



Volume 30, Number 5
March 2023

Event Horizon



From The Editor

Now that March is here, it shouldn't be long until we get milder temperatures and more comfortable conditions for astronomy activities.

Enjoy the March edition.

Clear Skies!

*Bob Christmas,
Editor*

*editor 'AT'
amateurastronomy.org*



Chair's Report by Bernie Venasse

Our Previous Meeting

Dr. Laura Parker of McMaster University made a wonderful presentation to our group during our last meeting. Her topic was galaxy Groups and Clusters. The talk was well received, and a lot of interest was generated. February Foodbank contributions consisted of 10 pounds of goods and totaled \$77.00 Cash. Your continued support is appreciated.

Our next meeting

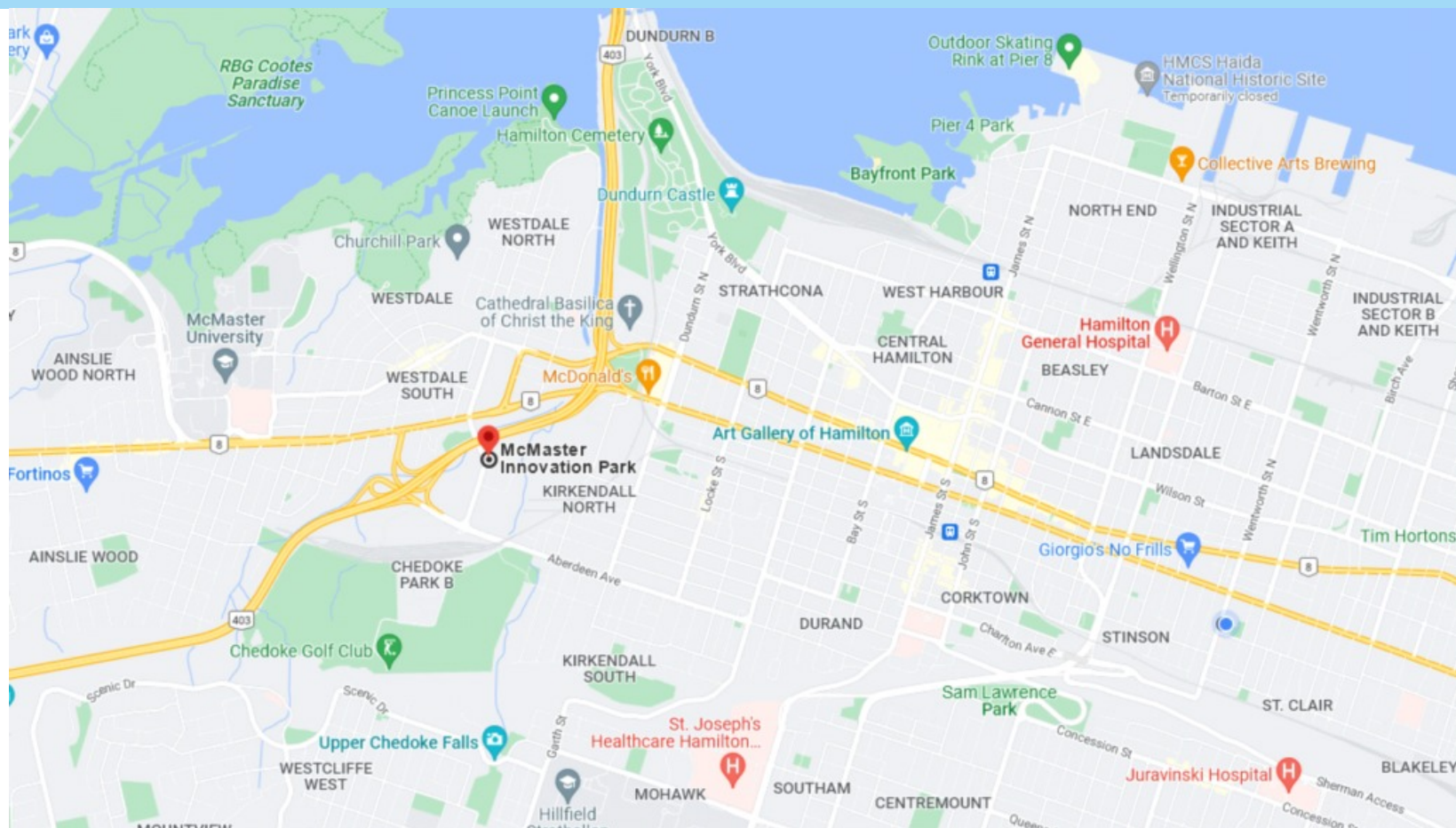
Our final meeting of the winter season is scheduled for March 10th, 2023, at McMaster Innovation Park. MIP is located at 175 Longwood Rd. S. in Hamilton. This will be a hybrid meeting combining a live audience with a Zoom presence. Doors open at 7:00 and the meeting begins promptly

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- The Sky for March 2023
- What's Up in Awards? March-April 2023
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- Eye Candy
- The HAA Spring Telescope Clinic – February 18, 2023
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- Upcoming Events
- Contact Information

Chair's Report (continued)



at 7:30. Our scheduled guest for our next meeting is *Kerry-Ann Lecky Hepburn*. She will be demonstrating some of her recent astrophotography.

Night Sky Photography Under Adverse Conditions – “As astrophotographers, we dream of clear and transparent skies with no light pollution, but in reality, we oftentimes don't get that. However, instead of seeing poor conditions as a hindrance, we can learn to work with them in unique ways that may still result in producing some great astro images. In this presentation, I will share some examples of how I worked with these subpar conditions to produce some of my favourite images.”

Inreach and Outreach events

We had a very hastily organized outing to Binbrook on the evening of February 11th. There were about 20 members, new and some more experienced, taking in a great view of the comet, Mars, Jupiter, Venus, etcetera. Despite the fact that it was rather cool and there was a sneaky breeze, a good time was had by all involved.

On Saturday, February 18th, the HAA held the Spring Scope Clinic. Organized by Matthew Mannering, there were 25 members setting up advice stations. Many people attended, seeking advice about the various versions of telescopes and equipment. Great job, Matt!!!

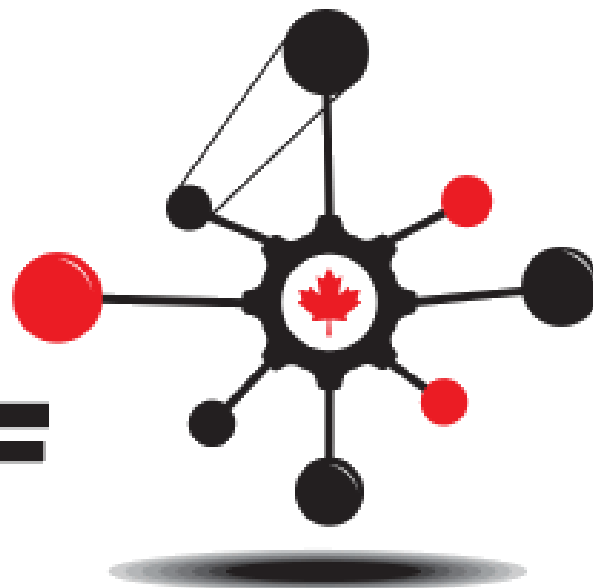
Upcoming Observing Events:

Friday, March 17, 2023	Binbrook Conservation Area	Membership Observing Session
Saturday, March 25, 2023	Grimsby Welcome Centre	Outreach <i>(Continued on page 3)</i>

Masthead Photo: *Red Planet, Green Comet – Mars & Comet C/2022 E3 ZTF*, by Bob Christmas.

Taken through a 300mm Tamron lens at f/4 with a Canon 40D DSLR at ISO 1600 on February 11, 2023. 16 x 1 minute; 16 minutes total exposure. Tracked on SP EQ mount. Crop of original.

BASEF



The Bay Area Science and Engineering Fair

Today, there are many opportunities for young people to explore their interests in the fields of science, technology, engineering, and math (STEM). They may work on a school project, or join a club, or investigate an area of interest on their own. *The Bay Area Science and Engineering Fair (BASEF)* is a regional fair providing an opportunity for students to show off their work and gain recognition for their effort. As well, through its affiliations, BASEF provides opportunities for students to compete at the national and international levels.

Public viewing Saturday, March 25th, 9:00am - 12:00pm.
Mohawk College, Fennel Campus, David Braley Athletic Centre (Gymnasium)

BASEF is committed to providing a safe environment for all fair attendees - students, judges, volunteers, parents, and the public. Therefore, everyone attending BASEF 2023 is expected to wear a mask.

Masks will be provided if you forget yours.

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

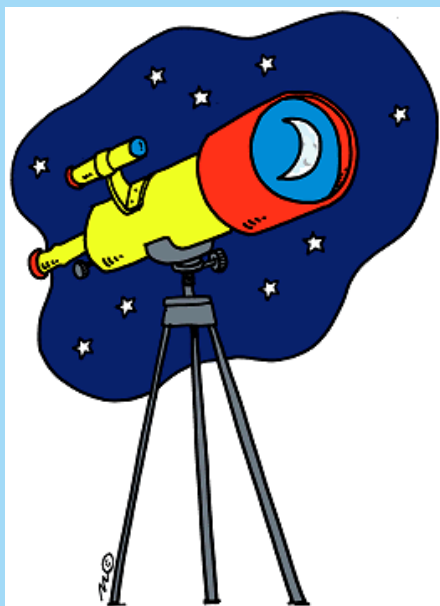
We would like to take this opportunity to welcome 9 new/returning members (Jan 29-Feb 26).

Steven Smith, Hamilton. Individual membership.
Andrew Smillie, Hamilton. Individual membership.
Greg Gill, Dundas. Individual membership.
Tosh Nanva, Hamilton. Individual membership.
Madie Hickie, Hamilton. Individual membership.
Stephan Landis, Dundas. Family membership.
Dino Le Donne, Hamilton. Family membership.
Paul Shaker, Hamilton. Family membership.
Marcus Freeman, Hamilton. Family membership.

