Celebrating Sixty Years of the Warren Astronomical Society

The W.A.S.P.

Vol. 53, no. 7

Winner of the Astronomical League's 2021 Mabel Sterns Award

July 2021

The Warren Astronomical Society Publication

50 years
Apollo 15 Mission

Launched July 26, 1971- Returned August 7

60 YEARS

The WASP

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

Dale Thieme, Editor

2021 Officers

President	Diane Hall	president@warrenastro.org
1st VP	Dale Partin	firstvp@warrenastro.org
2ndVP	Riyad Matti	secondvp@warrenastro.org
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Publications	Dale Thieme	publications@warrenastro.org
	Entire Board	board@warrenastro.org

The Warren Astronomical Society, Inc., is a local, non-profit organization of amateur astronomers. The Society holds meetings on the first Monday and third Thursday of each month, starting at 7:30 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.

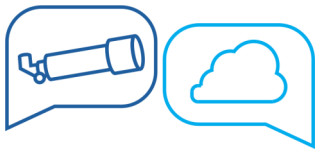
The Warren Astronomical Society Publication (WASP) is the official monthly publication of the Society.
Articles for inclusion in the WASP are strongly encouraged and should be submitted to the editor on or before the end of each month. Any format of submission is accepted. Materials can either be transmitted 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 [illegible] astronomy, space news,

In This Issue:

President's Field of View

The June solstice marks a turning point for the Michigan astronomer; the northern night at midsummer is a sliver of true darkness set in an expanse of lingering blue twilight. Now the nights lengthen again, bringing the close of twilight to an hour where one can put in a solid evening at the observatory or an urban sidewalk session and still catch a reasonable night's sleep. Of course, our summer solstice this year has been followed by clouds, rain, more rain, and yet more clouds— a bad break for astronomers, but a good thing for a Michigan landscape parched by semi-drought conditions.

Earth science is planetary science, and conditions this year have been particularly grim: a deepening drought in the southwest, historic triple-digit temperatures in the Pacific Northwest, and our own paradoxical dryness in the midst of fresh water, a dryness that's frazzled native wildflowers in their meadows and turned marshes to mud holes. As excited as I am about NASA's upcoming space projects, including the two newly-authorized missions to Venus, I am glad to have an new administrator at the helm who understands the fragility of our blue marble and embraces earth science and climate science as part of NASA's mission.

This is the planet we're on, the only one we've got. Elon Musk can die on Mars if he likes. I want my little patch of milkweed and cattails to survive.

Diane Hall,
President

Club Member Name Tags

Email publications@warrenastro.org for your personalized name tag

Save the Date

Warren Astronomical Society Annual Picnic

August 28, 2021

Pavilion, Rotary Park and Stargate Observatory

Swap meet this year at the picnic. Bring along Astronomical gear you wish to sell/swap. Going up for sale from a donation to the club is this Galileo brand telescope shown at right.

We are going ahead with picnic plans, but, the board may elect to cancel the event based on COVID-19 State and Federal health mandates and recommendations. This will be determined as we get closer to the date of the picnic.

Even though the event is outdoors, we still recommend social distancing, wearing of face masks when not eating, and not sharing eyepieces for safety.

This is a members and immediate family only event. No pets, please.

Letters

"New NASA Missions Will Study Venus . . .." 2 June, NEW YORK TIMES

All though Bertin will bang this drum, let us rejoice! Per my history making short [lecture] recently: "The Case Against Mars", it is about the bloody time, even recognising other countries are still beavering away since our *Magellan* flew in 1990.

Canada for Expo67 was "friendly, foreign, and near", but Venus lacks one of those elements. None the less "Earth's twin" (of sorts) has been neglected because of Mars and the "L" word. No lander, pity, but we leave such boldness to the Russians.

Truly sorry a proposed mission to Triton has been put on back burner, because that capture moon has been fascinating to me since 1989 -- to say nothing about a possible water world in Neptune. Imagine observing cryo-vulcanism! But again: All Mars, all the time . . ..

G. M. ROSS,
who remembers as if it were yester-day,
the launch of the first Moon rocket.

Ray Bosshard's "atmospheric" picture

Don't that beat all! I have never seen the like. "Right place at right time", but all so a skilled eye.

G. M. ROSS

Mabel Sterns Newsletter Award

I am extremely happy to inform you that you have won the Astronomical League's Mabel Sterns Newsletter Award for 2021. This award comes with a beautiful plaque and an invitation to receive the award during our ALCon '21 Virtual convention on August 19-21, 2021. The award plaque will be sent to you in advance of the convention.

We will also be recognizing your award in the September issue of Reflector.

Newsletters are the lifeblood of most of our League member societies and your newsletter, The W.A.S.P., impressed all of our newsletter judges who included past Mabel Sterns winners.

Congratulations, again, on creating and maintaining such a content-rich, visually attractive, and easily navigated newsletter. You have excellent talent, and I hope that I will have a chance to meet you in person at a future League convention or perhaps even sooner.

-- Chuck Allen
Vice-President, Astronomical League

To the Editor

A big congratulations to our esteemed news letter editor, Dale Thieme, for winning the Astronomical League's Mabel Sterns Newsletter Award for 2021! Well done and well deserved!

Bill Beers

Just saw the email on you receiving the AL Mabel Stearns Award for your WASP wizardry!
You 'da man!!!!

Mark K
Secretary
WAS

Indeed!
Well-deserved, long overdue, and a very nice thing to wake up to this morning!
Congratulations Dale!

Diane Hall

Congratulations Dale. Best WASP editions we have ever had.

Riyad Matti

Excellent!!! :D

Doug Bock

Congratulations Dale! A very significant achievement!

Adrian Bradley

Observation Reports

May 31 - 1 June

Conjunction of Moon and Jupiter.

Observer + "Handsome Joe" McBride. Morning twilight. Official event time ~

09 h. U.T. One day short of Last Quarter, the Moon 5 deg. S. of Giant Planet (Dec. - 12 deg.). Steep climb on celestial sphere required of the Moon to meet Sun for annular eclipse near "top" of Ecliptic in nine days.

+21 deg. 12 min.

Transparency nominal.

Naked eye obs'ns.

4 - 5 June

M 57 -- Even in a good telescope, very difficult to discern as a ring at low magnification. The nebula is a small object, at first blush circular. Per M.

Messier's practice pointer: very easily be mistaken for a comet.

61 OPHIUCHI -- Contrary to its depiction on the *SKALNATE PLESO* and *POCKET ATLAS*, a triple in Hirschfeld and Sinnott's massive compendium. Alternate designation = Sigma 2202. A "cat's eyes", estimated as ~ Position Angle 90 deg. confirmed by H & S as 93 deg. Burnham lists the mags. as "6 - 6 1/2". H & S: the AB pair 21 arc-sec. both 1827 and 1968, whilst Burnham adds same distance for 1955. The C companion is 12.5 mag. (1912) @ 96", an easy omission over years. NOTE: H & S catalogue fails to enter this star system with Flamsteed Number 61.

MENKENT -- Brightest star in northern Centaurus (2.1) catches the eye from the lat. of S. Michigan, all be it requiring good horizon. Much of constellation is in fact available to observation here. So low after culmination, ruddiness could be mistaken for "late" spectrral class of K0, actually atmos. extinction.

KEMBLE'S CASCADE OF THE SOUTH -- This Observer has so named a small asterism in Scorpius.

Not plotted on *SKALNATE* nor *POCKET* atlases because most stars too faint. Not on *ATLAS ECLIPTICALIS*, very southerly Declination ~ 34. Due W. of M 6.

Easily fits in low power field, a "stair-step" of six stars, most same magnitude. Transparency + low elevation made further penetration impossible.

Confirmed by Chris ("The Brain") Miller.

Transparency good. Seeing good.

6-cm. refractor ~ f /11, 25X, 75X (More . . .
cont. . . .)

4 - 5 June (more)

SIGMA 2223 Ophiuchi -- Easy to resolve. HIRSHFELD and SINNOTT record 18" sep. (1894, presumably all so 1924). Pos. Angle 211 deg., per authors. Observer estimates slightly greater, but simple inspection. 7th mag. "A" star clearly orange, in keeping with "F" class. Very close to I. 4665, large open cl.

h4962/ Ho647 SCORPII -- System immediately W. of M-6, enveloped in N.G.C. 6383 small nebula. "AB" pair = 5.7/ 10.5 magnitude @ 5.4" (1933). "C" 10.5 mag. @ 13" sep. (1907). Could not resolve, probably low elevation, all though "C" star reasonable target. "A" star is "0" class, rare in H & S compendium.

14 - 15 June

V1942 Sgr -- Carbon star immediately W. of Upsilon. Class C6. Appeared dark, occasionally dark orange from seeing. Two double stars to west impossible to split/ resolve.

Sky disappointing with cirrus in W. & advancing.

6-cm. refractor @ 75X. Veen Observatory

15 - 16 June

V1942 Sgr colourless, dark. Split the two doubles S 715/ S 716. Widely spaced w/ faint companions. Jupiter: Close conjunction with star immediately to N. Ganymede at western elong. 3 satellites vis. North Aequatorial Belt pronounced, ruddy-orange.

6-cm. refractor @ 75X, 100X. Veen Observatory.

COMMENTARY: Per CATALOGUE of Hirschfeld and Sinnott S 715 is doubled 7.0-7.5 mag. 8.5 arc-sec. (1951). S 716 is 8.4-8.6 mag. @ 5.1 arc-sec. ("). Are NOT "faint" companions. Such separations are not "wide" at 75X, granted well within telescope's ability. Some thing is wrong. This "double-double" is within the Galaxy's isophotes, so faint stars are to be expected.

16 - 17 June.

V1942 Sagittarii a murky brown.

Return to the "double-double" due west of Upsilon Sgr: Southernmost star has faint companion ~ to S. Northernmost star has a faint "B" at approx. P.A. 20 deg.

Transparency excellent. 6-cm. refreactor @ 75X

COMMENTARY: Confusion. Three stars at issue. S 715, S 716, Rst 3220. ATLAS OF THE HEAVENS plots two doubles but magnitudes are "strange".. ATLAS ECLIPTICALIS (deep penetration) plots three doubles. POCKET SKY ATLAS plots two. First-mentioned = 1950's field data. 3220 has a fourteenth mag. companion @ 7 arc-sec. hence NOT observed. S 715 has "faint" companion (above). Hirschfeld & Sinnott call the P.A. at 15 deg., de-

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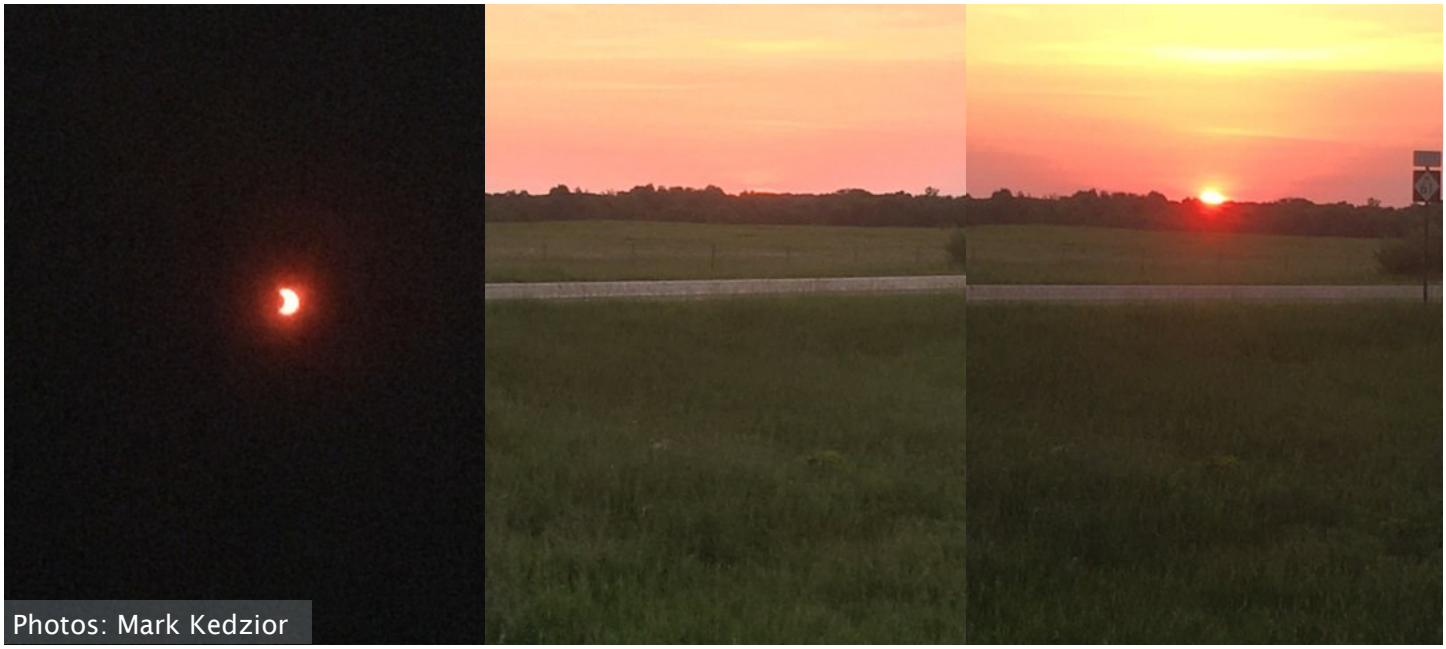

Photos: Mark Kedzior

cent agreement, but the companion is not "faint" @ 7.5, and at 8.5" distance, an easy object in such a refractor. More over, there is no "faint" B star for S 716, cf. 7.5 mag.!

