



Event Horizon



Volume 30, Number 8
June 2023



From The Editor

This is our last E.H. before our Summer break, so this is the equivalent of a thick Sunday paper. This edition is very M101-themed, and includes images of M101's Supernova SN 2023ixf in the Eye Candy section!

*Bob Christmas,
Editor*

editor 'AT' amateurastronomy.org



Chair's Report by Bernie Venasse

Heading into the summer break I can only hope that the smokey skies depart and the seeing stays settled enough for decent viewing. Between now and our September meeting, there is a full list of scheduled events. Binbrook openings for celestial viewing as well as the Perseid event followed by our club picnic. There are also several outreach events featuring solar and celestial viewing. Mark your calendars now and have a great and safe summer!

(Continued on [page 2](#))

IN THIS ISSUE:

- HAA Explorers
- The Sky for Summer 2023
- What's Up in Awards? June-September 2023
- NASA Night Sky Notes
- Eye Candy
- Upcoming McCallion Planetarium Shows
- Upcoming Events
- Contact Information

Chair's Report (continued)

Inreach and Outreach events

Friday, June 9, 2023	MIP	Membership Meeting
Saturday, June 17, 2023	Binbrook	Observing
Saturday, June 24, 2023	Bayfront	Mixed Outreach
Sunday, June 25, 2023	Lakeland Pk	Solar Observing
Friday, July 14, 2023	Binbrook	Observing
Sunday, July 16, 2023	Lakeview	Solar Observing
Saturday, July 22, 2023	Grimsby	Mixed Outreach
Sunday, August 6, 2023	Lakeland Pk	Solar Observing
Friday, August 11, 2023	Binbrook	Outreach... Perseids (Fri) Public
Saturday, August 12, 2023	Binbrook	Outreach... Perseids Picnic
Saturday, August 19, 2023	Binbrook	Observing
Saturday, August 26, 2023	Bayfront	Mixed Outreach
Friday, September 8, 2023	MIP	Membership Meeting
Friday, September 15, 2023	Binbrook	Observing
Friday, September 22, 2023	Lakeland Pk	Astronomy Day- Mixed

Watch your Email for additions, notices, and changes!!

Our Previous Meeting

Our featured speaker for our May meeting was Alan Dyer. Alan brought advice on observing and photographing the solar eclipse. I will be spending a lot of time practicing and honing my photography skills.

Our May meeting was recorded and is available on YouTube:
www.youtube.com/results?search_query=hamilton+amateur+astronomers

Our next meeting

Our next meeting is scheduled for June 9, 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.

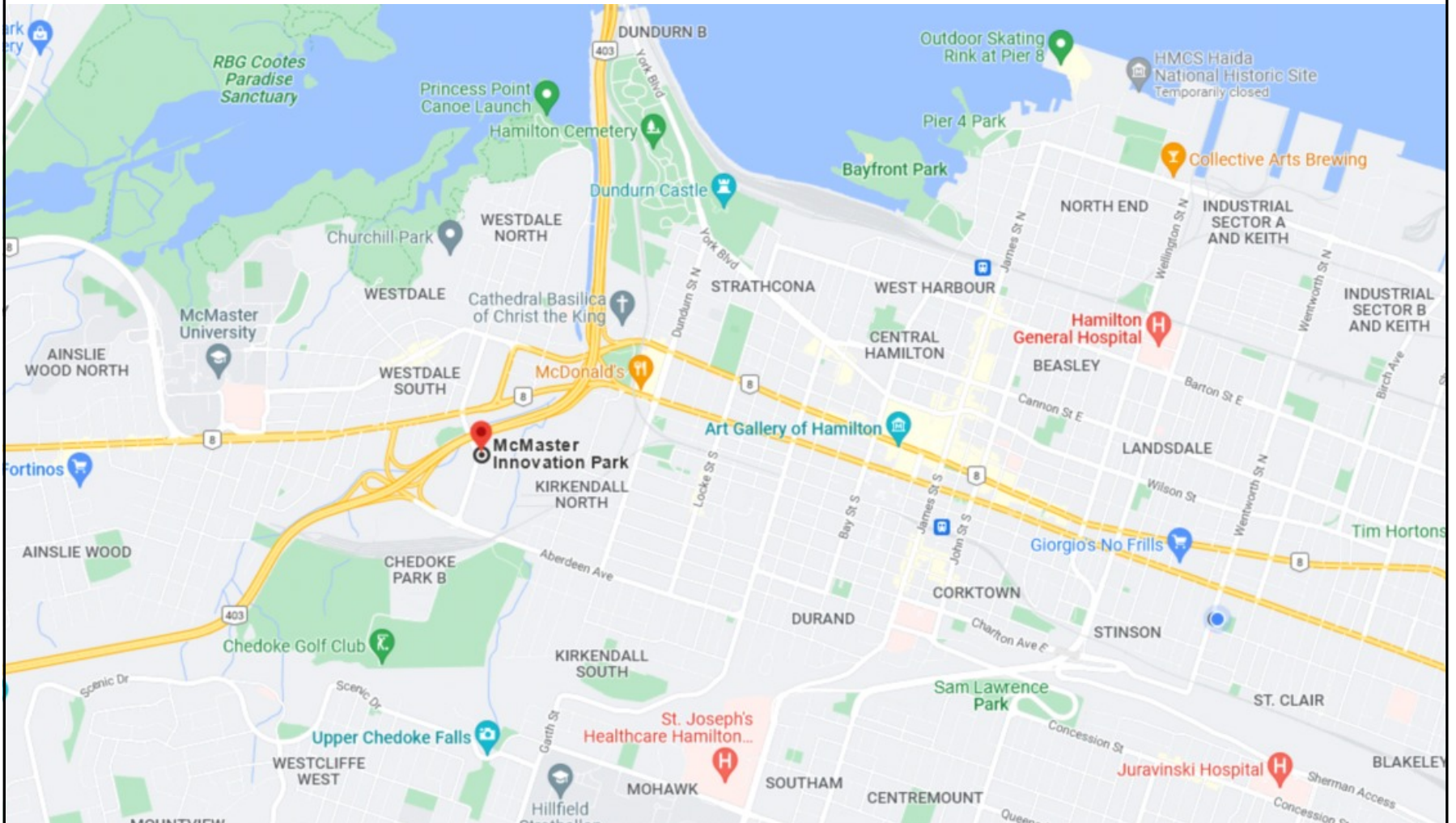
(Continued on [page 3](#))

Masthead Photo: *The Pinwheel Galaxy (M101), by Pavle Culum.*

Taken with a Sky-Watcher Starlux 190MN on the EQ6r mount. 8 hours total integration time.

See images of Supernova SN 2023ixf in M101 taken by HAA Members on page 28.

Chair's Report (continued)



Our featured speaker for our next meeting is *Dr. John Percy*, Professor Emeritus, University of Toronto.

His topic: Variable Stars...

Title: Variable Stars, the AAVSO, and You

Summary: *"Variable stars are those stars which change in brightness, which most do -- they are "action in the sky". In this presentation, I will give an overview of variable stars, and how skilled amateur astronomers contribute to their understanding -- especially through the American Association of Variable Star Observers (AAVSO). You can, too! I will also briefly describe my current research projects which make use of AAVSO data."*

Bring your notepads for this one!!

Membership growth...

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'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

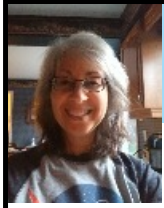
The HAA executive has created a policy for any HAA member who wishes to do outreach presentations to vulnerable sectors, which includes children under 18 years of age and vulnerable adults. This does not include our general club outreach activities.

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 Neptune...this month we're going to explore what used to be a planet and is now a dwarf planet instead...Pluto! Let's Go!

Pretty Pluto!

The first time humans could see Pluto up close was *only 8 years ago* in 2015. And it was actually the New Horizons spacecraft that took photos. A distinct heart-shaped marking was seen and can easily be seen in the photo below. It is named Tombaugh Regio after the astronomer Clyde Tombaugh, who discovered Pluto in 1930. That's where the story begins...



One of the final images taken before New Horizons made its closest approach to Pluto on 14 July 2015.

Image Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

At that time, planet Pluto was named by an 11-year-old girl named Venetia Burney in a planet-naming contest. She named it after the Roman God of the underworld, not after the popular Disney character! Pluto existed as a planet for 76 years, until 2006 when things changed. As astronomers had better equipment to let them see further away, they began discovering other smallish objects in the same area as Pluto. This area is known as the Kuiper Belt.