Current membership:	78 Individual memberships	= 78
	47 Family memberships (x2)	= 94
	<u>1</u> Honorary membership	= <u>1</u>
	126 memberships	173

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

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.

Telescopes are loaned out on a first come basis.

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.



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.



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

Last month we explored Jupiter's Moons...this month we are going to explore another planet with a lot of Moons - Saturn! Let's go!

Spectacular Saturn!

There are many amazing things about Saturn! Not only does it have many moons at 83 in our Solar System, and a beautiful ring system (see the June 2022 HAA Explorers article for more on Saturn's rings), but did you know it is so light it could float on water??!! That's if there was a body of water large enough!

Saturn was named after the Roman God of Agriculture. It is the 6th planet from the Sun and can be seen with your eyes. However, you would need a telescope to see the rings. Even with Galileo's telescope, he thought that Saturn had bulges and did not know they were rings.

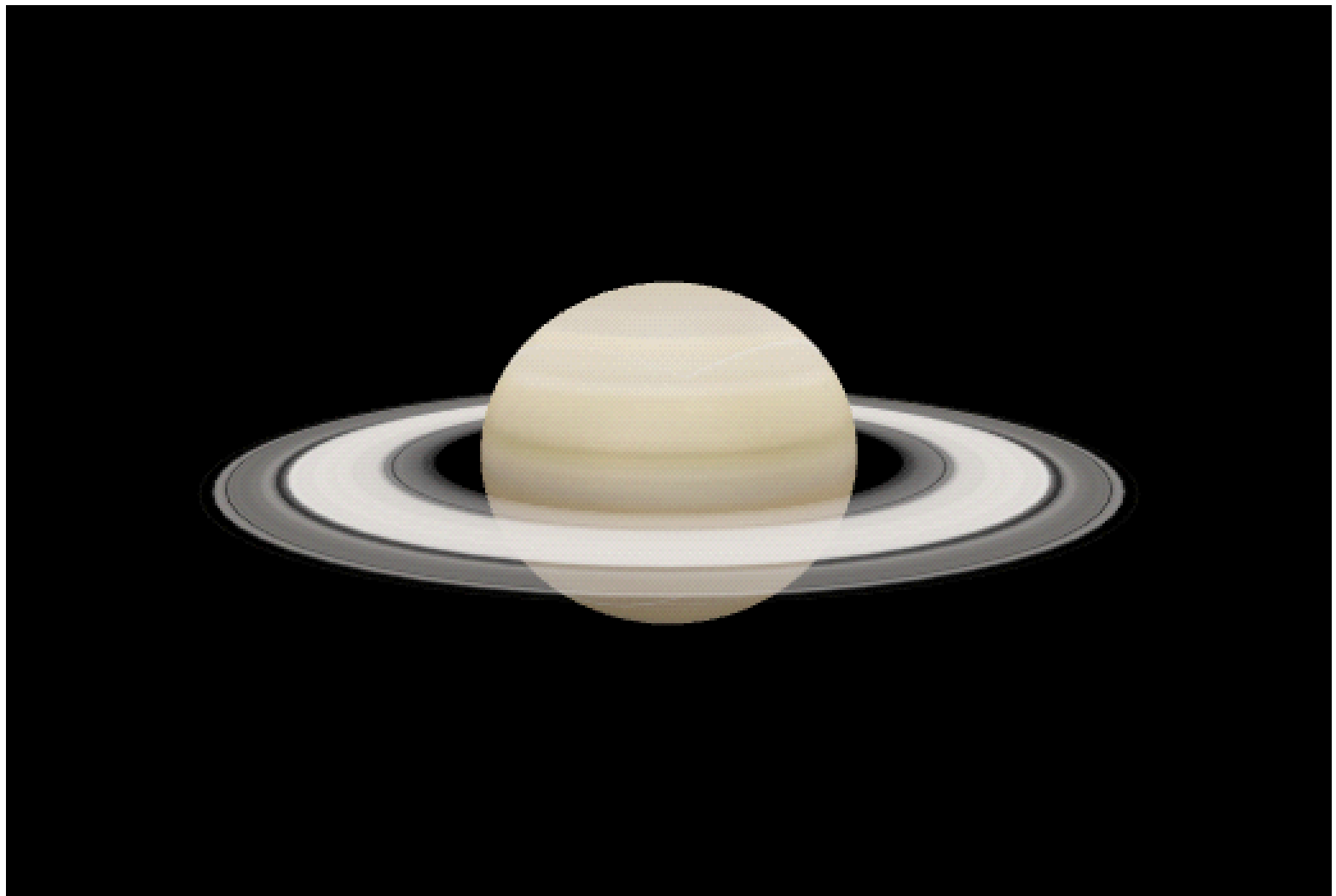


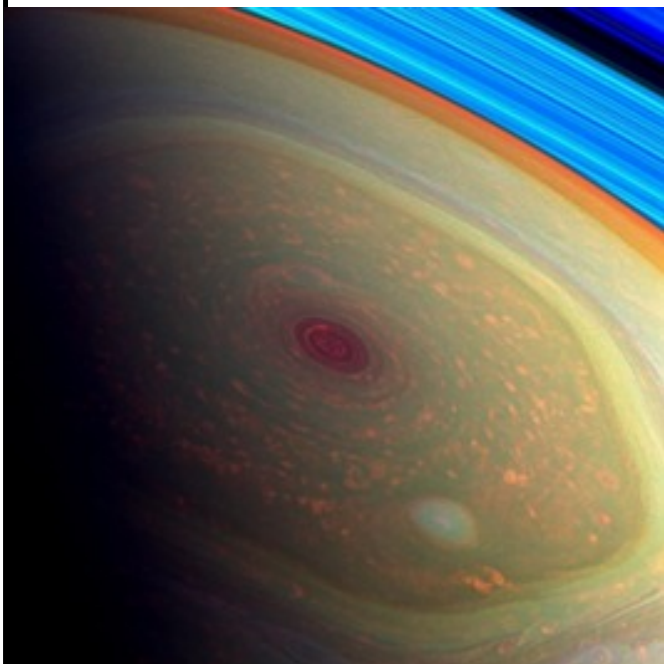
Image Credit:

NASA Visualization Technology Applications and Development (VTAD)

It takes Saturn about 29.5 Earth years to go around the Sun once! No wonder - it is 1.4 BILLION kilometers from the Sun. Saturn is the second largest planet and is a gas giant like Jupiter. The gasses on Saturn are mostly hydrogen and helium. If Saturn was larger, it too, may have become a star. And also, like Jupiter, it rotates very fast with its day being 10.7 Earth hours. Similar to Jupiter, this quick rotation generates very fast wind. The winds on Saturn are the fastest in the solar system and can reach 1,120 miles per hour, or 1,803 kilometers per hour! Another interesting thing to note about Saturn is that because its axis is tilted 26.7 degrees, it has seasons...each season would last over seven years long! Imagine having winter on Earth for seven years??!!

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HAA Explorers (continued)



North Pole of Saturn

*Image Credit: NASA Solar System
Exploration*



*NASA's Cassini spacecraft captured this image of Enceladus on
Nov. 30, 2010. The shadow of the body of Enceladus on the
lower portions of the jets is clearly visible.*

Image Credit: NASA/JPL-Caltech/Space Science Institute

Saturn's core is thought to be a small solid core made of metals and rocks. The next layer is a thick liquid layer of hydrogen and the top three layers are made of clouds. There is a magnetic field around Saturn and aurorae can be seen! Another cool feature is a large storm in the shape of a hexagon (six sides) on Saturn's North Pole, as seen in the photo.

Saturn's moons range in size from small boulders to larger than the planet Mercury. Sixty-three of them are confirmed and the other 20 are waiting for confirmation. Saturn's largest Moon is called Titan. It is the second largest moon in the solar system after Ganymede. There is actually weather on Titan with clouds and rain. Although the rain is not water...it's methane! There are lakes of ethane and methane on Titan. We know this because the Huygens probe landed on Titan...the first probe to land on a Moon other than Earth's moon. Another interesting moon is called Enceladus. It may have a liquid ocean. The Cassini spacecraft saw water shooting out of the south pole!

Things to do until next time **:

