



# Event Horizon

Volume 30, Number 6  
April 2023



## From The Editor

This month's E.H. has yet more stunning images courtesy of our talented members.

As Spring sets in, here's hoping we get clearer skies more often than what we've been getting in recent months.

Happy Reading!

*Bob Christmas,  
Editor*

*editor 'AT'  
amateurastronomy.org*



## Chair's Report by Bernie Venasse

Spring, Olde beginnings  
wait for the fields to dry,  
those April-shower clouds  
go by.

New equipment  
and new goals  
nebulae, galaxia and  
clusters galore.  
bring aperture fever... MORE!

Waning winter, waxing spring  
Buds come out, robins sing  
Dry the sky, warm the air  
Make the seeing better,  
than only fair!

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

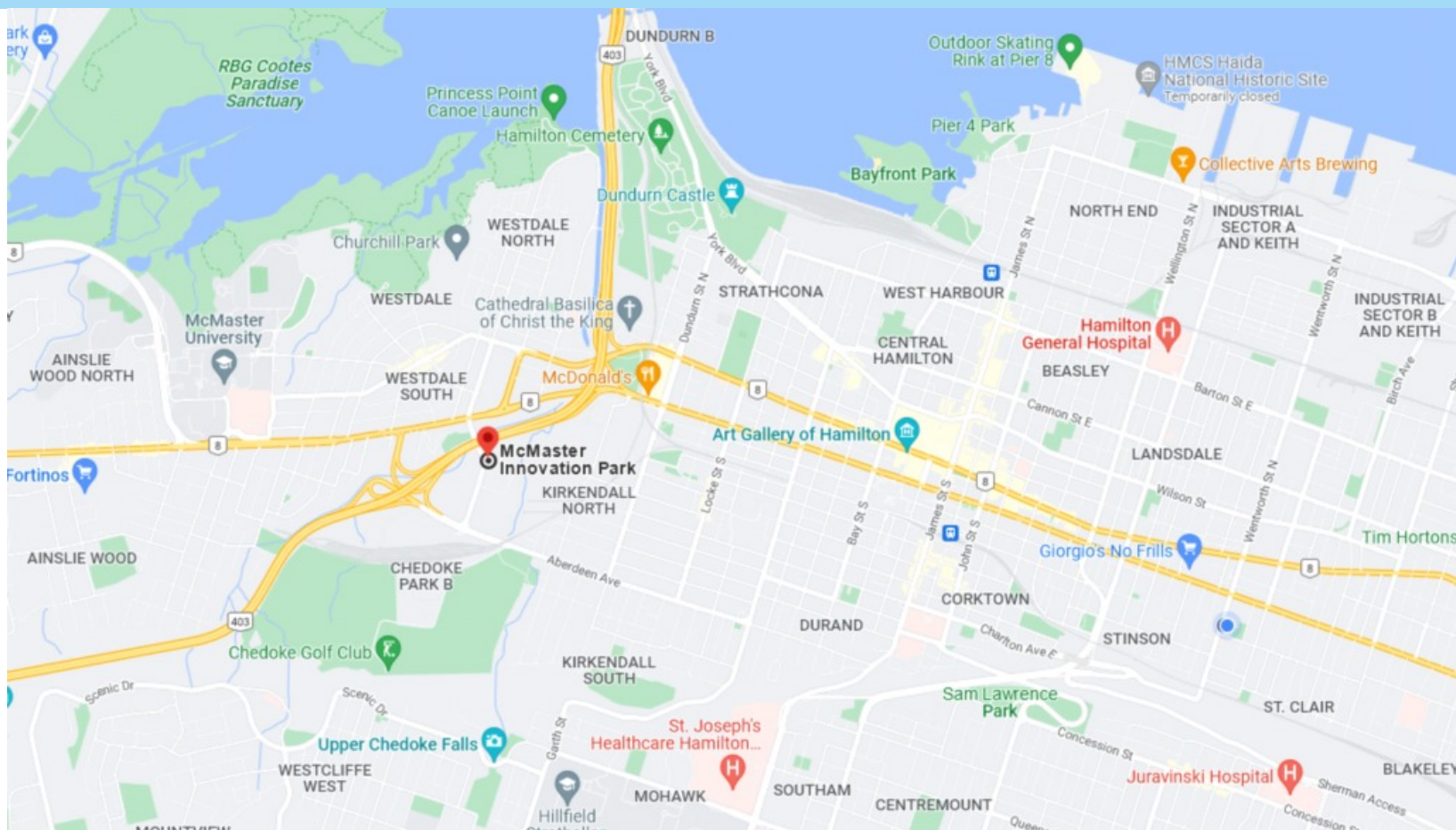
*(Continued on [page 2](#))*

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## Chair's Report (continued)



### Our Previous Meeting

In a ZOOM meeting, Kerry-Ann Lecky Hepburn spoke to us about astrophotography and observing in 'less-than-perfect' conditions. She showed many slides of astrophotos, some chronicling the process of stacking exposures to obtain higher detailed images. Well done, Kerry!

### Our next meeting

Our final meeting of the winter season is scheduled for April 14, 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 at 7:30. Our featured speaker for our next meeting is *Matthew Mannering*. Matt will be offering advice on regular and not-so-regular maintenance of your equipment. Speaking about telescope maintenance, he may touch upon cleaning optics, collimation of scopes, and all kinds of suggestions to keep your equipment running smoothly... Bring your notepads for this one!!

### Inreach and Outreach events

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

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

**Masthead Photo:** *North America Nebula (NGC 7000; Cygnus Wall)*, by Alex Kepic.

Taken through his Explore Scientific ED102mm telescope with a ZWO ASI294MC Pro camera on a Celestron AVX mount. 22 x 3 minutes; 66 minutes total exposure.



## Chair's Report (continued)

Upcoming Meeting & Observing Events.

April 14, 2023	McMaster Innovation Park	Membership Meeting
April 22, 2023	Bayfront Park	Outreach
May 7, 2023	Lakeview Park	Solar Observing
May 12, 2023	McMaster Innovation Park	Membership Meeting
May 19, 2023	Binbrook	Membership Observing
May 27, 2023	McQuesten Park	Outreach

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

We would like to take this opportunity to welcome new/returning members (Feb 27-Mar28).

Shawn Morrison, Hamilton. Individual membership. Rejoined.

Andres Parraga Colman, Hamilton. Family membership.

Susan Hudspith, Alberton. Individual membership.

Craig Heaton, Hamilton. Family membership.

Ryan Wagner, Hamilton. Individual membership.

George Catsoudas, Hamilton. Individual member.

Current membership:	82 Individual memberships	= 82
	49 Family memberships (x2)	= 98
	<u>1</u> Honorary membership	= <u>1</u>
	132 memberships	181

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

### 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.

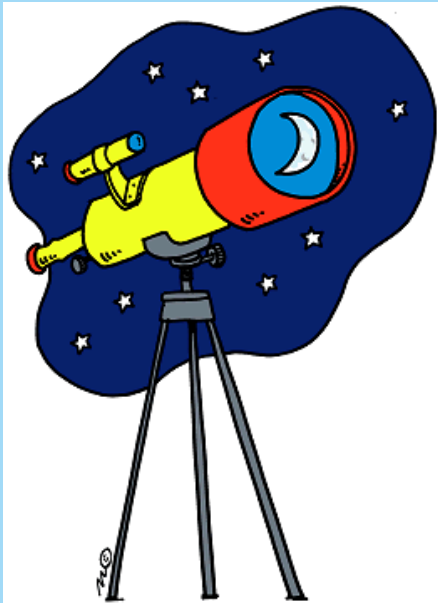
Presentations include in-person or virtual sessions where parents/guardians may not be present. **As it is not always possible to anticipate caregiver attendance at outreach activities for children under the age of 18, or vulnerable adults, it is therefore a requirement for HAA member-volunteers who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

## HAA's Loaner Scope Program



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

We have telescopes of varying expertise levels, a

MallinCam, a spotter scope and various eyepieces.

Please visit the HAA website for more information!

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

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

Telescopes are loaned out on a first come basis.

## HAA 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 Presents”

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

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



[Home](#) [About](#) [Newsletters](#) [Gallery](#) [Club Events](#) [Resources](#) [Contact](#) 

[HAA Presents](#)

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



# STAR PARTY

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

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

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



**Bottle 3.5**  
Power for battery charging  
Washrooms and Swimming  
included



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



# HAA Dark Sky Star Party

September 22-25, 2023  
Andromeda Meadow  
Warton, Ontario

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

## Weekend Events

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

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

## ONSITE AMMENITIES

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

## CONTACT INFORMATION

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



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



**REGISTRATION OPENS APRIL 1, 2023**



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

Last month we explored Saturn...this month we are going to explore a planet that orbits the Sun on its side - Uranus! Let's go!