Because of these findings, astronomers created 3 new criteria to define a planet:

1. They needed to be round in shape, which would be caused by their own gravity ✓
2. They needed to orbit the Sun ✓
3. They needed to be large enough to clear their own path x This is where Pluto no longer fit the description of a planet as it was surrounded by other similar objects.

(Continued on [page 6](#))

HAA Explorers (continued)

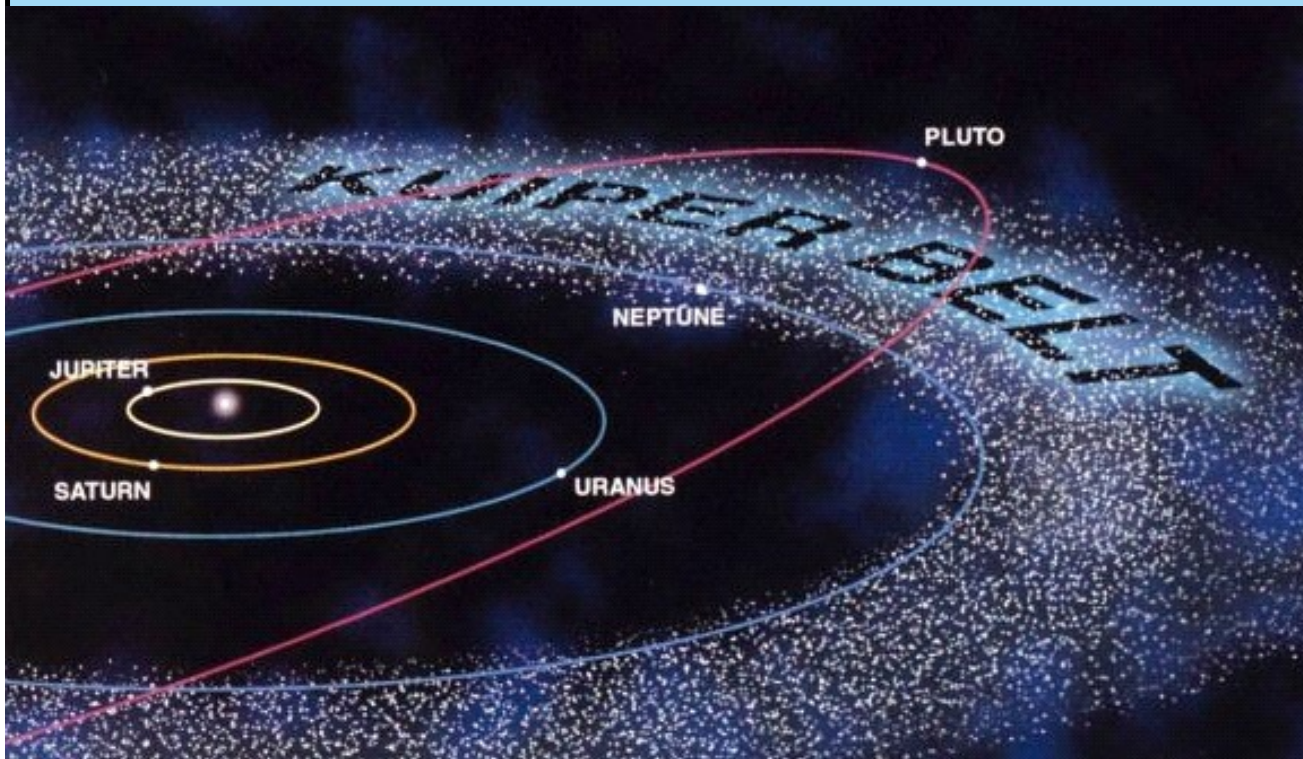


Image Credit:

Phys.org

So, in 2006, the International Astronomical Union labeled Pluto as a dwarf-planet. This was (and still is) a controversial decision for many!

So, what do we know about Pluto? It takes 248 Earth years to orbit the Sun once. It hasn't even gone around the Sun once since it was discovered in 1930. It is 5.9 billion kms (3.7 billion miles) away from the Sun. And it takes 6.5 Earth days to spin once on its axis. Pluto's orbit around the Sun is oval-shaped which brings it closer to the Sun than Neptune during part of its orbit! And Pluto is not on the same plane as the other planets and rises above the ecliptic by 17 degrees.

Pluto is actually smaller than Earth's moon at 2,300 kms (1,400 miles) across. It's just a little smaller than the United States! Pluto is believed to have a rocky core with a water-ice ocean above it. It has an icy crust with mountains and deep valleys and craters.

Pluto has 5 moons which were created when Pluto collided with another body billions of years ago. The largest of these moons is Charon. What's interesting about Charon is that it does not orbit around Pluto! They actually both orbit together around a point in space and are known as a binary (2-part) dwarf-planet system. Pluto is definitely a beautiful, unique dwarf-planet!

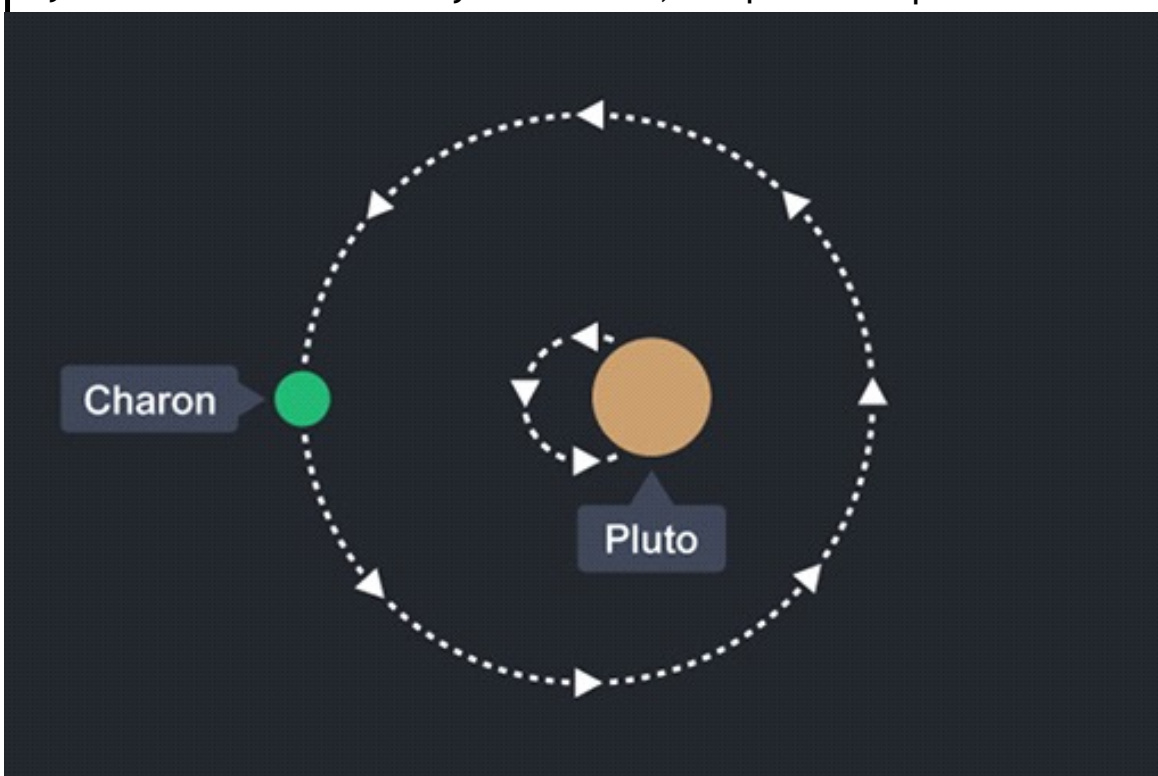


Image Credit:

The Open University

(Continued on [page 7](#))

Finding Pluto!

O	N	O	E	I	C	W	T	C	H	A	R	O	N
B	O	A	V	W	O	I	O	L	T	Y	A	E	A
P	R	N	N	E	N	R	M	H	E	R	Y	T	I
I	A	V	E	E	T	C	B	D	N	A	I	O	T
P	E	R	W	C	R	K	A	L	A	N	V	T	E
M	N	P	H	L	O	U	U	R	L	I	S	U	N
B	U	Y	O	I	V	I	G	O	P	B	M	T	E
T	T	Y	R	P	E	P	H	W	F	A	N	I	V
E	P	T	I	T	R	E	E	R	R	U	E	B	E
E	E	I	Z	I	S	R	C	E	A	O	Y	R	O
D	N	V	O	C	I	B	K	D	W	C	S	O	T
Y	I	A	N	E	A	E	R	N	D	Y	V	E	U
L	R	R	P	L	L	L	L	U	R	R	R	E	L
C	R	G	O	E	N	T	R	C	T	W	U	B	P

- VENETIA
- NEPTUNE
- CONTROVERSIAL
- TOMBAUGH
- CLYDE
- DWARF PLANET
- NEW HORIZON
- GRAVITY
- UNDERWORLD
- ECLIPTIC
- KUIPER BELT
- BINARY
- PLUTO
- ORBIT
- SUN
- CHARON

© TheWordSearch.com

Answers on page 9.

