The W.A.S.P.

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The Warren Astronomical Society Publication

The WASP

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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.

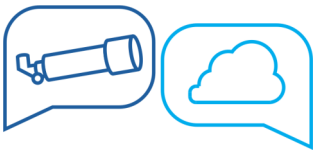
Articles for inclusion in the WASP are strongly encouraged and should be submitted to the editor on or before the end of each month. Any format of submission is accepted. Materials can either be transmitted in person, via US Mail, or by email (publications@warrenastro.org)

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 over and talk astronomy, space news,

In This Issue:

Want to keep track of W.A.S. meetings and exciting astronomical events next year?

Order your 2023 Warren Astronomical Society calendar now!

These beautiful calendars feature W.A.S. member astrophotography photos, including:

- Bill Beers - M33 - Triangulum Galaxy
- Bob Berta - Pelican Nebula
- Doug Bock - IC434 - Horsehead Nebula
- GM Ross - Aurora from Pellston, MI in 1982
- Dale Hollenbaugh - Saturn
- Jeff Charles - Moon Craters
- Ken Heilig - Ready for solar observing outreach
- Gary Klein - Geminid Meteor Streak
- Ken Meloche - M42 - Orion Nebula
- Fred Pompei - Lunar Eclipse Meteorite Strike
- Steven Tennenberg - M8 - Lagoon Nebula
- Mike Young - Faint Milky Way between the trees

And Milky Way Over the Lake by Adrian Bradley on the front cover.

Two Ways to get Your Calendar

1 If you can pick up your calendar at a Cranbrook meeting, you can pre-order on PayPal or pay by check or cash at the meeting for $20 each (email publications@warrenastro.org beforehand that you are getting a calendar so we know how many are available).

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2 If you need your calendars mailed, then the cost is $20 + $5 flat rate shipping per order (regardless the calendar count) via PayPal or by sending a check to Treasurer, Warren Astronomical Society, PO Box 1505, Warren MI, 48090 (Again, email publications@warrenastro.org ahead of time.) Be sure to include your mailing address so we can get them to you.

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President's Field of View

Astronomy at the Beach returned to an in-person event (with some hybrid components) this year, and it was a stirring if slightly melancholy experience to walk the field at Island Lake one last time as your president. Mark Kedzior, Marty Kunz, and Greg Nizio assembled the Big Dob, by far the largest 'scope on the field that evening. Jeff MacLeod had his amazing custom-built Gemini simulator, which I've dubbed "The Gusmobile" for reasons Gemini geeks will know. Doug Bock, Ken Bertin, Mike O'Dowd, and Dale Partin were all on the scene, as were many of our members who wield dual credentials and were wearing the clothes of other regional clubs under the GLAAC umbrella that night. I hadn't seen a few faces in-person since before the pandemic hit the Metro Area... and some mainstays of AatB, of course, aren't around anymore.

Astronomy on the Beach is once more truly on the Beach, with our Big Dob shining on the hill thanks to Greg Nizio and the rest of our Big Dob team. Attendance was roughly on par with our first year at Island Lake, if I remember those numbers correctly. It was good to see everyone again.

Title: The POWER of the Moon
Date Taken: September 7th, 2022, around sunset
Submitted by: Ray Bosshard

In Memoriam

Wendee Levy

1948—2022

It was with great sorrow we learned of the passing of Wendee Levy, astronomer and wife of David (Doveed) Levy. Our hearts go out to Doveed.

Wendee taught Physical Education in the Las Cruces Public Schools, the last five years of which she was Athletic Director at her schools. Throughout her career She also coached extensively in volleyball, basketball, softball, track and field, and swimming. Wendee Levy's volunteer efforts included thousands of hours with the Red Cross, during which she was an instructor trainer educator in water safety, first aid, and CPR.

She retired to be Director of Jarnac Observatory where she co-discovered 28 asteroids. In 1996, Asteroid 6485 Wendeesther was named in her honor by the International Astronomical Union. In 2004, her nomination to have asteroid No. 27776 named after her alma mater was officially approved by the International Astronomical Union. That world is now known as Cortland.

Wendee also co-hosted an internet radio program called Let's Talk Stars and served as Secretary-Treasurer of the National Sharing the Sky Foundation, an outreach organization devoted to making people look up at the stars.

In memory of Wendee, please consider donating to the Arizona Beagle Rescue or other worthy animal rescue organization.

Observing Reports

31 - 1 September

Jupiter. The N. hemis. beyond the Aequatorial Belt is completely featureless. The South Belt is nondescript & faded, so detail imposs. to describe. Great Red Spot to E. of Central Meridian, very small, probably invisible but for tint. Red-orange.

Eruptive var. stars. None of the 3 obs'd in Ori & Eri visible, one very difficult but low to horizon.

Transparency fair (at start). Seeing fair.

12" f /10 Borr II, Veen Obs'y @ 330X, 100X

6 - 7 September

Jupiter. Great Red Spot on Central Meridian. Orange-red and small, major to minor axis ~ 1.5. The deformation in the S. Aequatorial Belt makes inverted "eyebrow" for the Spot. To the east is a short span of S. Temperate Belt, but not on W. side. Above these features, no markings on S. hemis. Callisto to W. not yet at elongation. Strangely tan/ yellowish.

The Sun. 3 groups, one extensive but not dense, total of fifteen spots.

Transparency poor (Moon)/ good. Seeing fair/ good.

16" Borr II @ 160X. 5-cm. refractor @ 55X with mylar filter.

7 - 8 September

CZ Orionis. In out-burst @ 13.4 mag.

Transparency fair, seeing poor.

16" f /10 Borr II @ 250X

8 - 9 September

Jupiter. Little observed, except out of focus image showed different tints in hemispheres, slightly yellow in S. to grey-white in N. Noted again shift in colour for Callisto, "blue moon" was tan.

The problem of DH Orionis. Immediately W. of Minkata. Impression of comparison stars not in accord with chart. Present chart very recent issue.

Compromise estimate = 10.1.

Transparency poor. Seeing poor.

16" f /10 Schm.-Cass. var mags., 4" refractor.

COMMENTARY: Shift in Callisto to longer wave-length probably explained by report from N. Mich. re high altitude smoke. All so challenged in two other var. star obs'ns in Ori. At one point in session Observer asked if "losing the field". DH difficulty: Question of chart magnitudes sent to h. q. @ Cambridge last year, but chart upheld. To raise the matter again . . ..

9 September

The Sun. 3 small groups with 12 spots total. One spot "mature" with bifurcated umbra.

Transparency good.

5-cm. f /11 refractor + sub-dia. mylar filter.

17 September

The Sun. Two medium sized groups in S. hemisphere. ~ 11 spots and ~ 16 spots. Both groups with a penumbra developed spot, and divided umbrae.

Transparency good, seeing good.

5-cm. f /11 refractor, rest same.

13-14 September

Jupiter. Very little because of seeing. Elevation at transit unimp.

The Moon. Waning gibbous. Even with unfavourable libration in longitude, checked "Shining Mountain [s]" on west limb. Inconspicuous, but a feature seen, likely "false" S. M. Under high magnification a tiny bright peak, much different albedo from the mountain face. Sun very high in sky there, likely creating impression of a "snow" cap. On opposite hemisphere, 4th quadrant, terminator at approx 50 deg. (E), good analogue of D. Alter's atlas Plate 44: Altai Mtns: standing out in shadow arc (likely from impact for Mare Nectaris). How ever in setting sun-light across the "top" of M. Nectaris, a similar long feature, brightly lit. Rheita with strong central peak and seemingly terraced walls, planted on it. Both long land forms, shadow to R. and brilliant to L. describe a huge arc ~ 180 deg. around the Mare. Not possible to calculate impactor mass, but likely considerable + a vulnerable portion of early Moon's crust?

CZ Orionis. The U Gem star still in out-burst (see above), very faint in 13s".

The problem of W Ori. Var. Star Assn. "ab" and "b" charts, 2021, depict comparison stars to right and left of variable, both 5.9. Observer found it impossible to reconcile identical mags., one brighter, other dimmer than W., compromised @ 5.9 mag. W is "late" class, appearing in telescope yellow gold, and obs'd value is close to max on chart.

Transparency poor, seeing fair. Smoke?

16" f /10 Schm.-Cass. + 4" f /10 refractor, various magnif.

.....

COMMENTARY: For years, occasional problems with star chart comparison objects, duly submitted to

(Continued on page 6)

(Continued from page 5)

h. q. On one occasion "Handsome Joe" McBride made picture of DW Cyg field and sent to Cambridge. All ways resolved by technical staff as problems of colour differences, not brightness. Observer aware of shift in R. eye (eye-piece) toward longer wave-lengths at expense of bluer. See reply of head woman.

On 9/16/22 8:01 AM, G. M. Ross wrote:
Via Dolorosa. There was a problem this week, all be it in turbid sky with gibbous Moon. Optics excellent, and I did not just fall off the turnip truck.

Vide either "b" or "ab". My chart is the former, annotated last year, south at top, as God would prefer. To R. and L. are "59" stars, but I had a fine time making them equal. W was brighter than one, dimmer than the other, so as a split-the-difference man, I declared W @ 5.9.

Oh, no. No situational ethics for this boy. By inspection on ATLAS COELI they are different mags. Ditto ATLAS ECLIPTICALIS, nota bene different spec. classes. I did not consult Hirschfeld and Sinnott.

Please, return the serve . . ..
--
From: Elizabeth Waagen
To: G. M. Ross
Date: Monday, September 19, 2022 15:12
Subject: Re: W Orionis, help on the court!

Hi Gary,
I think the issue may be the color - they are very different from each other. In the table below, the B-V is in the penultimate column at the right. The V mags (field to the left of the B-V) are extremely similar, but the B-V of one is twice that of the other!
[table not forwarded]

If you don't think that would solve the mystery, please let me know.

Va bene,
Elizabeth

Elizabeth O. Waagen
Senior Technical Assistant (Science Operations)
American Association of
Variable Star Observers (AAVSO)
185 Alewife Brook Parkway, Suite 410, Cambridge, MA 02138, USA
617-354-0484 x111 (phone)

13-14 September (Supplemental)

Sigma-630 Orionis. Plotted triple on *ATLAS ECLIPTICALIS* and *ATLAS COELI*. At low mag. a double, companion judged as Position Angle 60 deg. In Hirschfeld and Sinnott, quadruple: the AB pair 50 deg. 14 arc-sec. separ. 6.5/ 7.7 (1832). Other stars: A2630 9.5 magnitude, 130 arc-sec. (1909); BC pair 0.5 sec. @ 11th mag. Given sky conditions & elev. only two components reasonably vis.

