

# Event Horizon

Volume 30, Number 7  
May 2023



## From The Editor

This month, NASA did not put out their monthly Night Sky Notes article. But in its usual place in the E.H. is an update to last month's HAA Explorers article about Uranus, by Jo Ann. That's in addition to her regular article this month about Neptune.

Happy Reading!

*Bob Christmas,  
Editor*

*editor 'AT'  
amateurastronomy.org*



## Chair's Report by Bernie Venasse

### What do you find the most fulfilling about amateur astronomy?

1. Is it the meditative process of setting up your equipment?
2. The excitement of peering through your telescope into the vastness of space?
3. Is it the joy of exploring and discovering all the fascinating stories behind the objects in the night sky?
4. Perhaps you enjoy the research and preparation and then the anticipation as you watch the sky forecasts?
5. Reaching your observing goals while learning about a new facet of this hobby and sharing your victories?

Less than a year till the 2024 eclipse. Are you getting ready?

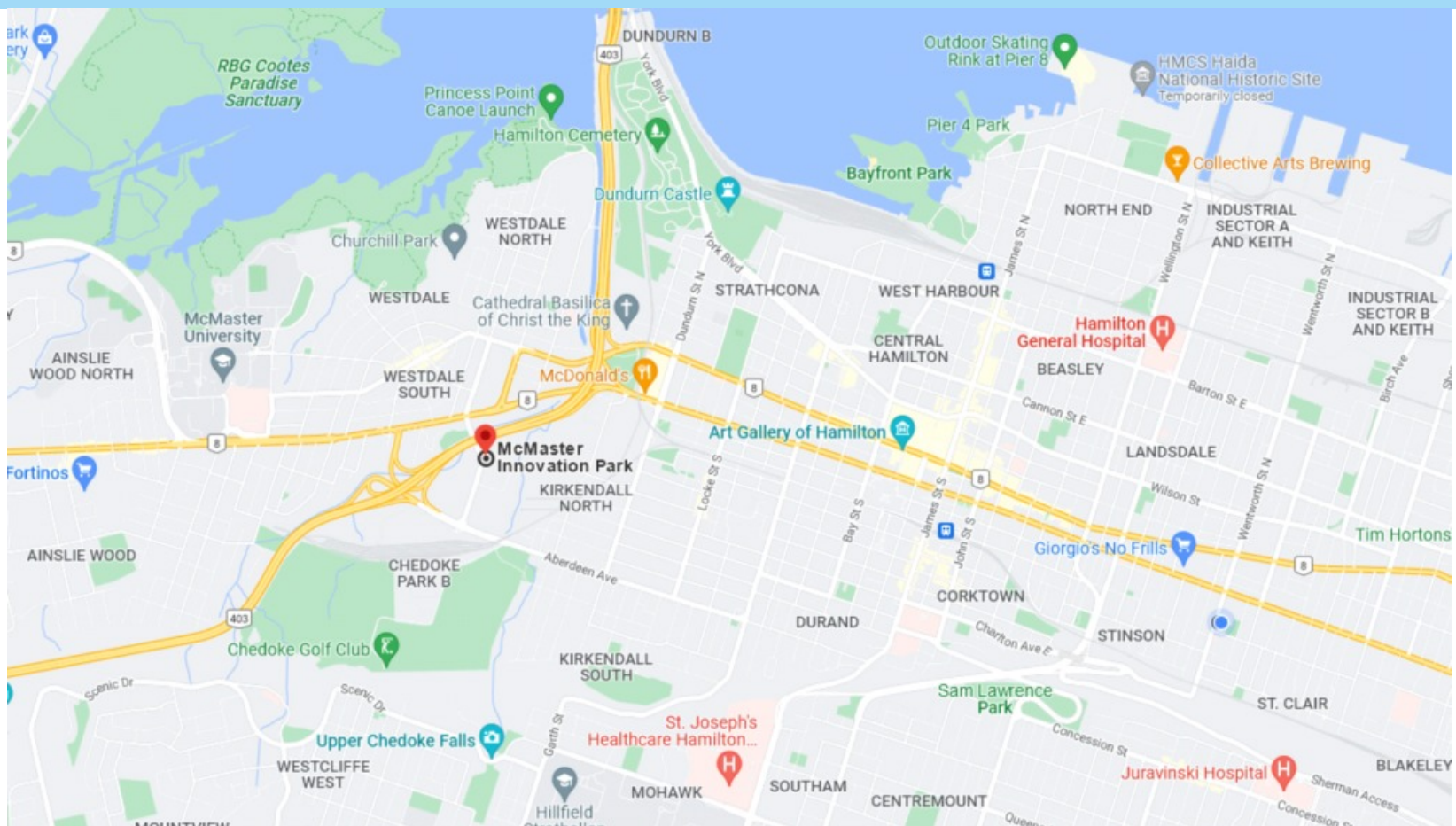
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## Chair's Report (continued)



### Our Previous Meeting

Our featured speaker for our April meeting was Matthew Mannering. Matt brought advice on regular and not-so-regular maintenance of your equipment...

Our April meeting was recorded and is available on YouTube:  
[www.youtube.com/results?search\\_query=hamilton+amateur+astronomers](https://www.youtube.com/results?search_query=hamilton+amateur+astronomers)

### Our next meeting

Our next meeting is scheduled for May 12, 2023, at McMaster Innovation Park. MIP is located at 175 Longwood Rd. S. in Hamilton. This will be a hybrid meeting combining a live audience with a Zoom presence. Doors open at 7:00 and the meeting begins at 7:30.

Our featured speaker for our next meeting is *Alan Dyer*. Alan will speak about observing and photographing the upcoming 2024 eclipse.

“Alan presents his tips and techniques for viewing and photographing the solar eclipse, using methods that best ensure success and still allow you to see and enjoy the eclipse!

Alan has chased 16 total solar eclipses – on land, in the air, and at sea, from the Arctic to the Antarctic, on two oceans, and on five continents. Alan is co-author with the late Terence Dickinson of *The Backyard Astronomer's Guide*. Asteroid #78434 is named for him.”

Bring your notepads for this one!!

*(Continued on [page 3](#))*

**Masthead Photo:** *Crescent Moon April 24, 2023 & Gibbous Moon March 29, 2023, by John Gauvreau.*

Taken through his 80mm refracting telescope with a Canon 80D DSLR camera.

## Chair's Report (continued)

### Inreach and Outreach events

Sad to say that both the March 17th and March 25th events were cancelled due to weather related safety concerns.

Upcoming Meeting & Observing Events.

May 7, 2023	Lakeland Park	Solar Observing
May 12, 2023	McMaster Innovation Park	Membership Meeting
May 19, 2023	Binbrook	Membership Observing
May 27, 2023	McQuesten Park	Mixed Outreach

### Membership growth... new members list... Welcome!!

We would like to take this opportunity to welcome new/returning members (Mar 29-Apr 29).

Matt McCausland, Hamilton. Family membership

Delia Couto, Toronto. Family membership.

Tim Moody, Toronto. Family membership.

Linda Carey, Dundas. Family membership. Rejoined

Jessica Belgrave Sookhoo, Burlington. Individual membership.

Emily Cameron & Mohamed Chemsy, Hamilton. Family membership.

Geoff Wozniak, Burlington. Family membership

Tom Burke, Hamilton. Individual membership.

Joline Stewart, Hamilton. Family membership.

Current membership:	84 Individual memberships	=	84
	57 Family memberships (x2)	=	114
	<u>1</u> Honorary membership	=	<u>1</u>
	142 memberships		199

<https://www.amateurastronomy.org/membership/>

### HAA Helps Hamilton



The H.A.A. is once again accepting and collecting donations from our members and guests for local food banks at our general meetings.

The H.A.A. has always valued its relationships with food banks in the community, particularly [Hamilton Food Share](#).

If you can't make an in-person meeting, you can make a donation directly to your local food bank.

## 2023 Bay Area Science and Engineering Fair (BASEF) Winners!

The HAA has been a proud supporter of BASEF since 1994! Next year will be our 30th year!

The HAA sponsors an award at BASEF every year, called the James A. Winger Award. James Winger was a founding member of the HAA and is the only person to have been named its Honorary Chair. Jim was a skilled astronomer, expert telescope maker and taught many people how to make their own telescope optics. Jim was always a great supporter of BASEF, personally donating prizes to foster the enthusiasm of young scientists.

Consideration for this Award is given to a student who does a project related to Astronomy, Physics, Light Pollution Abatement, or Space Travel. The Award consists of:

- a. The James A. Winger Junior Award: \$100 for a student in Grades 7-8
- b. The James A. Winger Senior Award: \$100 for a student in Grades 9-12

Also included is a free one-year family membership to the HAA for each winner, and the opportunity to present the project to the HAA's membership.

This year our BASEF judges were HAA members Mario Carr, Jo Ann Salci and Chris Strejch. For the first time since 2019, BASEF was held in person again! It was great to see the projects in person and mostly to have great conversations with the students.

This year's BASEF award winners are:

**Leah** and **Janine**, are receiving the award in the Junior Category for their experiment "Statocytes in Space". They combined their love of astronomy and plants to learn how plants might grow in microgravity. We were impressed by their creativity, passion and excitement about what they learned.

**Isabella** did a project called "Expansion of the Cosmos", and is receiving the award in the Senior Category. Isabella looked at Hubble's theory of expansion and now factored in newer discoveries of dark energy and dark matter. We were again impressed by Isabella's creativity and passion for astronomy. (Isabella won the Junior Award last year for her experiment "Cosmic Chocolate".)

Congratulations to Leah, Janine, and Isabella! We hope to have them share their projects with you at a later date and to have them join our membership!

### "HAA Presents"

Members of the public of any age in the GTHA can now request an in-person (once it is safe to do so) or virtual presentation from the HAA directly on our website.

Simply navigate to [www.amateurastronomy.org](http://www.amateurastronomy.org) and select "Contact" from the top menu bar and then click on "HAA Presents" (see image below). You will be presented with a request form and once all required fields are entered, click on the "Submit" button and you will see a confirmation message that your request has been successfully submitted.

