



Kevin M.
weather.sky.com

Event Horizon

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From The Editor

The year 2025 was another banner year for astronomical events – comets, the northern lights, and a lunar eclipse!

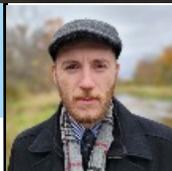
Here's looking forward to 2026!

Happy Holidays, and Clear Skies!

Bob Christmas,

Editor

editor 'AT' amateurastronomy.org



Chair's Report by Kevin Salwach

Hey all, Merry Christmas! What a year 2025 has been, but we are now in the final stretch. As promised, I will keep my EH Report brief from here on out.

Our Loaner Scope Program is finally full back up and running. We currently have 3 8" Dobs and an 8" SCT available for borrowing - email Jeff Parsons at loanerscope@amateurastronomy.org if you want to borrow one of these great scopes to take for a ride around the sky for a couple of months!

Our Communications Team Director, Paula Owen, is hard at work with her team updating our digital platforms, revamping our website, and ironing out whatever issues they have found with our hosting services. A big thanks to them for all the work they are putting in

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Chair's Report (continued)

to make the behind-the-scenes tech run smoothly. Anticipate a brand-new look for our club website in the coming months.

Our Education Team Director, Jo Ann Salci, has also been hard at work giving various public outreach presentations to different groups around the Hamilton area, and has a few more events in the coming weeks. Keep an eye out in January for an exciting announcement about an outreach project she has been working on!

Our Members Services Director position is still vacant - this is a voting position on council. I mentioned it at our November meeting, and will send out more information on this position in my monthly email in the first few days of December, but if you are interesting in volunteering, please reach out to me at chair@amateurastronomy.org.

I am happy to announce that we are fully paid up with BIG Charity Law. Due to a misquote on the original cost of incorporation, BIG Charity Law compensated us the second half of our anticipated payment for their fees, meaning the incorporation process is complete, and our balance to them is paid with nothing outstanding.

Council is currently looking at different quotes for director's and officer's insurance for the club - I will give a full explanation about its purpose in my monthly email, and will present the quotes to membership at our January meeting before a decision is made.

Skip down to my Sky This Month article below for an update on our public observing program.

Finally, don't forget our *December monthly meeting* and annual *Christmas Social* will be Friday, December 12th at St. Matthew's, beginning at 7:30PM. Our guest speaker is *Dr. John E. Moores* from York University, presenting to us an overview of his new book, *Daydreaming in the Solar System*, a full description of Dr. Moores' talk can be found on our website. After his presentation, we will have door prizes (6 books in total this month - since I forgot to bring them last month!), as well as a telescope raffle. The telescope is a Celestron StarSense Explorer LT80 Refractor - the club acquired it without its smartphone mount or software, but otherwise it is in new condition - meaning it is a manual alt-az refractor, great for beginners in the hobby or a great project scope for a more advanced member to deck out for astrophotography. Afterwards will be our Christmas Social, where members can enjoy coffee and snacks and chat and talk for the rest of the evening. Feel free to bring some snacks to share with everyone, it would be greatly appreciated. The Christmas Social is always a great time!

That's all from me for this month, keep an eye out in your emails for updates, and keep an eye out on those winter skies, hopefully Santa will finally bring us a stretch of clear skies after the lacklustre month that was November!

