Event Horizon

Volume 28, Number 10
October 2021

From The Editor

This month's edition features ***John Gauvreau's*** last column as HAA Chair before he steps down. A big "thank you" goes out to John for all his hard work during these last 3 years!

Clear Skies,

Bob Christmas, Editor

editor 'AT' amateurastronomy.org

Chair's Report by John Gauvreau

This is my last report as chair. After having had the pleasure of spending 3 years in this role for the club I am looking forward to seeing a new chair step into the role next month. This is such a wonderful club, full of great people, and I know that the incoming chair will have the support and help of a great group on council, and an equally great group among the membership.

Along with the new chair we will see some changes on council. There will be a new second chair and a new membership director and although I will leave it to the next chair to make introductions, I know that both roles will be filled by competent and enthusiastic people. In one case we will see a new member joining council and I am very enthused about that.

So with the incoming council being left for next time, I want to take this opportunity to speak about the outgoing council and the amazing people I have had a chance to work with over the past few years. At the still youthful age of 28, the HAA has grown to one of the largest, most active and best respected astronomy clubs in the country, with over 150 members. It is those people that

(Continued on page 2)

IN THIS ISSUE:

Chair's Report (continued)

make the club great and the tireless efforts of its members that combine to make the whole greater than its individual parts. The following is in no particular order.

Along with me, ***Jim Wamsley*** will be stepping down from council. Jim is a past chair (3 years) and has also run the food bank program and loaner scope program since they both began. I can't say enough about the contributions he has made to this club and his presence at public observing and outreach events is always appreciated. Jim also hosted all the council meetings until we were forced to hold them online. In the days when the club was smaller, we were able to hold meetings in member's living rooms, but as the club grew and council grew we needed more room and Jim was able to host council meetings, beginner groups and other club events in his building. The club owes a great debt of gratitude for his many contributions over the years. And Jim's number was always the first I called when in need; I couldn't ask for better.

Lesley Webb is also stepping down from his position of membership director. Les has held that post for 8 years; a truly remarkable feat. Membership director is one of the quiet posts that happens in the background, but make no mistake, it is a very valuable position and one of great responsibility. We are fortunate to have had someone so reliable in that post and I offer my thanks and appreciation to Les.

Many positions will continue to be filled by those currently in council. The post of Treasurer is one of the most challenging and thankless jobs in the club. ***Ann Tekatch*** is staying on for one more year at this position. Ann is one of the founding members of the club, here since day one. The HAA would not be the club it is today without her. Ann is also a past chair and has been on council for every year of the club's existence. Her wisdom and clear vision of what this club is and should be has guided us to what we are today, and I personally have valued her insight and guidance a great amount. Ann has also handled our relationship with McMaster Innovation Park, and taking that task off my plate is very much appreciated! I am very thankful to have had such a supportive and strong presence to turn to over the years.

Also returning is ***Denise White***, to the role of Secretary. This is Denise's second year in that role and I couldn't be happier that she has taken on such a prominent and responsible role in the club. Denise also handles the club library and takes on other projects (like the current and very exciting Hamilton Placemaking Project, which we have been working on for some time and you will hear more about shortly). Both as Secretary and chairing committees like this one she has worked immensely hard with little recognition. She deserves a big thank you from all, including me!

You all know ***Sue MacLachlan***; she is the smiling face welcoming you to the monthly meetings. Sue is a council member without portfolio, like several others, but don't be fooled; she is one of the hardest working and most valuable members of council. I could not have got through chairing this club these past couple of years without her. Sue has a tireless work ethic, strong vision and clear manner of speaking that brings what is necessary right to the forefront. Although she may not get the recognition she deserves because she has no title, the club has benefited greatly from her contributions (and if you didn't notice, I have tried to give her a new title every month, in the meeting announcement emails, since we went online a year and a half ago. Go back and check!).

Matthew Mannering is a very public face in the club and we couldn't ask for a better ambassador to represent the HAA. As Observing Director, Matthew takes us out into the virtual night and reminds us all of just why we are here. I have done the job Matthew now holds and I know how much work goes into his wonderful presentations. He entertains and educates us and does it all with a good dose of humor. Thank you Matthew for each and every month reminding us all of just why we enjoy this wonderful hobby and why we are lucky to be part of a club like the HAA. *(Continued on page 3)*

Masthead Photo: *M27, the Dumbbell Nebula, September 6, 2021,* by *Alex Kepic.*

Chair's Report (continued)

Jo Ann Salci handles all our outreach and public education. It is a challenging and rewarding task that Jo Ann does so well. Here enthusiasm is infectious and her approach to kids and youth programs is perfect. In the time she has held the post she has found new and innovative ways to reach the public and even found ways to do it during these restrictive times. I can't imagine anyone going out into the public and representing the club better than Jo Ann does.

Our Recorder is ***Brenda Frederick***. Brenda has been a part of council for 13 years (wow!) and for the past couple of years has been our recorder. Her brilliance in making sense out of the busy and vibrant talk that happens at council meetings is invaluable. I can always count on Brenda to bring order out of that particular little bit of chaos.

Bernie Venasse held this job before I did. His plate was so full that after 3 years as chair he moved into a position without portfolio simply because he had so many ideas for club projects that we couldn't ask him to take on any regular duties. Bernie now oversees the club awards programs and contributes a monthly column to this newsletter. Like others on this list, I can only say that I couldn't have done it without you.

Chris Strejch is our Digital Platforms Director. Chris handles our online presence, from our website to all our social media platforms to helping get our meetings on air and into everybody's homes. Aside from that Chris has been a valued contributor to so many meetings, with sharp ideas and quick solutions. Chris has always answered yes to any task I have brought him (and there have been many, and mostly the ones that I didn't know how to do myself). His contributions have been invaluable and I hope that Chris is a part of this club for a long time to come.