Transparency poor (+ Moon).

4" f /10 refractor @ 30X, Veen Obs.

29 September

The Sun. Three groups well distributed across disc, none with numerous spots. Only one spot with developed penumbra.

Transparency excellent, seeing poor.

5-cm. refractor with mylar aperture filter.

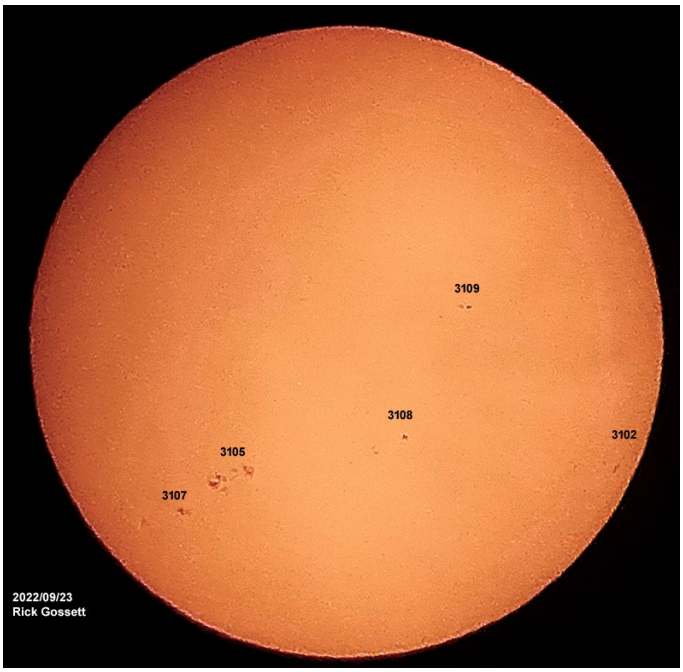
29 - 30 September

Variable stars. Observing difficult. Mag. estimates adequate for conditions, but not to ability of telescope. No objects obs'd, but most eruptives at or near min.

Transparency good. Seeing poor.

16" f /10, 340X

-GM Ross



Rick Gossett captured this shot of the sun, showing the current state of activity. Shot with 80mm, f5 refractor.

W.A.S. Astro-Images

IC 5070

The “Pelican Nebula”

Bob Berta writes:

It was taken up near Bad Ax at a campout/star party.

I finally had some time to finish the color version of the Pelican. This was with my 6" APO refractor and SBIG large format mono/color wheel.

It is a combination of RGB-L plus Ha with following combinations which is a Tony Hallas method:
Red + Ha
Green +Green
Blue + 30% Ha
Luminance + Ha

Exposures were:
L 5 at 6 min
RGB 5 each at 12 min
Ha 2 at 30 minutes

I probably spent 24 hours on this one in processing...it was quite a process. I used Maxim DL to take photos, calibrate, remove dead pixels, blooms, stack, align, and a few filters. The rest was done in Photoshop.

(Continued on page 8)

Photo: Bob Berta

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.

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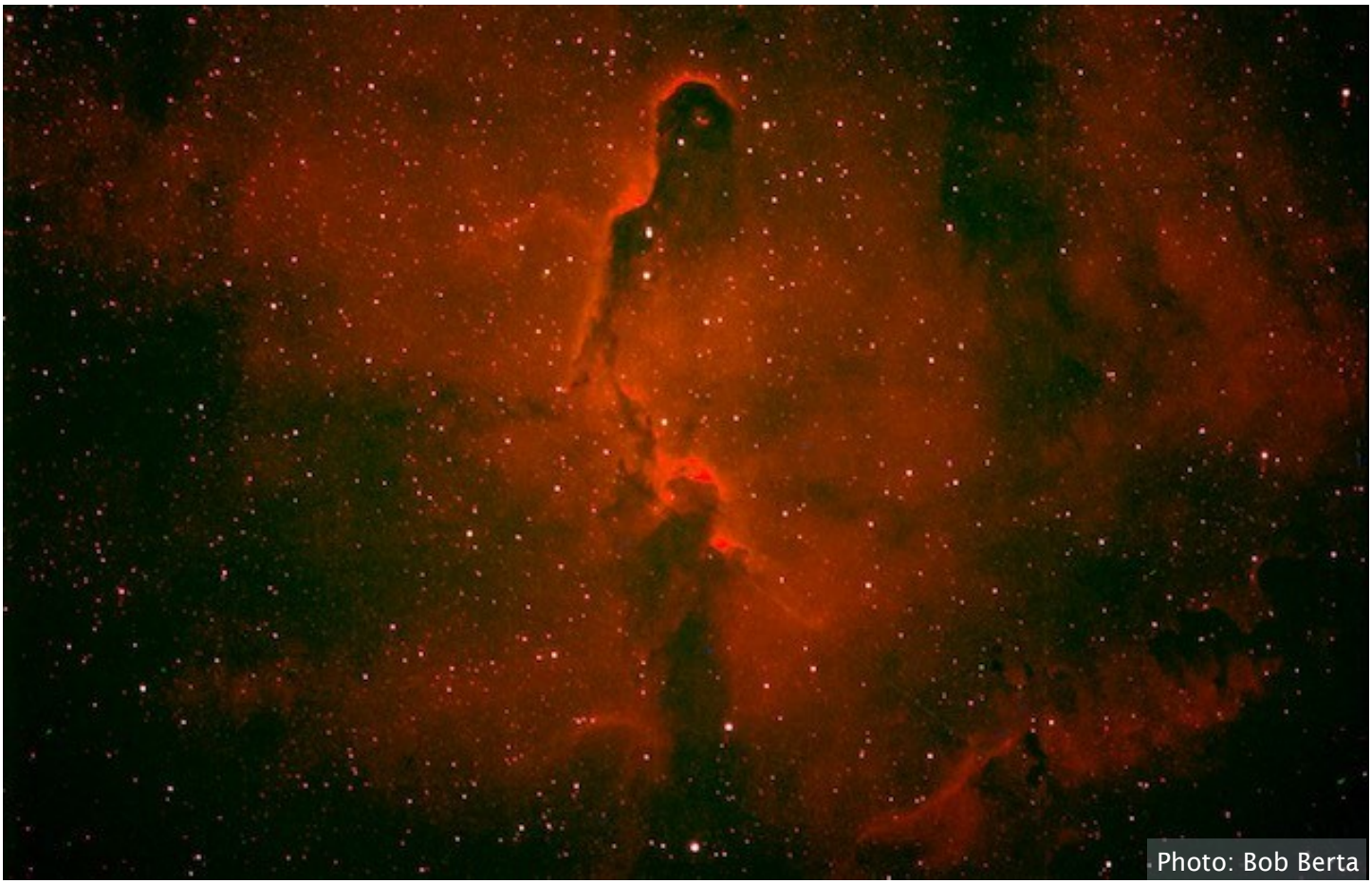
Elephant's Trunk Nebula



The Elephant's Trunk Nebula is a concentration of interstellar gas and dust within the much larger ionized gas region IC 1396 located in the constellation Cepheus about 2,400 light years away from Earth.

Bob Berta took this photo from his backyard, all in narrow band. This was taken one day before full moon and in light polluted skies.

6" APO refractor and SBIG mono camera through Ha, OIII, SII filters.

Title: Lunar Triplets
Photo by: Ray Bosshard
Date taken: 9/10/22 AM

This is one of my experiments from the last full moon. I wanted to make sure that the camera did what it claimed to do, and that I was interpreting the user manual instructions correctly. These moon exposures are separated by five minutes each. I want to use this technique whenever we have a lunar eclipse that we can actually see from start to end.

In the film days, such a photo technique would require pressing the film rewind button and cocking the shutter without advancing the film, and without shaking the camera from its established view of the sky. Nowadays, most people would do this in photoshop, which is a product that I respectfully eschew. As far as I know, the camera model that I used is the only consumer DSLR that has this feature allowing me to accumulate multiple exposures on one frame.

Next steps? Fine tune the focus, exposure, time between exposures, and maybe go to a higher millimeter lens. Stay tuned.

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Two more images, the moon and Saturn, from Rick Gossett, taken with an 8 inch SCT shooting at about f30. Extra points if you can identify the craters...

The View From C.W. Sirius Observatory

Happy Halloween!