These objects must be revisited under good sky conditions. Worrisome consideration, optics quality.

27 - 28 June

Jupiter -- South Aequatorial Belt has shrivelled, nondescript. Per contra, the North ia strong reddish-orange, possibly bifurcated, continuing enhanced colour of recent years. Ganymede near western elongation. At first, assumed only three satellites in view, but bright Gan. seemed to throw an optical "flare". Said lens effect absent on the ball of planet. Close obs'n: Callisto extremely close to S., one of the closest satellite conjunctions Observer has ever seen. Inclinations of Jovian system orbits make transits/ occultations possible depending on year. Magnitudes of satellites III and IV notable. 4.6 vs. 5.7

Seeing good but transparency fair, fields of cirrus. Planet low in S.E.

4" f/ 15 refractor @ 85X (w/ 5mm eyepiece imposs. to focus)

-G. M. Ross

2021 Annular Eclipse Reports

10 June

Observed partial solar eclipse from latitude N44 deg 01.854' W84 deg 56.964' (M61 & Bringold Road , Harrison) - three images - 06:00 , 06:02 & 06:10 through iPhone with AstroBaader filter - last contact at 06:38 - viewed on side of road with wife Anna - did informal outreach by sharing solar glasses with passerby travelers who stopped to view final few minutes of eclipse - maximum eclipse coverage of sun from my locale approximately 60% -

Photo: Adrian Bradley

Mark Kedzior

I arrived at Pointe Aux Barques Lighthouse an hour before sunrise. The first thing I noticed besides the mild temperatures were the clouds on the horizon, and all of the bugs that began to

(Continued on page 7)

(Continued from page 6)

swarm over me. I instantly pulled out the bug spray, and I noticed that all of my shots would contain bugs in the foreground.

It didn't stop me from taking some test shots. Eventually I saw the sky get brighter as the sun came closer to rising. I tried to notice if there was less

Photo: Adrian Bradley

light than normal during a sunrise, but couldn't quite tell, since clouds were also in the way. But the first moment that I saw the sun being to rise, I noticed that it was rising as a crescent. There was too much cloud cover on the horizon to see it just above the water; it rose a bit higher and it's crescent shape began to shine through the clouds. That is when I began taking multiple pictures to make sure I captured the phase of the eclipse that was already in progress.

At this time the moon was moving to the southwest and away from the sun. About 45% of the Sun was covered. I was also about 45% covered, in bugs.

After taking several images of the crescent sun shining through clouds, I attempted to frame the eclipsed sun with other surrounding scenery. Before I could incorporate the lighthouse

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Eclipse Rise

Photos: Mark Jakubisin

10 June

The misty lake coupled with clear sky were perfect for the occasion. Photos were taken at Brandenburg park pier, Chesterfield MI. Beautiful naked eye sight for a microsecond on the horizon. I forgot how far north the sun rises near the solstice. I had to relocate to avoid the trees in the downtown New Baltimore pier.

-Mark Jakubisin

(Continued from page 7)

itself, a thick bank of clouds came and covered the Sun/Moon pair. They effectively wiped out my ability to watch the eclipse wane, up until only a little was left. I took a couple more shots and watched as the sun shed itself of the moon... and got brighter once the eclipse ended.

Seeing a rising crescent sun and capturing pictures without needing a filter was a very fullfilling experience. Getting some creative photos was also a plus.

-Adrian Bradley

Editor's Note: Adrian also participated in an international online stream: "10 June 2021 Annular Solar Eclipse: online observation" Click on this link to see it in its entirety: https://youtu.be/ewnLJFIK53A, or click this one to see where Adrian comes in: https://youtu.be/ewnLJFIK53A?t=4362.

2021 June annular (partial for us) eclipse. This is one of the images Adrian shared with the eclipse stream.

W.A.S. Nightscapes

A Little Night Music

Photo by Ray Bosshard

Ray writes: “I did not expect to see the colors recorded by my camera in the pre-dawn hours of June 15th.”

Aurora Panorama

By Adrian Bradley

Created from two 29 second exposures, stitched together in Adobe Lightroom CC. Adrian says, “I also got lucky in that I captured both of those images back to back and the aurora didn't change shape a whole lot.”

The View From C.W. Sirius Observatory

Centaurus A Galaxy

When I attended the Texas Star Party this past May, known this year as the WesTex Star party due to covid, I was able to image some objects that cannot be viewed from our Michigan latitude. This galaxy Centaurus A, or NGC 5128, is called a lenticular or some call it an elliptical galaxy in the constellation Centaurus.

NGC 5128 was discovered on 29 April 1826 by James Dunlop during a survey at the Parramatta Observatory in Australia. Located approx.15 million light-years from earth, Centaurus A has a nice dust lane that runs through the center, which is easily visible using a larger telescope. In 1847 John Herschel described the galaxy as "two semi-ovals of elliptically formed nebula appearing to be cut asunder and separated by a broad obscure band parallel to the larger axis of the nebula, in the midst of which a faint streak of light parallel to the sides of the cut appears."

Centaurus A galaxy is also the fifth-brightest in the sky, making it an ideal amateur astronomy target. It is only visible from the southern hemisphere and low northern latitudes.

The center of the galaxy contains a supermassive black hole with a mass of 55 million solar masses, which ejects a relativistic jet that is responsible for emissions in the X-ray and radio wavelengths. By taking radio observations of the jet separated by a decade, astronomers have determined that the inner parts of the jet are moving at about half of the speed of light. X-rays are produced farther out as the jet collides with surrounding gases, resulting in the creation of highly energetic particles. The X-ray jets of Centaurus A are thousands of light-years long, while the radio jets are over a million light-years long.

Like other starburst galaxies, a collision is suspected to be responsible for the intense burst of star formation. Models have suggested that Centaurus A was a large elliptical galaxy that collided with a smaller spiral galaxy, with which it will eventually merge. For that reason, the galaxy has been for years under particular interest by astronomers. While collisions of spiral galaxies are relatively common, the effects of an elliptical and a spiral collision are not fully known.

If you have the chance to visit the lower states, bring your binoculars. A telescope would be better, but Centaurus A can be viewed using binoculars. I imaged this one using my 102mm refractor and ZWO 071 camera. It is comprised of 6 ½ hours of integration time. I highly recommend attending either the Winter Star party in the Florida Keys, or the Texas Star party, to view all of the southern beauties that we can't see from Michigan.

And now for something completely different…

(Continued on page 11)

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

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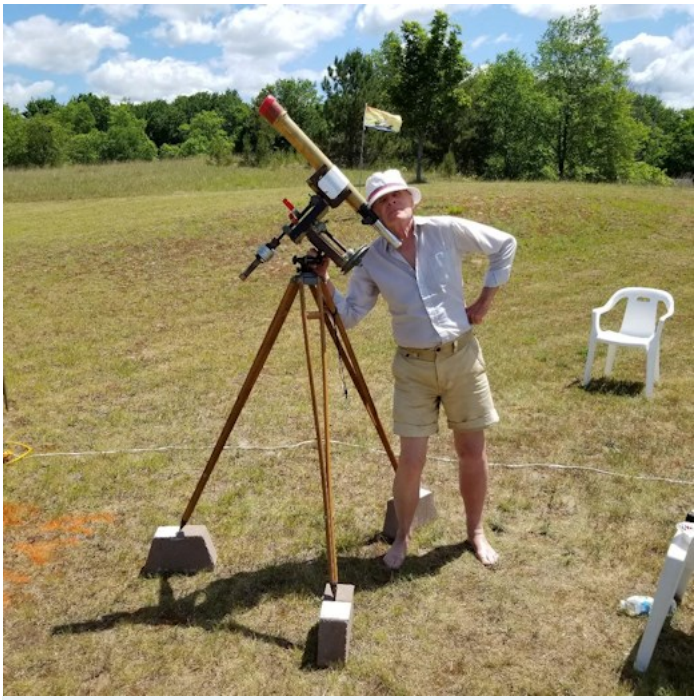
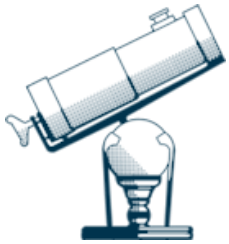
Here are some other "views" at Cadillac West:



Gary Ross "the 1st greatest observer in Michigan" preparing for a night of variable star observations at the Cadillac West astronomer get together.

The esteemed GM Ross hard at work. Rich Brenz in the background with his 6" refractor.



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.

From the Desk of the Northern Cross Observatory

This month I did some more testing, as I switched out the Canon T3i camera for my ZWO asi071mc PRO camera, connected to the Canon 300mm f/4 lens. I borrowed a coupler ring that allows for remote focusing. This way I can use the astrophotography cameras cooled to a temperature of 0C and automatically keep focus and running this way with Sequence Generator Pro as the automation software. Piggybacked on the 10" provides autoguiding. The testing went well.

The target this month was in the region of the Milky Way where the Trifid and Lagoon Nebula are located.

I collected 60 x 120 second light frames, 50 flats and 24 dark frames to generate this 2-hour integrated image.

The Trifid Nebula (top) is an H II region in the north-west of Sagittarius in a star-forming region in a nearby spiral arm's Scutum-centered part. The Lagoon Nebula (bottom) is a giant interstellar cloud in the constellation Sagittarius. It is classified as an emission nebula and as an H II region. – June 15-16, 2021

-Doug Bock

Presentations

Monday, July 5, 2021

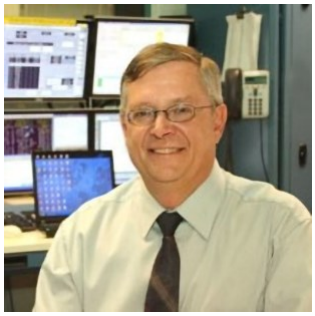
Virtual Presentations

Main Talk:

By Doug Bock

With over 5 decades of observing, astrophotography and astronomical outreach under his belt, Doug Bock has heard and asked a lot of questions. In this talk he will cover types of equipment, methods for observing and nomenclature, that a beginner and/or intermediate observer will or has asked about during their journey through this hobby.

About the Speaker



Past President, VP and Editor for the Warren Astronomical Society

Member since the Spring of 1973

Member of ½ dozen other clubs over the years.

Chairman and Vice-Chairman of the Great Lakes Region of the Astronomical league in the early '80's.

Retired from Ford Motor Company at the end of 2018

Owner and operator of the Northern Cross Observatory

(Continued on page 14)

Thursday, July 15, 2021

Virtual Presentation

By Brian Ottum

Astrophotography is the fastest-growing facet of our hobby. New digital technology is making it possible to take shots that only professionals could just a couple decades ago. However, astrophotography can be a HUGE investment in time and money. The joys can be higher than with visual astronomy, but the frustrations can be greater as well. Brian will show you how to get started while preserving your sanity and wallet.

About the Speaker

Brian has been an avid amateur astronomer for nearly 50 years, launched by seeing a lunar eclipse. He has done a lot of different things:

- Traveled to see 4 total solar eclipses
- Spent a summer at Bryce Canyon National Park as a volunteer "Night Sky" ranger
- Member of 6 different astronomy clubs
- Dedicated the Port Crescent State Park "dark sky preserve"
- Co-author on a comet nucleus research paper
- Installed a remote-control astrophotography rig in the NM desert
- "Astronomy at the Beach" booster

Brian was going to get a Ph.D. in astronomy, until he visited actual astronomers in AZ and found out that they spend their days doing math and sitting in front of computers. He eventually got a Ph.D. in market research and spends his days doing statistics and sitting in front of computers.