Mario Carr has handled our publicity, getting the word out to the media about the club, for over 10 years. I can't think of a nicer guy or better friend to have in this position. Simply, I have never had to ask Mario to do anything because he just always handles things. And he has never come to me with problems to be solved for exactly the same reason; he just handles things. Couldn't ask for better!

The same can be said of ***Bob Christmas***, who is our newsletter editor. Bob has done this job for 8 years and has molded the newsletter that you are reading right now into what it is today. I will offer Bob my personal thanks for being so patient with me and my sometimes (often?) late reports. I did him no favours this month by handing this one in particularly late! He always sent the kindest and gentlest reminders. Thanks Bob!

Melissa Whitman is our new Loaner Program director. She is the perfect person to take this on and I couldn't be happier knowing that it is in such good hands. The Whitmans have made this club a family endeavor, and Brian, Maia and Geoffery have all become just as big a part of the club as Melissa has. Members like the Whitman family are a wonderful reminder of just how fun this hobby is. And that, quite simply, is what it's all about.

Swapna Shrivistava is (as of today, though that will soon change) the most recent addition to council. Swapna has brought a keen insight and valuable mind to council. I couldn't be happier that she joined us during my tenure as chair. Swapna's ideas and generous approach to being a club member has been inspirational and I am very appreciative of all she has done.

Steve Germann is another past Chair and past Treasurer who has taken on a behind-the-scenes role this year and offered his insight and support as a councillor at large. Thank you Steve for being a wonderful support and valued part of the team.

Barry Sherman has been involved in amateur astronomy for his whole adult life and has probably forgotten more about telescopes than I will ever know. He quietly fixes our loaner scopes and finds a myriad of ways to pitch in and make the club a better one for all. Barry is also stepping away from council this year,

(Continued on page 4)

Chair's Report (continued)

making space for some new faces. Although not far away (thankfully) so we can still rely on him, Barry recognizes the value of fresh insights and the benefits of involving more members, something I will touch on again.

Finally, but most certainly not least among council members, I offer my thanks to ***Michael Jefferson***. Michael, like Ann, is also a founding member of the HAA. Michael's generosity and graciousness has done this club proud over the years. There are countless little things that go on behind the scenes and it is worth noting, as an example, that Michael has kindly been the club's correspondent to any member or family that has needed a kind word or a card sent to them. Michael's personal touch has been just what was needed on many an occasion when more customary approaches would have fallen short. Just one way that Michael's unique abilities have made this club so much better. I am lucky to have known Mike for over 30 years now and his friendship has been a blessing.

Kevin Salwatch is not currently a council member, although he has been in the past, and yet he has still found the time to sit in on many meetings, offering his help and expertise and providing insight and ideas that are greatly valued. I appreciate so much that members like Kevin know that the club is what we all make it.

Paula Owen will be joining council this year but it feels like she has been a part of the team forever (and that is a great compliment). Paula, like Kevin, has offered her time and energies to keep things going and making them better. I couldn't ask for better members and couldn't be happier that Paula is staying on in a new and expanded role. The incoming council will be all the better for her involvement.

Doug Turner is finishing up his second HAA Celestial Events Calendar. No small task, the calendar is so important to the club, showcasing the members work and making us all feel like part of a really great team. Doug has done a stunning job and we all owe him a debt of gratitude for the great amount of time and effort he has put into it over the past two years.

The list goes on and on. Yes that's a lot of names, but I want to convey just how many hard working people there are that make this club happen, each finding a way in their spare time, after their work day or giving up their day off to spend time finding a way to make the club a little more fun and better for all the members. Members, both on and off council, make this club one of the best around. I love being a part of the *beginners group*, meeting all the new faces each year. This year we did the beginners group online for the first time and I was so pleasantly surprised that it worked so well. It's success was due in no small part to the great group of newcomers that made up the group. So much fun!

When the HAA first started it was a small but enthusiastic group that quite rightly realized that this is a hobby that is supposed to be fun. Their approach was that the club should be dedicated to the enjoyment of astronomy. I couldn't agree more!

Over the years the club has grown in scope and size. We do more, reach farther and accomplish more than we did those many years ago. We are also much larger, having grown into what appears to be the largest independent astronomy club in the country. A small group of councillors is just not enough to keep all the club activities running these days. Yes, council has grown over the years too, but in doing so, it has become a large body on its own (in fact, today's council is almost as big as the entire club was when it formed). But this large council has its own challenges, making it hard for everyone to be heard among other things. And of course we want to avoid a growing sense that the council could become a club within a club.

I believe that what the club needs now is the ability to bring more members into active roles without bringing them onto an already overly large and cumbersome council. In short, some restructuring is needed that will better reflect and serve the current state of the club.

