



Event Horizon

Volume 27, Number 3
January 2020



From The Editor

Happy New Year,
everybody.

Here's the January
2020 E.H. This
month's 12-page
edition is a shorty,
but a goody.

Happy Reading!

*Bob Christmas,
Editor*

*editor 'AT'
amateurastronomy.org*



Chair's Report by John Gauvreau

A very Happy New Year to all! I hope that 2020 sees days of health and happiness for all.

My year has started out a little under the weather. I missed the December council meeting because of the flu, and went on to miss quite a bit of work and other festivities of the season. Missing council was disappointing since we always enjoy a meal together before the December meeting each year. I heard that the pot luck approach this year yielded a particularly fine spread for all to enjoy. Since the flu laid me out I have recovered somewhat, even getting out for a walk in the park with the dog on some days. I don't think I have missed many observing opportunities because the weather has not seemed too cooperative, but once back on my feet I look forward to getting out once again

January Meeting

First, I can't say enough good things about our last meeting. Our speaker, Kevin Salwach, was as entertaining as ever, and Matthew Mannering's triumphant return as Observing Director was filled with humour; the room was filled with laughter.

(Continued on [page 2](#))

IN THIS ISSUE:

- The Sky This Month for January 2020
- Astrophysics Group Update
- A Night Under The Stars - Finally!

- NASA Night Sky Notes
- Eye Candy
- Upcoming McCallion Planetarium Shows
- Upcoming Events
- Contact Information

Chair's Report (continued)

Thank you to both for such a good program. Perhaps the biggest thanks though goes to Sue McLaughlan who organized our Christmas social. Our extended break was filled with good company, good conversation and very good treats! Thanks to everyone who brought goodies to share.

This month, we have had a speaker step away at the last minute but there are a couple of members already eager to bring in some newly acquired astro gear to show and tell. If you are interested in participating please get in touch. Everyone is welcome to join in! It will be a fun night with a variety of interesting items to see and stories to hear.

Also, there are just a handful of our beautiful wall calendars left and this meeting will be your last chance to purchase one.

Library

Our new room is working well and Denise White has found a home for the library. As you walk in, you will find her set up along the wall to your right. Be sure to stop by and check out a book.

As always, feel free to get in touch (council emails are on the last page of the newsletter) and see you out there.

H.A.A.'s Loaner Scope Program



We at the HAA are proud of our Loaner Scope Program.

If you don't have a telescope of your own and want to make use of one for a month or so, you can borrow one of our fine loaner scopes.

Please contact Jim Wamsley, at:
905-627-4323
or e-mail Jim at:
[secondchair 'AT' amateurastronomy.org](mailto:secondchair@amateurastronomy.org)

and we'll gladly get one signed out for you.

HAA Helps Hamilton



To support our community, we collect non-perishable food items and cash for local food banks at our general meetings.

Please bring a non-perishable food item to the meeting or a donation of cash and help us help others.

Our donations go to [Hamilton Food Share](https://www.hamiltonfoodshare.ca/), which delivers them to various food banks around the Hamilton area.

If you would like to help or have any questions about this initiative, please contact the H.A.A.



Masthead Photo: *The Orion Nebula (M42) and the Running Man Nebula in Orion, by Mike Hamilton.*

This is about 3 hours integration with an Explore Scientific ED102 and Celestron AXV.



The Sky This Month for January 2020 by Matthew Mannering

January has a lot to offer for amateur astronomers. Orion, Taurus, Auriga and Gemini are nicely placed in the south east by 6:30pm. They are followed by Canis Major, Lepus and Cancer by 10pm. Showcased all evening in the north are Cepheus, Cassiopeia, Andromeda and Triangulum.

The Big Dipper is a great asterism to watch over an evening as it starts out almost level with the horizon at 6pm and moves into a vertical position by 11pm. This is a great visual indicator of the rotation of the Earth. It also allows you to prove to yourself that no matter what orientation the Big Dipper has in the sky, it always points to Polaris the north star.