Things to do until next time **:

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

1. Visit *this website* to learn LOTS more about Pluto and to see how its size compares to the United States: <https://spaceplace.nasa.gov/ice-dwarf/en/>
2. Visit *this website* to learn more about dwarf planets: https://www.youtube.com/watch?v=flp4Ay1_-ml
3. Visit *this website* to read a fun info sheet about dwarf planets including Pluto: https://spaceplace.nasa.gov/review/posters/stardust/dwarf_planets_fun_sheet

(Continued on [page 8](#))

HAA Explorers (continued)

During June, check out:

1. On June 11th around 10:00 pm, check out Venus and Mars in the Western sky:

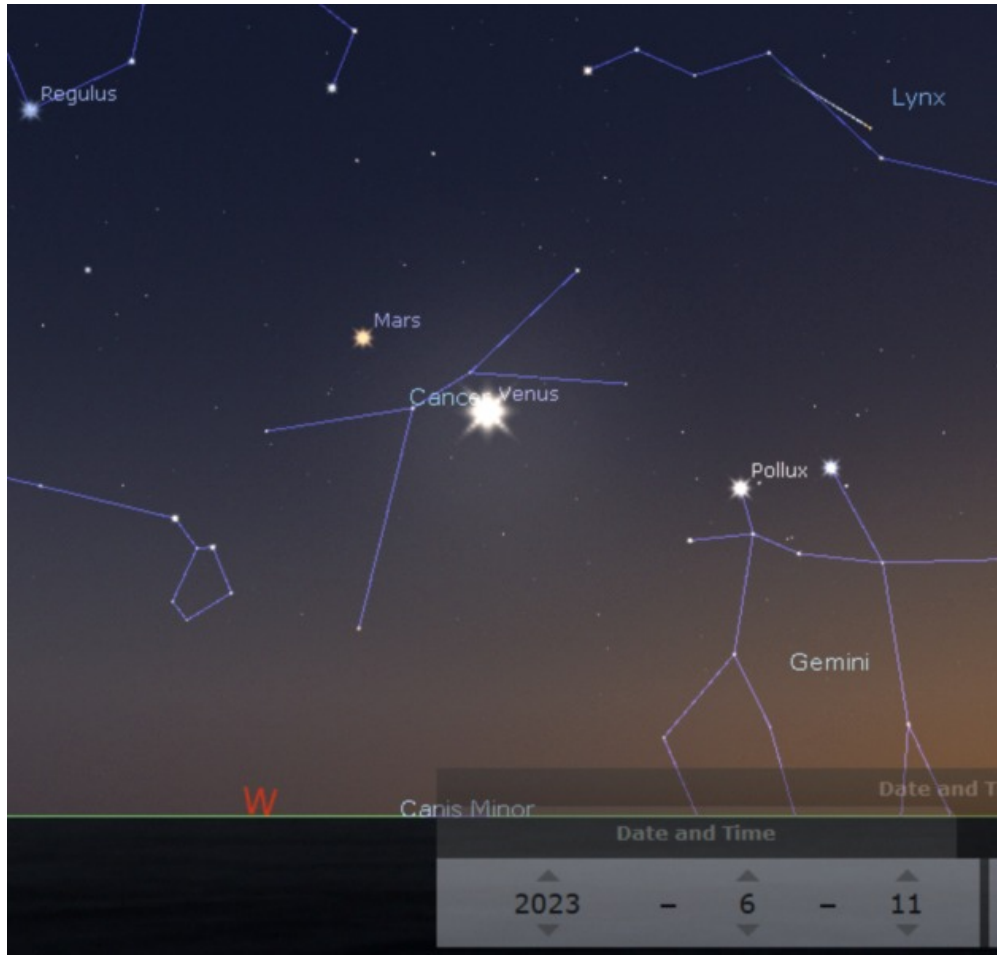


Image generated using Stellarium

2. On June 22nd around 10:00 pm, see the thin Crescent Moon, Mars and Venus all in a row:



Image generated using Stellarium

(Continued on [page 9](#))

HAA Explorers (continued)

Finally:

Why did Mickey Mouse go to outer space?

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

Answer: 😊 To find Pluto!!

Thank you to Ro for reviewing this article! 😊

References:

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 Word Search Answers:

O	N	O	E	I	C	W	T	C	H	A	R	O	N
B	O	A	V	W	O	I	O	L	T	Y	A	E	A
P	R	N	N	E	N	R	M	H	E	R	Y	T	I
I	A	V	E	E	T	C	B	D	N	A	I	O	T
P	E	R	W	C	R	K	A	L	A	N	V	T	E
M	N	P	H	L	O	U	U	R	L	I	S	U	N
B	U	Y	O	I	V	I	G	O	P	B	M	T	E
T	T	Y	R	P	E	P	H	W	F	A	N	I	V
E	P	T	I	T	R	E	E	R	R	U	E	B	E
E	E	I	Z	I	S	R	C	E	A	O	Y	R	O
D	N	V	O	C	I	B	K	D	W	C	S	O	T
Y	I	A	N	E	A	E	R	N	D	Y	V	E	U
L	R	R	P	L	L	L	L	U	R	R	R	E	L
C	R	G	O	E	N	T	R	C	T	W	U	B	P

© TheWordSearch.com



The Sky for Summer 2023 by Steve Germann

The summer season is almost here. Astronomy is amazing, but just remember... don't look down!

As your observing director, I have 3 roles. One is to try to make sure everyone has seen the interesting 'same' things, so we can compare our observations and impressions. The second is to find and promote the interesting things to see. Third, and not least important, is to ensure that everyone has the best chance to enjoy astronomy. That means being configured for success, and enjoying the process.

With summer almost here, already we have warm nights, the summer constellations, especially near the galactic center, annual events such as the Perseids meteor shower, and opportunities for picnics and observing nights.

With all that great stuff, come mosquitos, humidity and dew, and shorter nights, but at least you get plenty of time after dinner to get ready to observe.

Let's consider all those things, one at a time, starting with the good stuff.

Warm Weather

Warm evenings and nights offer benefits, and challenges.

First, less bundling up for observing, shorter cool-down times for the scopes, no snow on the ground, actual grass instead of gravel or mud, and an easier chance to convince a friend to come with you. It's easier to get a clear sky, and more convenient to wait for a clearing if the weather is nice.

Here's an easy question... do all your friends know you are a member of the HAA and that you have access to the wealth of knowledge and resources the club has to offer?

Do they all know there is an eclipse coming next year? I hope so. Casual conversation about astronomy can help you find astronomers among your acquaintances.

What you don't see

The summer constellations are dear to me, in part because I have always been a late-night owl, and have enjoyed Sagittarius' inevitable rise late or later at night. The familiar view of a steaming teapot always gives me a smile.

Now that those constellations are prominent in the evening sky, we should take the chance to observe them. Since in June the nights are getting to their shortest, which might mean adjusting our evening target list to include more carbon, variable and double stars, which can be found in deep twilight, and less of the faint constellations.

The direction of the galactic center (which is in Sagittarius) has a lot of dust clouds too, so that on average we see only about 30 percent to the center from here, before looking deeper is blocked by dust.

Infra-red light can pass through dust, and the James Webb Space Telescope can see through them, as can other IR telescopes and surveys. So when you see a field of stars against a dark background, it's not the infinite blackness of distant space, it's a dust cloud.

Speaking of which, you can find something new by looking for dark nebulae. It's what you don't see that counts. Edward Emerson Barnard made a famous collection of dark nebulae, many with descriptive names like 'the coal sack'. From Hamilton Ontario, some of these dark nebulae can be seen.