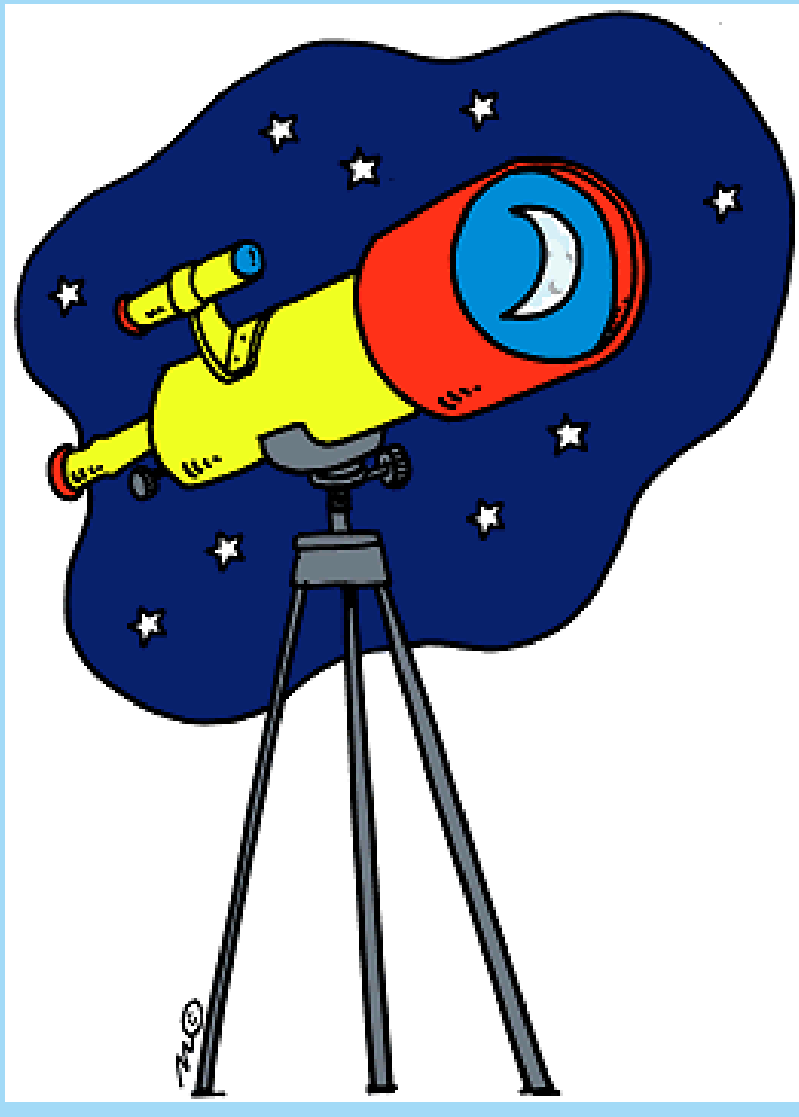
(Continued on page 5)

Chair's Report (continued)

A smaller council to manage the administrative aspects of the organization, with each councillor part of a team of equals that works toward making that part of the club grow and run smoothly, may be the path forward. As an example, the chair would benefit from a committee of people who could help with booking speakers, leaving the chair to handle emergent situations and other tasks. Many aspects of the club could benefit from this approach, with a committee made up of members, contributing whatever they can and no more, to make up a team that handles each position. One team member (and I would much rather call them teams than committees) reports to council so that the administrative aspects (budget votes, paperwork and such) can be handled. Each councillor could benefit from more member involvement, and each member would benefit from being more immersed in the club. And each member could involve themselves to a degree they are comfortable with, without having to decide simply between being a member that shows up at meetings once a month or joining council and making a commitment in time and effort that they might not be able to afford. Council itself would be smaller and more manageable, club involvement would be greater and all members could benefit from having many levels of involvement rather than just two; councillor or regular member. I truly think this path of a smaller council with more involvement from regular club members is the future for the club. Of course, it is not for me to decide, but rather a group effort that will move us in that direction.

I know that this past year and a half has been a challenge for the club, as it has for so many of us in so many ways. I think it is a great testament to the HAA that it is strong and vibrant and thriving even with so many of our activities curtailed. And as I said at the beginning, the club is its members.

I look forward to our next meeting, the new calendar coming out, more observing sessions, the next season of beginners group meetings and of course, the chance to see you all in person again.

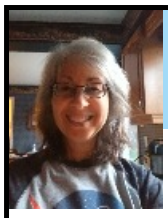


H.A.A.'s Loaner Scope Program

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 telescope, please contact Melissa Whitman at loanerscope@amateurastronomy.org.

Telescopes are loaned out on a first come basis.



HAA Explorers by Jo Ann Salci

…A column for young astronomers - and those young at heart!

Last month we learned about two exoplanets called Wolf 359b and Wolf 359c. So, what IS an exoplanet, anyways? If there are exoplanets, what are planets? Let's explore planets this month and continue exploring exoplanets next month!

Have you ever wandered?

Wandering, or traveling without a plan, is what early astronomers thought some sky objects were doing. These objects didn't twinkle, nor did they move together with the stars in the sky throughout the year. Early Greek astronomers named these objects "planets", which means "wanderer". So, where did these planets come from? What are their names? Phew…get ready to explore!

In May's HAA Explorers article, we learned how our Sun was formed about 4.6 billion years ago. At the same time our Sun was forming, there was a large cloud of dust and gas swirling around it. Eventually over millions of years, the dust and gas collided with each other and came together by the force of gravity. This formed what we now know as planets, moons, asteroids, comets and dwarf planets. We call this group of objects our "Solar System", or our Sun's family. In fact, it is our Sun's gravity that keeps everything rotating around it in orbits. Now that's powerful!

(Continued on page 7)

