The W.A.S.P.

Volume 55 Issue 3 March 2023

The Warren Astronomical Society Publication

Jan 31, 2023
C11HD Hyperstar v4
540mm focal length @ f/1.9
Dale Hollenbaugh reports on this image he captured: “This was a very fast moving target and difficult to process. I stacked on comet separately from stars using "Adam Block Method". It took 7 hours of processing.”

The WASP

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

Dale Thieme, Editor

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

First Monday meeting:	Third Thursday meeting:
Cranbrook: Institute of Science	Macomb Community College
1221 North Woodward Ave	South campus, Bldg. J, Room J221
Bloomfield Hills, Michigan	14600 Twelve Mile Rd.
	Warren, Michigan

Membership and Annual Dues

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

Astronomical League (optional) $7.50

Send membership applications and dues to the treasurer:

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

Pay at the meetings

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

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

The Warren Astronomical Society Publication (WASP) is the official monthly publication of the Society.

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

Disclaimer: The articles presented herein represent the opinion of their authors and are not necessarily the opinion of the Warren Astronomical Society or this editor. The WASP reserves the right to edit or deny publication of any submission.

Stargate Observatory is owned and operated by the Society. Located on the grounds of Camp Rotary on 29 Mile Road, 1.8 miles east of Romeo Plank Road, Stargate features an 8-inch refractor telescope under a steel dome. The observatory is open according to the open house schedule published by the 2nd VP.

In This Issue

Discussion Group Meeting

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

When: Tuesday, March 28, at 6:30pm.

Where: 3219 Woodside Ct. Bloomfield Hills, MI

Amenities and Refreshments:

Laura Wade will have drinks, bring snacks.

Field of View

I receive email updates from the IAU's Working Group on Small Bodies Nomenclature (WGSBN) - frequent bulletins from this group contain citations for newly named asteroids. The bulletin I received from them a few weeks ago had newly named asteroids for three Jesuits and a Pope! Br. Bob Macke, curator of meteorites at the Vatican Observatory, had to update a post of his with these new entries.

The bulletin I received today (Feb. 28) had this interesting entry:

(12995) Wendellmendell = 1981 EY27
Discovery: 1981-03-02 / S. J. Bus / Siding Spring / 413

Wendell W. Mendell (b. 1941) is an American planetary scientist who worked for NASA for over 50 years, conducting lunar and planetary geological remote sensing, and working toward a permanent human base on the Moon. He helped to establish the International Space University.

I have no idea why I've never heard of this person; I wrote Br. Guy and asked if he'd heard of him. He responded with: "I was just talking about him with some friends yesterday! He was about 10 years ahead of me… mostly knew him because of his name!"

Wendell was the recipient of the 1989 Space Pioneer Award - an annual award given by National Space Society "to individuals and teams who have opened the space frontier."

Wendell was on an episode of the TV series "The Universe" discussing NASA's Constellation Program - whose major goals were the "completion of the International Space Station" and a "return to the Moon no later than 2020" (well… that hasn't happened, yet).

The Orion spacecraft recently made famous by the Artemis 1 mission, was designed for the Constellation program as a crew compartment.

Wendell retired at the end of 2013 after 50.5 years at the Johnson Space Center as a NASA planetary scientist; he was interviewed by Sandra Johnson in September of 2017 for NASA's Science Mission Directorate Oral History Project - he seems to be quite the character!

The International Space University, mentioned in Wendell's asteroid citation, is the sole university worldwide devoted entirely to space education since 1987. The University is located in Strasbourg, Alsace, in North East France, and has the goal of developing future leaders of the world space community "by providing interdisciplinary educational programs to students and space professionals in an international, intercultural environment."

So, an interesting find! These IAU asteroid citation bulletins frequently contain some fascinating individuals - many of whom would be interesting subjects for a short presentation!

-Bob Trembley,
President

Texas Star Party

Registration for:

TSP 2023 10 am May 14th, to Sunday 10 am, May 21, 2023

Is OPEN!

Please go online at https://texasstarparty.org/register/. Login, confirm your profile information and register.

Below, all of you will discover important information regarding TSP 2023.

Please be aware that the current registration period will end on Friday February 17th, 2023 at 11:59pm (23:59 Hours) Central Daylight Time.

The great tradition of Dark Sky Observing continues with the 43rd Annual TEXAS STAR PARTY, May 14 to 21, 2023 near Fort Davis, Texas!

IMPORTANT DATES TO KNOW

- Friday, Feb 17th – close regular registrations.
- Friday, Feb 17th through Monday, Feb 20th – run the random lottery and start housing assignments
- Monday, Feb 20th through Sunday, March 5th – do housing assignments (this gives us two weeks)
- Monday, March 6th – confirmation emails go out to regular registrants
- Wednesday, March 8th – late registration open and late housing assignments made (whatever is left)

Late Registration will close April 28, 2023.

Last day to cancel and receive a refund is April 28, 2023 at 11:59 pm CDT. Your email must be time and date stamped at or prior to 11:59 pm (23:59 hours) Central Daylight Saving Time to receive a refund. Special Conditions apply to refunds

The Texas Star Party is accepting registrations for TSP 2023. Please go to https://texasstarparty.org/register/ and log in to your TSP account to begin the process.

New for this year:

A. Application and Registration are now combined into one registration form, and TSP. Payment for registrations is due at the time of registration.

B. Please consider making a donation to one of "Fund Programs". Donations made to these programs are restricted to be used only for these programs. The registration form includes the ability to make donations to:

1. Friends of TSP Fund Program
2. John Wagoner Memorial Student Astronomer Award Fund Program
3. TSP Youth Outreach Fund Program
4. TSP Operations Fund Program

Items that you can purchase when you register:

C. You can purchase these items while registering for TSP 2023:

1. TSP 2023 Group Photo
2. TSP 2023 Hat
3. TSP 2023 Official T-Shirt

You can purchase these items when completing your registration form.

You can pick your items up during TSP 2023 at the Sales and Information Desk in the meeting hall.

D. Cancellation and Refund Deadline is April 25, 2023

Telescope Support Systems

FAAC Astronomy Conference & Swap Meet

Saturday, April1, 2023 9:00 am - 3:00 pm

General Astronomy

9:30 am: **Imaging A Rocket Launch** - John McGill
10:45 am: **3D Printing for Astronomy** - Liam Finn
12 N **Astronomy for Everyone** - Don Klaser
1:30 pm: **Interstellar Comets & Asteroids** - Jonathan Kade

Technical Talks

9:30 am: **Starlink Internet +** - Jeff Thrush
10:45 am: **James Webb Telescope** - Tim Campbell
12 N: **My Obervatory** - Sean Pickard
1:30 pm: **Jantar Mantar** - Jim Frisbie

Planetarium Shows

10:00am, 11:30am & 1:00pm FAAC Members

Swap Meet

All Day…Earn Cash by Selling Those Items Sitting Around Collecting Dust!
Telescopes, Eyepieces, Cameras, Binoculars, Mounts, Software, Books, and Accessories, etc.

Admission: $5.00 (children 15 and younger – Free / must be accompanied by an adult)

Sales Table: $15 in advance, or $20 at the door as available, (one admission ticket included).

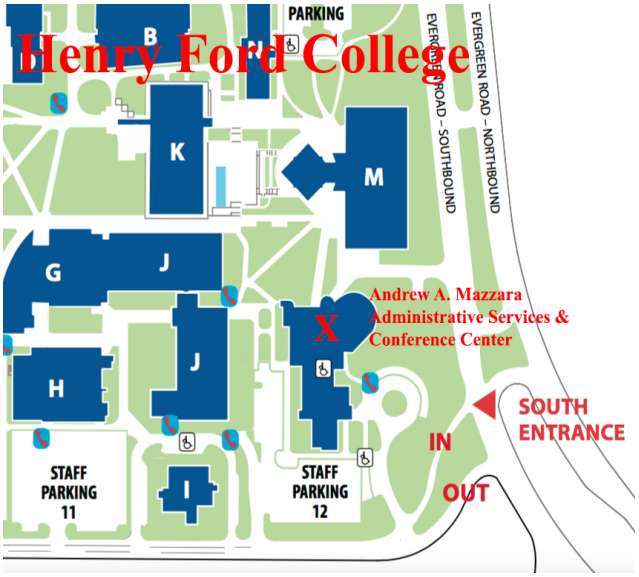
Advanced Table Registration ends Mar 15, 2023

Doors Open: 8:00am for setup.

Make Checks Payable: to **FAAC** for advance table registration.

Send payment to: Ford Amateur Astronomy Club, P.O. Box 7527, Dearborn, MI 48121-7527

Location: Henry Ford College, 5101 Evergreen Rd, Dearborn, MI 48128 (Andrew A. Mazzara Admin. & Conference Center… See **X** on map, Staff Parking Lots 11 & 12 will be open)



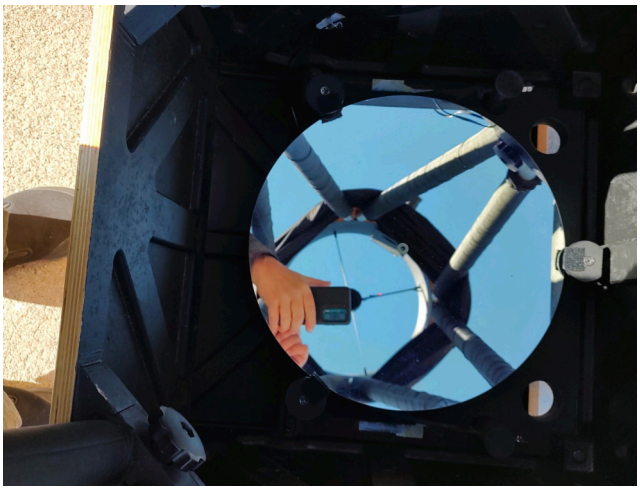
For More Information: Contact Jim via email: w8tu@comcast.net or call (734) 751-6280

For Sale

Seven Ponds Astronomy Club has a nice 16" Telekit for sale. Details:

16" f/4.5 Telekit approx 20 years old in good shape
- Galaxy optics
- Adjustable Primary Fan
- Secondary Dew Heater
- Single Speed Focuser
- NGC Max and encoders (computer has issues, encoders are working, and one encoder is new)
- Shroud
- Scope cover in good condition
- Asking price $3700

Located near Attica, MI
Please contact Paul L at paulluotonen@gmail.com or fredprl@outlook.com



Famous Radio Horn at Risk

-Bob Trembley

The Holmdel Horn – the device which first heard evidence of the Big Bang, is at risk due to redevelopment plans of its historic site

The radio telescope used by Arno Penzias and Robert Wilson when they discovered the cosmic microwave radiation from the big bang is still in place on Crawford Hill in Holmdel, New Jersey. It has been designated a National Historic Landmark and has also been named an Historical Site by the American Physical Society. However, these designations are mere honors, and provide no real protection.

The Bell Labs Crawford Hill Laboratory has been sold to a private developer, who has no desire to keep the antenna, as it would interfere with planned residential development. The developer may be willing to have the antenna moved, but that would be very expensive, and would remove the antenna from its historical landmark.

Not everyone is happy about this, including Bob Wilson, who still lives nearby. A group of local organizations, including Friends of Holmdel Open Space (Janet Jackel president) is advocating for preservation of the antenna and the creation of a park for the land on which it sits.

