# Event Horizon

**Volume 27, Number 1**
**November 2019**

## From The Editor

Happy new membership year, H.A.A.! Welcome to our 27th year! Here's issue 1.

This month, we have an expanded Eye Candy section full of awesome new images from several H.A.A. astrophotographers' fall harvests so to speak.

Enjoy, and Clear Skies!

*Bob Christmas, Editor*

*editor 'AT' amateurastronomy.org*

## Chair's Report by John Gauvreau

Ok, I admit it, I have a problem. I have way too many binoculars (actually, I don't think I have too many binoculars because I don't think there's any such thing as too many binoculars!). A few days ago it was hazy and kind of cloudy all day and then in the evening it suddenly cleared. It was one of the nicest nights I had seen in a long time and since I wasn't expecting it, I didn't have the scope ready or even cooled down. And I didn't have a lot of time since the next morning was a work day. So out I went with the binoculars; 3 of them. Two around my neck and one in my hand. My wife is quite tolerant of my binocular obsession since she is a fan of them too, but at the sight of me going out the door with 3 binos at once even she had to comment on how silly I looked. However, all performed beautifully and gave great (yet different) views of the autumn open clusters, and I even split Albireo as it was sinking into the west with my 10-powers (let's face it; if any of them didn't perform beautifully, I would find a new home for it, but how can I give one up when they are all so nice?). So I remain convinced that good binoculars are a great observing tool for those nights when you can't get the scope out but still want to go out for a quick observing session.

*(Continued on page 2)*

## IN THIS ISSUE:

## Chair's Report (continued)

### Upcoming Events

Our next meeting of the 2019/2020 season is coming up on Friday November 8th. This will be our first meeting at *McMaster Innovation Park*. Our guest speaker is *Trevor Jones* and I'm really looking forward to his talk. I have heard him speak before and he has a very easy to understand approach to astrophotography. I highly recommend him!

Our last outreach event for the year is the following Friday, November 15th. This is a combination scope clinic and workshop. There will be several presentations from expert members after a drop in clinic for all who wish to learn about scopes, get their scope tuned up or just want to show their gear or see others. This event is equally for members and public. If you would like to show off your astro-gear, bring it along! Or if you would like to help others learn about their gear so they can go out and enjoy it, then even better! And don't forget; the clinic/workshop will be back at our old stomping ground, the auditorium at the Spectator Building.

### Calendar

The calendar is ready! With a big thank you to Matthew Mannering, who was the HAA Celestial Events Calendar editor for the third year, this wonderful wall calendar will be available for sale at the November meeting. Still just $15 each, these high quality publications are full of great information and beautiful images, all taken by HAA members. They make great gifts!

### 2019/2020 Council

The new council was acclaimed at the last meeting, and thank you to all who have once again volunteered. This month, the elected council will appoint the councillors at large, and if you are interested in joining, please get in touch with me. And don't hesitate to get in touch if you have questions or just want to attend one of the council meetings; all members are welcome.

I look forward to seeing you at one of the upcoming club events.

## 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*

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

**Masthead Photo:** *M31, The Andromeda Galaxy, by Christopher Strejch.*

Chris used his ES ED102 APO scope on an HEQ 5 with a 0.8 reducer/flattener and his Canon 5D Mark III DSLR. 94 x 60 second subs and 20 darks. M31's dwarf elliptical companions M32 and M110 appear also.

# October Astrophysics Group Meeting Summary by Mike Jefferson

*October 18/2019:*

We met at Doug Black's house in Hamilton. Present were Doug Black, Doug Currie, Mike Jefferson and Gary Sutton. The topic under discussion and presentation was instabilities in the Solar System and all of the ramifications that these disturbances have for the development and future of the Sun and its family.

We started out by viewing some email from a RASC London Centre member who expressed her regrets at not being able to attend last night's programme. Following this, we set up the HAA's computer and projector to go through Doug Black's revised PowerPoint document of solar system instabilities. There were some very minor equipment glitches which soon got sorted out, allowing us to proceed.

Doug led us through a history of our perceptions of the solar system, and even the universe in general. From the times of Kepler and Newton, when it was believed that the universe was run on clockwork principles, civilization graduated to more mercurial beliefs and precise measurements which showed us that collisions, gravitational perturbations, orbital dynamics, temperature changes and extremes, and attractions and repulsions, were more the rule than the exception. In other words, the solar system is more characterized by instability than precisely defined, eternal motions.