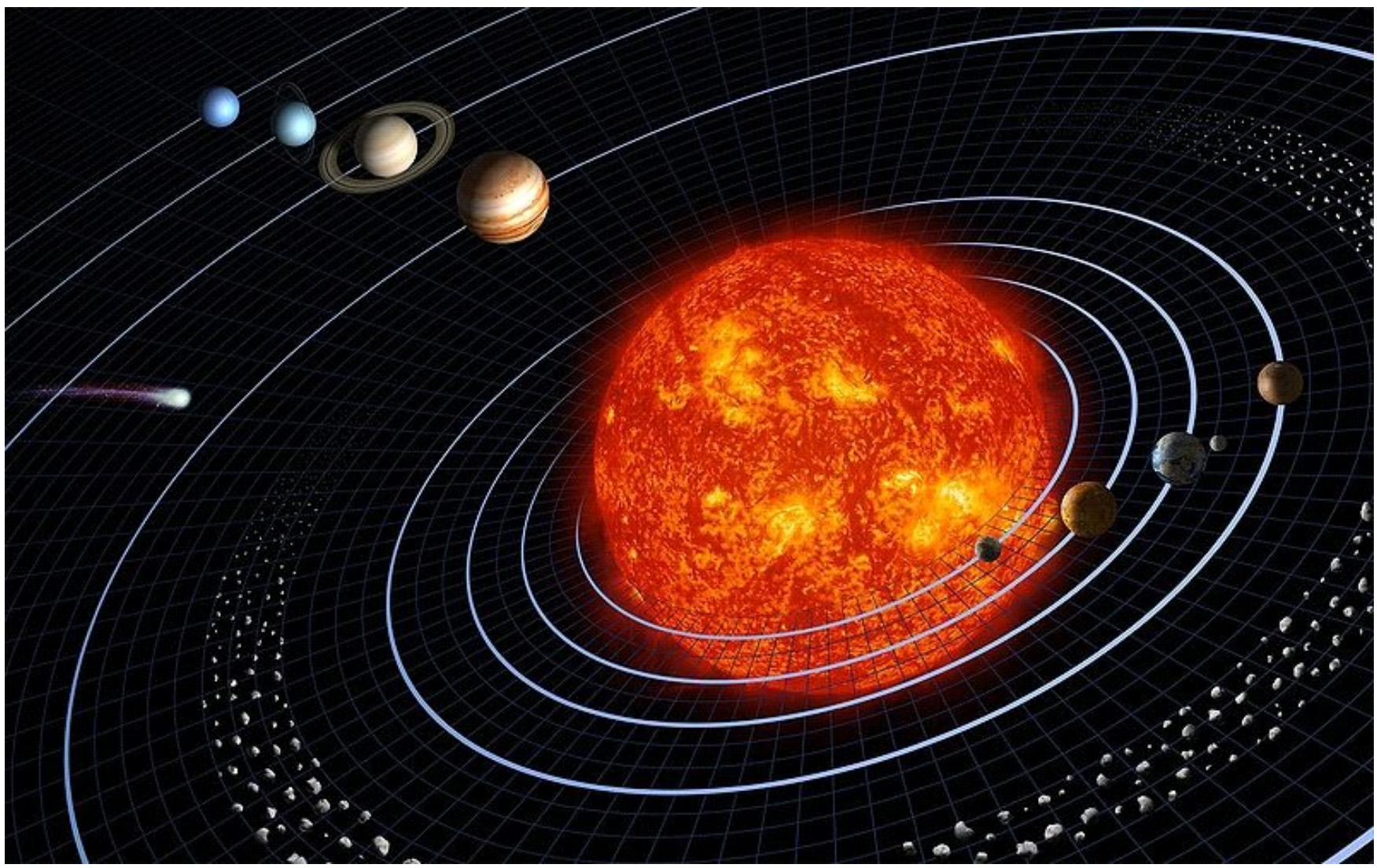


Image credit: NASA https://en.wikipedia.org/wiki/File:Solar_sys8.jp Image not to scale

HAA Explorers (continued)

There are 8 planets that orbit our Sun. Around those planets are hundreds of moons that orbit them! The four planets closest to the Sun are smaller, rocky planets that you could stand on: Mercury, Venus, Earth and Mars. The asteroids are rocky leftovers that never formed into a planet, and even they orbit the Sun. Beyond the asteroids, are the four large, cold, gas planets: Jupiter, Saturn, Uranus and Neptune. You could not stand on these planets, as they are not solid.

