# The W.A.S.P.

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## The Warren Astronomical Society Publication

Caroline Herschel—1750-1848

# The WASP

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P.O. Box 1505
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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
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Warren, Michigan

**Membership and Annual Dues**

| Student | Individual | Senior Citizen | for families |
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| $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.
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Pay at the meetings

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

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

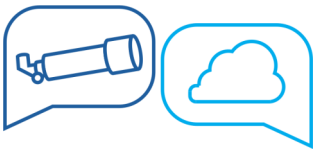
**The Warren Astronomical Society Publication** (WASP) is the official monthly publication of the Society.
Articles for inclusion in the WASP are strongly encouraged and should be submitted to the editor on or before the end of each month. Any format of submission is accepted. Materials can either be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

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

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

## Snack Volunteer Schedule

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



## Discussion Group Meeting

Come [illegible] astronomy, space news,

CANCELLED UNTIL FURTHER NOTICE

## In This Issue:

## President's Field of View

I had hoped to come to you this month with tales of observing Southern Sky objects from the dark desert of New Mexico, possibly coupled with an account of a visit to the Very Large Array. Instead I report that our tripod, a gift from a former member of Livonia's defunct club, went unused but its formidable legs did punch holes through the fabric of my favorite hoodie and Jonathan's hoodie as well. Our fault for using outer garments as padding material, I guess.

We never deployed the tripod or our 66mm travel scope, and while we came within an hour's drive of the VLA, we never made it there. We did enjoy delicious food, ancient petroglyphs, the dear company of an old friend, and New Mexican wildlife… plus a glimpse of the radio telescope of Los Alamos.

Sometimes failure is glorious. Shame about the clothes, though.

-Diane Hall,
President


## Space Pirate Radio

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Wednesday nights at 9:00 pm ET on

Astronomy.fm

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*PRESENTS*

## Travelogue of the Night Sky

**Tuesday, March 22, 2022**

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

**Take a visual tour of the night sky from Michigan and beyond**

### About this event

Astrophotographer Adrian Bradley is active in the Warren Astronomical Society, the University (of Michigan) Lowbrow Astronomers, and the Great Lakes Association of Astronomy Clubs. He frequently travels with camera in hand to photograph the night sky.

He will share a stellar travelogue of his journey learning to image the night sky.

Zoom link will be sent to registrants before program.

*Image from Adrian Bradley's collection.*

Free:

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# Observing Reports

**4 February**

The Sun. Three groups: one large near W. limb with a principal spot; two more groups ~ centre of disc, one large with ~ 10 spots, other with a major spot and little else. Three groups = max. number seen since sun-spot minimum.

Transparency poor (cirrus), seeing fair.

5-cm. refractor @ 30X (Bob Watt Memorial Eye-Piece) + mylar aperture filter.

**8 February**

The Sun. Principal group of 8 spots. 2ndry group ~ 4 spots. Remaining group 2 spots, one large.

Transparency fair, seeing fair.

5 cm. refractor, 30X. Mylar filter.

.....

COMMENTARY from OBS. HAND. "After a relatively long activity minimum, Cycle 25 is at last underway".

## BONUS FEATURE (Transl. "out-take" / "blooper reel") AWARD WINNING W.A.S.P. EXCLUSIVE

**13-14 February**

The Moon. Gradual clearing @ twilight. Telephone discussion with "Handsome Joe" McBride re sky prospects for night (clouding late + possible snow). He sounded the advance, and Observer agreed as 1st Greatest in Michigan. But no unprepared. Temp. all ready -10 C. Carefully placed (gift) 9.7 mm in oft-used coat pocket. Waded down to barn: 3 support blocks invisible in paddock. Took out 6-cm. refractor with difficulty because rain fly over main door weighed down with ice & snow. Difficulty inserting tripod through snow with ice crust(s). Observing chairs similarly challenged & unstable.

Telescope much too small for Orion variable stars on meridian, so Observer went for gibbous Moon, high in E. for pro forma definitive examination.

Failed to remove stiff plastic aperture cap, so unscrewed entire "dew" collar, put up-side down in snow to save trek to barn. Locks on aequatorial axes -- jaw clamps -- ineffective. Optical tube pointed high, so slid back-ward in saddle secured marginally with Al flashing. Impossible to return tube to balanced position w/o releasing flashing. Dropped eye-piece on wooden folding chair (borrowed from Veen Obs. ca. 1987). View approached Moon but never on it, even held by hand, because eye-piece position very low, all most requiring a seat on ground. Bowed to inevitable: very carefully removed/ pocketed eye-piece, replaced cap w/ collar to telescope aperture. Left all else in place despite snow prediction. Hands like wood, returned up to house using existing foot holes, chary from recent fall on the road. Tea time.

.....

In recent years two Society members have deemed Observer "verbose". To protect their families: D. C. and T. [A.] L. Observer opines "verbose" is from those who can not keep up. One hopes Aesop's Fables are not "verbose".

**18 February**

The Sun. One group of one spot.

Transparency good, seeing fair (low).

5-cm. refractor @ 30X

.....

COMMENTARY: Poor showing for the new cycle.

**20 February**

The Sun. One group of one spot very near limb.

Transparency good, seeing fair (wind).

5-cm. refractor @ 30X, mylar filter.

**26 February**

The Sun. One group of two matched spots of medium size.

Transparency good. Seeing good.

5-cm. refractor @ 57X, mylar filter.

# Letters

## February issue

The **obituaries** were excellent not withstanding the subject. Jon Root, yes, he disappeared for a long while.

**Diane's** analogy of bird field study with astronomy: Yes, understood about nature study degrading in to a numbers' race. I would like to make the same special pleading about my variable star "work", but much of the decline is inspired by laziness. ("*I'm no kid any more*".)

**William the Conqueror's** pictures of Crux were amazing given the camera, but a tough go in a brightly lit library. His favourite constellation? "Change of latitude means change in attitude". (Got that right?)

**Doug Bock's** commentary on the Double Cluster ended with the note that, as big as the two are, they are set in an immense complex of stars, tens of thousands in solar mass. A big portion of the sky! So -- he is a scholar and not just a soulless astrophotographer. I prefer sources from e.g. Harvard-Smithsonian rather than [citation omitted].

Thanks to **Brad Young** I now understand solar eclipse number indicating the passage of the shadow's axis in relation to the centre of the Earth. [negative for April's] 1.19 indeed explains the poor eclipse for far southern hemisphere.

I stopped reading the book review upon encountering "geek".

-- G. M. Ross, whose star is fading at Cambridge.

## Letter to Award winning WASP

Last night, 7 February, was Dr Partin's fascinating paper on replicating ancient observations and calculations. With plywood stage and portable gnomon, he personifies my own virtuous approach to astronomy: "Simple pleasures for a simple lad", except Dr Partin is not. He likely has one of the most advanced cerebral cortices in the Society per natural selection. Tolstoy: The necessity of history had him eschew a career on the rail-road for graduate work at Carnegie-Mellon.

Now where was I . . .? Oh, the lecture for "Cranbrook".

The most demanding part of his field works was establishing the distance to the Sun, using the Moon as metric. This geometry required observation of the Moon at quarter phase, for which he used a modern telescope.

Partin's simulation was what the Greeks did using naked eye This is not the place to bang on about their results nor geometry. What is of note is the difficulty of establishing time, probably even date, of dichotomy. Some over fifty years ago there were reports in Sky and Telescope about errors or biases in estimating Venus's precisely half phase: what observers thought, as opposed to the calculated geometry of the planet's position in orbit. The same challenge stands for lunar observation, plus the vague terminator crossing the dark maria.

Demanding work all around. He would have fit in the Age of Pericles, right enough.

**G. M. ROSS**, who has never attempted in the field to establish time of lunar quarter phase, and has no intention of doing so. "Simple pleasures for a simple lad".

# From the March 2006 WASP

### Extract from Larry Kalinowski's Astro-Chatter column

Occasionally, light patterns appear in the sky, caused by unfamiliar sources. The picture below is a series of light pillars but not the pillars you and I have come to know as northern lights. They're caused by ice crystals in the atmosphere on cold days when the temperatures drop below freezing. This picture was taken in Kalamazoo, during our cold snap in mid February.

*(Thought Adrian Bradley might appreciate this—Ed.)*

# W.A.S. Astro-Images

*Trees appear to be cradling the sun*

Date taken: 2/9/22 AM
Submitter: Ray Bosshard

Daytime has been better than nighttime recently. The moon (with Lunar X and V).
Image: Adrian Bradley

Date: Tue. Feb. 8, 2022 4:43 pm
ISO speed: ISO 400
Shutter speed: 1/800 sec
F-stop: f/5.6
Camera: Sony A7III
Lens: Canon 100-400mm L f/4.5-5.6 (with adapter)

*BRRRRRRR!!! The brilliantly burning daybreak belies the blisteringly blustery breezes.*
Submitter: Ray Bosshard Date Taken: 2/14/2022 AM

# The View From C.W. Sirius Observatory

## Messier 42 - The Great Nebula in Orion

While vacationing in the Florida Keys a couple weeks ago, I looked up over the ocean on one of the clear nights and saw the constellation Orion blazing away very high in the sky. From the Keys lower latitude, Orion is much higher in the sky than up in Michigan. Below Orion's "belt stars", I could see the faint glow of the "Great Nebula". The Orion Nebula (also known as Messier 42, M42, or NGC 1976) is a diffuse nebula situated in the Milky Way, being south of Orion's Belt in the constellation of Orion. It is one of the brightest nebulae, and is visible to the naked eye in the night sky. M42 is located at a distance of 1,340 light years away and is the closest region of massive star formation to Earth. The M42 nebula is estimated to be 24 light years across. Older texts frequently refer to the Orion Nebula as the Great Nebula in Orion, or the Great Orion Nebula. The first discovery of the diffuse nebulous nature of the Orion Nebula was credited to French astronomer Nicolas Claude Fabri de Peiresc, on November 26, 1610 when he made a record of observing it using a refracting telescope. Charles Messier later observed the nebula on March 4, 1769, and he also noted three of the stars in the Trapezium. Messier published the first edition of his catalog of deep sky objects in 1774. As the Orion Nebula was the 42nd object in his list, it became identified as M42. The Orion Nebula is an example of a stellar nursery where new stars are being born. Observations of the nebula have revealed approximately 700 stars in various stages of formation within the nebula.

The Nebula is visible with the naked eye even from areas affected by some light pollution. It is seen as the middle "star" in the "sword" of Orion, which are the three stars located south of Orion's Belt.

I took this photo a few years ago using my 102 mm refractor and the ZWO 071 one shot color camera. This image is 2 hours of integration time using no filters.