Interestingly, “The New York Times” of October 19 / 2019 contains an article, “Space Dust Slowly Cooled the Earth”, which advocates that an ice age of long ago was started by the collision of an ancient asteroid. What happens in the solar system can really influence what occurs on Earth, too.

Doug's thesis goes so far as to say that orbital resonances between celestial bodies can cause collisions, can fling very small objects right out of the solar system, can change established orbits, can permit large bodies to accumulate a wealth of smaller objects, and thus, have many moons and rings of rocks and dust. In short, we are looking at how celestial chaos can often lead to what is perceived by us as celestial order – until it is changed by future chaos, and then we see it as unstable.

Some of our topics for future meetings might be Henri Poincaré and the solar system stability contest; Albert Einstein's biography and highlights; 18th to 20th century French astrophysicists; circles, ellipses, parabolas and hyperbolas; optics, telescopes and spectroscopes; celestial mechanics, Kepler and Newton. We have 2 1/2 more pages of topics. There could be many more.....and that would be up to you. The HAA is your society and Astrophysics is part of that. If you have further ideas, please let us know. We do not operate in a vacuum! We are not a closed shop and you are more than welcome to join Astrophysics.

We thank the Blacks very much for the hospitality and refreshments; and members of the group who also contributed food to the evening's success. Our next meeting will be on Friday, November 15 / 2019 at 7:30 PM. Please consult “Event Horizon” and the Hamilton Amateur Astronomers website for verification and possible changes /cancellations etc.


## 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.

Hamilton Food Share
Hunger. It's just unacceptable.

Our donations go to Hamilton Food Share, 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.

# The Sky For November 2019 by Bob Christmas

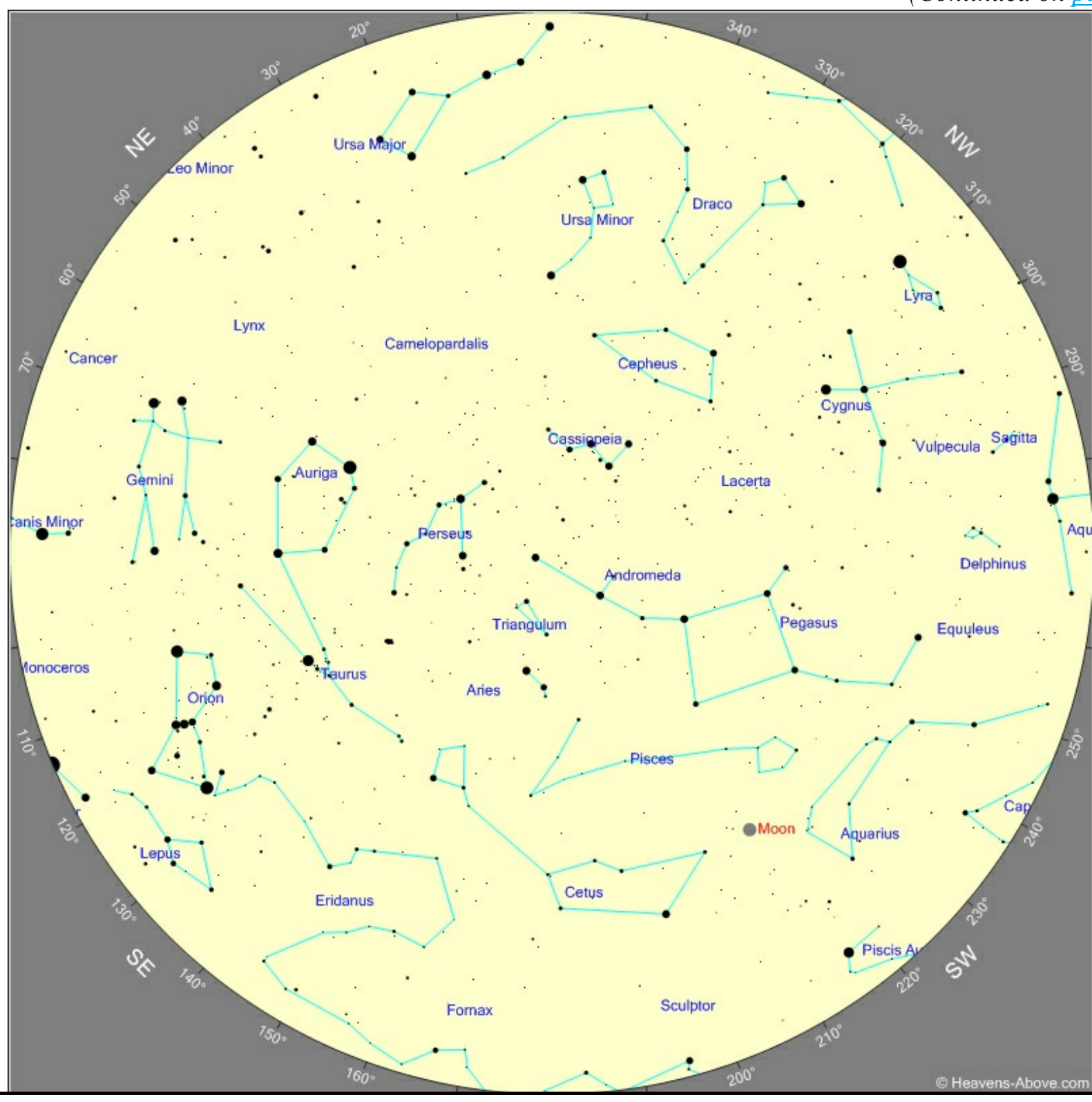
I'm pleased to let you know that *Matthew Mannering* will be your Observing Director for the 2019/2020 Council Term. Matthew served before as Observing Director a few years back. He did great work then, and I'm sure he will again! I look forward to his TSTM articles and talks in the upcoming year. So this should be my last TSTM article before handing it off to Matthew, who should be available in December. Meanwhile, *Kevin Salwach* is slated to do the TSTM talk at the November 8 HAA meeting at our new venue. Outgoing Observing Director *Steve Germann* did a fabulous job these past 3 years, and he deserves many thanks from all of us in the HAA! Well done, Steve!