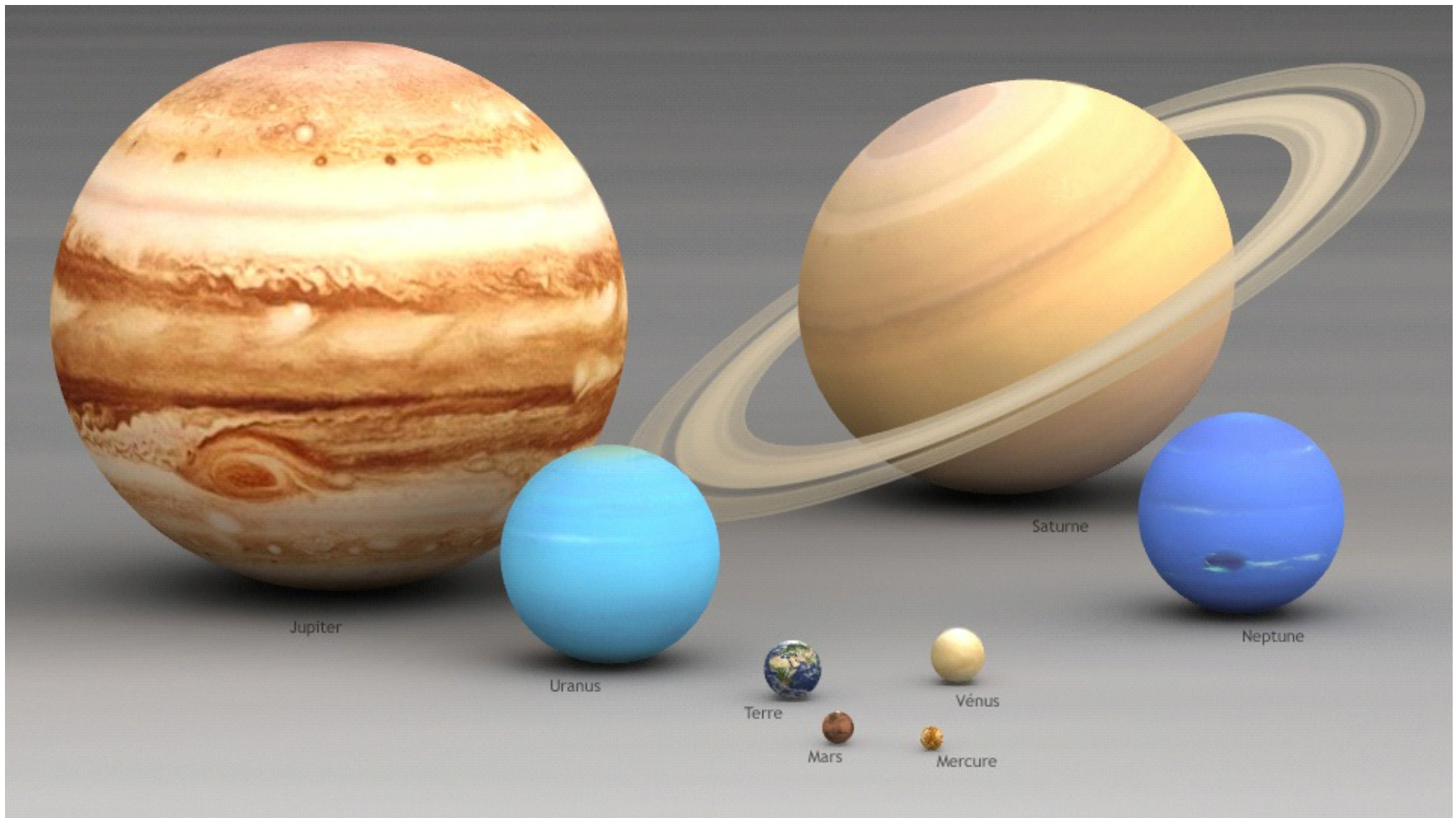


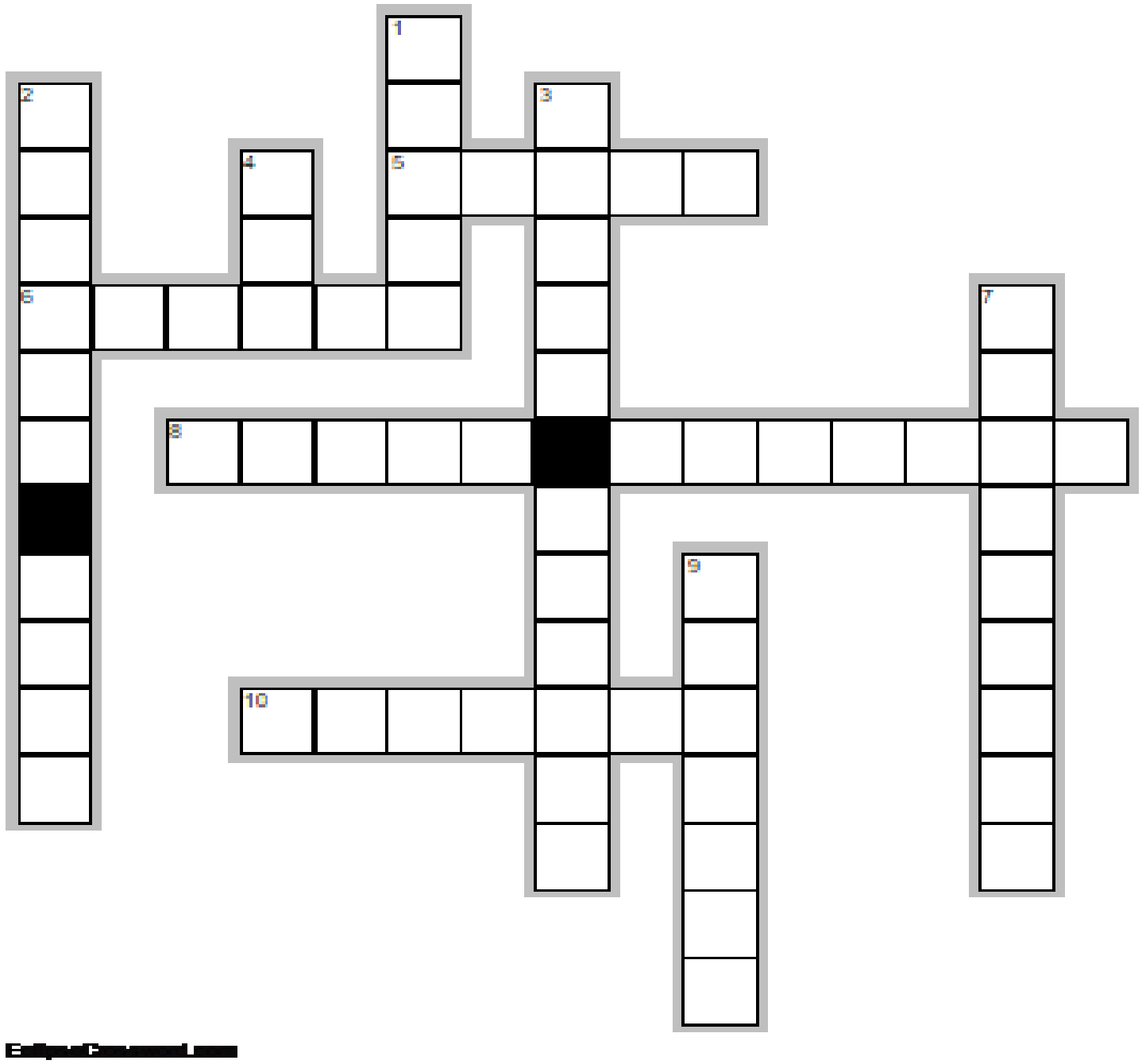
Image credit: Lsmpascal http://www.lesud.com/lesud-astronomy_pageid81.htm Image to scale!