Hunting targets in the cold of winter is a challenge. You have to wait for your scope to cool down to the ambient temperature and of course while that is happening, your fingers and toes are trying to reach the same temperature. Overdress for winter viewing as it is always colder while just standing around.

I prefer a smaller telescope in the winter as the glass will cool down faster than a big Dob or SCT and you can start observing much sooner. In these conditions binoculars are your best friend. Assuming you have a list of targets for the night, use the binoculars to find them while the scope is cooling. Once the scope has cooled, spend your time at the scope looking at the targets rather than trying to find them.

Most observing time is spent looking at the nebulae and open clusters of the winter sky. I like to look at some of the double stars that are available at this time of year including the holy grail of double stars, the white dwarf *Sirius B* aka 'The Pup'. The Pup is usually very difficult to see due to both its proximity to Sirius and the vast differences in brightness between the two. However, the Pup is currently close to its furthest point in its orbit from Sirius and can be found in most scopes. The Pup is a white dwarf that is smaller than the Earth and is 10,000 times dimmer than Sirius. On average, the Pup is about as far from Sirius as Uranus is from the Sun. So at 8.6 light years away you are seeing an object smaller than the Earth in an orbit that would easily fit into our solar system.



Last year I saw Sirius B for the first time along with Denise, Chris and Les. We were using Les' 130mm refractor at around 250x magnification on a goto mount. The trick is to move Sirius just out of the field of view to get rid of most of the glare and then look for the Pup. If you are using a Dob, put Sirius in the field of view and then let it drift out of view. The Pup should be visible without moving the scope once Sirius has left the field of view. I have included this image of Sirius A and B as well as a graphic of the orbit of B at the top of the next page.

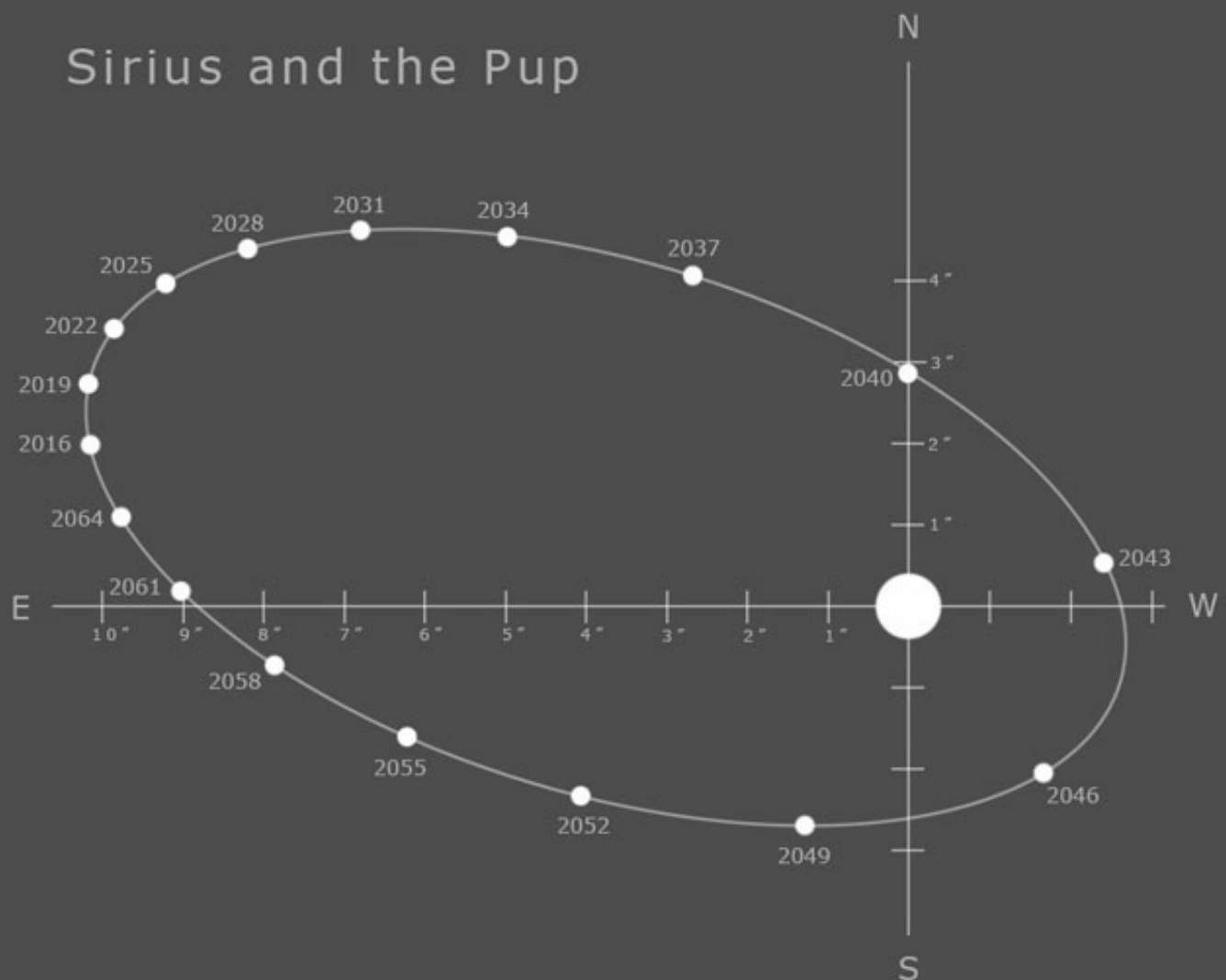
(Continued on [page 4](#))