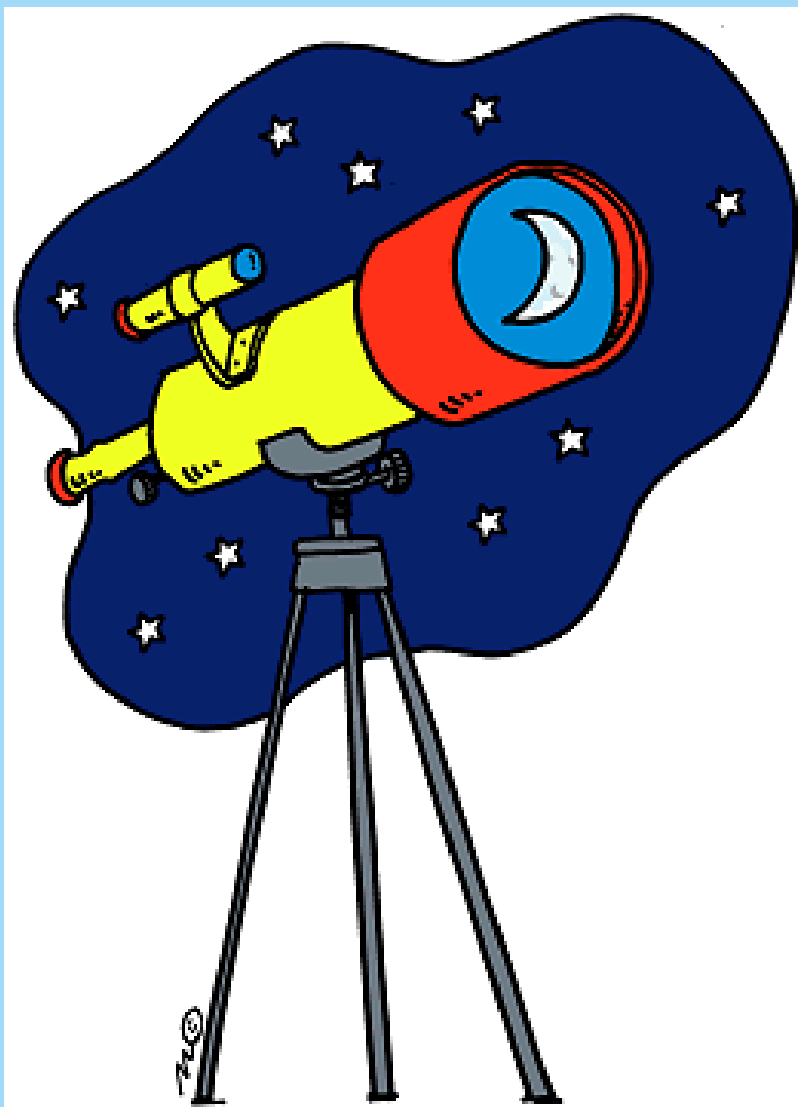


Home About Newsletters Gallery Club Events Resources **Contact** Q

HAA Presents

Once received, our Public Education Director, Jo Ann Salci, will respond to your request within 5 business days to discuss next steps. If you have any questions, feel free to send an email to: [haapresents@amateurastronomy.org](mailto:haapresents@amateurastronomy.org).

## HAA's Loaner Scope Program



We at the HAA are proud of our Loaner Scope Program. It allows members who don't own a telescope to get more up close with the night sky, and it allows members to explore different types of telescopes! Paid members are welcome to borrow a telescope for one month.

We have telescopes of varying expertise levels, a MallinCam, a spotter scope and various eyepieces.

Please visit the HAA website for more information!

If you are interested in borrowing a scope, please contact Paula Owen at

*[loanerscope@amateurastronomy.org](mailto:loanerscope@amateurastronomy.org)*.

Telescopes are loaned out on a first come basis.

## HAA Outreach Presentations with Vulnerable Sectors

The HAA executive has created a policy for any HAA member who wishes to do outreach presentations to vulnerable sectors, which includes children under 18 years of age and vulnerable adults. This does not include our general club outreach activities.

Presentations include in-person or virtual sessions where parents/guardians may not be present. **As it is not always possible to anticipate caregiver attendance at outreach activities for children under the age of 18, or vulnerable adults, it is therefore a requirement for HAA member-volunteers who work with these vulnerable populations to complete a Police Vulnerable Sector Check.**

These can be obtained only in your region of residency. Costs vary from one area to another. They will be kept on file by the HAA Education Director. No details regarding the findings of the check will be made in any way public or viewed beyond the HAA Education Director.

The HAA will reimburse any member who wishes to do outreach presentations to vulnerable individuals, provided a receipt is submitted.

Please contact Jo Ann Salci if you have any questions about this policy and/or if you wish to put your name forward to help with outreach activities to young people! This policy is effective immediately.

# STAR PARTY

**May 12th weekend rain date  
May 19th weekend**

Backus Heritage Conservation Area  
1267 Second Concession Road,  
Port Rowan, ON N0E 1M0  
**\$15 per day per site.**

Pay at the gate for the  
number of days you will be here



For more information go to  
[www.amateurastronomy.org](http://www.amateurastronomy.org)



# HAA Dark Sky Star Party

September 22-25, 2023  
Andromeda Meadow  
Warton, Ontario

Cost: \$25 per person, \$50 Family  
\$37.50 1 Parent/Guardian & 1 child under 18

## Weekend Events

- Visual observing and astrophotography opportunities
- E.S Fox Observatory Tour Saturday afternoon
- Chinese Food Buffet Dinner onsite Saturday (optional extra cost)
- There are no lectures

Ground camping and trailer sites onsite  
Motels, Cottages rentals etc. nearby

## ONSITE AMMENITIES

- Portable Washrooms
- Gas generator for charging astronomy equipment only
- Gathering tent

## CONTACT INFORMATION

Sue at  
[starparty@amateurastronomy.org](mailto:starparty@amateurastronomy.org)  
Matt at  
[mattmannastro@outlook.com](mailto:mattmannastro@outlook.com)



This is a remote site  
with no:  
water,  
electricity,  
flush toilets,  
showers,  
electical or water  
hookup for trailers.



**REGISTRATION OPENS APRIL 1, 2023**

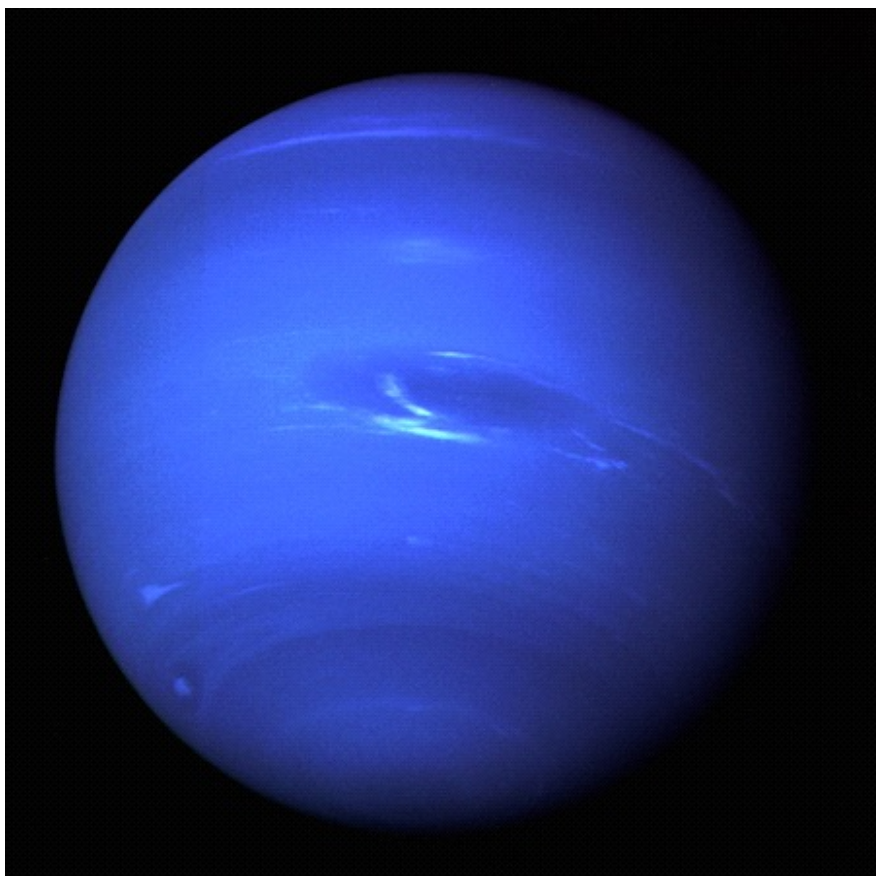


...A column for young astronomers - and those young at heart!

Last month we explored Uranus...this month we're going to explore another ice-giant planet - Neptune! Let's go!

### Notable Neptune!

The "discovery" of Neptune was actually predicted! Astronomers noticed a pull on Uranus' orbit and hypothesized (guessed) that there was another planet's gravitational pull causing it. So, in 1846 Neptune was found based on mathematical measurements! Neptune is the 8th and farthest, final planet from the Sun (more on this next month 😊). It is 2.8 billion miles (or 4.5 billion kilometers) away from the Sun. It was given the Roman name "Neptune" for the Greek God of the Sea (Poseidon) because of its blue colour. It takes Neptune about 165 Earth years to go around the Sun once. It has only gone around the Sun one time since it was discovered! And it spins a little faster than Earth and rotates on its axis in about 16 hours.



*Image Credit:*

*Voyager 2 took this picture of Neptune in 1989*

<https://spaceplace.nasa.gov/all-about-neptune/en/>

Neptune is the smallest of the four gas giant planets. Like Uranus, Neptune is made of gas and ice. The presence of methane in its atmosphere gives it a blue colour and scientists believe that there is another gas that makes Neptune a darker blue colour than Uranus. Neptune is tilted by about 28 degrees, so it has seasons, although each season lasts about 40 years!

Astronomers believe that Neptune has an icy, rocky core with a mantle made of water, ammonia and methane ice. There may be an ocean of super hot water under the clouds of Neptune. The winds on Neptune are very fast - up to 1,200 miles per hour (or 2,000 kilometers an hour)! There's even a storm on Neptune that can be seen in the photo which has been named the Great Dark Spot.