This November will be a great month for astronomical events. We have a transit of Mercury on the 11th, Remembrance Day, and, a week later, the Leonid meteor shower will peak.

## The Sky at a Glance

Here's an all-sky chart for *November 7, 2019, at 11:00 pm EST* as seen from Binbrook, ON. This chart was generated using the Heavens Above website. The fall constellations are very high up, the *Summer Triangle*

*(Continued on page 5)*



# The Sky For November 2019 (continued)

is low in the west-north-west, about to set, and the winter sky is starting to show itself in the east, including *Orion*, *Gemini* and *Canis Major & Minor*.

## The Moon

Late in the month, on consecutive evenings at about supper hour on the 28th and 29th, the Moon has close brushes with three planets. Below is a chart, generated using the Stellarium program, of the Moon, Venus and Jupiter in a close conjunction at 5:30pm Eastern Standard Time on the 28th, at Hamilton's longitude and latitude. That's less than an hour after sunset in the evening twilight, so you would have to start looking for this immediately after the Sun goes down from a location with an unobstructed southwest horizon, and maybe have some binoculars ready.

On the night following, the 29th, at about 6-ish in the evening, the Moon is beside Saturn, as shown in the Stellarium chart at the bottom of page 6.

Phases this month:

- November 4 10:23 UT — 1st Quarter
- November 12 13:34 UT — Full Moon
- November 19 21:11 UT — Last Quarter
- November 26 15:06 UT — New Moon

*(Continued on page 6)*


*Conjunction of the Moon, Venus and Jupiter in Sagittarius November 28, 2019 at 5:30pm EST. Chart generated using Stellarium.*

# The Sky For November 2019 (continued)

## The Planets

- *Mercury* gets lost in the evening twilight until it TRANSITS the disk of the Sun on the 11th (see diagram with timing details on page 7, and see this month's NASA Night Sky Notes on pages 9 and 10). After that, it enters the morning sky, where it passes within 1.9 degrees of the Moon on the 25th and reaches its greatest western elongation on the 28th.

- *Venus* gets more easily visible low in the evening sky in the southwest as the month progresses. Venus passes within 1.4 degrees of Jupiter on the 24th, then within 1.9 degrees of the Moon on the 28th.

- *Mars* is in morning twilight in the east in Virgo.

- *Jupiter* is rapidly disappearing in evening twilight. Venus passes within 1.4 degrees of it on the 24th.