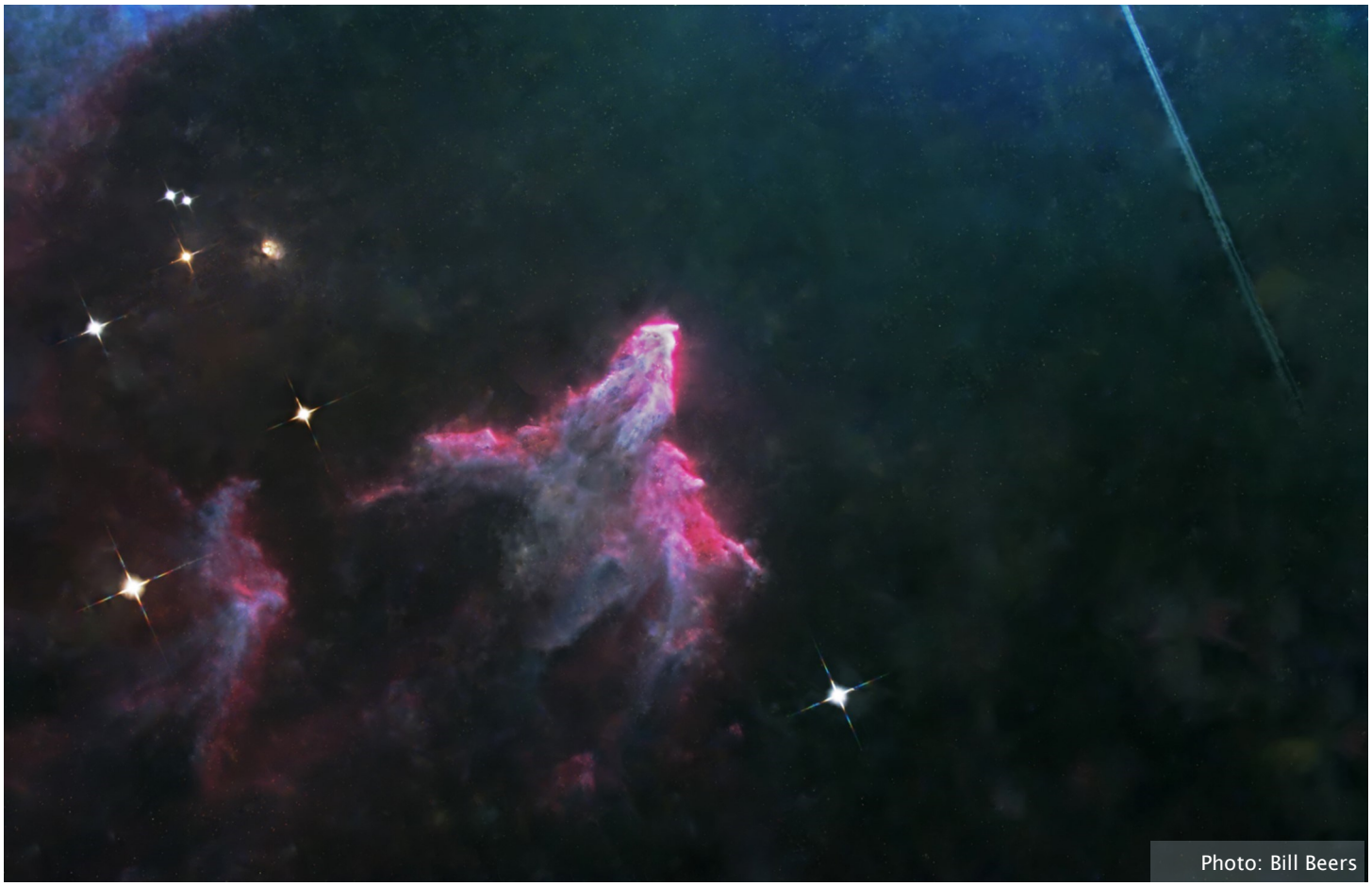

Photo: Bill Beers

IC 63 – The Ghost of Cassiopeia

IC 63, also known as the Ghost Nebula, is located 550 light-years away, near the bright star Gamma Cassiopeiae, or Navi, in constellation Cassiopeia. Since this object is in the heart of the Milky Way where there are a very large amount of stars, I have removed most of the stars from the image to enhance the details if the nebula.

The constellation of Cassiopeia, named after a vain queen in Greek mythology, forms the easily recognizable "W" shape in the night sky. The central point of the W is marked by a huge star named Gamma Cassiopeiae, also known as Navi. The bluish color and the diffraction spike in the upper right hand corner of the image is from this bright star Navi.

The remarkable Gamma Cassiopeiae is a blue-white subgiant variable star that is surrounded by a gaseous disc. This star is 19 times more massive and 65 000 times brighter than our Sun. When I took this image, I purposely moved the bright star just outside the field of view so as to not overpower the photograph.

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The nebula is a giant space cloud made of gas and dust. The radiation of Gamma Cassiopeiae (Navi) is so powerful that it affects the Ghost Nebula, which lies several light years away from the star. The colors in the eerie nebula showcase how the nebula is affected by the powerful radiation from this distant star. The hydrogen within IC 63 is being bombarded with ultraviolet radiation from Gamma Cassiopeiae, causing its electrons to gain energy which they later release as hydrogen-alpha radiation — visible in red in this image. This hydrogen-alpha radiation makes IC 63 an emission nebula, but we also see blue light in this image. This is light from Gamma Cassiopeiae that has been reflected by dust particles in the nebula, meaning that IC 63 is also a reflection nebula.

This colorful and ghostly nebula is slowly dissipating under the influence of ultraviolet radiation from Gamma Cassiopeiae. However, IC 63 is not the only object affected by this mighty star. It is part of a much larger nebulous region surrounding Gamma Cassiopeiae that measures approximately two degrees on the sky, or roughly four times as wide as the full Moon. The bright reflection nebula IC 59, which is part of the same region, is also located very near the Ghost nebula.

The Ghost is best seen from the Northern Hemisphere during autumn and winter. Though it is high in the sky and visible all year round, it is very dim, so observing it is challenging and requires a fairly large telescope and dark skies. I recommend using a 10" or larger scope, plus a nebula filter. Move your scope so the bright star Navi is just outside your field of view. Then use averted vision to try to locate the ghostly features.

Happy hunting and HAPPY HALLOWEEN!

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

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

From the Desk of the Northern Cross Observatory

This month I headed up to the Great Lakes Star Gaze, with my 105mm f/7 refractor on the G11 mount. Using the ZWO asi2600mc pro camera, I managed to acquire this image of M 33 in Triangulum.

The Triangulum Galaxy is a spiral galaxy 2.73 million light-years from Earth in the constellation Triangulum. It is catalogued as Messier 33 or NGC 598.

Acquisition details: 86 x 300 second light frames, 24 x 300 dark frames. 50 flats

-Doug Bock

Notes from the Apache-Sitgreaves Observatory

There is a goal to devote telescope time to science here at ASO in 2022 (after some work is done). Two science projects are planned; utilizing a 200-line-per-millimeter grating to get spectra from Wolf-Rayet stars for a temporal study, and, the other is a Supernovae (SNe) Patrol of Abell Galaxy Clusters (AGC). Both are within reach and between the two the best bang for the buck is finding SNe in Abell's where one image with this system can be used to check 30 to 100 galaxies at a time. On average, there is a supernova (SNe) in the Milky Way galaxy every 100 years so monitoring 100 clusters each with 100 galaxies improving the odds for success. SNe reports are still very useful data to astronomers and supernova candidates will be sent to the Transient Name Server (TNS), the official IAU mechanism for reporting new astronomical transients (AT).

The positives are; big scope, fast scope, dark skies (21.85 mpsas), 7000-foot elevation, ~5-30% Rh, excellent seeing. The negatives are; accurately tracking with a 2000-pound telescope, long focal length, small piece of sky imaged at any one time, autoguiding is TBD, Alt-Az mount field rotation, GoTo accuracy, wind. While the telescope aperture is extremely large at 36-inch diameter, and a fast optical system at f/4.5, increasing to f/5.17 with a ParaCorr (a coma corrector and field flattener), the focal length of 4732mm makes most large-chip cameras produce a very small true field view (TFOV). The TFOV I get from a Canon 60D(a) is 10.8 arcminutes by 16.2 arcminutes.

For this project, the first steps are complete. To determine the cluster criteria to increase the chances of success, and, then define a list, a very limited subset of only AGC's that met a defined criteria typical for; Distance Class and Richness Class, and then visually inspect each to choose only the highly-condensed clusters.

Distance for Abell Clusters is defined as the magnitude range of the 10th brightest galaxy. Richness as the number of galaxies in a range from the magnitude of the 3rd brightest to two fainter magnitudes. Distance Groups 1 (magnitude 13.3–14.0) and 2 (magnitude 14.1–14.8) tended to be too extended, too large of a piece of sky so too few galaxies at any one time. However, Distance Groups 3 (magnitude 14.9–15.6) and 4 (magnitude 15.7–16.4) showed a larger set of condensed clusters to image with the 60D(a). These Distance Groups 3-4 showed the Richness Groups for them would range between 0 and 3, containing 30–49 galaxies, 50–79 galaxies, 80–129 galaxies, and, 130–199 galaxies respectively.

Now, the clusters that are chosen are condensed yet still sprawling over a square degree of sky, so the patrol may in one shot show only 50%-75% of the members. Still, one image with this system can check 30 to 100 galaxies at a time. The Palomar Observatory Sky Survey (POSS) plates available online, which are representative of what the visual view through the 36" scope is, are downloaded for use as my comparison images which provide the magnitude depth for comparison for SNe detection I'm looking for.

My image of the Ring Nebula, written about in a previous WASP issue, was a test image for my magnitude depth, and a 2.5-second image showed it could easily reach magnitude 15 with good Signal to Noise (SNR), 18.2 magnitude not so good SNR but seen. Enough variables are positive for this project. The plate-solve GoTo for the 36-inch scope is not 100%, but has worked. Hopefully results soon on AGC's.

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.

Presentations

Monday, October 3, 2022

Presentations

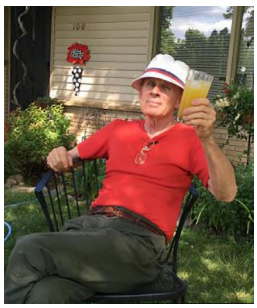
Main Talk:

By G. M. Ross, W.A.S., G.R.A.A.

Clayton V. Carey, G.R.A.A.

Those involved in or interested in the natural sciences have good reason to reject the astrology of the ubiquitous "daily horoscope", as pablum for the masses. On the other hand, when allowing for man's relationship with the world and vast heavens, one should be more tolerant. We are in the midst of mighty forces and works of nature. Rational people look for order, connections, and so some security. Daily life can be hard and discouraging. Rulers want to be aggrandised. We will not present a history of astrology, but historical development is unavoidable, especially given the relationship between astrology and astronomy. For millennia there was symbiosis. Is it sensible to want to believe in heavenly interactions with life on Earth? Yes.

About the presenters:



GM Ross: Inspired by Larry F. Kalinowski, first attended a Society meeting, 1962. Refused to join for years, but past president. Greatest Observer in Michigan (decree of William B. Beers)

Clayton Carey: Joined Grand Rapids Assn. with no particu-

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Thursday, October 20, 2022

Virtual Presentation

Feature:

By Dr Dale Partin

The United States has been sending missions to explore Jupiter and its moons for 50 years. Now, both the European Space Agency and NASA are preparing to send missions to explore three of the Galilean moons: Europa, Ganymede and Callisto. Europa and Ganymede appear to have liquid water oceans under thick crusts of ice. Callisto may also have an ocean. The goal of these missions is to explore these moons and their oceans to determine their properties. The prime question is whether these oceans are suitable for life. It is also possible that these missions may discover actual traces of life if it's there.

About the Speaker:

Dale Partin has a Ph.D. from Carnegie-Mellon University. He formerly did advanced research in the auto industry. He has over 80 scientific publications and 38 patents, and is a fellow of the American Physical Society and a member of Sigma Xi and the American Scientific Affiliation. He teaches astronomy at Macomb Community College here in Michigan. He has been a member of the Warren Astronomical Society since 1998 and has frequently served as an officer.

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.

(Continued from page 14)

lar interest in astronomy, but to associate "with intelligent people", results still uncertain. With the break-neck Bullerman expedition to 2017 solar eclipse in Kentucky. Early experimenter with "P.C.s", hence the Man of a Hundred Hard Drives (on the floors of his bed-rooms).