You can use binoculars or any size telescope to observe a very nice image of M42. But using a 12" or larger telescope will really enhance the beauty of this Great Nebula in Orion. I'm glad I brought my binos with me down to Florida this time. This beauty is a "must see" object in the late fall and winter!

### About CW Sirius Observatory:

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

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

# From the Desk of the Northern Cross Observatory

This month the nights were mostly cloudy. The few clear nights we had were sub-zero temperatures, so I didn't get any DSO imaging in. Equipment doesn't work well at -10F degrees. Neither do I. However, a few hours during a couple of days, gave me a chance to capture some sunspots. The sun has been relatively active recently.

These two images were taken one day apart, February 8th and February 9th, 2022. Note the rotation of the groupings from one day to the next.

Using a 6" f/10 SCT with a white light filter and with the ZWO asi2600MC PRO camera at prime focus, I took several 30 second videos of raw data. Once collected, I processed them using Autostakkert3 to stack the best 25% of the frames. This is done so we collect the seconds of good seeing to improve the quality of the final image.

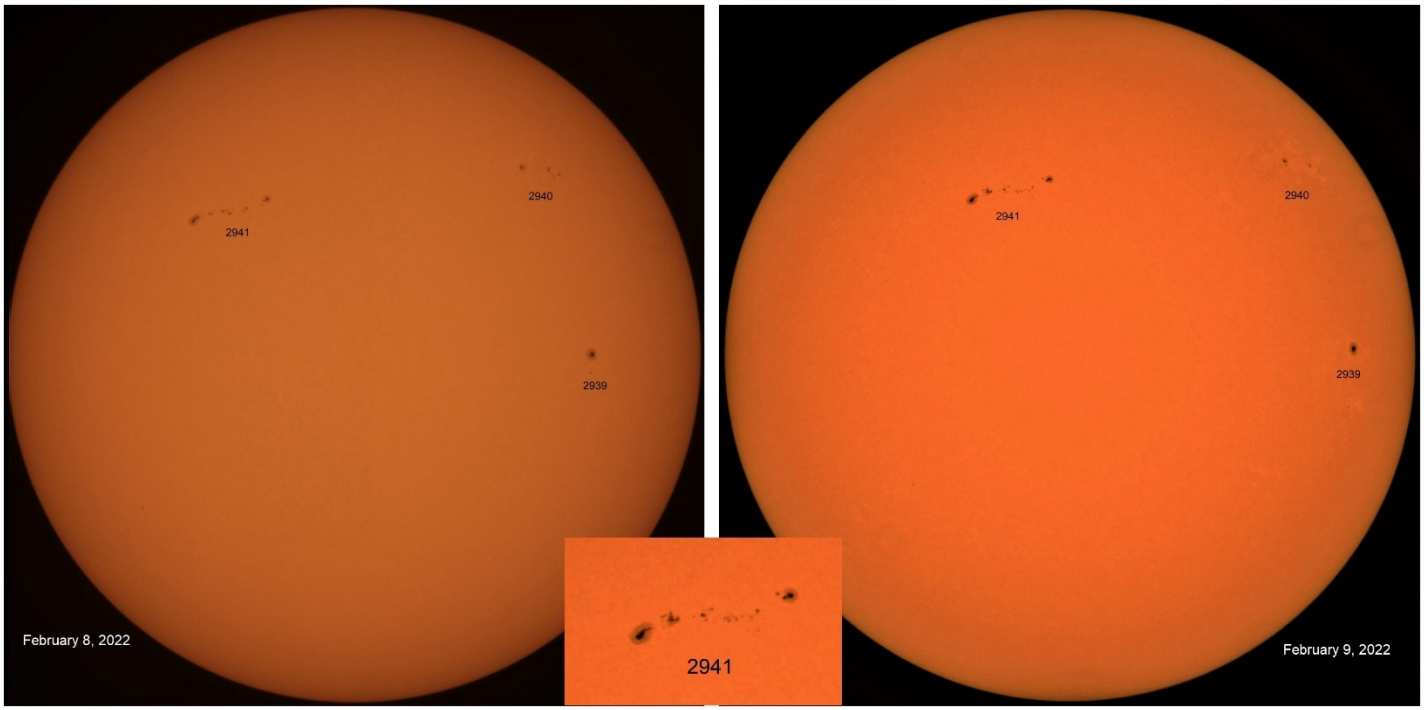
On the 8th, the seeing was about 1/5, and on the 9th about 2/5, so it wasn't the best, but still a nice change of pace to night time imaging. Clouds rolled in early afternoon on the 9th, so I was a bit lucky to get anything.

My processing varied a bit with me brightening up the picture on the right a bit. This may or may not make the spots a little more pronounced. This ends up being another learning opportunity for me, which I like. I've highlighted the group 2941 from February 9, 2022

I also made a short video while I was collecting data. It is located on my YouTube channel:

https://youtu.be/DgE03NAxsIg

If you have solar filters for your equipment or an actual solar scope, you might consider checking out the sun this year as the activity increases through its cycle.




Celestron 6" f/10 SCT with the ZWO asi2600MC PRO camera, White Light filter.

**-Doug Bock**

## Open House Report - February 26, 2022

This past month's open house was virtual using the Northern Cross Observatory as the platform on February 26, 2022

We had 10 people online for the event, which started at 7:30pm and concluded at 11:30pm.

We had the William Optics 105mm APO refractor mounted in the observatory for this event, to give a wider field of view than the 10" RC. The FOV is approximately 1.8 by 1.2 degrees using the ZWO asi2600mc pro camera.

The objects targeted for the night were:

The Leo Triplet M 65, M 66 and NGC 3628, M97 and M 108, M 35 with NGC 2158, IC 410, NGC 2264 with the cone nebula, NGC 2244 and The Rosette Nebula, and The Markarian Chain of galaxies in Virgo.

-Doug Bock

# Presentations

## Monday, March 7, 2022
## Virtual Presentations

### Beginning Astro Imaging

Main Talk:

**By Doug Bock**

Thinking about tackling astrophotography? Doug Bock has years of experience and learning to share with us. He will take us from a simple setup to advanced, with examples of results; using a tracking system, some time lapse examples, and a look at processing software.

### About the Speaker:

Past President, VP and Editor for the Warren Astronomical Society
Member since the Spring of 1973
Member of ½ dozen other clubs over the years.
Chairman and Vice-Chairman of the Great Lakes Region of the Astronomical league in the early '80's.
Retired from Ford Motor Company at the end of 2018
Owner and operator of the Northern Cross Observatory.

Short Talk:

### The Europa Clipper Mission

**By Bob Trembley**

NASA's Europa Clipper mission will conduct detailed reconnaissance of Jupiter's moon Europa and investigate whether the icy moon could harbor conditions suitable for life. Follow along as Bob introduces us to this robotic explorer, scheduled to launch in 2024, and see what NASA has planned for it.

### About the Speaker:

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

## Thursday, March 17, 2022
## Virtual Presentation

### Ancient Fossils and the Search for Life on Mars

**By Dr. Andrew Gangidine**

Billions of years before humans walked the Earth, our planet was inhabited solely by microscopic life. Searching for evidence of ancient microbial life on Earth is challenging, as non-living phenomena can mimic the simple morphology of microbial organisms, and the passage of time can distort microbial fossils. On Mars, the search for microbial life will be even more challenging since we do not know if life ever arose on the Red Planet. Join Dr. Andrew Gangidine, Curator of Earth and Space Sciences at Cranbrook Institute of Science, to learn how hunting ancient fossils on Earth can inform our search for life elsewhere in the Universe.

### About the Speaker

Dr. Andrew Gangidine is the Curator of Earth and Space Sciences at Cranbrook Institute of Science in Bloomfield Hills, Michigan. With degrees in both biology and geology, Andrew's research seeks to broadly understand the history of our planet and the life that calls (or used to call) it home. Andrew is specifically interested in how life is preserved in hot spring environments on Earth, and how we might use this information to help identify evidence of ancient life on Mars.

### 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.

# Star Gazers

*What crowd is this? What have we here? We must not pass it by;*
*A telescope upon its frame, and pointed to the sky…*
■ William Wordsworth, 1806

While I was working on my master's degree at Queen's University in Canada some 42 years ago, I came across this poem, loved it, and decided to include it in my thesis. Norman MacKenzie, my thesis advisor, a scholar and a genius, penciled one comment at the bottom of this poem: "Wordsworth wrote some wretched verse." Norman did not have much of a sense of humour, but I am still laughing at his written comment.

In his poem, Wordsworth complains about how many people who look through a telescope are disappointed in what they see. At no point in time is that idea more cogent than now. If a telescope we look through cannot offer us a view as good as a space telescope, then that telescope is a failure.

By the end of the poem, the crowd abandons the telescope:

"*One after one they take their turns,*
*nor have I one espied*
*That doth not slackly go away, as if dissatisfied.*"

For me, the night sky is far more than our imagined perceptions of what we can see through a telescope. Some of us can look at an internet photograph all day long, but not I. The beauty of the sky lies in its reality. The planets I see are real worlds. The constellations I point out to young observers contain real stars. One evening I asked a group if they had seen the recent eclipse of the Moon. "Yes," answered one, "I saw it online." No, he didn't. Eclipses are real only if you see them in the sky, while they are happening.

It is a given that a back yard telescope will never show us Jupiter as detailed or as colorful as a telescope out in space will. What that telescope does show us is the genuine sky, a sky without artificial color enhancement, a sky as it really exists on top of our heads on every clear night. It shows us a sky untarnished by the trivial events of the day, and unspoiled by petty concerns that are bothering us. Our own telescope truly shows us the Moon as it was a third of a second ago, a star as it appeared thirty-four years ago, or a galaxy as it appeared twelve million years in the past. Our back yard telescope shows us what is there, and unlike the crowd from 1806 that left dissatisfied, the people of today can understand that the sky they see is real.

Eureka, one of my telescopes, is probably a bit better than the one referred to in Wordsworth's 1806 poem Star Gazers.

# Adventures in Armchair Astronomy

-Dale Thieme

## About the Cover

We celebrate Caroline Herschel's birth on this month's cover. The other connection that cemented her spot on the cover comes from an email conversation I had regarding someone using her as an example of the discrimination against women in astronomy. Naturally, I had to investigate. I found a book by Michael Hoskin, *Discoverers of the Universe: William and Caroline Herschel*, to be rather even-handed in covering the story of William and Caroline. Her story is quite remarkable, and I find that Caroline makes a poor "exhibit -A."