The Voyager 2 spacecraft visited Neptune in 1989 after its visit to Uranus. It's the only spacecraft to have visited. It saw that Neptune had 6 dark and dusty rings and a total of 14 moons. Triton is the largest of these moons and Voyager 2 could see geysers (eruptions of gas, dust and ice), likely causing Triton to have a thin atmosphere. And it orbits in the opposite direction of the other moons! The James Webb Space Telescope has taken a photo of Neptune, and its rings and a few moons can be seen. Neptune's beautiful colour certainly makes it a notable planet!

*(Continued on [page 9](#))*



# HAA Explorers (continued)

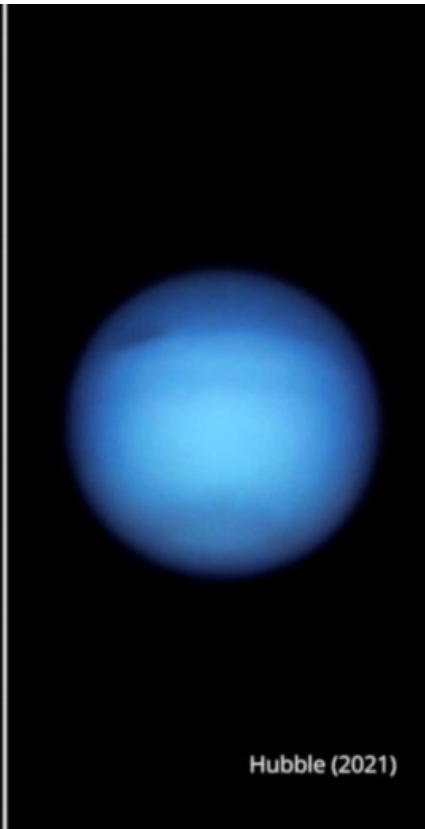


Image Credit:  
ABC News

**NEPTUNE**

NEPTUNE ORBIT

EARTH ORBIT

4.32 TO 4.71 BILLION KILOMETRES

Distance from Neptune to Earth depending on their orbits.

**NEPTUNE**  
4 times  
THE SIZE OF  
**EARTH**

**NEPTUNE**  
17 times  
THE MASS OF  
**EARTH**

**165**  
**ONE YEAR ON NEPTUNE**  
Number of Earth years it takes for Neptune to make one revolution around the Sun.

**-201**  
**DEGREES CELSIUS**  
Is the average temperature on Neptune's "surface," defined as the layer of its atmosphere where the pressure is the same as it is on Earth's surface.

**16 HOURS**  
**ONE DAY ON NEPTUNE**  
Number of Earth hours it takes for Neptune to complete one rotation on its axis.

**14 MOONS**  
Neptune's largest moon, Triton, orbits in retrograde, the opposite direction of Neptune's rotation.

**ICE GIANT**  
Neptune is the densest of the giant planets. Its atmosphere is hydrogen and helium with a little methane. Beneath the atmosphere Neptune has a mix of slushy water, methane, and ammonia around a rocky core.

**WINDIEST PLANET**  
Clouds of frozen methane travel at speeds up to 2,000 km/h, driven by the strongest winds in our solar system – up to 3 times stronger than Jupiter's winds.

**DISCOVERED BY MATH**  
Neptune is the only planet in our solar system discovered using math. Its position was predicted using disruptions observed in Uranus's orbit.

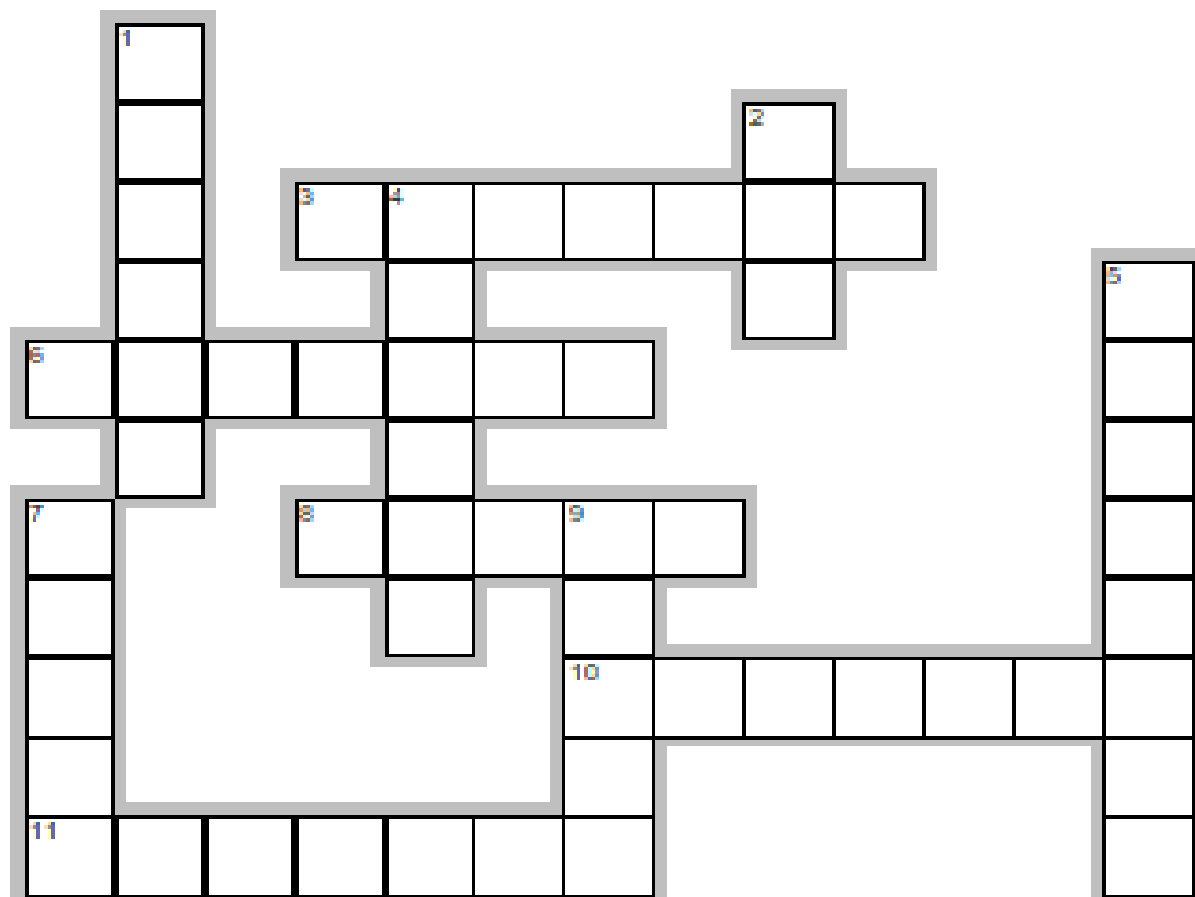
Canadian Space Agency / Agence spatiale canadienne

Credit: Canadian Space Agency

(Continued on [page 10](#))

## HAA Explorers (continued)

### Crossing Neptune!



*EclipseCrossword.com*

*Answers on page 12.*

### Across

3. Gas that makes Neptune blue in colour.
6. Spacecraft that took photos of Neptune.
8. The Great Dark Spot.
10. The Roman name for the God of the Sea.
11. Each of these lasts 40 years on Neptune!

### Down

1. The largest of Neptune's moons.
2. The number of times Neptune has orbited the Sun since it was "discovered".
4. Neptune is the \_\_\_\_\_ planet from the Sun.
5. Neptune is the \_\_\_\_\_ of the gas giant planets.
7. Neptune has 14 of these.
9. Neptune has 6 of these.

### Things to do until next time \*\*:

\*\* Check with your parents or caregivers before checking out websites.

1. **Visit this website** to learn more about and rotate Neptune:

<https://spaceplace.nasa.gov/all-about-neptune/en/>

2. **Visit this website** to make your own Neptune mask: <https://spaceplace.nasa.gov/planet-masks/en/>

3. **Visit this website** to learn more about the Voyager 1 and 2 spacecraft:

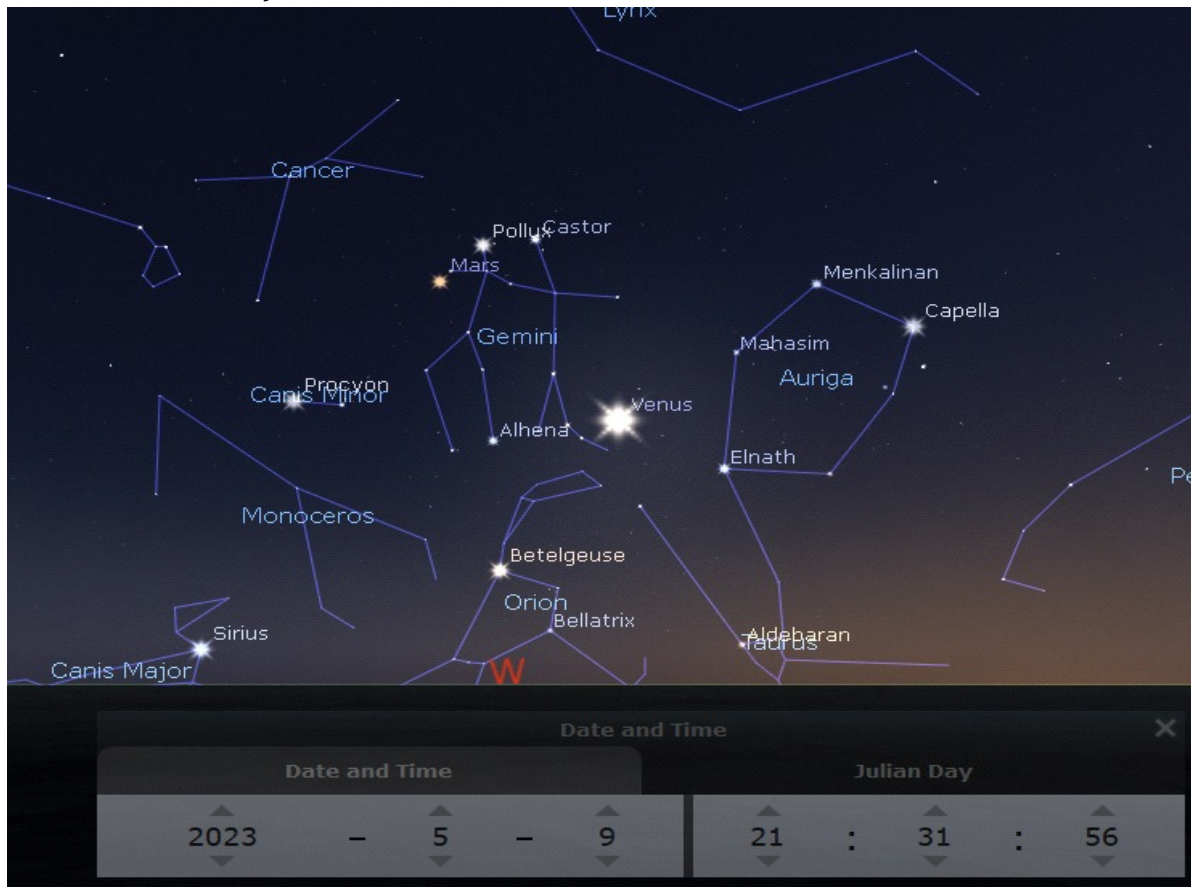
<https://spaceplace.nasa.gov/voyager-to-planets/en/>