Sirius A and B

Image Credit: Gabriela and Fabio Carvalho

The Sky This Month for January 2020 (continued)

Sirius and the Pup

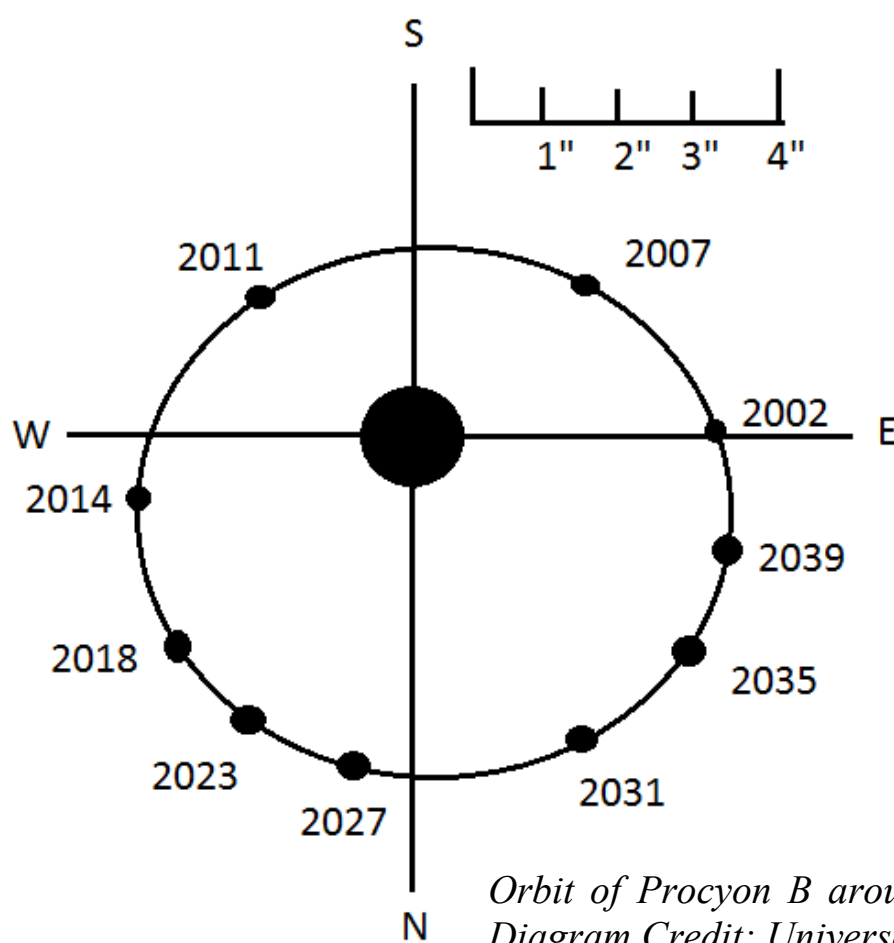


Orbit of Sirius B around Sirius A

Diagram Credit: Jerry Lodriguss

Another worthwhile double star is *Rigel* in the constellation of Orion. This one is a little easier than the Pup but still requires a steady atmosphere and lots of magnification. The difference is that you can see

Rigel and Rigel B in the same field of view. If you are using a Dob, make sure that Rigel B isn't hiding behind a diffraction spike. If so, just wait an hour and the apparent angle between the two stars will change and Rigel B should be visible. Let's just say that in this particular situation I speak from experience.



Orbit of Procyon B around Procyon A
Diagram Credit: UniverseToday.com

A more difficult target is *Procyon B*, another white dwarf. This chart shows that the dwarf star never moves very far from Procyon. Currently the separation is about 4 arc seconds. If you can't see Procyon B visually, then try taking a photo of Procyon being very careful not to overexpose the image. Remember, the longer the exposure, the larger the halo around Procyon. The halo can overwhelm the white dwarf and render it invisible.

(Continued on [page 5](#))

The Sky This Month for January 2020 (continued)

You may have heard that the star *Betelgeuse* has recently dimmed significantly. Betelgeuse is a variable star in Orion that has dropped a whole magnitude of brightness (2.5 times dimmer) in the last month or so. Take some time to compare the brightness of Betelgeuse to some of the other stars in Orion. Normally, Betelgeuse is the second brightest star in Orion. Now it appears to be only slightly brighter than *Bellatrix*, the third brightest star.

Other events for January are:

- 4th - The Quadrantid meteor shower peaks.
- 20th - The Moon, Mars and Antares make a nice grouping low in the east at 6am.