Born March 16, 1750, to Isaac and Anna Herschel in Hanover, Caroline got off to a rough start. Early on, she suffered a bout of smallpox, leaving her face pockmarked. Her illiterate mother saw an opportunity to obtain a free scullery maid in Caroline. Her brothers, William and Alexander, now in England, hatched a plan to get her over to England.

Here's where Caroline departs from the discrimination narrative. Caroline received an annuity from the King to be William's assistant, taking notes while William observed, making her a professional astronomer. The etching (Fig. 1) is of the occasion William discovered Uranus. William built her a telescope and she discovered eight comets, much to the delight of the Astronomical Society members. For this she enjoyed international attention from the astronomical community. She also indexed the *Astronomical Atlas of Flamsteed*, twice, once by constellation (following Flamsteed) and then again by "zone" to make it usable for astronomers. Later in life, she edited John Herschel's catalogue of the southern sky, completing the work William started. For her efforts, Caroline received gold medals from both the Royal Astronomical Society and the King of Prussia (after she returned to Germany.)

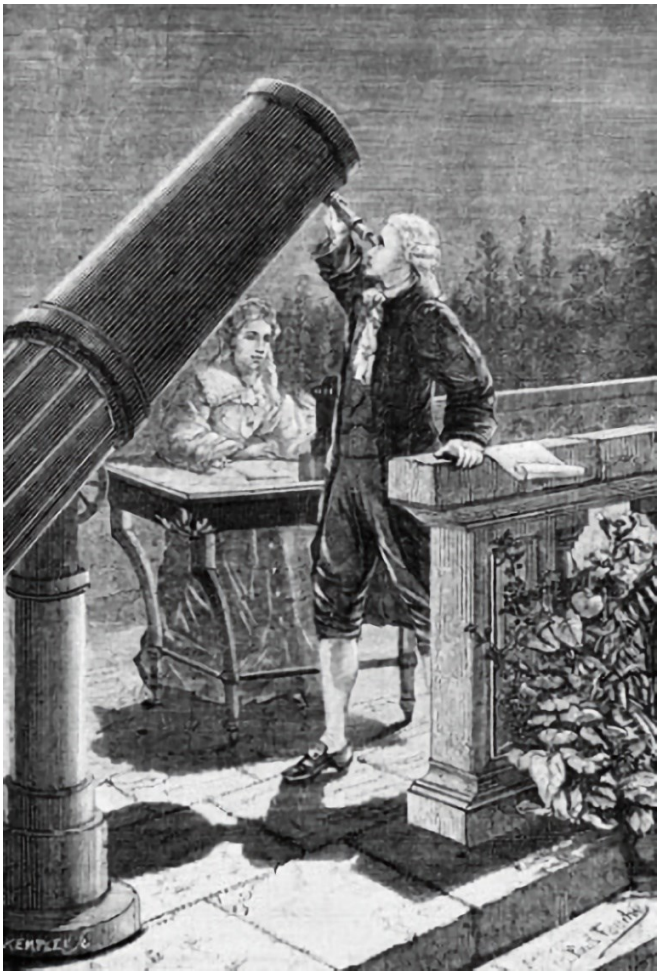


*Fig 1: Discovering Uranus*

Speaking of her return, after William died, Caroline felt the pull of home in her memories and set off for Hamburg. But it wasn't the Hamburg of her childhood, she was disappointed, and grew bitter as she aged. Her remorse over decisions *she* made regarding her singing career evolved into blaming William. While in England she was affectionate towards her mother, showing no resentment for the harsh treatment of her childhood. But, in the end, bitterness set in and the grave site that entombs her father, mother, and herself, bears only two names—and the mother isn't one.

*Discoverers of the Universe: William and Caroline Herschel,* 2011 by Michael Hoskin
ISBN 978-0-691-14833-5

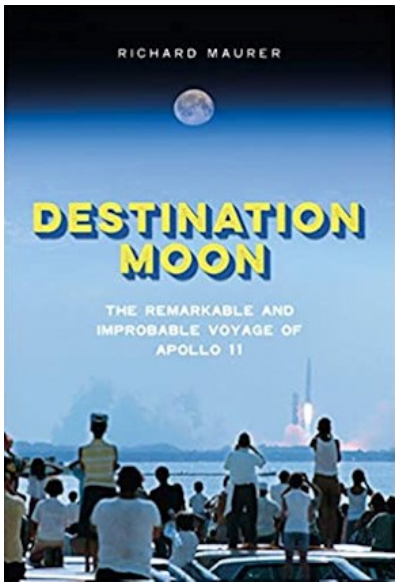
# Book Review

-Ed Bas

## Destination Moon:

### The Remarkable and Improbable Voyage of Apollo 11

Who is James Webb? You know the name, launched December 25, the greatest and latest Webb Space Telescope. And you know about his name, an administrator of NASA. But this book starts with the first history of the space race: World War II.




Incidentally, Destination Moon was a 1950 science fiction movie and the book written by Robert Heinlein, "The practical scientific and engineering challenges of space travel." I know it's cheesy and low-budget but it's 1950. Maybe it's just a coincidence, but it is still in my memory vault. Destination Moon was named a chapter in The Golden Book of Astronomy, published 1959 (!)

This recent book (published 2019) was written by Richard Maurer. "This is the true story of the people behind Apollo 11."

Major Jim Webb, 38, was a Marine former aviator assembling 250,000 soldiers in Operation Olympic. He had assembled supplies and munitions gathering portable radar, one of the wonder weapons of the war. He was a fine pencil pusher.

Webb was instrumental as the second administrator of NASA in the 1960s, changing its name from NACA in 1958. He grappled and shoehorned and finally attacked over its tough budget, for his bosses, JFK and LBJ. It's just a misnomer that NASA will spend a million dollars for its space toilet. Most of his bosses are the U.S. Congress, to be stingy and low-dollar budget. But Webb was a midwife of the birth of NASA.

The first 75 pages in the book were war stories about the 1940s and the Soviet Cold War during the 1950s. Enthusiastic Disney, the infamous von Braun and less-enthusiastic Eisenhower were set up in the stage, late 50's, of a moon launch. The Cold War is heating up. Space race is neck-and-neck. Personalities clashed. Rockets blew up.

Once Webb said, maybe I'm the wrong person to be headed the moon project. He is not an astronomer or an engineer and "I've never seen a rocket fly."

Most astronomers know well about the early rockets, especially Apollo. It's not really news, not even surprising, it was written 50 years after Apollo 11. And more simplistic, the audience geared to be a general readership. I need more meat on the bone. The author's book was clear and readable but– alas– the short chapters could be captions in the photos. Most of the references cited newspapers or general readership magazines, not scientific or technical publications.

But it's interesting to read about Kennedy's hard target. Mr. Webb "was relieved, since the original deadline had been 1967." Whew, he had a couple of years respite!

# 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! —

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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.

# Reba and Cano

Guest article by Brad Young, Astronomy Club of Tulsa

Winter can make it hard on a person to do astronomy outside at night. Sometimes it's just too frigid to drag out the scope, and you must enjoy little things, like watching well known pairs of bright stars rising together on clear cold nights. (Valentine's Day "pairs" inspired this article a bit too). A few couples that I enjoy watching include Betelgeuse and Rigel in Orion, Procyon and Sirius (the Dog Stars), Regulus and Alphard, and Arcturus and Spica. These pairs are bright enough to see from your window, while you enjoy hot chocolate inside. I particularly like watching the Dog Stars rise, because I have a big dog (Cano) and a smaller one (Reba), just like the legend associated with these constellations.

I wondered how closely each pair rises together, and what effect latitude would have on the closeness of their rise time. I called this delta in the table below, defined as first star rise time until second star rise. The calculations are shown here.

Folks read these articles at many latitudes, even in the Southern Hemisphere, but I decided to focus on three latitudes, all in the Northern. I'm sure the southerners have their own pairs, and if they let me know I could prepare a table like this for them. The latitudes I selected are for Lansing Michigan, Tulsa Oklahoma, and Gurudev Observatory, India.

| PAIR | LANSING DELTA | TULSA DELTA | GURUDEV DELTA |
|---|---|---|---|
| BETELGUESE / RIGEL | 0:17 | 0:05 | (0:15) |
| PROCYON / SIRIUS | 0:29 | 0:11 | (0:18) |
| REGULUS / ALPHARD | 0:36 | 0:20 | (0:06) |
| ARCTURUS / SPICA | 1:07 | 0:42 | 0:01 |

The effect of latitude is interesting on these pairs, especially seeing that Procyon (ancient Greek for "before the dog") doesn't precede Sirius in India but is instead 18 minutes slow.

I was also surprised that some of the pairs I thought rose together at my latitude are further apart than it seems when you watch them rise. Arcturus and Spica don't come up that closely together, but they are nice to see, knowing all the treasures in the sky between them. Speaking of that, I don't need to tell you that there are a lot of deep sky objects between each of these star pairs and in their respective constellations. The one case that doesn't quite fit this pattern is Procyon, and its constellation Canis Minor. More on that later; first, a look at the stories behind the star group and its lucida.


The modern view of the Greco-Roman tale is that Canis Minor is the smaller of Orion's two hunting dogs. Ancient and non-European cultures often saw star patterns differently, but there are several similar tales about the Dog Stars. The 15th century Tartar astronomer Ulug Beg designated it as Al Shamiyyah, essentially "northern Sirius". Euphratean scholars identify it with the Kakkab Paldara of the cylinders, the Star of the Crossing of the Waterdog, a title evidently given with some reference to the River of Heaven, and the adjacent Milky Way. The ancient Chinese had Procyon as Nan Ho, "the Southern River", in which beta (β Gomeisa) and eta (η) were included. With the natives of the Manuae [Cook] Islands it was their goddess Vena. [1]