Short Talk:

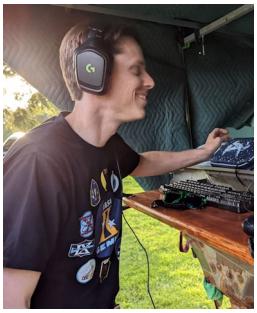
Simulating Spiral Galaxies

The Quasi Static Density Wave Theory

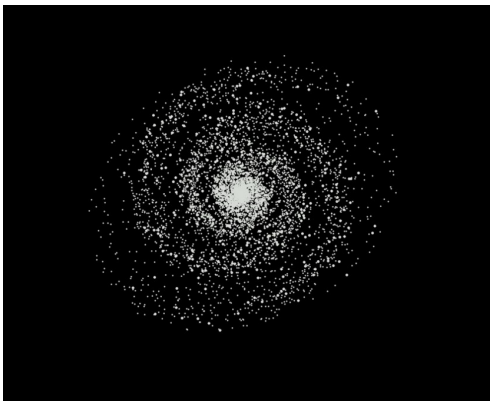
By Jeff MacLeod

Galaxies are one of the least understood structures in astronomy. Simulating them is so computationally demanding that many things are still not well understood. But emulating (cheating) can get us remarkably close. The Density Wave Theory (QSDW) attempts to explain what galactic spiral arms are. Jeff will break down the theory and in doing so demonstrate how well it can emulate what we observe in spiral galaxies.

About the Speaker:



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



DETROIT PUBLIC LIBRARY

Business, Science & Technology

PRESENTS

Shoot the Moon

Tuesday, October 25, 2022

6:00-7:30 p.m. EDT

How do you photograph the moon without seeing a featureless blob?

About this event

Adrian Bradley, an award-winning landscape astrophotographer, will share his equipment and methods for getting shots of our nearest natural satellite, the moon. His methods are for photographers who want to produce nice, detailed pictures of the moon to print or share online.

DPL continues partnering with WSU's planetarium on these talks related to astronomy.

Zoom link will be sent to registrants before program.

Image from Adrian Bradley's collection.

Free:

Register

Call 313-481-1409 for more information during branch hours.

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

www.detroitpubliclibrary.org

Astronomy at the Beach 2022

Island Lake State Park


Photo: Doug Bock

Return to the Beach

This year marks GLAAC's return to the public star party. Officials at the park estimated 4,000 attendees.

In addition to manning a table, the WAS group brought the club's 22" Dobsonian and Jeff MacLeod's Gemini Capsule Simulator. By Saturday evening both boasted long lines.


Photo: Doug Bock


Photo: Doug Bock

Photo: Doug Bock


Photo: Doug Bock

Besides the optical telescopes, we had a radio telescope set up. In the field. Along with our friend, Brian Ottum, the South Lyon Amateur Radio Club had a table.

(Continued on page 17)

(Continued from page 16)

Going outside the big tent, Jeff MacLeod had his Gemini simulator running.

Photo: Doug Bock

The club's big Dob was in attendance, shown here with Marty Kunz, Greg Nizio, Diane Hall, and Mike O'Dowd.


Photo: Doug Bock

And, of course, a view down telescope row:


Photo: Doug Bock

Photo: Mike O'Dowd

The WAS table was present, with Ken Bertin (working the table both nights) and other WAS members. Pictured is Mike O'Dowd's model rocket collection.


Photos: Mike O'Dowd

Diane poses with the autograph of David Levy on the Big Dob. Below, a close up of the signature.

The "Big Dob"

@ Astronomy at the Beach 2022

The big DOB is a force of nature, anytime it is wheeled out it is a crowd pleaser. People who know nothing about astronomy know they need to look through that scope, and they line up to do just that. But the big DOB came close to not making it to Astronomy at the Beach this year. Had it not been for the team effort of some dedicated WAS members.

For those not in the know, taking the DOB anywhere is an undertaking. It needs to be disassembled, safely loaded and secured into the trailer, carefully driven to its destination and reassembled. Now all that in reverse to get it back home, honestly, it's too much for one person. After talking with Mark Kedzior at the picnic we decided to try a team approach. We found a member willing to do the driving, Greg Nizio. We then started recruiting members to run the scope at the beach. Observatory chair Riyad Matti, Mark, Marty Kunz, Kevin Mclaughlin, and David Baranski all took shifts over the two nights. The Wednesday before Riyad, Mark and myself disassembled and loaded the DOB, on Friday Mark, Marty, and Greg assembled the scope and got it running. We were able to store the DOB, assembled, in one of the park's buildings overnight, saving us time and energy (let's make sure this becomes a regular thing). Saturday night Riyad, Marty, Mark & Kevin disassembled the DOB and I helped load it into the trailer. On Sunday Riyad and Greg got it back to its home in the shed at Stargate.

Astronomy at the Beach this year was a big success with attendance estimates between 3 & 4 thousands!

The big DOB was the biggest scope on the field and was in use with a long line the entire event! All of these guys deserve a BIG attaboy from the club and I may have promised minstrels would sing songs about them (maybe Jim Shedlowski will).

Members of the Big Dob crew: Marty Kunz, Greg Nizio, and Mark Kedzior
Photos courtesy of Jeff MacLeod

An Obituary for Donald Edward Machholz

Dear Don,
You left us far too soon, my friend. From your home in California and later in Arizona, you lived quietly and well, with a passion for stargazing that dominated your life.

As the English poet Gerard Manley Hopkins wrote, "I am like a slip of comet,/ Scarce worth discovery." He wrote his poem in 1864 but it might have been composed with you in mind. You were born on October 7, 1952, in Portsmouth, Virginia. I first heard of you during the 1970s, when you were popularizing a program to observe all (or almost all) the Messier objects in the sky, in a single night. I did not take the idea seriously for a long time. I have seen all the Messier objects, but I found them over a relaxing period of five years, from Messier 45 (The Pleiades star cluster) during the summer of 1962, to the distant and ethereal galaxy Messier 83, in the spring of 1987. Your idea was to learn the sky far more thoroughly than I did, and catch all the clusters, clouds of gas and dust, and distant galaxies that Charles Messier carefully recorded. (Messier himself was an 18th century hunter of comets, but he is known more for his catalogue.)

Thank you for inspiring me. By the mid-1980s, I was more proficient in observing than I was in earlier decades. One clear night in the early spring of 1983, I successfully observed all but one of the Messier objects. Messier 30 was the only one I missed that night.

By that time, Don, you were already famous. In 1978, after some 1700 hours of searching, you discovered your first comet using your simple telescope. (You never gave up, did you?) I thought of your success on that beautiful quiet night. In 1985, on the final night of the Riverside Telescope Maker's Conference that year, you discovered a second comet after another 1700 hours. You used a beautiful 10-inch cardboard and glass telescope for that second comet. (You really never gave up, did you.) Luck began to go your way after that. Your third comet arrived in 1986. You used a pair of 29 x 130 binoculars for that one. Right in between the passages of your second and third comets, Comet Halley, the most important and famous comet of them all, rounded the Sun on February 9, 1986. I like to think that as the great Halley's comet made its pass through the inner solar system, it was guarded by these two other comets discovered by you.

Don, you never ever quit. No one would have criticized you if you had. Instead, you spent the remaining years of your life searching the sky. You spent almost *nine thousand* hours over the course of your life comet hunting. Through it all, you never lost your passion for watching the sky. You and I share that one important aspect, Don. As many comets as you and I might have found, it was the search that was so important, for "in no better way," as Leslie Peltier wrote, "can we come face to face, night after night, with such a wealth of riches as old Croesus never dreamed of."

In recent years the professional astronomers have taken over comet discoveries. But still you kept on searching. Despite their great big telescopes, you kept going, always searching, with a series of small telescopes. You found two new comets in 1994, one of which broke apart into several pieces.

By the start of the new millennium, amateur astronomers had pretty much given up. Visual comet hunting, was passé. No more. Only not for you. You discovered not one, not two, but three comets since the year 2004 and as of August 2022, you were the leading discoverer of comets by visual means in the world.

Don, I wish I had known you better. I do know I shall miss you, and our friendship which has evolved over the years, very much. I conclude this letter, this obituary, with the end of the Hopkins poem:

> "But then her tether calls her. She falls off,
> And as she dwindles sheds her smock of gold…
> So I go out. My little sweet is done.
> I have drawn heat from this contagious sun,
> To not ungentle death now forth I run."

Rest in peace my friend.
David H. Levy

Citizen Science Using Remote Telescopes

-Brad Young, Astronomy Club of Tulsa

Part Two: Asteroids, Satellites, and Comets

"To confine our attention to terrestrial matters would be to limit the human spirit."- Stephen Hawking

As discussed in Part One, there are many ways to pursue citizen science using remote telescopes. If you are not equipped with high-end imaging, visual or radio telescope equipment, using either commercial or academic resources available remotely may be an answer for you. Or, if you tire of long stretches of poor weather with no observing, having access to clear skies may be a welcome relief.

Asteroids

"Noise proves nothing. Often a hen who has merely laid an egg cackles as if she laid an asteroid." – Mark Twain

With asteroids, there are several opportunities open to amateurs using remote imaging. The Minor Planet Center (MPC) provides orbital data for all known asteroids and comets to use for preparing observations. The MPC also processes both astrometry (positional) and photometry (brightness) data for nearly all minor planets. Information you gather can be reported to them in MPC format, which most software will prepare automatically. Association of Lunar and Planetary Observers publishes the Minor Planet Bulletin four times a year, a journal of various findings, especially determination of rotational period for asteroids. You can either use their template to write an article for their journal, or if you prefer, you can use data you've gathered and the methodology and determine rotational periods yourself. (fig. 1)

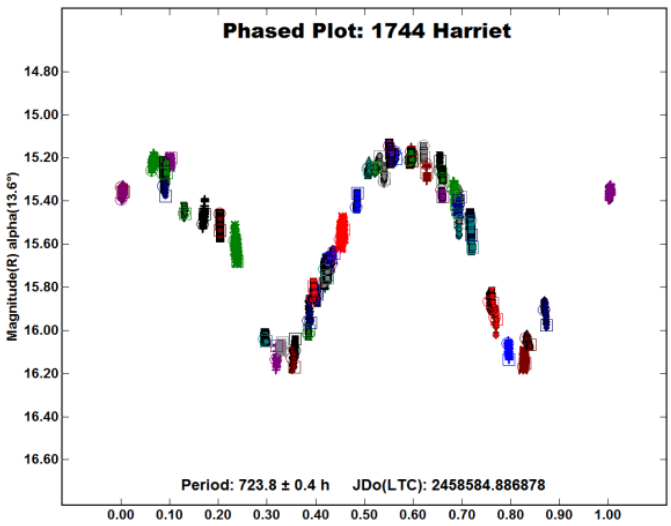


Fig. 1
Pilcher, Klinglesmith III, and Oey, MPB VOLUME 46, NUMBER 4, A.D. 2019 OCTOBER-DECEMBER
Note: I chose example of 1744 Harriet for my wife

Other useful data in the MPB is the annual list of "Minor Planets at Unusually Favorable Apparitions", which appears in every Jan-Mar issue of the Bulletin.