The Friends of Holmdel Open Space, along with two other local groups, have created an online petition which at the time of this writing has received almost 7000 signatures. The petition website has considerable background information; there have been signatories from across the US, and from many other countries, including many ex-Bell Labs researchers, astronomers, scientists, and a large number of local people.

The situation is evolving as more people become aware of it; the Friends of Holmdel Open Space are hoping for a happy outcome.

Plaques at the site detail the history of the Holmdel Horn. Credit: Lawrence Faltz

Articles

Sky and Telescope: The Holmdel Horn that "Heard" the Big Bang is at Risk
https://skyandtelescope.org/astronomy-news/holmdel-horn-which-heard-evidence-of-the-big-bang-is-at-risk/
IEEE Spectrum: Saving the Big Bang (Antenna)
https://spectrum.ieee.org/cosmic-microwave-background

Additional Publications

https://tworivertimes.com/holmdels-historic-big-bang-antenna-at-risk-residents-say/
https://patch.com/new-jersey/holmdel-hazlet/redevelopment-study-holmdels-horn-antenna-site-approved

Petition

https://actionnetwork.org/petitions/save-big-bang-antenna

Observation Reports

31-1 January

"Green" comet. With difficulty. No "nucleus", a "blob" reminiscent of M-56 in a 10-cm. telescope. Dia. +/- half the Moon.

Transparency poor from gibbous Moon, serious sky glow, quickly moving clouds.

7X50 binoculars, 11X80 binoculars

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COMMENTARY: Dispatch from Handsome Joe McBride, Gr. Rapids.

1 February

The Sun. Two very modest groups, 1 N. three spots, 1 S. five spots.

Transparency excellent, seeing good.

5-cm. refractor with Mylar aperture filter.

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COMMENTARY: Activity Cycle 25 has temporarily collapsed at least in white light.

1-2 February

"Green Comet". Failed to locate approx. 08.30 U.T. after sustained examination of N.W. sky in Camelopardalis.

Transparency fair, gibbous Moon in same quadrant.

7X35 binoculars.

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COMMENTARY: Transparency much improved over previous evening at Veen Obs. when Moon high. Very few stars visible from warm air mass turbidity and regional snow cover..

3 February

The Sun. One small group in N. hemisphere, three de minimis spots.

Transparency excellent, seeing good.

5-cm. refractor + Mylar aperture filter.

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COMMENTARY: Least photospheric activity noted since summer.

3-4 February (from Handsome Joe McBride)

"Green comet". Failed, despite prev. sighting.

Transparency poor, Moon approaching full.

11X80 binoculars.

4 February

The Sun. One very small group with three spots, northern hemisphere. One spot has "ripened" since last rept., but still *de minimis*.

Transparency fair, cirrus fields. Seeing fair.

5-cm. refractor.

7-8 February

The Moon. 2+ days past full. **Endymion** a shallow "bite" out of waning terminator, showing crenelated S. wall, but all of its flat floor dark, Max. libration on S. limb on the 5th, so the crater depressed toward the north limb. The **"Shining Mountains"** both vis. given reasonably favourable libration of W. limb, max. several days off. Both ranges *de minimis* but probably to emerge better in 4-5 days. Per prev. obs'n the "false" one is a single feature, pearl grey. The southerly "true" one is serrated and pure white (hard to reckon given lunar glare). All the mare-like tracery of Mare Orientale in view. Short anomalous (?) **gash/ vallis** in vicinity of Snellius & Furnerius. Wide for its length, fusiform, with no similar feature appearing on same line from either end. Fault slippage from near-by crater formation?

Transparency poor, turbid extreme, seeing fair.

16" Mighty Borr II @ 185X

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COMMENTARY: Interesting to see how well or if "Shining Mountains" appear over limb in coming says. Diligent examination of plates in excellent Rukl *Atlas* sheds no light on the "gash". Much likely depends on illumination angle and libration. His detailed depictions can not show every thing, and feature is small.

Addendum: COMMENTARY (more) To observe features which are close to the (east) limb is not easy. The effort ought to be during waning gibbous phase, as soon after full Moon as possible, the situation on the morning of the 8th. To observe the same limb region during waxing crescent means a very thin Moon, likely in twilight close to the horizon. (Same situation with the west limb, but in mirror image.) In sum, to see the horizontal extremes on the Moon, one has to be nimble -- and have favourable sky in the Great Lakes country. It will be trying to re-create the situation for observing there a month hence.

11 February

The Sun. Five groups of great variety of species: very small/ sparse to Waldmeier "E" and "G" from judging spot size + extent in longitude. Probably 2 large old cycle groups in S. hemisphere close to aequator. Total spots impossible to count.

Transparency good, seeing fair.

5-cm. F /11 refractor

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COMMENTARY: Estimating hemisphere difficult using A.A.V.S.O. Solar Division Circular No. 77. Assignment to a hemisphere considers axial tilts to establish position of aequator. Waldmeier classifications are from International Astronomical Union.

"Green comet". No colour nor tail. "Nucleus" occasionally vis., but usually just "inner" coma. Ovoid shape with major axis fading to north-east.

Transparency fair at ~ 20 degrees W. of meridian.

6-cm. f /11 refractor @ 130X.

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COMMENTARY: Mark John ("The Mind") Christensen observing same night estim 6 - 6.5 mag. Observer disagrees, closer to 7.

12 February

The Sun. Now seven groups, most in years. New de mimimis formation in S. hemisphere, joining two large noted, supra. This addition clearly New Cycle.

Whole northern 1/2 of disc filled with activity whether O. S. or New Cycle.

Transparency good.

5-cm. f /11 refractor.

14 February

The Sun. Five groups. S. hemisphere array with two loci widely spaced in longitude (~ 25 deg.?), well developed primate spots. Very large. A northern hemisphere group approaching central meridian, Waldmeier "E" (?): host of small spots and pores following primate.

Transparency poor (cirrus), seeing fair.

5-cm. refractor, Mylar aperture filter.

17 February

The Sun. 5 groups total incl. emerging one with major spot therein. One very extensive S. hemisphere spot with two distinct loci but nada in between, sustains.

Transparency excellent, but seeing fair.

5-cm. refractor w/ Mylar aperture filter.

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COMMENTARY: Is the S. hemis. display two groups?

19 February

The Sun. 5 groups. Very extended S. hemisphere group now fore-shortened toward limb. In longitude could be Waldmeier "F", but in constituency given no centre spots, probably "G". Moving in from east limb is a N. hemis. "G".

Going off disc is Waldmeier "J" which seems not to have developed satellite spots detected by present gear.

Transparency fair (from cirrus), seeing fair.

Instrumentation as before.

24 February

The Sun. Four groups total. The one in S. hemisphere is Waldmeier "B", and Observer suspects it is of (old) Cycle 24. Largest group in N. hemis. = "C"

of great longitudinal extent, possibly 25 deg. To its left is a Waldmeier "A", initially impossible to see.

Transparency excellent, seeing fair.

Instrumentation as before..

26 February

The Sun. Three groups, one N. hemisphere de minimis. Other a classic Waldmeier "C", with primate spot (leading) containing 4 umbrae in penumbra. Near central meridian. At least fifteen spots, typically most very small. In S. hemis. a longitudinally extensive "B", with only two spots of note.

Transparency good, seeing fair.

Instrumentation as before.

28 February

The Sun. 3 groups. A just emerged over E. limb. single feature (Waldmeier "A") on N. hemisphere. Same, but larger lone spot in southern hemisphere. The current major feature = type specimen, class "C" sustained group in N. hemisphere. "Tadpole" shaped with multiple umbrae in a penumbra leading + elongated array following.

Transparency fair from cirrus, seeing fair.

5-cm. refractor @ 45X and Mylar aperture filter

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COMMENTARY: Prediction that as the Class "C" nears W. limb, another large formation will appear on opposite limb. Activity Cycle 25 is in full.

G.M. Ross

PRICE REDUCTION

MEADE 8” LX90 ACF F/10 SCT

For sale is a Meade 8” LX90 ACF f/10 SCT with tripod. Included in this package:

- Audio Star Hand Control
- 8 x 50 Rear Focus Finder Scope
- Accessory Case w/keys
- 90 degree Star Diagonal
- 2x Barlow
- Six 1.25” eyepieces (32, 26, 15, 9, 6, 4mm)
- Color Filters (#12, 21, 25, 56, 58A, 80A)
- Meade LXPS7 Power Supply
- Celestron Sky Scout - Comes with original shipping container for OTA/Fork Mount

Retails for $3099 – asking $1500 – proceeds of sale will go to granddaughter in Florida (Ft. Myers) to help with costs from Hurricane Ian damage to her home.

Contact Cindy Babisz: cab8260@gmail.com or text/call 810-748-7080

The View From
C.W. Sirius Observatory

Planetary Nebulae

After almost 15 years of astro-imaging, my favorite target objects have become planetary nebula's. Due to the fact that each one has its own unique size, shape, and color make them very beautiful objects to photograph. A planetary nebula is a form of emission nebula consisting of an expanding, glowing shell of ionized gas ejected from red giant stars late in their lives. The issue of how such a diverse range of nebular shapes can be produced is still a debatable topic. It is theorized that interactions between materials moving away from the star at different speeds gives rise to most observed shapes. However, some astronomers believe that close binary central stars might be responsible for the more complex and extreme planetary nebulae shapes. Several have been shown to exhibit strong magnetic fields, and their interactions with ionized gas could explain some planetary nebulae shapes. Another explanation may be that an elongated shaped star may expel its gases at different angles then a more round star.

So why do they call them planetary nebulas if they are not planets? Because back in 1764 when Charles Messier saw the first planetary nebula (M27, the Dumbbell) through his small low resolution telescope, it looked like a planet to him. Most planetaries are 1-2 light-years in diameter.

I have been working on this collage of planetaries for over 2 years, among other objects. They range from 5 to 10 hours of exposure time each depending on their brightness. While most of these particular nebulas in the collage are a bit faint for small to medium size telescope viewing, M27, M57, M97, the Helix and the Cats Eye can be seen through smaller scopes. While you will not be able to see the colors, these objects are definitely worth a look.

-Bill Beers

Next page: Bill's composite image of his nebula collection.

About CW Sirius Observatory

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

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

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.

Collage of Planetary Nebulae

Photos by Bill Beers

From the Desk of the

Northern Cross Observatory

This past few months Comet C/2022 E3 has been in our sky flirting with naked eye magnitudes. With very few clear nights it has been a challenge to capture it visually and photographically. However, there have been a few nights to give it a try.

There were 4 nights this past month that I was able to open up the observatory and collect data. The comet was easy to spot and fairly bright for imaging, but just bright enough visually to see. A pair of binoculars made it easier early on, but as the Moon headed towards full, it became more difficult with the sky brightening.

However it has been reported to have reached 5.6 magnitude.

The images below are from 4 nights. January 30th, February 1st, February 10th and February 11th.

I used both the 105mm f/7 refractor with the ZWO asi2600mc PRO camera and a Canon 300mm f/4 lens with the ZWO asi071mc PRO camera to acquire these comet photos. Some are stacks of multiple frames, and a few are single frames.