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 Dale Partin at:

firstvp@warrenastro.org.

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Short Talk:

By Gary Ross

Even the most seasoned observer in the field can make a mistake when approaching a phenomenon *ab initio*. What started as the final observation in a 2020 report on carbon stars to authors in the Observer's Handbook, ended in confusion, ennui, recrimination, and self-contempt. These reactions were shared with others who were foolish enough to lend a hand. Their identities duly will be revealed. To date R Fornacis has eluded us, but the report was sent to Toronto any way.

About the Speaker:

Member, Warren Society and Grand Rapids Astronomical Association. One of the last of the old-line observers, began exploring the Wonders of the Universe with father's 8X30 binoculars mounted on a work bench, 2nd Eisenhower administration. Continuing dispute whether first or second greatest observer in Michigan. Has never used "go-to", "push -to", or even setting circles.

Never taken a digital astro-picture, with no intention of starting.

Once the Grand Duke of Urban Observing until Royal Oak house was sold.

Once the Archbishop of the James C. Veen Observatory -- which he helped construct -- until the mighty Jeffery Borr Telescope suffered a karmaic occlusion, but not responsible therefor.

Gave up the Life of the Mind, February 2020, when the Michigan Academician rejected for 2nd time a paper on aquatic biology.

Fired for incompetence, Wayne Oakland Science Olympiad.

Fired from Grand Rapids Bar Association for attempting to take over the organisation. Wore a beard in 1990, but only to appear on the musical stage, with no intention of starting.

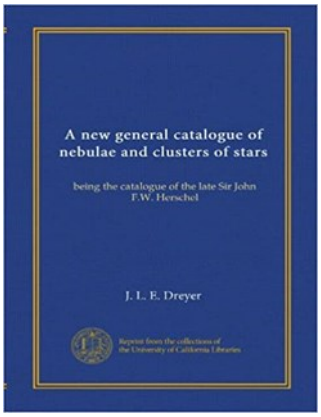
Here's a photo of the esteemed GM Ross using the infamous "solid gold-plated" 6 cm refractor at Cadillac West. Photo by Bill Beers

Another capture of the rising eclipsed sun at the Pointe Aux Barques Lighthouse by Adrian.

The New General Catalogue

Lifetime Achievement Award for Amateur Observers

Guest article from Brad Young, Tulsa Astronomical Society

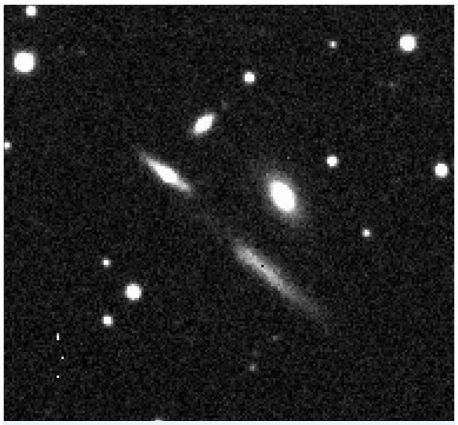


Many amateur astronomers are familiar with the NGC - the New General Catalogue. It is a comprehensive list of deep sky objects that was compiled by John Louis Emil Dreyer in 1888, before the widespread use of astrophotography. For many people, it represents a daunting challenge for optical observing, both due to the sheer number of objects involved, and the fact that it extends through both hemispheres of the sky. However, for those who choose to take it on, it can provide a penultimate optical observing challenge and many nights of observing joy along the way.

I first began to consider observing all the NGC objects as I was finishing up all the Herschel objects in 2016. I had already optically observed quite a few of them by that point, and naively assumed it would just be another level of commitment. Having had the chance to go to the southern hemisphere before, I had even knocked off quite a few objects down there, including all of the Caldwells, several showpiece items and both Magellanic Clouds. So, what could it hurt? I might as well go ahead and finish when I started.

My first thought was to do a survey level imaging run of all the NGC objects I hadn't already visually sketched. I typically sketch all objects that I see through the telescope, so going back through nearly 100 volumes of records, I was able to determine which ones I needed to image. This was made much easier by access to remote telescopes, especially the one in Perth Australia. When I refer to survey level of quality, the intent was more to support how to approach viewing them than to provide good images of the objects. I'm not a good imager, and was really more interested in figuring out which objects are realistically available to what size instrument and whether they were objects that I might have seen before, adjacent to sketched targets.

That part of the project only took a little more than a year and lulled me into a sense of complacency. After all, if I can image it, I can see it, right? So, armed with my 22" Obsession, and my own obsessive personality, I began my journey into the rest of the catalog visually.



My image of NGC 4169, 4173, 4174, 4175 (“The Box”)

As with any observing program, planning is essential, especially when taking on over 7,000 objects. Since I wasn't sure when I would get back to the southern hemisphere, I began by limiting myself to everything above -30˚ declination. Since I live at 36˚ North, and all of my observing sites are near that latitude, this seemed like a reasonable cut off point.

Next came the seasonal adjustments both for location in the sky and my availability for observing. Spring is particularly bad in Oklahoma, which doesn't flange up well with the fact that there are so many NGC objects in the spring sky. I knew that

(Continued on page 16)

(Continued from page 15)
would always be a pinch point and determined that every single clear night not overwhelmed by the moon would need to include observing. Then, in the fall, at the Okie-Tex Star Party, I would have a famously ink black sky to check off the other items as best I could in one week a year.

Part of the plan was trying to figure out how long this might take. Based on an aggressive estimate of about 20 objects a night, tempered by the fact that three or four months of the year I wouldn't be able to observe it all, I figured I could do something like 20 nights a year or 400 objects a year. Since I started off with 3,764 objects to go, I assumed I could finish in about 10 years. I added a few years due to the vagaries of weather and my advancing age (I started at age 52).

As for the status update and lessons learned so far, I have gotten to the point where I'm 64% through the list:

	OVERALL	FROM START
Total Objects Cataloged	7840	
Non-Existent	494	
Total Existent	7348	
Sketched	4704	3584
Remaining Objects	2644	3764
Progress	64%	30%

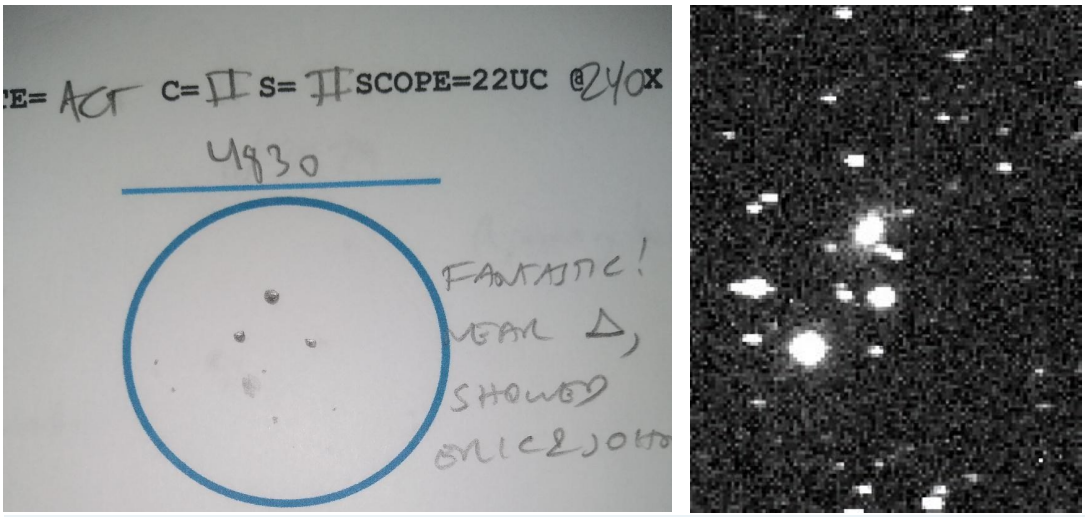
However, as many of you know, NGC objects tend to be a lot of galaxies, and these are often found in clusters. With such a daunting task in front of me I took advantage of that fact and finished quite a few on the list via observing galaxy groups. Coupled with the fact that my early emphasis was on southern objects, since these present the least availability for me in the northern hemisphere, there are still an awful lot of objects all over the sky and the ones that are left tend to be the faintest and most remote.

As far as the lessons learned so far, these have been legion. For one, much like galaxy clusters, observing nights tend to come in clusters and so I have learned not to canvas one area of the sky so that the next few available nights there's "nothing up there to see." I've also resisted the temptation to look at Index Catalog (IC) objects along the way; if for some odd reason I am able to finish the NGC list I'll go back and look at those. They cause quite a distraction if you allow them.

I would be doing the reader a disservice if I didn't mention to crucial decision of what list to use. The new general catalog is famous for its imperfections. The original NGC contained 7,840 objects. Many of these were later found to be duplicates, non-existent, or just stars. There is a good account of all the different attempts to reconcile the catalog from Astronomy Magazine: NGC Primer The gist of it is that when I started my journey, I used the SEDS list as published by the Saguaro Astronomical Society back in 2016. However, after reading the article I decided to go back and revisit the list I was using against the recently published NGC 2000. This turned out to be a real bear of an exercise. Not only was it hard to reconcile everything, again mainly due to the sheer volume involved, but it began to erode my confidence.

I finally decided on using the SEDS list as is. A spot check seemed to indicate that they were the same. But beware, if you intend on attacking this observing challenge, make sure you compile your list with a trusted source and don't try to change things midstream. It is confusion.

(Continued on page 17)



NGC 4830 (sketch and my image, neither does it justice)

(Continued from page 16)

But by far the most interesting lesson I've learned is that even though these objects do tend to be "end of season sale" faint galaxies for the most part, there are quite a few that have been surprisingly bright or interesting. One that comes to mind from a recent night was NGC 4830 in Virgo. I was trying to show a visitor something through my telescope but didn't want to get up on a ladder or sit down and look at anything low. My first try I had nothing to show him that I thought he would be able to see.

Later I happened upon this object a nice little galaxy near a triangle field stars, and perfectly place for both of us to stand at the eyepiece and look at it. Still, I was concerned about its brightness and wondered if he would enjoy it at all. He was delighted, in fact both of us and another observer were pleasantly surprised this unknown NGC object was such a nice view. So don't give up on the NGC objects if you start them and find several of them to be quite faint and boring. There are still a few gems left in the tailings pile and you may have a "come upon one" yourself one night.

I would appreciate any feedback from those who have completed the list visually, or anyone else currently attempting this challenge.

For selected sketches, images, discussion, and updates, please see my webpage.

-Brad Young

In Other News

In the September 2020 WASP issue, we introduced the new Astronomical League's Alternate Constellation Program. Recently the A.L. posted a video on YouTube talking about the program. Brad Young shared an email about the project:

Alternate Constellations, by Brad Young

Orion, Leo, Scorpius are officially recognized constellations we are familiar with. But other cultures have formed their own star patterns in the sky. The Alternate Constellations program explores some of these, encouraging participants to think multiculturally. If you are seeking a new, different way of looking at the night sky, this program just might be the one for you!

https://www.youtube.com/watch?v=2T0nlPd52FM

Join the Astronomical League!

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

Also:

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

Only $7.50 annually,
(Membership starts July 1)

alcor@warrenastro.org

"Nature had spoken to him."

David H. Levy with Roy L. Bishop.

Gravity is one of the most fundamental things in physics. Everything and everyone has gravity. The more massive something is, the more gravity it has. When you jump into the air, Earth's gravity brings you back down. What you cannot see while you are in the air is that your gravity brings Earth towards you just a wee little bit, off-setting the extra push away from you that your feet gave Earth when you jumped.

Isaac Newton presented the first ever mathematical description of gravity in 1687. I admit that I know nothing about gravitation, except that it is all around me. I do recall the myth that Newton was sitting under a tree when an apple fell on his head. Supposedly, he then formulated his law of gravity. Did the apple actually fall on his head? I doubt it. But at his childhood home in the village of Woolsthorpe, England, he probably did witness an apple fall from a tree.

During the last half of the nineteenth century physicists realized that Newton's theory of gravity did not accurately describe the orbit of Mercury, the planet closest to the Sun. Mercury's elongated orbit precesses slightly faster than Newton's theory predicts. Several unsuccessful attempts were made to account for this discrepancy.

Newton's theory, which assumes that gravity is a force, held sway for more than two centuries, until superseded by Albert Einstein's General Theory of Relativity in 1915. A decade earlier, Einstein realized that mass and energy are two aspects of one thing, and that space and time are interrelated, a blended spacetime. With General Relativity, Einstein treated gravity not as a force, but as the geometry of spacetime. The geometry of spacetime is curved by the mass-energy of matter, and the curvature instructs matter how to move.