Another way that remote telescopes are used in minor planet studies is the Astronomical League's Target NEO program (formerly Target Asteroids program co-sponsored by NASA and University of Arizona). This effort is centered on determining characteristics of asteroids that are Near Earth Objects, and others that may be worth visiting, landing on, or even returning samples from such as the recent success at Bennu . They accept reports in MPC format so you won't have to do any extra work to provide the data; however, in their case you will need to provide the FITS (image) file in addition to the report.

Although it is probably beyond the reach of most amateurs, you could do image surveys for Near Earth Objects. A better use of your time might be to join a group that processes images from the PanSTARRS or Catalina Sky Survey such as via the IASC (International Astronomical Search Collaboration).

Satellites

Satellite tracking is another observing situation where remote telescopes are often useful. There are many satellites that are geosynchronous and will never appear in your sky, as their orbit is designed to stay over one spot on the Earth's surface. These can be imaged or tracked by radio remotely if the equipment is at the proper location.

Another use for tracking satellites are the ones that may be confused with Near Earth Objects because they are in solar or highly elliptical orbits and were often rocket bodies or other debris from early launches. Project Pluto is an effort to determine and

(Continued on page 21)

(Continued from page 20)

follow some of these very high orbit objects so that they are not using up valuable survey effort and can be discounted as a threat to the Earth (fig. 2).

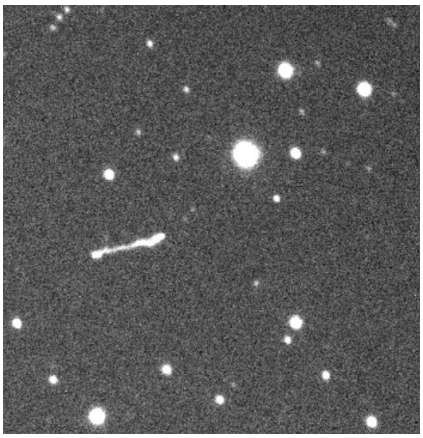


Fig. 2
Spektr-R was a Russian scientific satellite with a 10 m (33 ft) radio telescope

Seen here 9 Feb 2022 at 345,000 km from telescope at apogee (Image by Author)

Remote telescopes have also been useful, at least in my case, in identifying objects that are listed in the ISON (International Scientific Optical Network) catalog but are not listed in the US Space Command catalog (aka Space-Track). This goes beyond just the classified satellites - although those do appear in that list. I'm more interested in the ones that are not matched with a classified payload but are indeed tracked by one system and not matched to another. I recently published my final version of this study which I performed over a period of nearly three years.

Comets

"I came in with Halley's Comet (he was born in 1835). It is coming again next year. The Almighty has said, no doubt, 'Now there are these two unaccountable freaks; they came in together, they must go out together. '" He died on April 21, 1910—one day after the comet had once again reached its perihelion.

Comets are notorious for being on the other side of the world from where you are when they're at their best. Or they will be here, just as soon as they round the sun…

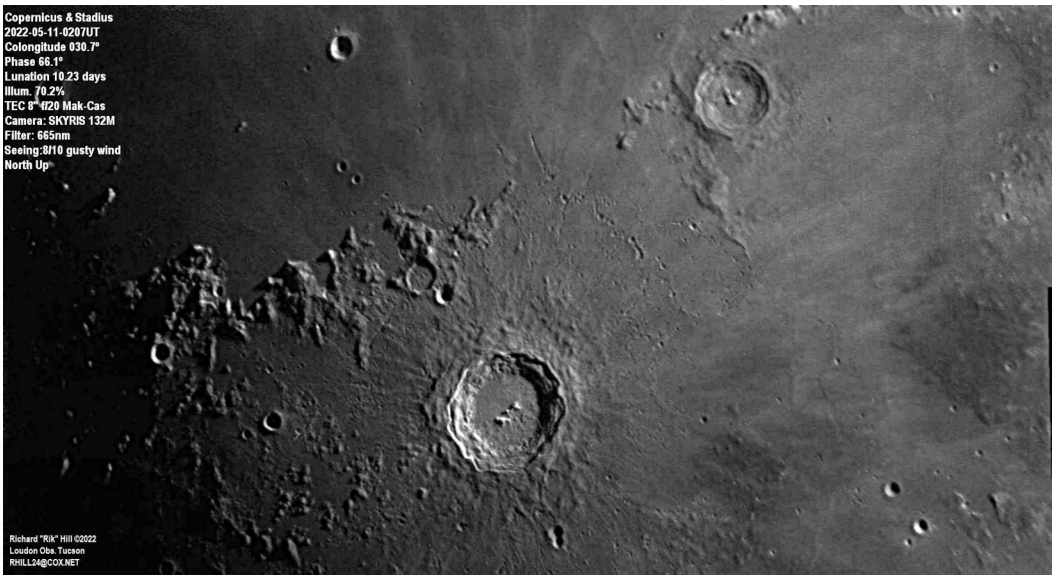
This is another way that remote imaging may be useful to you, as you may be able to find a telescope that has a better view of the comet you can't see well or at all. As a bonus, you can always report data on the comet to the COBS (Comet Observation Data Base) and add to our general knowledge of comets through citizen science.

I hope that these two articles have shown you that remote imaging can be useful across a variety of astronomical targets and scientific studies.

References:

https://minorplanetcenter.net/iau/mpc.html
https://alpo-astronomy.org/
https://www.astroleague.org/node/4017
https://www.nasa.gov/osiris-rex
http://iasc.cosmosearch.org/
https://www.projectpluto.com/sat_eph.htm#start
https://en.wikipedia.org/wiki/International_Scientific_Optical_Network
https://www.space-track.org/auth/login
https://hafsnt.com/index.php/recent-articles/
https://cobs.si/

Crater Chains

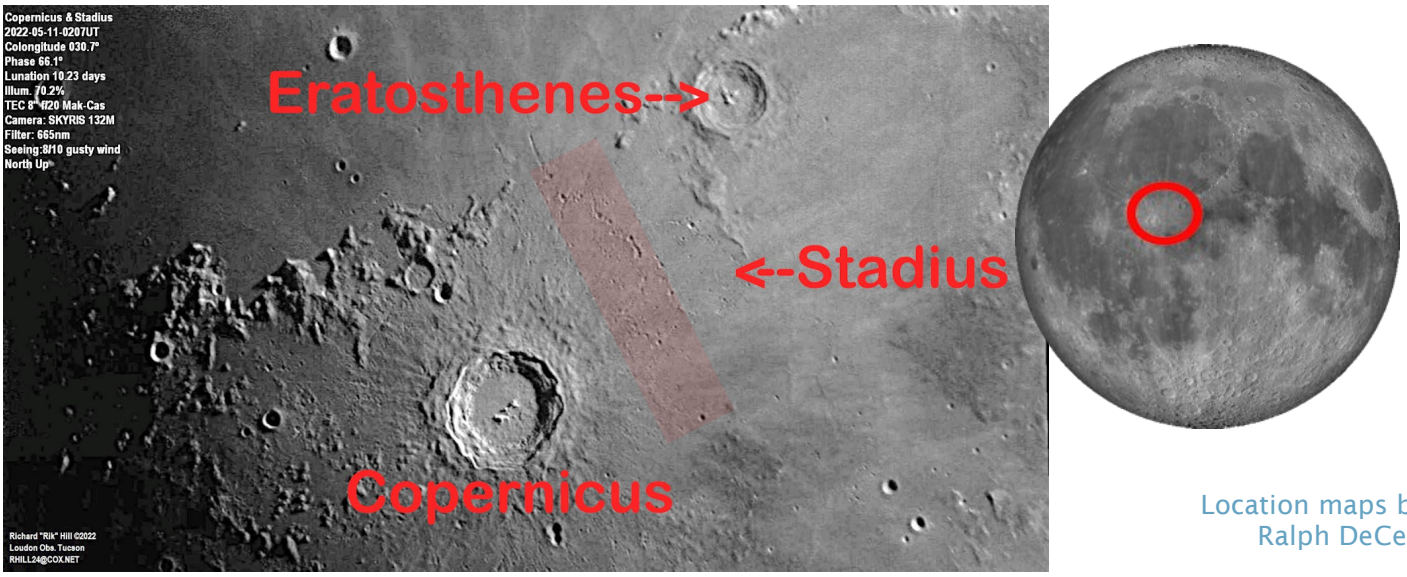


As many of you undoubtedly know, the large crater below center is Copernicus (95km dia.) and, appropriately enough, of Copernican age (less than 1.1 billion years old). To the upper right (northeast) of that crater is what seems like a smaller version, Eratosthenes (60km) twice as old, of Eratosthenian age (1.1-3.2 b.y.o.). You can get a hint of this in that all the radial ejecta rays are gone around this crater erased from Copernicus ejecta. Between them and a little south is the ghost crater Stadius (71km) barely seen here and older than either of the other two craters, as you might expect by its appearance. It is of Lower Imbriam age (3.2-3.8 b.y.o.) buried ejected material from both the other impacts as well as possibly the Imbrium impact itself.

But what interests us this time is not these big craters, but the chain of smaller craterlets and pits between Stadius and Copernicus. These have always fascinated me ever since I first noticed the larger craterlets in my 60mm refractor in the early 1960s. Listed as satellite craters of Stadius, they range in size from 3-7km for the named ones (Stadius A through W) though there are many more. You'll notice many are not nice round little craters, especially the spectacular northernmost gash. This is because they were formed from low velocity impacts of debris ejected in the Copernicus impact event. At one time they were thought to be examples of volcanic venting along a fault but now that we understand meteoric (asteroidal) impact to be a dominant crater forming process we know a lot of these clusterings of craterlets, near large craters to be the result of impact debris.