January 30, 2023 - 154 x 10 second frames - refractor

January 30, 2023 - 8 x 10 second frames - refractor

January 30, 2023 - 10 x 10 second frames - 300mm lens

February 1, 2023 - 66 x 30 second frames - 300mm lens

February 1, 2023 - 74 x 10 second frames - refractor

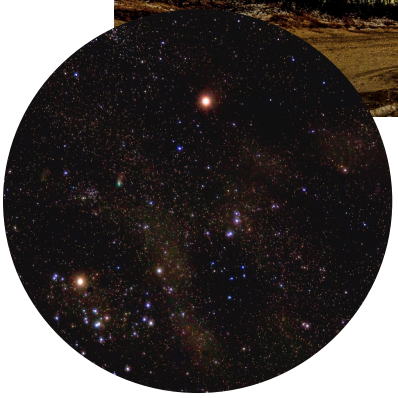
February 10, 2023 - 1 X 10 second frame - 300mm lens - Mars and the comet

February 11, 2023 - 1 X 60 second frame - 300mm lens - Mars and the comet

February 11, 2023 - 21 x 60 second frames - refractor

WAS Astrophotos

Images: Adrian Bradley



Comet C/2022 E3 (ZTF)

Adrian Bradley went comet hunting and, using the wide-field on steroids approach (panorama), captured this shot. He says, "For those of you looking for that comet, see if you can spot the li'l thing just to the left of a line between Mars and Aldebaran. Mars is the bright orangish dot near the center of the picture. Aldebaran is a smaller orangish dot below and to the left of Mars."

Insert to the left is a close-up of the comet's location in Adrian's image.

M31

Bob Berta writes
This photo was taken from my house in light polluted Macomb Twp last night with my new ZWO and ASI setup with ZWO-AM 5 harmonic mount and ASI-071 color camera. This was only 5-5 minute long stacked photos all controlled and stacked with the ASI AIR Plus module. Darks, bias frames, flat fields were from a library I had created earlier. The scope was my existing 80mm APO with my 25+ years old TV .8 flat field/ focal reducer. I used an IDAS light pollution filter. The setup did an excellent job auto-guiding and auto focusing. I still prefer my AP mount and larger scopes but this is SO-O-O much easier to transport and setup.

Guess I am getting lazy in my old age.

Image: Bob Berta

Presentations

Cranbrook
March 6, 2023

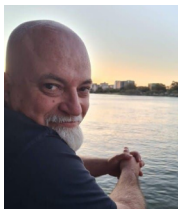
Main Talk

NERVA, Orion and Now

By Adam Crowl

Nuclear rockets have been studied as long as applied nuclear fission. The key challenge of the nuclear rocket is containing and directing the mighty energies of fissioning atoms. Two main approaches have been explored. One uses controlled nuclear fission to boil liquefied gases, the other uses uncontrolled nuclear fission to hurl great masses into the sky. One became real hardware in the 1960's, the other became legend. Both might be reborn in our near future, a half century later.

About the Speaker



Adam Crowl is an Australian space enthusiast and independent researcher who unintentionally became an Interstellar Propulsion expert. Space and science blogger, Interstellar Practitioner for the Institute for Interstellar Studies (I4IS) and former member of Project Icarus. He has been to the USA twice for Interstellar events, in 2011 and 2013, and hopes to visit again someday.

Short Talk

The Laplace Resonance

Another Look

By John Dumar

The periods of the four Galilean moons have been known since Galileo discovered them. In his day, it was known that the orbits of the moons were a better clock and could be used as a means to navigate across the oceans. However, it wasn't until the late 18th century that Pierre-Simon Laplace developed the idea of the mean motion (average angular velocity) of the orbits of the planets. This then could be applied to the Galilean moons, and implied that the three inner moons Io, Europa, and Ganymede are in a 4:2:1 mean motion resonance. We will take a quick look at what is meant by the 4:2:1 Laplace resonance and how it should be viewed.

About the Speaker

John moved to Michigan in 1982 after graduating from Concordia College in Nebraska and for the last 40 years he has been a Physics and Mathematics teacher at Lutheran North High School in Macomb, MI. John earned an MEd in science education at Wayne State University in 1996. He coached wrestling for 24 years and he is also a professional archer. In 2015, he began his journey as an amateur astronomer and he hasn't looked back.

Live at Macomb
March 16, 2023

Starting this month, we are meeting in person at Macomb, see next page for directions to the room.

Main Talk

Chasing Dark Skies

Why You Should Get an SQM-L Meter

By Adrian Bradley

Many of us who love astronomy, from the professional to the amateur, to the visual observer to the astrophotographer, love to talk about dark skies. There are places where we feel the skies get no darker than at that location. Or, we may simply say 'it's really dark'. We may even form an emotional bond with that location, such that everywhere else we go, we tell people about the darkness at that location...

...until we go somewhere and can visibly see the difference.

Astrophotographers and Visual Astronomers alike should know the difference between levels of dark skies, and how it affects our views and/or data captures. There is one empirical way to do that, and it's with an SQM-L meter, which measures the darkness of the sky.

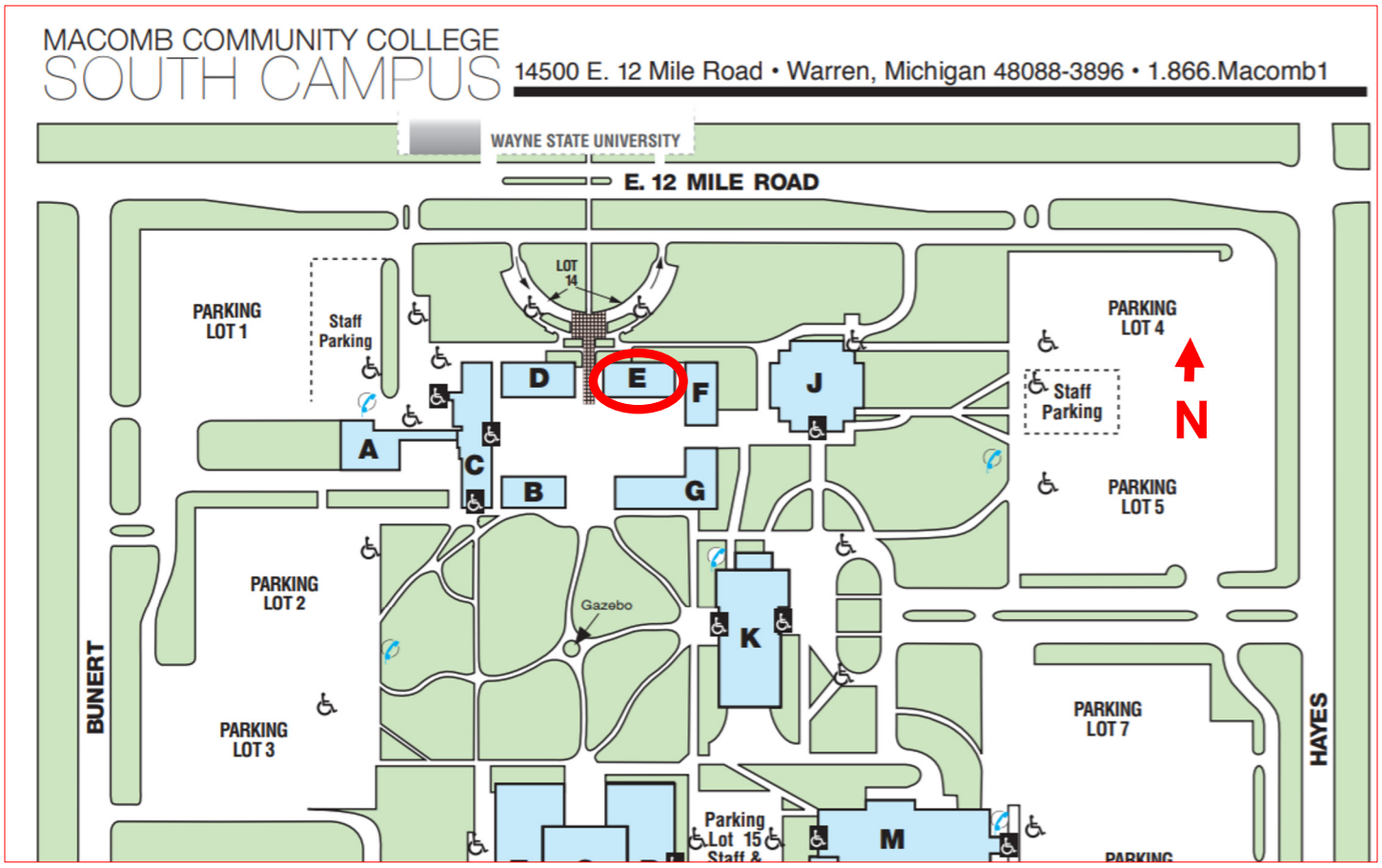
Adrian will show why it's still much better to use an SQM-L meter to get readings of a sky, rather than 'eyeball it.'

About the Speaker

Adrian Bradley is an avid amateur nightscape photographer and astronomer. He prefers wide angle 'landscape astrophotography', especially any images involving the galactic plane of the Milky Way - a.k.a. Milky Way Photography. He uses his images to share his love of the night sky and his desire to understand and preserve it. He is currently involved with a few different astronomy groups, including the Royal Astronomical Society of Canada, Explore Alliance, the Astronomical League, The University Lowbrow Astronomers, G.L.A.A.C., and of course the W.A.S. He is a husband and father of two children, aged 21 and 16.

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.



Access for E Building

The simplest access is to park in Parking Lot 4 (near the big red "N" symbol on the map), which is where people have parked in the past. One walks past the library (J Building) and continues going west between F and G Buildings, entering on the south side of E Building. This is the second floor, where room E-208 is located. This route will also work for those in a wheelchair. It does involve going up a ramped sidewalk between the parking lot and the library.

A better alternative ONLY for those with a "wheelchair" placard in their vehicle is to park in a tiny parking lot (Lot 14) immediately on the north side of E Building. One then needs to go up a couple of ramped sidewalks, past the west side of E Building, and enter on the south side of E Building.

A third way to get to E-208 for those in a wheelchair does not involve any ramped sidewalk. Use Parking Lot 1 on the northeast corner of the campus. With a wheelchair placard one can park right next to the entrance to the first floor of C Building. Take the elevator to the second floor. Walk out of the building heading east. Enter the south side of E Building and find room 208.

While it is possible to walk to E-Building from parking lot 2, there is no easy way to get there with a wheelchair.

The address of Macomb Community College South Campus is 14500 E Twelve Mile Rd, Warren, MI 48088.

View of the front of E-310 from the doorway. Room E-208 looks very similar.

View of the "back" of E-310 from the doorway. One can see the usual projector hanging from the ceiling.

Skyward

David H. Levy

Of Comets, more Comets, and Fritz Zwicky

Since October 1965, when I spotted my first comet, Comet Ikeya-Seki, I have seen 227 different comets. Near the dawn of my passion for the night sky, watching that mighty comet rise, apparently right out the St. Lawrence River, was a sight I shall never forget. The two most recent comets I have seen share the same name; they are both called Comet ZTF for Zwicky Transit Facility. This project t uses a new camera that offers a very wide field of view. The camera is attached to the large 48-inch Oschin Schmidt camera at Palomar.

This project has a rich history. It is loosely named for astronomer Fritz Zwicky, one of the founding astronomers at Palomar and one of the foremost scientists of the last century. He developed not the big Schmidt but the original smaller 18-inch Schmidt camera, the very first telescope atop that mountain. Since this project is named after Zwicky, why are its comets called "ZTF" instead of just Zwicky? It is because the comets are named for the project, not the man.

