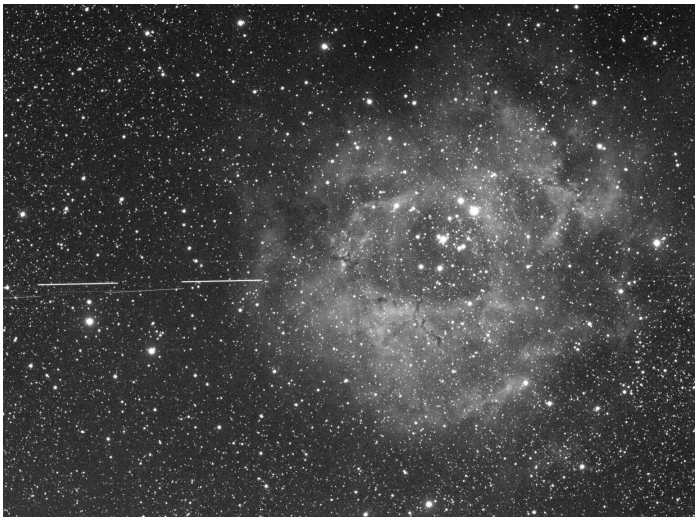


Image by Author

As mentioned above, a direct result of the launching of satellites and other space vehicles is that we can observe them, also. Many of the oldest spacecraft are still up there. The OAO payloads and their rockets are bright enough to see with your naked eyes, hundreds can be seen with binoculars, and even Vanguard 1, launched in 1958 (and oldest still in orbit), can be seen with a telescope on occasion. Though some people are irritated by their presence (e.g., Starlinks), they can be an interesting part of our hobby and show firsthand the Space Age and its impact on our civilization. Where would astronomy be without Hubble Space Telescope, ISS, and all the science missions on orbit?

Epilogue

Astronomy has evolved as a science throughout history, with new methods, instruments, and especially, new ways of thinking using scientific, critical methods. There have been many objects discovered or observed in new ways throughout mankind's quest to understand his home that you can observe for yourself. Using your eyes alone, or with instruments and tools, you too can experience the wonder of our universe by revisiting these objects for yourself. Who knows? You might even discover something new or different yourself. So, get out and observe!

Resources:

https://en.meming.world/wiki/Modern_Problems_Require_Modern_Solutions
https://kids.britannica.com/students/assembly/view/73048
http://www.csun.edu/sfo/dailyim.cgi
https://umbra.nascom.nasa.gov/images/
https://gong2.nso.edu/products/tableView/table.php?configFile=configs/hAlpha.cfg
https://www.space.com/apollo-landing-sites-moon-observer-guide
Wikipedia
https://mars.nasa.gov/technology/helicopter/#Quick-Facts
https://launiusr.files.wordpress.com/2014/11/venuscarson.jpg

(Continued on page 28)

(Continued from page 27)
https://nwspprs.com/marsim1
https://www.sciencenews.org/article/hope-life-venus-survives-centuries-against-all-odds
https://launiusr.wordpress.com/2014/11/07/visions-of-venus-at-the-dawn-of-the-space-age/
https://www.nytimes.com/2021/02/08/science/venus-life-phosphine.html
https://www.nationalgeographic.co.uk/space/2020/10/ancient-asteroid-bennu-contains-ingredients-for-life
NASA, Jeff Hester, and Paul Scowen (Arizona State University) - http://hubblesite.org/newscenter/newsdesk/archive, retrieved May 15, 2022
Hubble Space Telescope Comet Team and NASA - https://hubblesite.org/contents/media/images/1994/34/179-Image.html, Public Domain, https://commons.wikimedia.org/w/index.php?curid=972901, retrieved May 15, 2022
https://cobs.si/
https://www.globeatnight.org/
https://www.zooniverse.org/
https://hla.stsci.edu/hlaview.html