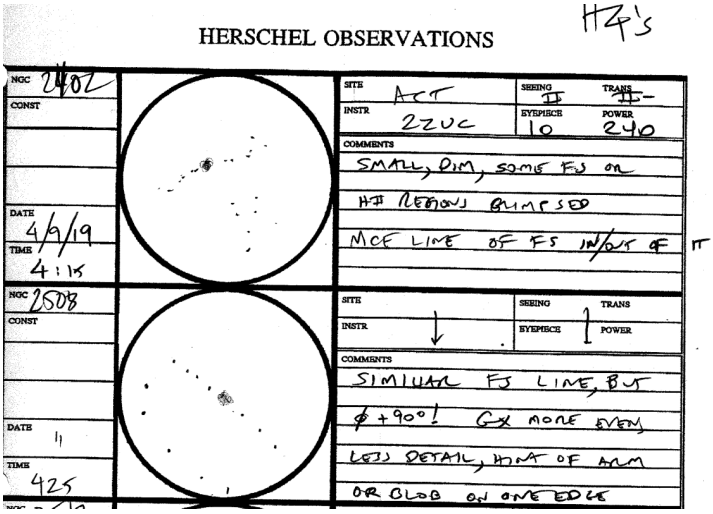
A look at Canis Minor to see what deep sky objects are there and which ones I have seen before led to the conclusion that there aren't very many. In the New General Catalog list (NGC), there are only 19, and several of those are just close multiple stars that look fuzzy and were mistaken for a cluster or galaxy. Rejecting those, I reviewed my records and sketches and found four I have visually observed. Be aware, though, that these observations were all made using a 22" Dobsonian:

| NGC | R.A. | Dec | TYPE | MAG |
|---|---|---|---|---|
| 2394 | 7 h 29 m | + 7 ° 02 ' | Open Cluster | N/A |
| 2402 | 7 h 31 m | + 9 ° 39 ' | Galaxy | 15 |
| 2470 | 7 h 54 m | + 4 ° 27 ' | Galaxy | 14 |
| 2508 | 8 h 2 m | + 8 ° 34 ' | Galaxy | 14 |

*(Continued on page 15)*

*(Continued from page 14)*

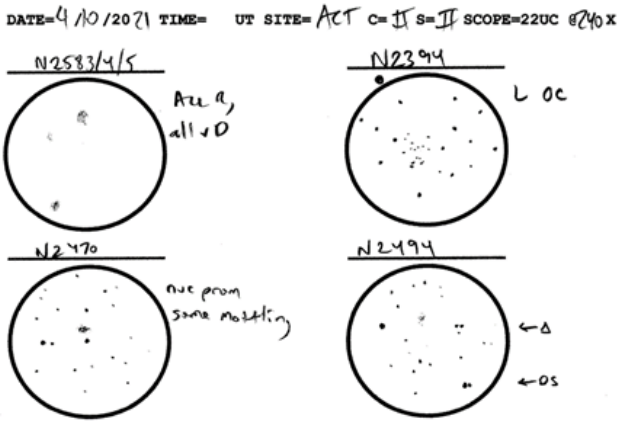
Below are the sketches I have made. For comparison, I decided to image them again because my survey images were poor.




*NGC 2402*

*NGC 2508*

NGC 2402 and 2508 seemed alike to me, small and dim with some hints of detail [not borne out by images]. A line of faint field stars was noted for each.




*NGC 2394*

*NGC 2470*

NGC 2394 did not impress – a large, poor open cluster. However, it is easy to locate, with eta (η) Canis Minoris in the same field. In my sketch, NGC 2470 was called "not prominent" with "some mottling". It was seen between two stars as listed in the catalog.

*Note: you can also find the NGC 2402 / 2508 sketches, and the majority of all the ones I've done for AL Astronomical Programs here. These are in the Herschel 3 and 4 list.*

*(Continued on page 16)*

*(Continued from page 15)*

*The NGC 2394 / 2470 sketches are among those here, in my ongoing project to visually observe all the NGCs. Those sketches are grouped by date of observation.*

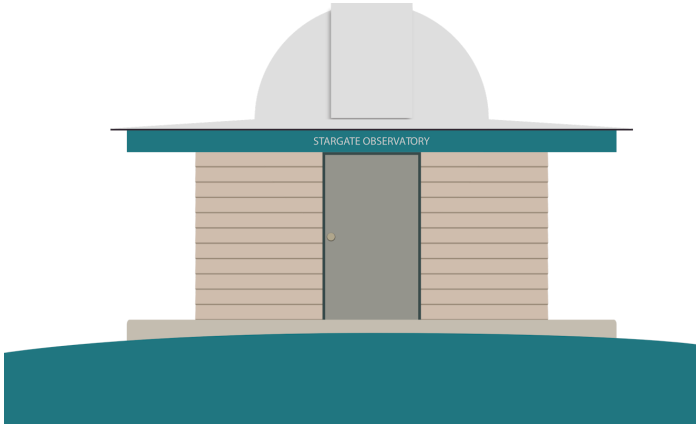
Although I love my smaller dog Reba a lot, I can't say the same for her representative in the sky.

Canis Minor has one of the brightest stars, Procyon, and a rich history of star lore. But for deep sky objects, I'm afraid it is not the leader of the pack. Even so, the next time you have a clear winter night, check out a few of these objects and see for yourself. Or stay in with your sweetie and watch these famous star pairs rise together with a cup of hot cocoa.

**References:**

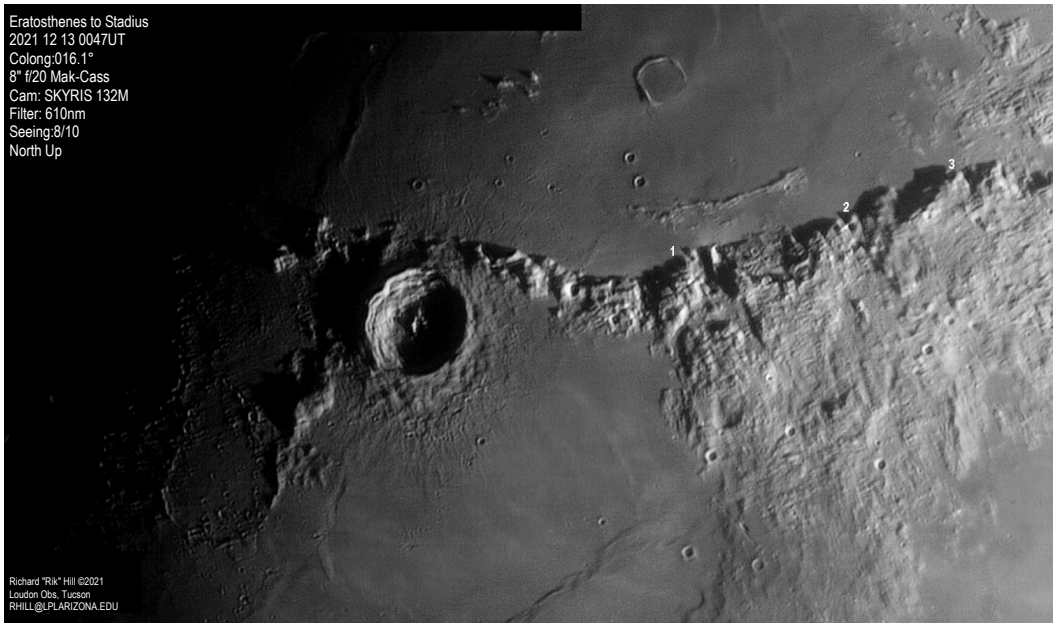
(1) https://www.space.com/22929-procyon.html
Image of Orion and his dogs: https://bobmoler.wordpress.com/2020/02/17/02-17-2020-ephemeris-a-look-at-orion-and-his-hunting-dogs/
https://hafsnt.com/index.php/2021/08/24/cano/
https://hafsnt.com/index.php/barks-and-parks/
https://hafsnt.com/index.php/2022/02/15/rise-time-table/
https://hafsnt.com/index.php/ngc-new-general-catalog-project/
https://hafsnt.com/index.php/al-programs/
https://hafsnt.com/index.php/ngc-new-general-catalog-project/
https://www.astroleague.org/content/alternate-constellation-observing-program

All deep sky images and sketches by author



# Southern Tip of the Apennines

The night before Copernicus comes into view we get a fine view of his little brother Eratosthenes (60km dia.) seen here just left of center.




The sunlight is catching just the tip of the central peak casting a shadow onto the base of the wonderfully terraced western interior wall.

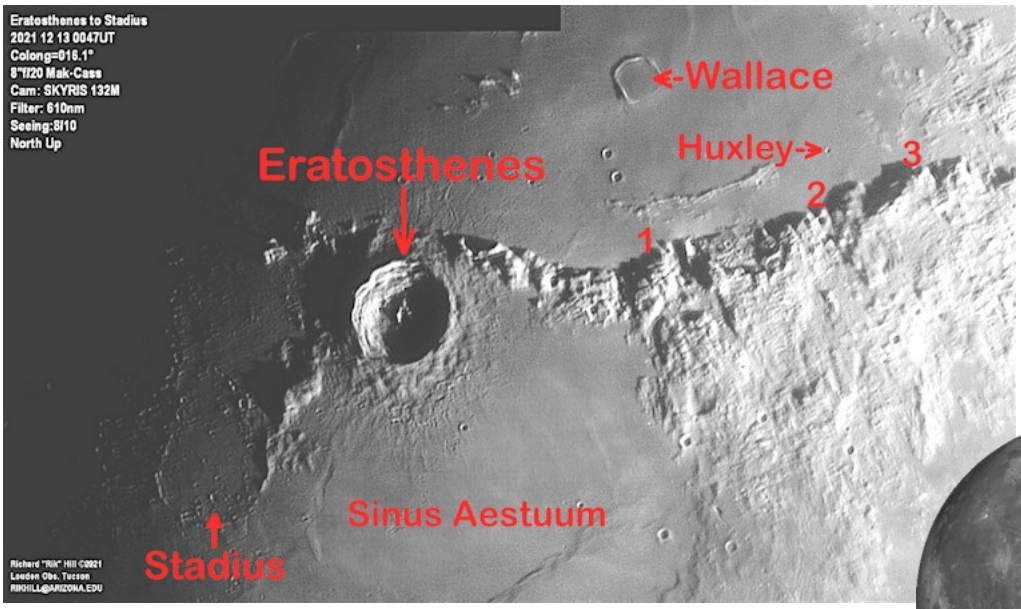
Only when the Sun is this low can you see the ejecta splash to the south on Sinus Aestuum. To the lower left (west) from Eratosthenes is the large ghost crater Stadius (71km) splattered with secondary craters from the Copernicus impact trailing off into the terminator to the north.

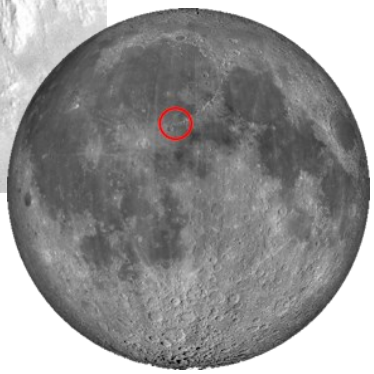
To the east of Eratosthenes is a spectacular ridge that is the southern third of the Montes Apenninus with some of the taller peaks on the moon.

Mons Wolf (labeled "1") is 3.5 kilometers high, Mons Ampere ("2") is a little shorter at 3 km, but Mons Huygens is a full 5.5 km in height from the floor of Mare Imbrium to its peak.