The historical Zwicky actually had little interest in comets. His career leaned towards the big questions of cosmology, the study of the large-scale issues of the Universe. But he was the first regular user of Palomar's 18-inch Schmidt camera, the telescope Gene and Carolyn Shoemaker and I used to discover our comets, including the one that collided with Jupiter in 1994. That in itself was a tribute to Zwicky, for it offered insights into how comet impacts contributed to the origin of life on different worlds. Zwicky was not into comets, but he was deeply concerned with the distant explosions of massive stars that he and colleague Walter Baade called supernovae. When he began using the 18-inch there were 12 known supernovae. He discovered 121 supernovae with the 18-inch, 120 by himself and one with Paul Wild.

Even though I never met Zwicky, I can share three aspects of him, not including the most famous one in which he called anyone he did not like a "spherical bastard." The expression was intended to mean that no matter from which angle you look, that person is (or was) a bastard. One story I heard from Walter Haas, founder of the Association of Lunar and Planetary Observers, who said that when Zwicky was having a quiet chat in a corridor at Caltech with another astronomer, one could hear him two blocks away. The other involved Zwicky's observing coat, which he left in a closet at the 18-inch observatory building. One night as I was about to observe alone there, as Gene Shoemaker left the building he said "If you get too cold, you can wear Zwicky's coat! The thought of that coat haunted me all night. Third, my friend David Rossetter named his large 25-inch diameter reflector Fritz, after Zwicky's first name. It is a wonderful telescope named for a brilliant man.

In January, the ion or gas tail of Comet ZTF showed a sort of disconnection in which the part of the tail closest to the comet was a thin line which suddenly broadened to a larger fan further out. This "disconnection event" was closely tied to a sudden increase in sunspot activity. This ZTF comet teaches us how comets interact with the solar wind.

As this article goes to press, there is not one ZTF comet, but two. David Rossetter and I saw the other one at our club's dark observing site. The second one is much fainter, visible as an amorphous smudge of small slowly moving haze. As I looked at this second comet, I tried to understand and appreciate the seminal role that Zwicky played in his time. And in our time, that role has expanded to explore in still greater detail the night sky that he loved.

The photo shows the dome of the 200-inch at Palomar at sunset, taken from the opened dome of the 18-inch, from where Zwicky (and later the Shoemakers and I) observed.

Determining the Saros

By Brad Young, Astronomy Club of Tulsa

As you probably know, there is a New Moon every month*, where the Moon passes the Sun in our sky from morning to evening phases. So, why is there not a solar eclipse every month? The Moon is not in alignment with the ecliptic (the path the Sun appears to take), so the New Moon may pass north or south of the Sun. Because it is inclined to the ecliptic by 5o and the Sun and Moon only appear 1/2o wide in our sky, often there is no eclipse.

*It may be helpful to start off with a list of what "months" are:

- Sidereal Month = period for Moon to return to same position compared to distant stars
- Synodic Month = interval of return to the same lunar phase
- Draconic month = period for the Moon to pass through the same node
- Anomalistic month = time required for perigee to perigee

Most of us think of a month as a synodic month, for example, full moon to full moon. For determining the Saros, the synodic and the draconic month are of greatest interest.

ECLIPSE SEASONS

Black hole sun, won't you come, and wash away the rain? – Chris Cornell

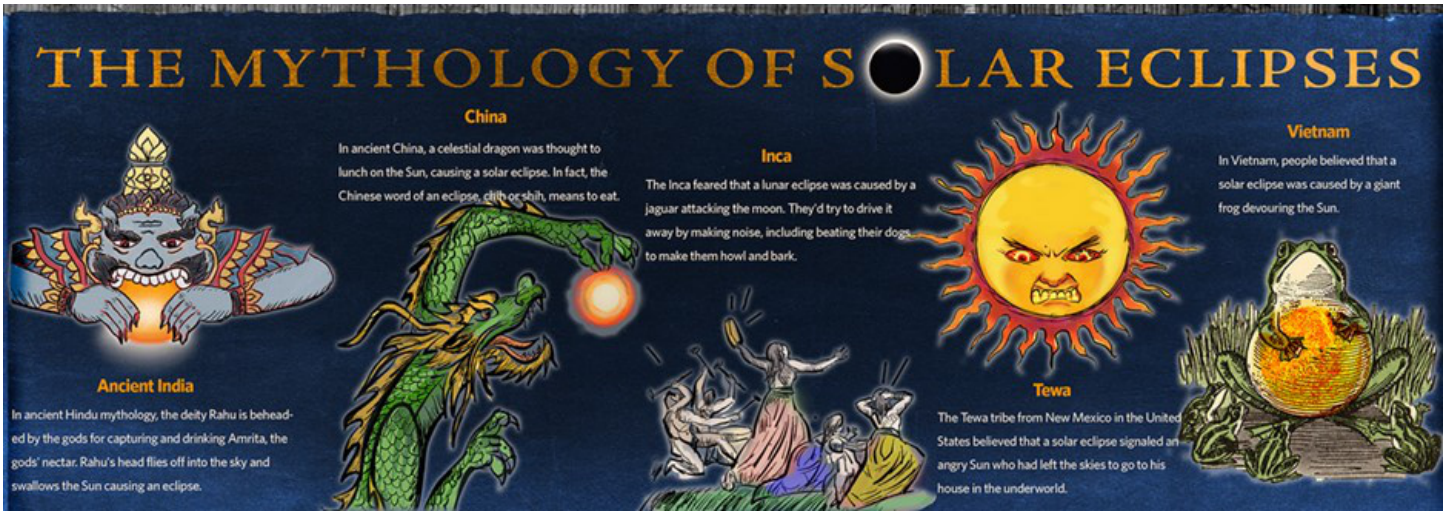
The moon appears to cross the "orbit" of the sun at two points – at the Moon's ascending and descending nodes. New and Full Moons near these times – usually twice a year – may result in a lunar or solar eclipse. Lunar eclipses are wonderful sights, but can be seen from half the world when they occur. Solar eclipses, especially total ones, are much rarer for a specific location. Since astronomy began, we have tried to predict monumental events like solar eclipses. In fact, this is one of the quests that started astronomy, predicting eclipses, seasonal events, and the wandering planets.

Total solar eclipses, along with comets and perhaps meteor storms, were upsetting events that people strived to know about ahead of time. A stone in Ireland may record an eclipse that took place on 30 November 3340 B.C., contemporaneous the beginning of writing. Ancient Chinese eclipse records are accurate enough to allow us, millennia later, to calculate the slowing of Earth's spin and the rate at which the Moon is receding.

All over the world, different cultures reacted to solar eclipses in different ways:

- Native people in Colombia shouted to the heavens, promising to work hard and mend their ways.
- In Norse culture, an evil enchanter, Loki, was put into chains by the gods. Loki got revenge by creating wolf-like giants, one of which swallowed the Sun—thereby causing an eclipse. (Another of the giant wolves chased the Moon, trying to eat it.)
- Fear led Chippewa people to shoot flaming arrows into the sky to try to rekindle the Sun. Tribes in Peru did the same for a different reason; they hoped to scare off a beast that was attacking the Sun.
- In India, the demon spirit Rahu steals and consumes the nectar of immortality but is beheaded before he can swallow it. His immortal head flies into the heavens. The Sun and Moon had alerted the gods to his theft, so he takes revenge on them: When Rahu swallows an orb, we have an eclipse—but the orb returns to view because Rahu has no body!
- Similarly, in China, Mongolia, and Siberia, beheaded mythical characters chase and consume the Sun and Moon—and we experience eclipses.
- In Indonesia and Polynesia, Rahu consumes the Sun—but burns his tongue doing so and spits it out!
- In Armenia, a dragon swallowed the Sun and Moon.
- In Transylvanian folklore, an eclipse stems from the angry Sun turning away and covering herself with darkness, in response to men's bad behavior.
- In India, many believe that when an eclipse occurs a dragon is trying to seize the two orbs. People immerse themselves in rivers up to their neck, imploring the Sun and Moon to defend them against the dragon.

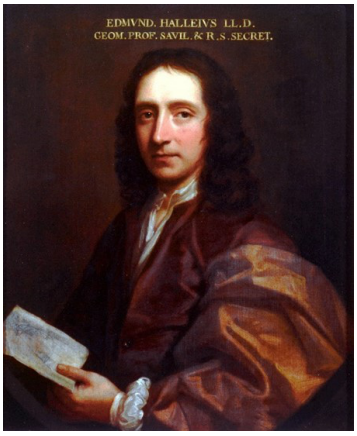
Meanwhile, attempts to predict a Total Solar Eclipse (TSE) met with mixed results. As amazing as sites like Chaco Canyon are, there is no evidence that people living in the SW US could predict eclipses. The Tewa of the Rio Grande dreaded the eclipse of the Sun. This may be because many Native Americans, such as the Dine, felt that "during the eclipse, we must always look down at the ground, cannot be looking up or outside." These were real, sometimes terrifying events. Even today, some people commit violent acts against themselves or others during a TSE.



THE SAROS

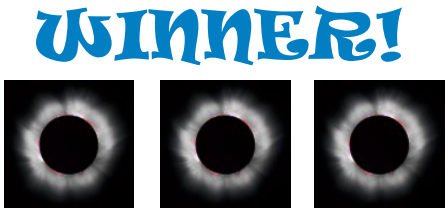
The modern astronomical usage of the word saros is attributed to Edmond Halley, who based it on the word σάρος, defined in the Suda as "a measure and a number among Chaldeans."

It is not known exactly when a scheme for predicting eclipses was developed, but it was almost certainly before about 575 BC. Chinese and Babylonians both independently knew of the Saros cycle. This is the cycle of the lunar nodes, as the pull of the Sun and Earth cause changes in moon's orbit known as perturbations. All the characteristics of the lunar orbit are perturbed, including the sidereal month (Moon returns to the same star field). But where the other features of its orbit affect the type of eclipse, the Saros cycle predicts when a similar eclipse may happen.



Modern studies of the Saros cycle began with Edmond Halley. He rediscovered Saros studying the Moon to determine longitude more accurately, which was the focus of astronomy in his day. He predicted a Total Solar Eclipse in London 1715 to within 4 minutes and 19 miles and crowd-sourced reports of this TSE to correct errors in Moon's orbit. Considering the width of the path, or greatest extent of shadow of a TSE is 167 miles, that was no mean feat.

In his study, which lasted nearly 20 years, he determined the precession of the plane of the Moon's orbit. This included the Saros cycle that had been found by many ancient civilizations to be the period it takes the Moon's ascending node to move through 360˚ relative to the vernal equinox. The period is 223 lunar (synodic) months, or over 18 years. The direction of motion is westward, i.e., in the direction opposite to the Earth's orbit around the Sun, if seen from the celestial north. This is the reason that a draconic month or nodal period (the period the Moon takes to return to the same node in its orbit) is shorter than the synodic month. After one nodal precession period, the number of draconic months exceeds the number of synodic months by exactly one. The cycles line up, and, like a slot machine hitting, we are rewarded with an eclipse.



However, Saros is not an integer number of days, and the Earth rotates 120o to the point of the eclipse (1/3 of the way around the Earth, to the west). For instance, the eclipse of 2017 many of us saw will have a similar sister total solar eclipse on September 1-2, 2035, located in China and the Pacific. A Greek astronomical clock called the Antikythera ("turning of the wheel") mechanism used epicyclic gearing to predict the dates of consecutive exeligmoses and is the root of our modern word.