Clear Skies,

Kevin Salwach

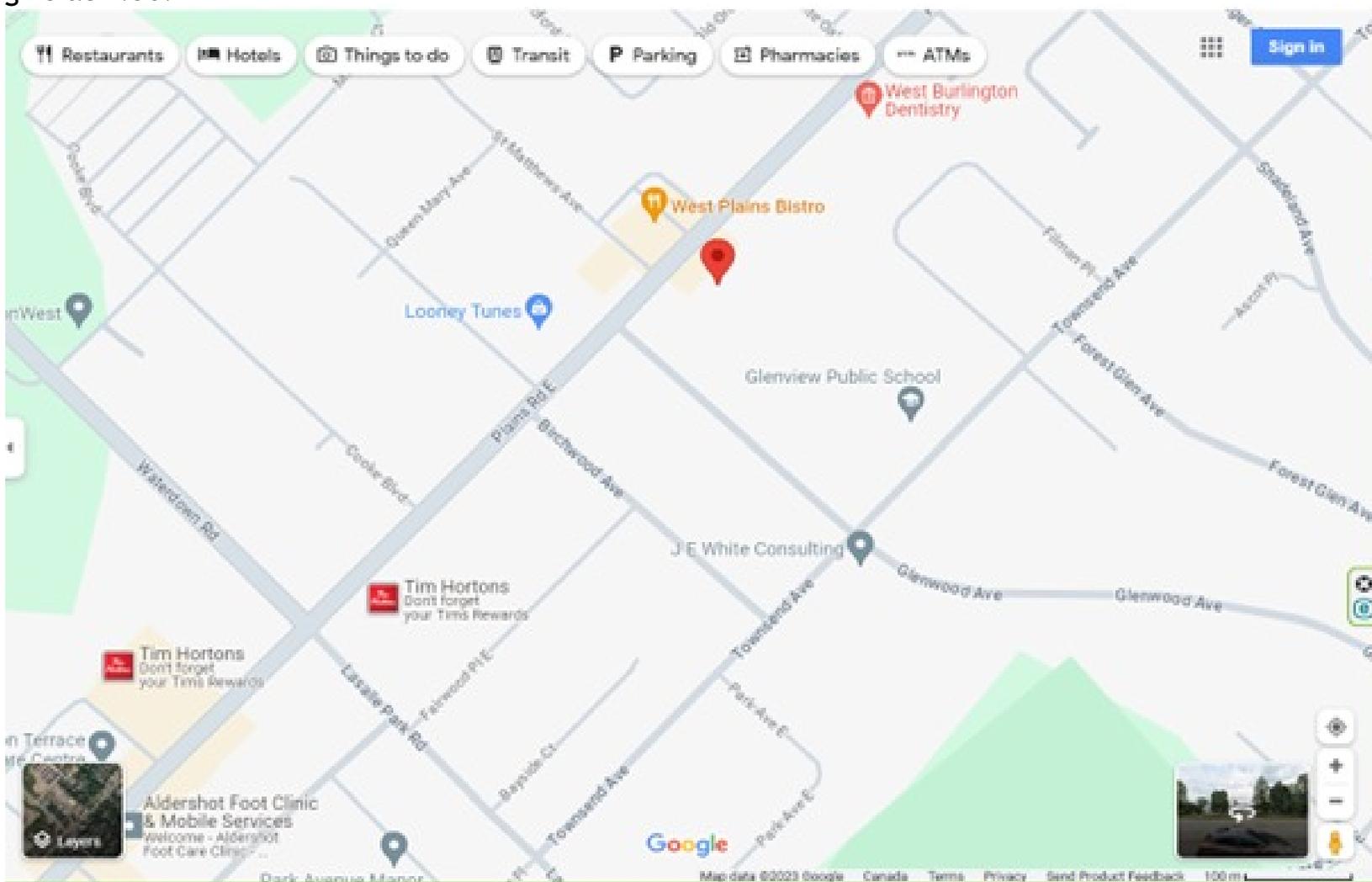
Masthead Photo: *NGC 7023, the Iris Nebula, by Kerry-Ann Lecky Hepburn.*

Taken with an Astrotech 8" RC scope with an SBIG 8300 Mono camera on a Sky-Watcher EQ6 mount.

Exposures and integration times: Luminance: 102 × 10 min = 17hrs; Red: 18 × 10 min = 3hrs;
Green: 22 × 10 min = 3.6hrs; Blue: 21 × 10 min = 3.5 hrs.

Meeting Location

Our upcoming meeting is scheduled for *December 12th, 2025*, at St. Matthew on-the-Plains Anglican Church. St. Matthew's is located at 126 Plains Road East, Burlington, Ontario. Doors open at 7:00 and the meeting begins at 7:30.