Pluto, which used to be a planet, is now called a dwarf planet, because the definition of a planet changed in 2006. So, what is a dwarf planet? It orbits the Sun, is round, is not a moon and it doesn't have enough gravity to clear the area around it. There are at least five dwarf planets that are located in our solar system. Ceres, which is about ¼ the size of our Moon lies in the asteroid belt, while Pluto lies in an area of our solar system called the Kuiper Belt. This area contains many objects made mostly of ice, such as comets. Scientists believe that there is another area even further out called the Oort Cloud.

What can you see with your eyes? Five of the seven planets can be seen without binoculars or telescopes. Mercury and Venus can be seen shortly before sunrise or just after sunset. Venus is very bright and is easy to see! Mars, Jupiter and Saturn are also easily visible. Sometimes you see them in the evening, middle of the night or early morning, depending on where the Earth (and they) are in their orbits around the Sun. Uranus and Neptune can be seen with binoculars and telescopes. Pluto is harder to see and a larger telescope is needed. What you are seeing is the planets reflecting the Sun's light as they do not give off their own! And don't forget our Moon, which is a great solar system object we can easily see with our eyes!

(Continued on page 8)

Wandering the Solar System



Answers on page 18.

Across

5. Many of these are in our solar system and orbit around other objects.
6. It "wanders" around the sky.
8. Orbit the Sun, are round, but don't have enough gravity to clear the area around them.
10. The largest planet in our Solar System.

Down

1. Like a snowball, but made with dust, gas and ice, and it orbits the Sun.
2. The area beyond Neptune where many icy objects are found.
3. Our Sun's "family", all held together by our Sun's strong gravity.
4. The centre of our Solar System. It holds everything together with its strong gravity.
7. Rocks or dust particles that orbit the Sun as a large group.
9. The smallest planet in our Solar System.

(Continued on page 9)

During October, check out:

1. October 8th around 7:30 p.m.: In the southern and southwestern sky, you can see **4** of our solar system objects at once! A thin crescent Moon, Venus, Jupiter and Saturn:

2. October 15th around 8:30 p.m.: In the southern sky, you can see 3 solar system objects at once: the Moon, Jupiter and Saturn, all with your own eyes!

Images generated using Stellarium

(Continued on page 10)

Things to do until next time**:

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

1. Visit https://www.solarsystemscope.com/ to see how the planets, and other solar system objects, orbit the Sun. This is ***very*** cool!!

2. Visit https://spaceplace.nasa.gov/menu/solar-system/ to learn more about Pluto and even make a comet on a stick!

3. Watch this video about our Solar System: https://www.youtube.com/watch?v=Qd6nLM2QlWw

Did you know??

If our Sun was 1 inch in diameter and was placed on the goal line of a 100-yard football field, Pluto would be in the middle of the opposite end zone!! To demonstrate this, I had some help from Maia and Melissa as we created a "Solar System on a Rope". If the Sun was 1 inch, or 2.54cm in size, the largest planet, Jupiter, would only be about 2.6 MILLIMETERS in size, about the size of a small pea!! Earth would be about the size of a pencil tip and at about the 8-yard line and Jupiter would be at about the 40-yard line. Contact education@amateurastronomy.org if you would like to see a "Solar System on a Rope" demonstration. In the photo, Jo Ann is the Sun and Maia is Pluto.

Photo Credit: Melissa Whitman

Finally:

What kind of song does a planet sing? Answer: ¡ǝunɟ-dǝN ∀

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

Thank you to Mi for reviewing this article! 😊

References:

Astronomy.com: Astronomy for Kids. 2019.
Discover the Universe: https://www.discovertheuniverse.ca/resources
National Geographic Kids: Ultimate Space Atlas. 2017.
National Geographic Kids: Ultimate Explorer Field Guide: Night Sky. 2016.
Philip's Essential Guide to Space. Paul Sutherland. 2016.

The Sky This Month for October 2021 by Matthew Mannering

September will have come and gone by the time you read this. Janice and I took the opportunity this past month to do some imaging on several of the few clear nights. As you know, the weather in September was wild at times. The combination of storms and high humidity really cut into the amount of observing time. I must say that the amount of dew on our scopes and cameras was very impressive every night that we imaged. Dew heater strips around the objective were mandatory if you wanted to continue imaging beyond the first hour after dark. It was also very cold, and on the first night we made the mistake of not wearing our winter coats. Both of us got very cold and damp. After that we brought our winter coats, thin gloves, hats and lots of sweaters.

Drying everything out the next morning was also mandatory. You do not want mold eating away at the coatings on the optics. Remember to open the focuser of the scope so that any moisture can escape from the tube. This may allow a tiny amount of dust to enter the tube and settle on the optics. Do not freak out! It really doesn't affect the view.

However, on this last trip, I ignored my own advice. I removed the objective cell from my 80mm refractor and cleaned the surfaces of the lens. Note that it took about eight years of use to reach the point where a good cleaning of my refractor's objective seemed reasonable. This isn't as scary as it sounds but you must take some precautions. Put a thick towel on the table and work over the towel. Make sure you have clean lens cloths and some liquid lens cleaner. I use glasses cleaner on my lenses, and it doesn't hurt the coatings at all. Do not take the objective lens components out of their cell unless you know how to put it back together! Just clean the front and back surfaces. It is also very important to not adjust any of the screws in the lens cell. These are used to collimate the objective and are usually set at the factory and never need changing.

So, what does October bring us this year? Venus is low in the southwest at sunset and by 8:30pm is setting, and by 9:00pm Jupiter and Saturn will be almost due south.

Through October, Pluto is only about 12.7° west of Saturn. However, with our skies around the great lakes, you need a big scope (300mm +) to see Pluto which is only magnitude 14.4.