The picture is of Sir Isaac Newton's childhood home. It was taken by Roy Bishop. He had just visited it and was driving through a rain shower when he noticed the sky clearing. He rushed back in time to capture the house framed by a double rainbow.

Now comes the hard part. When Roy Bishop, emeritus professor of Physics at Acadia University, pointed out to me that gravitation is geometry, and not a force at all, I didn't believe him at first. But Dr. Bishop is the most brilliant person I have even had the privilege of knowing. Recently he described gravity this way, and he is right:

> "Einstein spent several years in an eventual successful attempt to include gravity in a modified description of spacetime. Early in his progress toward that goal Einstein had what he called the happiest thought of his life — that if a person were to fall off the roof of a house, while falling she would not feel a force of gravity. Before she falls, she feels the force of the roof supporting her. When her fall comes to its abrupt halt she feels the ground pushing against her. If she cannot feel a force of gravity while she is falling, why pretend that she felt a force of gravity when the roof supported her before she fell, or that she feels a force of gravity when she is lying on the ground?
>
> "When thinking about the falling lady, Einstein had the fantastic insight that perhaps gravity never was a force. By late in 1915 he had that insight in elegant mathematical form such that the resulting theory, General Relativity, can be used to make precise predictions concerning gravitation."

Einstein was elated when, on November 18, 1915, he found that his General Theory of Relativity–predicted the measured precession of Mercury's orbit. According to his friend and biographer Abraham Pais: "This discovery was, I believe, by far the strongest emotional experience in Einstein's scientific life, perhaps in all his life." Pais then continues with five words that crystallize that profound experience: "Nature had spoken to him." After several years of work, on that day Einstein knew that he was the only person on Earth who understood gravity!

Today, there are thousands of people who understand gravity. Roy is one of them. Most of us, including me, are not one of them. But reading it described so well is one of the pleasures we can feel as we try to appreciate the wonderful cosmos in which we live. Not only does General Relativity correctly predict the precession of Mercury's orbit, but it is essential to the programs used in the GPS navigation system, and it describes the gravitational waves (ripples in the geometry of spacetime) generated by two coalescing black holes, directly detected 100 years after 1915 by LIGO, the Laser Interferometer Gravitational-Wave Observatory.

(End)

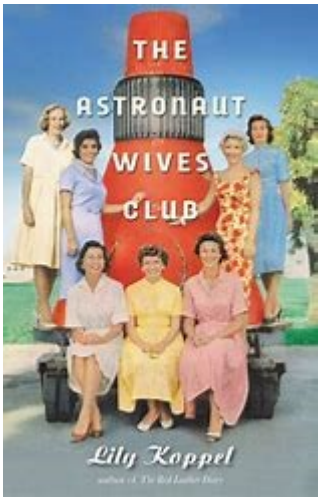
Movie Review with Diane Hall

Astronaut Wives Club

https://abc.com/shows/the-astronaut-wives-club

Episode Nine: The Dark Side

Once upon a time, there was a little website that coined the term "jump the shark"— the moment where a television show degrades so much that bizarro events are included for the sake of novelty.



Annie Glenn (Azure Parsons) and Rene Carpenter (Yvonne Strahovski) are on the campaign trail again, this time supporting RFK's bid for President. They're shown on the scene when "Bobby" wins the California primary in June of '68 so y'all know what happens next. Anyway, now that we've established that 1968 is a crap show of a year it's on with the grinding of plot & character gears. Wally Schirra (Aaron McCusker) has decided the moon isn't for him; he's going to finish the earth-orbit Apollo mission Gus would've flown and he's done. Jo (Zoe Boyle) therefore becomes the latest in the growing line of Astronaut Wives who will never achieve their original goal of being Mrs. First Man on the Moon. Given how that concept drove the early episodes you'd think it'd take more than a couple of lines of dialogue, but no. Same goes for Gordo Cooper (Bret Harrison), who has a throwaway line that lets on he still cherishes the dream of the moon, or something like that. Blink and you miss it.

Meanwhile, Marge Slayton (Erin Cummings) is delegated to help manage Harriet Eisele (Elaine Carroll), who is just about done with husband Donn. She counsels Harriet not to blow up everything over a "Cape Cookie" but then Trudy Cooper (Odette Annable) busts in and announces the result of the detective work she and Louise Shepard (Dominique McElligott) did in Florida two episodes back. Lady Louise has failed to internalize the lessons about putting up a front of perfection that we thought she was learning in the last episode. Anyway, when Marge finds out the Eisele (rhymes with "weaselly," sort of) indiscretions go far beyond Cookie escapades she enlists as Harriet's co-conspirator in embarking on the first AstroDivorce.

Meanwhile as Apollo 8 draws close, it's apparent that Susan Borman (Antonia Bernath) is now a lush, preferring the self-medication of waaaaaay too many vodkas over the pills the generic NASA doctor guy apparently dispenses to nerve-stricken Wives. Also Jo's boy Marty is a little gung-ho Vietnam war hawk who decides to ditch college so he can go win the Vietnam War by himself. Frankly I'm sorry he didn't go and get killed because he ended up going to prison for crimes against children, but whatever. And then Louise and Al (Desmond Harrington) spend the night in a hippie commune. Don't ask.

So there goes the motorcycle sailing over the shark tank. Just in case you had any doubt, being married to Alan Shepard is like being the frog who rescues the scorpion, gets stung, and gets told by the scorpion "Why the surprise? You knew my nature," except I think we're still supposed to love the scorpion and want to see the frog live happily ever after with it? Then again what I'm getting out of this show is that an ideal marriage involves lots of time apart, possibly with a chunk of the Atlantic between you, and makin' your dude sleep on the couch when he's at home. No-fault divorce laws are a good thing, yo.

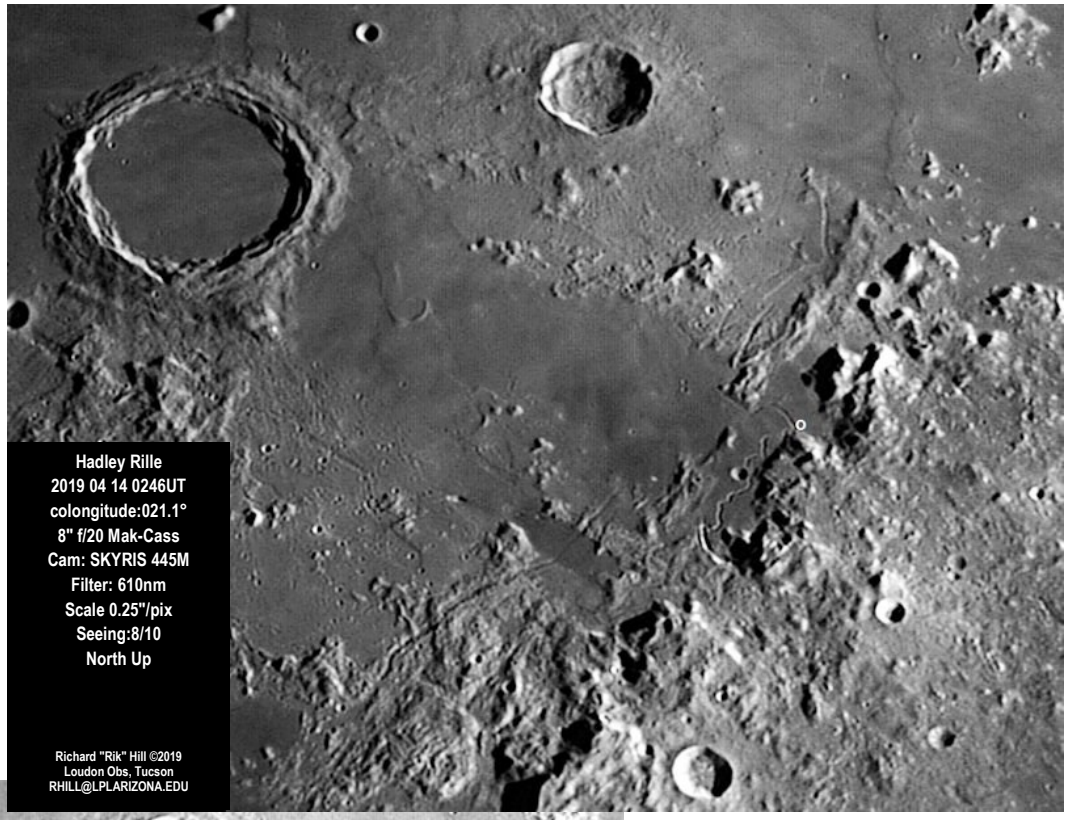
Anyway, the rote AstroWives launch party goes weird when Susan Borman locks herself in the bedroom to go write her Frank's eulogy. But of course, Apollo 8 saves 1968 so there's a happy ending and a Genesis reading for everyone. The Schirras leave Houston for Wally's post-NASA career, with the hole cut in the fence half a season ago strapped on the roof of the old sedan. And I, the example of Susan notwithstanding, need a drink.

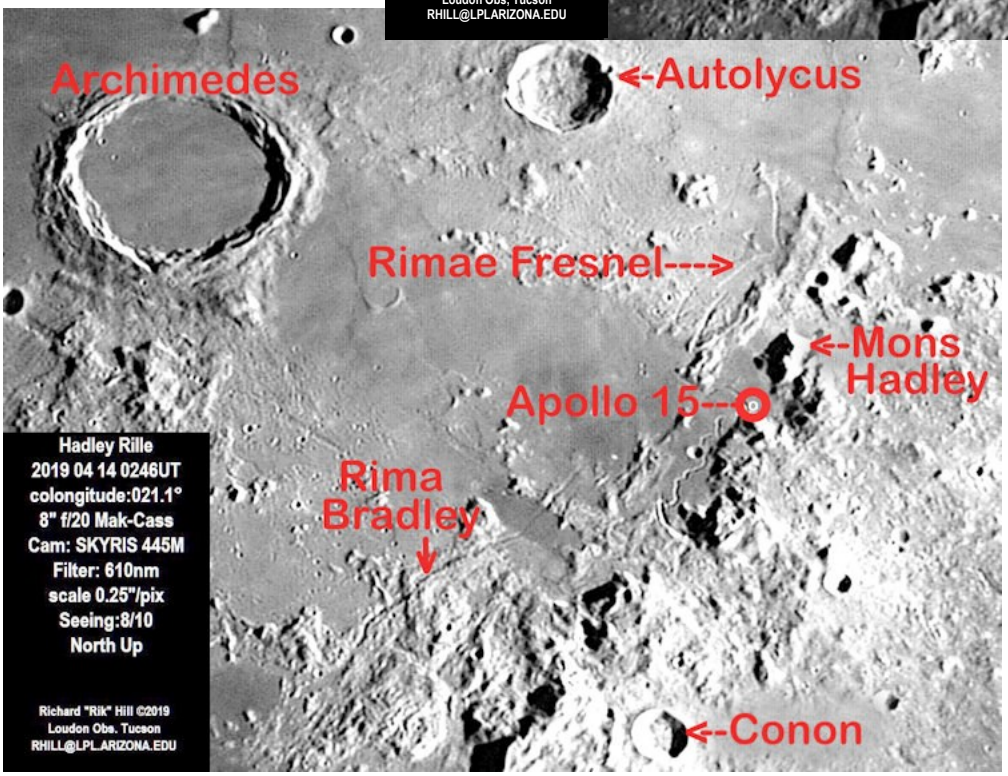
Two and a half moons out of five. The show is starting to resemble those meatloaf cupcakes from a few episodes back. Maybe it's good meatloaf & taters, but… why?

Home, Home on the Rille

I think the Apollo 15 landing site at Hadley Rille, now known as Rima Hadley, is about the easiest site to image and identify. The rima is right of center on this image and the landing site marked with a white circle. The rima is just under 2km wide at that point but quite clear in this image. The large mountain to the north is, appropriately enough, Mons Hadley reaching a height of 4800m. As it meanders northwest it curls around some mountains at which point it's only 1km wide. North of Rima Hadley is Rimae Fresnel with many fine rimae in that system. Then to the lower left of Hadley is the broad Rima Bradley.

The large crater in the upper left is Archimedes (85km diameter) a site for numerous transien phenomena over the decades and to its right is Autolycus (41km). Below them is the plain of Palus Putredinis. At the bottom of this image is the crater Conon (22km) with Mons Bradley between it and Rima Bradley rising to 4200m one of the many spectacular peaks in the Montes Apenninus that stretch well to the south of this image.