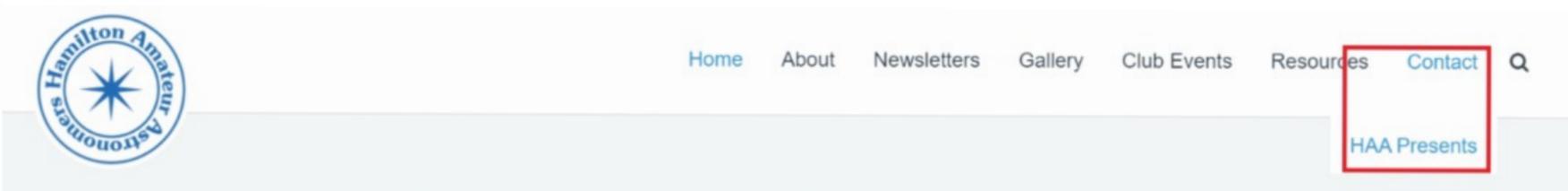


*St Matthew on-the-Plains Anglican Church (indicated with red locator)
Image generated using Google Maps*

“HAA Presents”

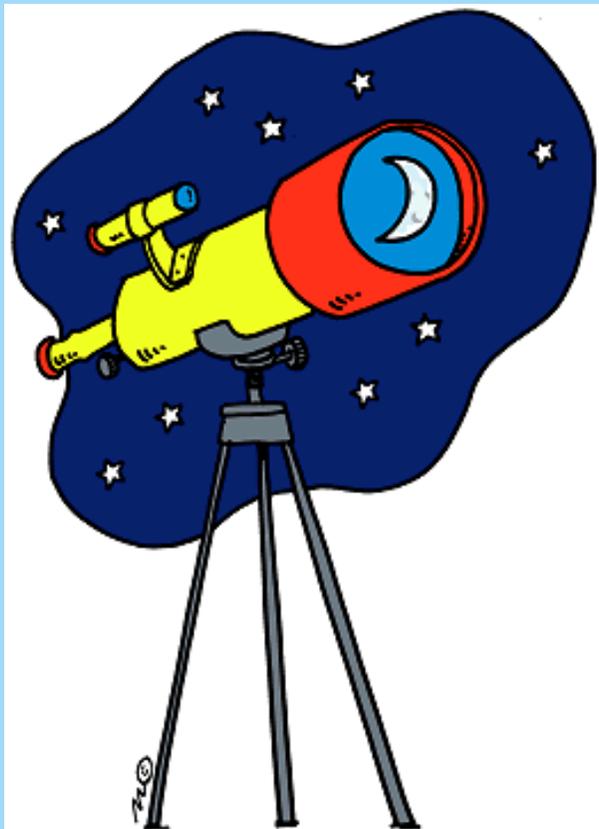
Members of the public of any age in the GTHA can now request an in-person or virtual presentation from the HAA directly on our website.

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.



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.

HAA's Loaner Scope Program



The HAA Loaner Scope Program is back!

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, as well as various accessories, including various eyepieces.

Please visit the HAA website for more information:

<https://amateurastronomy.org/telescope-loaner-program/>

If you are interested in borrowing a scope, please contact Jeff Parsons at

loanerscope@amateurastronomy.org.

Telescopes are loaned out on a first come basis.

HAA Helps Hamilton

The H.A.A. is 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.



2025-2026 Event Dates

Friday Dec. 12, 2025	Monthly Meeting Seasonal Social Speaker: John Moores, author of <i>Daydreaming in the Solar System</i>	St. Matthew on-the-Plains Anglican Church, 126 Plains Rd, Burlington
Friday Jan. 9, 2026	Monthly Meeting Speaker: Akbar Ahmed Chowdhury	St. Matthew on-the-Plains Anglican Church, 126 Plains Rd, Burlington
Friday Feb. 13, 2026	Monthly Meeting Speaker: Keith Momberquette: Astrophotography	St. Matthew on-the-Plains Anglican Church, 126 Plains Rd, Burlington
Saturday Feb. 14, 2026	Telescope Clinic/ Kids Workshop: Tentative	Valley Park Library, Stoney Creek
Friday Mar. 13, 2026	Monthly Meeting Speaker: TBD	St. Matthew on-the-Plains Anglican Church, 126 Plains Rd, Burlington
Friday Apr. 10, 2026	Monthly Meeting Speaker: TBD	St. Matthew on-the-Plains Anglican Church, 126 Plains Rd, Burlington
Friday May 8, 2026	Monthly Meeting Speaker: TBD	St. Matthew on-the-Plains Anglican Church, 126 Plains Rd, Burlington
Friday Jun. 12 2026	Monthly Meeting Speaker: TBD	St. Matthew on-the-Plains Anglican Church, 126 Plains Rd, Burlington