- 27th - Venus only 11 arc minutes (about a fifth of a degree) from Neptune at 6:30pm in the south west.

The Moon

Libration this month is as follows: The northern limb will be most exposed on the 3rd and 30th. The southern limb is most exposed on the 16th. The western limb will be most exposed on the 8th and the eastern limb on the 21st. Try taking a few images of the Moon at these times and look on a Moon map to identify craters that are normally hidden from Earth behind the curve of the Moon.

The phases of the Moon for December occur as follows: first quarter Moon on the 2nd, full Moon on the 10th, last quarter on the 17th and new Moon on the 24th.

The Planets

- *Mercury* appears very low in the western evening sky at the end of the month.
- *Venus* shines brightly in the western evening sky all month.
- *Mars* sits about 20 degrees above horizon in the south east all month.
- *Jupiter* sits very low in the eastern dawn sky at the end of the month.
- *Saturn* isn't visible this month.
- *Uranus* in Aries and *Neptune* in Aquarius are well placed in the evening sky all month.



Astrophysics Group Update by Mike Jefferson

There has been **NO Astrophysics Meeting** scheduled for December of 2019.

The next one is on **January 17, 2020**, at Doug Black's home, on Markland Street in Hamilton.

Be sure to consult the HAA website and "Event Horizon" for updates, confirmations and any changes before that date.



A Night Under The Stars - Finally! by Mike Jefferson

I am one given to checking the condition of the night sky by looking through a window to see if it is worth going out to observe and/or to pull down some spectra from the heavens above. If it looks at all good, I will take the Unihedron Sky Quality instrument (courtesy of Anthony Tekatch and Doug Welch) and check for good sky conditions at about the 17, 18 reading. If I get this kind of reading, or better (ie. 20, 21! Am I dreaming?), I will go out with a visual instrument or a camera and spectroscope and commence my enjoyment and study.