This image was made from 1300/1800 frame AVI stacked with AVIStack2 and further processed with GIMP and IrfanView.

Location maps by Ralph DeCew

History S.I.G.

July 1984

The cover of this issue is the drawing (sketch?) of the club's Stargate Observatory. This same image appears numerous (twelve times, I counted) on various issues (Perhaps when the editor is stuck for a theme?)

The remainder of the issue addresses the upcoming event of the W.A.S. Star Party and Camp Out. They didn't do just picnics in those days.

The chart, "Location of the Sun, Moon and Planets" is submitted by Raymond Bullock and an "Update on Observing Sessions" from Doug Bock completes the slender issue.

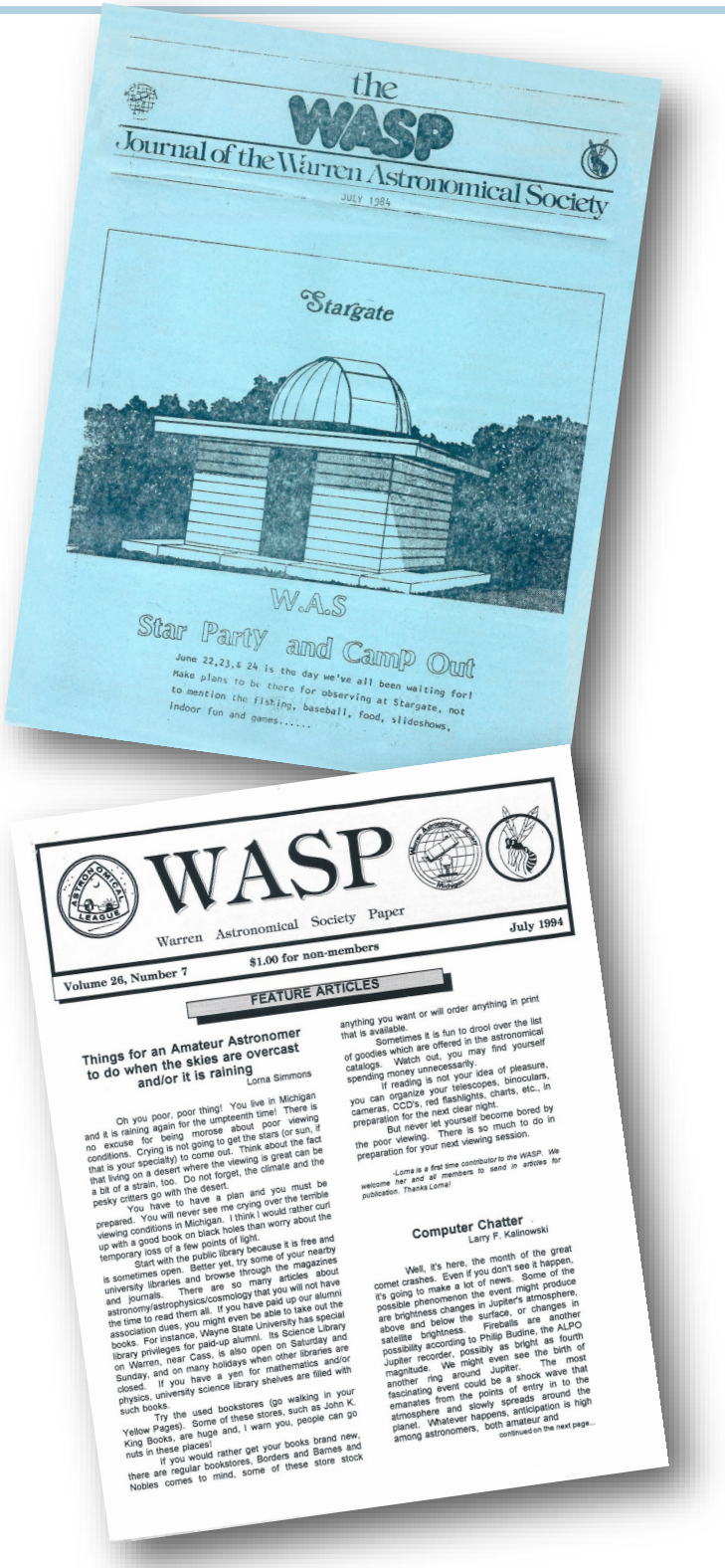
July 1994

While cover images are a thing of the past by this time (the newspaper/newsletter style front page started in September of 1989) They did at least use my favorite font for the title banner.

Before the Cloudy Nights site on the internet, we had "Things for an Amateur Astronomer to do when the skies are overcast and/or it is raining" by Lorna Simmons. Of course, there is "Computer Chatter" by Larry F. Kalinowski, the WASP's energizer bunny. Editors live for long running contributions.

On a more somber note: "In Memory"- the passing of Dean Levine, who was new to the club.

And we finish the issue with a consideration for the (then) upcoming collision of comet P/Shoemaker-Levy with Jupiter in "Comet Bash Update" by Jeff Bondono.



From the Scanning Room

I've gotten over the whole sorry business of replacing my all-in-one printer with one that couldn't do a decent duplex scan. I've worked out, or, more accurately, stumbled on a method that works quite well. The result being that I have nearly doubled the entries in the DAS archive with two days' work and gave myself something to write for this part of my report.

The rapidity of production in this case does have a downside: I left the OCR program to its own devices, rather than painstakingly reproduce the newsletters in another document processor. All this means that while the resulting PDFs are not only readable, but they look exactly like the way they were originally printed. The rub is copying and pasting the text will be a bit rough for any researcher- some repair work will need to be done on the resulting copy, but it's not overwhelming.

Dale Thieme,
Chief scanner

Looking Back

The Film Board of Canada made a documentary of the February Eclipse of 1979 by following the WAS members in their quest to view and record it.

In his introduction to the movie, Doug Bock identified some of the participants, the "movers and shakers" of the club. Here is a brief rundown of their contributions to the club. We owe a debt to their dedication and enthusiasm.

Pete Kwentus

President 1976-7

E. John Searles

Namesake of the trophy for dedication to the club

(Continued on page 23)

Airport scene from *Chasing the Eclipse*

One of the Sub-plots in the documentary was the examination and adjustment to one of the member's telescope (the scope made a brief appearance in the airport scene early in the video.)

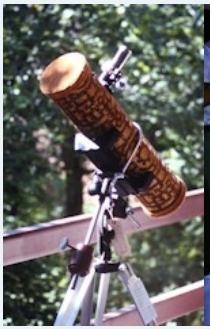
Scene from *Chasing the Eclipse*

Turns out this scope has bit of a history in the WAS:

From the August 1978 WASP- in the June 15th meeting minutes:

Nancy Wagner reported on her 4½ inch reflector telescope which she herself constructed. The 23½ focal length mirror, which took 40 hours to construct, was a real beauty: She received a certificate of merit at the Dayton Apollo Rendezvous. Lou Faix, in testing the performance of the Wagner instrument concluded the "optics were very good."

Below is the telescope on display as an entry and Nancy receiving her award. Photos by Doug Bock.



(Continued from page 22)
(Came from Toledo to attend and participate), died way too young.

Paul Strong, Judy Strong

Paul was instrumental in getting us in to Macomb College for the third Thursday meetings. Judy was 1st VP 1972-3

Frank McCullough, Dave Harrington

Frank was Recording Secretary 1968-9; 1st VP 1969 -70, 1977-8, 1991-2, 1995; WASP editor 1969-75, 1981-2*; President 1970-75, 1980-1, 1983-4; and 2nd VP 1979-80

Dave was 2nd VP 1974-6; President 1978-80

Ken Wilson

WASP editor 1973-6

Tim Skonieczny

1st VP 1971-2; WASP editor 1979-81

Don Misson

Treasurer 1976-7

Doug Bock

1st VP 1980-1; President 1981-2; WASP editor 1981 -2; Hosted star parties at his Northern Cross Observatory and continues to host the virtual observatory open house nights on Webex for the club.

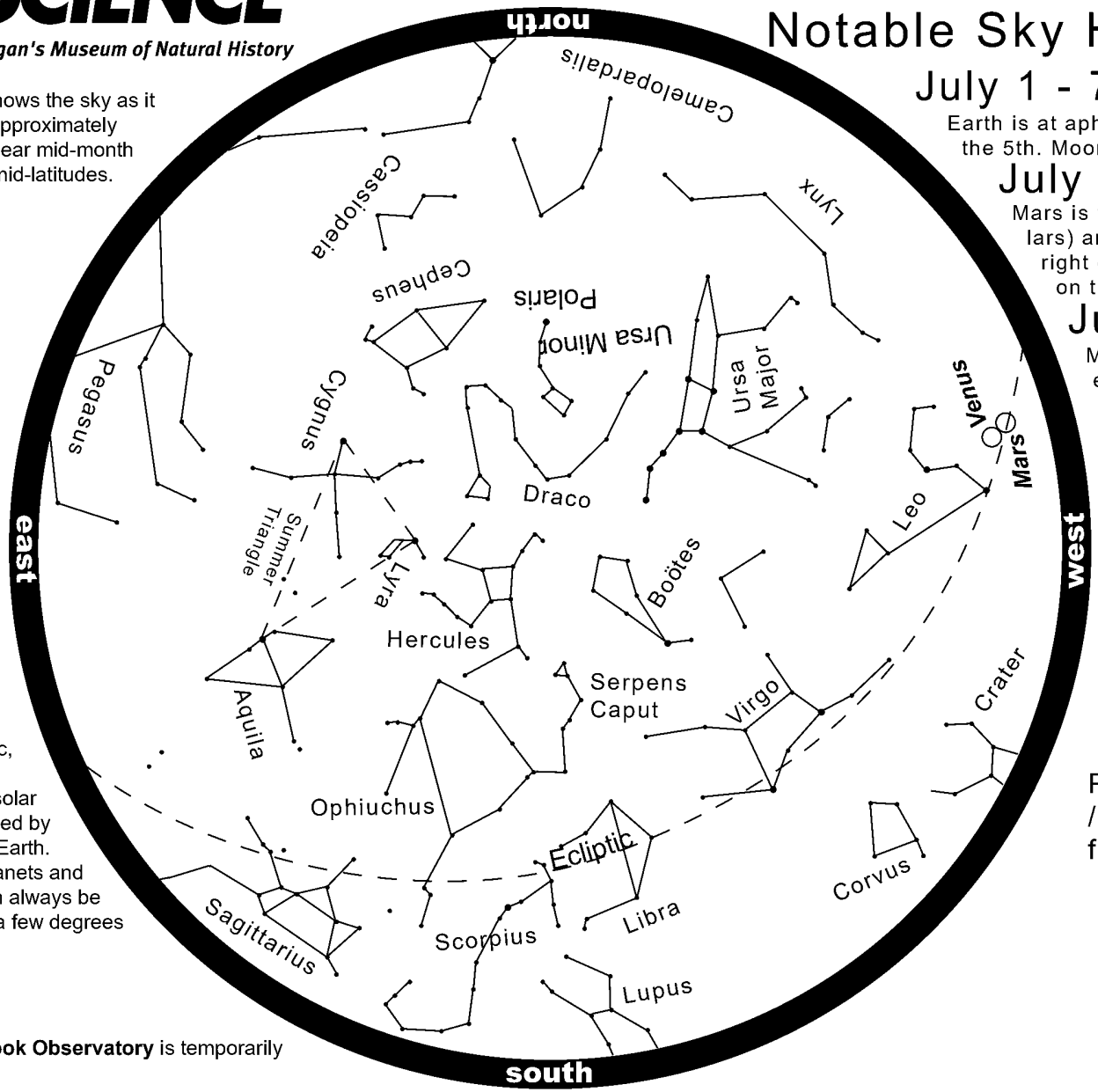
CRANBROOK INSTITUTE OF SCIENCE

Michigan's Museum of Natural History

JULY 2021

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 temporarily closed.

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 5th. Moon is above Aldebaran on the 6th (E predawn).

July 8 - 14

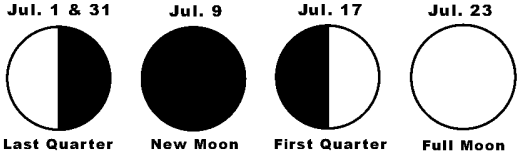
Mars is to the left of Venus on the 11th (use binoculars) and the Moon is to the right. The Moon is to the right of Regulus on the 12th. Venus is above Mars on the 13th. (All events are in the WNW evening).

July 15 - 21

Moon is upper right of Spica on the 16th (SW eve.) and upper right of Antares on the 19th (S). Venus is above Regulus on the 21st (W eve.).