(Continued on [page 11](#))

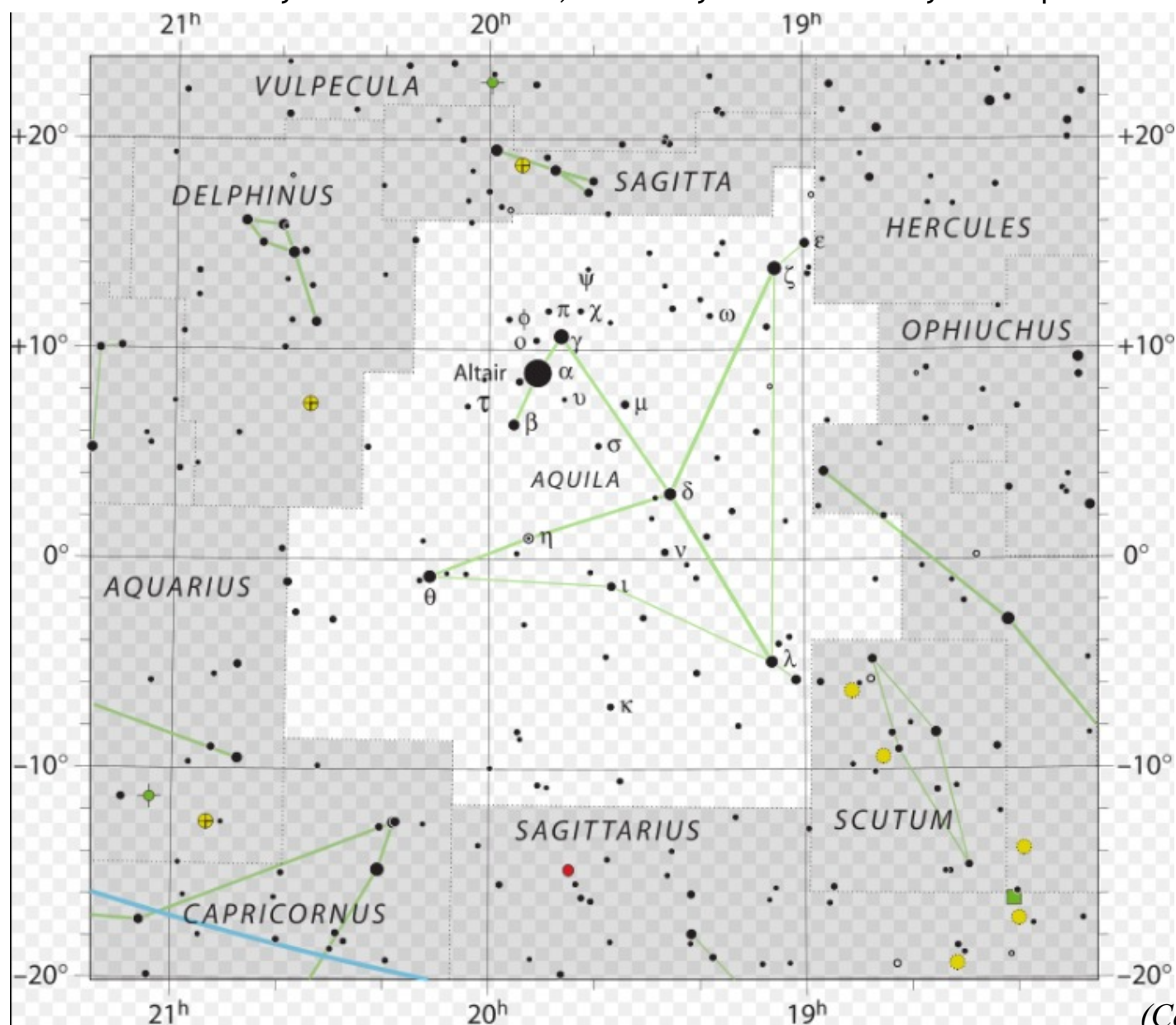
The Sky for Summer 2023 (continued)



*E or Barnard's E Nebula
B142 and B143*

*Image Credit:
Newholooks/Hunter Wilson*

Try using binoculars to find Barnard's famous E cloud, in Aquila, not far from Altair, just above and to the right of it. Here's a chart. Aquila will be well placed all summer. Page 319 of the 2023 RASC Observer's Handbook lists many more dark nebulae, ranked by ease of visibility and impressiveness.



IAU Aquila Chart

*Credit:
IAU and Sky & Telescope
magazine/Roger
Sinnott & Rick
Fienberg*

(Continued on [page 12](#))

The Sky for Summer 2023 (continued)

Consider how many stars are in the sky if we could see them without intervening dust. The Milky Way, in round numbers, has about a trillion stars, many of course are distant and invisible to our eyes but not our cameras. There are about 500,000 square degrees on a sphere, and if apportioning those stars evenly there would be about 2 million per square degree. There are 12,960,000 square arcseconds in a square degree, meaning about 1 star per 12 square arcseconds. In a 12 inch or larger telescope, in good seeing, stars appear to be about 1 arcsecond in size.

Stars are not evenly distributed, but in fact from our vantage point, way more stars are towards the center than the edge... probably 100x more and hence the Milky Way eventually resolves to a solid milky white, instead of many stars. Interstellar thin dust clouds also disperse the light, taking away the lumps.

It is important to note here that while the star appears to be about a square arcsecond in area, the real area is millions of times smaller, even for the biggest brightest stars, measured as a fraction of a milli-arc second, so that's why the Milky Way does not look as bright as the surface of the Sun.

The Milky Way galaxy is literally everywhere we look, but the most uniformly milky parts are where our view is not obscured by dark nebulae.

Meteor Showers

A meteor shower in the summer is a special thing. It is the best opportunity you will get to convince a (new or longtime) friend to come with you. Usually the best meteors wait until about midnight, when the Earth turns towards the radiant, but each shower has a time when the radiant has risen above the horizon and meteors will start to be detectable. The *Perseids* have a radiant above the horizon throughout the night hours, so that's good, and it just gets better.

The peak is at 4 AM EDT on August 13. That is a Saturday night in the summer, and Sunday morning. This is the best set-up for the Perseids we will have for years.

The Moon will only be 8 percent lit and waning, and it won't impact the observing at all. These meteors are fast, at 60 km/s relative to the atmosphere, second in rank only to the fragments of Halley's comet we see in October and May.

The HAA will have a member's picnic and observing on Saturday, August 12 as well as a public night on Friday, August 11 at the park. Both events are worth attending, and you can help with some of the runaround for the public night too. It's easy and fun.

You don't need a telescope for a meteor shower. Even if you have one, it is best not to bring it, unless you are specifically intending to do 'outreach' because, no matter how fast you are, by the time you hear the cheers for a great meteor passing by, you won't be able to get your eyes from the eyepiece to the sky in time to know what the fuss was about.

When it comes to meteor observing, Murphy's Law applies. Just don't look down.

Outdoor Club Events

In terms of picnic opportunities, as mentioned, the HAA will be having a summer picnic and observing day, at the Binbrook Conservation Area, and it will be possible for us to see what happens in the daytime there. Our picnic will be during the Perseids, so you will have a good chance of seeing a shooting star in the evening.

The first shooting star I see, I plan to wish for clear skies on April 8 2024.

(Continued on [page 13](#))

The Sky for Summer 2023 (continued)

Mitigation

Now let's consider the downside of summer observing, and how to mitigate it.

First the mosquitos... be sure you use a heavy telescope, or the mosquitos might carry it away. An eagle can carry up to 4 pounds, (not the weight of a lamb) but a swarm of mosquitos can cause a telescope to be carried to a car, very quickly, unless you have taken precautions. (This is a case where a heavier telescope can inspire you to remain steadfast and observe anyways.) I have a mosquito net hat, and have been admonished to never wear it anywhere, by my fashion advisor. It unfortunately interferes with looking through the eyepiece.

The tricky thing about repellents is you need to ensure you don't put any on your fingers, and that you spray it far away and downwind of all observers, or at home before you come. Try putting it on a cloth and wiping it on. I am not so suspicious of artificial chemicals... they are mostly tested, but be advised that DEET dissolves plastic and optical coatings. So none on the face or inside of the hands, I guess, is the best advice I can give.

Of course, you can wear lots of clothing to prevent attack, or get some lotion to mitigate the bites after the session is over. Mosquito bites cause itching and swelling due to an immune response. I have noticed over the years that if I don't scratch them, they are not a concern after a couple of hours, on me. Your mileage may vary.

Efforts to not notice the itch are greatly aided by having a lot of distractions. Looking for galaxies is a good distraction. Try taking binoculars and observing the *Andromeda Galaxy*, and when you have found it, put them away and try to make it out in the sky without them.