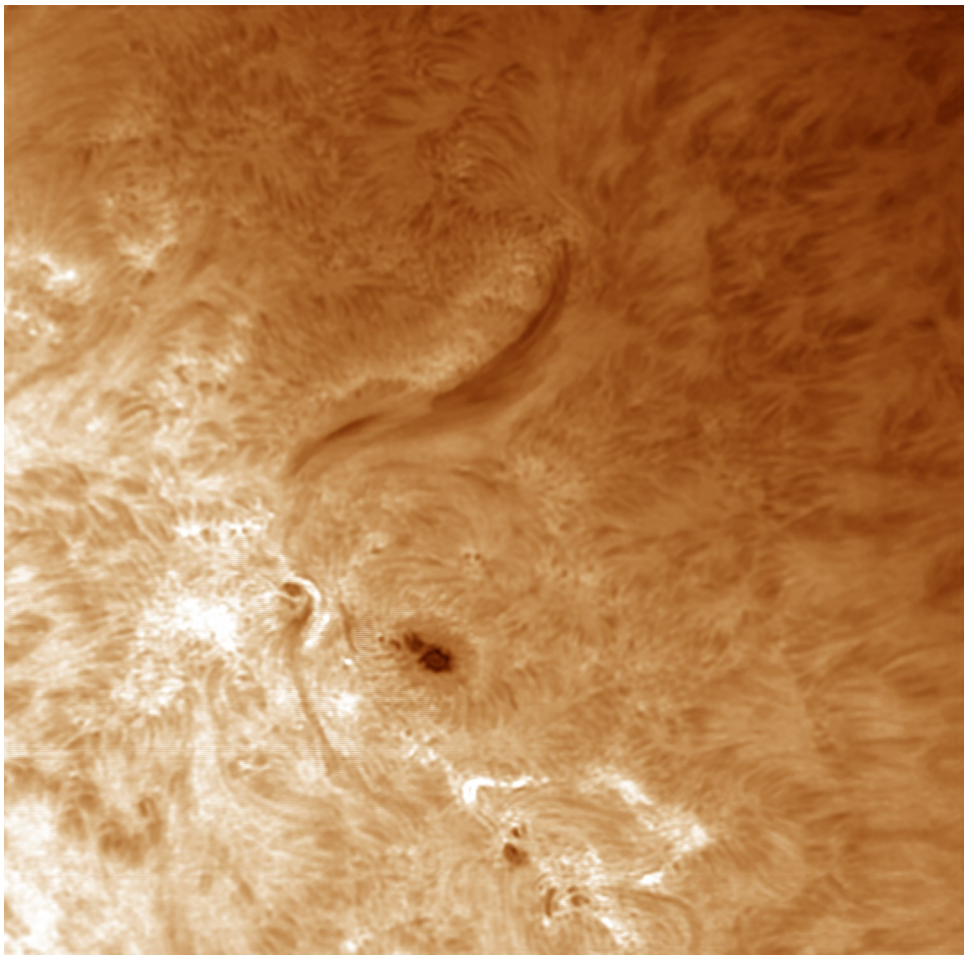


Image by Bob Berta

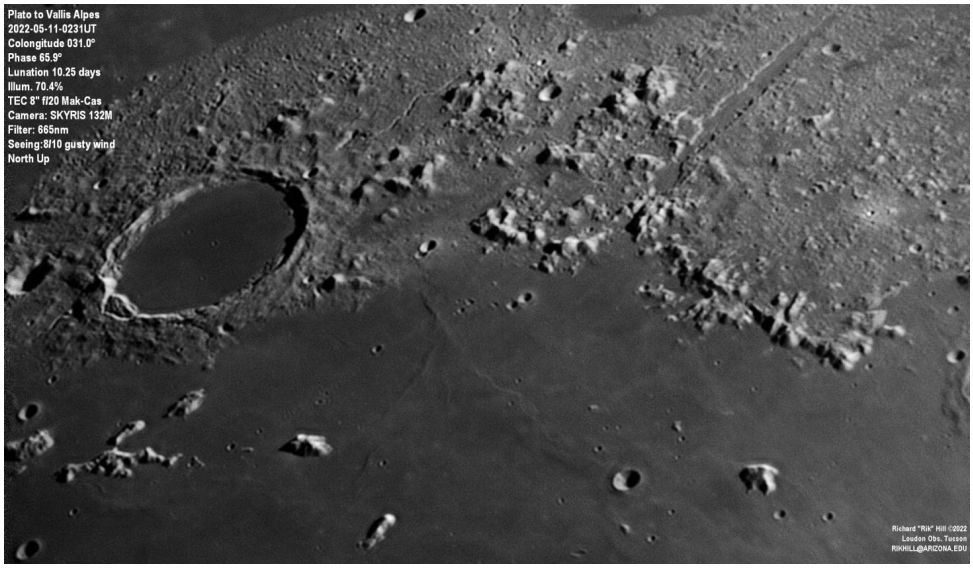
June 14th photo on of Ha solar activity

Bob states, "This was a different setup than I normally use. Instead of my smaller 80mm refractor I used my 6" (152mm) f8 Officina Stellare APO refractor which is my normal night time imaging scope. The Ha filter was my DayStar Quark Chromosphere with IR/UV filter and a f5.95 focal reducer. To avoid excess IR/UV to the camera I used a 5" aperture mask. The Quark has a built in 4.4x Barlow so this works out to about a 3080 mm focal length. The camera is a simple Player One Neptune 6 MP mono camera with 2.4 micron pixel size, so capable of high resolution but a small FOV. Since the exposures are very short....just a fraction of a second for each video frame, a cooled camera is not required.

I shot a video 2000 frames long captured with Sharp Cap software, Processed with Autostakkert, which aligns and stacks every video frame then determines which are sharpest and best contrast, selecting about 25% of the best then throws out the rest. Final colorizing and tweaking is done with Photo Shop or similar programs."

Over the Moon with Rik Hill

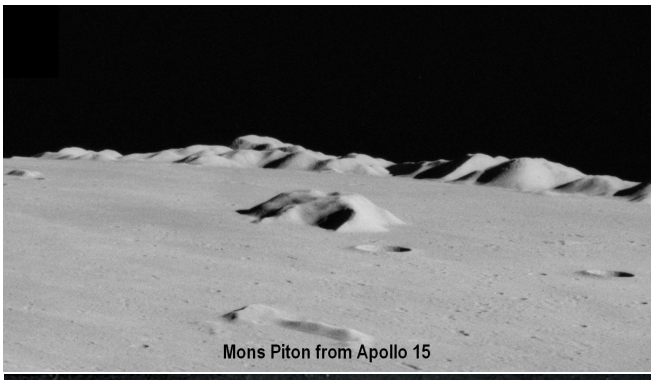
Plato to Vallis Alpes



When on the terminator this region catches the attention of all lunar observers. I have imaged it many times at many librations. This was not a particularly favorable libration but many features were well shown in this image. First we have the large crater Plato (104km dia.) on the left side of this image with the dramatic collapse features on its west (left) wall and on the floor you can see 4 of the famed craterlets. To the right are "Plato Rilles" according to Wood in his Atlas of the Moon, but the LROC QuickMap and Virtual Moon Atlas shows them to be smaller rimae south of this. I have used the term Rima Plato to refer to the larger rille for years. Moving further right or east, we come to the magnificent Vallis Alpes at the bottom of which you can see the kilometer wide rima meandering it's length.

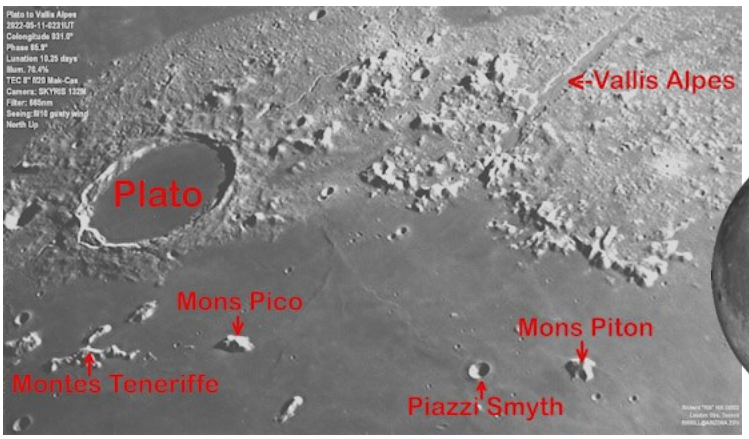
In the lower right of this image is the impressive massif Mons Piton (alt. 2250m). There was a spectacular oblique view of this mountain taken by Apollo 15 orbiter (attached), looking north with the Montes Alpes in the distance. It is worth looking up. The crater to the left of this is Piazzi Smith (22km). Then moving further left is and unnamed mountain and farther, Mons Pico (2400m), every bit as impressive as Mons Piton. It was the subject of a famous drawing by the astronomer James Nasmyth (1874) and another Apollo 15 image.

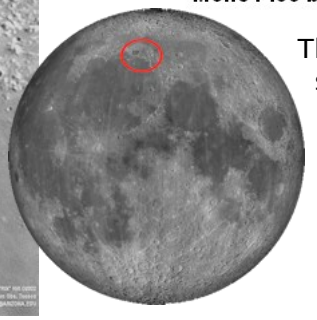
Lastly we have the Montes Teneriffe south of Plato to the left of Mons Pico, just the tops of gigantic mountains that were flooded by the Imbrium lavas. They are quite a sight in the early morning lunar light.



Mons Piton from Apollo 15

Mons Pico by James Nasmyth (1874)





This was made from a single stacked 1800 frame AVI using AVIStack2 (IDL) and then further processed with GIMP and IrfanView.

Location maps by Ralph DeCew

History S.I.G.