This past Christmas Eve 4:00 AM was such a night!

I woke up at about 3:30 AM, stepped out the front door and couldn't believe it! It was the best I had seen in weeks of waiting for it. The outdoor temperature was -1 degree C. I went to the family room and gathered up the Hensoldt 8X56, donned a heavy coat, toque and gloves and went out the front door into the light-polluted skies of "Suburbia". I do have dark spots on the property where I can hide from street lights and over-illuminated houses, and just enjoy. To the unaided eye, it looked fairly reasonable, but in the binocular there were starry and nebulous backgrounds to the south, west, east and on the zenith. Lower to the ground (where you don't want to be observing anyway) it was foggy. I did not make a list of things observed as I was just glad to be able to do this! However, I did see the Big Dipper, Polaris, a bit of the Little Dipper, Sirius (was a jewel!), the setting Orion, nebulosity and star fields galore in the south. If the sky looked foggy naked-eye, the binocular told a completely different story.

What has become apparent to me over the last 3 ½ years of sky-checking is how quickly and drastically our night skies are deteriorating actually before our eyes. Before dinner last night, I checked and found clear skies with the setting sun. After dinner, the clouds had moved in, which is what happens every night, with regularity - sadly. Our once-clear skies are becoming polluted with sub-micron sized particles from forest fires, high winds, jet planes, automobiles, rocket launches, etc. They are about 0.35 microns in size and they become the nuclei for water in the upper atmosphere. These droplets get heated by the sun during the day and become quite dissipated, and so we have a nice 'clear', blue sky. At night, they become 'a fog' with water condensed on these particles, which just destroys astronomical observing. About 5:00 AM the following morning, another 'fog' blew back over our GHA skies. Therefore, going anywhere else to observe is almost sinful because of the pollution it causes. So, is it better to stay home to observe? And yet our neighbourhoods are light-polluted because of the insistence of 'uneducated' people who want more street-lighting and outdoor lighting to scare away the 'boogey-men'. Coupled with this is Elon Musk's purported Internet communications satellite network, marching across the sky, creating funding for his very unlikely trip to Mars (for a very long time) and trashing data collection by professional astronomers - a classic astronomical 'white elephant' if ever there was one. We, astronomers, just cannot win against the climate and the antics of a professional, corn-pone con man.

The situation is such now that I do not know what we can do to get some relatively immediate solutions, if they ever come at all. Perhaps, if we battle light-pollution first, we may be able to get other members of the community onside and show them how light pollution is created and how it can be fought. The second step would be to go after global-warming-causes themselves and see how much we can influence that. In both cases, public education is a huge help and we need to exploit it in various, attractive and aggressive ways. We need to start now because we have very little time left in this endeavour, before astronomy becomes a fossil, like Latin, Greek and the Classics. If you cannot see the sky, you cannot do astronomy - PERIOD!



This article is distributed by NASA Night Sky Network.

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach.

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

Spot the Young Stars of the Hyades and Pleiades

By David Prosper

Orion is the last of a trio of striking star patterns to rise during the late fall and early winter months, preceded by the diminutive Pleiades and larger Hyades in Taurus. All three are easily spotted rising in the east in early January evenings, and are textbook examples of stars in different stages of development.