- *Saturn* is still visible in the evening sky in Sagittarius. *The thin crescent Moon passes less than one degree from Saturn twice this month*, in the early morning of the 2nd, then again on the 29th! (See the Stellarium generated chart below for the view of the southwest on the 29th around 6:15pm.)

- *Uranus* is in the sky most of the night this month in Aries. It just passed opposition on October 28.

- *Neptune* is in the sky much of the night this month in Aquarius.

## Minor Planets

- *(4) Vesta* is well-placed in Taurus, and is visible most of the night. It reaches opposition on the 12th. It is quite bright at about magnitude 6.5, easily visible in binoculars.

*(Continued on page 7)*


*Conjunction of the Moon and Saturn in Sagittarius November 29, 2019 at 6:15pm EST. Chart generated using Stellarium.*

## The Transit of Mercury, November 11 *(Warning: Use proper solar filter!)*

The Solar System's innermost planet, Mercury, will pass directly between the Earth and the Sun on Remembrance Day, November 11. Here's a diagram of the transit, which includes the entry times, time of greatest transit, and the exit times, in Universal Time (UT). There is also a time scale on Mercury's path, also in UT. For more information on the transit, see this month's NASA Night Sky Notes, pp. 9 & 10.

Remember, for Eastern Standard Time, you must subtract 5 hours from the UT time. For example, mid-transit is at 15:19:48 UT, which is *10:19:48 am Eastern Standard Time*. *(Continued on page 8)*