It is important to note that this does not mean that eclipses occur only with spacings of several years. At any time, there are many interleaved Saros cycles in action: 39 at present. This is why we may have up to five solar eclipses per year, though many of those may be only slightly partial, or located in extreme reaches near the poles. It also explains why the American eclipses of 2017, 2023, and 2024 can occur close together.

DETERMINING SAROS

We will either find a way…or make one – Hannibal

By following a method carefully, over several months, you too can determine the Saros Cycle by simple means.

Assumptions

- Assume Moon's orbit is circular (this will remove effect of the anomalistic month)

- Assume the orbits of the Moon and Earth remain unchanged over the entire cycle of interest (no perturbations)
- Choose field stars and moon phases to make the calculation easier, e.g.:
  - Choose a bright star to check the sidereal month
  - Choose a phase around first quarter to get the synodic month
  - The difficult nodal crossing observations will be near New Moon, so start the project soon after a solar eclipse (even a poor one, or one you could not see) This will give you several months before the sun reaches the other nodal crossing, at the next eclipse season
- Don't forget there are two nodes; eclipses occur at either one, but each should be considered separately for the calculation

Methodology

In recording the position of the moon, we will start near the positions of the last eclipses. So, if the last eclipse was a lunar one in Aries, concentrate on the Moon in Aries, and the mirror of it in Libra. One of these is the Ascending, the other the Descending node.

Method:

- Sketch or image moon, capturing a few stars in the field
- Record time to nearest minute
- Use those nearby stars and a star chart to find the Moon's position
- Find position within +/- 2o (4 moon widths)
- Repeat for at least 6 months (more preferred)

Note that you should concentrate on getting positions around the node crossings; the sidereal month is not needed for the calculations; however, you may find calculating it to be an interesting exercise also.

Calculations:

From your careful records, you should easily notice the time required to return to the same field of stars (sidereal month - optional), back to the same phase as before (synodic month) and, less easily, the motion of the nodes over several months. Once you see the approximate motion, you can extrapolate to determine the time of entire circuit. There will be a solar eclipse of similar type as before at the point where the draconic month and synodic month line up. The period from the previous eclipse to this line up point is the Saros and is attended by another eclipse.

We can't say the next eclipse will be at the same location, as this is affected by rotating Earth. If the Saros cycle was exact in days, it would be located very close to the previous spot, but as it is not, the eclipse will occur at a location to the west. There is another cycle (the Exeligmos) which determines when you will see an eclipse at the same location, but that is a topic for another day. There is also the matter of the type of eclipse; it will be solar, but whether it is Total, Annular, or Partial is determined by the anomalistic cycle (the effect of the Moon's orbit being an ellipse, not a circle).

NUMBERING SAROS

The Saros Cycles are numbered, for instance the TSE on April 8, 2024, is in Saros 139. The system for numbering was developed by Dutch astronomer G. van den Bergh in the 19th century. The upcoming American Eclipse (the Sequel) on April 8,2024 is #30 of Cycle 139.

Saros cycles usually start and end at the poles, usually with poor partial eclipses seen only by polar bears. #1 of Cycle 139 occurred on May 17,1501, as a partial eclipse of the sun with 9% covered. The "Last of Us" moment for Cycle 139 will occur on July 3, 2763 at 6% covered for the penguins to watch as they stand on their eggs.

I find it interesting that #30 is an amazing total solar eclipse, its path through our state, to be seen by millions on my son's birthday, while the final hurrah of this Saros cycle is on my 797th birthday. I might not be there with the penguins, but I will be there with Gus next year, standing under the dark side of the Moon.

SAROS CYCLE 139

Suggested resource: March 2023 Astronomy Club of Tulsa Presentation Observing Session 5

There will be no doubt an avalanche of new books on the 2023/2024 solar eclipses, but here is a selected bibliography and the sources for this article:

BIBLIOGRAPHY:

SEEING THE ECLIPSE

General Scientific Guides:

The Under-Standing of Eclipses by Guy Ottewell
David Levy's guide to Eclipses, Transits, and Occultations by David Levy
Your Guide to the 2017 Total Solar Eclipse by Michael E. Bakich

Observational Recollections and Histories:

Eclipse – Voyage to Darkness and Light, David Levy
Eclipses, Past and Future, Samuel Jenkins Johnson
The Last Stargazers by Emily Levesque, Chapter 9
Sun Moon Earth by Tyler Nordgren
Eclipse - Journeys to the Dark Side of the Moon, Frank Close
Mask of the Sun – The Science, History, and Forgotten Lore of Eclipses, John Dvorak

Technical Papers and Websites:

Solar Eclipse 1970 Bulletin F [US Gov't document NS 1.2:So 4] (provides data and outcomes from several technical experiments at that eclipse)
http://mega-what.com/glossary/LuniSolar.html
https://www.mreclipse.com/
https://solarsystem.nasa.gov/eclipses/home/

SAROS

Prehistorical Astronomy in the Southwest, J. McKim Malville
The Stars in Their Courses, Sir James Jeans, p 30
Observational Astronomy for Amateurs by J.B. Sidgwick, p.58-61
Roads to Center Place: A Cultural Atlas of Chaco Canyon and the Anasazi, Kathryn Gabriel, p.96
Living the Sky: The Cosmos of the American Indian, Ray A. Williamson, p.189
How the World Works: Astronomy, Anne Rooney, p.110-115
Eclipse Prediction and the Length of the Saros in Babylonian Astronomy, Lis Brack-Bersen and John M. Steele
Astronomy Made Simple, Meir Degani, p.157
Astronomy, E.G. Ebbighausen, p.30
Your Handle on the Night Sky, Daniel Pope, p.113
Out of the Shadow of a Giant: Hooke, Halley, and the Birth of British Science, by John and Mary Gribbin, p 240-250
Scheduling the Heavens: The Story of Edmond Halley, Mary Fox, p.109
The American Eclipse, David Baron, p.12

https://www.theguardian.com/science/1999/jul/15/eclipse.technology
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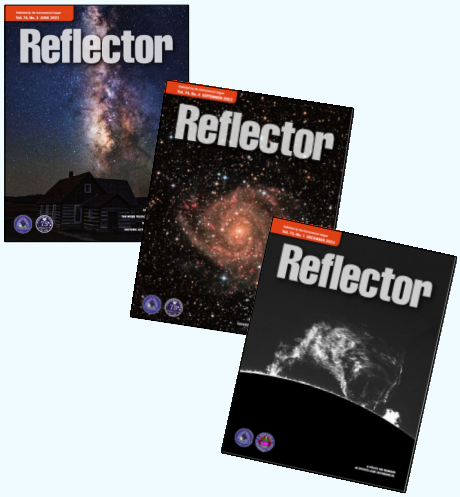
https://www.smithsonianmag.com/blogs/national-museum-american-indian/2017/08/21/american-indian-beliefs-about-eclipse/
https://www.almanac.com/solar-eclipse-folklore-myths-and-superstitions
https://kaiserscience.wordpress.com/2021/07/13/lunar-precession-the-moons-wobble/

Join the Astronomical League



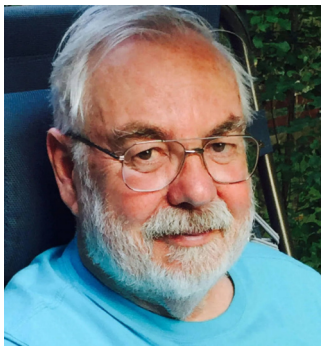
The mission of the Astronomical League is to promote the science of Astronomy. The major benefit of belonging to this organization is receiving the quarterly newsletter, The Reflector, which keeps you in touch with amateur activities all over the country.

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)

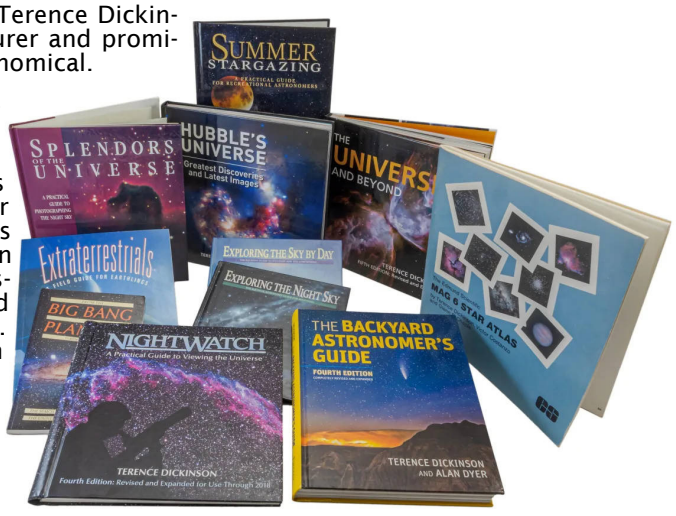
alcor@warrenastro.org



Terence Dickinson CM
1943 - 2023

Astronomy lost one of its best, Terence Dickinson — astronomer, author, lecturer and prominent advocate of all things astronomical.

A Canadian amateur astronomer and accomplished astrophotographer. He was the author of 14 astronomy books for both adults and children. He was the founder and former editor of SkyNews magazine. Dickinson had been an astronomy commentator for Discovery Channel Canada and taught at St. Lawrence College. He made appearances at such places as the Ontario Science Centre. In 1994, the International Astronomical Union committee on Minor Planet Nomenclature named asteroid 5272 Dickinson in his honor.



Over the Moon

with Rik Hill

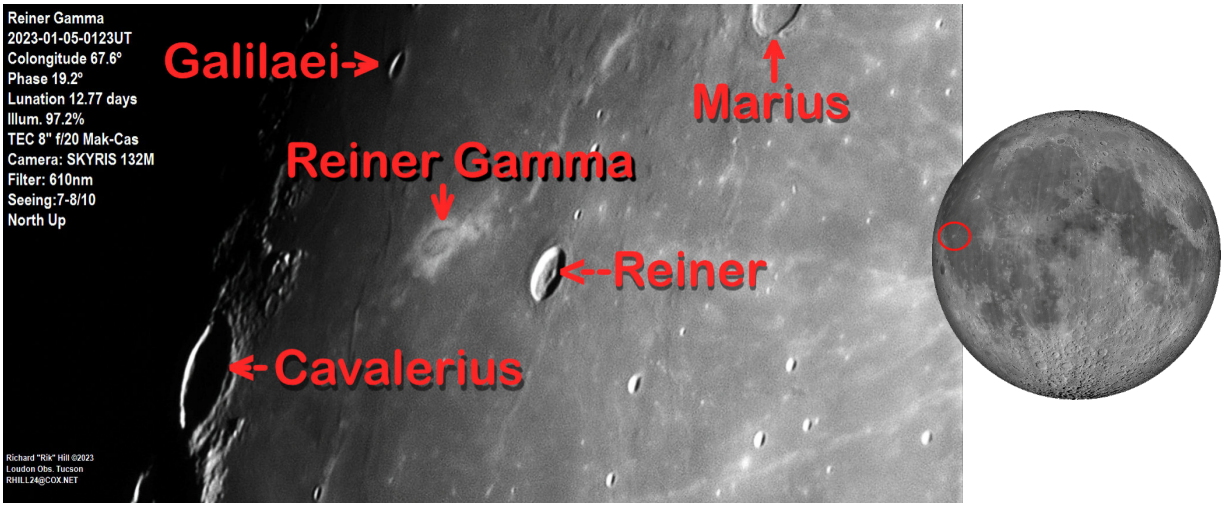
Reiner Gamma:

A lunar swirl enigma

People tend to think that since we have landed on the moon and bombarded our neighbor with countless spacecraft over the last 66 years, that we know all about it now. Nothing could be further from the truth! This is one of the features that represents "lunar swirls", a localized magnetic anomaly in Oceanus Procellarum. The crater in the center of the image is, appropriately, Reiner (31km dia.). At the top, half of the crater Marius (43km) is peeking down. To the left of Marius you can see some of the Marius Hills, the famous field of lunar domes. Then on the left side of this image is the large crater, Cavalerius (60km) still mostly in shadow. Above Reiner, on the terminator, is the crater Galilaei (15km) and roughly halfway between these two and a little left is the crash site of Luna 8. Unfortunately radio contact was lost with that spacecraft after two unsuccessful retro burns and it crash landed on 7 Dec. 1965 (Moscow date).