*(Continued on [page 11](#))*

## HAA Explorers (continued)

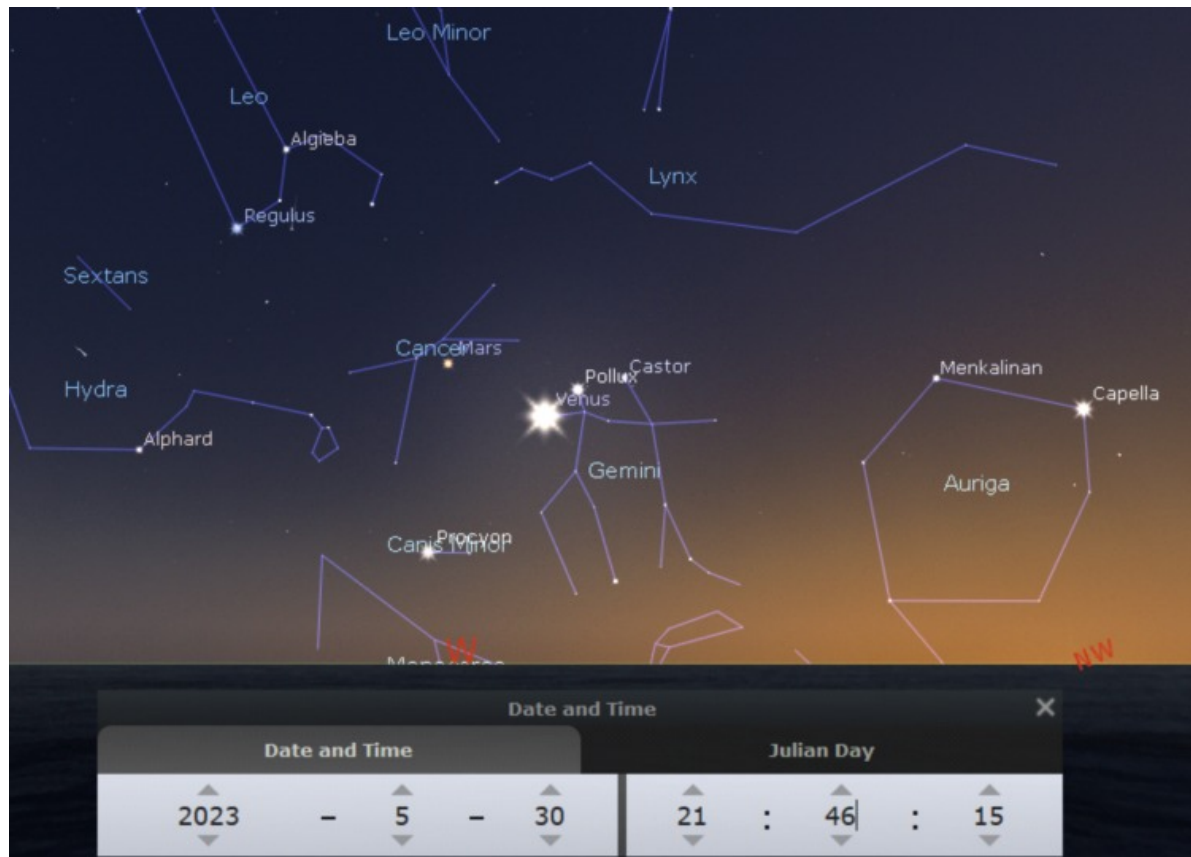
During May, check out:

1. On May 9th around 9:30 pm, check out the constellation Gemini “playing soccer” with Venus as they “catch” Mars in the Western sky:



*Image generated using Stellarium*

2. On May 30th around 9:45 pm, the Gemini twins are now “catching” Venus after they “threw” Mars to the constellation Cancer:



*Image generated using Stellarium*

*(Continued on [page 12](#))*

## HAA Explorers (continued)

### Finally:

Why kind of music do planets like?

If you have a question that you would like answered in the newsletter, please send it to [education@amateurastronomy.org](mailto:education@amateurastronomy.org)

Answer: 😊 ¡¡ñep-tune!!

Thank you to Ro for reviewing this article! 😊

### References:

Astronomy for Kids, 2019.

The Essential Guide to Space. Paul Sutherland. 2016.

Exploring the Sky. Richard Moeschl. Chicago Review Press. 1989. (Book courtesy of the late Michael Jefferson)

How Space Works. DK Penguin Random House. 2021.

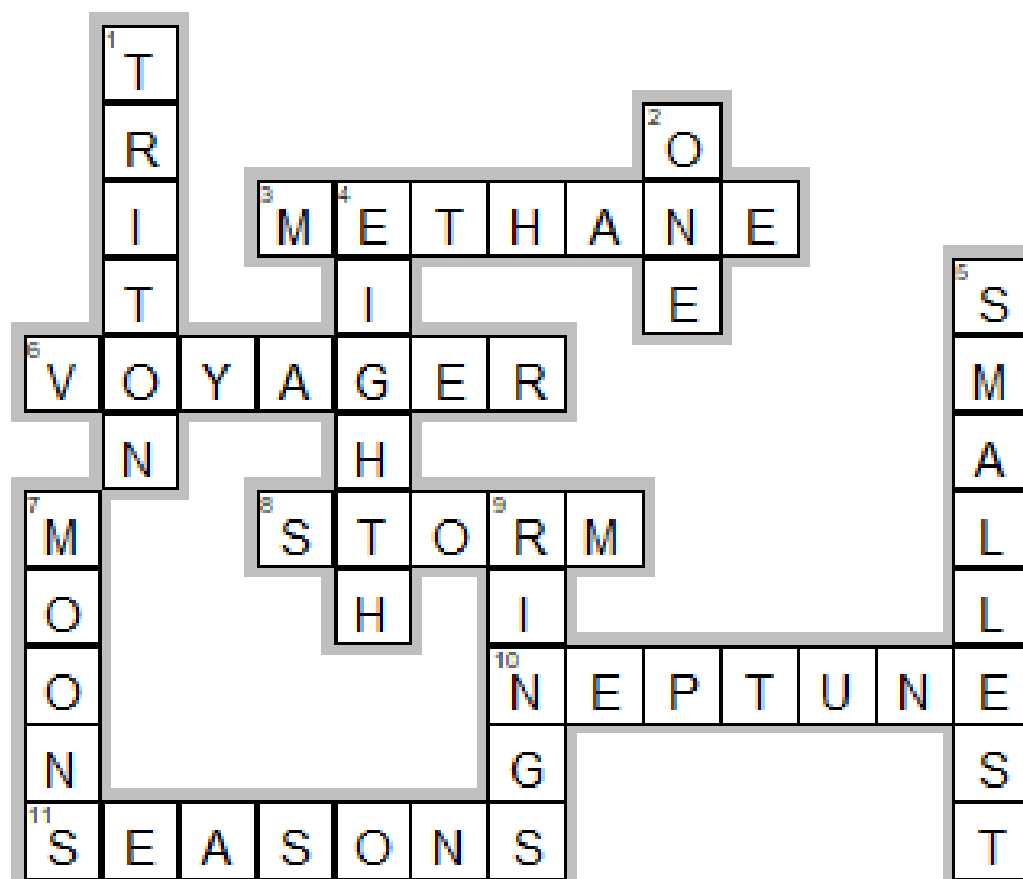
My Book of Stars and Planets. Dr. Parshati Patel. NY: DK Penguin Random House, 2021.

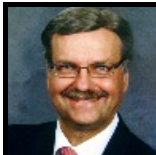
National Geographic Kids: Ultimate Space Atlas, 2017.

National Geographic Kids: Ultimate Explorer Field Guide, 2016.

<https://spaceplace.nasa.gov/>

*Page 10 Neptune Crossword Answers:*





## Armchair Astronomer's Challenge

Once again, our armchair astronomy challenge, to come to Binbrook Conservation Area for a Members' Night and see the sky, was rained out.

But if you read the emails and saw the clouds, you are on the right side of the grass, astronomically speaking.

This month, there are several astronomical phenomena worthy of observing.

## Comets - not

This month, there are basically no observable comets visually, using a telescope or binoculars, although some comets will make good astrophotography targets. For those, basically, you need a comet about 60 degrees from the Sun. For binocular viewing, a comet should be 7th magnitude or brighter.

In the below list, taken from Heavens Above (<https://heavens-above.com/Comets.aspx>) we have about 12 comets that fit the bill, but all are at least 12th magnitude, making them virtually invisible to us, without a camera and some sky background subtraction adjustments. The below chart uses our location and today's date as a reference, but you should access a fresh copy from heavens-above.com, at least naming your city, to get accurate Alt Az coordinates.

The chart shows the constellation the comet is in, which changes only weekly or slower, so you can use that, and the constellations you can see from your observing location, as a guide to which comets might be visible, and what astrophotography methods might work. *(Continued on [page 14](#))*

### Comets

This table shows the brightest currently observable comets. Click on the name of the comet to get more details, including finder charts.