#### Unique Uranus!

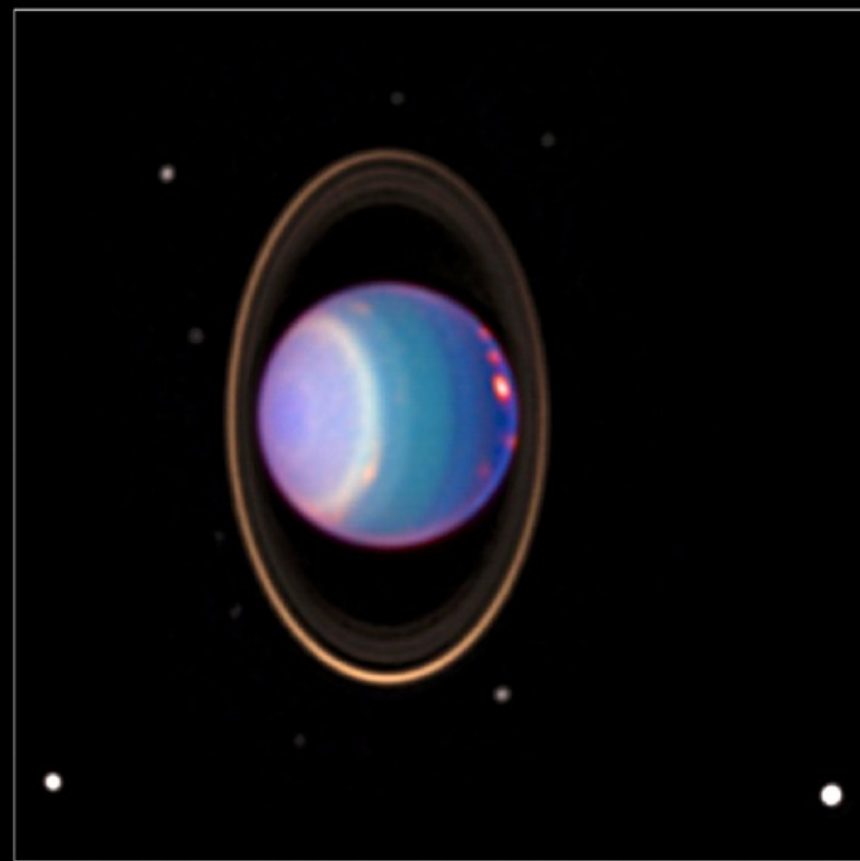
First of all, Uranus is pronounced YER-an-us, not your-AY-nus, like some people like to say for fun! And Uranus is named after a Greek God, not a Roman God like all the other planets. Ouranos was the Greek God of Heaven, and his wife, Gaea, was the Goddess of Earth. William Herschel described his discovery of Uranus in 1781 as a "lucky accident" while living in England, with a 6-inch telescope. He originally thought it was a comet, but after studying it for months realized it was not a comet, and instead was a planet. He wanted to name the planet after King George, the king of England at the time, but others thought it was best to use the name of a God. Uranus is in fact the first planet to be discovered by a telescope!



*Image Credit:*

*The Hubble Space Telescope took this picture of Uranus. You can see bands and a dark spot in Uranus' atmosphere.*

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



*Image Credit:*

*Hubble Space Telescope, <http://oposite.stsci.edu/>*

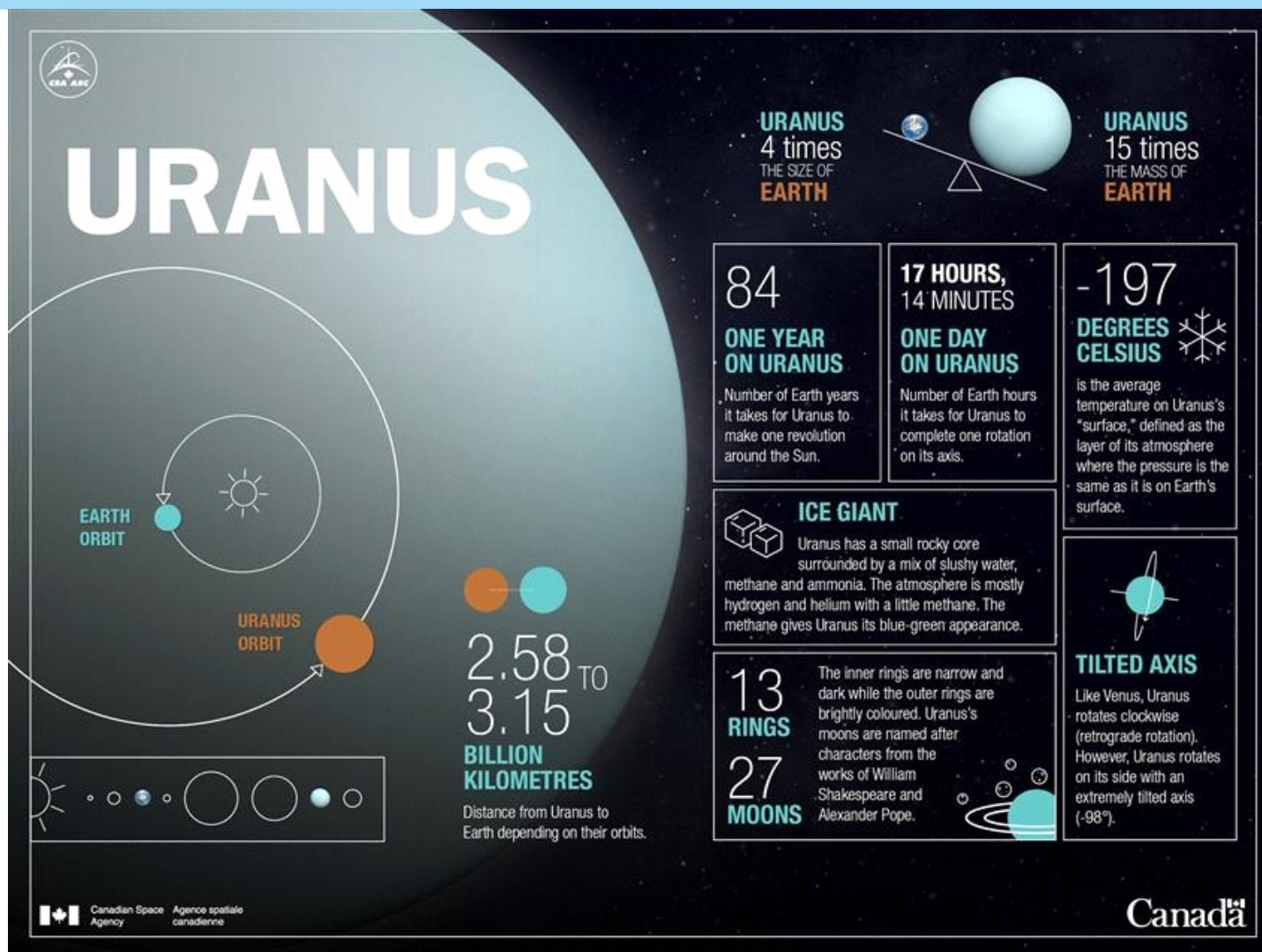
And yes, Uranus rotates on its side, something like a rotisserie chicken, as it goes around the Sun. It is the only planet to do so. Scientists believe that Uranus was hit by a large object early in its formation, that knocked it sideways.

Uranus is the 7th planet from the Sun and is considered an *Ice Giant*. It is the third largest planet, but unlike Jupiter and Saturn which are *Gas Giants*, made up of mostly gas, Uranus (and Neptune, which we'll explore next month) are made of gas - and ice. Its atmosphere not only has hydrogen and helium, but also more of water vapor, ammonia and methane. In fact, it's the presence of methane that gives Uranus its blue-green colour. Methane gas absorbs red light, so the colours we see are blue-green. Clouds on Uranus have hydrogen sulphide...it's a good thing we can't smell Uranus, because it would smell like rotten eggs!

*(Continued on [page 8](#))*



## HAA Explorers (continued)



*Credit: Canadian Space Agency*

While Saturn takes 29.5 Earth years to go around the Sun, Uranus takes 84 years! Because it takes so long, Uranus has extreme seasons...21 years each! Imagine 21 years of winter? We thought 7 years of winter on Saturn was tough!! Uranus happens to be the coldest planet in the solar system as well. Like many planets, Uranus has moons - 27 of them. Most were found by Voyager 2, the Hubble Telescope and powerful new instruments on Earth. They are named after Shakespeare characters from "The Tempest" and "A Midsummer's Night Dream".

Uranus is 2.94 BILLION kilometers away from the Sun...almost twice as far as Saturn. No wonder it's hard to see without binoculars and telescopes. In fact, only one probe, Voyager 2, has gotten close enough to take close-up photos. The Voyager mission was able to determine that Uranus has a total of 13 faint rings! These rings also rotate differently than other planets...more like a Ferris wheel, than a carousel. Because Uranus is on its side, so are its rings! AND, remember how Venus rotated on its axis from West to East? So does Uranus! It's a very unique planet!