As discussed in last month's Notes, the famous Orion Nebula (M42), found in Orion's "Sword," is a celestial nursery full of newly-born "baby stars" and still-incubating "protostars," surrounded by the gas from which they were born. Next to Orion we find the Hyades, in Taurus, with their distinctive "V" shape. The Hyades are young but mature stars, hundreds of millions of years old and widely dispersed. Imagine them as "young adult" stars venturing out from their hometown into their new galactic apartments. Bright orange Aldebaran stands out in this group, but is not actually a member; it just happens to be in between us and the Hyades. Traveling from Orion to the Hyades we then find the small, almost dipper-shaped Pleiades star cluster (M45). These are "teenage stars", younger than the Hyades, but older than the newborn stars of the Orion Nebula. These bright young stars are still relatively close together, but have dispersed their birth cocoon of stellar gas, like teenagers venturing

(Continued on [page 8](#))



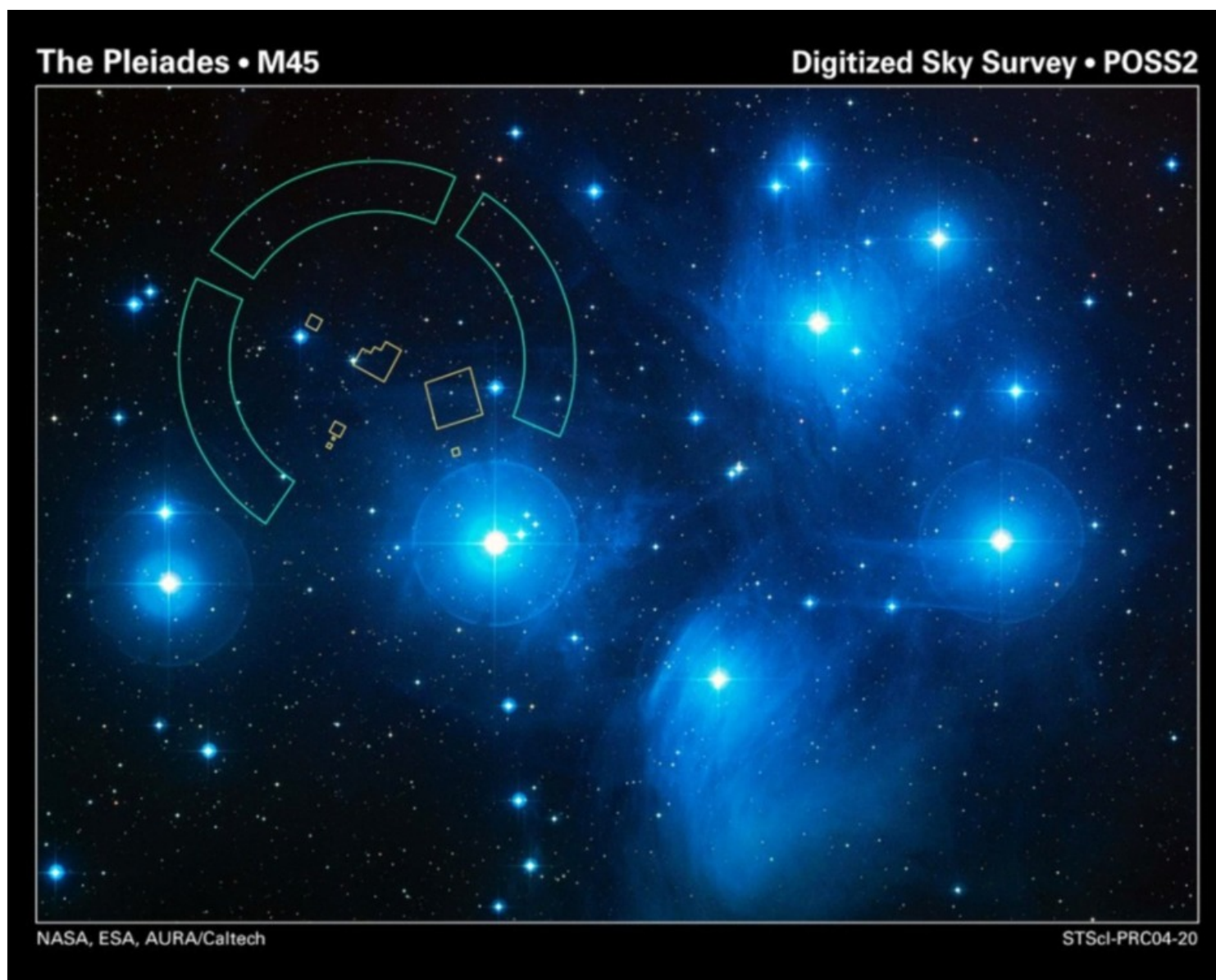
Locate Orion rising in the east after sunset to find the Orion Nebula in the "Sword," below the famous "Belt" of three bright stars. Then, look above Orion to find both the Hyades and the Pleiades. Binoculars will bring out lots of extra stars and details in all three objects, but you can even spot them with your unaided eye!