Comet	Brightness	Date of last reported observation	Angular separation from Sun	Altitude	Azimuth	Constellation
<a href="#">C/2020 V2 ZTF</a>	9.7	2023-Apr-18	11°	-3.1°	311° (NW)	Aries
<a href="#">C/2017 K2 PANSTARRS</a>	10.2	2023-Apr-23	51°	-17.7°	252° (WSW)	Eridanus
<a href="#">C/2017 K5 PANSTARRS</a>	10.2	2023-Apr-18	96°	-63.5°	173° (S)	Indus
<a href="#">C/2022 A2 PANSTARRS</a>	11.1	2023-Apr-28	36°	-3.8°	340° (NNW)	Andromeda
<a href="#">C/2022 E3 ZTF</a>	11.8	2023-Apr-29	48°	-2.9°	257° (WSW)	Lepus
<a href="#">C/2019 U5 PANSTARRS</a>	12.1	2023-Apr-27	125°	43.6°	177° (S)	Leo
<a href="#">C/2020 K1 PANSTARRS</a>	12.2	2023-Apr-30	102°	-66.3°	136° (SE)	Indus
<a href="#">364P PANSTARRS</a>	12.2	2023-Apr-25	46°	-51.5°	334° (NNW)	Aquarius
<a href="#">29P Schwassmann-Wachmann 1</a>	12.5	2023-Apr-21	57°	37.7°	273° (W)	Gemini
<a href="#">C/2019 L3 ATLAS</a>	12.9	2023-Apr-26	104°	11.5°	202° (SSW)	Pyxis
<a href="#">C/2020 T4 PANSTARRS</a>	13.0	2023-Apr-11	162°	-5.5°	128° (SE)	Lupus
<a href="#">C/2021 Y1 ATLAS</a>	13.0	2023-Apr-29	51°	-16.8°	252° (WSW)	Eridanus
<a href="#">71P Clark</a>	13.0	2023-Apr-25	53°	-56.9°	340° (NNW)	Aquarius
<a href="#">237P LINEAR</a>	13.5	2023-Apr-26	107°	-40.9°	70° (ENE)	Sagittarius
<a href="#">77P Longmore</a>	14.1	2023-Apr-26	162°	4.9°	142° (SE)	Centaurus
<a href="#">81P Wild 2</a>	14.5	2023-Apr-25	133°	-24.1°	93° (E)	Sagittarius
<a href="#">C/2022 U2 ATLAS</a>	14.5	2023-Apr-12	80°	22.8°	230° (SW)	Monoceros
<a href="#">C/2019 T4 ATLAS</a>	14.6	2023-Apr-28	144°	25.5°	88° (E)	Serpens
<a href="#">C/2021 S3 PANSTARRS</a>	14.8	2023-Apr-11	62°	-8.1°	241° (WSW)	Lepus
<a href="#">C/2020 S4 PANSTARRS</a>	15.8	2023-Apr-21	96°	70.1°	228° (SW)	Leo
<a href="#">C/2022 L2 ATLAS</a>	16.0	2023-Apr-28	116°	0.8°	60° (ENE)	Hercules
<a href="#">C/2021 G2 Atlas</a>	16.0	2023-Apr-13	101°	10.1°	205° (SSW)	Pyxis

Comet observations courtesy of COBS

## The Sky for May 2023 (continued)

### Planets in the Daytime

Finally, our best candidate for planets in the daytime is approaching. On May 23, Venus will be near the Moon, such that casual looking with binoculars should bring it out, and then you might be able to spot it without binoculars.

1-3 PM on May 23, which is a Tuesday afternoon, will be your best chance this season.



*Image generated using Stellarium*

You can get a bonus... with binoculars, try to locate Pollux about equidistant on the other side of the Moon from Venus.

I hope we get a bright sunny day on Tuesday the 23rd of May.

The apparent angle from the Moon to Venus is only going to be about 2 Moon diameters, making it possible for you to find it in the sky without a goto scope. The Sun will be in the south, and the Moon will be in the East, so you can arrange to be shaded by some structure or trees, with no danger of the Sun re-illuminating you.

In the diagram, the angle from the Moon to Venus is about 30 degrees below the line from the Moon to the Sun. This will be the clue you need to find Venus. I recommend you try it without binoculars first, and then use the binoculars to appreciate the 'phase' of Venus.

I don't know anyone who has ever seen Pollux on a sunny day, and I would like to meet them sometime (soon). Maybe in the mirror, but my eyes are probably not up for the task.

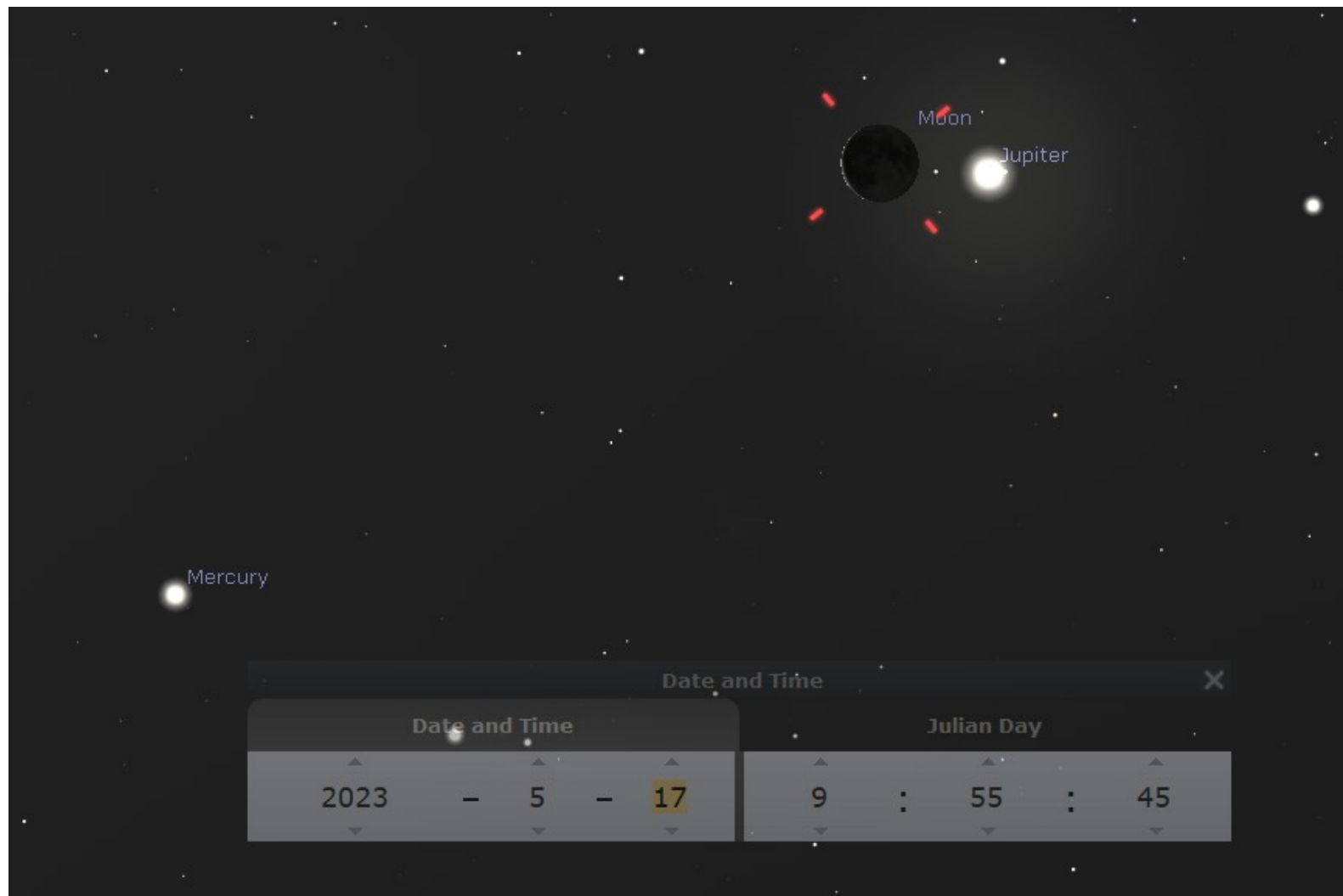
*(Continued on [page 15](#))*

## The Sky for May 2023 (continued)

### Occultation of Jupiter - our armchair challenge, the day after our meeting on Saturday morning.

Jupiter will be occulted by the Moon, in the early daylight hours, on May 13th which is a Saturday.

The Moon will be 2 days from New, so you will have a chance to find the Moon as it rises before the Sun, and then follow it until the occultation. Basically, anytime that morning, it will be close to Jupiter.



*Image generated using Stellarium*

I would like to see (and share with the club members) a photo of Jupiter partially obscured by the Moon.

### Meteor Shower

The *Eta Aquarids* are coming right up, May 3 to May 7.

These are very fast meteors, almost tied for fastest-there-is in terms of repeating meteor showers.

You have got to see this.

You won't have to worry about tripping in the dark, as it's during Full Moon this year. On the flip side, next year it will be near New Moon. So, get some practice! That means this year you don't have to travel anywhere. Only the brightest meteors have a chance to be visible, and light pollution won't obscure them.

Just don't expect to see a meteor every minute. This shower is going to be more like 3 or 4 fireballs in a few hours.

*(Continued on [page 16](#))*

## The Sky for May 2023 (continued)

The shower comes from Halley's comet. It is your chance to see part of the comet, up close and personal, without having to wait another 38 or 110 years.

Don't laugh, I know some procrastinators...

from wikipedia: [https://en.wikipedia.org/wiki/Halley%27s\\_Comet](https://en.wikipedia.org/wiki/Halley%27s_Comet)

### 2061 [\[edit\]](#)

The next perihelion of Halley's Comet is 28 July 2061,<sup>[3]</sup> when it will be better positioned for observation than during the 1985–1986 apparition, as it will be on the same side of the Sun as Earth.<sup>[36]</sup> The closest approach to Earth will be one day after perihelion.<sup>[4]</sup> It is expected to have an **apparent magnitude** of  $-0.3$ , compared with only  $+2.1$  for the 1986 apparition.<sup>[133]</sup> On 9 September 2060, Halley will pass within 0.98 au (147,000,000 km) of Jupiter, and then on 20 August 2061 will pass within 0.0543 au (8,120,000 km) of Venus.<sup>[4]</sup>

### 2134 [\[edit\]](#)

Halley will come to perihelion on 27 March 2134.<sup>[134]</sup> Then on 7 May 2134, Halley will pass within 0.092 au (13,800,000 km) of Earth.<sup>[4]</sup> Its apparent magnitude is expected to be  $-2.0$ .<sup>[133]</sup>

So, this meteor shower is your chance to observe Halley's comet much sooner.