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

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

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

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

2. **Visit this website** to learn why it took so long to discover Uranus:

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

3. **Visit this website** to learn more about ice on other planets:

<https://spaceplace.nasa.gov/ice-on-other-planets/en/>

*(Continued on page 9)*



# HAA Explorers (continued)

Searching for Uranus: Look for words in the article!

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

- SIDEWAYS
- HERSCHEL
- EGGS
- METHANE
- TELESCOPE
- HUBBLE
- ROTISSERIE
- MOONS
- ENGLAND
- GIANT
- GEORGE
- HYDROGEN
- VOYAGER
- COMET
- CAROUSEL
- HELIUM
- RINGS
- UNIQUE
- URANUS
- SEASONS

© TheWordSearch.com

Answers on page 20.

During April, check out:

1. On April 12th around 8:30 pm, check out Venus and Mercury in the Western sky:

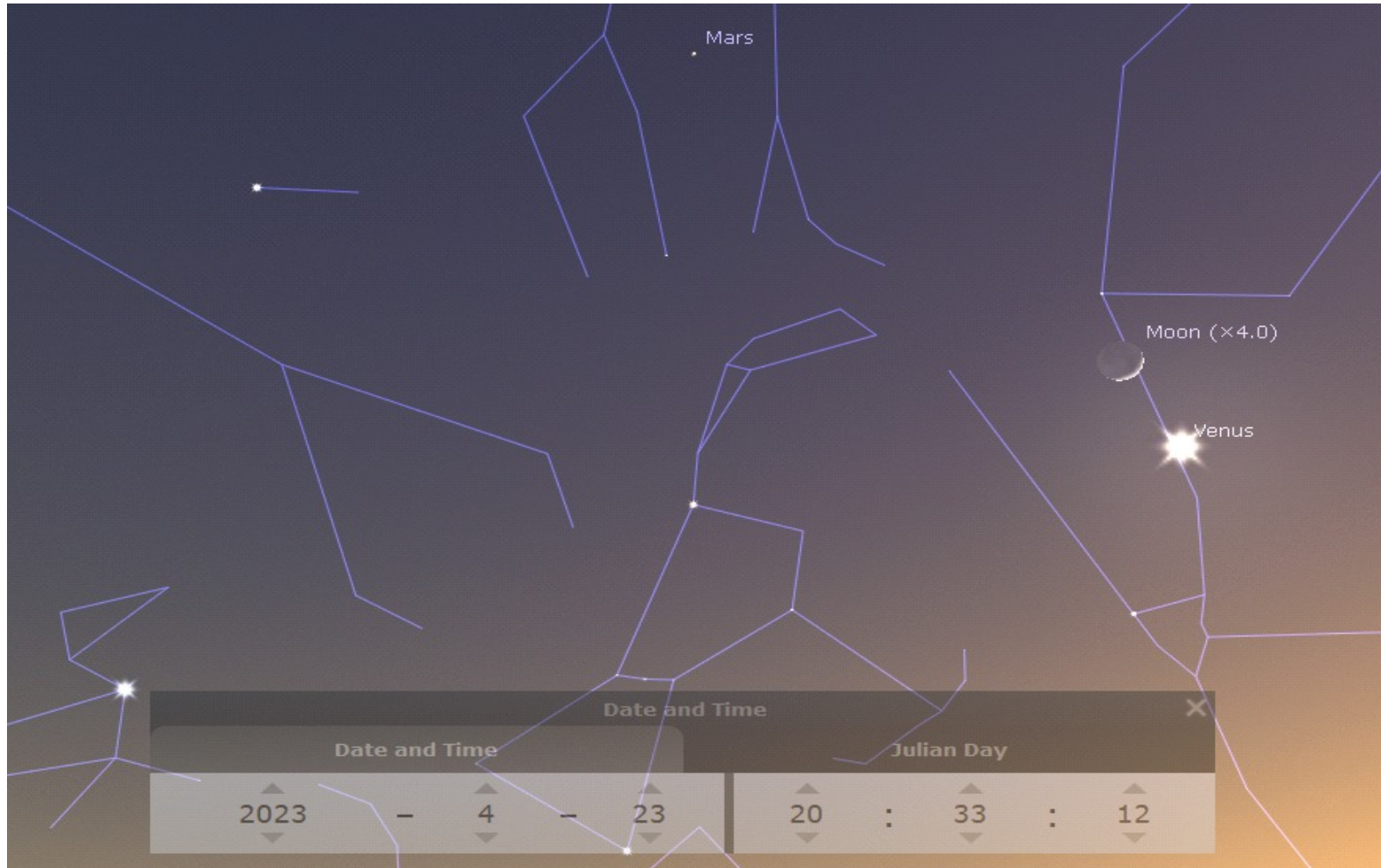


Image generated using Stellarium

(Continued on [page 10](#))

## HAA Explorers (continued)

2. On April 23rd around 8:30 pm, you will see a crescent Moon, just above Venus in the Southwestern sky, with Mars overhead. Also, bright Sirius will be in the Southern sky as well...see if you can find it!



*Image generated using Stellarium*

### Finally:

Why did Uranus have a stomach ache?

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

Answer: 😊 It was full of gas!

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.

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

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

National Geographic Kids: Ultimate Space Atlas, 2017.

Nightwatch. Terence Dickinson (Thank you to Terence Dickinson for his many amazing publications). 2006.

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





The weather outside has been cloudy at some critical times, as March often is, but there have still been some clear nights and pearls.

Alas, our Daytime Saturn challenge did not pan out, but until it is old hat, there will now be a 'Planets in the Daytime' chart which we can consult for the next chances. Priority will be given to planets during a waxing crescent Moon, where the Sun can be placed to not unexpectedly shine on your equipment.

Basically, what we need is a chart showing the planet, and the date and time of the Moon's closest approach. Those in the daytime with the Moon as a waxing crescent will be the ones to watch for. Obviously we also need the Moon above the horizon, so there will be many cases where a month of Moon travel will not give us a target.

### The Messier Marathon

Now that the March New Moon has passed, I am pleased to report there was, in fact one clear night, and one of our members, Thomas Burke, was able to utilize the Messier spreadsheet which I crafted, to actually image all of the Messier objects in one night, bar M30 which was not above the horizon in March. Kudos to him, but I must indicate he used a Goto scope, and an electronic eyepiece/camera, so detection was assisted, but nonetheless, the objects were in the sky and technically findable. (Not obscured by clouds)

Here is an image of his final observation, at 6.07am on a Monday morning, of M55, right through the sky-glow over Hamilton, from the Dundas lookout on Sydenham Road.

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



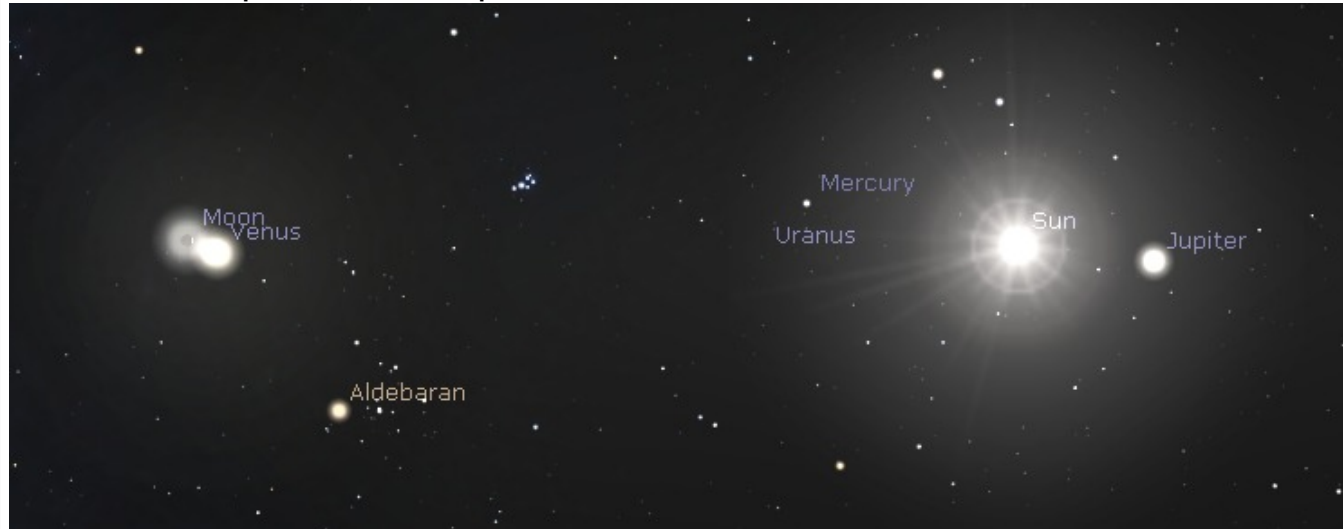
*Globular Cluster M55 Image Credit: Thomas Burke*

## The Sky for April 2023 (continued)

### Planets in the Daytime

For the Month of April until June 30th, here are a few upcoming events worth a look...