July 1987

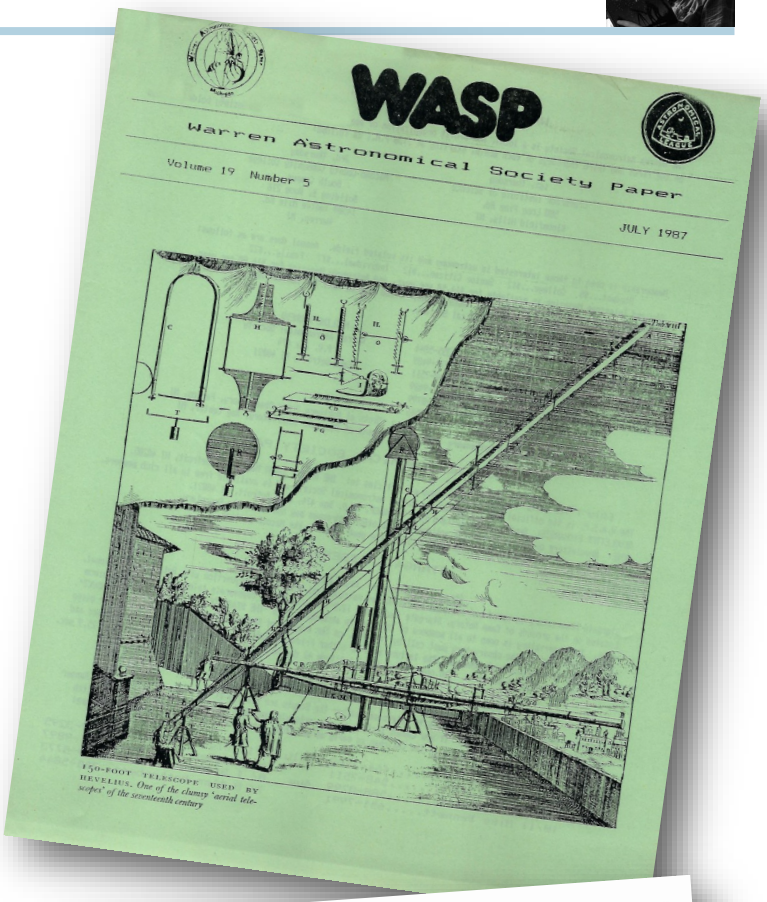
The cover of this issue features an image of a seventeenth century "aerial telescope." This one a 150-footer used by Hevelius. Images from his star atlas are scattered throughout the issue.

A thank you letter from Cranbrook for Astronomy Day participation is on display inside, along with an article, "The Stars - Fixed or Moving?" by Ken Kelly. Plus, the charts:

MINOR PLANETS FOR JUNE - JULY
(Calculated by Ken Kelly)
- EPHEMERIS FOR (2) PALLAS
- EPHEMERIS FOR (1) CERES
- EPHEMERIS FOR (6) HEBE
- EPHEMERIS FOR (7) IRIS

SOURCE OF ELEMENTS: 1987 Ephemerides of Minor Planets

EPHEMERIS FOR COMET 1986l - Wilson



WASP

Warren Astronomical Society Paper

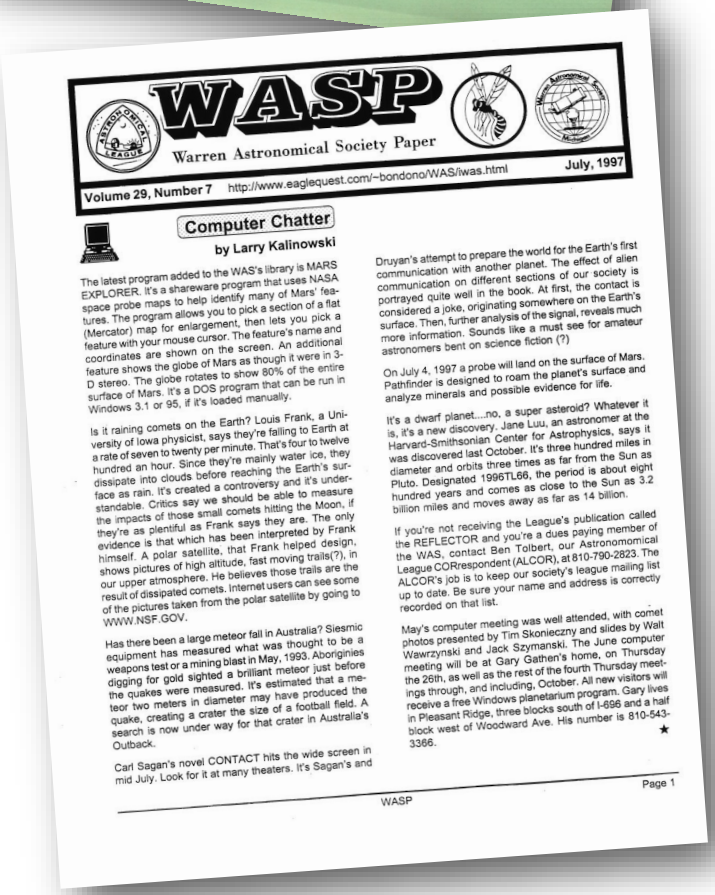
Volume 19 Number 5

JULY 1987

150-FOOT TELESCOPE USED BY HEVELIUS. *One of the clumsy 'aerial telescopes' of the seventeenth century*

July 1997, Web version

Computer Chatter by Larry Kalinowski is interesting this month as the issue appears as both a printed issue and an online version and they are different in content. Fascinating. Greg Milewski posts "Astro-Facts" and a crossword puzzle, Constellations. In "Minutes of Meeting" by Glenn Wilkins, Secretary we find Frank McCullough is honored with a plaque on the Club's 22" Dobsonian.



WASP

Warren Astronomical Society Paper

Volume 29, Number 7 http://www.eaglequest.com/~bondono/WAS/iwas.html July, 1997

Computer Chatter

by Larry Kalinowski

The latest program added to the WAS's library is MARS EXPLORER. It's a shareware program that uses NASA space probe maps to help identify many of Mars' features. The program allows you to pick a section of a flat (Mercator) map for enlargement, then lets you pick a feature with your mouse cursor. The feature's name and coordinates are shown on the screen. An additional feature shows the globe of Mars as though it were in 3-D stereo. The globe rotates to show 80% of the entire surface of Mars. It's a DOS program that can be run in Windows 3.1 or 95, if it's loaded manually.

Is it raining comets on the Earth? Louis Frank, a University of Iowa physicist, says they're falling to Earth at a rate of seven to twenty per minute. That's four to twelve hundred an hour. Since they're mainly water ice, they dissipate into clouds before reaching the Earth's surface as rain. It's created a controversy and it's understandable. Critics say we should be able to measure the impacts of those small comets hitting the Moon, if they're as plentiful as Frank says they are. The only evidence is that which has been interpreted by Frank himself. A polar satellite, that Frank helped design, shows pictures of high altitude, fast moving trails(?), in our upper atmosphere. He believes those trails are the result of dissipated comets. Internet users can see some of the pictures taken from the polar satellite by going to WWW.NSF.GOV.