July 22 - 31

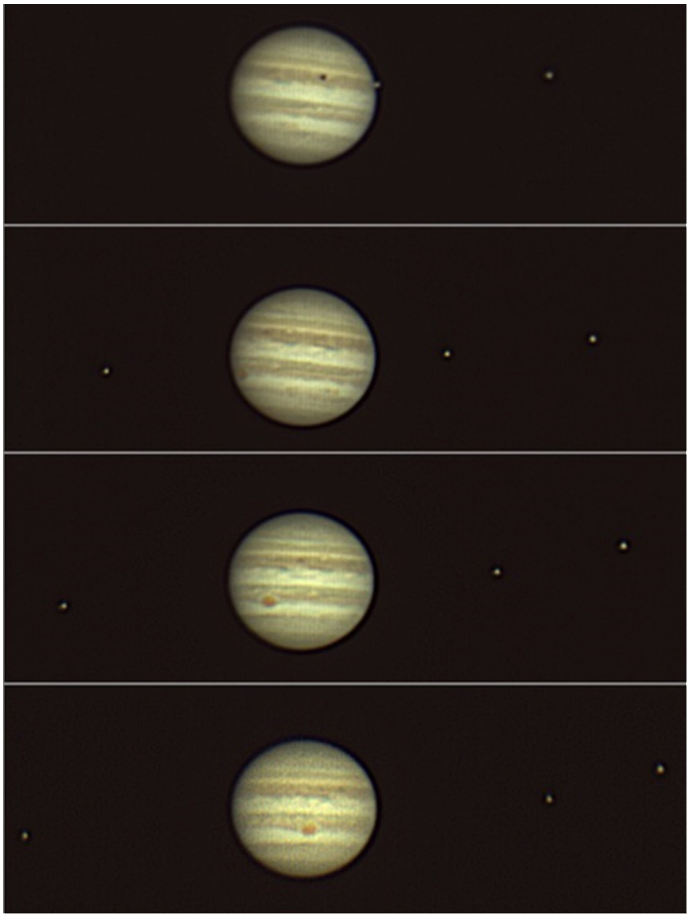
Moon is below Saturn on the 24th (SW morn.) and lower left of Jupiter on the 26th (SSW morn.). Delta-Aquarid Meteor shower peaks on the night of the 27th-28th.



Now Showing

Please visit science.cranbrook.edu /explore/acheson-planetarium for program updates.

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



John Dumar - Rotation of Jupiter with its Moons

Bob Berta - Messier 17 The Swan Nebula in Narrow Band

July 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 Canada Day (Can.)	2	3
4 Independence Day (USA) Mercury easy to see at dusk	5 Independence Day Observed	6	7	8	9 New Moon	10
11	12 Cranbrook Virtual Meeting	13	14 Flag Day (USA)	15 Macomb Virtual Meeting	16	17
18	19	20 Eid al-Adha	21	22	23 Full Moon	24 Picnic at Stargate (Tentative) Virtual Stargate
25	26	27 Delta Aquarids	28	29	30	31

AMERICAN ASTRONOMICAL SOCIETY

Register for the Satellite Constellations 2 Workshop

The Satellite Constellations 2 (SATCON2) workshop will be held virtually Monday to Friday, 12–16 July, to discuss how to implement the mitigation strategies (determined in SATCON1) to minimize the impact of satellite constellations on astronomy.

- **Workshop agenda**
- **Code of conduct**
- **Official SATCON2 web page**

Registration is free.

Register for SATCON2

SATCON2 is funded by the National Science Foundation (NSF) and the American Astronomical Society (AAS) and is hosted by NSF's NOIRLab. Jeffrey Hall (Lowell Observatory) and Constance Walker (NSF's NOIRLab) are the workshop's co-chairs.

AMERICAN ASTRONOMICAL SOCIETY

Stargate Observatory

Special Notice

Due to the measures taken during the Covid-19 pandemic On-site Star Parties and group events are cancelled.

During this time, you are encouraged, when the skies co-operate, to join the livestream with Northern Cross Observatory on the open house schedule (4th Saturday of the month)

Past livestream are available on the Warren Astronomical Society's YouTube channel:

https://www.youtube.com/channel/UC12jUX4Gmweg6fTtUuqa8CQ

Observatory Rules:

1. Closing time depends on weather, etc.
2. May be closed one hour after opening time if no members arrive within the first hour.
3. Contact the 2nd VP for other arrangements, such as late arrival time. Call 586-909-2052.
4. An alternate person may be appointed to open.
5. Members may arrive before or stay after the scheduled open house time.
6. Dates are subject to change or cancellation depending on weather or staff availability.
7. Postings to the Yahoo Group and/or email no later than 2 hours before starting time in case of date change or cancellation.
8. It is best to call or email the 2nd VP at least 2 hours before the posted opening with any questions. Later emails may not be receivable (secondvp@warrenastro.org).
9. Generally, only strong rain or snow will prevent the open house... the plan is to be there even if it is clouded over. Often, the weather is cloudy, but it clears up as the evening progresses.

Advisory: Concerns are circulating in the amateur astronomy community about COVID-19 being passed from one person to another via contact of different persons' eyes with a telescope eyepiece. While we are not medical experts, we thought we should pass on this concern. Sharing telescopes may be considered by some to be high-risk due to the possibility of eyes touching eyepieces.

Stargate Report

Observatory report for July 2021.

Stargate observatory and the Dob shed along with all equipment are in good condition as of June 19, 2021.

There will be no open house in July due to COVID-19 pandemic. The plan is to return to in person observing starting with the WAS picnic planed for the open house date on August 28. The observatory will not be used however, members may set up their telescopes near the observatory.

Virtual observing or discussion may be possible from Northern Cross Observatory (NCO) depending on weather and if Doug Bock is available to host it. Use the same WebEx link from last meeting and join online starting at 8 pm on July 24.

Riyad I. Matti
2021 WAS 2nd VP
Observatory Chairperson

Treasurer's Report

Bank Accounts:

Main - $22,814.43

GLAAC - $3279.84

PayPal - $651.33

Memberships: 176

We paid for 75 members' renewals to the Astronomical League this year. We also sent in an updated roster. Total spent on renewal was $596.37. If you are unsure of whether or not your name would be on the list for an A.L. renewal, please contact me at treasurer@warrenastro.org.

Adrian Bradley,
Treasurer

amazonsmile
You Shop. Amazon Gives.

If you're shopping on Amazon, make sure to use Amazon Smile. It costs you nothing, and if you select us as your charity, Amazon will donate 0.5% of every purchase you make to the Warren Astronomical Society.

Astronomical Events for July 2021

Add one hour for Daylight Savings Time
Source:
http://astropixels.com/almanac/almanac21/almanac2021est.html

Day	EST (h:m)	Event
01	16:11	LAST QUARTER MOON
04	15:00	Mercury at Greatest Elong: 21.6°
05	09:48	Moon at Apogee: 405342 km
05	18:00	Earth at Aphelion: 1.01673 AU
06	17:41	Moon at Ascending Node
07	23:38	Mercury 3.7°S of Moon
09	20:17	NEW MOON
12	04:10	Venus 3.3°S of Moon
12	05:10	Mars 3.8°S of Moon
12	19:00	Mars at Aphelion: 1.66596 AU
13	08:00	Venus 0.5°N of Mars
17	05:11	FIRST QUARTER MOON
20	07:06	Antares 4.7°S of Moon
20	08:22	Moon at Descending Node
21	05:30	Moon at Perigee: 364520 km
21	16:21	Venus 1.0°N of Regulus
23	20:00	Mercury at Perihelion
23	21:37	FULL MOON
24	11:42	Saturn 3.8°N of Moon
25	20:17	Jupiter 4.2°N of Moon
27	22:00	Delta-Aquarid Meteor Shower
29	09:09	Mars 0.6°N of Regulus
31	08:16	LAST QUARTER MOON

Outreach Report

In my last two "In the Sky" posts for the Vatican Observatory, I've discussed the Hubble Space Telescope being down, and NASA's attempts to diagnose the problem. As I'm writing this, there have been few updates - it's looking pretty dire.

> I'm seeing a lot of "Repair the Hubble" posts – this IS possible, the Shuttle is not the only spacecraft that can service the Hubble. Astronaut Andrew Feustel told me that during the last Hubble servicing mission, he installed a bar on the bottom of the telescope – this bar can be latched onto by a robotic mission to either de-orbit or boost the Hubble. I've not seen any plans by NASA, yet, to repair the Hubble, but it might be interesting to see if some private space industry could do it.
>
> But if the Hubble was repaired, the mission would need to be extended, engineers would be needed to support it, and it would need continued funding… funding that could go to newer space telescopes and exploration missions. Think about it this way: how much sense would it make to fly from New York to Sydney to install brand new, top-of-the-line memory into your Mom's old Windows 95 PC?

I can't actually believe I wrote that! But seriously, as historic and iconic as the Hubble is, its factory warranty ran out a long time ago. It gave us an *astoundingly* good run!

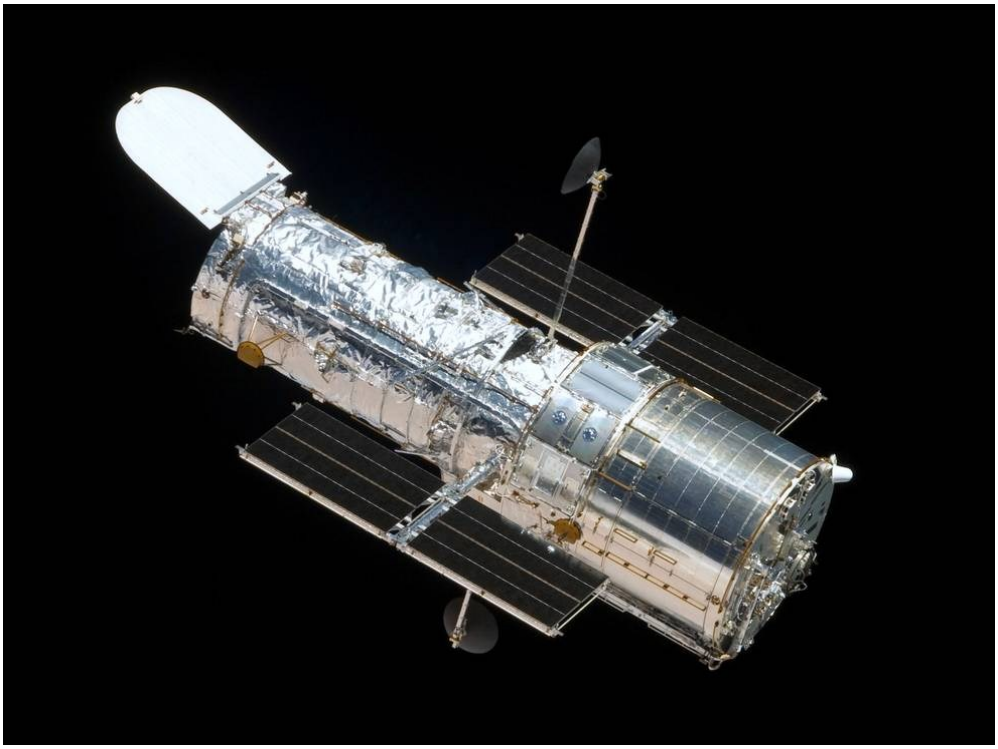


Image Credit:NASA/JPL-Caltech

Member Spotlight

Adrian Bradley had two of his images shown during a live-stream of the eclipse:

10 June 2021 Annular Solar Eclipse - https://youtu.be/ewnLJFIK53A

Ken Bertin continues his weekly "**Report on Objects in Space**" via Facebook each Wednesday. Ken says he's getting positive feedback on each of them.

If you are giving presentations or doing other astronomy outreach, *please let me know!* Use this link to send me a quick email report.

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Great Lakes Association of Astronomy Clubs Board Meeting

June 10, 2021 - ONLINE, 7pm

https://umich.zoom.us/j/584733345

AATB 2021: September 24/25, 2021

Call to order: 7:08 pm

Online:

1. Adrian Bradley - GLAAC President, Lowbrows
2. John Wallbank - GLAAC Vice President, Lowbrows
3. Jeff Kopmanis - GLAAC Secretary, Lowbrows
4. Bob Trembley - VOF, WAS
5. Mike Ryan - Ford
6. Brian Ottum - Lowbrows

Discussion:

AATB 2021 - In-person Event?