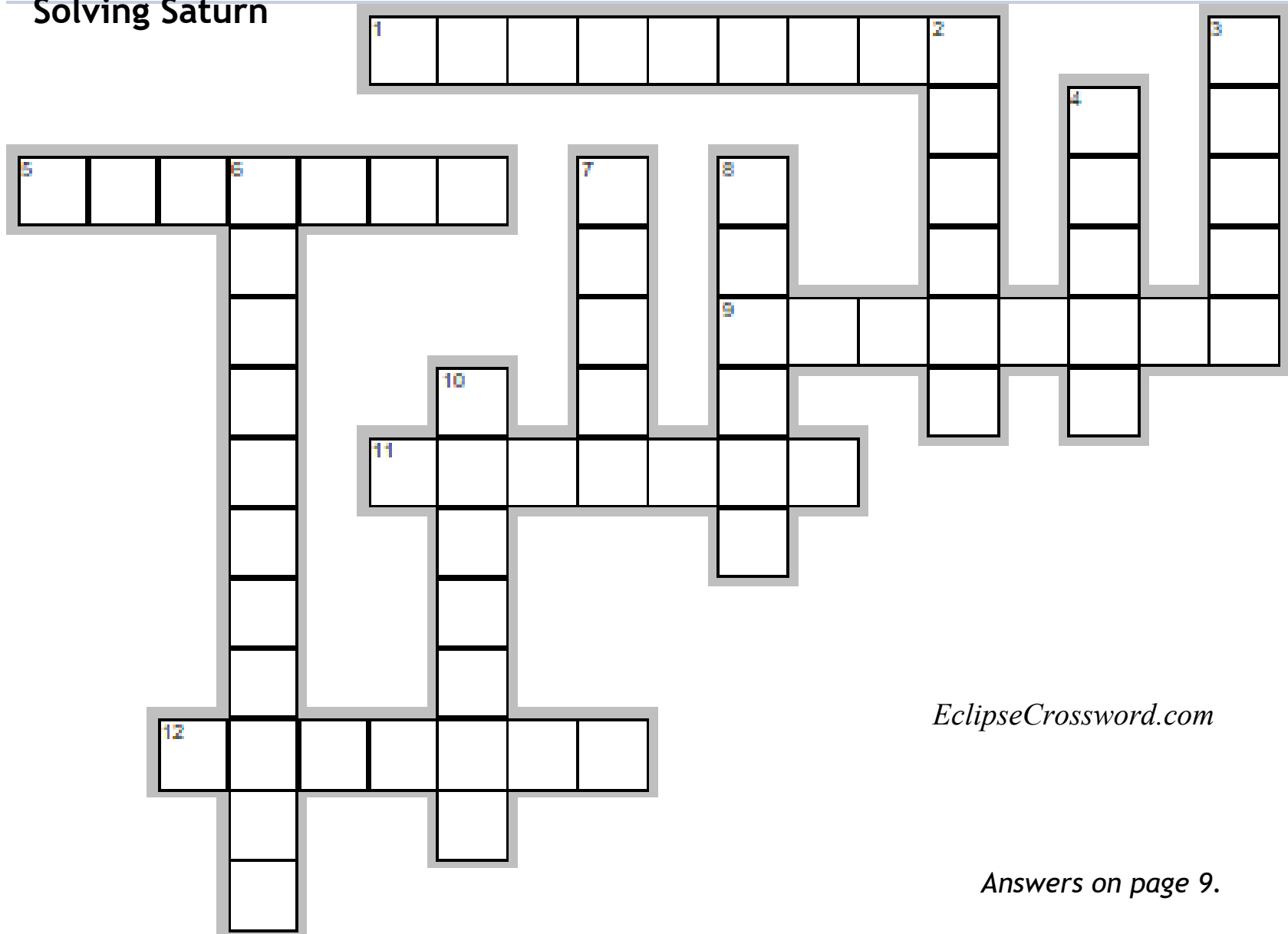
**** Check with your parents or caregivers before checking out websites.**

- 1. Visit *this website*** to make your own model of Saturn (You may have to ask your adult what a CD is):
<https://spaceplace.nasa.gov/saturn-model/en/>
- 2. Visit *this website*** to tilt Saturn and see what happens to its rings:
<https://spaceplace.nasa.gov/all-about-saturn/en/>
- 3. Visit *this website*** to learn more about Cassini and Huygens mission:
<https://solarsystem.nasa.gov/missions/cassini/overview/>

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HAA Explorers (continued)

Solving Saturn



EclipseCrossword.com

Answers on page 9.

EclipseCrossword.com

Across

1. A moon of Saturn's that may have oceans.
5. A six-sided figure.
9. A gas found on Saturn.
11. Spacecraft that traveled to Saturn.
12. Probe that landed on Titan.

Down

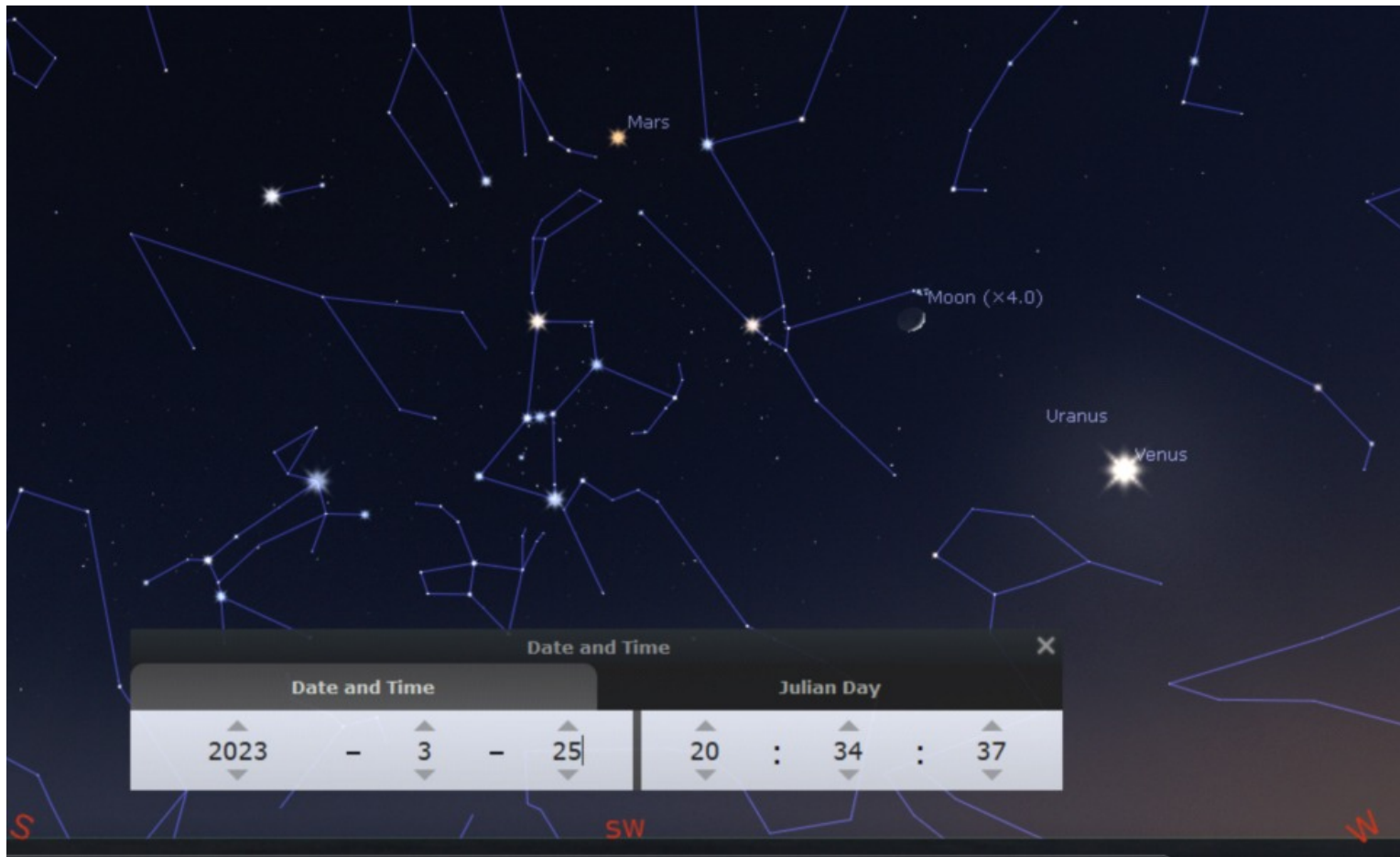
2. Sixth planet from the Sun.
3. Second largest moon in the solar system.
4. Saturn is known for these.
6. Saturn was named after the Roman God of
7. Saturn has 83 of these!
8. A gas found on Titan.
10. Who thought that Saturn had bulges?

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HAA Explorers (continued)

During March, check out:

1. On March 25th around 8:30 pm, check out crescent Moon between Venus and Mars in the Southern sky:



2. On March 31st around 8:30 pm, almost a week later, where is the Moon now?? Mars is now between Venus and the Moon...and there's Mercury trying to play along, too!



Images generated using Stellarium

(Continued on [page 9](#))

HAA Explorers (continued)

Finally:

What is Saturn's favourite movie?

If you have a question that you would like answered in the newsletter, please send it to education@amateurastronomy.org

Answer: 😊 Lord of the Rings

Thank you to Ro for reviewing this article! 😊

References:

Astronomy for Kids, 2019.

The Essential Guide to Space. Paul Sutherland. 2016.

How Space Works. DK Penguin Random House. 2021.

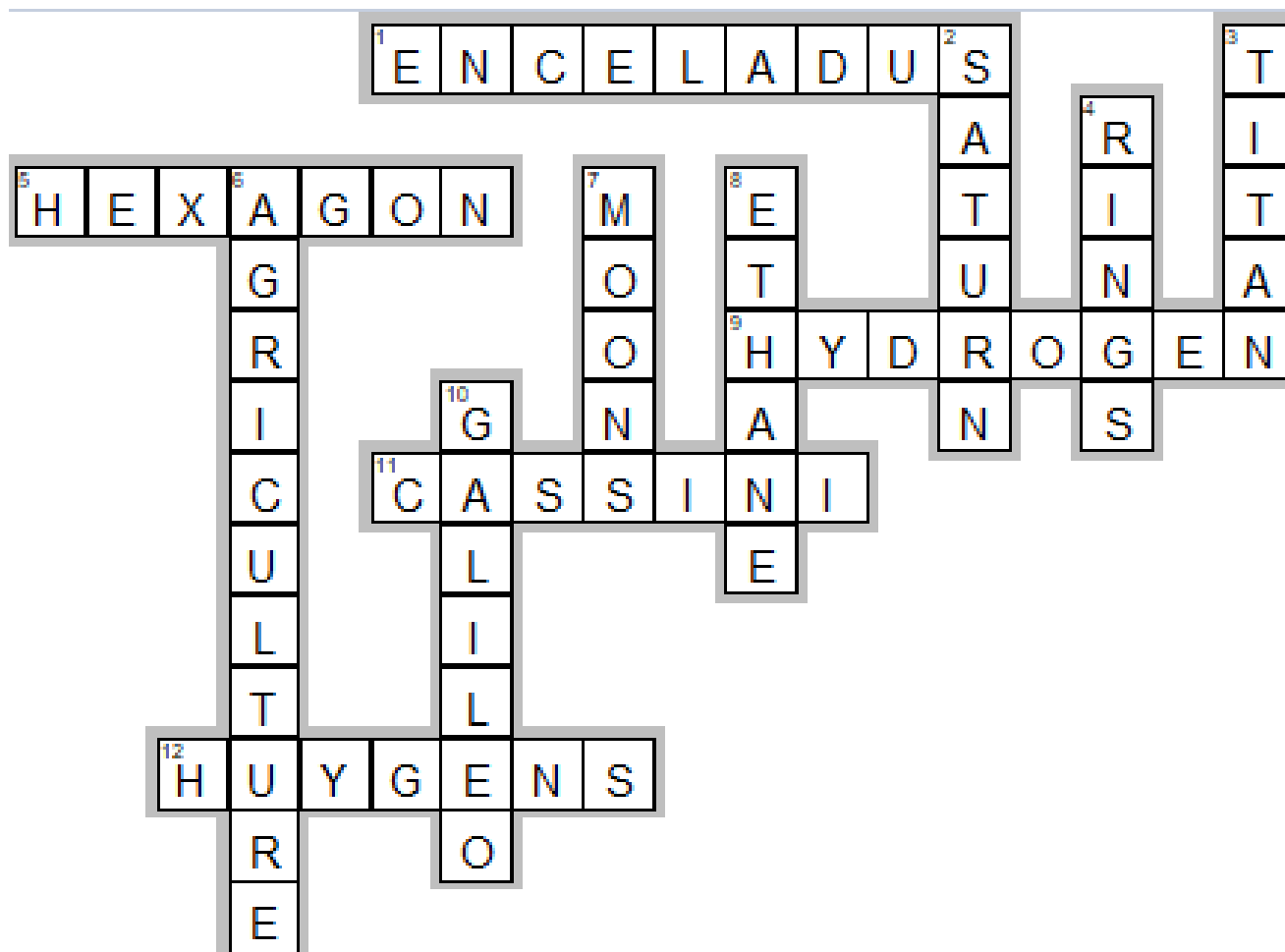
My Book of Stars and Planets. Dr. Parshati Patel. NY: DK Penguin Random House, 2021.