At 10am on April 23, Venus precedes the Moon:



*Images generated using Stellarium*

On April 26, the Moon will be near Pollux at about 1 PM (see right).

On April 29 at 1 PM, the Moon's terminator can be used to line up with Regulus in the sky, although it will be about 4 degrees away (see top of next page).

It turns out that Stellarium has a computation that makes this search very simple to do.

At the bottom of the next page is a chart for Planets.

Stellarium produces this chart which can be sorted by elevation of the Moon and Solar elongation, and time of day.

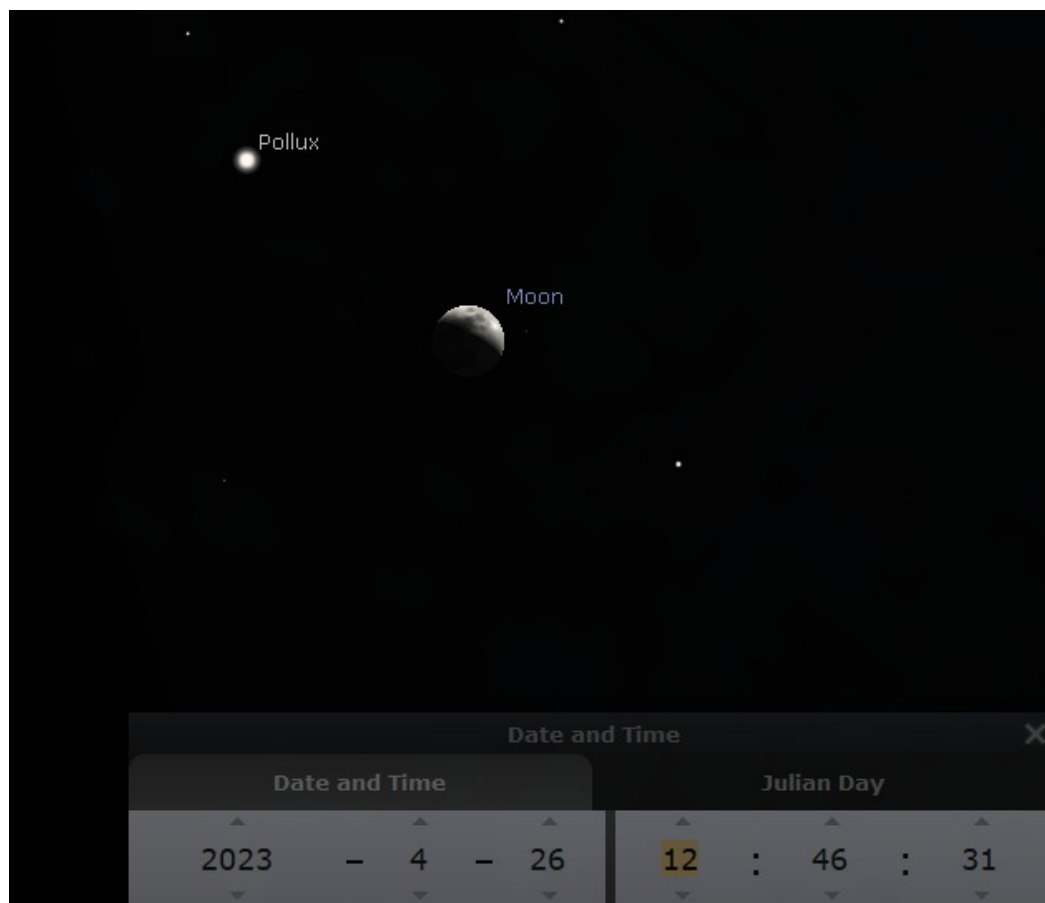
It's ideal for finding these events.

Unfortunately, I don't see a way to

delete rows in the chart then sort by another column what remains, so I had to do that manually in a spreadsheet, for the bright stars.

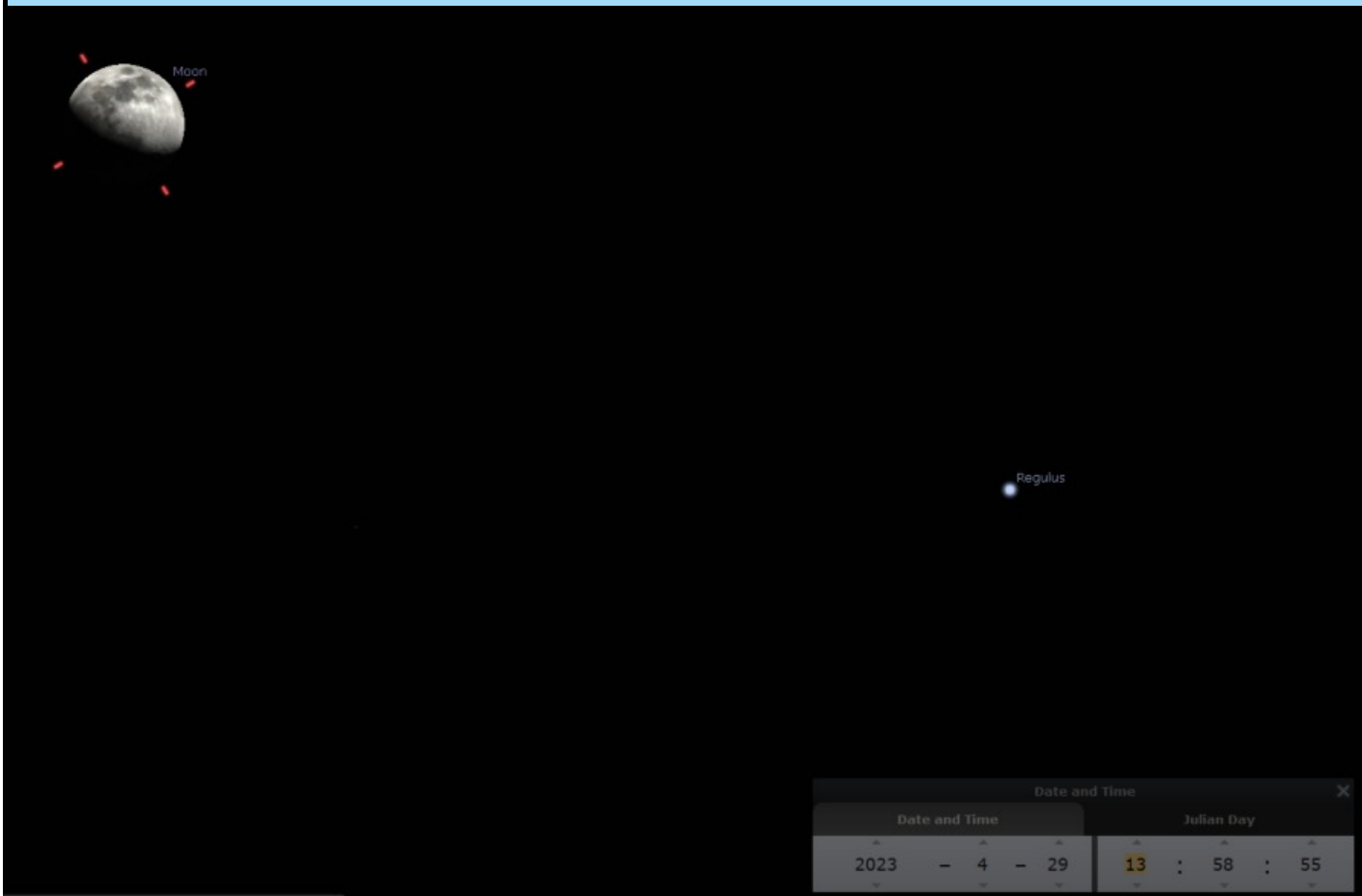
Requesting conjunctions with planets, yields all my year's work done in a trice.

The chart at the bottom of the next page is sorted by elevation of the Moon at Conjunction, with separation and solar elongation in the chart, as well as date and time, so we can just read off the likely events. I listed some elevations down to small negative numbers, but practically speaking, anything below 10 degrees is not a valuable target. That still leaves 14 rows, and then after we eliminate any at night, and we are down to just 5 rows: 1(Mars Sep 16) 3(Jupiter May 17) 5(Mars May 24) 8(Uranus Jul 12) and 10(Mercury Jun 16), with all but the last one having a robust solar elongation. (Continued on [page 13](#))





# The Sky for April 2023 (continued)



(left) The Moon and Regulus on April 29, 2023

Image generated using Stellarium

(below) Chart of Moon-Planet Conjunctions & Occultations generated using Stellarium

This will be a good chart to generate and have handy every year.

You cannot get better separation than an occultation, so on September 16th, in the afternoon, is our best chance to see Mars in the daytime. Much before that, we can get some practice...

June 16th at 5 PM will be a chance to see Mercury with a passable 15 degree elongation from the Sun, which is not ideal, but worth a peek. Mercury should show up without binoculars, if you are squeamish (as you should be) about using binoculars in the sky during the day, you must ensure the Sun is blocked behind the edge of a building and you are in shadow before you begin. This is also useful to prevent glare in your optics from sunlight hitting them at an angle.