Has there been a large meteor fall in Australia? Siesmic equipment has measured what was thought to be a weapons test or a mining blast in May, 1993. Aboriginies digging for gold sighted a brilliant meteor just before the quakes were measured. It's estimated that a meteor two meters in diameter may have produced the quake, creating a crater the size of a football field. A search is now under way for that crater in Australia's Outback.

Carl Sagan's novel CONTACT hits the wide screen in mid July. Look for it at many theaters. It's Sagan's and Druyan's attempt to prepare the world for the Earth's first communication with another planet. The effect of alien communication on different sections of our society is portrayed quite well in the book. At first, the contact is considered a joke, originating somewhere on the Earth's surface. Then, further analysis of the signal, reveals much more information. Sounds like a must see for amateur astronomers bent on science fiction (?)

On July 4, 1997 a probe will land on the surface of Mars. Pathfinder is designed to roam the planet's surface and analyze minerals and possible evidence for life.

It's a dwarf planet....no, a super asteroid? Whatever it is, it's a new discovery. Jane Luu, an astronomer at the Harvard-Smithsonian Center for Astrophysics, says it was discovered last October. It's three hundred miles in diameter and orbits three times as far from the Sun as Pluto. Designated 1996TL66, the period is about eight hundred years and comes as close to the Sun as 3.2 billion miles and moves away as far as 14 billion.

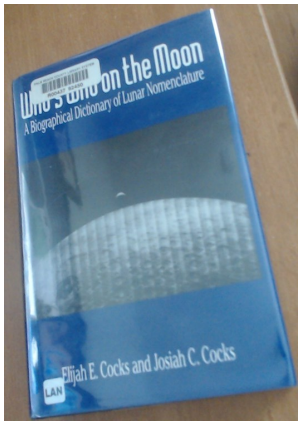
If you're not receiving the League's publication called the REFLECTOR and you're a dues paying member of the WAS, contact Ben Tolbert, our Astronomomical League CORrespondent (ALCOR), at 810-790-2823. The ALCOR's job is to keep our society's league mailing list up to date. Be sure your name and address is correctly recorded on that list.

May's computer meeting was well attended, with comet photos presented by Tim Skonieczny and slides by Walt Wawrzynski and Jack Szymanski. The June computer meeting will be at Gary Gathen's home, on Thursday the 26th, as well as the rest of the fourth Thursday meetings through, and including, October. All new visitors will receive a free Windows planetarium program. Gary lives in Pleasant Ridge, three blocks south of I-696 and a half block west of Woodward Ave. His number is 810-543-3366. ★

WASP Page 1

From the Armchair Astronomer

The June contribution of Gerald Persha's image of the crater Albategnius prompted an email conversation with Gary Ross where we discussed the origin of the name. Rukl gave it a brief mention in his Atlas, so I dove into my copy of Lunar Cognita to see what it had to say. Nearly a full column (half a page)! I was impressed. But wait, there must be more, so I went online and checked out the entry on Wikipedia. Nothing to add there but in the sources listing I spotted a book called Who's Who on the Moon. I scarcely think I need mention what happened next…



Dale Thieme,
Chief scanner

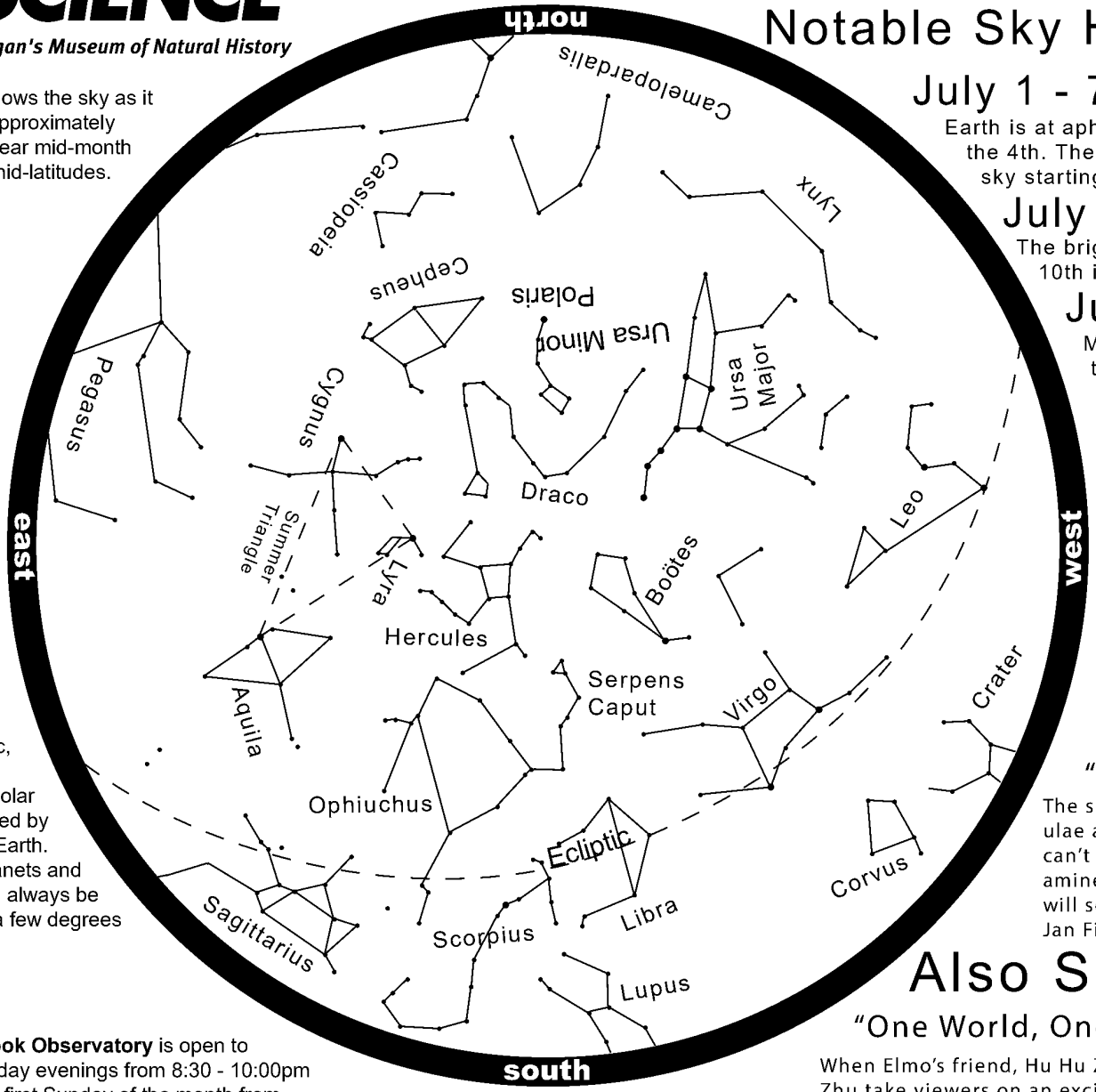
CRANBROOK INSTITUTE OF SCIENCE

Michigan's Museum of Natural History

JULY 2022

Notable Sky Happenings

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.
Come have a look through our telescopes!
For observatory information visit http://science.cranbrook.edu/explore/observatory

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

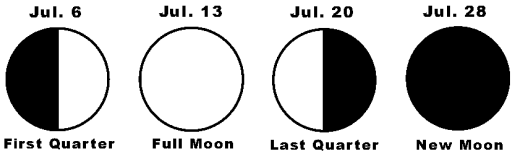
The bright star at the lower right of the Moon on the 10th is Antares, the "heart" of Scorpius (S evening).