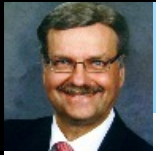
National Geographic Kids: Ultimate Space Atlas, 2017.

National Geographic Kids: Ultimate Explorer Field Guide, 2016

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

Page 7 Saturn Crossword Answers:





The Comet

I hope all of you looked for the comet and found it.

Our club had an observing session at Binbrook Conservation Area shortly after our February meeting, to see the comet and the Zodiacal light rising from the west, and we were not disappointed, although the parking lot was soft and it was not a very pleasant evening weather wise. The comet was near the zenith, making binoculars hard to use, but you could literally find it hand-held while sweeping the sky.

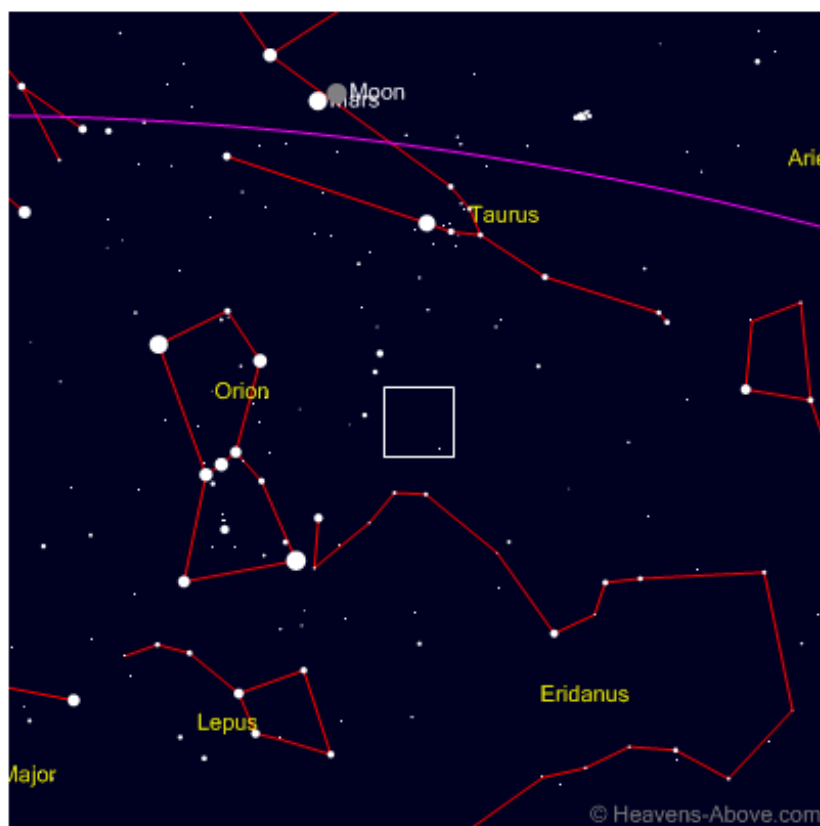
Comet C/2022 E3 ZTF has now dimmed into only-dark-sky territory, and will be seen only with a telescope that tracks the sky, as it's not a binocular or finderscope object anymore.

That said, you can still star-hop to it, and at 7.6 magnitude, it's not totally out of range, but you will need to find DARK skies for it.

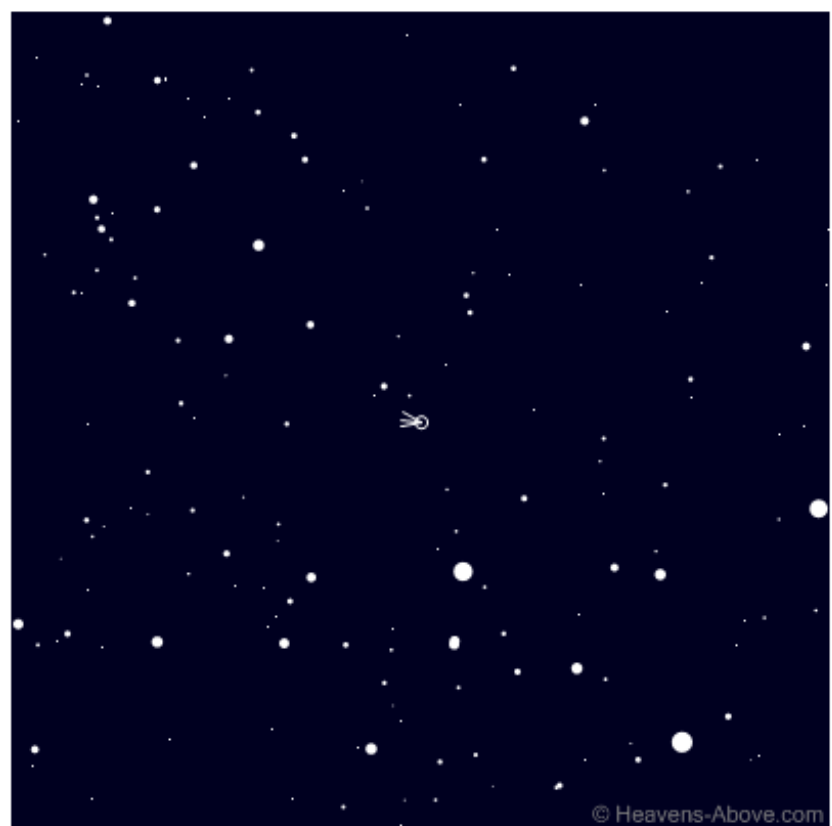
As usual, I recommend using Heavens-Above to generate a finder chart. A free account will remember your location quite easily.

Comet C/2022 E3 ZTF

Year Month Day Time



Coarse finder chart
(Field of view: 60°, Max. star mag.: 5)



Fine finder chart
(Field of view: 5°, Max. star mag.: 10)

Note that the comet is not all that far from Orion and Mars, considering the sky.

I did bring my big binoculars to our February meeting, and my observing attempt was clouded out, but true to my experience (*), within an hour there was a clearing, and for a few sweet minutes I could see the comet from my front yard in Burlington.

I had to hurry the setup, as a new bank of clouds blew in not long after I found the comet. I made a sketch of the comet relative to Mars and the background stars I could see.

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The Sky for March 2023 (continued)