(Continued on [page 14](#))

Astronomical calculations

Between objects: **Moon** and **Planets**

Maximum allowed separation: **+3.5 0' 0.00"** From: **2023.04.01** To: **2023.12.29**

Calculate also:  oppositions  perihelion and aphelion

Phenomenon	Date and Time	Object 1	Mag. 1	Object 2	Mag. 2	Separation	Elevation	Solar Elongation	Lunar Elongation
Occultation	2023-09-16 15:40:25	Moon	-5.15	Mars	—	—	+38°36'37.06"	+19°24'43.9"	—
Conjunction	2023-06-11 06:13:42	Moon	-10.02	Neptune	7.78	+2°35'10.7"	+36°41'46.94"	+82°04'18.6"	—
Occultation	2023-05-17 08:17:27	Moon	-6.48	Jupiter	—	—	+36°38'54.35"	+26°10'55.6"	—
Conjunction	2023-09-05 01:45:07	Moon	-10.93	Uranus	5.75	+2°02'50.1"	+36°06'17.68"	+109°52'15.4"	—
Conjunction	2023-05-24 12:57:18	Moon	-8.75	Mars	1.55	+3°22'38.5"	+31°55'38.90"	+58°44'00.0"	—
Conjunction	2023-08-08 02:34:20	Moon	-10.33	Jupiter	-2.41	+1°56'28.7"	+28°58'31.35"	+91°33'12.2"	—
Conjunction	2023-09-27 01:14:10	Moon	-12.19	Saturn	0.57	+3°05'27.7"	+25°42'38.20"	+148°15'33.3"	—
Conjunction	2023-07-12 14:10:25	Moon	-8.84	Uranus	5.84	+1°51'41.2"	+24°45'17.10"	+57°59'04.4"	—
Conjunction	2023-09-01 06:03:52	Moon	-12.44	Neptune	7.69	+1°35'41.4"	+22°38'45.98"	+161°26'38.7"	—
Conjunction	2023-06-16 17:39:57	Moon	-4.62	Mercury	-0.83	+3°52'14.8"	+21°41'56.56"	+15°54'20.6"	—
Conjunction	2023-11-26 04:32:55	Moon	-12.52	Uranus	5.66	+2°17'00.2"	+19°39'26.28"	+166°34'19.4"	—
Conjunction	2023-12-09 05:36:12	Moon	-8.00	Venus	-4.14	+3°47'16.6"	+13°55'35.72"	+42°39'32.4"	—
Conjunction	2023-04-26 00:55:53	Moon	-9.47	Mars	1.24	+2°34'34.6"	+11°31'33.22"	+71°00'17.2"	—
Conjunction	2023-12-17 20:54:29	Moon	-9.47	Saturn	0.92	+2°42'58.5"	+10°34'04.05"	+66°53'19.9"	—
Conjunction	2023-10-15 09:20:44	Moon	-3.54	Mars	1.59	+1°15'59.5"	+8°13'32.05"	+10°06'28.2"	—
Conjunction	2023-11-09 03:42:18	Moon	-8.14	Venus	-4.34	+0°39'37.1"	+6°25'05.76"	+45°34'41.4"	—
Conjunction	2023-10-29 19:16:59	Moon	-12.47	Uranus	5.66	+1°49'22.5"	+5°59'17.75"	+164°48'18.5"	—
Conjunction	2023-07-07 00:24:57	Moon	-11.50	Saturn	0.69	+3°22'20.8"	+5°12'49.20"	+127°38'23.8"	—
Conjunction	2023-04-17 16:59:10	Moon	-6.94	Neptune	7.83	+2°19'31.4"	+1°59'56.81"	+31°10'04.4"	—
Conjunction	2023-10-01 20:21:40	Moon	-11.90	Jupiter	-2.81	+2°14'33.2"	+1°16'54.96"	+144°29'43.8"	—
Conjunction	2023-06-15 03:48:52	Moon	-7.20	Uranus	5.87	+1°01'17.0"	+1°07'22.15"	+33°10'30.1"	—
Conjunction	2023-05-13 13:38:05	Moon	-9.74	Saturn	0.91	+3°20'51.7"	+0°31'18.81"	+76°01'10.7"	—
Conjunction	2023-04-21 07:12:46	Moon	-4.76	Uranus	5.88	+0°41'43.4"	+0°12'46.77"	+16°42'21.2"	—
Conjunction	2023-06-22 00:16:31	Moon	-7.86	Venus	-4.58	+2°41'45.2"	-3°32'43.75"	+44°17'18.4"	—

## The Sky for April 2023 (continued)

### Moonrise

April 6 will be when the 'Pink Moon' rises. The azimuth is not favourable to seeing the Moon rise over the water this time. That actually makes the Moonrise more interesting to observe, as you will see it rise over land.

I suggest using the Dundurn Park vantage point, as it will give the longest distance over water and obstructions, although in the distance, the Moon will rise above the escarpment almost directly over Niagara Falls.

Sometimes there is a mirage, and you see the Moon rising separate from the horizon, but still obviously not round, as it is blocked by a very distant horizon. Can you get a photo series of the Moonrise this month?

### Supernovas and Rogue Asteroids

On March 25, a near Earth asteroid passed the Earth on its orbit around the Sun. It will be back in about 3 years, but in both cases, it will miss the Earth.

This link below shows upcoming near passes of asteroids. The next 5 are too small to be detected without photography, so are not good observing targets for us. Since this list is updated often, it is good for you to check it yourself when you think the sky might be clear.

<https://www.jpl.nasa.gov/asteroid-watch/next-five-approaches>

### The Armchair Challenge for April

On April 22, I have chosen this Saturday evening starting just after sunset, for the armchair astronomer challenge. If it is clear, you can seek an open area and watch for the *Lyrid Meteor Shower*. We are fortunate that this will be the best chance this year, (hence the armchair challenge) as there will be no Moon in the sky to interfere with the viewing. The radiant for this shower will be almost directly overhead, making the shower easy to view anytime in the evening.

*(Editor's Note: See the chart for the Lyrid Meteor Shower on page 19 in "What's Up in Awards?".)*

Be sure to dress really warm, and find a reclining chair in an area with at least the half of the sky you can see at any given time, open and not obscured by trees.

The 'your mileage may vary' rating for this shower is 20 shooting stars per hour.

Good luck. When you see a shooting star, you can also wish for no mosquitos on the date of the May Armchair Astronomer challenge. Please note the time you see the meteors, and we can compare notes to see if your meteor was seen by another member at a distance.

If you are becoming a seasoned observer, you should actually record enough information to make your observing scientifically valid.


Here is a link to the Meteor Shower observing document you can fill in and note your observations on.

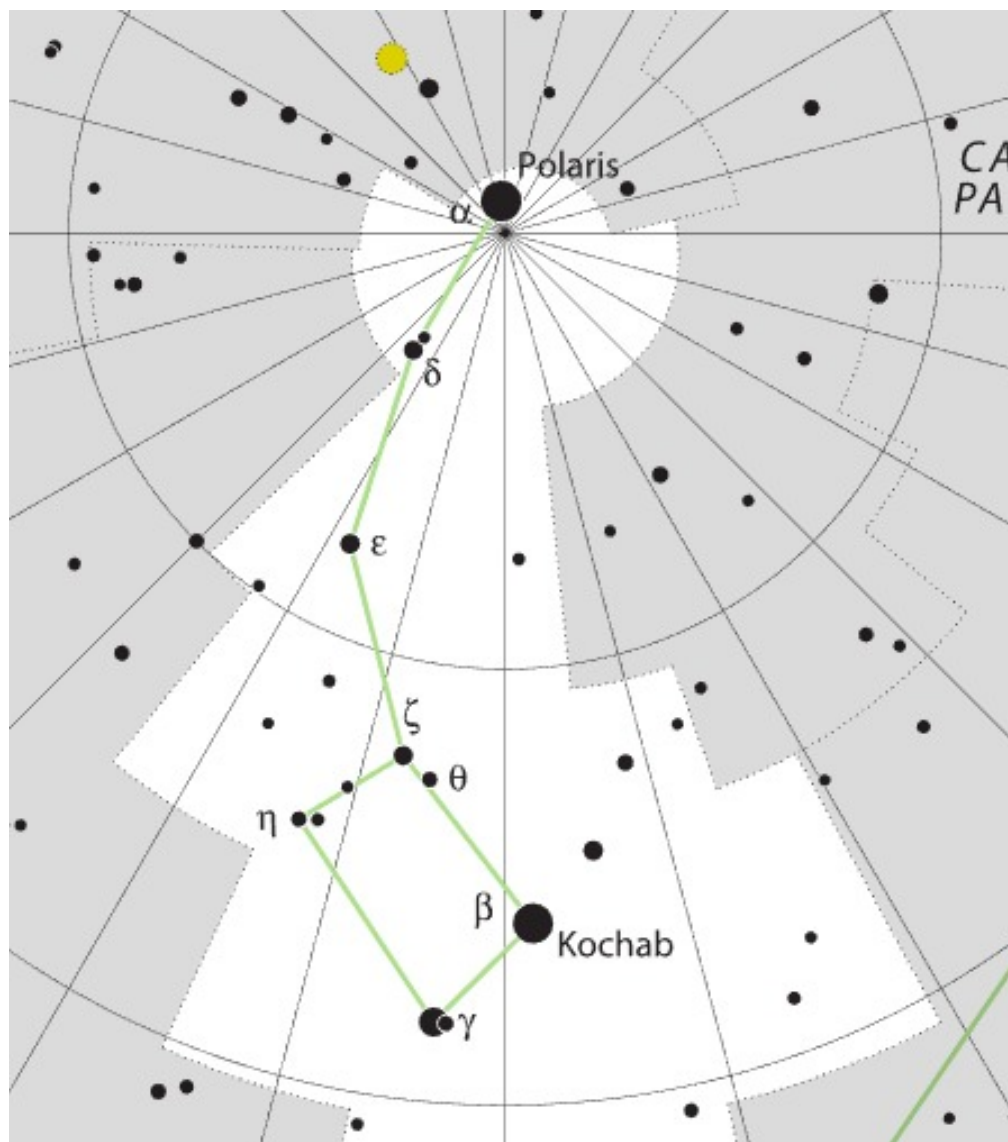
<https://britastro.org/wp-content/uploads/2014/02/MeteorSectionVisualReportBlank.pdf>