I didn't have the heart to make this an armchair astronomer challenge. It's way too hard for that. You will really need to want to do this yourself.

Here is the catch: This meteor shower is only visible after 3 am each night, so you will need a level of dedication not common among armchair astronomers. I am not a morning person. This is going to take everything I've got to see it. For me, staying up past 3 am is not the same as getting up early though, just saying, and I can sleep all day (only if it's raining though), which is a luxury.

## Star Party

This May marks the beginning of the star party season. Anytime after 3rd quarter moon is fair game for a star party, and there's one on the 12th-14th of May at Backus park near Lake Erie. See page 6 for details. But since it happens on our meeting night, I won't be able to go this time.

That said, camping with your telescope such that it is already set up in the evening, and when you get tired you can sleep without having to pack up and drive home, is the great attraction of star parties. Add to that it is usually a dark sky place, and the Moon phase is favourable, and it's a combination suitable for bucket-list-class (astronomical) achievements. For a star party that will be 'all that', see the ad on page 7 for our member's only star party in September.

I would be remiss if I did not also mention Starfest, which will be August 17th, and is a big production with tents, speakers, workshops, sellers and of course, dark skies, good friends, and a chance to see a 36 inch scope and look through it.

<https://www.facebook.com/events/1461026734412322/>

For the purest of dark skies, and the total star party experience, you might consider Cherry Springs Star Party, June 15-18, (sold out)

<https://sites.google.com/astrohbg.org/Cherry-Springs-Star-Party>

*(Continued on [page 17](#))*



## The Sky for May 2023 (continued)

...Or the Black Forest Star Party in September 15-17. <https://bfsp.org>

Cherry Springs is about a 5 hour drive, across a border to the US, but the price is right, (less than \$100) and the event is first class.

I used to attend every year, getting there a few days early to enjoy yet more dark skies. There are so many stars, you have to puzzle out the constellations, and satellites (the old iridium ones) were easy to spot every 11 minutes until midnight.

Being in the Summer, those star parties have short nights though, but the food was excellent... especially when our own members were doing the grilling. (Thanks, Jim!)

To attend those star parties, you need to plan many months in advance, because space is limited, and they do sell out. That said, there are other weekends and weeknights where Cherry Springs is perfectly good to visit and observe. I used to have an annual pass for the park and go several times a year. It is only closed to astronomy for a few days in August for the Lumberjack convention.

### Moonrise

Unfortunately, we have had several months of Moonrises that happen before our monthly meeting, thus preventing them from becoming uppermost in mind when the full Moon is about to rise. Not to even mention clouds.

At our monthly meetings, I have been showing Moonrise almost a month in advance... so this month, I will list all of them and invite you to find the best one of the year based on your preferred observing direction. Clicking through the Photographer's Ephemeris at high speed, the Moonrise azimuth (compass direction to the place where the (not necessarily full) Moon will be seen on the horizon) seems to move like a windshield wiper. Of course, only looking up the azimuth when the Moon is full, really narrows down the options.

Here is the chart for the rest of this year. Note that the Moon, while not technically 100 percent illuminated, due to the small distance from us to the Moon, comparatively speaking, means that it will \*appear\* 100 percent illuminated 1 day before or after the dates listed. All of the part of the Moon we can see, will be lit up. So you will have 3 target dates. However, on the earliest of those 3 dates, the Moon will rise before the Sun sets.

Watching the Moonrise is fun, and it's not a late night or early morning event either. You will see non-members likely also coming for a good look, if you go to the pier. I suggest bringing a DSLR camera and a good telephoto lens and a tripod. A magnetic compass, or sighting some landmarks to help you determine the right azimuth, will help too. I have had occasions where the Moon was up and I was looking for it a few degrees away.

<u>Month</u>	<u>Azimuth</u>	<u>Rise Time</u>	<u>Percent</u>
May 4	108.46	7:31 pm	99.35
June 3	126.17	8:56 pm	99.99
July 2	130.09	8:57 pm	99.72
August 1	120.25	9:15 pm	99.89
August 30	107.81	8:13 pm	99.99 (also the Supermoon)
September 28	93.51	7:00 pm	99.67
October 28	69.98	6:10 pm	99.99
November 27	53.18	4:44 pm	99.68
December 26	49.75	4:13 pm	99.98

(Continued on [page 18](#))

## The Sky for May 2023 (continued)

Of course, the August 30th Blue Moon rise will be the event of the year in terms of armchair motivations.

“Once in a blue Moon” is not to be taken lightly, as some years only have 12 full moons and in some cases, the blue Moon depends on your timezone.

A Blue Supermoon (largest apparent diameter of the year) defies Internet search, but you can see the actual supermoon distances here: <https://www.vercalendario.info/en/when/next-super-moon.html>

Spoiler alert: September 2024 has a Supermoon lunar eclipse.

There was actually a double Blue Moon straddling February some years back. (In January and March of 2018.) The year 2037 will be the next Double Blue Moon.

YEAR	FIRST FULL MOON	BLUE MOON	
2020	 Oct 2, 2020	 Oct 31, 2020	<a href="#">October 2020 Details &gt;</a>
2023	 Aug 1, 2023	 Aug 31, 2023	<a href="#">August 2023 Details &gt;</a>
2026	 May 1, 2026	 May 31, 2026	<a href="#">May 2026 Details &gt;</a>
2028	 Dec 2, 2028	 Dec 31, 2028	<a href="#">December 2028 Details &gt;</a>
2031	 Sep 1, 2031	 Sep 30, 2031	<a href="#">September 2031 Details &gt;</a>
2034	 Jul 1, 2034	 Jul 31, 2034	<a href="#">July 2034 Details &gt;</a>
2037	 Jan 2, 2037	 Jan 31, 2037	<a href="#">January 2037 Details &gt;</a>
2037	 Mar 2, 2037	 Mar 31, 2037	<a href="#">March 2037 Details &gt;</a>
2039	 Oct 2, 2039	 Oct 31, 2039	<a href="#">October 2039 Details &gt;</a>

Chart Credit: Moongiant [https://www.moongiant.com/Blue\\_Moon\\_Calendar.php](https://www.moongiant.com/Blue_Moon_Calendar.php)

We won't be waiting for the 'next' blue moon to come, will we?

Until our monthly meeting, I wish you clear skies, especially if you are up for Halley's Comet on Wednesday or Thursday or Friday morning.



## Contents:

What's up in awards?

Rising Star Program: May-June

Pathways Observing Program targets... May-June

Messier Observing Program: May-June... Including target hints!!

The Planets, Comets, Upcoming Meteor showers, Award Programs

## What's Up in Awards?

The Hamilton Amateur Astronomers Observing Programs are designed to provide direction for amateur astronomer's observations and to reward their accomplishments. A certificate is awarded when the goals of the observing program are met. The HAA offer various certificates based upon achieving specific observing goals. There is no time limit for completing the required observing but good record keeping is required. Each observer must perform all the requirements of each Observing Program themselves. However, observers are able to receive help from (an)other observer(s) as they learn to find and identify different objects. Each observer will then need to locate and observe the object on their own to meet the goals of the program. Observing logs will be submitted to and examined by the HAA Observing Programs Project Coordinator to confirm all observations before a certificate is granted.

This column tells you which objects are visible this next month for the HAA Observing Programs and other sights of interest.

## HAA Rising Star Observing Award

### *April*

Constellations: Ursa Minor, Leo

Stars: Dubhe, Regulus

Double Stars: 42 Leonis Minoris

Object Pairs: M65, M66

Messier Objects: M96, M109

### *June*

Constellations: Bootes, Corona Borealis, Hercules

Stars: Arcturus

Double Stars: Zuben el Genubi

Object Pairs: NGC 5024, NGC 5053

Messier Objects: M8

## Pathways Observing Program

### *Group A*

Observable in April, May, June.

Spring Constellations: Find, observe, sketch: Ursa Major, Bootes, Virgo

Stars: Find, observe, sketch: Polaris, Arcturus, Spica.

Asterisms: Find, observe, sketch: Big Dipper, Virgo Diamond, Sickle.

Planet: Any one planet that is remaining in the list.

## HAA Messier Objects Observing Award

### *May Messier targets*

**M51** The famous Whirlpool galaxy in Canes Venatici is a bright face-on spiral with a smaller elliptical companion, NGC 5195. Look for a pair of fuzzy patches of light. The slightly larger and brighter one

*(Continued on [page 20](#))*

## What's Up in Awards? May-June 2023 (continued)

is M51. Make sure to spend some time here as there is almost always some spiral structure to be seen, on good nights the detail possible is unbelievable. This is a difficult but very possible object in binoculars appearing as a hazy patch of light.

- M63** Another spiral galaxy in Canes Venatici. Smaller and fainter than M51, but seen more edge-on so the galaxy appears as an elongated patch of light with a bright star at one end. Further inspection will show a faint halo around this patch.
- M94** Just past M63 is another galaxy in Canes Venatici. Look for a bright fuzzy star to find the core of M94, surrounded by a faint haze.
- M101** I consider this face-on spiral galaxy in Ursa Major one of the most difficult Messier objects to find in a telescope. This is a large faint patch of light almost as big as the full moon. There are no real condensations so use low power and look for a brighter part of the sky, more of a change in contrast than an object at first glance, which is the galaxy.
- M102** Not an official Messier object in most references, we will look for the galaxy NGC 5866 which is a somewhat standard insertion. Look for a small, faint patch of light that looks like a short fuzzy line.
- M64** This galaxy in Coma Berenices is a fairly bright, slightly oval-shaped patch of light. Look for the dark lane which gives this galaxy the common name Black Eye.
- M85** This elliptical galaxy lies in Coma Berenices just north of the Virgo Cluster of galaxies. It appears as a bright, but small, patch of light with a bright stellar core.
- M49** This is an elliptical galaxy in Virgo just south of the main cluster of galaxies. M49 is a round patch of light with a bright center gradually fading to a round halo.
- M61** This is a face-on spiral galaxy just south of M49 in Virgo, but much fainter. Look for a faint, round, fuzzy patch of light.
- M104** This is the well-known Sombrero galaxy in Virgo. It is bright edge-on spiral galaxy which looks like a bright, elongated streak.