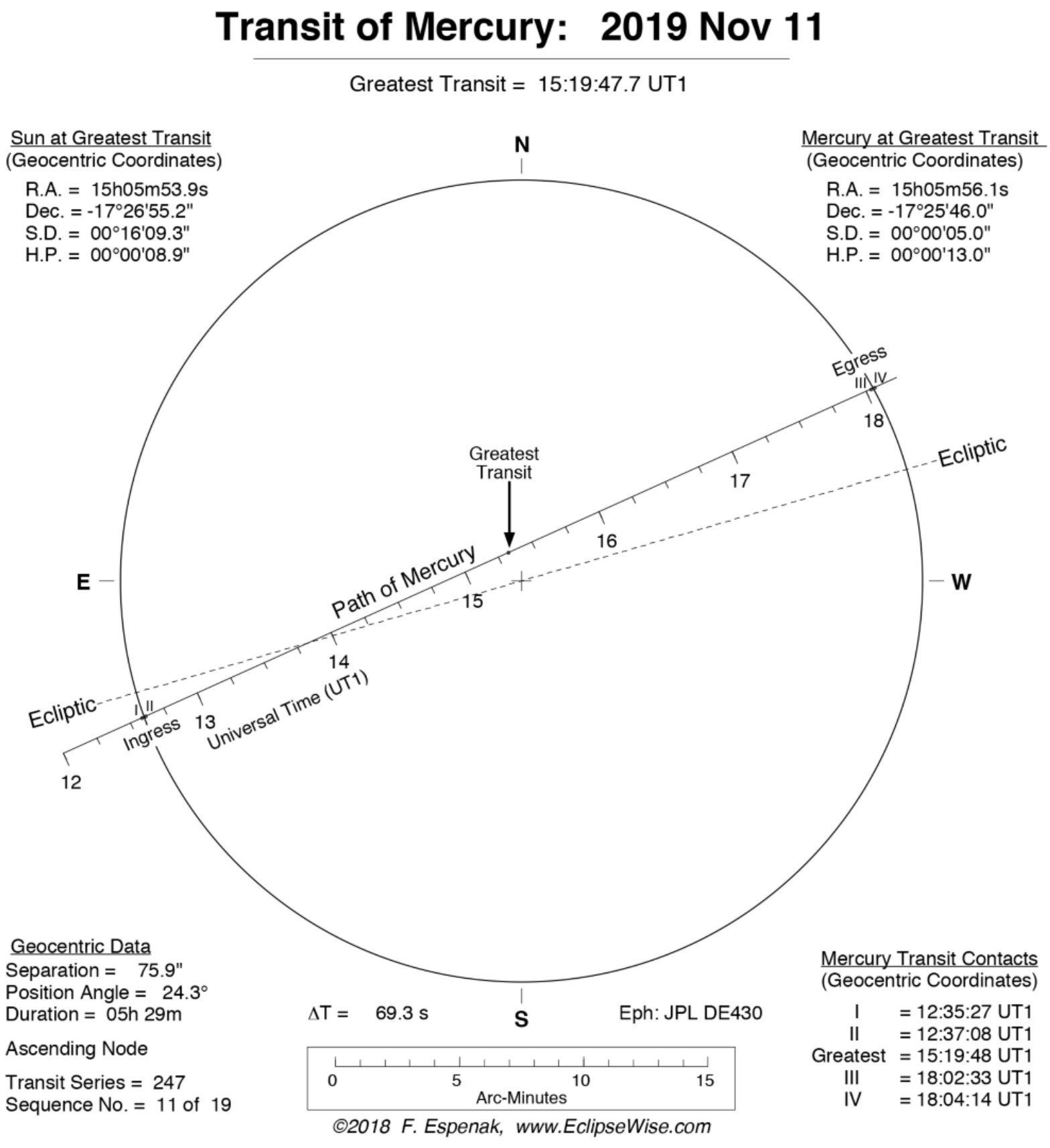



*Diagram Credit: Fred Espenak, EclipseWise.com*

## The Leonid Meteor Shower

One of the better meteor showers of the year are the *Leonids*.

The Leonid Meteor Shower has its peak on November 17 & 18 when there may be up to 20 meteors per hour. That doesn't sound like very many. But with an apparent atmospheric velocity of 71 km/s, these meteors may be brighter than most, given their higher kinetic energy and friction with the atmosphere.

It's best to view them past midnight, when Leo rises, and afterward.

This diagram shows the "radiant" point of the Leonids in Leo.