Reiner Gamma has no relief, and is a purely an albedo feature. Oblique views from the Lunar Orbiter 2 cameras show no topography at all, just a stain on the floor of Procellarum. It's magnetic field has been measured from spacecraft altitudes as low as 28km and those measurements have shown it to be one of the strongest magnetic anomalies on the Moon. In the 17th century this feature was identified as a crater that was named Galilaeus to honor Galileo. This was honorarium was moved changed to the aforementioned Galilaei after the true nature of Gamma was learned. However, the cause of this and other lunar magnetic swirls is still a tantalizing enigma.

This was made from 2-1800 frame AVIs stacked with AVIStack2 (IDL) then assembled with Microsoft ICE and final processed with GIMP and IrfanView.



Location Maps by Ralph DeCew

History S.I.G.

March 1991

Regarding content, the WASP has certainly gone through some lean times. This 5-page issue features a solitary article, “Mu Draconis” by Steve Franks where he writes about a binary star system (a surprise shows up in the last paragraph). He continues on with Nu Draconis, Psi Draconis, Omicron Draconis, 16-17 Draconis, 39 Draconis later in the issue.

Among the club information, calendar and announcements appears a notice that Jack Horkheimer would be joining the club (along with Rik Hill from Kitt Peak) on Astronomy Day at Cranbrook on April 20, 1991.

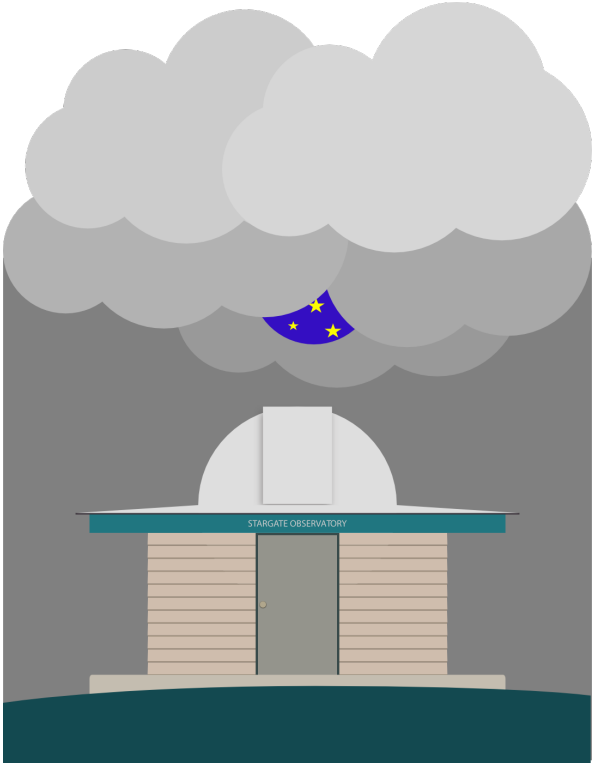
A couple paragraphs for “Computer Chatter” by Larry Kalinowski completes the issue.

March 2001

This issue is one of those web-based versions that we went through in the mid-nineties through the early two-thousands. Some printed versions popped up occasionally but, I digress. Links from the top of the page yield “Messier Marathon 2001” by Mike Simonsen, “Improving Seeing” by Rick Gossett, “Astro Chatter” by Larry Kalinowski, “Astronomy Web Sites” by Gary Repella, and “Lunar and Planetary Subgroup Notes” by Riyad Matti.

A bit of club business is taken care of in “Members” by Mark Femminineo and “The SwapShop” by Larry Kalinowski.

Dale Thieme,
Chief scanner



WASP

Warren Astronomical Society Paper

Volume 23 Number 3 Price: $1.00 for Non-members March, 1991

MU DRACONIS

By Steve Franks

The variety among double stars is endless! As an example, a close binary system whose movement can be followed over the years even in small telescopes. This is Mu Draconis, situated midway between the two binocular pairs Nu and 16-17.

Like Nu itself, both components of Mu are white and nearly a perfect match in brightness. The separation of the stars in the former, however, is more than 30 times that in the latter! The actual figures for Mu show that both stars shine at magnitude 5.8 and are presently a very close two seconds of arc apart. The two suns are also of the same spectral class (F6).

Mu Draconis was at one time thought to be a very long period binary, whose circuit required as much as 2,000 years to complete. More recent results, however, have shown its period to be much shorter - about 480 years. Closest approach of the two suns is predicted for 1988, when their separation will be about 1.9 seconds. This is very nearly its present value, so you'll see little change in this parameter over the coming decades. Maximum separation of 4.5 seconds is expected in the year 2180.

Although Mu's separation is now relatively constant, its position angle will continue to change noticeably over the years. Currently it is decreasing - meaning that the components are moving clockwise with respect to each other. Back in 1830, its position angle was measured at 200 degrees; in 1975, 50 degrees, and in 1995, it will have diminished to 15 degrees (nearly due north in the sky).

A 3-inch refractor at high magnification will resolve this pair in good seeing and a 4-inch glass will cleanly split it. Such instruments - together with lots of time and patience - are all that is needed to observe the two suns moving about each other.

At least one classic observer considers Mu Draconis "a pretty pair" - with sufficient resolu... Most small instruments will show the two stars apparently in contact with each oth... nights, and as a blended blob of light on other occasions.

Mu is actually a triple system, for a 13th magnitude star 14 s... drifting through space with it. There are also astrome... orbit that may signal the presence of an unseen c... lies about 76 light-years from us.

WASP

The Warren Astronomical Society Paper

Volume 33, Number 3 March, 2001

Messier Marathon 2001

by Mike Simonsen

The Warren Astronomical Society will be hosting this year's Messier Marathon at Stargate Observatory on the nights of March 23rd and 24th.

Once a year, it is possible to view all the Messier objects in one night if you start at dusk and observe until dawn. Attempting this is indeed a "marathon" observing session. It is quite a challenge to get [continued]

Improving Seeing

by Rick Gossett

(Now that you think that I have lost my mind, continuing reading this article will be easy.) Many times we blame our optics(too small) or sky conditions because we have not trained our eyes to see all that the eyepiece is showing us. It is very easy to develop the terrible habit of glancing [continued]

Astro Chatter

by Larry Kalinowski

To join or not to join, that is the question. Some members of the society want to keep our affiliation with The League alive. The answer should be based on how much we depend on the League to function. It's true that the League provides recognition to observers when they accomplish one of their observing programs, like observing Messier Objects, NGC objects or lunar observing. However, the society only gets awards for members about once a year, on the [continued]

Astronomy Web Sites

by Gary Repella

One of the first things that you notice when you check the internet for astronomy sites is the number of them. Its astronomical. Each sites has links to other sites. You could spend days tracking them all down. [continued]

Lunar and Planetary Subgroup Notes

by Riyad Matti

I would like to let the WAS members know that I will be at Stargate observatory on the following days, or weekend closest to these days depending on my other obligations. This list is collected from the A.L.P.O. Lunar web [continued]

Members

by Mark Femminineo-

The SwapShop

by Larry Kalinowski

John Herrgott is selling his Questar 3.5-inch f13 Maksutov-cassegrain fork-mounted equatorial telescope along with several eyepieces and other accessories. The firm price for this excellent telescope is $1700 firm. Email John at johnherrgott@earthlink.net or call him at 810-735-9313. Hurry, this scope will go quickly at this price!

Messier Marathon 2001, continued

them all. I haven't been able to do it yet myself, mostly due to uncooperative weather, and I get side tracked doing variable star estimates in between. The first few and the last two or three are the hardest ones because they are hidden in the murk of evening and morning twilight.

Planning is very important. Be sure to have a good set of finding charts made in advance and practice finding as many as you can in the months preceding the marathon. I have included a list that is a good sequence to do them in and includes some other information and tips.

In order to make it to the end, you should be sure to get plenty of rest, dress warmly and bring drinks and snacks to keep your stomach from breaking your concentration.

Regardless of how many you can identify in one night, this can be a lot of fun, especially if you have fellow astronomers to share the night with.

CRANBROOK INSTITUTE OF SCIENCE

Michigan's Museum of Natural History

MARCH 2023

Notable Sky Happenings

Mar. 1 - 7

Venus appears **extremely** close (half a degree) to the right of Jupiter on the 1st (W evening twilight).

Mar. 8 - 14

Moon is at the upper right of Spica on the 10th (SW morning). Daylight time begins at 2:00am on the 12th; set clocks forward one hour.