An example of this form with the things you can note is at the top of next page. *(Continued on [page 15](#))*



# The Sky for April 2023 (continued)

 <b>British Astronomical Association</b> <b>Meteor Section Visual Report</b>				OFFICE USE ONLY		
				Rec'd	Ack'd	
<b>Date:</b> 11/12 Aug 2020		<b>Observer(s):</b> A.N. Observer				
<b>Observing site:</b> 52 56 19 N, 000 58 50 W				Sheet 1 of 1		
<b>Correspondence address</b> 1 Address Rd, Observington						
<b>Observing conditions:</b> Clear but hazy. Lot of moisture in the air. Cloud appeared at end of session.				<b>Stellar limiting magnitude:</b> +5.1		
<b>Watch Times:</b>	<b>Start:</b> 00:30	<b>End:</b> 01:00	<b>Duration:</b> 00:30			
Code No.	Time UT	Magnitude	Name Shower or if Sporadic	Constellation(s) in which seen	Train details and time to fade (secs)	Notes
001	00:34:07	$\alpha$ Per	Perseid	TAU	---	---
002	00:36:43	$\alpha$ Lyr	Perseid	CYG	2s	Terminal burst
003	00:38:54	-5	Spor	CYG	15s	Slow moving



*Chart example courtesy of British Astronomical Association*

The limiting magnitude can be estimated by looking at the 'little dipper' Ursa Minor, and counting the stars you can see in its bowl. They are approximately, magnitude 2, 3, 4.25 and 4.95.

Until our meeting, and beyond for the rest of April, I wish you clear skies, at least when you are looking up.

*Chart Credit: Wikipedia/Sky & Telescope*



## Contents:

What's up in awards?

Rising Star Program: April-May

Pathways Observing Program targets... April-May

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

The Planets, Comets, Upcoming Meteor showers, Award Programs

## What's Up in Awards?

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

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

## HAA Rising Star Observing Award

### *April*

Constellations: Virgo, Leo

Stars: Dubhe, Regulus

Double Stars: 42 Leonis Minoris

Object Pairs: M65, M66

Messier Objects: M96, M109

### *May*

Constellations: Ursa Minor, Leo

Stars: Dubhe, Regulus

Double Stars: 42 Leonis Minoris

Object Pairs: M65, M66

Messier Objects: M96, M109

## Pathways Observing Program

### *Group A*

Observable in April, May, June.

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

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

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

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

## HAA Messier Objects Observing Award

### *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.

(Continued on [page 17](#))



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

- 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.
- 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.

### *May Messier targets*

- M51** The famous Whirlpool galaxy in Canes Venatici is a bright face-on spiral with a smaller elliptical companion, NGC 5195. Look for a pair of fuzzy patches of light. The slightly larger and brighter one is M51. Make sure to spend some time here as there is almost always some spiral structure to be seen, on good nights the detail possible is unbelievable. This is a difficult but very possible object in binoculars appearing as a hazy patch of light.
- M63** Another spiral galaxy in Canes Venatici. Smaller and fainter than M51, but seen more edge-on so the galaxy appears as an elongated patch of light with a bright star at one end. Further inspection will show a faint halo around this patch.
- M94** Just past M63 is another galaxy in Canes Venatici. Look for a bright fuzzy star to find the core of M94, surrounded by a faint haze.
- M101** I consider this face-on spiral galaxy in Ursa Major one of the most difficult Messier objects to find in a telescope. This is a large faint patch of light almost as big as the full moon. There are no real condensations so use low power and look for a brighter part of the sky, more of a change in contrast than an object at first glance, which is the galaxy.
- M102** Not an official Messier object in most references, we will look for the galaxy NGC 5866 which is a somewhat standard insertion. Look for a small, faint patch of light that looks like a short fuzzy line.
- M64** This galaxy in Coma Berenices is a fairly bright, slightly oval-shaped patch of light. Look for the dark lane which gives this galaxy the common name Black Eye.

*(Continued on [page 18](#))*

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

- M85** This elliptical galaxy lies in Coma Berenices just north of the Virgo Cluster of galaxies. It appears as a bright, but small, patch of light with a bright stellar core.
- M49** This is an elliptical galaxy in Virgo just south of the main cluster of galaxies. M49 is a round patch of light with a bright center gradually fading to a round halo.
- M61** This is a face-on spiral galaxy just south of M49 in Virgo, but much fainter. Look for a faint, round, fuzzy patch of light.
- M104** This is the well-known Sombrero galaxy in Virgo. It is bright edge-on spiral galaxy which looks like a bright, elongated streak.

### 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 Mabsuta (Epsilon ( $\epsilon$ ) 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.  $4^\circ$  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.

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

- Mercury:** Inferior conjunction 1 May, Mercury is poorly placed in the morning sky thereafter, so it is unlikely to be seen.
- Venus:** This spectacular evening planet has a crescent phase at the end of the month. The Moon is close on 22 and 23 May, so it is well worth a look.
- Mars:** Evening planet, now very small telescopically. Close to M44 at the end of the month.
- Jupiter:** Morning planet, not well-placed. Occluded by the crescent Moon; watch from 07:30 till 08:50 or so on 17 May.
- Saturn:** Poorly positioned morning planet. Saturn remains low as the day breaks, so it is probably not worth the effort.
- Uranus:** Uranus is in conjunction with the Sun on 9 May and so not currently visible.
- Neptune:** Neptune is a morning object but lost in the dawn twilight.