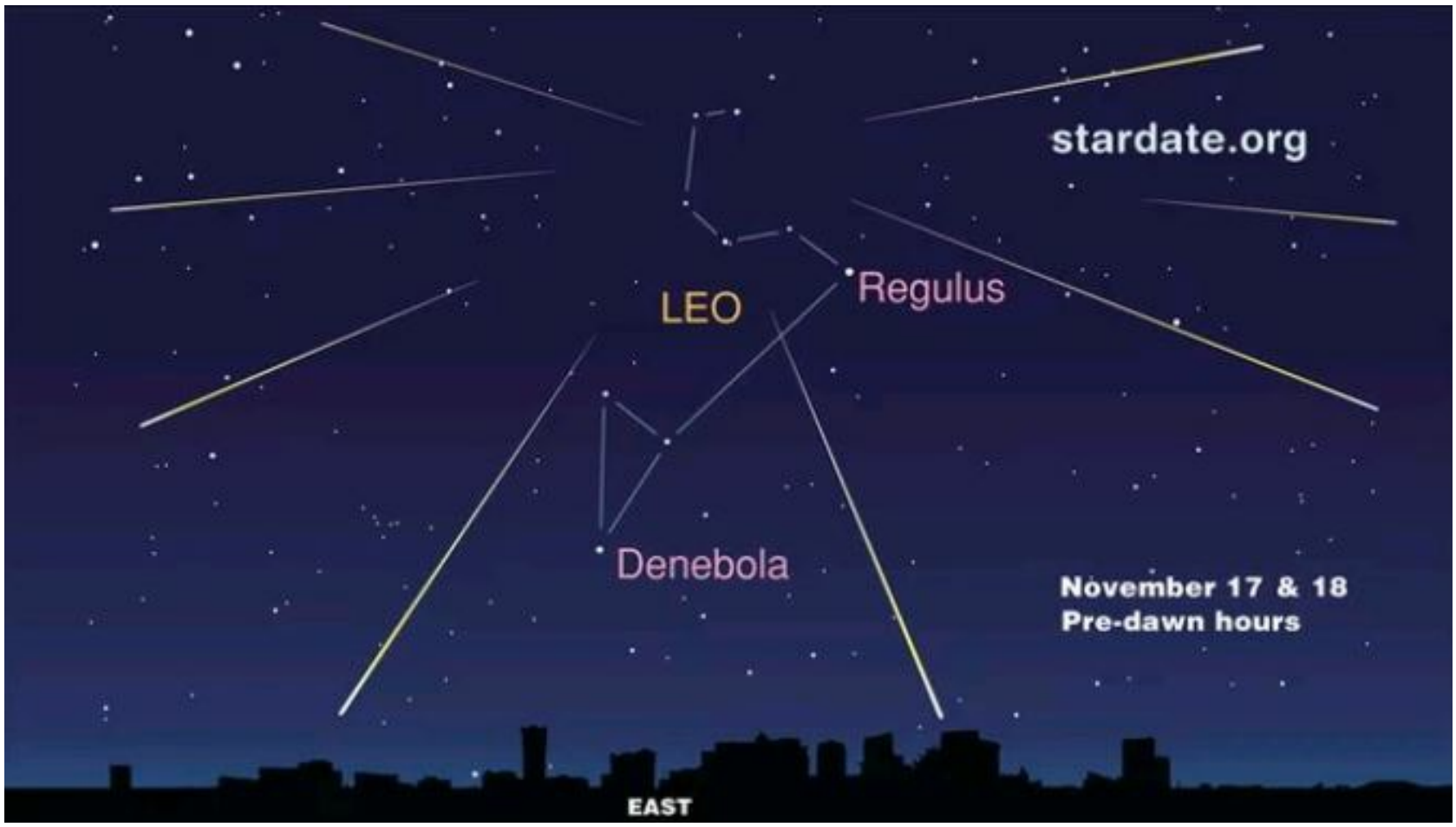



*Chart Credit: Space.com, stardate.org*

So there you have it; some interesting sky events are on tap for this November. Clear Skies, everyone!

## Sources


- The Royal Astronomical Society of Canada. *Observer's Handbook 2019*. Editor: James S. Edgar. Toronto, ON, 2018.
- The Heavens Above website; https://www.heavens-above.com
- The EclipseWise website; http://www.eclipsewise.com
- The stardate.org website; https://stardate.org

# NASA Night Sky Notes

**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!

## The Messenger Crosses the Sun: Mercury Transit 2019

By David Prosper

Did you know that there are two other objects in our skies that have phases like the Moon? They're the inner planets, found between Earth and the Sun: Mercury and Venus. You can see their phases if you observe them through a telescope. Like our Moon, you can't see the planets in their "new" phase, unless they are lined up perfectly between us Earthlings and the Sun. In the case of the Moon, this alignment results in a **solar eclipse**; in the case of Mercury and Venus, this results in a **transit**, where the small disc of the planet travels across the face of the Sun. Skywatchers are in for a treat this month, as Mercury transits the Sun the morning of **November 11**!

You may have seen the transit of Venus in 2012; you may have even watched it through eclipse glasses! However, this time you'll need a solar telescope to see anything, since eclipse glasses will only reveal the Sun's blank face. Why is that? Mercury is the smallest planet in our solar system, and closer to the Sun (and

*(Continued on page 10)*

*Photo of the May 9, 2016 transit of Mercury. Mercury is the small dot on the center right. Note how tiny it is, even compared to the small sunspot on the center left.*

*Credit: Dave Huntz*

further away from Earth) during its transit than Venus was in its 2012 transit. This makes Mercury's disc too small to see without the extra power of a telescope. Make absolutely certain that you view the transit via a telescope equipped with a safe solar filter or projection setup. Do NOT combine binoculars with your eclipse glasses; this will instantly burn a hole through the glasses – and your eyes! While most people don't have solar telescopes handy, many astronomy clubs do! Look for clubs hosting Mercury transit observing events near you at bit.ly/findnsn (USA) or at bit.ly/awbtransit (worldwide).

What a fun opportunity to see another planet during the day! This transit is expected to last over five hours. Folks on the East Coast will be able to watch the entre transit, weather permitting, from approximately 7:35 am EST until around approximately 1:04 pm EST. Folks located in the middle of North America to the west coast will see the transit already in progress at sunrise. The transit takes hours, so if your weather is cloudy, don't despair; there will be plenty of time for skies to clear! You can find timing details and charts via eclipse guru Fred Espenak's website: bit.ly/mercurytransit2019

Mercury's orbit is small and swift, and so its position in our skies quickly changes; that's why it was named after the fleet-footed messenger god of Roman mythology. In fact, if you have a clear view of the eastern horizon, you'll be able to catch Mercury again this month! Look for it before dawn during the last week of November, just above the eastern horizon and below red Mars. Wake up early the morning of November 24th to see Mars, the Moon, and Mercury form a loose triangle right before sunrise.