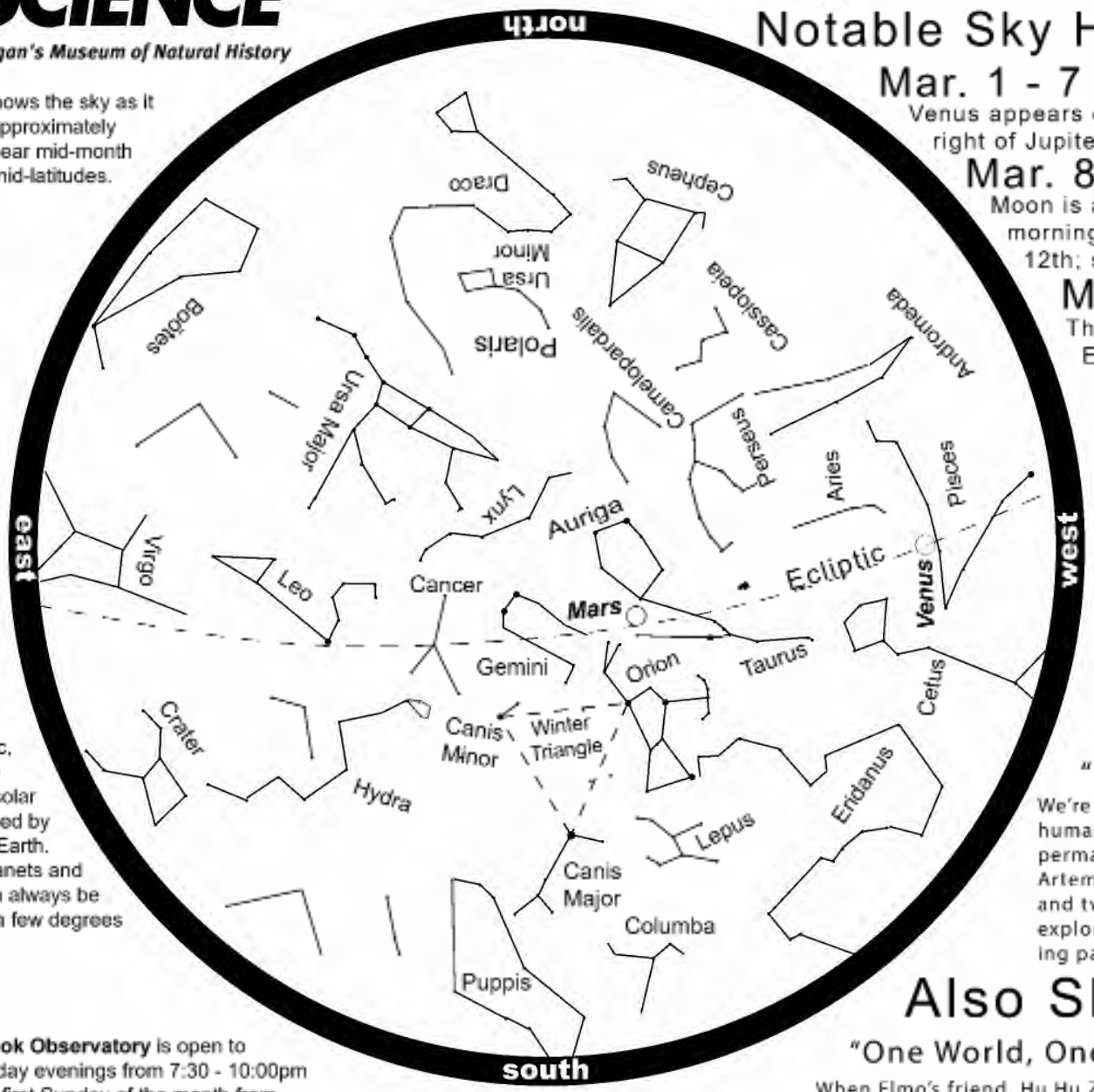
Mar. 15 - 21

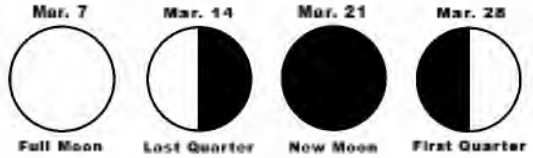
The March (Spring) Equinox is at 5:24pm EDT on the 20th.

Mar. 22 - 31

Moon is above and to the left of Jupiter on the 22nd (W evening twilight), below Venus (23rd) then above (24th), at the lower right of Mars (27th) and upper left on the 28th (W evening).

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.

Now Showing

"Forward to the Moon"

We're ready to start a new chapter in the history of human exploration and take our first steps towards a permanent presence om the Moon. NASA's 21st century Artemis program, named after the Greek Moon Goddess and twin of Apollo, is the next step in our mission to explore the universe. A Moon base will be the launching pad for the next target: the planet Mars.

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 7:30 - 10:00pm EST, and the first Sunday of the month from 1:00 - 4:00pm for solar viewing.

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

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

Doug Bock - IC434 - The Horsehead Nebula

March 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3 Moon at Apogee: 405890 km	4
5	6 Cranbrook	7 FULL MOON Holi	8	9	10	11
12 Daylight Saving Begins	13	14	15	16 Macomb	17 St Patrick's Day	18
19 Moon at Perigee: 362698 km	20 Vernal Equinox	21 NEW MOON	22	23 Ramadan begins	24	25 Stargate Open House
26	27	28	29	30	31 Moon at Apogee: 404921 km	

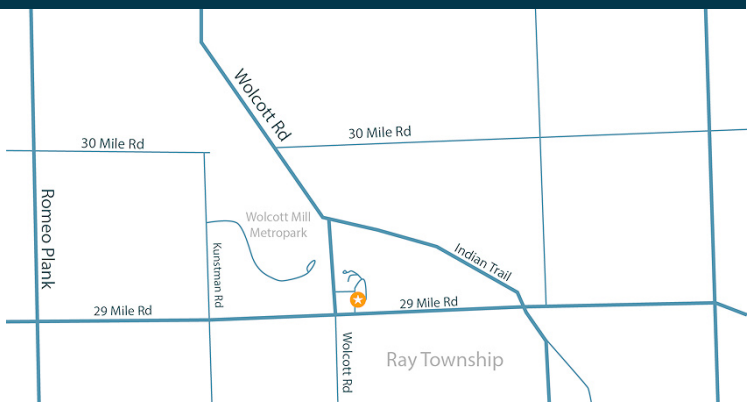
Stargate Observatory

Monthly Free Astronomy Open House and Star Party
7:30 PM, 4th Saturday of the Month

Wolcott Mill Park - Camp Rotary Entrance

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

- Sky tours.
- See different telescope types in operation.
- Get help with your telescope.
- We can schedule special presentations and outings for scouts, student or community groups.
- Contact: outreach@warrenastro.org
- Find us on Meetup.com



20505 29 Mile Rd (1.8 miles east of Romeo Plank Rd) Ray, MI 48096
82° 55'04" West Longitude, 42° 45'29" North Latitude

Observatory Rules:

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

Stargate Report

Observatory Report

Riyad opened the observatory at 6:30. We had 4 club members in attendance, with an additional 6 guests checking out the observatory under cloudy skies.

After some chit chat most called it a night. myself, Riyad and Mark Kedzior called it around 9:00.

March Open House

Scheduled for Saturday the 25th at 7:30pm

With a thin setting crescent Moon it could be a good night for Venus and Mars and Orion.

Jeff MacLeod
Observatory Chair

Treasury Report

Treasurer's Report for February 28, 2023

BOA account:

Balance:	$30,816.87
Deposits:	451.50
Expense (Webex):	15.90

PayPal Account:

Balance:	$434.24
Received:	152.55
Paid (Website annual fee):	61.93
Total Paid Memberships:	83

We welcome our new members, Melissa & Michael Calliea, Vatshalya Dandibhotla, Michael Smith, Paul Wakabayashi, and Cynthia Williams.

Notes from the Treasury:

Is it time to renew your membership? Every New Year, many memberships expire. Please let me know via email at treasurer@warrenastro.org to verify your membership status. We strongly recommend using PayPal for faster service, but we also accept checks and cash at the meetings."

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

Adrian Bradley,
Treasurer

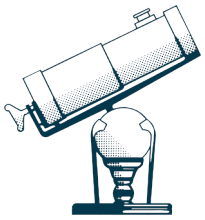
Astronomical Events For March 2023

Add one hour for Daylight Saving Time

Source:

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

Date	Time (h:m)	Event
1	23:00	Venus 0.5°N of Jupiter
2	21:10	Pollux 1.7°N of Moon
3	13:01	Moon at Apogee: 405890 km
5	19:08	Regulus 4.5°S of Moon
7	7:40	FULL MOON
10	5:06	Spica 3.4°S of Moon
11	3:53	Moon at Descending Node
13	19:21	Antares 1.6°S of Moon
14	21:08	LAST QUARTER MOON
15	18:00	Neptune in Conjunction with Sun
17	6:00	Mercury at Superior Conjunction
19	10:16	Moon at Perigee: 362698 km
19	10:20	Saturn 3.6°N of Moon
20	16:25	Vernal Equinox
21	12:23	NEW MOON
22	14:54	Jupiter 0.5°N of Moon: Occn.
23	21:08	Moon at Ascending Node
24	5:28	Venus 0.1°N of Moon: Occn.
25	18:42	Pleiades 1.9°N of Moon
28	8:16	Mars 2.3°S of Moon
28	21:32	FIRST QUARTER MOON
30	4:23	Pollux 1.6°N of Moon
31	6:18	Moon at Apogee: 404921 km
31	15:00	Mercury at Perihelion



Meeting Minutes

WARREN ASTRONOMICAL SOCIETY
MINUTES OF BOARD MEETING
FEBRUARY 6, 2023 @ 6:30PM

Meeting called to order @ 6:57PM. Officers in attendance: Bob Trembley, Dale Partin, Jeff MacLeod, Mark Kedzior, Adrian Bradley – VIRTUAL - Kevin McLaughlin, Dale Thieme – quorum present.

OFFICER REPORTS:

President Bob Trembley reported on his meetings with the Metroparks regarding the WAS and GLAAC being a presence and assist at planned monthly events. The Metroparks will be advertising our Open House dates on their site. Metroparks will be sending updated wording on a waiver that was required of clubs at events for board review.

1st VP Dale Partin reports speaker schedule is looking better. He reported that the WAS has approval from Macomb to meet again in person – the meetings would be held in the 'E' Building classroom, with internet and Wi-Fi access for streaming meetings – we would need to provide camera and other tech gear to run hybrid meeting.

Discussion – Motion by Dale Partin to return to in person meetings at Macomb beginning Thursday, March 16 – second by Jeff MacLeod. Motion passed. Discussion on tech equipment being needed for both Cranbrook and Macomb.

Dale Partin made a motion to pay speaker fee of $100 to Ken Zoll at a future meeting – second by Bob Trembley. Motion passed.

Discussion on Paul Strong Memorial Scholarship – Dale Partin will contact Macomb for further clarification on obtaining candidates' names and report back to board.

2nd VP Jeff MacLeod reported the January Open House was clouded over _ Riyad Matti hosted a Girl Scout troop visiting the observatory and gave a tour of our facility. Next Open House is February 25th.

Secretary Mark Kedzior reported there are six 2023 WAS Calendars still available to purchase.

Treasurer Adrian Bradley gave report on WAS Treasury accounts. Outreach Chair Kevin McLaughlin reported(virtually) on upcoming outreach events by members. Publications Chair Dale Thieme reports February WASP is posted online – also reported that the WAS website is now WAS owned and is being billed automatically through PayPal, along with DreamShield protection. Transfer fees and current plan came to total of $100.33 (transfer $38.40 – standard billing $61.93).

Bob Trembley reports that the Metroparks will be making a sign to place on Stargate building – they have the equipment and shop to make sign. They need info from the WAS regarding the wording to be placed on the sign.

With the eventual resumption of in person meetings at Macomb, Mark Kedzior asked if the Snack Volunteer Schedule can be implemented once again. Jeff MacLeod will get the list going. Mark will bring continue bringing snacks that were purchased to both meetings to add to the volunteers' offerings until depleted.

Motion to adjourn by Dale Partin – second by Bob Trembley. Motion passed.

Meeting ended at 7:25 PM.

Respectfully submitted,
Mark Kedzior,
Secretary

WARREN ASTRONOMICAL SOCIETY
CRANBROOK (Hybrid) MEETING
FEBRUARY 6, 2023 7:30PM

Meeting called to order for Cranbrook meeting at 7:30PM by President Bob Trembley. Persons in attendance – 29 – WebEx, 19 – YouTube attendance – 8@ 8:30PM).

OFFICER REPORTS:

President Bob Trembley reported that Macomb WAS meetings will resume in person beginning March 16 in the 'E' Building, Room 208. He also discussed meeting with the Metroparks in planning future astronomy outreach events to be held at various Metroparks.

1st VP Dale Partin updated membership on future speakers for our upcoming meetings, and as always, is in need of presenters for future meetings.

2nd VP Jeff MacLeod reports the next Open House will be held Saturday, February 25th. The Snack Volunteer sign-up sheet will be started once again for our in-person meetings beginning in March. He also is looking for individuals to host Discussion Group nights so as to schedule and notify interested individuals.

Treasurer Adrian Bradley gave the WAS Treasury report, which can be found in the February WASP, and encourages all, if not already done, to renew their memberships and Astronomical League memberships.

Outreach Chair Kevin McLaughlin reported on upcoming outreach events by members.