**June Messier advice (from [seds.org](http://www.messier.seds.org/xtra/12months/m-jun.html) <http://www.messier.seds.org/xtra/12months/m-jun.html>)**

Successfully navigating the Virgo cluster is the biggest challenge in the Messier Catalogue and is affectionately known as "Heartbreak Ridge" to marathoners. What makes the Virgo cluster such a challenge is the closeness of the Messier objects to each other, and the large number of other galaxies in this region. It is easy to become lost among the galaxies, and not be able to tell which one you are looking at. Here are several tips that can be of use as you navigate your way through the cluster.

- Get a good chart of the region that shows not only the M objects, but also the brighter NGC galaxies. You should also have pictures of the objects in the region to help in confirmation of a sighting.
- Use low power while searching. When you find an object, you can switch to higher powers to see more detail.
- Avoid large aperture scopes. Small telescopes 6"-8" in size make finding the M-objects easier. Large scopes will show many of the other faint galaxies and may help you become disoriented. Same is true for sky darkness. Minimal light pollution will also help to "filter out" the dimmer galaxies from the brighter Messier objects. In my moderately light polluted neighbourhood park with an 8" scope, I can find the Messier objects easily, but can barely see the other galaxies. Of course, to really enjoy and get the most out of any galaxy you want the largest scope and darkest skies you can find.
- Plot your paths through the cluster, including a "home base". Your home base should be an easily recognizable M-object or field in the cluster. This will be the starting point for any excursions you plan,

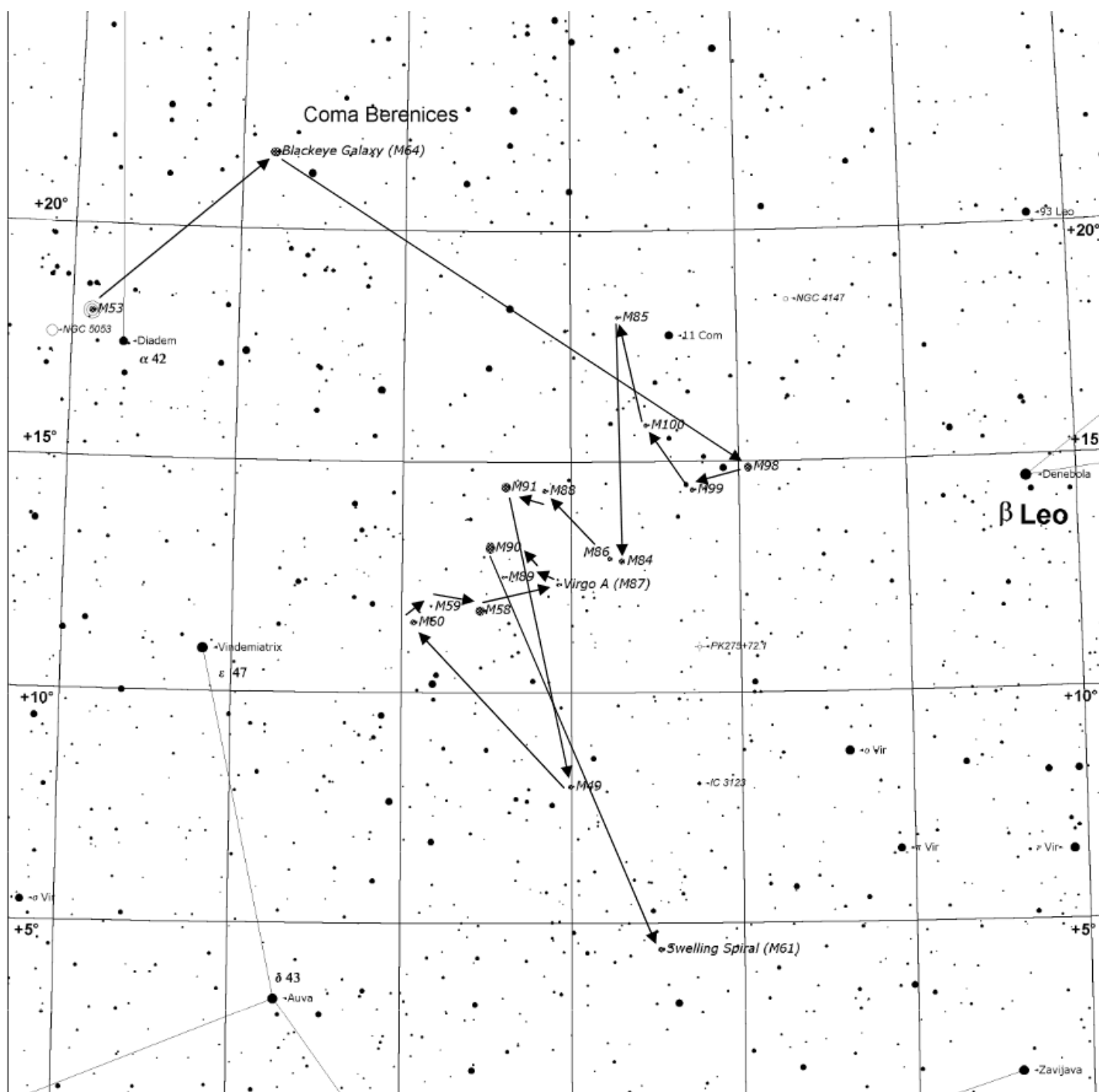
(Continued on [page 21](#))

## What's Up in Awards? May-June 2023 (continued)

and a place to return to should you become lost. I use M84 and M86 as my home base. I can find this pair of galaxies easily by pointing my accurately aligned finder scope on the midpoint of a straight line from Denebola (Beta Leonis) to Vindemiatrix (Epsilon Virginis). This matched pair of small fuzzy balls will both be within a low power field of view every time I do this. I've heard of other people using M87 as their home reference because of its brightness.

- As you move from an identified object in search of a new object keep track of how far you have travelled. At low power the most you should have to move between objects is 3 or 4 fields of view. If you go much farther than that go back to your last object or all the way back to home.
- Have patience and keep trying. Getting to know this area of the sky is very rewarding. Under dark skies and with a large scope I can easily get seven galaxies into the same field of view. An amazing sight to behold.
- Remember, you are looking for light that left its source about 70 million years ago. Most of these objects at low power are not much more than dim, fuzzy, out of focus looking stars. Allow your eyes to become fully dark adapted and take your time looking at each field. When done with this challenge be sure to swing over to M3 or M13 to let your photon-starved retinas feast on a real meal.

*(Continued on [page 22](#))*



## What's Up in Awards? May-June 2023 (continued)

### *June Messier targets*

- M84, M86** A pair of small fuzzy balls with bright, almost stellar cores. Both easily fit into the same low power field of view. M86 is slightly brighter and more oval than round M84.
- M88** A small oval shaped fuzzy patch with a bright stellar core. Similar in size and shape to M90. Can fit into the same field of view as M91.
- M91** A faint, slightly irregular oval hazy patch of light.
- M49** This is an elliptical galaxy in Virgo just south of the main cluster of galaxies. M49 is a round patch of light with a bright center gradually fading to a round halo.
- M59, M60** M59 and M60 can both easily fit into the same field of view. M59 is a small, hazy oval patch, not all that easy to see. M60 is another fuzzy oval patch of light, larger and brighter than M59.
- M58** A slightly oval shaped fuzzy patch of light with a bright central region.
- M87** Another round fuzzy ball with a bright core. Slightly brighter than both M84 and M86.
- M89, M90** Both of these galaxies fit into the same low power field of view. M89 is another round fuzzy ball like M84, while M90 appears as an oval patch of light larger than M89. M90 has a bright central region.
- M98** This galaxy appears as a bright pencil like streak of light.
- M99** A bright round fuzzy patch of light.
- M100** A round hazy glow of light, bright in the center but gradually fading towards the edge.

### **The Planets... May 2023 via (BBC) Sky at Night Magazine**

**Mercury:** Inferior conjunction 1 May, Mercury is poorly placed in the morning sky thereafter, so it is unlikely to be seen.

**Venus:** This spectacular evening planet has a crescent phase at the end of the month. The Moon is close on 22 and 23 May, so it is well worth a look.

**Mars:** Evening planet, now very small telescopically. Close to M44 at the end of the month.

**Jupiter:** Morning planet, not well-placed. Occulted by the crescent Moon; watch from 07:30 till 08:50 or so on 17 May.

**Saturn:** Poorly positioned morning planet. Saturn remains low as the day breaks, so it is probably not worth the effort.

**Uranus:** Uranus is in conjunction with the Sun on 9 May and so not currently visible.

**Neptune:** Neptune is a morning object but lost in the dawn twilight.

### **The Planets... June 2023 via (BBC) Sky at Night Magazine**

- All month: Noctilucent cloud displays are possible.
- 4 June: Venus lies at greatest evening elongation.
- 17 June: Earliest sunrise of the year (05:38 ET)
- 21 June: Northern Hemisphere's summer solstice at 10:57 ET
- 25 June: Latest sunset of the year (21:03 ET)

(Continued on [page 23](#))

## What's Up in Awards? May-June 2023 (continued)

**Mercury:** The planet makes a disappointing morning appearance but is best mid to late June. The Moon is nearby on 16 June.

**Venus:** Spectacular evening planet. Greatest eastern elongation ( $45.4^\circ$ ) on 4 June. Visibility deteriorating. Moon nearby on 21 June.

**Mars:** Low evening planet, which is best at the start of June when crossing M44, the Beehive Cluster. But the view is compromised by twilight. Weather permitting, you will have a 2-hour window to see this.