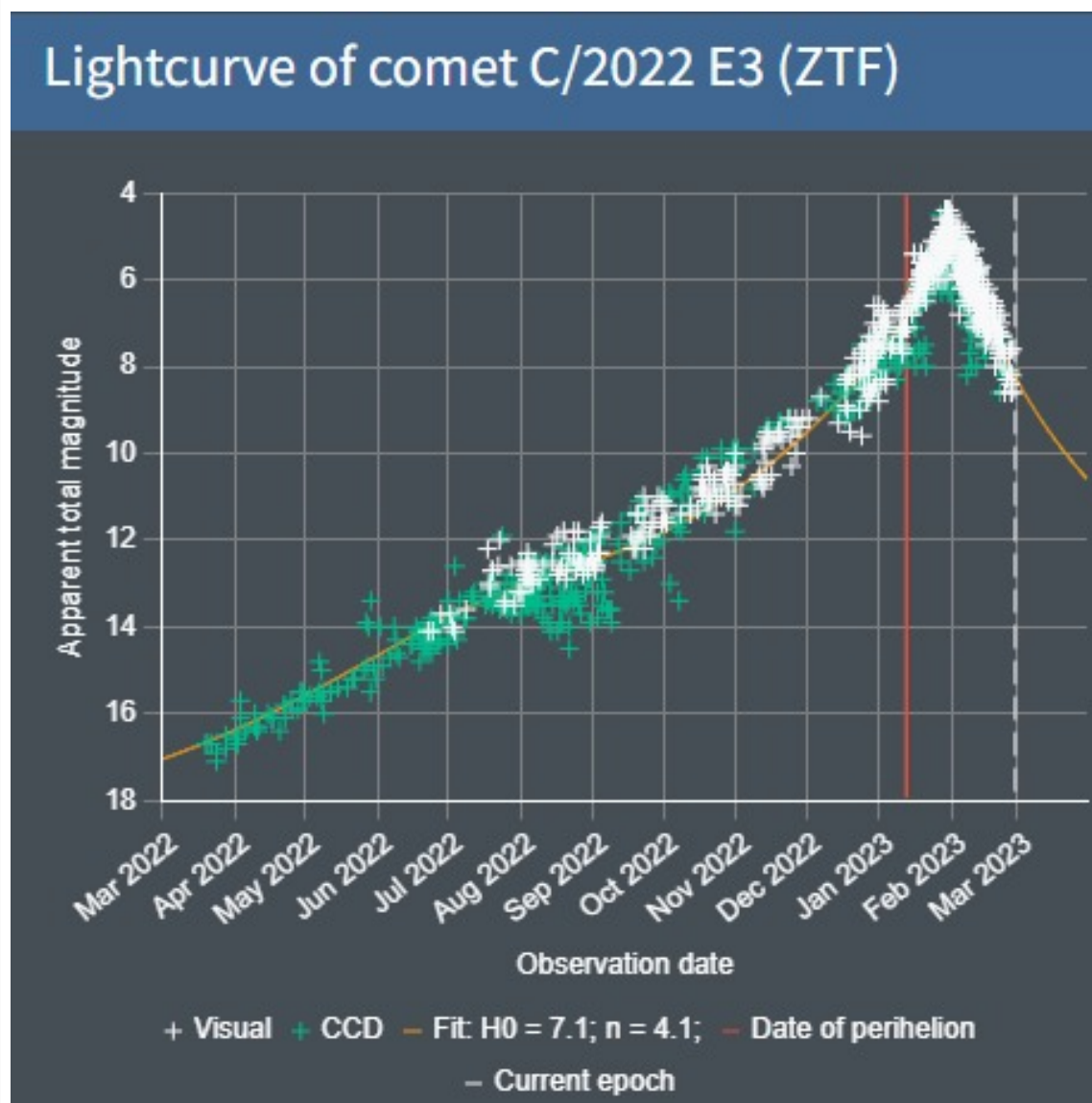


Chart Credit:

Comet Observation database (COBS)

We will eventually have new comets to observe, but this is still the brightest one visible.

Those new comets will not likely bear up to claims of easy visibility, but fortunately for us, we have telescopes which bring the comets to us. Any comet under 8th magnitude should be visible in a (clean) telescope from dark skies.

At top is the light curve for 'our' comet of the month. The diagram is plotted with data from an excellent comet-observing website called 'COBS'. <https://cobs.si>

Please send any new photos you made, of any comet (there are still 3 photographic comets) for me to show at our monthly meeting.

Did I mention there's no mosquitos during Winter and early Spring observing sessions?

The Start of Spring

The month of March includes a major annual astro event.

In fact our entire calendar and method of noting positions in the sky is factored on the annual *Vernal Equinox (VE)* the start of Spring (in the Northern Hemisphere). March has the equinox, nominally near March 21, but this year at **Monday, March 20, 2023, at 5:24 p.m. EDT.**

Technically the start of spring is an instant in time, when the Earth passes the point on its orbit around the Sun where it intersects the plane of the Earth's equator, but which timezone you are in will determine the hour, and the day.

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The Sky for March 2023 (continued)

In 2020, spring in North America began on March 19th, the earliest first day of Spring in 124 years!

The ebb and flow of leap years adjusts the time of the equinox, but the equinoxes themselves are almost perfectly evenly spaced in time. It is the calendar that is chasing, to keep it steady near March 21. For instance, we can look at the time of day of the equinox, taking into account the 0.25 turn of the earth each year over and above an integral number of days. Basically, after 4 years, the equinox should come back to the same time, minus about .75/25 of a day.

Here we see a chart showing that the equinox shifts a touch less than 6 hours a year.

Year	March Equinox in UTC	Looking closer at the times, I see they are not actually perfectly evenly spaced.
2020	March 20, 03:49	The position of Jupiter also affects the Earth's orbit a tiny bit, so the progression is not the same number of minutes short of 6 hours each time. So an average is used for the calendar. The amounts by which the spacing differs from 6 hours, for the last 5 years are:
2021	March 20, 09:37	
2022	March 20, 15:33	12 minutes, 4 minutes, 9 minutes, 18 minutes
2023	March 20, 21:24	Note specifically 2020 at 3:49 UTC and 2024 at 3:06 UTC.
2024	March 20, 03:06	Those 43 minutes difference will add up to .75 days in a century, resulting in our calendar needing no leap year on century years unless those years are a multiple of 400.

Shifting Sky relative to the Start of Spring

This month also gives me a chance to talk about the *precession* of the equinoxes.

The Vernal Equinox (VE) is also known as the 'first point of Ares' and that constellation's position relative to the direction in space where the Earth's equatorial plane crosses the Earth's orbital plane, has been shifting, almost 1/12 of the way around the sky relative to the VE in the last 2000 years or so of recorded history.

There is an excellent article in Wikipedia (https://en.wikipedia.org/wiki/Axial_precession) which includes a listing of all the ancient astronomers' estimates of the precession and how accurate they were.

Some of the ancient astronomers were even fair to give a range, acknowledging uncertainty in historical measurements they were relying on.

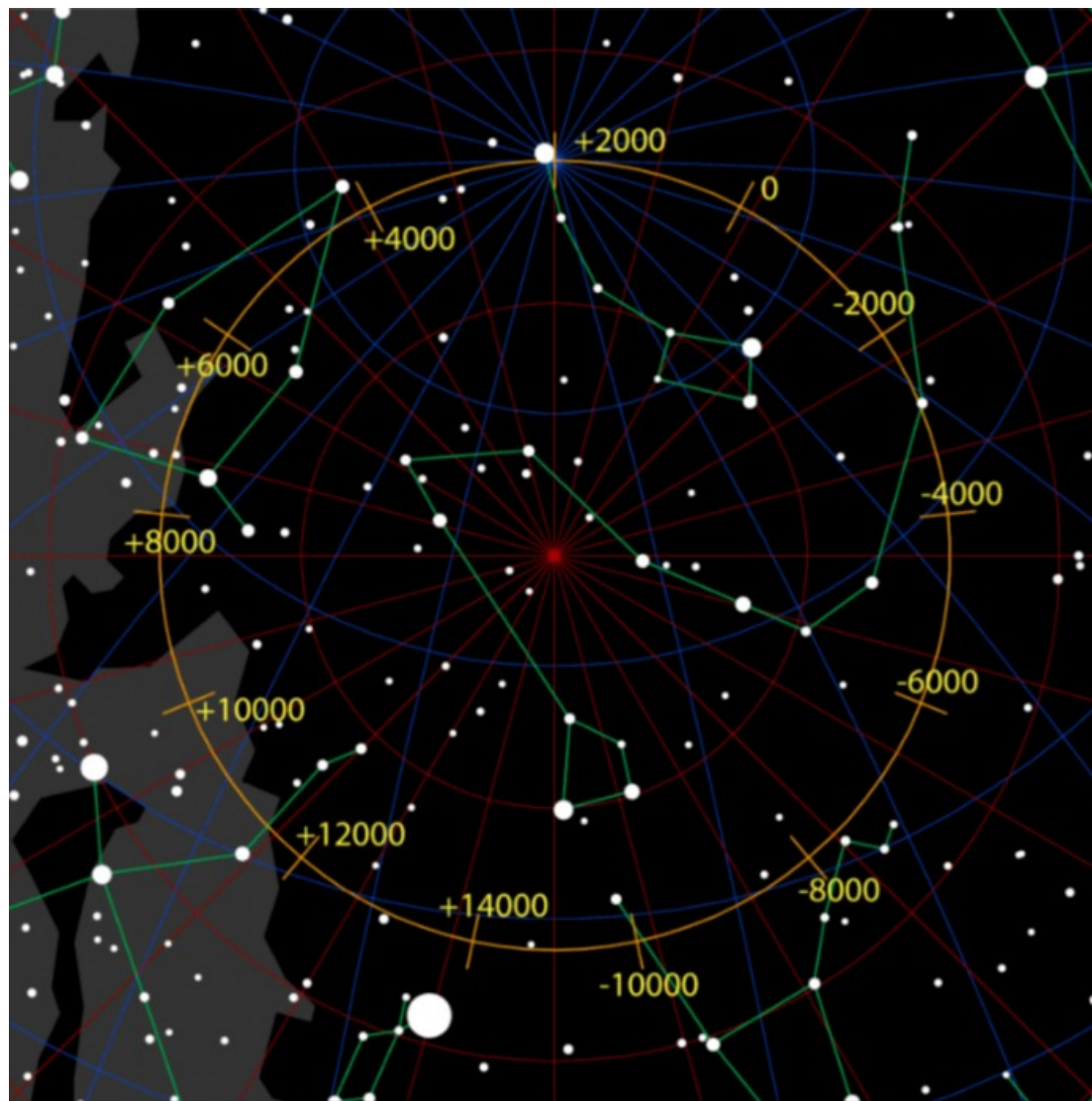
The North Celestial Pole (the point around which the celestial sphere seems to rotate) is near Polaris at this time (see diagram on next page), but was not always so, and will get near lesser rival stars eventually.

The diagram at the top of the next page shows how far it will go, if we live long enough.

Vega is a bright star, and will eventually make a passably good pole star even a few degrees from the pole, in 14000 AD, as shown. By then we might have other issues seeing stars in the sky, as there will likely be spaceships reflecting the Sun, and space telescopes beyond them.

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The Sky for March 2023 (continued)



We can see that Polaris is the best North Star. It is a pet theory of mine, that having a good North Star has resulted in more daring seafarers, and thus we have transatlantic voyages being relatively recent historically. Only since about 1500 AD has Polaris been closer than Vega ever got 14000 years ago.

Precession is a complicated topic, best researched in the above Wikipedia link. Suffice it to say, that circle in the diagram is not perfectly round. There's wiggles of all kinds in it.

*Diagram Credit:
Wikipedia/Tau'olunga*

Getting out Under the Stars

March is the month of *Messier Marathon*, as discussed in the February edition. Nearly every Messier Object is up in the sky this month, and to a lesser extent, in April, so if you have been thinking of a Messier object you wanted to observe, one that has been on your bucket list, here is your chance to find it.

Our club will have a Messier Marathon night near New Moon, as our keyholders' work schedule, and the clouds allow.