Above this ridge notice another smaller ghost crater, Wallace (27km) to the east of Wallace above the Mons Ampere "2" is the small crater Huxley (3km). The irony in the juxtaposition of these two will not be lost on those familiar with the history of evolutionary biology!

This montage was made from parts of two images each made from a stack of 1800 frame AVIs with AVIStack2 (IDL) and then final processed with GIMP 2.6.12 and IrfanView 4.42.



Location maps by Ralph DeCew

# History S.I.G.

## March 1989

The cover features a drawing of the Gemini constellation by Steven Aggas. And…a curious blend of the W.A.S. logo and the W.A.S.P. logo.

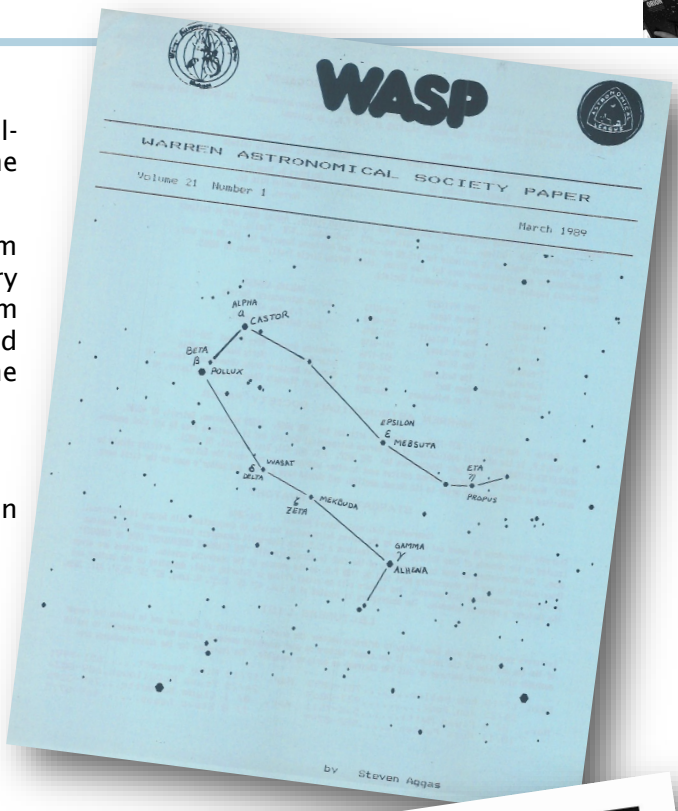
Once inside, the issue leads off with a letter from the president and minutes of the Macomb January meeting. Then we get a trio of articles by William Dominguez: Mercury, Venus, and Mars. Sandwiched between Venus and Mars is the minutes of the Cranbrook January meeting.

We complete the issue with two charts:

Minor Planets for Feb. – Mar. (calculated by Ken Kelly)

Ephemeris for (7) Iris
Ephemeris for (3) Juno
Ephemeris for (8) Flora
Ephemeris for (4) Vesta

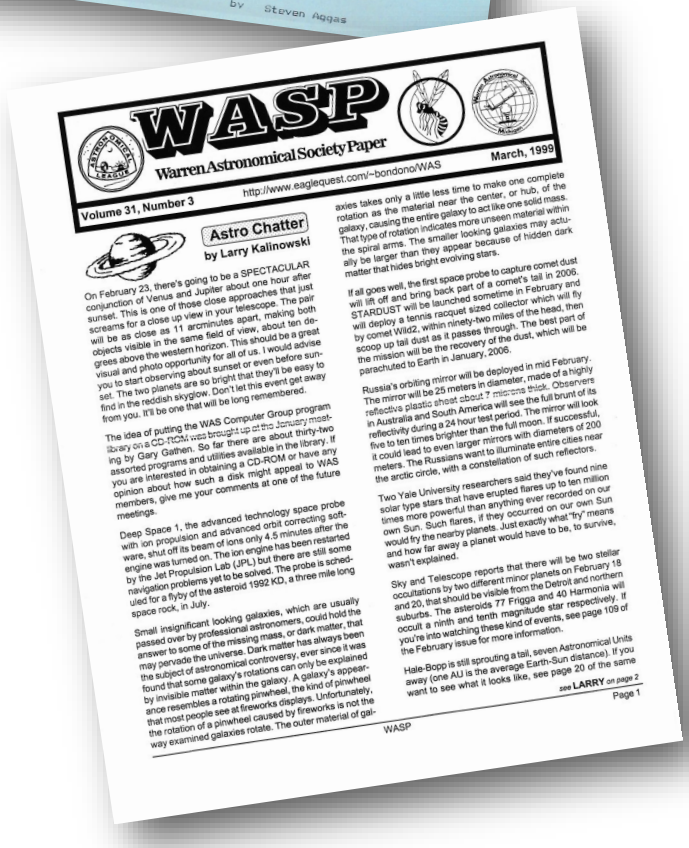
And:
The Moons of Jupiter- March 1989 by Marty Kunz




## March 1999

This issue is very much the product of desktop publishing software, and we see the W.A.S.P. and W.A.S. logos have gone their separate ways.

Astro Chatter by Larry Kalinowski is the solitary article in this issue (it had morphed from Computer Chatter July 1998, but still has some computer related items) The treasurer, Joe Van Poucker welcomes new members: Bruce Mandel & Family, of Lake Orion, MI; Sandy & John Robbins, of Taylor, MI, and notes the anniversaries of older memberships. The "Minutes of Meetings" is posted by LoriAnn Skonieczny, Secretary


WASP
Warren Astronomical Society Paper
March, 1999
Volume 31, Number 3
http://www.eaglequest.com/~bondono/WAS
Astro Chatter
by Larry Kalinowski
On February 23, there's going to be a SPECTACULAR conjunction of Venus and Jupiter about one hour after sunset. This is one of those close approaches that just screams for a close up view in your telescope. The pair will be as close as 11 arcminutes apart, making both objects visible in the same field of view, about ten degrees above the western horizon. This should be a great visual and photo opportunity for all of us. I would advise you to start observing about sunset or even before sunset. The two planets are so bright that they'll be easy to find in the reddish skyglow. Don't let this event get away from you. It'll be one that will be long remembered.
The idea of putting the WAS Computer Group program library on a CD-ROM was brought up at the January meeting by Gary Gathen. So far there are about thirty-two assorted programs and utilities available in the library. If you are interested in obtaining a CD-ROM or have any opinion about how such a disk might appeal to WAS members, give me your comments at one of the future meetings.
Deep Space 1, the advanced technology space probe with ion propulsion and advanced orbit correcting software, shut off its beam of ions only 4.5 minutes after the engine was turned on. The ion engine has been restarted by the Jet Propulsion Lab (JPL) but there are still some navigation problems yet to be solved. The probe is scheduled for a flyby of the asteroid 1992 KD, a three mile long space rock, in July.
Small insignificant looking galaxies, which are usually passed over by professional astronomers, could hold the answer to some of the missing mass, or dark matter, that may pervade the universe. Dark matter has always been the subject of astronomical controversy, ever since it was found that some galaxy's rotations can only be explained by invisible matter within the galaxy. A galaxy's appearance resembles a rotating pinwheel, the kind of pinwheel that most people see at fireworks displays. Unfortunately, the rotation of a pinwheel caused by fireworks is not the way examined galaxies rotate. The outer material of galaxies takes only a little less time to make one complete rotation as the material near the center, or hub, of the galaxy, causing the entire galaxy to act like one solid mass. That type of rotation indicates more unseen material within the spiral arms. The smaller looking galaxies may actually be larger than they appear because of hidden dark matter that hides bright evolving stars.
If all goes well, the first space probe to capture comet dust will lift off and bring back part of a comet's tail in 2006. STARDUST will be launched sometime in February and will deploy a tennis racquet sized collector which will fly by comet Wild2, within ninety-two miles of the head, then scoop up tail dust as it passes through. The best part of the mission will be the recovery of the dust, which will be parachuted to Earth in January, 2006.
Russia's orbiting mirror will be deployed in mid February. The mirror will be 25 meters in diameter, made of a highly reflective plastic sheet about 7 microns thick. Observers in Australia and South America will see the full brunt of its reflectivity during a 24 hour test period. The mirror will look five to ten times brighter than the full moon. If successful, it could lead to even larger mirrors with diameters of 200 meters. The Russians want to illuminate entire cities near the arctic circle, with a constellation of such reflectors.
Two Yale University researchers said they've found nine solar type stars that have erupted flares up to ten million times more powerful than anything ever recorded on our own Sun. Such flares, if they occurred on our own Sun would fry the nearby planets. Just exactly what "fry" means and how far away a planet would have to be, to survive, wasn't explained.
Sky and Telescope reports that there will be two stellar occultations by two different minor planets on February 18 and 20, that should be visible from the Detroit and northern suburbs. The asteroids 77 Frigga and 40 Harmonia will occult a ninth and tenth magnitude star respectively. If you're into watching these kind of events, see page 109 of the February issue for more information.
Hale-Bopp is still sprouting a tail, seven Astronomical Units away (one AU is the average Earth-Sun distance). If you want to see what it looks like, see page 20 of the same
see LARRY on page 2
Page 1
WASP

## From the Scanning Room

Have some good news, odd news this month. Finally started digging in the stockpile of material I had waiting in the wings, starting with a revisit to the Jim Shedlowsky collection. That brings the good news: found a "new" issue that we don't have in the digital collection: ***May 1990***. Now the odd news (not serious enough to be bad news). I reported before that I had a new scanner to replace the old HP one, only to find out that it didn't do double sided scanning but had worked out a solution. Since then, I replaced the computer with a new one and now the scanner and computer won't talk to each other- I can print like crazy, but the scanner misses the old computer. So now I must resort to scanning to a USB stick and taking it to the laptop. Good old sneaker net to the rescue.