Here's a chart showing how I find the great square of Pegasus, then work my way towards Cassiopeia and follow the pointer stars, straight to the left from the top left star in the square, and then turn right one star hop, then the same distance to Andromeda's core.



The great square is actually pretty easy to find. Cassiopeia is also easy to find.

This is from <https://www.space.com/7426-starhopping-101-find-andromeda-galaxy.html>. See it for more details.

The Andromeda Galaxy is huge (and coming this way). It will be fabulously arduous to stop it from getting all mixed up in the Milky Way. That's not for a while, so best to observe it while it's still a pretty spiral galaxy. If you can see the core without optics (okay, glasses are allowed, they are 1x magnifiers) then you have

Starhopping guide to the Andromeda Galaxy. Image credit: Starry Night Software (Continued on [page 14](#))

The Sky for Summer 2023 (continued)

seen with your own eyes, something 2 million light years away. That's the farthest thing people can see without fancy glass or cameras.

Dew Control and Humidity

All air on Earth has some water vapour content. At some low temperature, the water will condense out of the air, as the air's ability to hold water decreases with decreasing temperature. The temperature where the humidity reaches 100 percent is the 'dew point'. Before there is fog, there will be condensation on cold surfaces that are below the dew point temperature.

Space is cold. Really cold, like less than 3 degrees above absolute zero. So surfaces exposed to space under a clear sky rapidly lose heat, and therefore will be warmed only by nearby (optically thin) air, which means condensation is a distinct possibility. There are 2 ways to counteract this. One way is with a dew shield. It will provide that most directions, the optics are exposed to a heat source close to air temperature, and only the small fraction of the sky straight ahead is cold. When it comes to a small spot of cold and a lot of warm, the warm will dominate and keep your optics near the air temperature. That still might not be enough to keep them above the dew point, and for that you will need a heat source. Electric dew heaters, or hand warmers, can be attached near the optics, and their gentle heat will be enough to keep the temperature a couple of degrees warmer than the dew point.

Dew is the bane of astronomers. It's best prevented. Iron based hand warmers, held to the telescope near the primary, and near the eyepieces, work wonders and last for 'up to' 8 hours, which is still pretty long. Electric dew heaters by Kendrik are the best I have seen. I have a 4 channel dimmer for my heaters, so they don't drain the battery so much when not needed at full power. There are dew straps you can wrap around the scope too. The slight thermal gradient it causes is vastly outplayed by the increase in visibility due to no dew, and the increased peace of mind knowing the dew is not coming for you. In a pinch you can start your car, let it warm up, and use the heater to re-warm your equipment, or even use a 12 volt window defog dryer to clear dew.

Prevention.. most ideal.

The shorter nights are accompanied by longer twilight periods. Although we usually insist on astronomical twilight being over when the Sun is 18 degrees below the horizon, there are things to see before that. All the planets, the Moon, and many brighter stars, are fully visible during nautical and astronomical twilight. However, after a night of observing under the darkest skies, when the sky begins to brighten for astronomical twilight, I am usually all too happy to put covers on the scopes and pop into bed. But not before!

Late Sunset

The time spent preparing for observing is the most productive. For starters, during daytime preparation, you won't care if there are clouds or even moonlight.

Having a plan for the evening, of what type and what you would like to see, really makes a difference in your ultimate satisfaction.

Also the full Moon will rise before the Sun sets.

Armchair Astronomy

Speaking of the full Moon, there is a BLUE SUPERMOON in August.

(Continued on [page 15](#))

The Sky for Summer 2023 (continued)

That is not happening again for many many years. Do you really want to wait for 2054? I didn't think so.

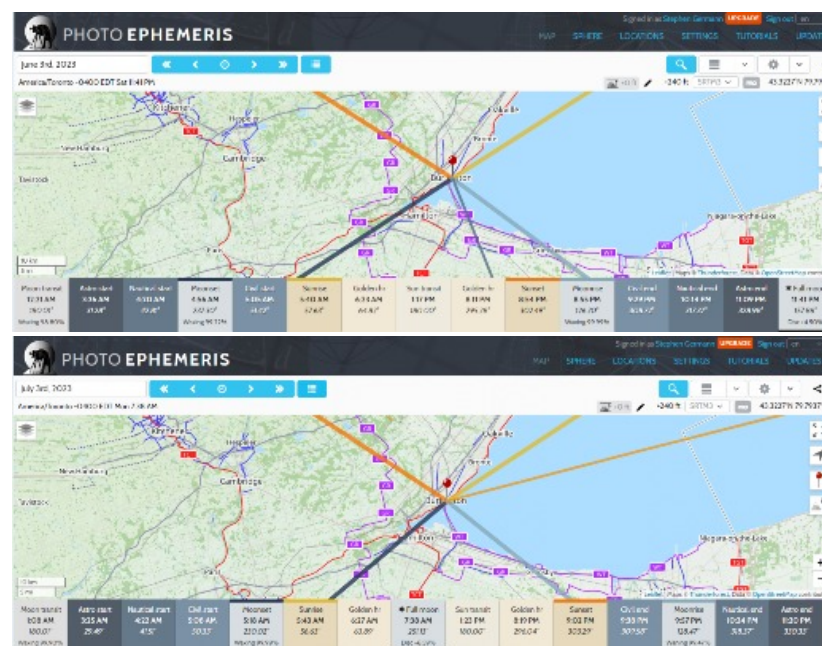
So that is our armchair challenge. Here's the twist... invite as many friends as you can to also watch for the Moon on that day. To be fair, you should start practicing already.

June 3 is our Moonrise for June. Then one in July and 2 in August, the second one being the Super Moon (closest full moon of the year).

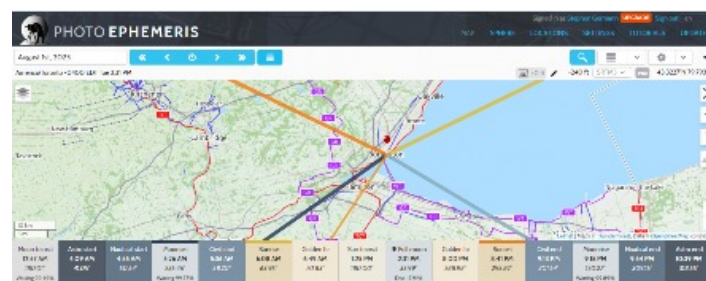
For June 3, the Sun sets 1 minute before moonrise.

(These charts were generated using the Photographer's Ephemeris web site <https://photoephemeris.com/>).

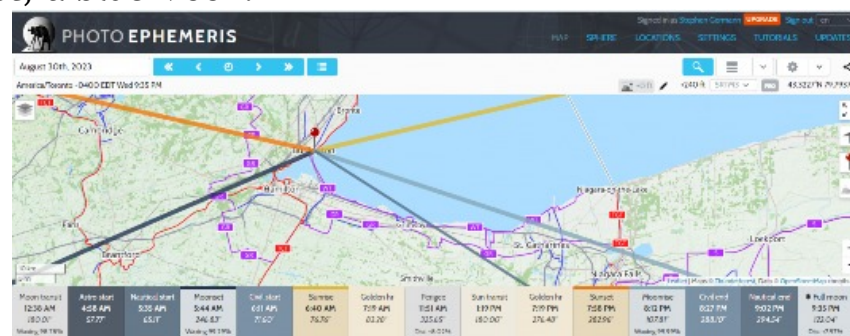
For July 3, the geometry is similar.



And then for August, the dates are August 1, 2:31 PM, comfortably in August (in no part of the world does the Moon rise in July).



And August 30th, 9:35 PM, comfortably within August, a blue Moon:



Notice that I have used the Burlington pier as observing point for these 4 moonrises. It is the only place the Moon can rise over water for these 4 moonrises, since in the summer, the Sun rises in the north and the Moon rises in the south. Contrast this with the winter when the Moon rises so far north it is hard to find a good place to see it rise over the lake.

I hope I have instilled some enthusiasm and demonstrated the potential for enjoyment at astronomical levels (and distances), and that you will have the clear skies and time availability to enhance your enjoyment. Once you have enjoyment taken care of, you can 'work' on the finer points of observing, which includes keeping track of what you see and when, and planning what to look for and see in the first place.

Start simple, but be advised that the more you write about (and sketch) what you see, the more you will cherish the memories you make while observing.

Don't forget, don't look down! It only gets better.



Contents:

What's up in awards?