The winter constellations will gradually set sooner and sooner each day and month, as we get into the summer constellations, which can now be seen in the early morning, as Sagittarius now has escaped from behind the Sun.

So it really comes down to what you prefer to observe.

Your choices (not a complete list) include:

- Planets
- Galaxies and other faint fuzzies
- Dark Nebulae
- Double Stars
- Constellations
- Carbon Stars
- Notable stars
- Near-earth dwarf galaxies

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The Sky for March 2023 (continued)

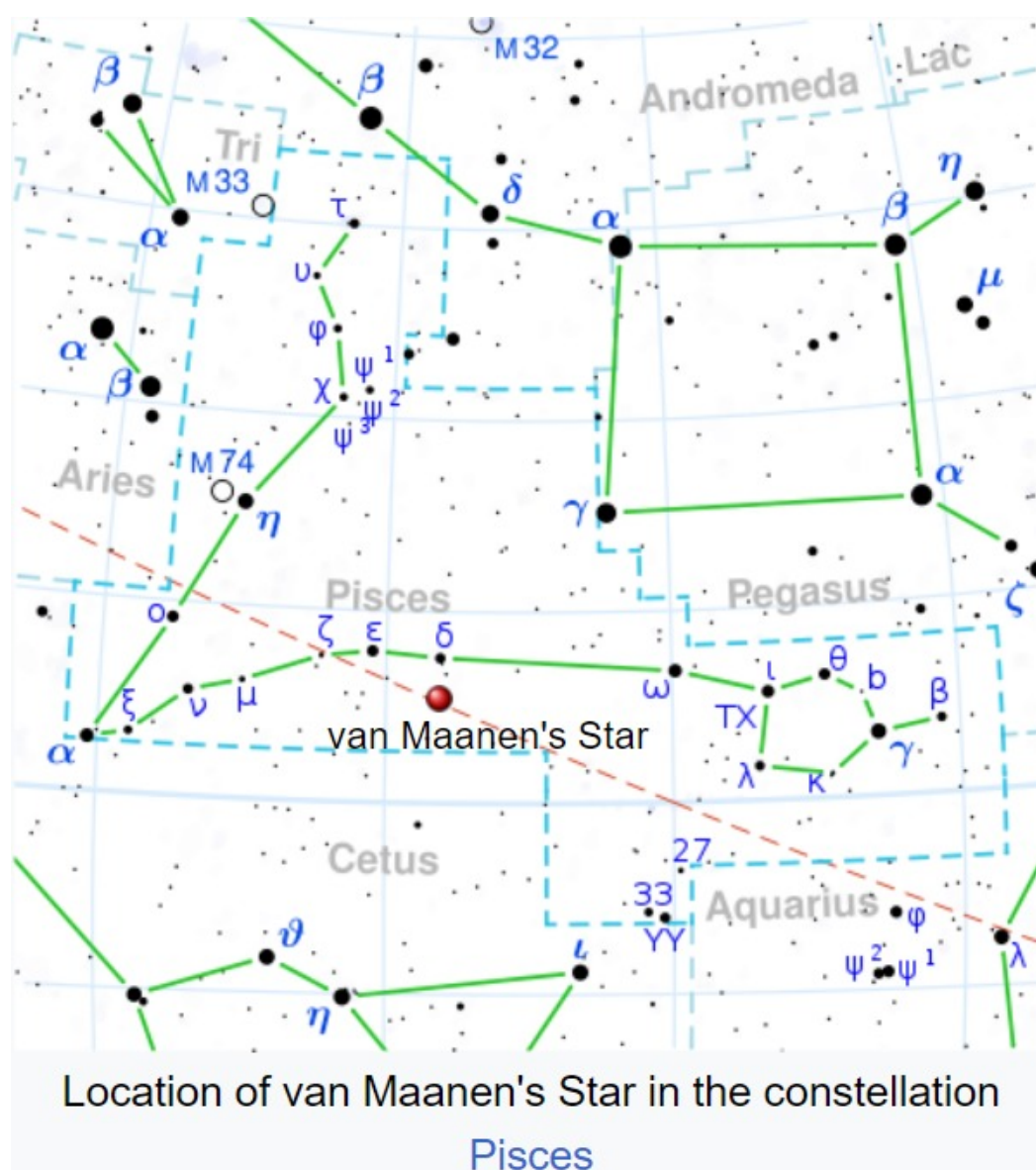
For me, I want them ALL. If I had an Astro bucket list, *the pup* (*Sirius B*) would for sure be in the top 3. To see all the carbon stars in the Astro League chart would be awesome. To be able to remember their locations, a feat of memory and skill. I think those 2 are at the top of my list more or less tied, in terms of warm satisfaction anticipated. To see a milky way supernova would be pretty impressive. We can expect one sometime in the next 400 years or so. I take my vitamins every day. Just saying. To visit another planet would be cool, and although I am not overly keen on it yet, I think I could get used to low gravity.

So practically, for me, *the pup* is the most likely accomplishment for me this year. For sure it has more recognizable bragging rights of the top 2, but probably is actually easier. It's within all of our grasp now. 25 years from now, you will need to be in space to achieve it. If you have a telescope, or you come to the Messier Marathon, there will be a chance for you to see the pup near Sirius A. That 8th magnitude white dwarf star is only 8 light years away, and it is one of the few white dwarfs you can actually see in the night sky with a small telescope. This is a twice in a lifetime event, the pup will not be easier to find until about 50 years from now, so I recommend putting in the effort now. So if you are over 50 and missed your first chance, here's your second chance. Seeing the pup will be possible most of this year, but there will be times when Sirius is too close to the sun, and those times will be in the warm summer months... so don't be shy.

Having Bucket Lists can splash you a little.

If you want an 'easier' target, you can reach for a white dwarf which is smaller, older, and dimmer, *Van Maanen 2* is the name given to the closest lone white dwarf star.

https://en.wikipedia.org/wiki/Van_Maanen_2



It is a solitary white dwarf, not lost in the glare of another star, although 12.34 magnitude means you will need an 8 inch scope to identify it.

It's pretty easy to find if you are looking for it, and does not depend on the seeing nearly so much as seeing a dim star near Sirius does.

It is zipping across the sky at about 1 arcminute per year. Lateral movement in the sky is called '*proper motion*'.

So stay tuned for an invitation to Binbrook Conservation Area, and we will have a chance to either do part of a Messier Marathon or to concentrate on using 'averted imagination' to see the pup. The key question will be, where is it relative to Sirius as a 'position angle'. If you can discern that, then you have truly observed it.

Until then, I wish you all Clear Skies!



Contents:

- What's up in awards? Rising Star Program: March-April
- Pathways Observing Program targets... March-April
- Messier Observing Program: March-April... 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

March

Constellations: Ursa Major

Stars: Regulus

Double Stars: tau Cancri

Object Pairs: M81 / M82

Messier Objects: M44, M65, M109

April

Constellations: Virgo, Leo

Stars: Dubhe, Regulus

Double Stars: 42 Leonis Minoris

Object Pairs: M65, M66

Messier Objects: M96, M109

Pathways Observing Program

Group D

Observable in March

Winter Constellations: Find, observe, sketch: Gemini.

Stars: Find, observe, sketch: Betelgeuse.

Asterisms: Find, observe, sketch: Winter Hexagon

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

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.

(Continued on [page 16](#))

HAA Messier Objects Observing Award

March Messier targets

- M41** This cluster in Canis Major is visible as a hazy patch to the naked eye just below Sirius. M41 appears fairly loose in telescopes at low power.
- M93** This is a small fuzzy patch of light in Puppis. Use low power to examine this cluster and the surrounding richness in a telescope. Medium power provides a nice view of the cluster itself.
- M47** A bright cluster in Puppis, easily visible as a hazy patch to the naked eye. Telescopes show a loose cluster with stars of wide variety of magnitudes.
- M46** This cluster is right next to M47 and is also visible to the naked eye. In telescopes at low powers this cluster evenly fills the eyepiece. While you are here go to medium or high power and look for the planetary nebula NGC 2438. It will appear as a faint uneven ring, with a blue/green color.
- M50** An open cluster in Monoceros. Like M93, the richness of the surrounding field is the only difficulty in finding this object. This is a fairly tight cluster at low power in a telescope.
- M48** Messier 48 is a large fuzzy patch in binoculars, partially resolvable. Use low to medium power in your telescope for a spectacular view.
- M67** In the southeast portion of Cancer is another open cluster, barely visible as a fuzzy patch to the naked eye. Use low power to resolve this large, rich cluster in a telescope.
- M44** Known as the Praesepe or Beehive Cluster, this open cluster is easily visible to the naked eye as a large, fuzzy patch bigger than the moon. Binoculars or rich field telescopes provide the best view of M44.
- M81, M82** Both galaxies will fit into the same low power telescope field. M81 will appear as a large oval gray patch of light. M82 is a pencil like streak of light next to and perpendicular to the long axis of M81.

April Messier targets

- M40** This is a pair of faint stars located in Ursa Major. In telescopes, they appear to be an identical pair of stars and easy to split even at low power.
- M108** This galaxy will appear as a thin streak of light in telescopes, there is a definite brightening towards the middle. M108 is a very tough object for the largest binoculars.
- M97** This planetary nebula in Ursa Major, also called the Owl nebula, appears as a fairly large, round, hazy patch of light in a telescope. It is in the same field of view as M108 at low to medium powers.
- M109** This spiral galaxy in Ursa major appears as a small, oval patch of light. It can be found in the same field of view as Gamma UMa at low to medium power in a telescope.
- M106** This galaxy in Canes Venatici appears as an oval patch of light, larger than M109, with a bright core.
- M95** This galaxy in Leo appears as a faint round patch of light with a bright nucleus.