-Dale Thieme,
Chief scanner

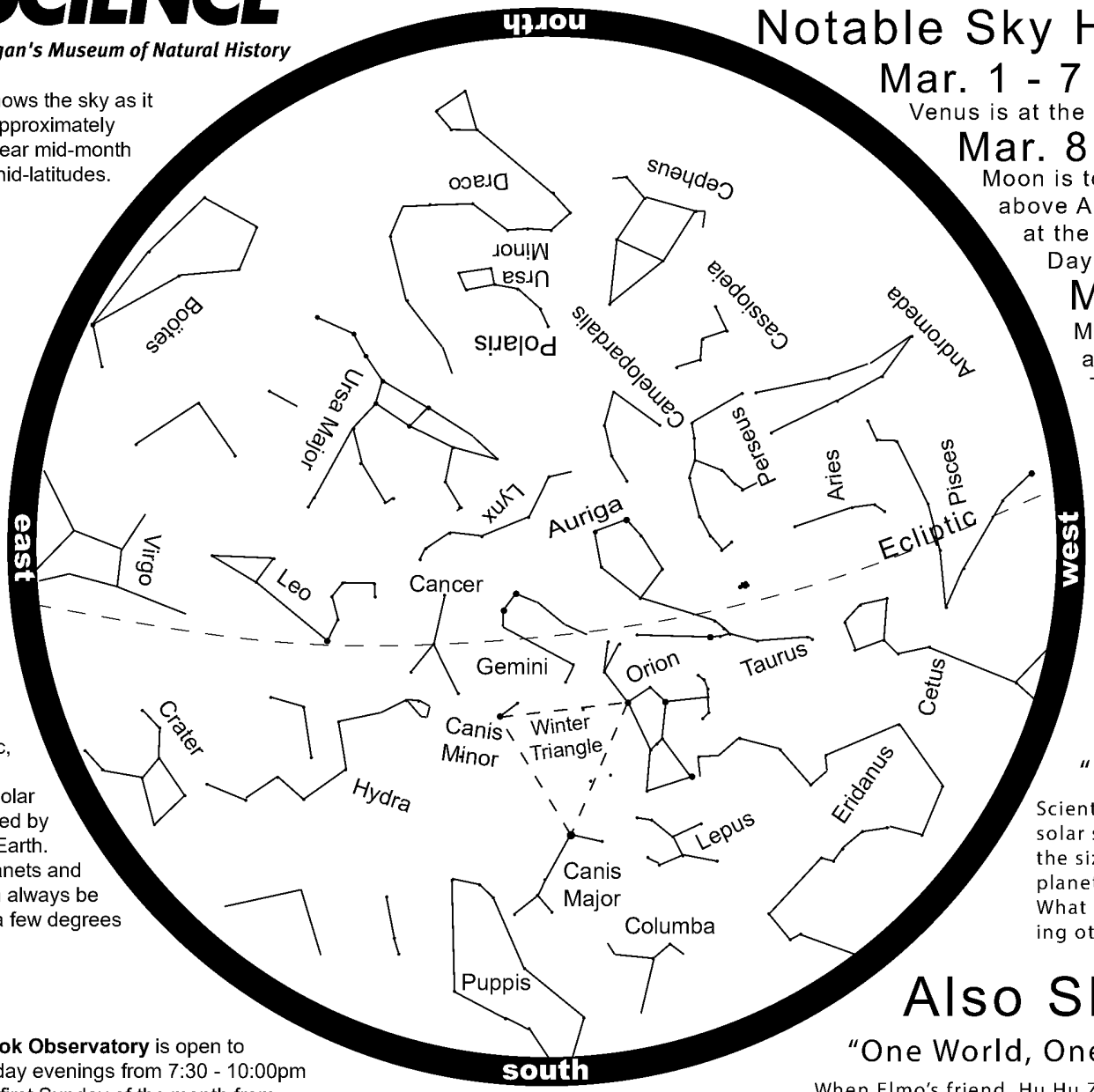
CRANBROOK INSTITUTE OF SCIENCE

*Michigan's Museum of Natural History*

# MARCH 2022

## Notable Sky Happenings

This chart shows the sky as it appears at approximately 10pm EDT near mid-month at northern mid-latitudes.




What is that dashed line? It's the ecliptic, the reference plane of the solar system, defined by the Sun and Earth. The major planets and the Moon can always be found within a few degrees of this plane.

**The Cranbrook Observatory** is open to the public Friday evenings from 7:30 - 10:00pm EST, and the first Sunday of the month from 1:00 - 4:00pm for solar viewing. Come have a look through our telescopes! For observatory information visit http://science.cranbrook.edu/explore/observatory

### Mar. 1 - 7

Venus is at the upper left of Mars this week (SE predawn).

### Mar. 8 - 14

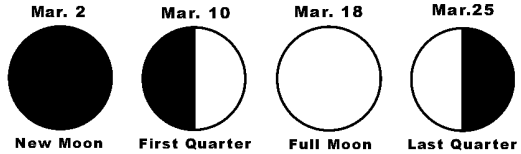
Moon is to the left of the Pleiades on the 8th and above Aldebaran on the 9th (SW evening). Moon is at the lower right of Pollux on the 12th (S eve.). Daylight time begins at 2:00am on the 13th.

### Mar. 15 - 21

Moon is above Regulus on the 15th (SE eve.) and above Spica on the 20th (SW predawn). The March (Spring) Equinox is at 11:33am EDT on the 20th.

### Mar. 22 - 31

The Moon is below Mars and at the lower right of Saturn; Venus is above Saturn (ESE predawn on the 28th).




## Now Showing

### "Birth of Planet Earth"

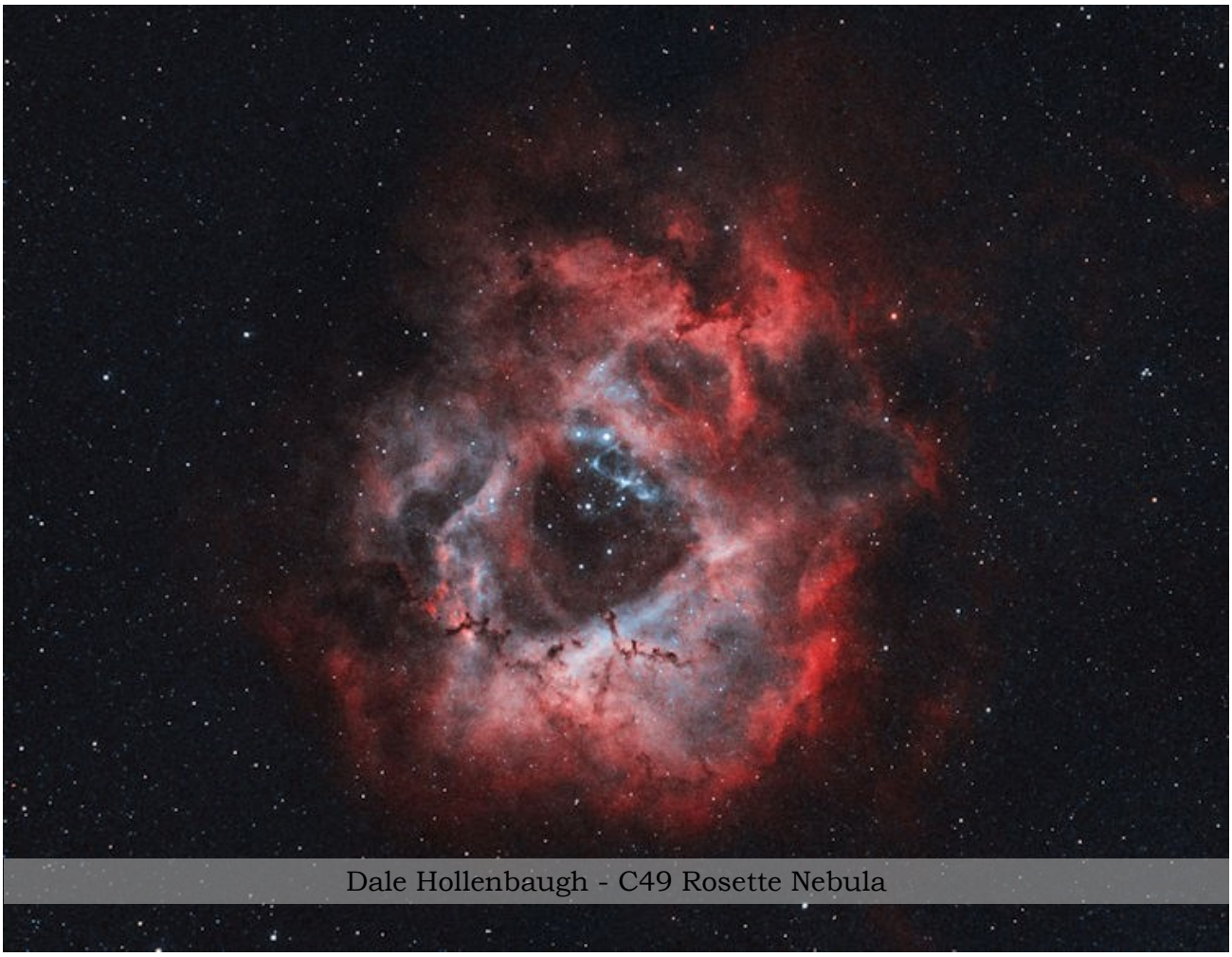
Scientists now believe that our galaxy is filled with solar systems, including up to a billion planets roughly the size of our own. How did Earth become a living planet in the wake of our solar system's violent birth? What does its history tell us about our chances of finding other worlds that are truly Earth-like?

## Also Showing

### "One World, One Sky: Big Bird's Adventure"

When Elmo's friend, Hu Hu Zhu, visits from China. Big Bird, Elmo and Hu Hu Zhu take viewers on an exciting discovery of the Sun, Moon, and stars. They learn about the Big Dipper and the North Star and take an imaginary trip to the Moon where they learn that the Moon is a very different place.

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



Dale Hollenbaugh - C49 Rosette Nebula

# March 2022

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | | 1 | 2<br>NEW MOON | 3 | 4 | 5 |
| 6 | 7<br>Cranbrook | 8 | 9 | 10<br>Moon at Apogee:<br>404268km | 11 | 12 |
| 13<br>Daylight Saving Time starts | 14 | 15 | 16 | 17<br>St. Patrick's Day<br>Macomb | 18<br>Holi<br>FULL MOON | 19 |
| 20<br>Venus at Greatest Elong:<br>46.6°W<br>Vernal Equinox | 21 | 22 | 23<br>Moon at Perigee:<br>369764km | 24 | 25 | 26<br>Stargate Open House |
| 27 | 28 | 29 | 30 | 31 | | |

# Stargate Observatory

## Monthly Free Astronomy Open House and Star Party

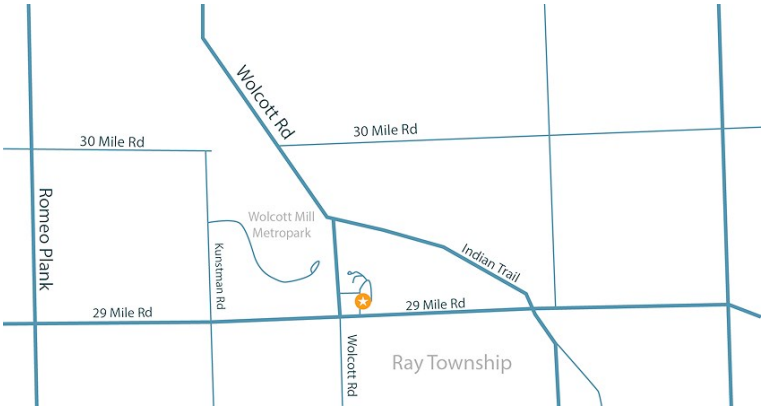
### 4th Saturday of the month!
### Wolcott Mill Metropark - Camp Rotary entrance

**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

### Observatory Rules:

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

# Stargate Report

## Stargate Observatory Report for Feb 26, 2022

The virtual open house started at 7:30 pm through the Northern Cross Observatory. Doug Bock first demonstrated how he photographed sunspots with a white light solar filter using a 6" SCT, and then started imaging deep sky objects while answering questions. Doug also showed images taken before with long time exposures for explanations of how imaging works and what is possible with similar equipment. Roughly 10 people attended including from as far as Arizona. The meeting was concluded at 11:30 pm.