Try to see these in your telescope. For the small 50-80mm refractors they will be a challenge as they were once for me. A 10cm telescope will start to show some of the fine detail. They are a good test for seeing.

This was made from portions of two images each stacked from 1800 frame AVIs using AVIStack2 (IDL) and then pasted together with AutoStitch and finally processed with GIMP and IrfanView.



Location maps by Ralph DeCew

History S.I.G.

October 1988

The cover of this issue is the Halloween-themed illustration from Liz Stabler as acknowledged by editor Ken Kelly- who goes on to preface the feature article: “The Fourth Redshift (or, The Rantings of an Amateur Cosmologist about the Limits of Current Scientific Knowledge)” by Jeff Bondono.

A chart, “The Moons of Jupiter October 1988”, is provided by Marty Kunz, who continues to point out the habits of Jupiter’s moons in the Astronomy.fm program, “Space Pirate Radio”.

Ken Kelly fills out the rest of the issue with “Missing Bayer and Flamsteed Stars” and “Minor Planets for Sept. - Oct.”

EPHEMERIS FOR (2) Pallas
EPHEMERIS FOR (18) Melpomene
EPHEMERIS FOR (1) Ceres
EPHEMERIS FOR (270) Anahita

October 1998

In the 1998 issues of the WASP, three months are currently missing from the printed catalogue (this editor hopes that is a temporary situation): August, September, and October. Of the three, the October HTML version looks most like the printed issues.

Randy Rubis leads off this issue with a fascinating story, “The India Connection”, then promptly reappears in “Focus on: Randy Rubis” by Ceil Bondono. Further on, in “A Letter from the President” by Dave D'onofrio, where he talks about establishing GLAAC’s Kensington Astronomy at the Beach.

We continue with Bob Watt’s “Minutes of Meetings” and Larry Kalinowski’s “Astro Chatter”.


WASP

WARREN ASTRONOMICAL SOCIETY PAPER

Volume 20 Number 8

October 1988

WASP

The Warren Astronomical Society Paper

Volume 30, Number 10

October, 1998

The India Connection
by Randy Rubis

Focus on: Randy Rubis
by Ceil Bondono

A Letter from the President
by Dave D'onofrio

Minutes of Meetings
by Bob Watt

Astro Chatter
by Larry Kalinowski

Cranbrook Meeting Schedule

WASP Submissions

The India Connection, continued

From the Scanning Room

Working on the cover image for each issue is both a delight and a challenge. For inspiration I reach for the club’s activities, historical references (Society for the History of Astronomy’s Facebook page gives me much of that), astrophotos by members, and the time of year (Hey, Halloween is coming!). Brian Thieme created an excellent vector rendition of Stargate Observatory which frequently appears in the pages of the WASP. This provides a great canvas to play with and several covers resulted from those exercises.

Dale Thieme,
Chief scanner

Bill Beers - SH2-136 - The Ghost Nebula, Happy Halloween!

October 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 International Observe the Moon Night
2	3 Cranbrook	4 Moon at Perigee: 369335km	5 Yom Kippur	6	7	8 Mercury at Greatest Elong: 18.0° W
9 FULL MOON	10 Columbus Day	11	12	13	14	15
16	17 Moon at Apogee: 404330km	18	19	20 Macomb	21 Orionid Meteor Shower	22 Stargate Open House
23	24 Diwali/Deepavali	25 Partial Solar Eclipse; mag=0.862 NEW MOON	26	27	28	29 Moon at Perigee: 368289km
30	31 Halloween					

CRANBROOK INSTITUTE OF SCIENCE

Michigan's Museum of Natural History

OCTOBER 2022

Notable Sky Happenings

Oct. 1 - 7

The Moon is at the lower left of Saturn on the 5th (SSE eve.).

Oct. 8 - 14

Mercury is at Greatest Elongation west of the Sun on the morning of the 8th. Rising in the east before sunrise, this is its best morning appearance in 2022. The Moon is at the lower left of Jupiter on the 8th (ESE eve.).

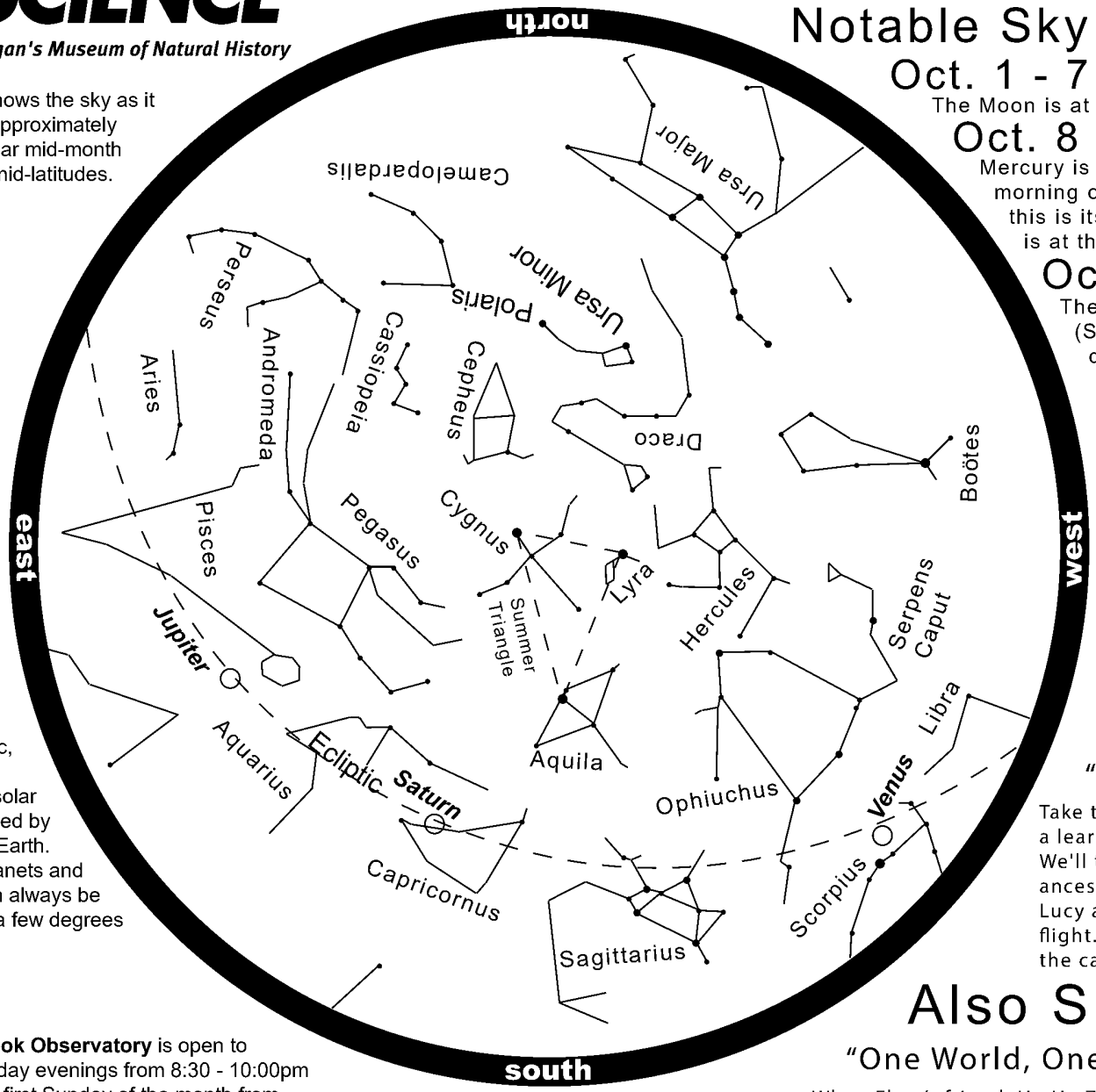
Oct. 15 - 21

The Moon is at the upper left of Mars on the 15th (S predawn). The Orionid meteor shower (produced by debris from Halley's Comet) peaks on the night of the 21st-22nd. It produces about 20 meteors per hour. Moon interferes in 2022.

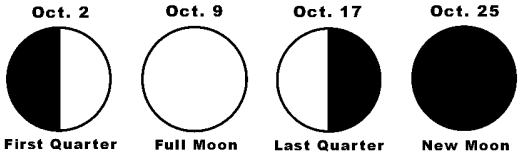
Oct. 22 - 31

Mars begins retrograde (backward) motion on the 30th. The planet will begin moving westward (as opposed to eastward) through the stars of Taurus until January 12, 2023.

This chart shows the sky as it appears at approximately 8pm 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.



Now Showing

"Dinosaurs at Dusk"

Take to the skies and discover the origins of flight! It's a learning adventure of a father and his daughter, Lucy. We'll travel back in time to meet the pterosaurs and the ancestors of modern-day birds, the feathered dinosaurs. Lucy and her father look for clues about the origins of flight. When time runs out, they experience first-hand the cataclysmic "last day" of the dinosaurs.

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.

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

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

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

Stargate Observatory

Monthly Free Astronomy Open House and Star Party

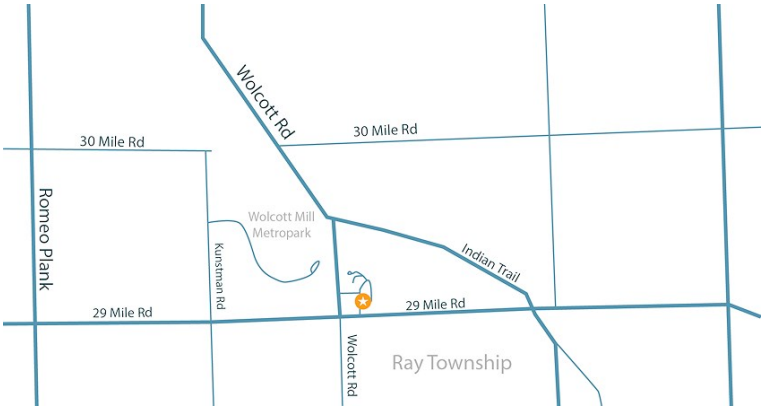
#:30 PM, 4th Saturday of the month!
Wolcott Mill Metropark - Camp Rotary entrance

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 Open House September 24

The observatory was opened about 7:21 pm. The sky was cloudy and it did not clear up. 5 people members attended and we discussed the history of the WAS and the observatory with the new telescope. Jeff Macleod purchased and installed a wheeled trailer jack on the WAS trailer.