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

"Treasures of the Night Sky"

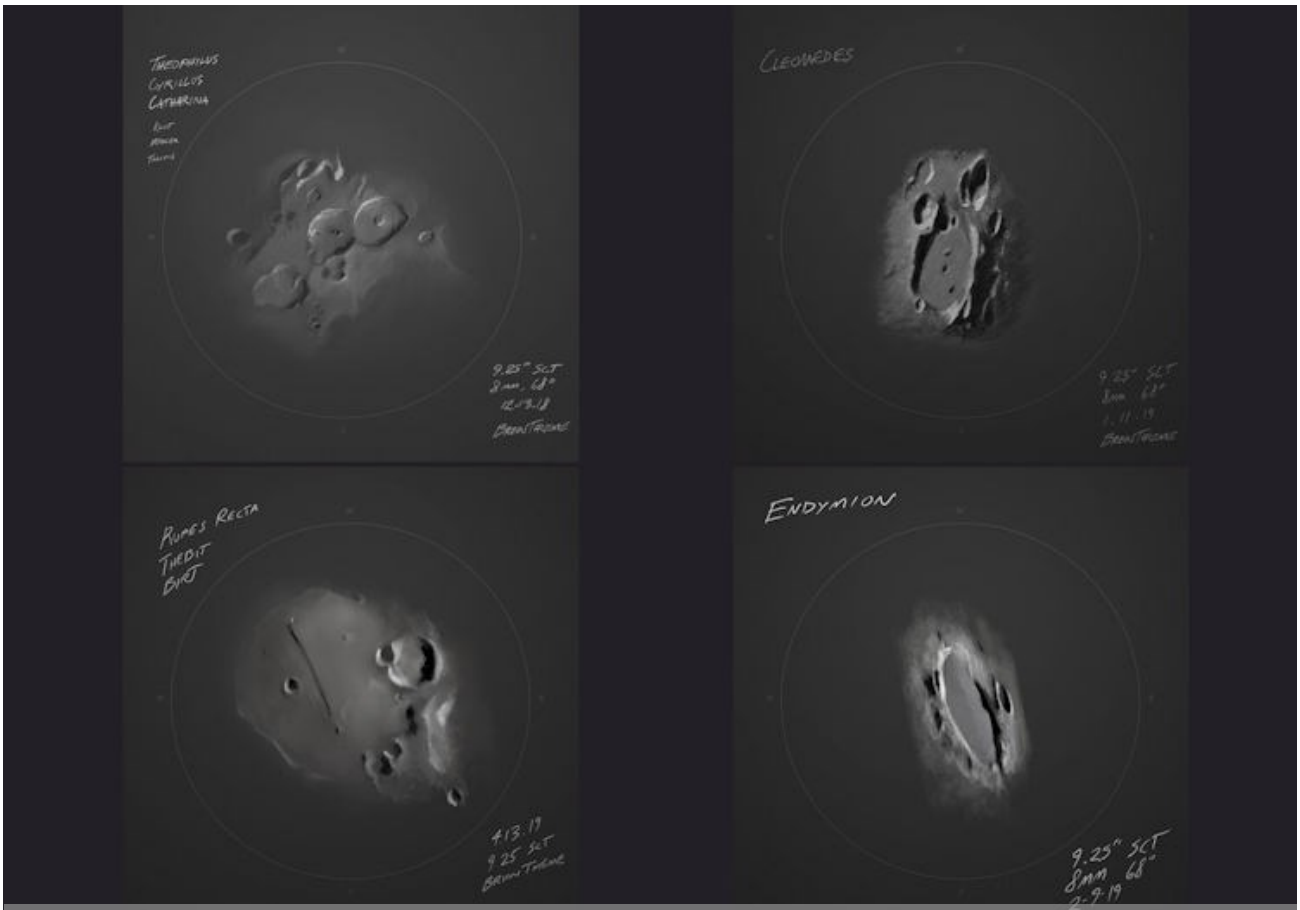
The sky covered with spectacular galaxies, hazy nebulae and sparkling star clusters. Most of these treasures can't be seen without a telescope. This program examines a variety of these riches. Many of the images we will see were rendered by our staff Program Presenter, Jan Fiolka, using telescopes in our observatory.

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



Brian Thieme - Collage of 4 Moon Craters—Hand Drawn

July 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 Canada Day (Can.)	2
3	4 Independence Day (USA)	5	6	7	8	9
10 Eid al-Adha	11 Cranbrook	12	13 Moon at Perigee: 357264km FULL MOON	14	15	16
17	18	19	20	21 Macomb	22	23 Stargate Open House
24	25	26 Moon at Apogee: 406276km	27	28 Delta-Aquarid Meteor Shower NEW MOON	29	30
31						

Stargate Observatory

Monthly Free Astronomy Open House and Star Party

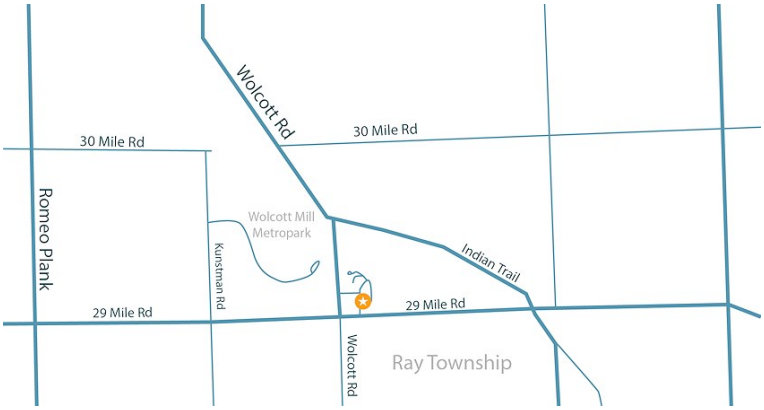
#:30 PM, 4th Saturday of the month!
Wolcott Mill Metropark - Camp Rotary entrance

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

Stargate Observatory Report for June 25, 2022

The observatory was opened at 7:25 pm and the sky was partly cloudy. Roughly 50 people attended including 4 members and about 10 scouts with their leaders. I gave a presentation to the scouts in the observatory while Bob Berta and Jeff Macleod helped some people with their telescopes, did some observing and answered questions. We also used the 10" Dob telescope to observe a few double stars through the haze.

The observatory was closed at 11:22 pm after everyone left and the sky was cloudy.