Next open house is scheduled for March 26, 2022

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

# Treasurer's Report

## Treasurer's Report for February 28, 2022

| | |
|---|---|
| **Main account,** | |
| **Bank of America** | $22,946.67 |
| Deposits: | $639.50 |
| Withdrawals: | $55.00 |
| **GLAAC account** | |
| **Bank of America** | $3,213.95 |
| Deposits: | $0 |
| Withdrawals: | $50.00 |
| PayPal Account as of Jan 31, 2021 | $1,352.63 |
| Money in (memberships, donations) : | $123.54 |
| Money out (for postage) | $ 17.90 |
| Total Paid Memberships | 98 |

## New Members for February:

Joan Ferrier
John Hammel

## News from the Treasury:

GLAAC has established 501(c)3 status and opened their new account with Comerica Bank. As funds are needed they will be transferred to the new account. All transfers will be pending WAS Board approval.

Keep those AL memberships coming in. Before we renew at the end of June, I will send out a full roster of AL payments that I received, giving the membership a chance to verify their status. Remember that you must be a paid member to take advantage of our $7.50/yr Astronomical League membership price.

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 2022

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

| Day | EST (h:m) | Event |
|---|---|---|
| 02 | 11:00 | Mercury 0.7°S of Saturn |
| 02 | 12:35 | NEW MOON |
| 05 | 08:00 | Jupiter in Conjunction with Sun |
| 08 | 03:22 | Moon at Ascending Node |
| 08 | 11:46 | Pleiades 3.8°N of Moon |
| 10 | 05:45 | FIRST QUARTER MOON |
| 10 | 18:05 | Moon at Apogee: 404268 km |
| 13 | 01:58 | Pollux 2.4°N of Moon |
| 13 | 06:00 | Neptune in Conjunction with Sun |
| 15 | 23:00 | Venus 3.9°N of Mars |
| 18 | 02:17 | FULL MOON |
| 20 | 05:00 | Venus at Greatest Elong: 46.6°W |
| 20 | 10:33 | Vernal Equinox |
| 22 | 03:12 | Moon at Descending Node |
| 23 | 05:43 | Antares 3.2°S of Moon |
| 23 | 18:28 | Moon at Perigee: 369764 km |
| 25 | 00:37 | LAST QUARTER MOON |
| 27 | 21:54 | Mars 4.1°N of Moon |
| 28 | 06:43 | Saturn 4.4°N of Moon |
| 28 | 20:00 | Venus 2.1°N of Saturn |
| 30 | 09:34 | Jupiter 3.9°N of Moon |

# Meeting Minutes

## WARREN ASTRONOMICAL SOCIETY MINUTES OF (VIRTUAL) BOARD MEETING FEBRUARY 7, 2022 @ 6:30PM

Meeting called to order @ 6:30PM by President Diane Hall. Officers in attendance: Diane Hall – Bob Trembley – Riyad Matti – Mark Kedzior - Kevin McLaughlin – Dale Thieme (Quorum present). Absent – Adrian Bradley.

### OFFICER REPORTS:

President Diane Hall reported on discussions with Cranbrook in regard as to when in person meetings will resume. She also will be meeting with the late former WAS Officer Jon Root's family regarding Jon's bequest to the WAS.

1st VP Bob Trembley reported on the upcoming presentation schedule and stated that we are still in need of presenters to fill the open dates.

2nd VP Riyad Matti reported on the January 22nd Open House, with three members in attendance. The next Open House will be held on February 26th.

Secretary Mark Kedzior reported on the Warren Library Telescope Program that will be launched sometime in the spring.

Treasurer Adrian Bradley (not present) provided report as posted in February WASP.

Outreach Chair Kevin McLaughlin reported on the Discovery Center and their request for programming.

Publications Chair Dale Thieme reports the February WASP is posted online.

### OLD BUSINESS:

Mark Kedzior reported on updating the authorized access list with the Warren PO for Box 1505, and also had another key issued to facilitate timely mail pickup. He also reported a late arriving door prize from the American Astronomical Society (Sky and Telescope) – a special drawing for this will take place at a future meeting.

### NEW BUSINESS:

Riyad Matti reported reserving the picnic pavilion for the WAS Picnic on August 27th. He also inquired as to if a plaque of Andy Khula was made for displaying on wall in the Stargate observatory. He also mentioned that some name plates were tarnishing and if the plaque is up to date with names of WAS members who made significant contributions to the organization.

Riyad Matti discussed/recommended three items to be purchased for Stargate observatory: 1) one atmospheric dispersion corrector filter for the K2 refractor($130) – motion by Riyad Matti, seconded by Dale Thieme to purchase – motion passed 6-0, 2) one Revolution Imager real time camera with accessories ($300) to be used to display images on a monitor or be projected on screen at open houses – motion by Riyad Matti, seconded by Mark Kedzior to purchase – motion passed 6-0, 3) one 2x WF 53 Binocular(not to exceed $170) – motion by Riyad Matti, seconded by Dale Thieme to purchase – motion passed 6-0.

Riyad Matti brought up discussion in regard to raising the loaner telescope deposit from $100 to $1000 – motion made but was amended to state "from $100 to $500 for the 2022 year only". Motion by Riyad Matti, seconded by Mark Kedzior to approve deposit increase on loaner telescopes from $100 to $500 -motion passed 6-0.

Mark Kedzior brought up discussion on updating the WAS website – committee of Bob Trembley, Dale Thieme, Mark Kedzior and Kevin McLaughlin will meet to review and discuss the current website and if any improvements/suggestions can be made to update the site.

Motion by Mark Kedzior to adjourn meeting – seconded by Dale Thieme – motion passed 6-0. Meeting adjourned at 7:15PM by President Diane Hall.

Respectfully submitted,
Mark Kedzior
Secretary

## WARREN ASTRONOMICAL SOCIETY CRANBROOK (VIRTUAL) MEETING FEBRUARY 7, 2022 7:30PM

Meeting called to order at 7:30PM by President Diane Hall (WebEx attendance – 29 & YouTube – 12 @ 8:30PM).

### OFFICER REPORTS:

President Diane Hall welcomed all to meeting. She reported meetings will still be in virtual format until host institutions' policies enable in person meetings. She also reported on the current exhibit at the Henry Ford Museum "When We Went to The Moon" and encouraged members to visit.

1st VP Bob Trembley gave upcoming presentation schedule and encouraged members to consider giving a presentation in the future.

2nd VP Riyad Matti reported that the next open house will be February 26th. He also discussed the approval of items to be purchased for the

*(Continued on page 24)*

(Continued from page 23)

Stargate Observatory as approved by the WAS Board at the February 7th meeting, and gave explanation on use of each item.

Secretary Mark Kedzior reported the January minutes are in the February edition of the WASP.

Treasurer Adrian Bradley (not present) has treasurer's report posted in February WASP.

Outreach Chair Kevin McLaughlin reports Marty Kunz will be doing an outreach event at Hawk Wood Nature Center from 7-9PM on February 12th – any volunteers who could bring additional scopes to the event would be greatly appreciated.

Publications Chair Dale Thieme reported the February edition of the WASP is online. He also reported that only three WAS 2022 Calendars remain for purchase if interested.

## SPECIAL INTEREST GROUPS:

Solar – many sunspots and active regions.

Double Star Group – List of objects to observe will be at the February 26th open house – weather permitting, possibility of observing Sirius B (Pup Star) being at its widest separation from Sirius A (11 arc seconds).

History – No report.

Radio Astronomy – No report.

Astrophotography – Bill Beers and Doug Bock report very few clear nights this past month for imaging attempts.

## OBSERVING REPORTS:

David Levy reports the month of February would be the 116th birthday of Clyde Tombaugh, discover of Pluto 92 years ago this month, and followed with a reading about Mr. Tombaugh. Riyad Matti did solar projection with family to view recent sunspot activity. Ken Bertin observed Venus in AM skies and enjoyed observing earthshine on dark side of moon. Bill Beers reported observing at 15 degrees latitude in Mexico, viewing Crux (Southern Cross), Musca, and Omega Centauri. Doug Bock shared images on the few clear nights he was able to do so (Jan 2, 3 & 21st): The Double Cluster in Perseus, IC 405 "The Flaming Star Nebula", and AE Aurigae.

## SHORT PRESENTATION:

Bob Trembley introduced Gary M. Ross, along with Clayton V. Carey, with a video presentation from a CBC program "As It Happens", hosted by Carol Off and Chris Howden, "A Western Hemisphere Stone Henge".

This presentation discussed the archeo-astronomical site in Chankillo, Peru, built by pre-Inca Peruvians, believed to be the oldest solar calendar in the western hemisphere to date. It has been classified as a UNESCO World Heritage Site. Questions and discussion followed the viewing of this program.

## MAIN PRESENTATION:

Bob Trembley introduced (with bio) his predecessor, Dr. Dale Partin, and his presentation "Calculations by Observing: Measuring Earth, Moon and Sun the Ancient Way". Dr. Dale's presentation began with ancient history on the beliefs of the cultures of that time in regards to the heavens, discussed ancient astronomers and their measurements of distances and diameters, and on June 4, 2005, he applied those techniques to an experimental setup to measure distances and diameters as did the ancients, and to see how accurate his calculations came to known values. Questions and discussion followed his excellent presentation.

To see both presentations in their entirety, please go to:

https://www.youtube.com/warrenastro

The meeting ended at 9:25 PM.