All equipment and both buildings are in good condition. The observatory was closed after 9 pm.

Next open house is scheduled for October 22.

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

Treasurer's Report

Treasurer's Report for September 30, 2022

BOA account:

Balance: $29,855.62
Deposits: 117.41
Payments: 1237.90
(Insurance for observatory, Webex)

PayPal Account:

Balance: $273.84
Received: 351.81
Paid 1456.45
(reimbursements LARA fee, calendar printing; mailing)

Total Paid Memberships 125

News from the Treasury:

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 October 2022

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

Day	EST (h:m)	Event
02	19:14	FIRST QUARTER MOON
04	12:01	Moon at Perigee: 369335 km
05	10:51	Saturn 4.1°N of Moon
06	16:00	Mercury at Perihelion
08	13:06	Jupiter 2.1°N of Moon
08	16:00	Mercury at Greatest Elong: 18.0°W
09	15:55	FULL MOON
11	16:49	Moon at Ascending Node
12	22:46	Pleiades 2.7°N of Moon
14	23:28	Mars 3.6°S of Moon
17	05:21	Moon at Apogee: 404330 km
17	10:41	Pollux 1.8°N of Moon
17	12:15	LAST QUARTER MOON
21	13:00	Orionid Meteor Shower
22	16:00	Venus at Superior Conjunction
25	05:49	NEW MOON
25	06:00	Partial Solar Eclipse; mag=0.862
26	01:30	Moon at Descending Node
27	21:48	Antares 2.3°S of Moon
29	09:48	Moon at Perigee: 368289 km

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.

Meeting Minutes

WARREN ASTRONOMICAL SOCIETY
MINUTES OF BOARD MEETING
SEPTEMBER 12, 2022 @ 6:30PM

Meeting called to order @ 6:30PM. Officers in attendance: Diane Hall, Riyad Matti, Dale Thieme (virtual) – Bob Trembley, Mark Kedzior, Adrian Bradley – quorum present.

OFFICER REPORTS:

2nd VP Riyad Matti reported on the WAS Picnic/ Open House that took place on August 27th. Prior to picnic, the 22" mirror on the Big Dob was cleaned by Dave Baranski, Kevin McLaughlin, Mark Kedzior and Riyad Matti – the final result was a very clean reflective mirror ready for observing. After picnic, observatory was opened for solar observing and evening viewing. The observatory closed at 2:30 AM.

Treasurer Adrian Bradley reported an $100 donation from Dr. Brian Ottum for the AATB event. He reported on the preparations for the event and costs (i.e., the cost of tent rental was $2500 to the GLAAC)– masks will be recommended and astronomers may ask for participants to wear masks while observing with their equipment. He also gave account balances and new memberships to the WAS (report found in September WASP).

1st VP Bob Trembley gave the upcoming presentation schedule to December. Due to scheduling conflict, he will be doing the short presentation at the September 12th Cranbrook meeting.

Outreach report – as of today, nine members have volunteered for the AATB event on September 16 -17.

Publications Chair Dale Thieme reports the September Issue of the WASP is posted on line.

OLD BUSINESS:

Dale Thieme reported on the progress of the WAS website overhaul. He also reported on the Calendar Committee -the previous company is no longer in business. A new publisher (Mixbook) was found and will charge $20 plus $5 shipping. Motion by Dale Thieme to charge $20 plus $5 shipping for each calendar – second by Adrian Bradley – discussion followed – motion passed.

NEW BUSINESS:

Dale Thieme reported the corporation dues have been paid.

Riyad Matti reported the Big Dob is ready for transport to the AATB event. A volunteer has been secured (thanks to the efforts of Jeff MacLeod) to transport the telescope/trailer for both days (Greg Nizio). Motion made by Bob Trembley to reimburse mileage plus 10% (pending calculations of mileage) to driver /transport of Big Dob Telescope to AATB – discussion followed – motion passed.

Discussion on the renewal of insurance policy – motion by Diane Hall to renew commercial insurance policy with KIG Insurance – second by Adrian Bradley – motion passed.

Discussion on return to in person at Macomb. Motion by Adrian Bradley to meet virtual for October Macomb meeting – second by Riyad Matti – motion passed.

Discussion took place on the regular Cranbrook December meeting and virtual Awards Banquet that follows. Motion by Mark Kedzior to combine the December Cranbrook Monday meeting (December 5) with the Awards Banquet, and cancel the December 8th Virtual Awards Banquet date – second by Adrian Bradley – motion passed. An honorarium of $150 will be paid to banquet speaker(virtual)for the December 5th event.

Motion by Dale Thieme to adjourn meeting – second by Adrian Bradley – motion passed. Meeting adjourned at 7:31PM by President Diane Hall.

Respectfully submitted,

Mark Kedzior
Secretary
Warren Astronomical Society

WARREN ASTRONOMICAL SOCIETY
CRANBROOK MEETING (w/Live Streaming)
SEPTEMBER 12, 2022 7:30PM

Meeting called to order for in person Cranbrook meeting with live streaming at 7:35PM by President Diane Hall. Number of persons in attendance - 19 (WebEx attendance – 14 & YouTube attendance – 4 @ 8:30PM). Meeting began with introduction of attendees and new members.

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OFFICER REPORTS:

President Diane Hall reported that volunteers are needed for the Astronomy at the Beach event on September 16-17, and to contact and sign up with Outreach Chair Kevin McLaughlin for the event. The WAS Board is asking for a volunteer to consider becoming the club's Audio-Visual Coordinator for our meetings. Please contact the WAS Board if you would like to perform this service to the organization. A reminder that Officer Elections will take place at the November Cranbrook meeting. Some positions are term limited and will have vacancies. If you would like to run for a position on the board to serve the organization, please contact the board so your name can be forwarded to the Nomination Committee.

1st VP Bob Trembley gave the meeting presentation schedule for the remainder of the year.

2nd VP Riyad Matti reported on the WAS Picnic and Open House held on August 27th. The 22" mirror of the Big Dob was cleaned prior to picnic. Solar observing and observing took place after the picnic until 2:30AM.

Outreach Chair (per Diane Hall) reports 9 volunteers have signed up for AATB event.

Treasurer Adrian Bradley gave account balances (found in September WASP) – he also gave update on the AL/CON event held in Albuquerque, NM.

Publications Chair Dale Thieme reports September WASP is posted on line.

SPECIAL INTEREST GROUPS:

Solar – Marty Kunz gave solar report describing moderate sunspot groups that were observed.

Double Star Group – Riyad Matti reported on the double stars and carbon stars being observed at the Open House.

No reports from the Astrophotography, Astronomical League and History groups.

OBSERVING REPORTS:

David Levy gave a brief history on Charles II – Diane Hall mentioned that Cor Caroli was named after Charles I. Diane Hall and Jonathan Kade are prepping observing area in Alcona County. Mark Jakubisin reports on the great seeing conditions in the night sky this past week. Adrian Bradley showed images of aurora he took at wedding in Charlevoix.

SHORT PRESENTATION:

Bob Trembley presented the latest in the NASA's Eyes on the Sky immersive apps found at: https://eyes.nasa.gov/apps

He briefly went through the different applications to give the audience key features of each app. Questions and discussion followed his informative presentation. To see his presentation in its entirety, go to:

https://www.youtube.com/warrenastro

MAIN PRESENTATION:

Jim Shedlowsky (of the "Skee Brothers" fame), gave his annual September presentation entitled "Orbital Light Pollution". In his presentation, he described the effects of satellites being launched into earth orbit and the effects it has (or soon to be/may have) on observing/imaging the night sky. He discussed iridium "flares", satellite "streaks", skyglow (the increasing source of artificial night sky brightness), StarLink satellites for internet systems, etc. As per tradition, he concluded his presentation with his rendition of "Space Debris" (sung to the tune of "Edelweiss" by Richard Rogers). Questions and spirited discussion followed his entertaining presentation.

To see his presentation in its entirety, go to:

https://www.youtube.com/warrenastro

The meeting ended at 9:30PM.

Respectfully submitted,

Mark Kedzior
Secretary, WAS

WARREN ASTRONOMICAL SOCIETY MACOMB (VIRTUAL) MEETING SEPTEMBER 15, 2022 7:30PM

Meeting called to order at 7:30 PM by President Diane Hall. Officers in attendance: Bob Trembley, Riyad Matti, Mark Kedzior, Dale Thieme (WebEx attendance – 14 & YouTube –8@ 8:15 PM).

OFFICER REPORTS:

President Diane Hall called for volunteers needed to be on Nominating Committee to recruit candidates for board positions – many positions are term-limited. The Calendar Committee has selected a new company to produce the 2023 WAS Calendar – previous company went out of business. Astronomy at the Beach takes place on September 16-17 at Island Lake State Recreation Area. Volunteers are needed to bring telescopes and to assist at WAS table in tent. Nominations are needed for our Distinguished Service Awards presentation which will take place at the combined December 5th Cranbrook/Banquet meeting. Please send your nominations to any board member for consideration.

1st VP Bob Trembley gave the upcoming presentation schedule. He reported that Nicole Zellner will be the keynote speaker both days at the AATB event September 16-17.

Publications Chair Dale Thieme reported the 2023

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Calendars have been readied and sent to the new printer.

No reports from the Special Interest Groups.

Observing Reports:

Dale Thieme played a recording provided by Gary M. Ross and Clayton V. Carey from the CBC Radio program "As It Happens" - the recording was of JWST images rendered as sound.

SHORT PRESENTATION:

Hayley Beltz presented " Hot Jupiters and Ultra-Hot Jupiters" – What We Can Learn From Them". In her presentation, she explained her research, describing transits, radial velocity, transmission spectroscopy, phase curves, emission spectroscopy, helping to model atmospheres in 3D. Questions and discussion followed her informative presentation. To see her presentation in its entirety, go to: https://www.youtube.com/warrenastro

MAIN PRESENTATION:

1st VP Bob Trembley moderated a panel discussion "What Fascinates You Most About Astronomy?" Bob's fascination centers around the chemistry of space and asteroids – Diane Hall – when looking at the same stars as our ancient ancestors did on earth – Ken Bertin – the size and distance of objects in the universe and the history of astronomy – Doug Bock – celestial mechanics – Riyad Matti – 60% equipment, 40% observing, especially deep sky objects and measuring the position angles of double stars. Discussion on other interests within astronomy also took place. To see this panel discussion in its entirety, go to: https://www.youtube.com/warrenastro

Meeting ended at 9:25PM.