DNR Guidance:
- Drinking fountains are closed
- Limits on indoor activity
- Outdoors: masks for unvaccinated
- Try to maintain social distancing
- No limits to attendance

Touching on eyepieces may still be an issue

What will happen in September?

WAS:
- Return to outdoor outreach events in August
- Discussion about touchless
- Do we trust vacc/no-vacc status stated by crowd?

What can we do to make things touchless?
- Online forms for surveys, checklists, etc
- Screens to display what the telescope is seeing

Core of AATB has been visual astronomy at the eyepiece
- In-person views bring meaning to the abstract
- Return to tradition or change in focus?
- 2020 was heavy in presentations and talks, while traditionally, observation (visual and digital) might be where 2021 is focused
- Eyepiece observing is more family-oriented while virtual is less so
- Club Members enjoy the “showing off” to the public

Objective: sharing our passion of astronomy with the public

Telescopes: have an operator and a knowledgeable narrator/kibitzer

Brian: We do not know:
- DNR policy/feelings
- Participation of volunteers and attendees
- Probably won’t have herd immunity

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Does a vaccination expire and when?
Do we have liability if there is an outbreak? *No. DNR does*.

AB and JW will be meeting next week regarding bank transfers

Sept 24: JK will not be present 6-9pm.

Adjourn:

Motion to adjourn by AB, seconded by JK. Approved by unanimous vote.

Meeting Adjourned at 8:06 pm

TODO - June:

Brian: Fan-out to clubs for prospective telescope field volunteers and attendees

Please consider masking and safe-distancing if you are not vaccinated

JK: Hot Spots from ATT/Verizon/Comcast

JW: Contact Bridgett about DNR attending on July 8

AB & JW: establish new account

TODO - May:

Speakers for AATB

BT: Ask to start trolling for speakers

JK: check out **Mobile-Cause**

JK: Have Bob create an outreach/contact page that we can refer people to

Next GLAAC Meeting: July 8th @ 7:00 PM

Save the Date!

AATB 2021: September 24/25, 2021

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Michigan Dark Sky Update
(Edited from emails from Sally Oey)

Washtenaw County & Scio: Scio Planning Commission chair Jan Culbertson is now on board with following up on complaints about roundabout lighting, joining Scio Supervisor Will Hathaway. In a meeting with the Washtenaw County Road Commission and DTE on May 12, they were able to persuade WCRC to review the lighting plan for Liberty/Zeeb, which will start construction in Aug. It seems that WCRC is setting a standard that is **400% brighter** than the spec from the Illuminating Engineering Society (IES), for unlit intersecting roads (0.7 footcandles). They want consistent specs throughout Washtenaw County. Jan says that WCRC is setting the spec, not DTE. Scio Twp will request WCRC to follow the IES spec. **We have a big opportunity -- could we please have a few Washtenaw County residents volunteer to write WCRC in support?** I have template text you can use and email addresses -- super easy. Please help make roundabout lighting safer and prevent garish lighting in the county!

Chelsea: The Chelsea DDA put Chelsea Dark Skies on their meeting agenda for May 20. Steve Wright presented the group's pitch and request to use shielded streetlights instead of the currently unshielded acorn design. Several other CDS members joined and provided public comment. City Administrator John Hanifan seemed supportive and engaged, and requested info about shielding for the models used. Sandy Peterson and Steve had already identified some options for shielding, and this info is being forwarded.

Detroit, Belle Isle Urban Night Sky Place initiative: We have an exciting new initiative to develop dark-sky educational programming! Amy Greene, BI Nature Center Director; Megan McCullen, Wayne State Planetarium Director; and Paulette Epstein, Michigan Science Center Director of Science and Theaters are the core collaboration within a subcommittee of Jerry Hasspacher's group. A new TBD Detroit Audubon program director is also expected to join. Still no invitation to present to the BI Park Advisory Committee, however.

Detroit, Beacon Park: Heidi Trudell and Sally Oey wrote in support of an effort to mitigate the eponymous beacon. DTE is in the process of reprogramming some of its lights. They seemed interested in the bird migration issue.

Ann Arbor: Council Member Erica Briggs shares that the Planning Dept projects our draft Lighting Ordinance to go to City Council in the next couple months. In August it will be a year since it was approved by the Planning Commission.

Upper Peninsula: Tyler Barron shares that the Environmental Law and Policy Center is making progress with their initiative to name 4 new federal Wilderness Areas in the U.P. They expect to have a project website soon. Michigan Dark Skies is one of many co-sponsors.

Meg Gower's new children's story book proposal on dark skies has been accepted by the Astronomical Society of the Pacific! It's titled *Milky Way* and projected to be published in 2023.

Pat Seitzer and Kay Fuller share info on the Lights Out Philly program to help birds during the migration season. They have a beautiful website -- maybe Michigan could also launch a website? Pat notes the availability of avian radar systems, in case that helps. Heidi Trudell shares US Fish & Wildlife Service info promoting red, flashing lights for communication towers. Flashing reduces light pollution and helps birds, too.

July 12 - 16 NSF's NOIRLab and the American Astronomical Society will host another virtual conference on satellite constellations, SATCON2. There are Working Groups on Observations, Algorithms, Community Engagement (including indigenous rights), and Policy.

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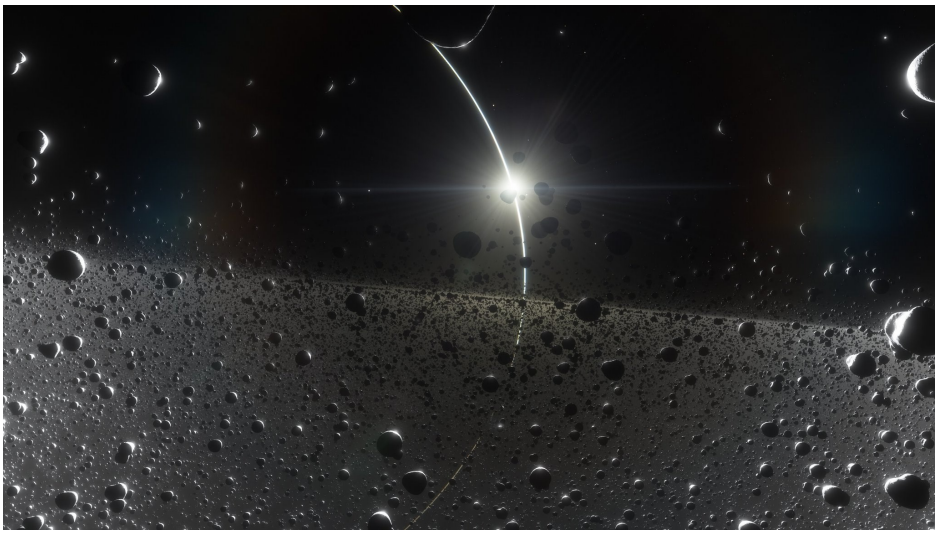
SpaceEngine adds Volumetric Rings



The universe simulation app SpaceEngine has added volumetric rings, and it is absolutely a thing of beauty! Individual ring particles are now represented when you are in the ring plane - and they fade into the distance. Rings also have differential rotation - it's quite the experience to see them fly past you when you are in the ring plane!

-Bob Trembley

Meeting Minutes

MINUTES OF (VIRTUAL) BOARD MEET ING JUNE 7, 2021 @ 6:30PM

Meeting was called to order at 6:30 PM by President Diane Hall. Board Officers in attendance: Dale Partin, Riyad Matti, Mark Kedzior, Adrian Bradley, Bob Trembley & Dale Thieme (quorum present).

OLD BUSINESS

Discussion on current setup for virtual open house is OK – focus is on following the guidelines on outdoor gatherings based on CDC and state recommendations. For June and July, we will still be doing virtual open house with possible August in person open house but are waiting for Metro Parks update on their guidelines. Discussion on outreach follow-up with Scouts request for outdoor presentation – 1st VP Riyad Matti provided response to scouts regarding the protocols. A mystery of WAS property was solved when Dale Partin discovered he was in possession of our missing projector given to him after a previous event pre-COVID. Dale P. will turn over to Outreach Chair Bob Trembley in near future for future activities. Discussion took place on wiping down eyepiece after each person who views through a telescope at outreach events. This discussion will resume at next board meeting.

NEW BUSINESS

Mark Kedzior inquired if we can utilize a real time camera through telescope that can project live images on our outdoor screen on the Dob Shed for future outreach events in lieu of observing through telescope until guidelines are relaxed for gatherings. Adrian Bradley said that was very feasible as long as the telescope has good go to tracking. A camera such as the Revolution Imager does this type of capturing live images for a cost of around $300.00. Discussion will resume at next board meeting. Picnic Planning – discussion in preparing for our anticipated in person WAS Picnic on August 28th. Dale Thieme has a sign-up sheet for items and tasks for the picnic – Mark Kedzior with assist from Dale Thieme will be grillmeisters for the event. The WAS will also have a Swap Meet at this picnic so members can sell or buy new/used astronomical items. Dale Partin gave the board an update from Macomb regarding in person meetings. Macomb will be experimenting with the policy

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during the easing of COVID restrictions, but no in person meetings of the WAS at Macomb can take place because of the size of rooms we meet in and keeps us from keeping safe distancing between individuals. Diane Hall will be contacting Cranbrook to see when the WAS can resume meeting in person based on their guidelines (the Cranbrook auditorium would enable safe distancing for in person meetings). The WAS is targeting a return to in person meetings for September and continue with the virtual Macomb meetings until in person gatherings are permissible. Adrian Bradley discussed providing nonprofit tax ID info to individuals who donate to the WAS – he will follow up with this item with Dale Thieme.

Meeting ended at 7:25PM

Respectfully submitted,
Mark Kedzior
Secretary

CRANBROOK (VIRTUAL) MEETING

JUNE 7, 2021 7:30PM

The meeting was called to order at 7:30PM and a welcome to all by President Diane Hall. She then reviewed the ground rules, meeting format and etiquette of this virtual meeting and presentation so as to be enjoyed by all in attendance.

(Attendance on WebEx was 30 at 8:30PM).

IN THE NEWS (presented by Diane Hall)

Of note - Two probes to Venus with Veritas probe to orbit Venus and DaVinci probe to plunge into Venus atmosphere

Juno probe flew within 645 miles of Ganymede to look for changes since the Voyager and Galileo missions – Polar lights caused by powerful electromagnetic waves - New dark matter map has been created – Close encounter of near earth grazer interstellar object –

IN THE SKY – Annular (partial in our area) solar eclipse on June 10th will occur at sunrise with about 54% of sun's surface covered by moon which will last approximately 50 minutes – Jupiter shadow transits continue during month of June but not visible here.

OFFICERS REPORTS

President Diane Hall reported on WAS Picnic planning for August 28th – the club will be providing the grilling meats and veggie alternatives – a sign up sheet will be provided for other items and tasks for the event (which will take place as we find out more on the lifting of COVID restrictions as the time nears). Macomb College will be experimentally opening and relaxing restrictions on their campus, but in person meetings will not take place until in person meetings can take place in our regular meeting room. Macomb meetings will still continue to be virtual until restrictions are lifted.

1st VP Dale Partin announced upcoming WAS presenters: July 5th Cranbrook meeting – Lifetime WAS member Doug Bock with the main presentation "Ten Questions You Have Asked or Will Ask During Your Astronomy Hobby", preceded by G.M. Ross with his short presentation "In Search of R Fornacis". The July 15th Macomb meeting has Brian Ottum with his presentation "How To Get Started in Astrophotography – Maximize Joy and Minimize $$$". As always, short or long presentations are needed for future WAS meetings.

2nd VP Riyad Matti reports that his regular inspection of Stargate Observatory and the Dob Shed finds everything in order. A virtual Open House will take place on June 26 and also in July. The Open House for August will be reviewed as the time nears to see if it will be in person based on the state guidelines.

Secretary Mark Kedzior reports that the board and regular meeting minutes for the month of May are in the June edition of the WASP.

Treasurer Adrian Bradley reported the WAS account has a balance of $22,732.43, the GLAAC account has a balance of $3,279.84, and the PayPal account has a balance of $1,246.05. We have 176 paid memberships to date.

Outreach Chair Bob Trembley reports outreach efforts by G.M Ross at Veen Observatory, Ken Bertin with his Facebook astronomy every Wednesday, Bob Trembley did his "Tour of the Milky Way" presentation to Connie Trembley's science class in New Haven.

Publications Chair Dale Thieme reports the June WASP is on line and is continuing to scan past Detroit Astronomical Society newsletters and posting in WAS archives for members' perusal.