HAA Outreach Presentations with Vulnerable Sectors

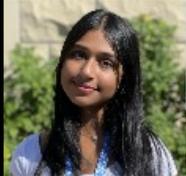
The HAA executive has created a policy for any HAA member who wishes to do outreach presentations to vulnerable sectors, which includes children under 18 years of age and vulnerable adults. This does not include our general club outreach activities.

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!



****IMPORTANT**:** read until the end to find out how YOU can contribute to next month's edition!

Welcome to another edition of HAA Explorers 2.0! This month, we are exploring how engineering shapes our understanding of the universe. From telescopes to rovers, astronomy depends on engineering to create innovative solutions.

FUN FACT: The James Webb Space Telescope's mirrors are coated with gold because it reflects infrared light extremely well!

How Engineering is Used in Astronomy

1. Telescopes and Optics

Every telescope, whether on Earth or in space, is a result of the brilliant mind of an engineer. Engineers design mirrors that stay perfectly shaped, even in extreme temperatures, create lenses that focus faint light from distant stars. They develop optic systems that can adapt to atmospheric turbulence.

2. Spacecraft and Rovers

Robotics engineers design rovers that can survive dust storms, radiation, and freezing nights on different planets. Mechanical engineers build wheels, suspension systems, drills, and robotic arms. Electrical engineers design solar panels, batteries, and communication systems that send data from millions of kilometers away.

3. Software and Data Engineering

Astronomical efforts produce massive amounts of data. Often, these amounts are too large for humans to analyze on our own. Software engineers write programs that control telescopes, process images, identify exoplanets, and use machine learning to detect patterns in the cosmos. When we identify patterns, we are able to further understand how the universe works and possibly predict future occurrences.

4. Precision Instruments

Devices like spectrometers, detectors, and specialized sensors allow astronomers to measure the chemical composition of stars, galaxies, and the atmosphere. Engineers design these instruments with extreme precision, often measuring tiny differences in light or vibration.

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Careers That Combine Engineering and Astronomy

Are you fascinated by the intersections of engineering and astronomy? Read about careers in engineering to find out which one is suited for you!

1. Aerospace Engineer

- Designs rockets, satellites, and space probes. Works on propulsion, aerodynamics, or spacecraft structure (this one piques my interest the most!)

2. Mechanical or Electrical Engineer

- Builds the mechanical systems and electronics used in telescopes, rovers, and spacecraft.

3. Software Engineer

- Creates the software that controls instruments, processes telescope images, or runs simulations of planets and galaxies.

4. Astronomical Engineer

- A specialized type of engineer focused on designing and building tools for astronomers (like telescope optics, mount designs, and space instruments).

How you can become an engineer at home:

If you're like me, you can't wait until you can finally engineer your own astronomical creations. Here are some experiments you can conduct at home:

1. LEGO Robotics Kits

You might be able to find robotics kits or LEGO sets that allow you to engineer your own creations. To start, try building your own rover using LEGO pieces. You can add motors and use the design to mimic how real Mars rovers move!

2. Coding

Coding is a wonderful hobby to begin at any age. Software engineers write code for fascinating devices, from telescopes to rovers. If you've never coded before, a great introduction is the website scratch.mit.edu. Scratch allows you to use blocks to make your own code in a simplified way that is great for beginners. You can make games, stories, and so much more. Here are some ideas:

1. Solar system model in which planets orbit around the Sun in circles.
2. Moon phases simulator that shows how the Moon changes shape as it orbits Earth.
3. Mars rover simulator that allows users to drive a rover across the Martian surface collecting samples.
4. Space quiz game, asking astronomy questions to get coins.
5. Exoplanet finder game.