Respectfully submitted,

Mark Kedzior
Secretary, WAS

Title: Sunset from forest's edge
Date taken: August 30th, 2022
Submitted by: Ray Bosshard

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: https://www.vaticanobservatory.org/profile/rtrembley
Bob Trembley: Vatican Observatory Foundation Blog
Steven Aggas: http://apache-sitgreaves.org/

Doug Bock:
Facebook: Northern Cross Observatory https://www.facebook.com/NorthernCrossObservatory
Boon Hill and NCO Discussion https://www.facebook.com/groups/369811479741758
Flickr (astrophotography album): https://www.flickr.com/photos/141833769@N05/
YouTube channel: https://www.youtube.com/channel/UC-gG8v41t39oc-bL0TgPS6w

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!

Fomalhaut: Not So Lonely After All

David Prosper

Fall evenings bring a prominent visitor to southern skies for Northern Hemisphere observers: the bright star **Fomalhaut**! Sometimes called "The Autumn Star," Fomalhaut appears unusually distant from other bright stars in its section of sky, leading to its other nickname: "The Loneliest Star." Since this star appears so low and lonely over the horizon for many observers, is so bright, and often wildly twinkles from atmospheric turbulence, Fomalhaut's brief but bright seasonal appearance often inspires a few startled UFO reports. While definitely out of this world – Fomalhaut is about 25 light years distant from us – it has been extensively studied and is a fascinating, and very identified, stellar object.

Fomalhaut appears solitary, but it does in fact have company. Fomalhaut's entourage includes two stellar companions, both of which keep their distance but are still gravitationally bound. Fomalhaut B (aka TW Piscis Austrini, not to be confused with former planetary candidate Fomalhaut b*), is an orange dwarf star almost a light year distant from its parent star (Fomalhaut A), and Fomalhaut C (aka LP 876-10), a red dwarf star located a little over 3 light years from Fomalhaut A! Surprisingly far from its parent star – even from our view on Earth, Fomalhaut C lies in the constellation Aquarius, while Fomalhaut A and B lie in Piscis Australis, another constellation! – studies of Fomalhaut C confirm it as the third stellar member of the Fomalhaut system, its immense distance still within Fomalhaut A's gravitational influence. So, while not truly "lonely," Fomalhaut A's companions do keep their distance.

Fomalhaut's most famous feature is a massive and complex disc of debris spanning many billions of miles in diameter. This disc was first detected by NASA's IRAS space telescope in the 1980s, and first imaged in visible light by Hubble in 2004. Studies by additional advanced telescopes, based both on Earth's surface and in space, show the debris around Fomalhaut to be differentiated into several "rings" or "belts" of different sizes and types of materials. Complicating matters further, the disc is not centered on the star itself, but on a point approximately 1.4 billion miles away, or half a billion miles further from Fomalhaut than Saturn is from our own Sun! In the mid-2000s a candidate planetary body was imaged by Hubble and named Fomalhaut b. However, Fomalhaut b was observed to slowly fade over multiple years of observations, and its trajectory appeared to take it out of the system, which is curious behavior for a planet. Scientists now suspect that Hubble observed the shattered debris of a recent violent collision between two 125-mile wide bodies, their impact driving the remains of the now decidedly non-planetary Fomalhaut b out of the system! Interestingly enough, Fomalhaut A isn't the only star in its system to host a dusty disc; Fomalhaut C also hosts a disc, detected by the Herschel Space Observatory in 2013. Despite their distance, the two stars may be exchanging material between their discs - including comets! Their co-mingling may help to explain the elliptical nature of both of the stars' debris discs. The odd one out, Fomalhaut B does not possess a debris disc of its own, but may host at least one suspected planet.

While Hubble imaged the infamous "imposter planet" of Fomalhaut b, very few planets have been directly imaged by powerful telescopes, but NASA's James Webb Space Telescope will soon change that. In fact, Webb will be imaging Fomalhaut and its famous disc in the near future, and its tremendous power is sure to tease out more amazing discoveries from its dusty grains. You can learn about the latest discoveries from Webb and NASA's other amazing missions at nasa.gov.

**Astronomers use capital letters to label companion stars, while lowercase letters are used to label planets.*

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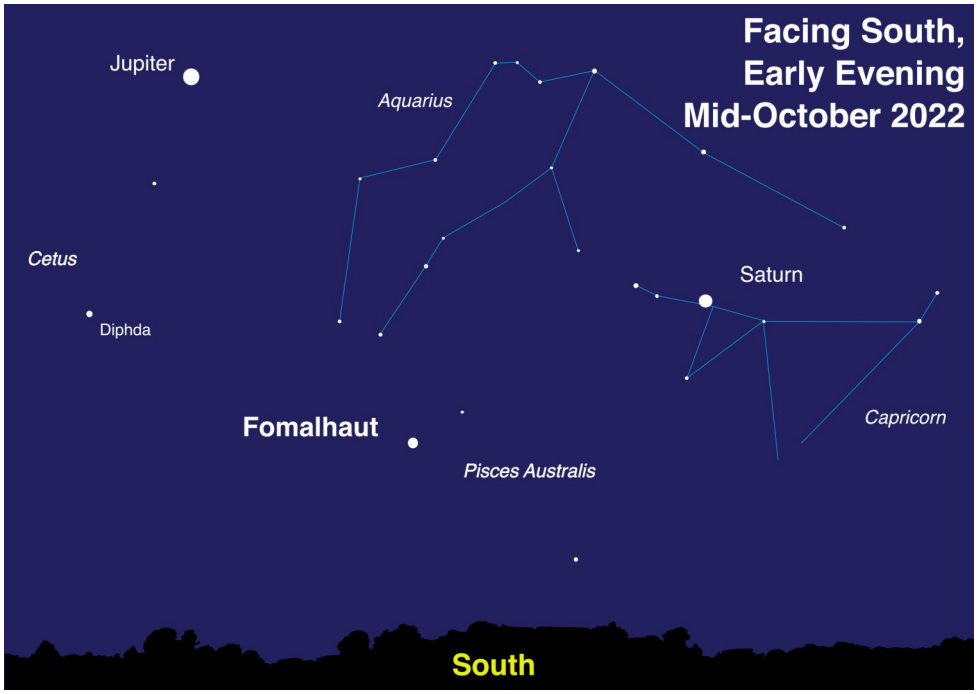
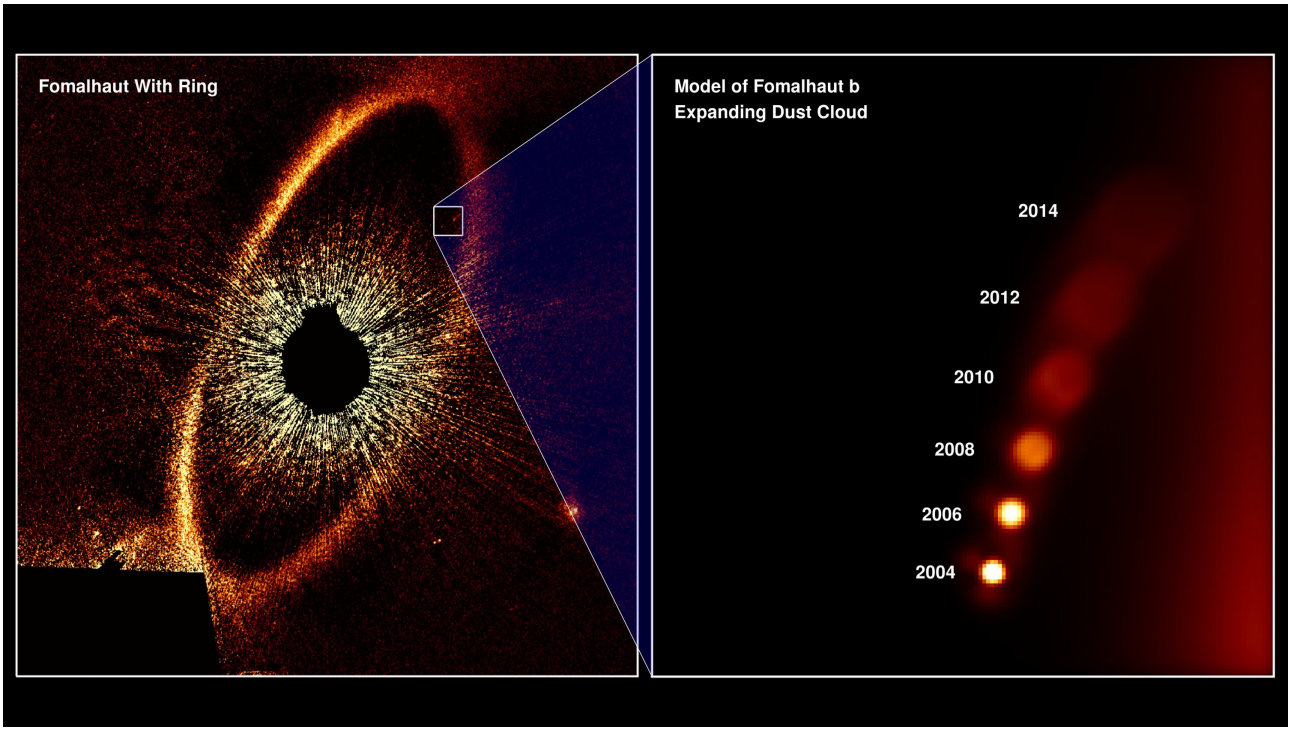


Sky map of the southern facing sky for mid-latitude Northern Hemisphere observers. With Fomalhaut lying so low for many observers, its fellow member stars in the constellation Piscis Australis won't be easily visible for many without aid due to a combination of light pollution and atmospheric extinction (thick air dimming the light from the stars). Fomalhaut is by far the brightest star in its constellation, and is one of the brightest stars in the night sky. While the dim constellations of Aquarius and Capricorn may also not be visible to many without aid, they are outlined here. While known as the "Loneliest Star," you can see that Fomalhaut has two relatively close and bright visitors this year: Jupiter and Saturn!
Illustration created with assistance from Stellarium



The magnificent and complex dust disc of the Fomalhaut system (left) with the path and dissolution of former planetary candidate Fomalhaut b displayed in detail (right).
Image credits: NASA, ESA, and A. Gáspár and G. Rieke (University of Arizona) Source: https://www.nasa.gov/feature/goddard/2020/exoplanet-apparently-disappears-in-latest-hubble-observations