Look for our solar system's Ice planets at about 10:00pm. Uranus trails Neptune by a couple of hours in the eastern sky. You will need binoculars and some detailed charts to spot them.

The Moon and Venus October 9, 2021. Image generated using Stellarium

This month's new Moon occurs around October 5th/6th followed by a nice photo/observing opportunity a few nights later. October 9th at dusk provides a wonderful view of the Moon and Venus just 2 degrees apart. The waxing crescent Moon at four days old will be 16% illuminated. As a bonus, the current libration favours Mare Crisium which will be nicely framed by the Moon's terminator and limb. Be sure to get out your binoculars to enjoy the view.

(Continued on page 12)

The Sky This Month for October 2021 (continued)

October is such a great month for visual observing. Most of the summer constellations are still visible in the west as night falls followed by the fall constellations in the east.

If you can find a clear field of view, look for the Milky Way at about 10:00pm and follow it from one end to the other. You can start in the south-west where Sagittarius is setting and follow it through the zenith where you will find Cygnus and Cassiopeia. Looking to the south-east, follow the Milky Way through Perseus and Auriga. Try this with your binoculars and prepare to be amazed by the number of stars that jump out at you from the milky glow. You can also check out the dusty dark lanes and clusters that litter the view.

By 2:00am some of the winter constellations can be observed in the eastern sky. At that time of night, you will have Taurus, Orion and Gemini available for your viewing pleasure.

Make sure to get out this month as we are running out of good observing weather. The winter forecast this year predicts lots of snow leading up to Christmas. If that's the case, there will be lots of clouds to go with the snow. I hope you have a chance to get out and enjoy the fall sky before the hammer drops.

above: The Milky Way at 10pm October 10.

right: The Moon close up October 9, 2021.

Images generated using Stellarium

What's Up in Awards? October 2021 by Bernie Venasse

Contents:

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

October
Constellations: Pegasus
Stars: Alpheratz
Double stars: delta Cephei
Object Pairs: NGC 7788, NGC 7790
Messier objects: M15

November
Constellations: Cassiopeia
Stars: Schedar
Double stars: Almach, Mesarthim
Object Pairs: M31/M32, NGC133/NGC146, NGC436/NGC457
Messier objects: M33

HAA Messier Objects Observing Award

October Messier targets

Our October sky includes two nebulae and the clusters that power them, four open clusters, a star cloud, and two globular clusters. Several of these are possible naked eye objects.

M24 This um…"object" is a section of the Milky Way in Sagittarius. It is easily seen with the naked eye as a fuzzy, oval patch about four times the size of the full moon. The best views are through binoculars or rich field telescopes. Includes several other objects including NGC 6603, Markarian 38, and Collinder 469.

M25 Find this open cluster just east of M24 in Sagittarius. Visible to the naked eye, M25 lies in the same binocular field as M24. A view through a telescope shows the nebulosity is in fact many faint stars that are not resolved in small instruments.

M18 This is a small open cluster just north of M24 in Sagittarius. Telescopes reveal this cluster for what it is - a small, sparse collection of fairly bright stars.

(Continued on page 14)

What's Up in Awards? October 2021 (continued)

M17 Just north of M18 lies the Omega nebula. Possible to see with the naked eye, this nebula appears as a small faint patch of fuzz. A telescope will show the unique V shaped nebulosity that gives the cluster its name.

M16 Through a telescope M16 looks like a sparse open cluster of stars surrounded by faint wisps of smoke. IC 4703 is the diffuse emission nebula or HII region associated with Messier 16. It is the nebulous region surrounding Messier 16. These two objects make up the Eagle Nebula.

M26 Telescopes partially resolve this cluster and show several stars buried in a faint glow from the unresolved stars.

M11 Just north of M26 in Scutum lies the Wild Duck Cluster. Possible to see with the naked eye, telescopes resolve many of the stars in this very rich cluster.

M55 Possible naked eye object. Telescopes show a round patch of light - bright in the center and fading toward the edges. Large apertures are needed to resolve this globular.

M75 A telescope will show a small fuzzy with a bright center.

November Messier targets

This month we will search for seven more objects from the Messier Catalog. These include four globular clusters, the largest and the smallest planetary nebulas in the catalog, and a small oddity.

M57 This smallest planetary nebula in the Messier Catalog is the famous Ring nebula in the constellation Lyra. Low power telescope views show a very small blue/green disk, not much bigger than a star. Medium to high power will magnify the size of the nebula while leaving the surrounding stars the same size, confirming you have found it.

M56 Look for a small round ball of light, slightly brighter in the center.

M27 Also known as the Dumbbell nebula, the largest planetary nebula in the Messier Catalog. This object lies in the constellation Vulpecula. In small to medium scopes it appears as a rectangular patch of light. In large scopes it may even appear round in shape with a bright rectangular, or dumbbell shaped core.

M71 Lying in Sagitta, this globular cluster appears as a faint oval hazy patch of light in a telescope.

M30 Telescopes show a small fuzzy ball of light, bright in the center fading to the edges.

M72 This is a small faint globular cluster in Aquarius. Look for a faint oval patch of light, gradually brighter towards the middle.

M73 This asterism is located near M72 in Aquarius. In a low power telescope view it looks like a very small fuzzy patch of light at first glance. When stared at it reveals itself as a small collection of stars. Medium to high power shows the view best described by Messier "cluster of three or four stars… containing very little nebulosity".

Pathways Observing Program

Observable this season: October, November, December
Group C,
Autumn Constellations: Find, observe, sketch: *Perseus, Cygnus, Lyra.*
Stars: Find, observe, sketch: *Algol, Deneb, Fomalhaut.*
Asterisms: Find, observe, sketch: *Great Square, Northern Cross, Circlet.*
Planet: Any one planet that is remaining in the list.