NASA Night Sky Notes (continued)

around the neighborhood with friends and wearing their own clothes, but still remaining close to home - for now. Astronomers have studied this trio in great detail in order to learn more about stellar evolution.

Figuring the exact distance of the Pleiades from Earth is an interesting problem in astrometry, the study of the exact positions of stars in space. Knowing their exact distance away is a necessary step in determining many other facts about the Pleiades. The European Space Agency's Hipparcos satellite determined their distance to about 392 light years away, around 43 light years closer than previous estimates. However, subsequent measurements by NASA's Hubble Space Telescope indicated a distance of 440 light years, much closer to pre-Hipparcos estimates. Then, using a powerful technique called Very Long Baseline Interferometry (VLBI), which combines the power of radio telescopes from around the world, the distance of the Pleiades was calculated to 443 light years. The ESA's Gaia satellite, a successor to Hipparcos, recently released its first two sets of data, which among other findings show the distance close to the values found by Hubble and VLBI, possibly settling the long-running "Pleiades Controversy" and helping firm up the foundation for follow-up studies about the nature of the stars of the Pleiades.

You can learn more about the Pleiades in the Universe Discovery Guide at bit.ly/UDGMarch, and find out about missions helping to measure our universe at nasa.gov.



Close-up of the Pleiades, with the field of view of Hubble's Fine Guidance Sensors overlaid in the top left, which helped refine the distance to the cluster. The circumference of the field of view of these sensors is roughly the size of the full Moon. (Credit: [NASA](http://nasa.gov), [ESA](http://esa.eu) and AURA/Caltech)



Star Trails around the North Celestial Pole from Algonquin Park, Ontario, by Dan Copeland

This is a 30-minute exposure with an Olympus DSLR at f/2.8

Note the satellite tracks at right.



The Northern Lights from Inside a Cave Entrance, by Simon Ozorio



The Orion Constellation, December 12, 2019, by Sylvie Gionet
Taken with a Canon Rebel T6i & 50mm lens. 13 second exposure at f/13 & ISO 1600.
Note the dimmer Betelgeuse near upper left.



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:
 - Jan 8: **Introductory Astronomy for Kids — Solar System**
 - Jan 15: **Astronomy For Muggles**
 - Jan 22: **Our Research Series: Rust and Stardust**
 - Jan 29: **Discovering the Planets of our Solar System**
- For more details, visit
www.physics.mcmaster.ca/planetarium

UPCOMING EVENTS

January 10, 2020 - 7:30 pm — *HAA Meeting* at McMaster Innovation Park, 175 Longwood Road South, Hamilton, ON. This will be our equipment show-and-tell night. Everyone is welcome.

February 14, 2020 - 7:30 pm — *HAA Meeting* at McMaster Innovation Park. Everyone welcome.

2019-2020 Council

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Check out the H.A.A. Website

www.amateurastronomy.org

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Observing site for the HAA provided with the generous support of the

Binbrook Conservation Area

Come observing with the HAA and see what a great location this is for stargazing, a family day or an outdoor function.

Please consider purchasing a season's pass for \$79 to help support the park.

<http://www.npca.ca/conservation-areas/binbrook/>
905-692-3228

The Harvey Garden HAA Portable Library



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E-mail: library@amateurastronomy.org