Next observatory open house is scheduled for July 23, 2022

Riyad I. Matti
2022 WAS 2nd VP,
Observatory Chairperson

Treasurer's Report

Treasurer's Report for June 30, 2022

BOA account:

Balance: $31,795.86
Deposits: $0.00
Withdrawals (Webex): $15.90

PayPal Account:

Balance: $1,500.77
Received (PayPal giving): $1.00
Money in: $102.57
Total Paid Memberships 112

News from the Treasury:

We have 31 AL memberships now.

A.L. Memberships were sent to be renewed on the final day in June. For those of you who renewed or bought a new membership to the A.L., you are good until the end of June in 2023.

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

Astronomical Events for July 2022

Add one hour for Daylight Savings Time
Source:
http://astropixels.com/almanac/almanac21/almanac2022est.html

Day	EST (h:m)	Event
04	02:00	Earth at Aphelion: 1.01672 AU
06	21:14	FIRST QUARTER MOON
09	12:28	Moon at Descending Node
10	17:00	Mercury at Perihelion
10	18:50	Antares 3.0˚S of Moon
13	04:08	Moon at Perigee: 357264 km
13	13:37	FULL MOON
15	15:16	Saturn 4.0˚N of Moon
16	14:00	Mercury at Superior Conjunction
18	19:55	Jupiter 2.2˚N of Moon
20	09:18	LAST QUARTER MOON
21	11:46	Mars 1.1˚S of Moon: Occn.
22	04:21	Moon at Ascending Node
22	22:29	Pleiades 3.4˚N of Moon
26	05:22	Moon at Apogee: 406276 km
26	09:12	Venus 4.2˚S of Moon
28	04:00	Delta-Aquarid Meteor Shower
28	12:55	NEW MOON

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Meeting Minutes

WARREN ASTRONOMICAL SOCIETY
MINUTES OF BOARD MEETING
JUNE 6, 2022 @ 6:30PM

Meeting called to order @ 6:35PM. Officers in attendance: Diane Hall, Bob Trembley, Mark Kedzior, Adrian Bradley, Kevin McLaughlin – Riyad Matti & Dale Thieme (Virtual) – quorum present.

OFFICER REPORTS:

President Diane Hall reported the May Cranbrook in person meeting went well (after a two-year hiatus due to COVID restrictions) except for some technical glitches. A new tech setup will be in place for the June Cranbrook meeting which follows. The traditional meeting at the Red Coat Tavern after the Cranbrook meeting went well also.

1st VP Bob Trembley gave update on presentation schedule and stated there is a need for presenters from the end of July and beyond.

2nd VP Riyad Matti reported (virtually) that the May 28th Open House was clouded over but still had 20+ visitors on hand for tour and explanation of the Stargate facilities.

Treasurer Adrian Bradley gave WAS account balance and update on the Astronomical League membership and dues for 2022-2023.

Secretary Mark Kedzior reported May meeting minutes are in the June WASP. He also gave update on Library Telescope Program at the Warren Libraries, and soon to be launch of the Library Binocular Program in Warren.

Outreach Chair Kevin McLaughlin reported on the website update meetings. He also reported an outreach request for Girl Scout troop at Stargate for June 10-11, and the AATB dates of September 16-17, with more details to follow.

Publications Chair Dale Thieme reported (virtually) the June WASP is online.

OLD BUSINESS

The website committee will provide the cost options in owning our site and will present this info for board consideration at the July board meeting.

NEW BUSINESS

The board(publications) is asking for members' photo submissions for the 2023 WAS Calendar to be sent to the Calendar committee in order to have calendar ready for purchase at the November meetings.

Picnic discussion – WAS Picnic will be held Saturday, August 27th, at the pavilion. The club will provide burgers, hot dogs, veggie alternative burgers and condiments, and NA beverages. Members are asked to bring a side dish to pass. Officers will report at 4PM and members at 5PM. Our informal Swap Meet will take place during this event and observing will follow at Stargate (weather permitting).

New building at Stargate – Discussion took place in regard to finding an architect and have the Stargate Committee meet to discuss the location and design of a new observing facility before approaching the Metroparks Administration for review and (hopefully) approval of the new structure, which will be funded through the Jon Root bequest to the WAS.

Discussion on Jonathan Kade and Diane Hall making a journey to Stellafane at end of July, and also discussion on the James Webb Telescope.

Motion to adjourn by Mark Kedzior – second by Bob Trembley. Motion passed.

Meeting adjourned at 7:16 PM by President Diane Hall.

Respectfully submitted,

Mark Kedzior
Secretary
Warren Astronomical Society

WARREN ASTRONOMICAL SOCIETY
CRANBROOK MEETING (w/Live Streaming)
JUNE 6, 2022 7:30PM

Meeting called to order for in person Cranbrook meeting with live streaming at 7:30PM by President Diane Hall. Number of persons in attendance - 24 (WebEx attendance – 13 @ 8:30PM). Meeting began with introduction of attendees and new members.

ANNOUNCEMENTS

President Diane Hall announced details of upcoming WAS Picnic to be held Saturday, August 27, at Wolcott Mill Metropark Pavilion. She also announced an early start for Calendar photo submissions for the 2023 WAS Calendar, in order to have calendars ready for purchase and pickup at the November meetings. The Stargate Committee will be meeting to formulate a design and plans to be submitted to the Metroparks for the new construction of a third building on the Stargate campus. This construction will be funded through a bequest from the Jon Root Estate.

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1st VP Bob Trembley announced the upcoming presenters for our future meetings.

2nd VP Riyad Matti's report (read by President Hall) stated the May 28th Open House was clouded over but was able to entertain 20+ attendees for a tour of the Stargate Observatory, and a report that our new observing equipment purchases have been received and ready to be put to use. The next Open House will be held June 25th.

Treasurer Adrian Bradley reported the WAS Treasury report can be found in the June edition of the WASP. He also announced details on how to renew your Astronomical League membership for the June 30th deadline.

Secretary Mark Kedzior reports the May meeting minutes are posted in the June WASP.

Outreach Chair Kevin McLaughlin reported an outreach request for a Girl Scout troop at Stargate for June 10-11. The Lunar Eclipse event at Cranbrook was washed out due to inclement weather. He also announced that all members will receive an email blast in regard to any future outreach events that is in need of volunteers/scopes to increase our outreach presence.

Publications Chair Dale Thieme (reporting from Pensacola, FLA) stated that the June edition of the WASP is up on line.

OBSERVING REPORTS

David Levy (from Arizona) reported observing 19 meteors during the Tau Herculid meteor shower, and recording 5 on his camera. He followed with a reading of a poem by Percy Shelley about the Moon. Diane Hall reported that she and Jonathan Kade will be attending Stellafane at the end of July, and gave details on the logistics of this premier ATM event.