Rising Star Program: June-September

Pathways Observing Program targets... June-September

Messier Observing Program: June-September... 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

June

Constellations: Bootes, Corona Borealis, Hercules

Stars: Arcturus

Double Stars: Zuben el Genubi

Object Pairs: NGC 5024, NGC 5053

Messier objects: M8

July

Constellations: Corona Borealis, Hercules, Lyra, Scorpius, Ophiuchus

Stars: Antares

Double Stars: delta Bootis

Object Pairs: NGC 5676/IC 1029

Messier objects: M4, M6, M7, M8, M13

August

Constellations: Lyra, Cygnus, Aquila, Sagittarius

Stars: Altair, Vega

Double Stars: epsilon-1,-2, Lyrae

Object Pairs: NGC 6475/Cr 355

Messier objects: M11, M57

September

Constellations: Cepheus

Stars: Deneb

Double Stars: Albireo, 61 Cygni

Object Pairs: NGC 6939/NGC 6946

Messier objects: M15

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.

(Continued on [page 17](#))

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

Group B

Observable in July-August-September.

Summer Constellations: Find, observe, sketch: *Hercules, Cepheus, Scorpius.*

Stars: Find, observe, sketch: *Altair, Vega, Antares.*

Asterisms: Find, observe, sketch: *Dragon Head, Hercules Keystone. Summer Triangle.*

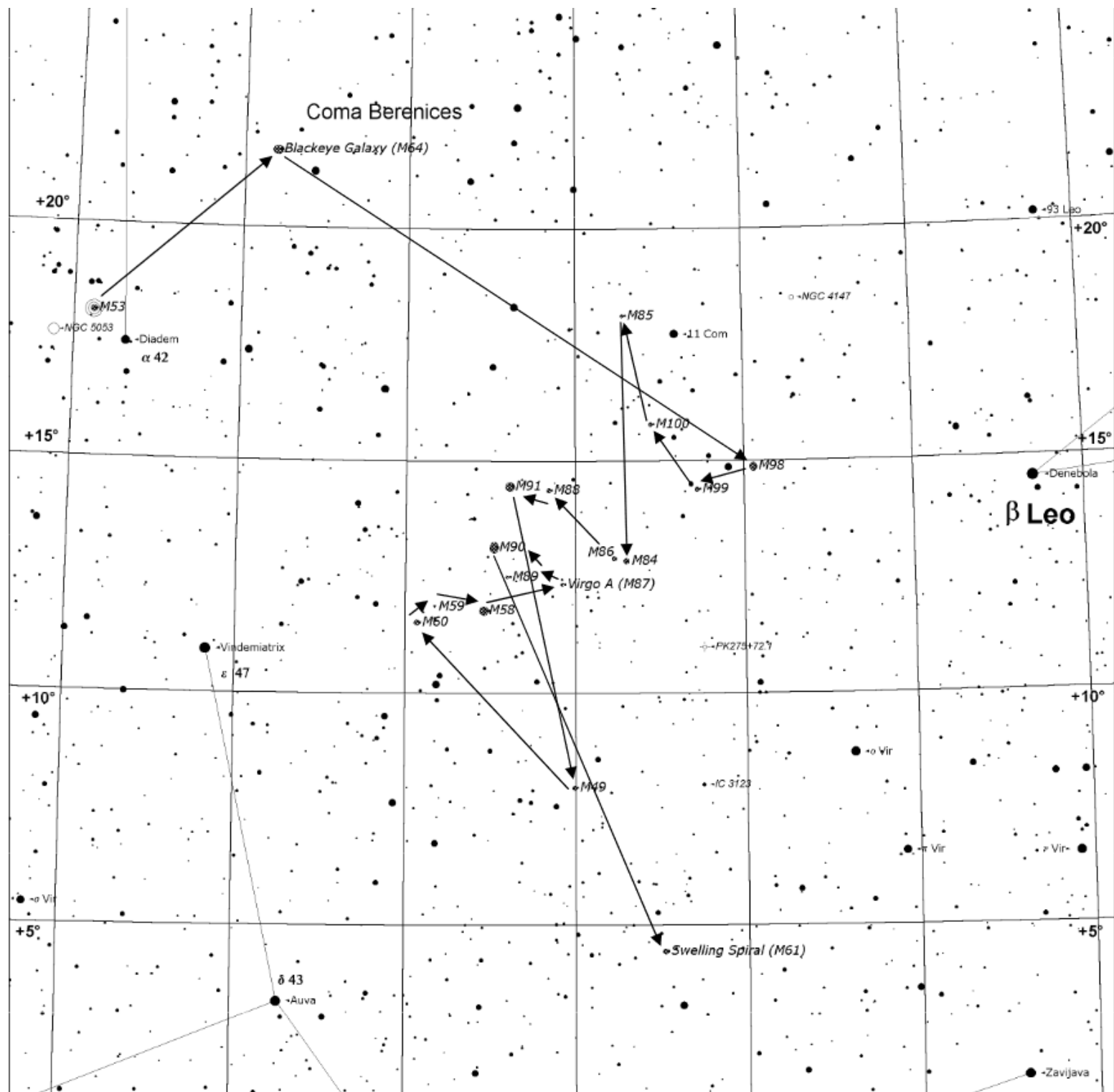
Planet: Any one planet that is remaining in the list.

HAA Messier Objects Observing Award

June Messier advice (from [seds.org](http://www.seds.org) <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.

(Continued on [page 18](#))



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

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, 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.

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.

(Continued on [page 19](#))

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

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.

July Messier targets

M3 This globular cluster in Canes Venatici is one of the brightest objects in the sky. In binoculars this object is definitely not star-like, but more like a bright, small snowball. Easy to see. Small telescopes will begin to resolve M3 into individual stars. The hardest part of this object is locating it in a portion of sky that contains few bright landmarks.

M53 This is another globular cluster in Canes Venatici. While not quite as big or bright as M3 it is still an obvious binocular object. Resolvable in smaller telescopes, it is an easy object to find sharing the same low power telescope field as fifth magnitude Alpha Coma Berenices.

M5 A big, bright globular cluster located in Serpens Caput. M5 is as nice as M3 but lies near a fifth magnitude naked eye star (5 Serpentis) making it an easy object to find.

M68 An eighth magnitude globular cluster in Hydra, M68 is a difficult binocular object for Northern observers. It appears as a faint fuzz-spot in binoculars. You may need to use averted vision or large binoculars to find this one. Appearing as a round fuzzy patch in an 8" telescope, you will need a much larger aperture to really resolve it.

M83 A face-on spiral in Hydra. M83 is fairly easy in binoculars as a faint, fuzzy, patch of light. In a telescope look for a large patch of light with a bright center.

M4 A big, bright, globular in Scorpius. Easily located near Antares. This is an easy binocular object appearing as a round snowball. Partially resolvable in a telescope, the identifying feature of this globular is a line of bright stars crossing the center.

M80 This is the smallest and faintest globular cluster this month. Located in Scorpius, M80 is a very tough binocular object appearing as a faint star with slight fuzziness around the edges. This is confirmed with a telescope, M80 has a bright central condensation in the middle of faint fuzz. It is one of the Messier objects that even through a medium telescope still looks like a comet.

August Messier targets

M10, M12 This pair of globular clusters in the middle of Ophiuchus are easily swept up in binoculars. Through an 8" telescope M12 is well resolved while M10 is slightly more fuzzy looking. Both become very bright towards the center.

M107 A small, fairly faint globular cluster in Ophiuchus. It is a tough binocular object, appearing as a very small faint patch of light possibly requiring averted vision. In a telescope, M107 is a larger and brighter fuzzy patch of light than what can be seen in binoculars.

M9 Another small, relatively faint globular cluster in Ophiuchus. M9 is very similar to M107, only slightly brighter. Another tough, but possible binocular object.

M19, M62 Another pair of globular clusters in Ophiuchus separated by about four degrees. Fairly easy to find in binoculars, they are smaller than M10 and M12 thus not quite as obvious. These clusters are not resolvable through small scopes, and appear as round fuzzy patches brightening towards the center. M19 is slightly brighter than M62.