Now that I've given you the ideas, it's up to you to use the blocks in Scratch to make them come to life. Even if you don't want to be an engineer, I highly recommend using Scratch at any age. It is so much fun and teaches you so much! Once you're comfortable with Scratch, you can move on to learning more advanced languages, like Python.

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3. DIY Projects

Here are some projects you can build with cardboard:

- Build a cardboard spectroscope: lets you see the spectrum of different light sources
- Make a pinhole camera: helps you understand how telescopes focus light

If you have access to an Arduino or similar microcontroller:

- Build a mini weather station (like NASA uses on Mars)
- Make a simple star tracker that follows a light source
- Experiment with ultrasonic distance sensors to simulate rover navigation

Have fun!

DO YOU WANT TO CONTRIBUTE TO NEXT MONTH'S ISSUE?

We are looking for your input! If you have any astronomy related questions that you would like answered or any ideas that you would like us to write about, email us at education@amateurastronomy.org.

If you try any of the projects listed in this article or previous articles, email us at education@amateurastronomy.org with an image and you will be featured in next month's article!

****Note that all images must be appropriate and approved by our team before featuring!***

That's all for this month's issue! Engineering is truly a fascinating field that we can all learn from. It helps our everyday lives and fuels our constant pursuit for more knowledge about the universe. Next month, we'll dive more into opportunities to build your own creations at home. Thanks for reading.



Image Courtesy of www.educations.com



The Sky This Month for December 2025 by Kevin Salwach

We're on to the final stretch of fall, before we begin winter on the Solstice later this month - the cold weather is arriving, and December presents us the shortest days of the year. That's bad for pretty much everything else, but great for stargazing! As the Sun sets early and rises late, we have plenty of opportunity this month to see a whole host of interesting objects and events in the night sky. Before I get into what's happening this month, let me quickly give an update as Observing Team Director about upcoming projects.

As I have mentioned before, I would like to see the HAA get back to engaging in a lot more sidewalk astronomy and public observing like we used to way back before COVID. I have put out a call for volunteers to come on board the "Public Observing Team" - and so far, Robert Smoke and Gary Sutton have both come forward - two extremely capable and knowledgeable members who both love their public outreach. The three of us will sit down soon and map out a calendar for public events for 2026; sidewalk astronomy at various locations around Hamilton, where club members come out, set up their equipment at a park or local area, and show the public the Moon and planets, more often than not for their very first time. Some of my best memories in the club are the shouts of "WOW!" and "HOLY SMOKES!" from people who got their very first few of Saturn or the Moon through a telescope - it's how many of us ourselves first got into the hobby. The duties are simple - we plan out good viewing nights a couple months in advance, find a suitable location, and at least one of us confirms "yep, I'll be there", and then we head out, set up our scopes, and show people the wonders of the universe. Naturally, many other club members end up attending these events, but I want a set group of people to make sure we always have coverage and no events get cancelled. Events will all be held within the Hamilton area. If you are interested in joining the team, email me at observing@amateurastronomy.org.

As it is winter and people generally don't like standing around in -15-degree weather for too long, our first event will be held in the spring. We are planning some public outreach for International Astronomy Day on Saturday, April 25th. The location is still TBD as we are several months out, but mark it down in your calendars.

Now onto the night sky.

Starting off with the naked eye sky to the west on our meeting night (December 12th), we see the last summer constellations and most of the fall constellations heading down under the horizon. The Summer Triangle has set, and Pegasus, Aquarius and Pisces are all sinking very low by 9:00PM. After midnight, all the fall constellations are straddling the horizon. Up at zenith, Andromeda and Perseus sit directly above you, surrounded by Cassiopeia, Taurus, and the back end of Pegasus. There are plenty of really bright, beautiful objects in this area of the sky to see, and as we all know, directly up above is the best position to view them, as you are looking up through less atmosphere than you would be looking across towards the horizon. Take advantage of this positioning to see the Andromeda Galaxy, Triangulum Galaxy, and the Milky Way open clusters in Perseus and Cassiopeia at their best. Down east, we have the winter Milky Way rising right after sunset, with the Winter Triangle fully above the horizon by 9:00PM. Another area packed full of great objects, Orion, Auriga, Gemini and Canis Major rise higher and higher as the night progresses. Over in the north, the Big Dipper is making its way up from under the North Star, while the first signs of the spring constellations Cancer and Leo are peeking up in the northeast.