SHORT PRESENTATION

1st VP Bob Trembley gave a short presentation entitled "Planetary Science Decadal Survey". Bob described this ongoing NASA project outlining their scientific missions and goals, covering the 2003-2013, 2013-2022 and the 2023-2032 periods. Questions and discussion followed his very informative presentation (also with applause). To see his presentation in its entirety, go to:

https://www.youtube.com/warrenastro

MAIN PRESENTATION

1st VP Bob Trembley introduced (with bio) Peter K.G Williams, with his presentation on "World Wide Telescope". Peter is the Innovation Scientist for the Center for Astrophysics and the American Astronomical Society, and also Director of the AAS World Wide Telescope Project. His presentation explained the operation of the WWT and related databases, and his adding to all databases as info becomes available in order to help astronomers do their research better and faster (e.g. - data from the James Webb Telescope images when it becomes available). Questions and discussion followed his excellent presentation. To see his presentation in its entirety, go to:

https://www.youtube.com/warrenastro

The meeting ended at 9:40 PM.

Respectfully submitted,

Mark Kedzior
Secretary

WARREN ASTRONOMICAL SOCIETY
MACOMB (VIRTUAL) MEETING
JUNE 16, 2022 7:30PM

Meeting called to order at 7:30 PM by President Diane Hall. Officers in attendance: Bob Trembley, Adrian Bradley, Mark Kedzior, Dale Thieme (WebEx attendance – 24 & YouTube – 5 @ 8:15 PM).

OFFICER REPORTS

President Diane Hall commented on the Cranbrook meeting, and our better technical results in comparison to the May meeting. The ending time of the Cranbrook meeting may have to be moved up a little earlier to accommodate those attending the afterglow at the Red Coat Tavern due to their hour changes. Diane also discussed details on the upcoming WAS Picnic to be held on Saturday, August 27th, at 5:00PM, with WAS officers reporting at 4PM to set up venue. She also reported on the upcoming AATB event September 16-17 (Astronomy at the Beach), and details on the Stellafane event at the end of July, which she will be attending along with Jonathan Kade.

1st VP Bob Trembley reported the mailers went out for the AATB event, along with the future list of presenters.

President Diane Hall read 2nd VP Riyad Matti's observatory report – the next Open House will be June 25th.

Secretary Mark Kedzior reported on the Warren Library Telescope Program and the startup of the Library Binocular Program.

Diane read the outreach requests to the WAS, and asked members to consider participating at events with their telescopes.

Treasurer Adrian Bradley reported on the WAS and PayPal accounts, and also on Astronomical League membership dues details and upcoming events.

Publications Chair Dale Thieme reported that photo submissions for the WAS 2023 Calendar are being accepted so as to ready calendar for November distribution. He also is accepting any submissions and articles for publication for the July WASP.

OBSERVING REPORTS

David Levy reported on the Tau Herculid "Meteor Shower That Wasn't" – a total of 19 observed and 5

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imaged the following night. He followed with a reading from Robert Frost's "The Road Not Taken". Discussion took place in regard to the current morning planetary alignment of Mercury, Venus, Mars, Moon, Jupiter and Saturn, with Uranus in close proximity to Venus and Neptune to be found in between Jupiter and Saturn. Adrian Bradley shared his image of the Tau Herculid meteor shower. Steve Stuart shared his images of Jupiter and Saturn and the M57 "Ring Nebula".

MAIN PRESENTATION

1st VP Bob Trembley introduced (with bio) Deirdre Kelleghan (live from Ireland), with her presentation "Astronomical Sketching the Sun, the Moon, Stars and other Stories". In her wonderful and informative presentation, Deidre (a member of the Irish Astronomical Society)described her techniques and tools that she uses to capture and sketch her astronomical subjects into beautiful images as seen through her eyes. She described her tool kit consisting of pastels, conte (hard pastels), silicone-tipped brushes (to spread pastels), cotton Q-Tips, a field easel, a quilling needle (for etching on paper), the paper medium used for her drawings, and her fingers. She also uses a dinner plate to trace the disk edge of the sun and moon and uses a sealer on her pastels when her drawing is complete to keep the integrity of her drawing. She showed examples of her solar drawings as observed through a PST 40mm of prominences and "filaproms". Her drawings of prominences are taken over a period of hours to show movement in .gif. She showed examples of her lunar drawings of Sinus Iridium and Copernicus, the M42 Nebula (as seen through both 8" and 16" reflector scopes), the Perseid meteor shower, sixteen drawings of Comet 17P/Holmes and its changing shape in 2007, and Comet C/2020 F3 (Neowise).

Many questions and discussion followed her wonderful presentation.

To see her presentation in its entirety, go to:
https://www.youtube.com/warrenastro

Meeting ended at 9:32 PM.

Respectfully submitted,
Mark Kedzior
Secretary

"QUICK TIPS FOR CLEANING OPTICS"

(From Edmund Optics)

(Forward - Being the owner of a few Newtonian reflecting telescopes, I have on occasion found it necessary to clean the primary mirror when it looks like something has been deposited on the coatings, and there is a special way and technique that is used to do this task. If done correctly, you will definitely see the difference a clean objective will make in your observing. Fortunately, the Warren Astronomical Society has experienced members who have performed this task and may be able to provide guidance and assistance if you find you have a need to clean your optics on your observing instrument. – Mark Kedzior)

Recently I was researching information on the correct procedure to clean a Newtonian reflector mirror (our club's 22" Big Dob mirror is in need of some cleaning – ask Riyad about it) and wanted to understand all of the proper steps in performing this task so as to assist our club in getting this mirror cleaned for optimal viewing. As we all know, YouTube has numerous self-help videos/tutorials by individuals to provide some insight into this process. One of note was from Edmund Optics – "Quick Tips for Cleaning Optics". The individuals in this video show the "do's and don'ts" of cleaning optics – you can make your own judgment on their presentation. You can find this presentation at:

Quick Tips for Cleaning Optics - YouTube

Also, if you scroll down to see comments and questions that viewers provide or inquire about on this video, this one submitted by a "Karl Harvey Marx" really got my attention:

"I had some pollen and lovebug splatter on my telescope mirror, so I cleaned it off with a belt sander and 30 grit sandpaper. What is the best way to remove the white and silver dust left behind by that stage of the cleaning process? I already tried tack-cleaning it off with duct tape so please don't suggest that."

I don't know if anyone was able to respond to his question, but I would sure like to know . . . . . .

The Warren Astronomical Society is a Proud Member of the Great Lakes Association of Astronomy Clubs (GLAAC)

GLAAC is an association of amateur astronomy clubs in Southeastern Michigan who have banded together to provide enjoyable, family-oriented activities that focus on astronomy and space sciences.