Secretary Mark Kedzior reported that there are six (6) 2023 WAS Calendars still available to purchase.

Publications Chair Dale Thieme reports the February WASP is up on line. He also reported that the WAS website is now owned and maintained by our club. Three new guests were in attendance at the meeting.

SPECIAL INTEREST GROUPS:

Solar – Marty Kunz reports reduced activity on the sun but spots are visible if observing features. David Levy reports viewing the Sun from Arizona, and recorded two large complexes, 17 spots and 15 prominences. Double Star Group – Riyad Matti reports that at the next Open House, he will be using our newly acquired spectrum analyzer to study star spectra.

OBSERVING REPORTS:

David Levy reported on observing Comet ZTF, and reported seeing two ZTF comets – one in Cassiopeia – also one is brighter than the other. Marty Kunz reported that the Cranbrook Observatory was open on February 3rd for visitor to view Comet ZTF. Kelly LeTourneau reported observing Comet ZTF on January 31st with 10 x 50 binoculars. Adrian Bradley reported on observing a close Moon-Mars occultation. Dale Hollenbaugh shared his excellent images of Comet ZTF and showed a 4-hour video capture showing movement of the comet in the sky against a background of stars.

SHORT PRESENTATION:

1st VP Dr. Dale Partin introduced Jacob Callebs, a third- year undergraduate at Wayne State University, and his presentation "A Novel Approach to Echo Mapping Supermassive Black Holes". His research is centered around active galactic nuclei and the method for measuring them. He discussed the echo mapping of a black hole in M87 and Centaurus A. Questions and discussion followed this very informative presentation. To see his presentation in its entirety, go to: https://www.youtube.com/warrenastro

MAIN PRESENTATION:

1st VP Dale Partin introduced "our own" David Levy (with bio) and his presentation "Of Comets, Love, and Poetry". In his wonderful and moving presentation, David spoke of his history in searching for comets beginning in 1965, the discovery of his first comet in 1984, and his relationship with Gene and Carolyn Shoemaker and the story of the discovery of the now famous Comet Shoemaker-Levy 9, which made astronomical news as it broke apart and plunged into the atmosphere of Jupiter in 1994. He also shared with us the story of his beloved wife Wendy, how they met, and her passing after a courageous battle with cancer. He finished his presentation by reading a favorite poem of Wendy's.

Questions and discussion followed this special presentation. To see his presentation in its entirety, go to: https://www.youtube.com/warrenastro

Meeting ended at 9:30 PM.

Respectfully submitted,
Mark Kedzior
Secretary, WAS

WARREN ASTRONOMICAL SOCIETY

MACOMB (VIRTUAL) MEETING

FEBRUARY 16, 2023 7:30PM

Meeting called to order at 7:30 PM by President Bob Trembley. WebEx attendance – 20 & YouTube – 14@ 8:15 PM).

OFFICER REPORTS:

President Bob Trembley encouraged members to send in their renewal membership dues – still in need of a volunteer for AV Tech for meeting setup – Macomb in person meetings will resume on March 16 in the 'E' Building, Room 208 -Metroparks will be listing dates of our Open Houses on their website to promote astronomy and the WAS – 2024 Total Solar Eclipse interest is increasing. 1st VP Dr. Dale Partin reports we are still in need of speakers for upcoming meetings. 2nd VP Jeff MacLeod reports there will be an Open House on Saturday, February 25th, and the Snack Volunteer Schedule will resume beginning with the March Cranbrook meeting. Treasurer Adrian Bradley gave brief report on WAS accounts. Secretary Mark Kedzior reports there are six 2023 WAS Calendars available to purchase. No report from Outreach. Publications Chair Dale Thieme is preparing the March WASP and encourages those wishing to send in submissions to do so.

SPECIAL INTEREST GROUPS:

Solar – Recent images of sun shown with large sunspots – large CME erupted causing radio blackout in South America – auroras on the way. David Levy observed 5 sunspot complexes with 29 spots and 17 prominences. Double Star Group – Riyad Matti reports that newly acquired spectrum analyzer will be used at February 25th Open House.

OBSERVING REPORTS:

David Levy reports observing Comet ZTF – a brighter ZTF and the second at a faint magnitude 11 – read poem by Walt Whitman. Adrian Bradley shared his image of the night skies over Saginaw Bay towards Lake Huron showing the Comet ZTF in his image.

BRIEF IN THE NEWS:

1. Rings discovered around dwarf planet Quaoar
2. Small asteroid impact near English Channel with possible articles in France
3. Three Jesuit priests and Pope Gregory XIII (Ugo Boncompagni) had asteroids recently named in their honor.

MAIN PRESENTATION:

1st VP Dr. Dale Partin introduced Jon Blum, past WAS President/Vice President (with bio), with his presentation "The Fermi Paradox: Where Are They?" This presentation was a video of one of Jon's series of astronomy presentations he gives to the Fox Run active senior community where he lives. He discusses and explains the "Drake Equation" (Frank Drake 1930-2022) with possible answers (as to how many intelligent civilizations live in our Milky Way?), and the Fermi Paradox (why haven't we heard from them?). He presented clear, concise questions, facts and figures, and possible answers to stimulate further discussion and thought about these two items.

Questions and discussion followed his great presentation.

Meeting ended at 9:31PM.

Respectfully submitted,
Mark Kedzior
Secretary, WAS

The Warren Astronomical Society is a proud member of the

Great Lakes Association of Astronomy Clubs

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

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

Club and Society Newsletters

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

WAS Member Websites

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

Jon Blum: Astronomy at JonRosie

Doug Bock:

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

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

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

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

Bob Trembley:

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

Vatican Observatory Foundation Blog

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

Spot the Morning and Evening Star: Observe Venus

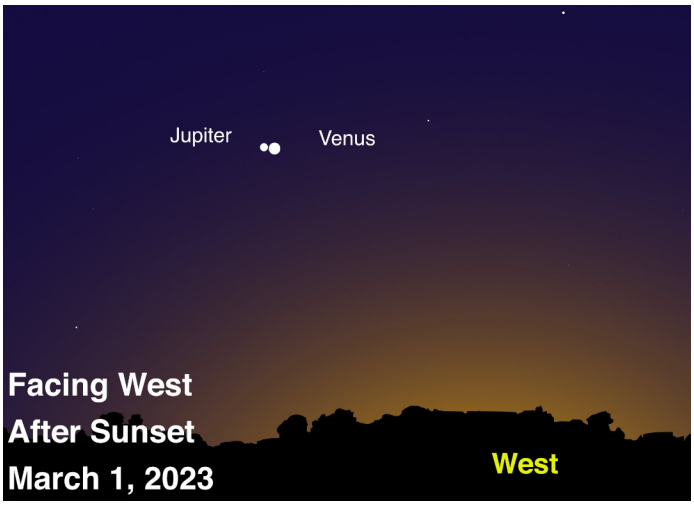
David Prosper

Venus is usually the brightest planet in our skies, and is called "Earth's Twin" due to its similar size to Earth and its rocky composition. However, Venus is a nightmare version of our planet, featuring a thick, crushing atmosphere of acidic clouds, greenhouse gasses, howling winds, and intense heat at its surface.

This rocky inner world's orbit brings it closer to Earth than any of the other planets, and is the second closest to the Sun after Mercury. Like Mercury, Venus orbits between our planet and the Sun, so Earth-based observers can observe Venus in the morning before sunrise, or in the evening after sunset – but never high in the sky in the middle of the evening, unlike the outer planets. Since Venus is so striking in its twilight appearances, the planet features heavily in sky mythologies worldwide. Venus's bright morning and evening appearances are the origin for its dual nicknames: the Morning Star, and the Evening Star. Some ancient astronomers never made the connection, and assumed the Evening Star and Morning Star were two unrelated objects! Observers can even spot Venus during the daytime, if the sky is very clear and the planet is bright enough. Venus also has phases, similar to the Moon and Mercury. Galileo's observations of Venus's phases helped turn the astronomy world upside down in the early 1600s, and you can see them yourself using a telescope or even a surprisingly low-power pair of binoculars. **Warning**: Please be very careful when observing Venus with a telescope in the early morning or daytime. Never allow the Sun to enter your instrument's field of view, as you could be permanently blinded.

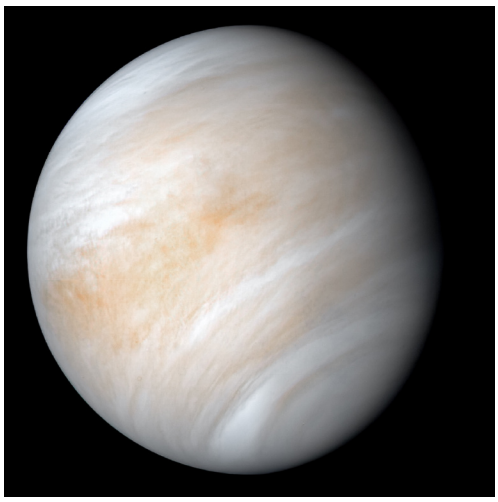
Venus's other moniker of "Earth's Twin" is a bit misleading. In terms of their surface temperatures and atmospheres, Venus and Earth are extremely different! The surface of Venus is warmer than that of Mercury, despite Mercury being many millions of miles closer to the Sun. While Mercury is still a scorching 800 degrees Fahrenheit (427 degrees Celsius), Venus is even hotter: 900 degrees Fahrenheit (482 degrees Celsius). The vast amount of carbon dioxide in the thick Venusian atmosphere acts as an insulating blanket that retains much of the Sun's heat, creating the runaway greenhouse effect that dominates its present-day climate. The Venusian surface is a crushing 90 Earth atmospheres on top of its absurd temperatures. These extreme conditions mean that the mission life of any past Venusian robotic landers were measured in **hours** at best – and usually minutes! However, conditions in Venus's upper atmosphere may be much more hospitable, with temperatures and pressures at 30 miles (50 km) above the surface that are much more Earth-like in temperature and pressure. Studies of the Venusian atmosphere, including seasonal appearances of dark streaks and faint signals of suggestive chemistry, intrigue researchers with the possibility that some sort of life may persist in its clouds. But far more evidence is needed to confirm such a claim, since non-biological factors like volcanism and other processes could also be the source for these signals.

Venus's thick sulfuric acid clouds block direct visual observations of its surface from optical telescopes on Earth. Multi-wavelength observations from space probes show evidence of active volcanoes and possibly some sort of plate tectonics, but followup missions will be needed to confirm the presence of active volcanism, plate tectonics, and any possible signs of life. In order to do so, NASA is sending two new missions to Venus by the end of this decade: the orbiter **VERITAS**, which will map the surface in high detail and study the chemistry of its rocks and volcanoes, and **DAVINCI+**, which will study its atmosphere and possible tectonic surface features via a "descent sphere" that will plunge into Venus's clouds. Follow their development and discover more about Venus at solarsystem.nasa.gov/venus, and of course, continue your exploration of the universe at nasa.gov.



Venus and Jupiter continue to move closer together in the evening sky this month. Jupiter will continue its descent towards the horizon while Venus will continue to climb and will be visible in the evenings though mid-summer of 2023. It's a great year for Venus fans!

Image created with assistance from Stellarium



The top layers of Venus's cloud pop in this contrast-enhanced image, reprocessed with modern techniques from Mariner 10 data.

Credit: NASA/JPL-Caltech

Source: https://solarsystem.nasa.gov/resources/2524/newly-processed-views-of-venus-from-mariner-10/