(Continued on [page 17](#))

What's Up in Awards? March-April 2023 (continued)

- M96** Look for M96 in the same low power telescope field as M95. Another round patch of light, slightly larger and brighter than M95, it too has a stellar core.
- M105** This is a small elliptical galaxy in Leo and can be found in the same low power field as M96. It looks like a small fuzzy star. M105 has a close companion galaxy, NGC 3384, which is only slightly smaller and fainter than M105. To prevent confusion, M105 is the closer of the pair to M96.
- M65** A small, but relatively bright galaxy in Leo. It is an elongated oval patch of light with a bright stellar core.
- M66** A close companion galaxy to M65, it can be seen in the same low to medium power field as M65. M66 is another oval patch of light, brighter and slightly wider than M65. While you are here be sure to look for a thin streak of light which is the galaxy NGC 3628. It can be found north of M66 in the same low power telescope field as both M65 and M66.

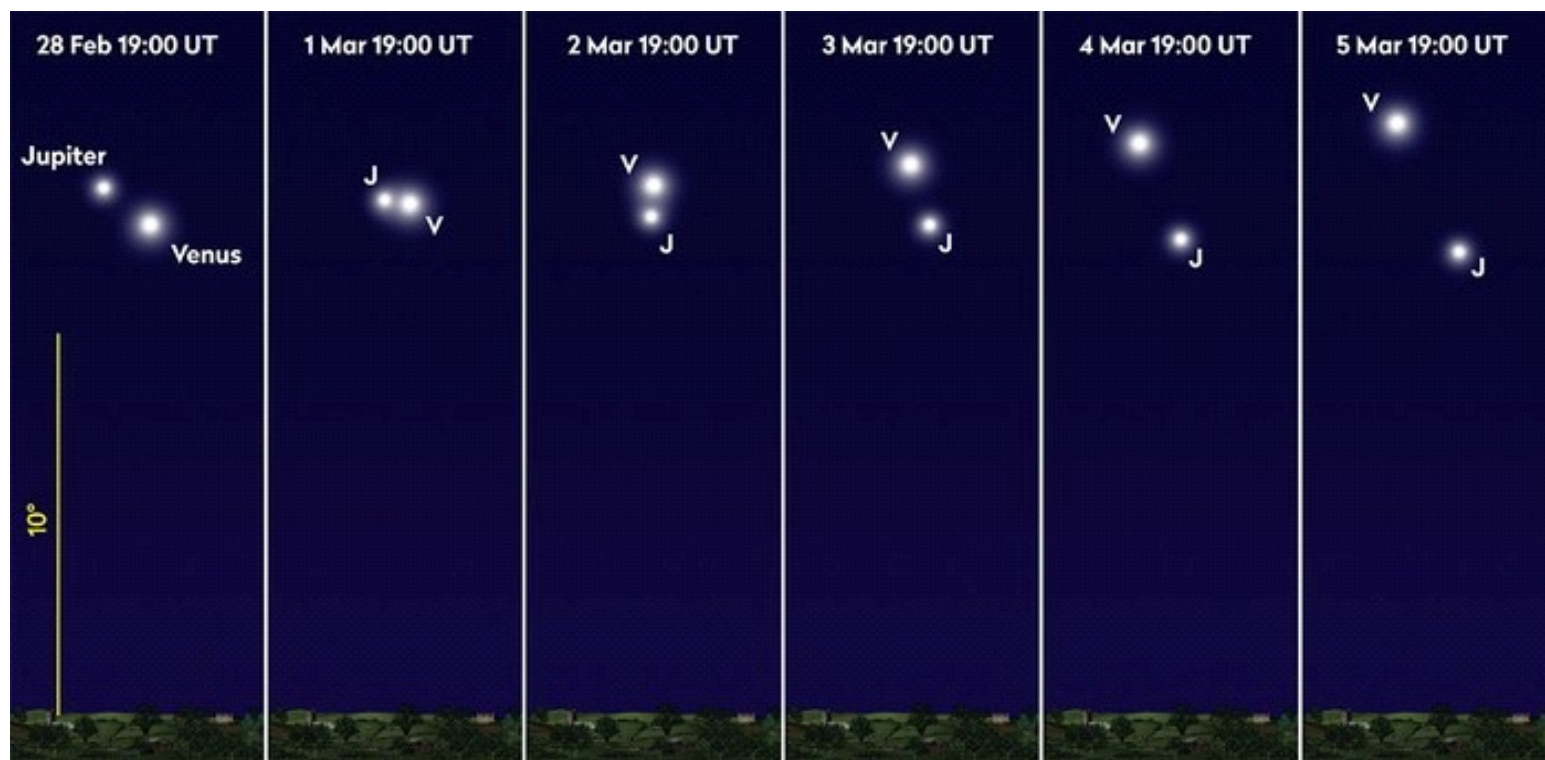
The Planets... March 2023 via (BBC) Sky at Night Magazine

Mercury: Best at the end of the month in the evening sky. Near to Jupiter on 27 March.

Venus: Lovely evening planet. Close to Jupiter in the first week. Moon close on 23 and 24 March.

Mars: Declining evening planet. Still well presented but fading and shrinking. Mars is near the open cluster M35 on 30 March.

Jupiter: Evening planet near Venus early March, but poorly placed. Moon close on 22 March. Near Mercury on 27 March.



Venus and Jupiter have a close encounter at the start of March 2023, best seen as they approach the western horizon. Credit: Pete Lawrence

Saturn: Poorly located morning planet, unlikely to be seen this month, so not worth trying to view.

Uranus: Deteriorating evening planet, losing altitude throughout the month. Uranus is near Venus on 30 March.

Neptune: Too close to the Sun to be seen this month, so not worth trying to view.

(Continued on [page 18](#))

What's Up in Awards? March-April 2023 (continued)

The Planets... April 2023 via (BBC) Sky at Night Magazine

Mercury: Evening planet, best at the start and middle of April. Sets two hours after sunset on 11 April.

Venus: Brilliant evening object, setting four hours after sunset at month end. Near the Pleiades on 10 April.

Mars: Fading evening planet, 9 arcminutes from Mebsuta (Epsilon (ϵ) Geminorum) on 14 April. Small when seen with a telescope.

Jupiter: Jupiter is in conjunction with the Sun on 11 April and not visible this month.

Saturn: Saturn is a morning object, but it is not well-placed and is unlikely to be seen, so not worth trying to view.

Uranus: Poorly located evening planet. 4° from Mercury on 19 April but tricky to see.

Neptune: Neptune is a morning object but lost in the dawn twilight, so not worth trying 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

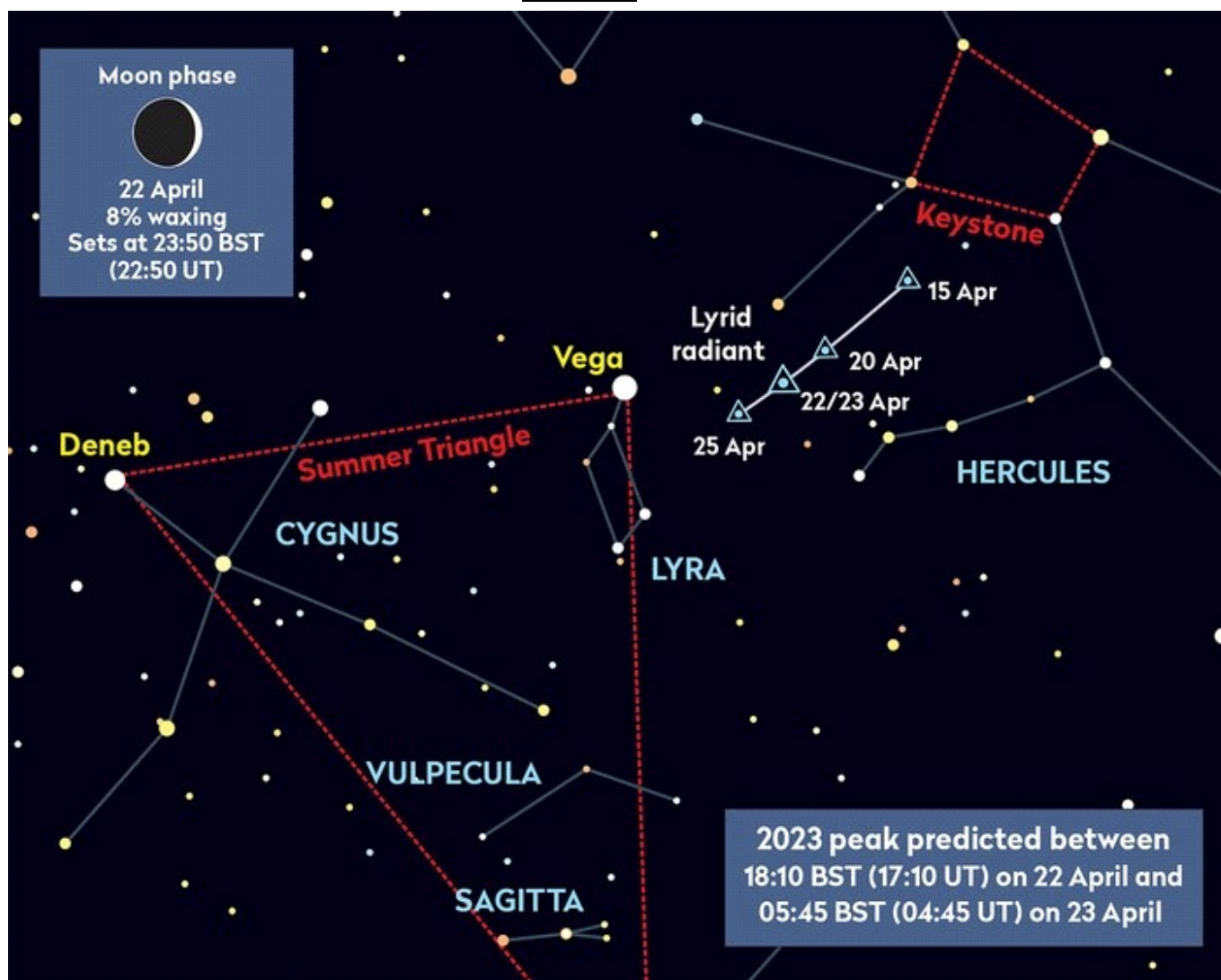
Lyrids

Status: Active from April 15th to April 29th

Peak Night: Apr 22-23 2023 (Moon 9% full.)