SPECIAL INTEREST GROUPS:

Solar – sunspots and active regions being observed – Double Star Group plans on returning to regular observing sessions in August (pending guidelines) – Astronomical League – dues for membership payable in June – Astrophotography – Doug Bock shared images taken with Adrian Bradley's 300mm telephoto prime lens – a 2 hour image of the North American Nebula NGC 7000 on May 18th – also shared images taken at our Open House – Moon, M3, M51, M97, Comet Palomar.

OBSERVING REPORTS

David Levy reports on his observations of Comet Palomar near M3, the lunar eclipse, and read a poem/quote from Thomas Hardy on an eclipse

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in 1902/03. Diane Hall (along with Jonathan Kade) reported on their viewing the spring globular clusters up north, viewing M14, M9, M5 and M13 to mention a few. Adrian Bradley shared his images of the Moon taken at Pointe Aux Barque in the Michigan Thumb.

SHORT PRESENTATION

Dale Partin introduced tonight's short presentation with bio of Kevin McLaughlin with "Thomas Kuhn and the Paradigm Shift and the Copernican Revolution". Kevin's presentation on the written work of Thomas Kuhn, with explanations using astronomy as a great example of how paradigms evolve and shift, and explain how "Kuhn's ideas are especially valid today as the world tries to adapt to new scientific data and models that may only be adopted when a substantial crisis occurs". Questions and discussion followed his excellent presentation.

BREAK – Doug Bock shared his recent images of M97 and M108 and discussed them during this time).

MAIN PRESENTATION

Dale Partin introduced Lifetime WAS member Doug Bock with bio for his presentation of the documentary "Chasing the Eclipse". Doug began his presentation with some background on this documentary – the total solar eclipse on February 26, 1979, in Brandon, Manitoba, Canada. This documentary was filmed by the National Film Board of Canada following the "one year in planning" and documentation of this expedition by the Warren Astronomical Society and other local clubs to observe this total eclipse. Before viewing the documentary, Doug previewed facts about this eclipse, and WAS members who were part of this expedition – the documentary was 28 minutes in length – this filming was eventually digitized by the NFBC from a master 16MM reel of the event, and the WAS recently obtained a copy of the digitized version to be viewed by our membership. Doug still has the original 16mm reel from the original filming.

Questions and discussions followed this showing of an important event in the annals of the Warren Astronomical Society.

Meeting ended at 9:43PM.

Respectfully submitted,
Mark Kedzior
Secretary

MACOMB (VIRTUAL) MEETING

JUNE 17, 2021 7:30PM

Meeting was called to order at 7:30 PM and a welcome to all by President Diane Hall. WAS Board members in attendance: 1st VP Dale Partin, 2nd VP Riyad Matti, Secretary Mark Kedzior, Treasurer Adrian Bradley, Outreach Chair Bob Trembley & Publications Chair Dale Thieme (WebEx attendance at 8PM – 23).

IN THE NEWS – presented by Bob Trembley

Of note: 1) One square KM Array Observatory being built in Australia and South America – 1 sq. km collection area - – requires two supercomputers to collect and process data 2) Mars Ingenuity helicopter stayed aloft for 62.8 seconds on June 8th 3) Image of impact on Mars which occurred within last five years 4) Three new missions scheduled to Venus – each will be performing specific functions in their missions 5) Uranus impact simulation showing how its axis moved to current position 6) Artemis I to perform 6 day orbit around moon – specialized mannequins (affectionately called "moonikins") on board to collect measurements on effects of radiation on humans during long periods in space 7) Asteroid 10199 Chiriko 8) 1st evidence of cell membrane molecules in space.

IN THE SKY – Sunspot 2833 visible and active – Jupiter – Saturn in AM skies – Jupiter has shadow transits occurring on 6/19, 6/23, 6/26 & 7/3 but visible in our locale – Mars-Venus in evening skies – Moon passes near Jupiter and Saturn in AM skies from June 27 – 29.

OFFICER REPORTS

President Diane Hall reports reopening plans for in person meetings are being discussed with both Cranbrook and Macomb, with Cranbrook being possible in September – the ever popular WAS Picnic on August 28th is in the planning stages and will be held barring any changes in the pandemic crisis – the WAS will be providing burgers, frankfurters, veggie burgers, buns and condiments to slather on said items – asking that participants bring a dish to share and confirmation on this item will be known as we near the picnic date – ALSO – our traditional WAS Swap Meet will take place at the picnic, providing members a chance to sell and buy some used astronomical items. Official times of picnic will be announced in the very near future.

1st VP Dale Partin announced the upcoming presentations at our July meetings: At the July 5th Cranbrook meeting, lifetime member Doug Bock with "Ten Questions You Have Asked or Will Ask During Your Astronomy Hobby", preceded by a short presentation by former WAS president G.M. Ross with "In Search of R Fornacis". At the July 15th Macomb meeting, Brian Ottum will be presenting "How to Get Started in Astrophotography – Maximize Joy and Minimize $$$".

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2nd VP Riyad Matti reports that Stargate and the Dob Shed are in good condition, and a virtual Open House is being planned pending weather conditions. Observatory still closed due to current state guidelines but are being monitored and discussed with WAS Board as for a date to return to in person meetings.

Secretary Mark Kedzior had nothing to report as of this time.

Treasurer Adrian Bradley reports that there is $22,814.43 in WAS account, $3,279.84 in GLAAC account, and $1,246.05 in the PayPal account.

Outreach Chair Bob Trembley reports that the GLAAC is in discussions regarding in-person or a hybrid version for this years' 2021 Astronomy at the Beach – more information is needed from the Metro Parks in order to finalize decision and plans.

Publications Chair Dale Thieme reports the July issue of the WASP is shaping up to be another splendid read.

SPECIAL INTEREST GROUPS

Solar: No report - Double Star Group: Anticipating return to observing in August – Discussion Group: No report – Astronomical League: Get dues in by end of month – also looking for volunteer to be AL Coordinator for the WAS – Astrophotography: Adrian Bradley reports on objects that can be imaged during the new moon: Milky Way, deep sky objects, lots of globular clusters and nebulas, the moon, and the splendid constellations of Scorpius and Sagittarius.

OBSERVING REPORTS

A partial solar eclipse occurred in the AM of June 10th – Ken Bertin reported his observation at Dane Field, Mark Kedzior observed eclipse from Harrison, MI, with first view at 6:02AM (approximately 58% of sun covered by moon) and ending at approximately 6:40AM – had extra solar glasses to share with motorists who stopped by to observe waning moments of eclipse – Adrian Bradley shared his image of the eclipse from Pointe Aux Barque in the Thumb – Mark Jakubisin captured nice images of the eclipse form Brandenburg Park in Chesterfield – photos were featured in both The Voice and The Macomb Daily publications, with a shout-out to the WAS – Diane Hall and Jonathan Kade were able to view the last 20 minutes of the eclipse due to their location.

The ALCON 2021 Virtual Event will feature David Levy as one of its presenters.

PRESENTATION

Following our customary break, Dale Partin did the intro/bio of our presenter, former WAS officer Stephen Uitti, with his review and discussion of the 2008 book "Death from The Skies" by author Phil Plait, PhD. Stephen described some of the astronomical events that occurred here on earth with facts and figures that Mr. Plait provided regarding meteors, comets, coronal mass ejections and solar flares, supernova detection, neutrino detectors and gamma ray bursts just to name a few. His presentation was followed by questions and discussion, especially in regard to the effects of CMEs.

Before the meeting ended, David Levy was able to make an appearance and read a few poems by Leslie Peltier to tonight's attendees.

The meeting ended at 9:50 PM.

Respectfully submitted,
Mark Kedzior
Secretary

About the Cover

50 years ago, another first for the Apollo program.

Apollo 15 was the first purely scientific mission (the previous lunar astronauts had geology training, but it played second fiddle.) This was also the first mission to deploy the Lunar Rover, aiding immensely in sample gathering.

The decision to land at Hadley came in September 1970. The selection of Hadley was made although NASA lacked high resolution images of the landing site; The proximity of the Apennine mountains to the Hadley site required a landing approach trajectory of 26 degrees, far steeper than the 15 degrees in earlier Apollo landings.

To facilitate driving the rover and get in and out of suits in close quarters, Scott and Irwin wore redesigned suits with slanted zippers and more flexible waists.

The mission, before departing, left a small satellite, the Particles and Fields Subsatellite (PFS-1) behind to orbit the moon. Its main objectives were to study the plasma, particle, and magnetic field environment of the Moon and map the lunar gravity field.

Apollo 15 astronauts James B. Irwin, left, and David R. Scott during a geology training field trip near Taos, New Mexico, with the Grover Lunar Roving Vehicle simulator parked at left.

For Sale

From Mark Kedzior:

TWO (2) CORONADO PST H ALPHA TELESCOPES WITH CASES

I have available for purchase two (2) Coronado PST H Alpha Solar Telescopes. Both telescopes have newly installed 656na ITF filters for excellent H Alpha views (the PST was known to have "rusting" issues with the ITF filters – both telescopes have new 656na ITF filters installed from Maier Photonics with sealed epoxied edges to eliminate "rusting" as with earlier production models). Included with each scope is an eyepiece – one has a 20mm Kellner and the other has an 18mm Coronado eyepiece, and each scope has a dovetail mounting wedge attached to install on tripods that have that mount. If not needed, the mounting wedge can be removed and then the scope can be placed on a standard photo tripod with ¼-20 thread.

Each scope will come with a case I provided after purchase for no extra cost. One case (on left) has a defective latch – the other works fine. The other case has both latches in good working order.

I am willing to sell each scope individually for **$500** (currently a new PST retails for $699) , **BUT**, if you have the urge to build yourself a bino H Alpha setup with two matching eyepieces (Howie Glatter used to make PST Bino mounts for this purpose – one may be able to find one online or know of someone who can fabricate such a mount) I will be willing to sell the pair for the firm price of **$900** – a $100 savings when you buy the pair. If this is what you are looking for, please email Mark at: bazonga952@hotmail.com with CoronadoPST in subject line, or text me at: 586-246-8288.

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
Sunset Astronomical Society: http://www.sunsetastronomicalsociety.com/
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: https://boonhill.org
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!

Observe the Milky Way and Great Rift

David Prosper

Summer skies bring glorious views of our own Milky Way galaxy to observers blessed with dark skies. For many city dwellers, their first sight of the Milky Way comes during trips to rural areas - so if you are traveling away from city lights, do yourself a favor and look up!

To observe the Milky Way, you need clear, dark skies, and enough time to adapt your eyes to the dark. Photos of the Milky Way are breathtaking, but they usually show far more detail and color than the human eye can see – that's the beauty and quietly deceptive nature of long exposure photography. For Northern Hemisphere observers, the most prominent portion of the Milky Way rises in the southeast as marked by the constellations Scorpius and Sagittarius. Take note that, even in dark skies, the Milky Way isn't easily visible until it rises a bit above the horizon and the thick, turbulent air which obscures the view. The Milky Way is huge, but is also rather faint, and our eyes need time to truly adjust to the dark and see it in any detail. Try not to check your phone while you wait, as its light will reset your night vision. It's best to attempt to view the Milky Way when the Moon is at a new or crescent phase; you don't want the Moon's brilliant light washing out any potential views, especially since a full Moon is up all night.

Keeping your eyes dark adapted is especially important if you want to not only see the haze of the Milky Way, but also the dark lane cutting into that haze, stretching from the Summer Triangle to Sagittarius. This dark detail is known as the Great Rift, and is seen more readily in very dark skies, especially dark, dry skies found in high desert regions. What exactly is the Great Rift? You are looking at massive clouds of galactic dust lying between Earth and the interior of the Milky Way. Other "dark nebulae" of cosmic clouds pepper the Milky Way, including the famed Coalsack, found in the Southern Hemisphere constellation of Crux. Many cultures celebrate these dark clouds in their traditional stories along with the constellations and Milky Way.

Where exactly is our solar system within the Milky Way? Is there a way to get a sense of scale? The "Our Place in Our Galaxy" activity can help you do just that, with only birdseed, a coin, and your imagination: bit.ly/galaxyplace. You can also discover the amazing science NASA is doing to understand our galaxy – and our place in it - at nasa.gov.

The Great Rift is shown in more detail in this photo of a portion of the Milky Way along with the bright stars of the Summer Triangle. You can see why it is also called the "Dark Rift." Credit: NASA / A.Fujii

If the Milky Way was shrunk down to the size of North America, our entire Solar System would be about the size of a quarter. At that scale, the North Star, Polaris - which is about 433 light years distant from us - would be 11 miles away! Find more ways to visualize these immense sizes with the Our Place in Our Galaxy activity: bit.ly/galaxyplace