### 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.)

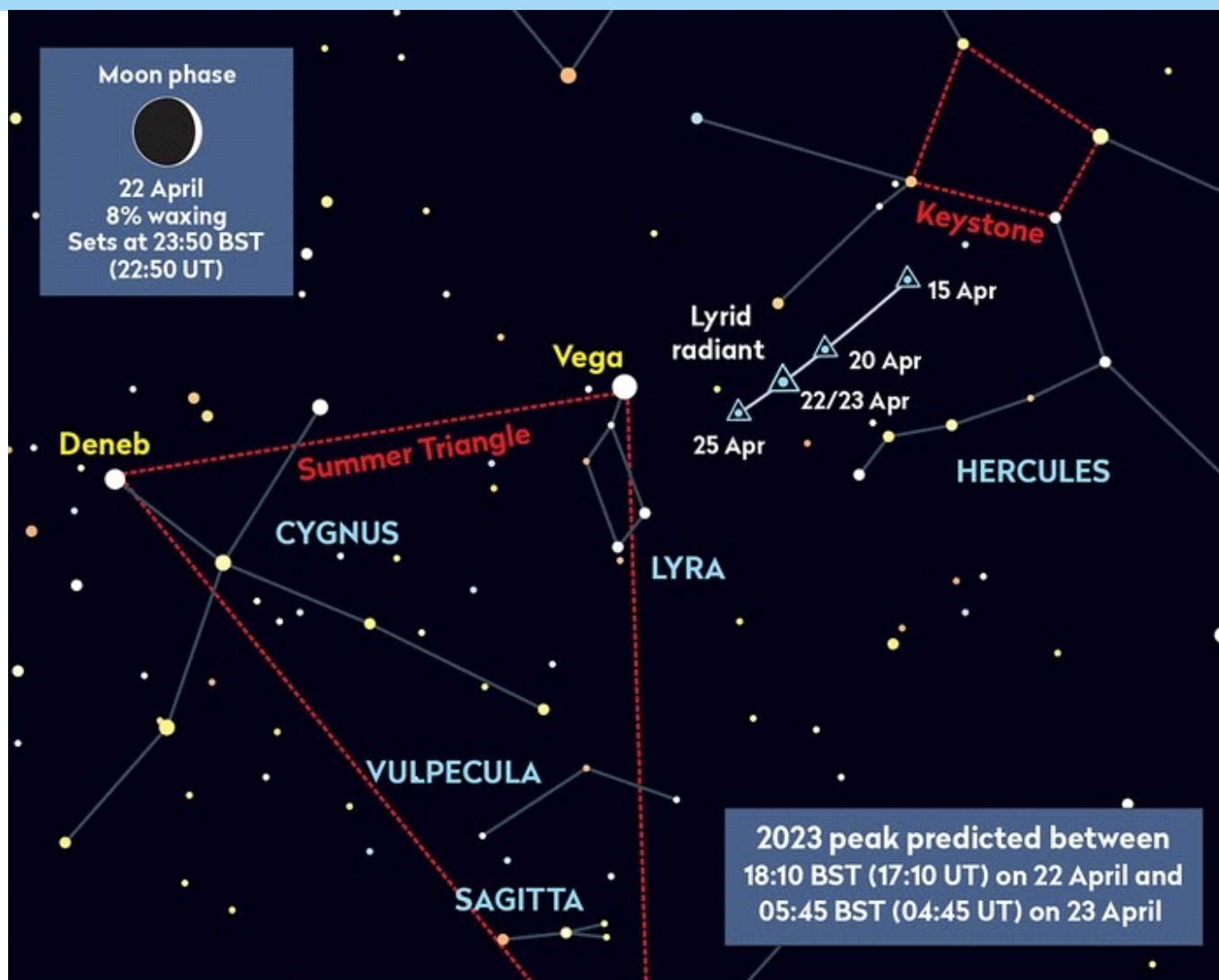
**Peak viewed from rising in the northeast till 01:45 AM on the 23rd.** See diagram on next page.

(Continued on [page 19](#))





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



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

### 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

### RASC

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

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

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

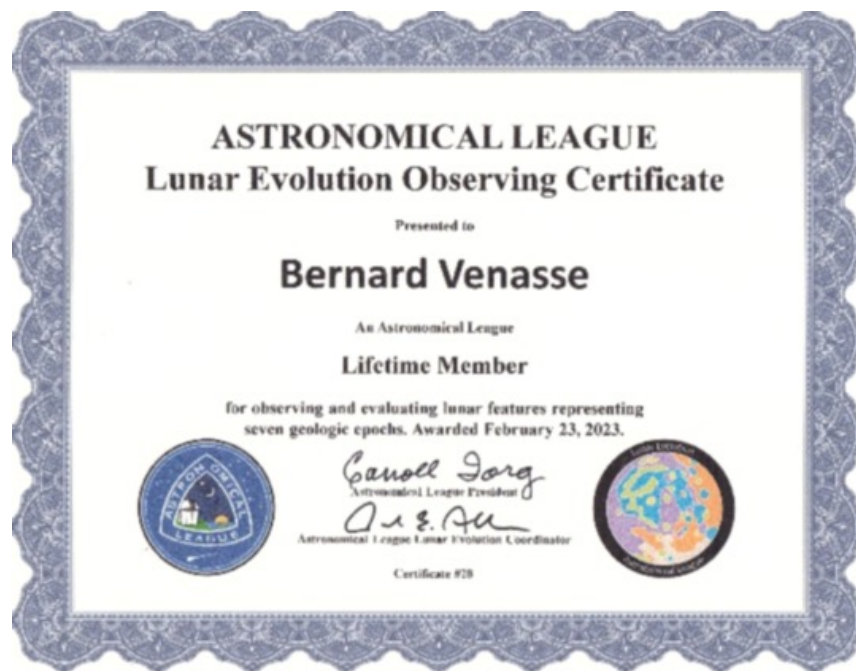
## Astronomical League

Bernie Venasse (2023)

Sunspotters Observing Program

Hydrogen Alpha Solar Observing Program

*Lunar Evolution ... New this month!*



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

## Word Search Answer key from page 9:

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





## How Far is Far? by Stephan Landis

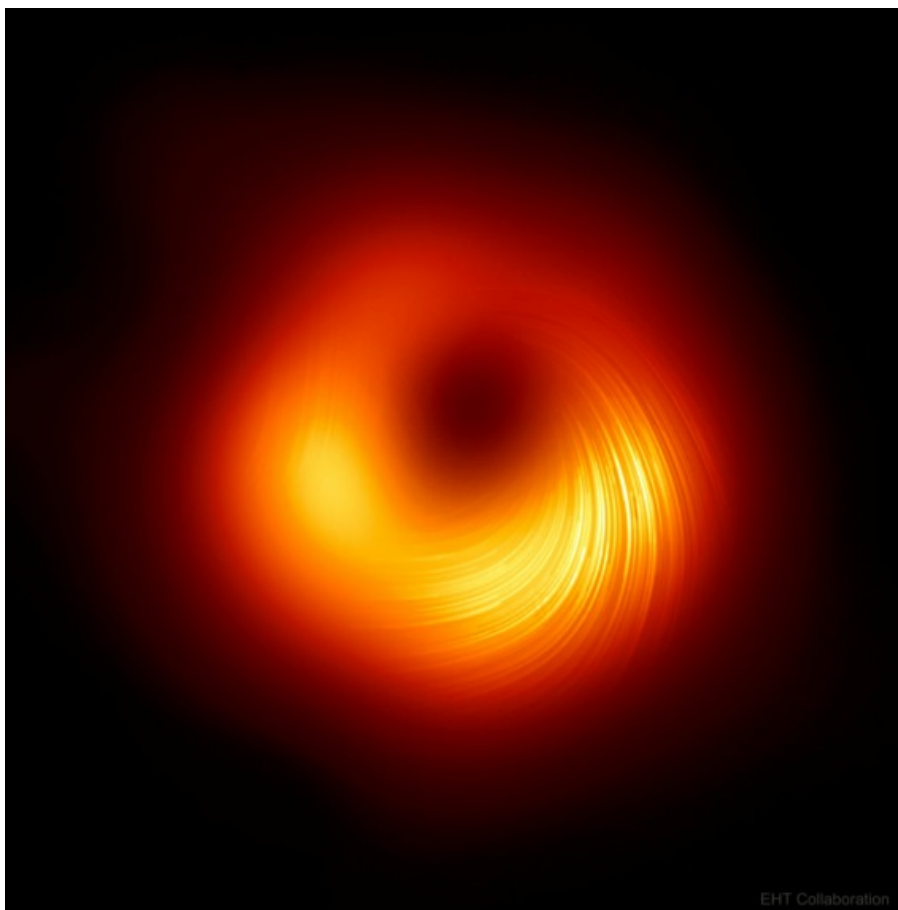
Astronomical distances frequently confuse the casual sky observer. If I ask a neighbour, “If you are standing on Earth, where do you think Mars would be? Jupiter? Proxima Centauri, the closest sun to our solar system? Andromeda? In distance proportion to where you are right now”, there would be a variety of answers. “Well, maybe Mars would be six houses down the street; Jupiter, at the end of the street; never heard about Proxima Centauri”!

A simple way to fathom the vastness of space is to imagine the concept of an “astronomical unit”, the distance from the Earth to the Sun, or 93,000,000 miles. We can see the Sun every day; it’s out there. We know where it is and it’s a safe distance away!

Now imagine if we bring the “astronomical unit” down to a manageable size, say, one inch; yes, the 93 million miles is now one inch. Where do we place the planets on this scale? Where is Pluto? How big is Andromeda, our closest galaxy? Where would we put the black hole, whose picture was taken in 2019? How big is a light year?

The numbers are easy to generate and the distances to conceptualize! Again, if an astronomical unit is one inch, on a ruler scale, the Sun is at one end, i.e., 0”; Mercury, just under 1/2” away; Venus 2/3”; Earth at 1.0”; Mars 1 1/2”; Jupiter 5”; Saturn 9 1/2”; Uranus 19”; Neptune 30” and Pluto about 35”, or about three feet away! This is our neighbourhood, all marked off on a wooden high school yardstick!

Now, a light year is something else. It would be one mile away (about 63240 Astronomical Units). So, our closest next star, Proxima Centauri, would be 4.3 miles or 7km away, in the “next village”! Using this scale, our closest galaxy, Andromeda, at 2 million light years, would be situated about 8 X the “real” distance from here to the Moon, and its diameter would be from “here to half-way to the Moon”. The massive black hole in the centre of galaxy Messier 87, whose photo was taken in 2019, at 55 million light years, would likely be situated in the “real” orbit of Mars - now, that’s one heck of a “telephoto lens”. The end of the universe, even with these figures, would be far beyond the Ort Cloud and almost impossible to conceptualize. So, when we look at the stars, it is useful to marvel at how far they are, and to appreciate how small we are in the realm of our universe.