**Jupiter:** Low morning planet. Early rising crescent Moon near Jupiter on 14 June.

**Saturn:** Poorly placed morning planet. Moon close on 10 June.

**Uranus:** Not visible this month.

**Neptune:** Neptune is a morning object but lost in the dawn twilight, so tricky to view.

### Comets March-April 2023 via Seiichi Yoshida – Click here:

<http://www.aerith.net/comet/future-n.html>

### When is the Next Meteor Shower? ...via American Meteor Society

*eta Aquariids* (CURRENTLY ACTIVE)

**Status:** Active from April 15th to May 27th  
**Peak Night:** May 5-6 2023 (Moon 100% full.)



### Observing Award Recipients

We would like to give recognition and congratulations to any member who completes an award program regardless of the sponsoring organization. Congratulations to the following:

#### HAA Pathfinder

A01 Anastasia Morissette

#### HAA Rising Star Awards

001 Jean Jefferson  
002 Kevin Salwach  
003 Jo Ann Salci

#### HAA Messier Award

No recipients

#### HAA Lunar Award

No recipients

#### Astronomical League

Bernie Venasse (2023)  
Sunspotters Observing Program  
Hydrogen Alpha Solar Observing Program  
*Lunar Evolution*

#### RASC

Jo Ann Salci  
Exploring Exoplanets (on-line course)  
Swapna Shrivastava  
Explore the Moon  
Explore the Universe  
Bernie Venasse  
Explore the Universe

Please feel free to contact me with any questions or comments at [chair@amateurastronomy.org](mailto:chair@amateurastronomy.org)  
– Bernie



## The Moon in Motion by John Gauvreau

With Venus high in the western sky each evening we have the opportunity to watch the Moon pass it each month, and last month we had the chance to see Venus and Mercury in the sky together, and the month before we got to see Venus and Jupiter slide by each other.

On March 23 and 24 I enjoyed a lovely view of Venus with the Moon, first below it and then a night later just above it.

On each night I took a photo by just stepping out on my front porch, handholding my camera and telephoto zoom lens and snapping away. Nothing fancy; just a quick pic each night, giving me a chance to compare them. Last month I sent the two images in to this newsletter to share with you but one got accidentally omitted.

But that worked out well, as I realized this was an opportunity to take a closer look at these images to see if we could calculate the orbit of the Moon just by looking at its motion relative to Venus over these two nights.

Here you can see the original image I sent in, with both nights shown side by side.

*(Continued on [page 25](#))*



*The Moon & Venus on March 23 (left) and March 24 (right). Image Credit: John Gauvreau (both)*



## The Moon in Motion (continued)

The first thing I had to do was make an adjustment for the differing focal lengths used with the zoom lens on the two nights. Yes, if I had known I was going to do this, I would have kept it the same, but who knew? It turns out there was a difference of almost exactly 10%, so all measurements in one image were increased by 10% so measurements across the two images were consistent.

With that in mind I measured (as best I could) the diameter of the lunar disk. And of course I measured the distance from the Moon to Venus in one photo, and then Venus to the Moon from the other, and added them together to get the distance the Moon moved (relative to Venus) over the one day. In each case I used the lower, sunlit limb of the Moon.

I found that the combined distance moved was 24 times the lunar diameter. The Moon was 31.5 arc minutes that night (I checked using Stellarium), so  $31.5 \times 24$  tells us that the Moon moved 756 arc minutes. Divide that by 60 (since there are 60 minutes in a degree) and we find that the Moon moved 12.6 degrees.

Then, all we have to do is divide 360 degrees (the distance around the whole sky, or the distance the Moon need to travel to complete one orbit) by the 12.6 degrees it moved in one day), and we find that the Moon should circle the whole 360 degrees in 28.5 days.

So, is the orbit of the Moon 28.5 days?

Well, close, but not quite.

Since we are measuring the movement of the Moon against the background stars (or in this case, the background planet Venus), we are trying to determine the *sidereal* month. This is different from the *synodic* month which measures the time from one phase to the same phase a month later (like one new Moon to the next new moon). During the time it takes for the Moon to orbit the Earth, the Earth also moves in its orbit around the Sun, so the lighting from the Sun is a little different, and so getting to the same phase (the synodic month) is a little longer than the sidereal month.

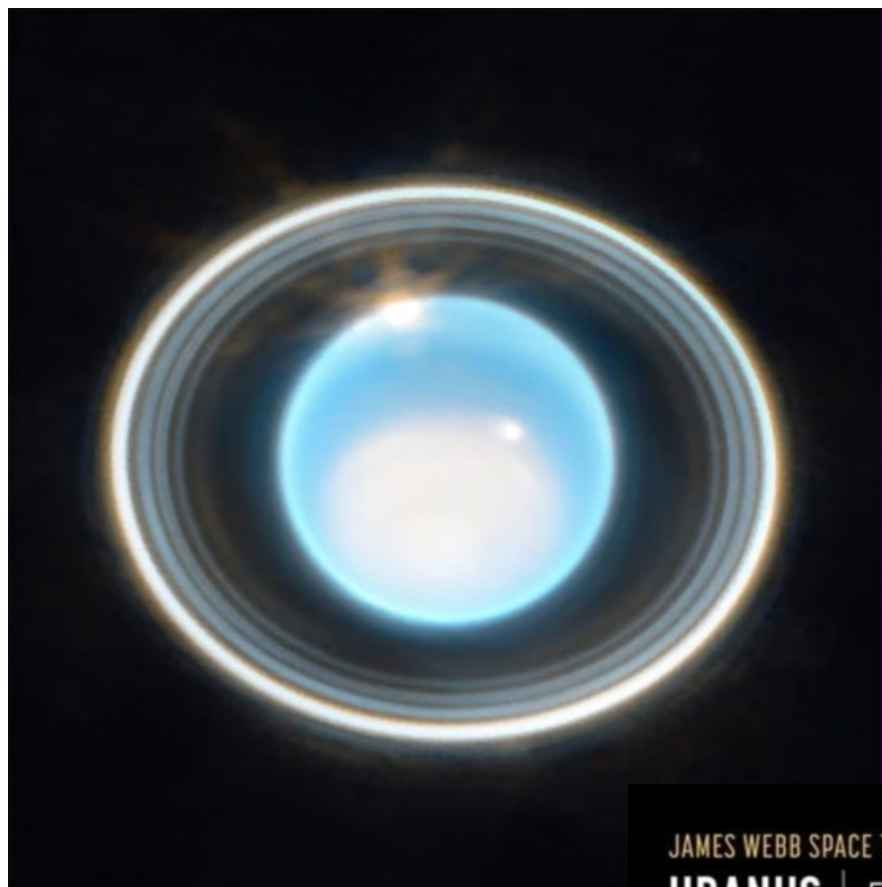
So how long is the sidereal month? It is 27.3 days, which is about 96% of the number I got. Why is it off? First of all, I make no promises that my measurement of the diameter of the lunar disk in the image, or the distances from the Moon to Venus, are accurate to within that margin! But also consider that over the course of that day, Venus also moved in its orbit. In fact, it moved almost  $\frac{1}{2}$  a degree in our sky, or about 1 lunar diameter. This would increase the distance that the Moon moved in the sky by 1 diameter, or about 4% (it moved 25 diameters instead of 24) which would decrease the orbital period from the calculated 28.5 days to about 27.4 days. That is pretty close to the actual orbital period of 27.3.

So there you go. Just some fun with a couple of pics taken for no reason other than the Moon and Venus looked pretty those nights. But I guess it's also good to know that the Moon is moving along just as it should in its orbit and we can all sleep sound for another month.



Last month we explored Uranus...Well, an astronomer's work is never done!

## Unique Uranus! (Continued)



The James Webb Space Telescope (JWST) decided to take pictures of Uranus shortly after my Uranus article was published in the April Event Horizon! All kidding aside, the images were taken in February and just recently published. The JWST is only the third instrument to take pictures of Uranus' faint rings. These photos were so beautiful, I just had to share them with you!

*Image Credit:*

*This zoomed-in image of Uranus, captured by Webb's Near-Infrared Camera (NIRCam) Feb. 6, 2023 NASA, ESA, CSA, STSCI. IMAGE PROCESSING: J. DEPASQUALE (STSCI)*

In this wide-angle image, many of Uranus' moons can also be seen:

*Image Credit:*

*SCIENCE: NASA, ESA, CSA, STSCI  
IMAGE PROCESSING: JOSEPH DEPASQUALE (STSCI)*



Thank you JWST!!! Can't wait to see what is next!



**The California Nebula (NGC 1499) in Perseus, by Alex Kepic**

Taken through an Explore Scientific ED102mm Triplet Essential scope with a ZWO ASI294MC Pro camera on a Celestron AVX mount. Exposures: 69 x 3 minutes; 207 minutes total.

# Binocular Bonanza!

I have several binoculars for sale.

All are in excellent condition, both cosmetically and optically.  
Feel free to come by and try them out or ask any questions you like.

Contact John at [astrojag@outlook.com](mailto:astrojag@outlook.com).

## Atlas Radian 8x42 binoculars

These 8x42 Radian binoculars from Atlas Optics are amazing for the price.

They come with front caps, case, strap and original box.

- Price: \$85



## Orion Ultraview 8x42 WA binoculars

They come complete with original box, case, caps and strap. Very comfortable to use with a nice wide field.

- Price: \$125



## Vortex Viper 10x42 binoculars

They come complete with original box, case and strap. Simply amazing!

- Price: \$375





# William J. McCallion Planetarium

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- **Public shows every Wednesday (7:00pm)**
- **Public transit available directly to McMaster campus**
- **Tickets \$7 per person; private group bookings \$150**
- **Different shows every week**
- **Upcoming shows include:**
  - **May 3: Introductory Astronomy for Kids — Galaxies**
  - **May 10: Introductory Astronomy for Kids — Solar System**
  - **May 17: The stories behind the constellations**
  - **May 24: The Celestial Bear: The Six Nations' Night Sky**
- **For more details, visit**  
**[www.physics.mcmaster.ca/planetarium](http://www.physics.mcmaster.ca/planetarium)**

## UPCOMING EVENTS

May 12, 2023 - 7:30 pm – H.A.A. Meeting at McMaster Innovation Park. Our speaker will be *Alan Dyer*, who will talk about next year’s Solar Eclipse. This will be a “hybrid” meeting, with the attendance option of in-person or online via [Facebook](#) and [Zoom](#).

June 9, 2023 - 7:30 pm – H.A.A. Meeting at McMaster Innovation Park.

### 2022-2023 Council

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All active HAA members have the privilege of access to an exclusive HAA members only dark sky location.

Be on the lookout for e-mails with dark sky observing details. Space is limited.

### The Harvey Garden HAA Portable Library



Contact Information

E-mail: [library@amateurastronomy.org](mailto:library@amateurastronomy.org)