(Continued on [page 20](#))

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

- M6, M7** This is a pair of large, bright open clusters in Scorpius visible to the naked eye. Binoculars provide the best view of these clusters. Both are completely resolvable in 10x50 binoculars and can be fit into the same field of view. M7 is the larger and brighter of the pair.
- M8** This is a bright emission nebula in Sagittarius, easily visible to the naked eye. The common name of M8 is the Lagoon nebula. In binoculars M8 is an oval cloud of light larger than the full moon with several bright stars embedded within it. A telescope makes this nebula larger and brighter but does not really improve the view.
- M20** Another diffuse nebula in Sagittarius only 1.4 degrees northwest of M8 and is called the Trifid nebula. This is easily seen in binoculars looking like a cloud of smoke around some bright stars. A view through a telescope appears much the same, although try to pick out the three dust lanes that gives M20 its name. This is a somewhat difficult object to see right away, at first glance it looks like the optics are in need of cleaning and are causing the light from the bright stars to "smear".
- M21** This is a small, but bright open cluster in Sagittarius right next to M20. Binoculars show a very small bright patch partially resolvable. Small telescopes easily resolve all of the clusters members. M8, M20, and M21 are all within the same binocular field and lie in a very rich region of the Milky Way. This view is one of the finest to be found.
- M23** This is a large open cluster in Sagittarius. Through binoculars M23 is a large, hazy patch of light almost the size of the full moon. A telescope at low powers easily resolves this cluster among a rich background of other stars.

September Messier targets

- M13** The great globular cluster in Hercules is bright enough to be seen with naked eye. Binoculars easily show this cluster as a bright fuzzy ball. M13 is partially resolvable in small aperture telescopes and becomes a fantastic swarm of tightly packed individual stars through larger scopes.
- M92** Another globular cluster in Hercules, M92 is easy to find in binoculars appearing slightly dimmer and smaller than M13. As with M13 it is partially resolvable in small scopes and is a fine sight in large instruments.
- M14** A small, bright globular cluster in Ophiuchus. It is a difficult binocular object, look for a small fuzzy patch of light. Through a telescope M14 is an even patch of light, the stars not resolvable except through large scopes.
- M22** This is the other great globular in our tour this month. Located just above the Teapot asterism in Sagittarius, M22 can be seen with no optical aid. M22 is easy to find in binoculars, and easy to resolve in telescopes, with about the same impressiveness as M13.
- M28** Located near M22 in Sagittarius, this is a small bright globular. A tough binocular object, look for a small fuzzy patch. Easily seen in a telescope, but requires large apertures to resolve individual stars.
- M69, M70, M54** All of these are small bright globular clusters laying along the bottom of the teapot in Sagittarius. Very similar in appearance to M28, these are all tough binocular objects requiring dark skies and possibly averted vision to see. M54 is slightly brighter and appears more star-like through binoculars than the other globulars. These are all easily seen in telescopes, though not easily resolvable.

(Continued on [page 21](#))

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

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)

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°) 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.

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

- All month: Noctilucent cloud display season continues.
- Ninth magnitude Comet C/2020 V2 ZTF favourable.
- 12 July: Early morning Jupiter near the Moon
- 13 July: Early morning Moon near the Pleiades cluster, M45
- 27 July: 'Jeweled handle' clair obscur effect visible on this evening's Moon

Mercury: Poorly positioned evening planet, best seen mid-month, but low in the west-northwest as the sky darkens.

Venus: Best at the start of July, as by the end of the month it is setting before the Sun. Currently in a very thin crescent phase.

Mars: Well positioned evening planet, which is low in the west as twilight darkens. Mars is near Venus at the start of July.

Jupiter: Improving morning planet, best at the end of the month (see chart page 22). There is a waning crescent Moon nearby on 12 July.

Saturn: Morning planet, best at the end of July. The Moon is close on 7 July.

Uranus: Morning planet, best at the end of July. Jupiter is relatively close.

Neptune: Morning planet, southeast of the Circlet asterism. Best at month end.

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

- All month: Venus visible as a thin crescent.
- 1 & 31 August: Two perigee full Moons this month, also known as 'supermoons'.
- 9 August: Morning scene of Jupiter, Hyades, the Pleiades and crescent Moon
- 12/13 August: Perseid meteor shower peak (favourable)
- 27 August: Saturn at opposition

Mercury: Poorly located evening planet. Mercury is best viewed on 1 August, but it will be very low in the west.

Venus: This bright morning planet is best observed at the end of the month, where it will be low in the east before sunrise.

Mars: Poor evening planet, best at the start of August, but hardly visible.

Jupiter: Brilliant morning planet reaching peak altitude under darker skies at the end of August.

Saturn: Opposition on 27 August when the rings will brighten. The Moon is close on 2, 3 and 30 August.

(Continued on [page 22](#))

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

Uranus: Morning planet, 50° in altitude at the end of the month, near Jupiter.

Neptune: Morning planet southeast of Circlet asterism in Pisces. Well placed at the end of the month.

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

- 4 September: Moon near Jupiter.
- 11 September: Morning crescent Moon near Beehive Cluster, M44.
- 14 September: Good opportunity to spot the thin crescent Moon.
- 20 September: Neptune at opposition.
- 29 September: Harvest full Moon.

Mercury: Greatest western elongation on 22 September with the bright planet rising 100 minutes before sunrise.

Venus: Impressively bright morning planet, visible against dark skies at the end of the month, rising four hours before sunrise.

Mars: Not visible this month.

Jupiter: Bright morning planet reaching its highest position under darkness from mid-month. The Moon is close on 4/5 September.

Saturn: Evening planet, currently well presented. Reaches 24° altitude under dark sky conditions.

Uranus: Morning planet near Jupiter. Peak altitude, due south, in a dark sky mid-month onwards.

Neptune: Binocular planet, reaching opposition on 20 September.

Comets June-September 2023 via Seiichi Yoshida – Click here:

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



left:

Ninth magnitude comet C/2020 V2 ZTF starts July 2023 near Jupiter and Uranus. Starting at mag. +9.4, it's expected to reach +9.1 mid-September, thereafter fading again.

Credit: Pete Lawrence

(Continued on [page 23](#))

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

Meteor Showers via American Meteor Society

Southern delta Aquariids

Period of activity: July 18th, 2023 to August 21st, 2023

Peak Night: Jul 30-31, 2023

The Delta Aquariids are another strong shower best seen from the southern tropics. North of the equator the radiant is located lower in the southern sky and therefore rates are less than seen from further south. These meteors produce good rates for a week centered on the night of maximum. These are usually faint meteors that lack both persistent trains and fireballs.

Shower details - Radiant: 22:42 -16.3° - **ZHR:** 25 - **Velocity:** 25 miles/sec (medium - 40km/sec)

Parent Object: 96P/Machholz?

Next Peak - The Southern delta Aquariids will next peak on the Jul 30-31, 2023 night. On this night, the moon will be 95% full.

alpha Capricornids

Period of activity: July 7th, 2023 to August 15th, 2023

Peak Night: Jul 30-31, 2023

The Alpha Capricornids are active from July 7 through August 15 with a "plateau-like" maximum centered on July 31st. This shower is not very strong and rarely produces in excess of five shower members per hour. What is notable about this shower is the number of bright fireballs produced during its activity period. This shower is seen equally well on either side of the equator.

Shower details - Radiant: 20:26 -9.12° - **ZHR:** 5 - **Velocity:** 14 miles/sec (slow - 22km/sec)

Parent Object: 169P/NEAT

Next Peak - The alpha Capricornids will next peak on the Jul 30-31, 2023 night. On this night, the moon will be 95% full.

Perseids

Period of activity: July 14th, 2023 to September 1st, 2023

Peak Night: Aug 12-13, 2023

The Perseids are the most popular meteor shower as they peak on warm August nights as seen from the northern hemisphere. The Perseids are active from July 14 to September 1. They reach a strong maximum on August 12 or 13, depending on the year. Normal rates seen from rural locations range from 50-75 shower members per hour at maximum. The Perseids are particles released from comet 109P/Swift-Tuttle during its numerous returns to the inner solar system. They are called Perseids since the radiant (the area of the sky where the meteors seem to originate) is located near the prominent constellation of Perseus the hero when at maximum activity.

Shower details - Radiant: 03:13 +58° - **ZHR:** 100 - **Velocity:** 37 miles/sec (swift - 59km/sec)

Parent Object: 109P/Swift-Tuttle

Next Peak - The Perseids will next peak on the Aug 12-13, 2023 night. On this night, the moon will be 10% full.

(Continued on [page 24](#))

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

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

Explore the Moon (*new this month*)

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.

Simply navigate to 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](#) 

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.