Discover more about Mercury and the rest of our solar system at nasa.gov

*This photo from the same 2016 transit event shows Mercury a bit larger, as it should; it was taken at a higher magnification through a large 16 inch telescope! Credit: J. A. Blackwell*

## **Eye Candy** the Members' Image Gallery


**The Waning Gibbous Moon** October 18, 2019, by **Sylvie Gionet**

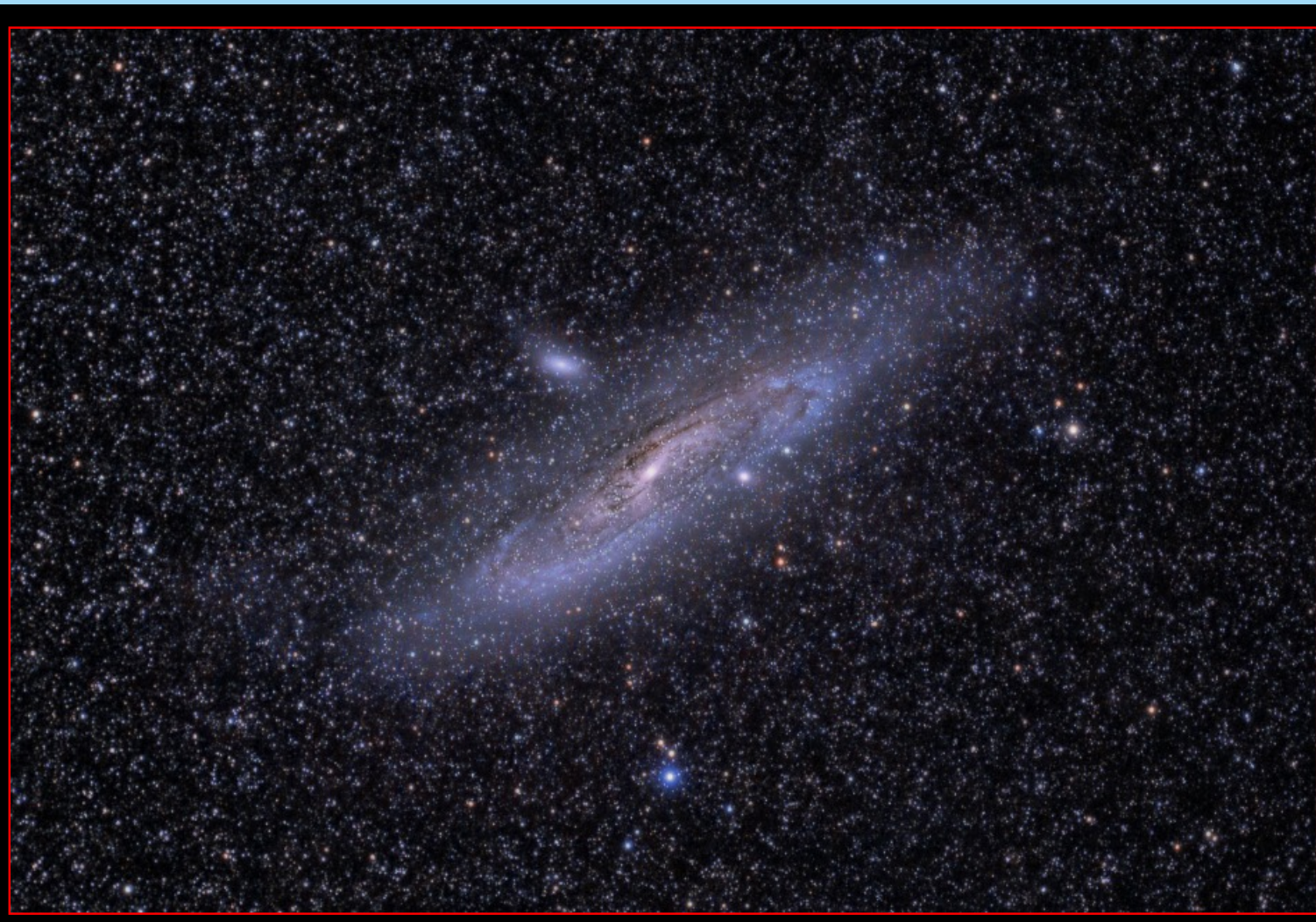
**Milky Way in Sagitta & Vulpecula** October 3, 2019, by **Bob Christmas**
The Dumbbell Nebula (M27) is near upper left; the "Coathanger" (Cr 399) is near lower right.