*Galaxy M87’s Central Black Hole*

*More details:*

[apod.nasa.gov/apod/ap210331.html](https://apod.nasa.gov/apod/ap210331.html)

*Image Credit:*

*Event Horizon Telescope Collaboration*



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

Visit [nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov) to find local clubs, events, and more!

### **Solar Eclipses Are Coming!**

David Prosper

Have you ever witnessed a total solar eclipse? What about an annular solar eclipse? If not, then you are in luck if you live in North America: the next twelve months will see two solar eclipses darken the skies for observers in the continental United States, Mexico, and Canada!

Solar eclipse fans get a chance to witness an **annular eclipse** this fall. On **Saturday, October 14, 2023**, the Moon will move exactly in front of the Sun from the point of view of observers along a narrow strip of land stretching across the United States from Oregon to Texas and continuing on to Central and South America. Since the Moon will be at its furthest point in its orbit from Earth at that time (known as apogee), it won't completely block the Sun; instead, a dramatic "ring" effect will be seen as the bright edge of the Sun will be visible around the black silhouette of the Moon. The distinct appearance of this style of eclipse is why it's called an annular eclipse, as annular means ring-like. If you are standing under a tree or behind a screen you will see thousands of ring-like shadows projected everywhere during maximum eclipse, and the light may take on a wan note, but it won't actually get dark outside; it will be similar to the brightness of a cloudy day. This eclipse must only be observed with properly certified eclipse glasses, or other safe observation methods like pinhole projection or shielded solar telescopes. Even during the peak of the eclipse, the tiny bit of the Sun seen via the "ring" can damage your retinas and even blind you.

Just six months later, a dramatic total solar eclipse will darken the skies from Mexico to northeast Canada, casting its shadow across the USA in a strip approximately 124 miles (200 km) wide, on **Monday, April 8, 2024**. While protection must be worn to safely observe most of this eclipse, it's not needed to witness totality itself, the brief amount of time when the Moon blocks the entire surface of the Sun from view. And if you try to view totality through your eclipse viewer, you won't actually be able to see anything! The Moon's shadow will dramatically darken the skies into something resembling early evening, confusing animals and delighting human observers. You will even be able to see bright stars and planets - provided you are able to take your eyes off the majesty of the total eclipse! While the darkness and accompanying chilly breeze will be a thrill, the most spectacular observation of all will be the Sun's magnificent corona! Totality is the only time you can observe the corona, which is actually the beautiful outer fringes of the Sun's atmosphere. For observers in the middle of the path, they will get to experience the deepest portion of the eclipse, which will last over four minutes - twice as long as 2017's total solar eclipse over North America.

While some folks may be lucky enough to witness both eclipses in full – especially the residents of San Antonio, Texas, whose city lies at the crossroads of both paths – everyone off the paths of maximum eclipse can still catch sight of beautiful partial eclipses if the skies are clear. The Eclipse Ambassadors program is recruiting volunteers across the USA to prepare communities off the central paths in advance of this amazing cosmic ballet. Find more information and apply to share the excitement at [eclipseambassadors.org](https://eclipseambassadors.org).

*(Continued on [page 23](#))*



## NASA Night Sky Notes (continued)

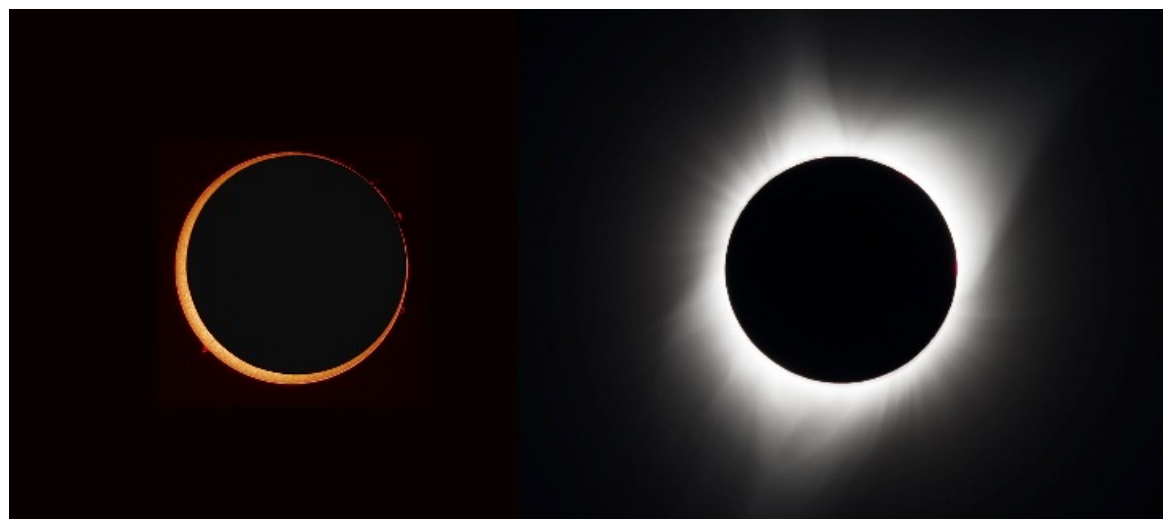
NASA has published a fantastic Solar Eclipse Safety Guide which can help you plan your viewing at [bit.ly/nasaclipsesafety](https://bit.ly/nasaclipsesafety). And you can find a large collection of solar eclipse resources, activities, visualizations, photos, and more from NASA at [solarsystem.nasa.gov/eclipses](https://solarsystem.nasa.gov/eclipses).



*This detailed solar eclipse map shows the paths of where and when the Moon's shadow will cross the USA for the upcoming 2023 annular solar eclipse and 2024 total solar eclipse, made using data compiled from multiple NASA missions. Where will you be? This map is very detailed, so if you would like to download a larger copy of the image, you can do so and find out more about its features at:*

<https://svs.gsfc.nasa.gov/5073>

*Credits: NASA/Scientific Visualization Studio/Michala Garrison; eclipse calculations by Ernie Wright, NASA Goddard Space Flight Center.*



*Photos of an annular total solar eclipse (left) and a total solar eclipse (right). Note that the annular eclipse is shown with a dark background, as it is only safe to view with protection – you can see how a small portion of the Sun is still visible as the ring around the Moon. On the right, you can see the Sun's wispy corona, visible only during totality itself, when the Moon completely – or*

*totally - hides the Sun from view. A total solar eclipse is only safe to view without protection during totality itself; it is absolutely necessary to protect your eyes throughout the rest of the eclipse!*

*Credits: Left, Annular Eclipse: Stefan Seip (Oct 3, 2005). Right, Total Eclipse, NASA/Aubrey Gemignani (August 21, 2017)*





**The Rosette Nebula (NGC 2244) in Monoceros**

by **Richard Kelsch**

Taken through a 105mm Astrophysics Traveller scope with an ATR3CMOS26000 OSC camera.





*left:*

**The Winter Night Sky  
at Death Valley, California**

**by Irene Walker**



*right:*

**Venus and the Moon on March 23, 2023,**

**by John Gauvreau**



**The Flaming Star Nebula (IC 405) in Auriga, by Alex Kepic**

Taken through an Explore Scientific ED102mm Triplet Essential scope with a ZWO ASI294MC Pro camera on a Celestron AVX mount. Exposures: 88 x 3 minutes; 264 minutes total.



*left:*

**At The Griffith Observatory  
in California**

**by Irene Walker**





**The Cone Nebula and Fox Fur Nebula (NGC 2264) in Monoceros**

**by Pavle Culum**

Taken through a SkyWatcher 190MN scope with an ASI533MC camera on a EQ6r Pro mount.  
Total exposure time: 6 hours.



# William J. McCallion Planetarium

McMASTER UNIVERSITY, HAMILTON, ONTARIO

- Public shows every Wednesday (7:00pm)
- Public transit available directly to McMaster campus
- Tickets \$7 per person; private group bookings \$150
- Different shows every week
- Upcoming shows include:
  - **Apr 5: Introductory Astronomy for Kids**  
– **Solar System**
  - **Apr 12: What Happened to the Sun?**
  - **Apr 26: What's Up in the May Sky?**
- **Masks strongly encouraged for duration of all shows.**
- For more details, visit  
[www.physics.mcmaster.ca/planetarium](http://www.physics.mcmaster.ca/planetarium)



## UPCOMING EVENTS

**April 14, 2023 - 7:30 pm** – H.A.A. Meeting at McMaster Innovation Park. Our speaker will be H.A.A member *Matthew Mannering*, who will talk about telescope maintenance. **This will be a “hybrid” meeting, with the attendance option of in-person or online via [Facebook](#) and [Zoom](#).**

**May 12, 2023 - 7:30 pm** – H.A.A. Meeting at McMaster Innovation Park.

### 2022-2023 Council

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

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

### The Harvey Garden HAA Portable Library



Contact Information

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