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The Sky This Month for December 2025 (continued)



The night sky looking west at 9:00PM on Friday, December 12th. Images generated using Stellarium



*The night sky looking towards zenith at 9:00PM on Friday, December 12th
(Continued on [page 11](#))*

The Sky This Month for December 2025 (continued)



The night sky looking east at 9:00PM on Friday, December 12th. Image generated using Stellarium

The Moon

The Moon this month begins at Full on the 4th, with Last Quarter on the 11th, New Moon on the 20th and First Quarter on the 27th. The whole week from the 14th to the 21st will be your moonless skies this month.

See the daily moon phase chart for December at the top of the next page.

Some notable Lunar events in December:

- (!!!) The Moon passes directly over The Pleiades on the 3rd, occulting the star cluster from about 8:00 until 11:00PM - Stellarium for whatever reason does not generate great images of The Pleiades, but this is one you don't want to miss
- The Moon passes within a half a degree of Regulus at 1:00AM on the 10th
- A couple degrees away from Spica in the early morning sky on the 14th
- A couple degrees away from Saturn and Neptune in the evening sky on the 26th

The Planets

Moving out to our planets. **Mercury** reaches its greatest elongation on the morning of the 7th, before turning back towards the Sun. It is visible as an early morning object until about Christmas Day. By the beginning of the month, **Venus** has moved too close to the Sun for any good observing. It won't be visible again until it becomes an evening object in March. **Mars** is also too close to the Sun this month, and won't be visible again for quite some time. **Jupiter** however, rises by 9:00 at the beginning of December, and

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The Sky This Month for December 2025 (continued)



The Moon Phases for December 2025

earlier and earlier as the month goes on. All month long it will be visible high in Gemini until sunrise. It's a great month for the King of Planets, so make sure to take a peek at its gaseous bands and Galilean moons. **Saturn** is visible right after sunset in Aquarius all month long, though it is starting to move lower as we enter the new year. Still you have all month long to get several hours opportunity to see its razor thin rings and collection of moons dancing around its sphere. **Uranus** is visible all night long in Taurus, while **Neptune** still trails very close behind Saturn in Aquarius.

Meteor Shower

The *Geminid meteor shower* peaks on the nights of the 13th-14th. Both nights are moonless until about 5AM, meaning that under dark skies, you can expect to see anywhere from 80-120 meteors per hour, on par with, if not better than the summer Perseids.

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The Sky This Month for December 2025 (continued)



The Moon, Saturn and Neptune in Pisces/Aquarius on the night of the 26th at 10:00PM

Deep Sky Objects

Now to end off with our deep sky - last month I listed off a whole slew of very challenging and hard to see objects straddling the horizon in the obscure fall constellations. This month I will pivot back towards some easier objects for our new or beginner members. I think from here on out I will rotate each month - easy and bright, challenging and dim, well placed and picturesque, difficult to find and a faint fuzzy, etc. etc.

Of course December is prime time for the winter Milky Way, and the famous constellations of Gemini, Taurus, Orion and Auriga. There is so much to see in this area, I will simply throw out a list of great, bright, beautiful beginner objects you can see in any telescope, and many you can even see with just binoculars:

M36/M37/M38 - This line of bright, magnitude 5.6-6.4 open clusters in Auriga is a crown jewel of the winter sky. Big and easy to find cutting through the heart of the constellation, they are each, in their own right, some of the night sky's finest clusters.

M1 - The Crab Nebula - this supernova remnant just off Tianguan (the lower "horn" of Taurus) is bright at magnitude 8.4, though sometimes a little trickier to find. Nonetheless, with a large aperture scope, you can see some of the wispy filaments and the shape which gives the cluster its name.

M35 - The Shoe Buckle Cluster - at magnitude 5.1 this is one of the brightest open clusters in the entire night sky. Just off of Castor's "shoe", it is a big, bright, dense open cluster easily seen in any instrument, almost overlapping with the smaller but great open cluster NGC 2158 a few arc minutes away.