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

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

Look Up in the Sky - It's a Bird

Theresa Summer

Bird constellations abound in the night sky, including **Cygnus**, the majestic swan. Easy to find with its dazzling stars, it is one of the few constellations that look like its namesake and it is full of treasures. Visible in the Northern Hemisphere all summer long, there's so much to see and even some things that can't be seen. To locate Cygnus, start with the brightest star, Deneb, also the northeastern most and dimmest star of the Summer Triangle. The Summer Triangle is made up of three bright stars from three different constellations – read more about it in the September 2022 issue of Night Sky Notes. “Deneb” is an Arabic word meaning the tail. Then travel into the triangle until you see the star **Albireo**, sometimes called the “beak star” in the center of the summer triangle. Stretching out perpendicular from this line are two stars that mark the crossbar, or the wings, and there are also faint stars that extend the swan's wings.

From light-polluted skies, you may only see the brightest stars, sometimes called the Northern Cross. In a darker sky, the line of stars marking the neck of the swan travels along the band of the **Milky Way**. A pair of binoculars will resolve many stars along that path, including a sparkling open cluster of stars designated **Messier 29**, found just south of the swan's torso star. This grouping of young stars may appear to have a reddish hue due to nearby excited gas.

Let's go deeper. While the bright beak star Albireo is easy to pick out, a telescope will let its true beauty shine! Like a jewel box in the sky, magnification shows a beautiful visual double star, with a vivid gold star and a brilliant blue star in the same field of view. There's another marvel to be seen with a telescope or strong binoculars – the Cygnus Loop. Sometimes known as the **Veil Nebula**, you can find this supernova remnant (the gassy leftovers blown off of a large dying star) directly above the final two stars of the swan's eastern wing. It will look like a faint ring of illuminated gas about three degrees across (six times the diameter of the Moon).

Speaking of long-dead stars, astronomers have detected a high-energy X-ray source in Cygnus that we can't see with our eyes or backyard telescopes, but that is detectable by NASA's Chandra X-ray Observatory. Discovered in 1971 during a rocket flight, Cygnus x-1 is the first X-ray source to be widely accepted as a black hole. This black hole is the final stage of a giant star's life, with a mass of about 20 Suns. Cygnus x-1 is spinning at a phenomenal rate – more than 800 times a second – while devouring a nearby star. Astronomically speaking, this black hole is in our neighborhood, 6,070 light years away. But it poses no threat to us, just offers a new way to study the universe.

(Continued on [page 26](#))

NASA Night Sky Notes (continued)

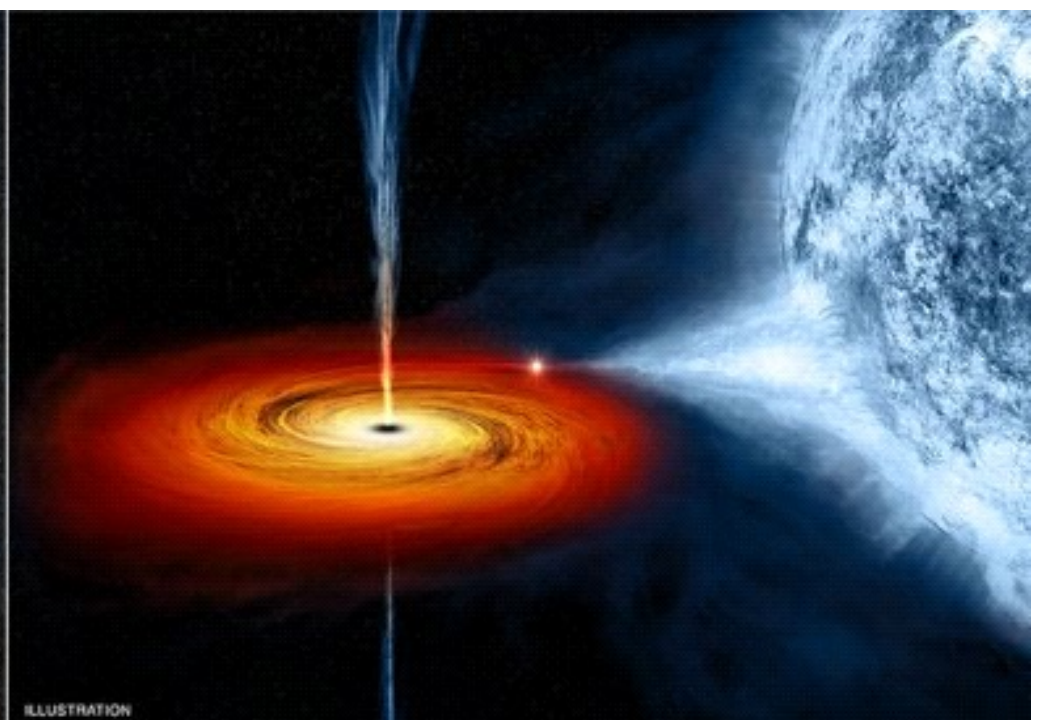
Check out the beautiful bird in your sky this evening, and you will be delighted to add Cygnus to your go-to summer viewing list. Find out NASA's latest methods for studying black holes at

www.nasa.gov/black-holes.



Look up after sunset during summer months to find Cygnus! Along the swan's neck find the band of our Milky Way Galaxy. Use a telescope to resolve the colorful stars of Albireo or search out the open cluster of stars in Messier 29.

Image created with assistance from Stellarium: stellarium.org



While the black hole Cygnus x-1 is invisible with even the most powerful Optical telescope, in X-ray, it shines brightly. On the left is the optical view of that region with the location of Cygnus x-1 shown in the red box as taken by the Digitized Sky Survey. On the right is an artist's conception of the black hole pulling material from its massive blue companion star.

(Credit: NASA/CXC chandra.harvard.edu/photo/2011/cygx1/)



above:

Galaxies M95, M96 & M105 in Leo
by Dan Copeland



left:

M81 (Bode's Galaxy) in Ursa Major,
by Alex Kepic

Taken through a Celestron C8 scope with a ZWO ASI294MC Pro camera on a Celestron AVX mount. Exposures: 265 x 2 minutes; 8 hours 50 minutes total.

Supernova SN 2023ixf in M101 from HAA Members

May 24, 2023, from
downtown Hamilton, ON

by Tom Burke



May 22, 2023, from
Schomberg, ON

by Rosemary & Rick Kelsch

For Sale

6" (150 mm) Skywatcher Dobsonian Telescope for Sale!



Purchased 4 years ago. Only used twice: **LIKE NEW!** Original packaging, Instruction Manual, tools, 2" eyepiece adapter and Finderscope included! Great views! Duplicate scope purchased for 2nd location; I don't need it any more.

Contact Jo Ann at joannsalci@gmail.com or 905 304 3331

For more information go to
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
Matt at
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



William J. McCallion
Planetarium

McMASTER UNIVERSITY, HAMILTON, ONTARIO

- Public shows Wednesdays (5:45pm & 7:00pm)
- Public transit available directly to McMaster campus
- Tickets \$7 per person; private group bookings \$150
- Different shows every week
- Upcoming shows include:
 - **June 7: Introductory Astronomy for Kids**
— **Solar System**
 - **June 21: Introductory Astronomy for Kids**
— **Galaxies**
- For more details, visit
www.physics.mcmaster.ca/planetarium

UPCOMING EVENTS

June 9, 2023 - 7:30 pm – H.A.A. Meeting at McMaster Innovation Park. Our speaker will be *Dr. John Percy*, who will talk about variable stars. This will be a “hybrid” meeting, with the attendance option of in-person or online via [Facebook](#) and [Zoom](#).

September 8, 2023 - 7:30 pm – H.A.A. Meeting at McMaster Innovation Park.

2022-2023 Council

Chair	Bernie Venasse
Second Chair	Sue MacLachlan
Treasurer	Ann Tekatch
Digital Platforms Director	Christopher Strejch
Membership Director	Paula Owen
Observing Director	Steve Germann
Education Director	Jo Ann Salci
Event Horizon Editor	Bob Christmas
Recorder	Brenda Frederick
Secretary	Denise White
Publicity Director	Mario Carr
Councillors at Large	Matthew Mannering Miranda Corvera

Check out the H.A.A. Website
www.amateurastronomy.org

Follow us!



Contact Us
 Hamilton Amateur Astronomers
 PO Box 65578
 Dundas, ON
 L9H 6Y6

www.amateurastronomy.org

General Inquiries:
secretary@amateurastronomy.org

Membership:
membership@amateurastronomy.org

Meeting Inquiries:
chair@amateurastronomy.org

Public Events:
publicity@amateurastronomy.org

Observing Inquiries:
observing@amateurastronomy.org

Education:
education@amateurastronomy.org

Newsletter:
editor@amateurastronomy.org

Digital Platforms Director:
webmaster@amateurastronomy.org

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