## **Eye Candy** the Members' Image Gallery

**NGC 7023, The Ghost Nebula** in Cepheus, by **Peter Wolsley**

**NGC 253, The Silver Dollar Galaxy** in Sculptor, by **Matthew Mannering**

## **Eye Candy** the Members' Image Gallery



**M31, The Andromeda Galaxy**, by **Janice Mannering**

**The Perseus Double-Cluster and the Heart Nebula,** by **Janice Mannering**
*NGC 869 and 884 are at right, and the Heart is at left.*

# A “Heads-Up”: Upcoming and Online Shows

*— from David Simpson:*

## Kronos Quartet: Sun Rings

Nov 9, 2019 and Nov 10, 2019

Details at:
https://socrates.mcmaster.ca/events/kronos-quartet-sun-rings/

*Location:* Concert Hall, L.R. Wilson Hall,
McMaster University
(https://socrates.mcmaster.ca/locations/concert-hall-l-r-wilson-hall-mcmaster-university/)

*“Art and science have enjoyed a triumphant meeting… Terry Riley’s empyrean masterpiece for the Kronos Quartet, chorus, electronic sounds from outer space, and lavish visual projections provides music of supreme beauty and spiritual impact.”* – Los Angeles Times

**November 9 at 8 p.m. and November 10 at 2 p.m.**
**Limited seating. General admission: $15 | Students: $5**
Buy tickets online
(https://secureca.imodules.com/s/1439/17/event.aspx?sid=1439&gid=1&pgid=8678&cid=15699&Source=SocratesWebsiteEvents)
or call 905 525 9140 ext. 26848.

One of North America’s most acclaimed string quartets presents their multi-disciplinary masterpiece. Sun Rings draws from sounds and images from space recorded by NASA and music for string quartet and chorus composed by Terry Riley.

Performances will include the participation of McMaster University and Women’s Choirs.

For 45 years, San Francisco’s Grammy-winning Kronos Quartet and its nonprofit Kronos Performing Arts Association have reimagined and redefined the string quartet experience through thousands of concerts, over 60 recordings, collaborations with composers and performers from around the globe, more than 1,000 commissioned works, and education programs for emerging musicians.

In partnership with the Socrates Project and the School of the Arts and Faculty of Science.

## The man who brings astronomy to downtown Montreal

CBC Radio · Posted: Sep 20, 2019 5:47 PM ET | Last Updated: September 20

https://www.cbc.ca/radio/thesundayedition/the-man-who-brings-astronomy-to-downtown-montreal-1.5291212

Segment of The Sunday Edition, Sept 22, 2019 with Michael Enright

# William J. McCallion Planetarium

McMASTER UNIVERSITY, HAMILTON, ONTARIO

- Public shows every Wednesday (7:00pm; 8:15pm)
- Public transit available directly to McMaster campus
- Tickets $7 per person; private group bookings $150
- Different shows every week
- Upcoming shows include:

  – Nov 6: Introductory Astronomy for Kids — Solar System
  – Nov 13: Dammit Jim, I'm an Astronomer
  – Nov 20: The Golden Dance of Death
  – Nov 27: The Celestial Bear: The Six Nations' Night Sky

- For more details, visit
  www.physics.mcmaster.ca/planetarium

# UPCOMING EVENTS

**November 8, 2019** - 7:30 pm — *HAA Meeting* at McMaster Innovation Park, 175 Longwood Rd. S, Hamilton, ON. Our guest speaker is Trevor Jones, who will talk about "7 Ways to Improve Your Astrophotography". Everyone welcome.

**November 15, 2019** - 6:00 pm - 10:00 pm — *Fall Telescope Clinic and Astro Workshop* at the Hamilton Spectator Auditorium, 44 Frid St, Hamilton, ON. Doors open at 6pm, workshops begin at 7:30pm. Everyone welcome.

**December 13, 2019** - 7:30 pm — *HAA Meeting* at McMaster Innovation Park. Everyone welcome.

## 2019-2020 Council

| | |
|---|---|
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| Second Chair | Jim Wamsley |
| Treasurer | Ann Tekatch |
| Digital Platforms Director | Christopher Strejch |
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| Councillors at Large | To be confirmed by the new council |

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 out-door 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**

Contact Information
E-mail: library@amateurastronomy.org