Mark Kedzior
Secretary

# WARREN ASTRONOMICAL SOCIETY MACOMB (VIRTUAL) MEETING FEBRUARY 17, 2022 7:30PM

Meeting called to order at 7:30 PM by 1st VP Bob Trembley (WebEx attendance – 21 & YouTube – 10 @ 8:15 PM).

## OFFICER REPORTS:

1st VP Bob Trembley gave presentation schedule through May, and is still in need of speakers for future meetings.

Treasurer Adrian Bradley gave account balances – also made a donation to the WAS of a Revolution Imager for deep sky objects to be used at open houses.

2nd VP Riyad Matti searching for volunteer qualified to operate Stargate Observatory for next open house on February 26th.

Secretary Mark Kedzior had no report.

Outreach – no report.

Publications Chair Dale Thieme reports the March WASP is underway, and only three WAS 2022 Calendars remain for purchase.

## IN THE SKY (Bob Trembley):

Morning skies features Mercury, Mars, Venus, Moon, with Saturn appearing by February 27th. He also showed video on Milky Way mergers simulated through Sky Surveys.

## OBSERVING REPORTS:

David Levy observed six sunspots and twelve prom-

(Continued on page 25)

*(Continued from page 24)*

inences – also reported the large CME on opposite side of sun, which measured larger than diameter of sun – also mentioned that February 18th is the 92nd anniversary of the discovery of Pluto by Clyde Tombaugh. Adrian Bradley shared lunar images and attempts of imaging spring equinox with Milky Way rising in the east.

## PRESENTATION:

Bob Trembley introduced (with bio) President Diane Hall, with her presentation "Above it All: Observing from Apache-Sitgreaves Observatory". Diane discussed her experiences visiting the Apache-Sitgreaves Observatory in Heber-Overgaard, Arizona, being invited by former WAS President Steven Aggas, owner and founder of the AS Research Center. Her presentation covered her experiences and observations made at the Overgaard Star Parties of 2016 and 2018, viewing through a 36" telescope built by Steven. On her short list of objects she desired to observe were the Palomar Objects (faint clusters). She then proceeded to describe from her notes the objects viewed through the 36" scope:

Omega Centauri, Jupiter and Saturn (with aperture mask), Mars, Venus, M5, "The Mice"(merging galaxies), M51, M57(observed corpse star in center of nebula), M27, M20, M17, the Eagle Nebula (Pillars of Creation), M22, Veil Nebula, Centaurus A, Antenna galaxies, M33, Abell 2065, IC 1318, M87 (with plasma jet), Einstein's Cross (aka PGC69457), and finally, Palomar objects 1, 4, 7 & 9.

Questions and discussion followed her wonderful presentation.

To see this presentation in its entirety, go to:

https://www.youtube.com/warrenastro

The meeting ended at 9:32 PM.

Mark Kedzior
Secretary

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# FOR SALE

# 6" f/8 Dob Reflector

ATM built 6" diameter f/8 Dob reflector- 1.25" rack & pinion focuser, 6 x 30 straight thru finder scope w/ dovetail mount, two eyepieces (26MM & 9MM), Teflon bearing pads on altitude and azimuth, tube cradle allows OTA to rotate in cradle to adjust for balance and viewing comfort – also allows tube to be rotated and put into upright position to enable transport.

Asking **$150** – if interested email Mark with 6" Dob in subject line, at:
bazonga952@hotmail.com or text cell @ 586-246-8288



# FOR SALE:
# TWO (2) CORONADO PST
# H ALPHA TELESCOPES
# WITH CASES

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

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

I am asking **$425 for each telescope** (currently a new PST retails for **$799**), **BUT**, if you have the urge to build yourself a bino H Alpha setup (needs two matching eyepieces - Howie Glatter used to make PST Bino mounts for this purpose – one may be able to find one online or know of someone who can fabricate such a mount) I will be willing to sell the pair for the firm price of **$800**. If interested, please email Mark at:

bazonga952@hotmail.com with Coronado PST in subject line, or text me at: 586-246-8288.

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

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

# GLAAC Club and Society Meeting Times

| Club Name & Website | City | Meeting Times |
|---|---|---|
| Astronomy Club at Eastern Michigan University | Ypsilanti/EMU | Every Thursday at 7:30PM in 402 Sherzer |
| Capital Area Astronomy Club | MSU/Abrams Planetarium | First Wednesday of each month 7:30 PM |
| Farmington Community Stargazers | Farmington Hills | Members: Last Tuesday of the month<br>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<br>Public open house—first Saturday at 11 am |
| Oakland Astronomy Club | Rochester | Second Sunday of every month (except May) |
| Seven Ponds Astronomy Club | Dryden | Monthly: generally the Saturday closest to new Moon |
| Sunset Astronomical Society | Bay City/Delta College Planetarium | Second Friday of every month |
| University Lowbrow Astronomers | Ann Arbor | Third Friday of every month |
| Warren Astronomical Society | Bloomfield Hills/ Cranbrook & Warren/ MCC | First Monday & third Thursday of every month 7:30 PM |

# GLAAC Club and Society Newsletters

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

# WAS Member Websites

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

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

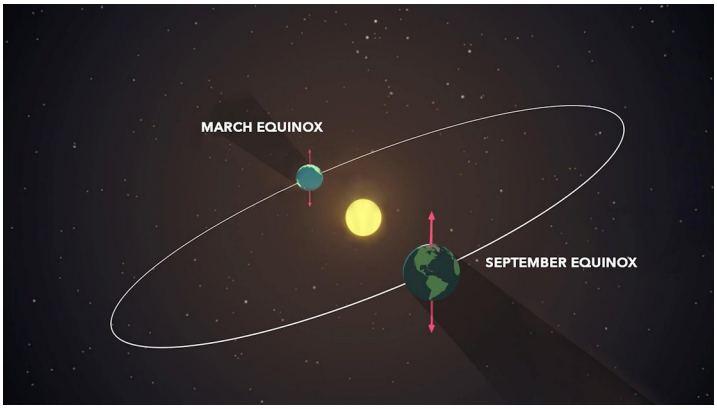
**This article is distributed by NASA Night Sky Network**
The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

# Embracing the Equinox

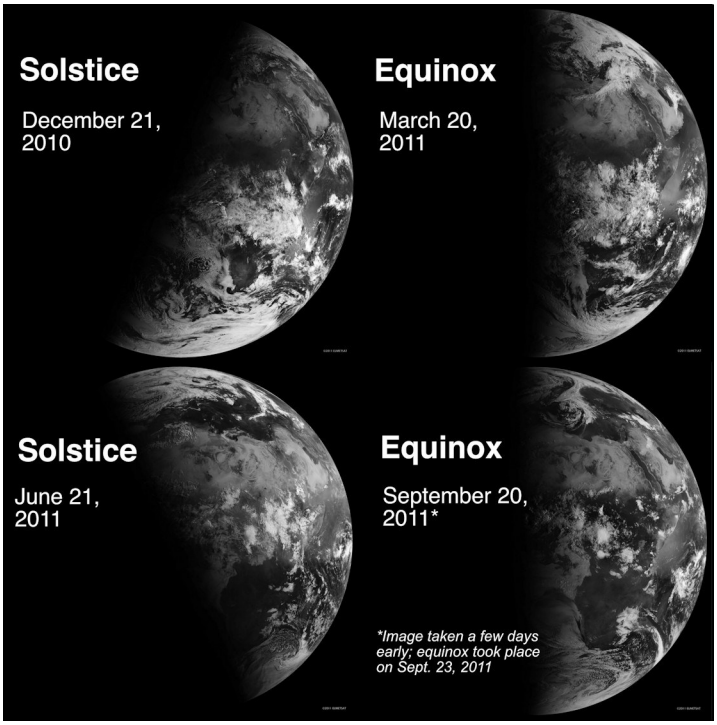
**David Prosper**

Depending on your locale, equinoxes can be seen as harbingers of longer nights and gloomy weather, or promising beacons of nicer temperatures and more sunlight. Observing and predicting equinoxes is one of the earliest skills in humanity's astronomical toolkit. Many ancient observatories around the world observed equinoxes along with the more pronounced solstices. These days, you don't need your own observatory to know when an equinox occurs, since you'll see it marked on your calendar twice a year! The word "equinox" originates from Latin, and translates to **equal** (equi-) **night** (-nox). But what exactly *is* an equinox?

An **equinox** occurs twice every year, in March and September. In 2022, the equinoxes will occur on March 20, at exactly 15:33 UTC (*or 11:33 am EDT*), and again on September 23, at 01:04 UTC *(or September 22 at 9:04 pm EDT)*. The equinox marks the exact moment when the center of the Sun crosses the plane of our planet's equator. The day of an equinox, observers at the equator will see the Sun directly overhead at noon. After the March equinox, observers anywhere on Earth will see the Sun's path in the sky continue its movement further north every day until the June solstice, after which it begins traveling south. The Sun crosses the equatorial plane again during the September equinox, and continues traveling south until the December solstice, when it heads back north once again. This movement is why some refer to the March equinox as the **northward equinox**, and the September equinox as the **southward equinox**.




*This (not to scale) image shows how our planet receives equal amounts of sunlight during equinoxes.*
*Credit: NASA/GSFC/Genna Duberstein*




*Scenes of Earth from orbit from season to season, as viewed by EUMETSAT. Notice how the terminator - the line between day and night - touches both the North and South Poles in the equinox images. See how the shadow is lopsided for each solstice, too: sunlight pours over the Northern Hemisphere for the June solstice, while the sunlight dramatically favors the Southern Hemisphere for the December solstice.*

*Source: bit.ly/**earthequinox** Images: NASA/Robert Simmon*

Our Sun shines equally on both the Northern and Southern Hemispheres during equinoxes, which is why they are the only times of the year when the Earth's North and South Poles are simultaneously lit by sunlight. Notably, the length of day and night on the equinox aren't precisely equal; the date for that split depends on your latitude, and may occur a few days earlier or later than the equinox itself. The complicating factors? Our Sun and atmosphere! The Sun itself is a sphere and not a point light source, so its edge is refracted by our atmosphere as it rises and sets, which adds several minutes of light to every day. The Sun doesn't neatly wink on and off at sunrise and sunset like a light bulb, and so there isn't a *perfect* split of day and night on the equinox - but it's very close.

Equinoxes are associated with the changing seasons. In March, Northern Hemisphere observers welcome the longer, warmer days heralded by their **vernal**, or spring, equinox, but Southern Hemisphere observers note the shorter days – and longer, cooler nights - signaled by their **autumnal**, or fall, equinox. Come September, the reverse is true. Discover the reasons for the seasons, and much more, with NASA at nasa.gov