(Continued on [page 19](#))



With no major Moon interference, the 2023 Lyrid meteor shower peak on the night of 22/23 April is looking favourable. Credit: Pete Lawrence

What's Up in Awards? March-April 2023 (continued)

eta Aquariids

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

Astronomical League

Bernie Venasse (2023)
Sunspotters Observing Program
Hydrogen Alpha Solar Observing Program

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
– Bernie

“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.

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HAA Presents

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This article is distributed by NASA Night Sky Network (NSN).

Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Spot the Morning and Evening Star: Observe Venus

David Prosper

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

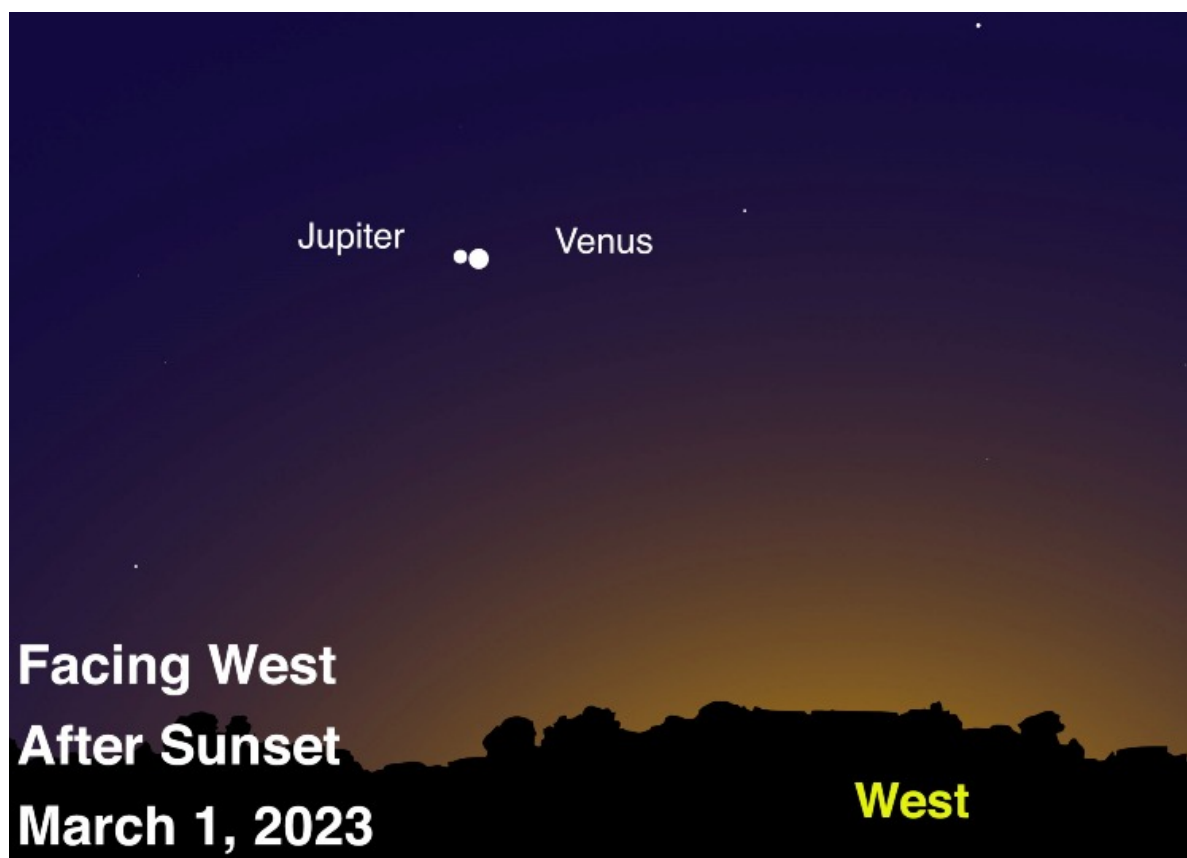
This rocky inner world’s orbit brings it closer to Earth than any of the other planets, and is the second closest to the Sun after Mercury. Like Mercury, Venus orbits between our planet and the Sun, so Earth-based observers can observe Venus in the morning before sunrise, or in the evening after sunset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

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

Venus’s thick sulfuric acid clouds block direct visual observations of its surface from optical telescopes on Earth. Multiwavelength observations from space probes show evidence of active volcanoes and possibly
(Continued on [page 21](#))

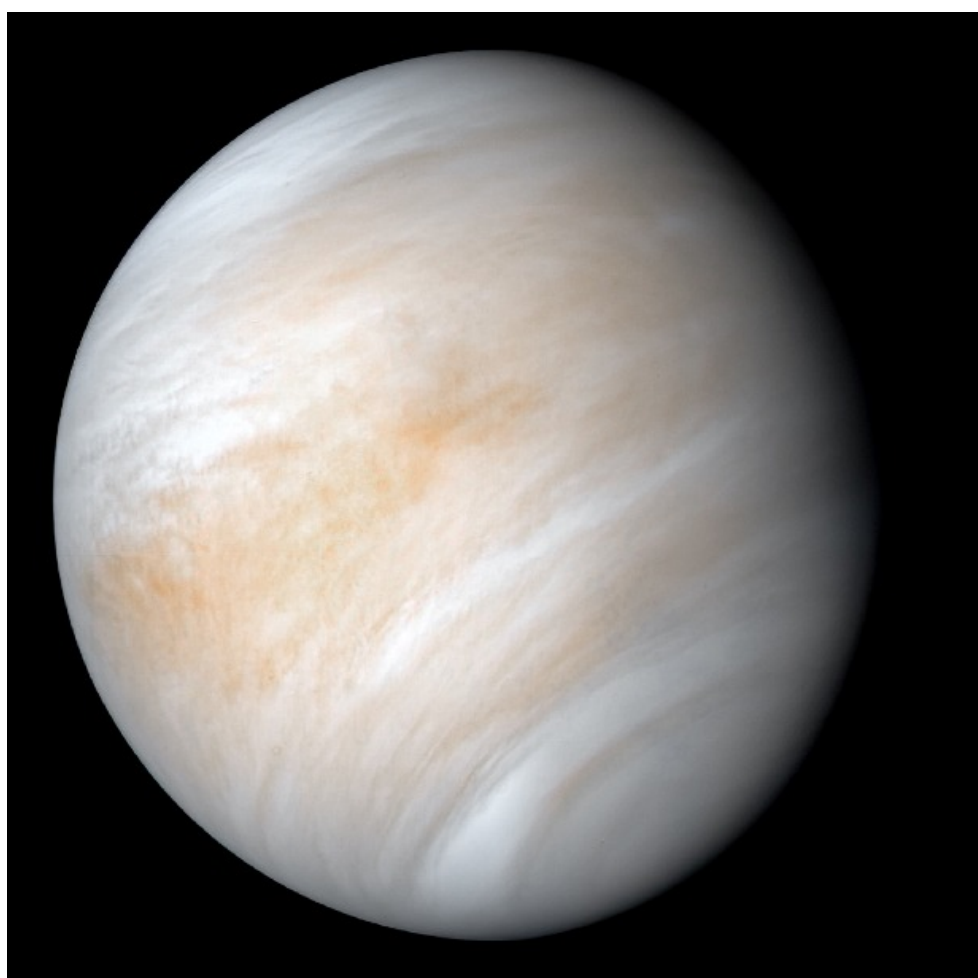
NASA Night Sky Notes (continued)

some sort of plate tectonics, but followup missions will be needed to confirm the presence of active volcanism, plate tectonics, and any possible signs of life. In order to do so, NASA is sending two new missions to Venus by the end of this decade: the orbiter **VERITAS**, which will map the surface in high detail and study the chemistry of its rocks and volcanoes, and **DAVINCI+**, which will study its atmosphere and possible tectonic surface features via a “descent sphere” that will plunge into Venus’s clouds. Follow their development and discover more about Venus at solarsystem.nasa.gov/venus, and of course, continue your exploration of the universe at nasa.gov.



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

Image created with assistance from Stellarium



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

Credit: NASA/JPL-Caltech

Source:

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



left:

**Mars and Comet C/2022 E3 ZTF,
by Matthew Mannering**

Taken February 11, 2023 from
Brantford, ON

below:

**Comet C/2022 E3 ZTF,
January 31, 2023,
by Chris White**





The Night Sky from Death Valley, by Jeff Parsons

Taken February 15, 2023 from near Furnace Creek, California, with his Google Pixel 4a smartphone.



The Flame and Horsehead Nebulas in Orion, by Andrew Brenyo



left:

**The Leo Triplet (M65,
M66 & NGC 3628),
by Pavle Culum**

Taken through a
SkyWatcher 80 ED scope
with an ASI533MC camera.

below:

**The Cave Nebula,
by Peter Wolsley**

Taken with an 8"
EdgeHD SC scope with
a QHY294C camera.



© Peter Wolsley



The Heart Nebula (IC 1805)

by Alex Kepic

Taken through an Explore Scientific ED102mm Triplet Essential scope with a ZWO ASI294MC Pro camera on a Celestron AVX mount. Exposures: 100 x 3 minutes; 300 minutes total.

The HAA Spring Telescope Clinic – February 18, 2023



Image Credit: Luke Meneok (all)

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— Dan Copeland



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 - **Mar 29: A Voyage with Voyager**
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www.physics.mcmaster.ca/planetarium

UPCOMING EVENTS

March 10, 2023 - 7:30 pm – H.A.A. Meeting at McMaster Innovation Park. Our speaker will be *Kerry-Ann Lecky Hepburn*, who will talk about Night Sky Photography Under Adverse Conditions. This will be a “hybrid” meeting, with the attendance option of in-person or online via [Facebook](#) and [Zoom](#).

April 14, 2023 - 7:30 pm – H.A.A. Meeting at McMaster Innovation Park.

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

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