M42/M43 - The Orion Nebula - perhaps the most famous object in the entire sky, at magnitude 4.0 this emission nebula is visible to the naked eye, and in any scope presents a stunning view, with bright clouds of gas and dust intersecting and overlapping, creating the most picturesque and easy to find deep sky object for a beginner stargazer.

(Continued on [page 14](#))

The Sky This Month for December 2025 (continued)

NGC 2392 - a more challenging object but still easily obtainable for a novice, this magnitude 9.6 planetary nebula in Gemini first looks like a small, faint star at first glance. Crank up the magnification however, and you will see its inner and outer rings, and perhaps even some of the shape in the core of the nebula resembling a person wearing a big fur hood.

Some other great objects of note in this area of the sky:

- M50, open cluster (mag 5.9)
- NGC 2281, open cluster (mag 5.6)
- NGC 1817/1807 - open cluster pair (mag 7/7.7)
- NGC 1647 - open cluster (mag 6.4)
- M78 - reflection nebula (mag 8.0)

Challenge Object: NGC 2244 / C50 - The Rosette Nebula

Long a favorite of astrophotographers, this large, bright emission nebula is notoriously difficult to see visually. Located in Monoceros, the cluster part of the nebulous region - NGC 2244, is quite easy to find. The nebulosity, however, will require very clear, dark skies, a wide field eyepiece, and preferably an O-III or UHC filter to pick out. It won't look like the photos, but with a good setup, a good eyepiece, the right filters and the right skies, you might just be able to see its faint, wispy annular structure and shape which gives it its name.



*The Rosette Nebula
through an 8" Dob with a
UHC filter at 32x,
courtesy of Michael
Vlasov at
DeepSkyWatch.com*

Rosette Nebula sketch

Michael Vlasov - deepskywatch.com



The Globular Cluster M15 in Pegasus, by Alex Kepic
Imaged through a Celestron C8 XLT with a ZWO ASI294MC Pro camera on an AM5 mount.



The Andromeda Galaxy (M31), by Chris White



The Sky in September 2025, by Chris White



The Galaxies M81 and M82 in Ursa Major, by Chris Szaban
Imaged with a Celestron NexStar 6SE and ASI2600MC Pro camera.
71 x 180s = 3 hours, 33 minutes total integration time.



Polaris and the surrounding 'Flare' Integrated Flux Nebula, by Chris Szaban
Imaged with a Rokinon 135mm lens and ASI2600MC Pro camera.
43 x 180s = 2 hours, 9 minutes total integration time.



The Helix Nebula (NGC 7293) in Aquarius, by Bob Christmas
Imaged with a ZWO Seestar S50 imager, in EQ mode. 90 x 10s = 15 minutes total integration time.



Comet C/2025 A6 (Lemmon), by Kerry-Ann Lecky Hepburn

Taken with an Astrotech 8in RC scope with an SBIG 8300 Mono camera on a Sky-Watcher EQ6 mount.
1 min subs 16 frames per channel (total time elapsed 1 hr)



William J. McCallion
Planetarium

McMASTER UNIVERSITY, HAMILTON, ONTARIO

- **Public transit available directly to McMaster campus**
- **Tickets \$10 per person; private group shows \$169.50**
- **Upcoming shows:**

– **Dec 3 - 7pm & 8:15pm: Festive Skies**

– **Dec 10 - 7pm & 8:15pm: Festive Skies**

- **For show times and further details, visit**
www.physics.mcmaster.ca/planetarium

UPCOMING EVENTS

December 12, 2025 - 7:30 pm – H.A.A. Meeting at St. Matthew’s Anglican Church. This will be our December “Seasonal Social”. Our main speaker will be *Dr. John E. Moores* from York University, author of *Daydreaming in the Solar System*. **There is the option of attending online via [Zoom](#)**. Past meetings can be viewed on our [YouTube](#) channel.

January 9, 2026 - 7:30 pm – H.A.A. Meeting at St. Matthew’s Anglican Church.

2025-2026 Council

Check out the H.A.A. [Website](http://www.amateurastronomy.org)
www.amateurastronomy.org

Follow us!



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Education Team Director	Jo Ann Salci
Observing Team Director	Kevin Salwach

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