GLAAC Club and Society Meeting Times

Club Name & 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 Public open house—first Saturday at 11 am
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

GLAAC 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

Jon Blum: Astronomy at JonRosie
Bill Beers: Sirius Astro Products
Jeff MacLeod: A Life Of Entropy
Bob Trembley: Balrog's Lair
Bob Trembley: Vatican Observatory Foundation Blog

Doug Bock:
Facebook: Northern Cross Observatory https://www.facebook.com/NorthernCrossObservatory
Boon Hill and NCO Discussion https://www.facebook.com/groups/369811479741758
YouTube channel: https://www.youtube.com/channel/UC-gG8v41t39oc-bL0TgPS6w

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

Find Hercules and His Mighty Globular Clusters

-David Prosper

Hercules is one of the standout heroes of Greek mythology, but his namesake constellation can be surprisingly hard to find - despite being one of the largest star patterns in our night skies! Once you find the stars of Hercules, look deeper; barely hidden in the space around his massive limbs and "Keystone" asterism are two beautiful globular star clusters: M13 and M92!

Since the constellation itself is relatively dim but bordered by brighter constellations, you can find the stars of Hercules by looking between the bright stars Vega and Arcturus. They are fairly easy to identify, and we have tips on how to do so in previous articles. Vega is the brightest star in the constellation Lyra and one of the three stars that make up the Summer Triangle (*June 2020: Summer Triangle Corner: Vega*). Arcturus is the brightest star in the constellation Boötes, and can be found by "arcing to Arcturus" from the handle of the Big Dipper (*May 2021: Virgo's Galactic Harvest*). You may be able to Hercules's "Keystone" asterism first; this distinct pattern of four stars is traditionally shown as the torso of the great hero, though some illustrators prefer marking the Keystone as the head of Hercules. What pattern do *you* see in the stars of Hercules?

Globular star clusters appear "fluffy," round, and dense with stars, similar to a dandelion gone to seed, in contrast to the more scattered and decentralized patterns of open clusters. Open clusters are generally made up of young stars that are gradually spreading apart and found inside our Milky Way galaxy, while globular clusters are ancient clusters of stars that are compact, billions of years old, bound to each other and orbit around our galaxy. Due to their considerable distance, globular clusters are usually only visible in telescopes, but one notable exception is M13, also known as the Great Cluster or Hercules Cluster. During very clear dark nights, skilled observers *may* be able to spot M13 without optical aid along the border of the Keystone, in between the stars Zeta and Eta Herculis - and a bit closer to Eta. Readily visible as a fuzzy "star" in binoculars, in telescopes M13 explodes with stars and can fill up an eyepiece view with its sparkling stars, measuring a little over half the diameter of a full Moon in appearance! When viewed through small telescopes, globular clusters can appear orblike and without discernable member stars, similar in appearance to the fuzzy comae of distant comets. That's why comet hunters Edmund Halley and Charles Messier discovered and then catalogued M13, in 1714 and 1764 respectively, marking this faint fuzzy as a "not-comet" so as to avoid future confusion.

While enjoying your view of M13, don't forget to also look for M92! This is another bright and bold globular cluster, and if M13 wasn't so spectacular, M92 would be known as the top celestial sight in Hercules. M92 also lies on the edge of naked-eye visibility, but again, binoculars and especially a telescope are needed to really make it "pop." Even though M92 and M13 appear fairly close together in the sky, in actuality they are rather far apart: M13's distance is estimated at about 25,000 light years from Earth, and M92's at approximately 27,000 light years distant. Since M13 and M92 appear so close together in our skies and relatively easy to spot, switching between these two clusters in your scope makes for excellent star-hopping practice. Can you observe any differences between these two ancient clusters of stars?

Globular clusters are closely studied by astronomers for hints about the formation of stars and

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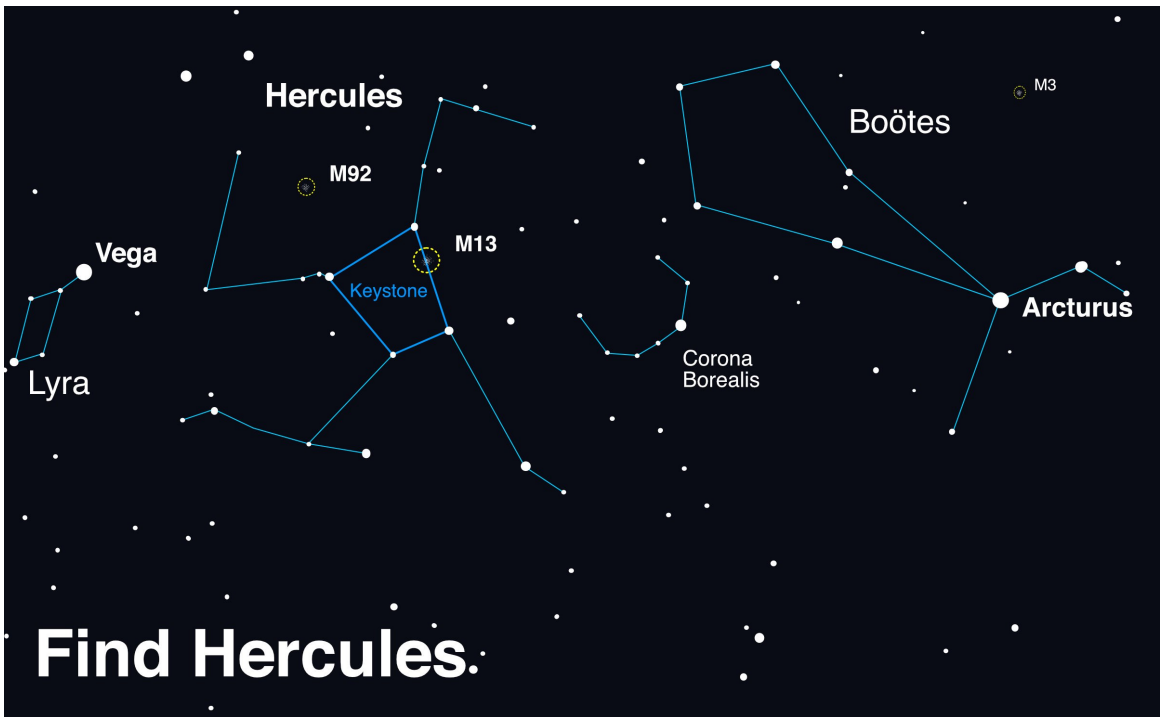
galaxies. The clusters of Hercules have even been studied by NASA's space telescopes to reveal the secrets of their dense cores of hundreds of thousands of stars. Find their latest observations of globular clusters - and the universe - at nasa.gov.

Composite image of the dense starry core of M92 imaged in multiple wavelengths. While your own views of these globular clusters won't be nearly as crisp and detailed, you might be able to count some of its member stars. How far into their dense cores can you count individual stars? Credits: ESA/ Hubble & NASA; Acknowledgment: Gilles Chapdelaine. Source:

https://www.nasa.gov/feature/goddard/2017/messier-92



Look up after sunset during summer months to find Hercules! Scan between Vega and Arcturus, near the distinct pattern of Corona Borealis. Once you find its stars, use binoculars or a telescope to hunt down the globular clusters M13 and M92. If you enjoy your views of these globular clusters, you're in luck - look for another great globular, M3, in the nearby constellation of Boötes. Image created with assistance from Stellarium: stellarium.org