(Continued on page 15)

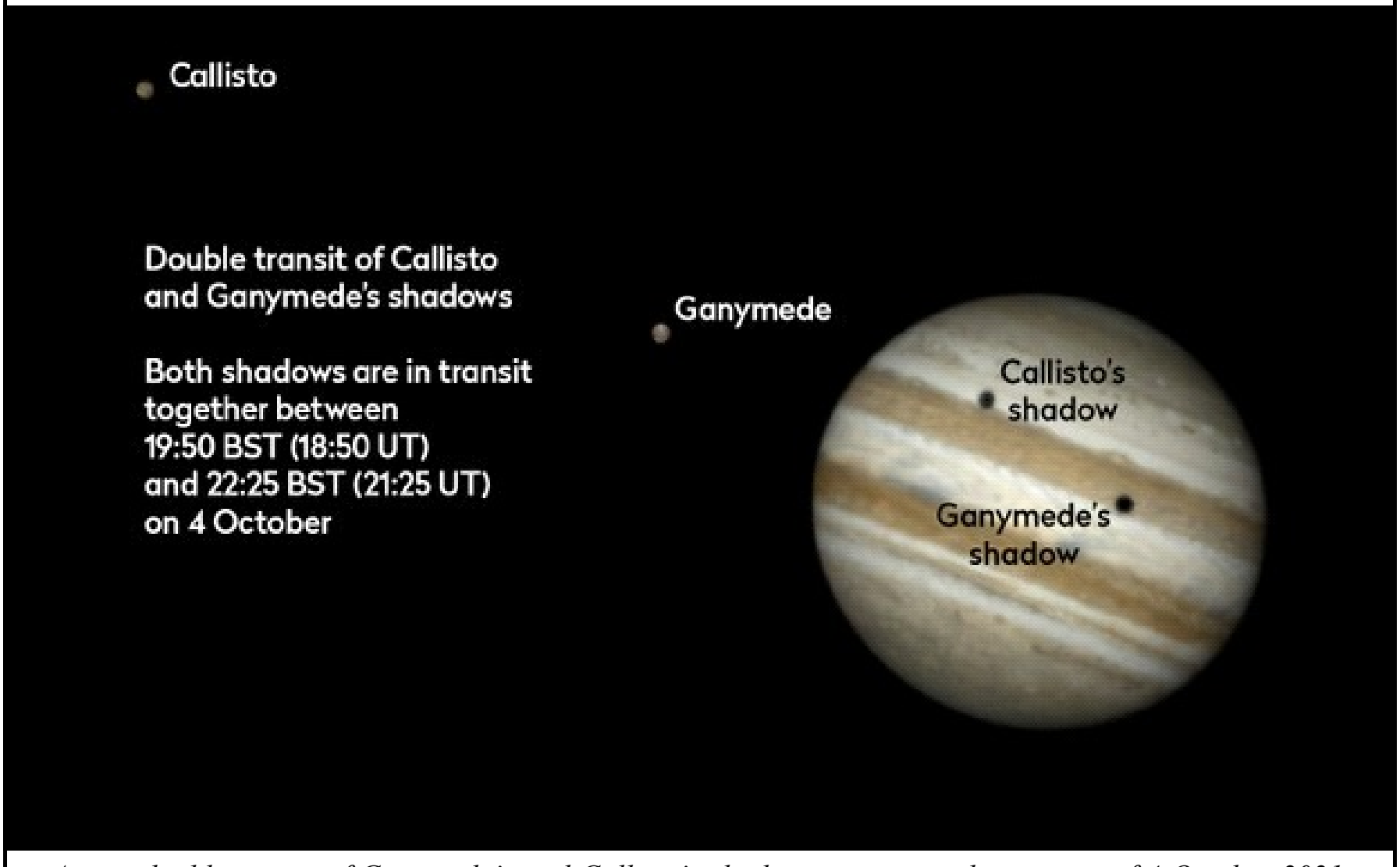
What's Up in Awards? October 2021 (continued)

The Planets… October 2021 via (BBC) Sky at Night Magazine

Mercury Poorly positioned at the start of October, returning to the morning sky for a good display from mid-month onwards.
Venus Evening planet, remains low after sunset. A 14%-lit waxing crescent Moon lies nearby on 9 October.
Mars Mars is in solar conjunction on 8 October and not visible.
J***upiter*** Evening planet, reaching greatest altitude early evening. A waxing gibbous Moon near on 14-15 Oct.
Saturn Evening planet, reaching highest altitude early evening. A waxing gibbous Moon near on 13-14 Oct.
Uranus Well-positioned morning planet, lying close to similarly bright Omicron (o) Arietis on 13 October.
Neptune Well-placed evening planet, reaching maximum altitude of over 30º in darkness all month.

The Planets… November 2021 via (BBC) Sky at Night Magazine

Mercury Well-positioned morning planet at the start of November, rises two hours before sunrise. Mars lies nearby on 15 November.
Venus Bright evening planet, low and poorly positioned. Waxing crescent Moon nearby on 7 and 8 November.
Mars Morning object. Near Mercury on 10 and 11 November and 3.6 arcminutes from Zubenelgenubi (Alpha-2 (α2) Librae) on 22 November.
Jupiter Evening planet. A first quarter Moon is near on 11 November.
Saturn Evening planet. A 41%-lit waxing crescent Moon is near on 10 November.
Uranus Opposition on 4 November. An almost full Moon is 1.8º south on the morning of 18 November.
Neptune Well positioned binocular planet near Phi (φ) Aquarii, reaches 30º altitude all month.



A rare double transit of Ganymede's and Callisto's shadows occurs on the evening of 4 October 2021. Credit: Pete Lawrence

(Continued on page 16)

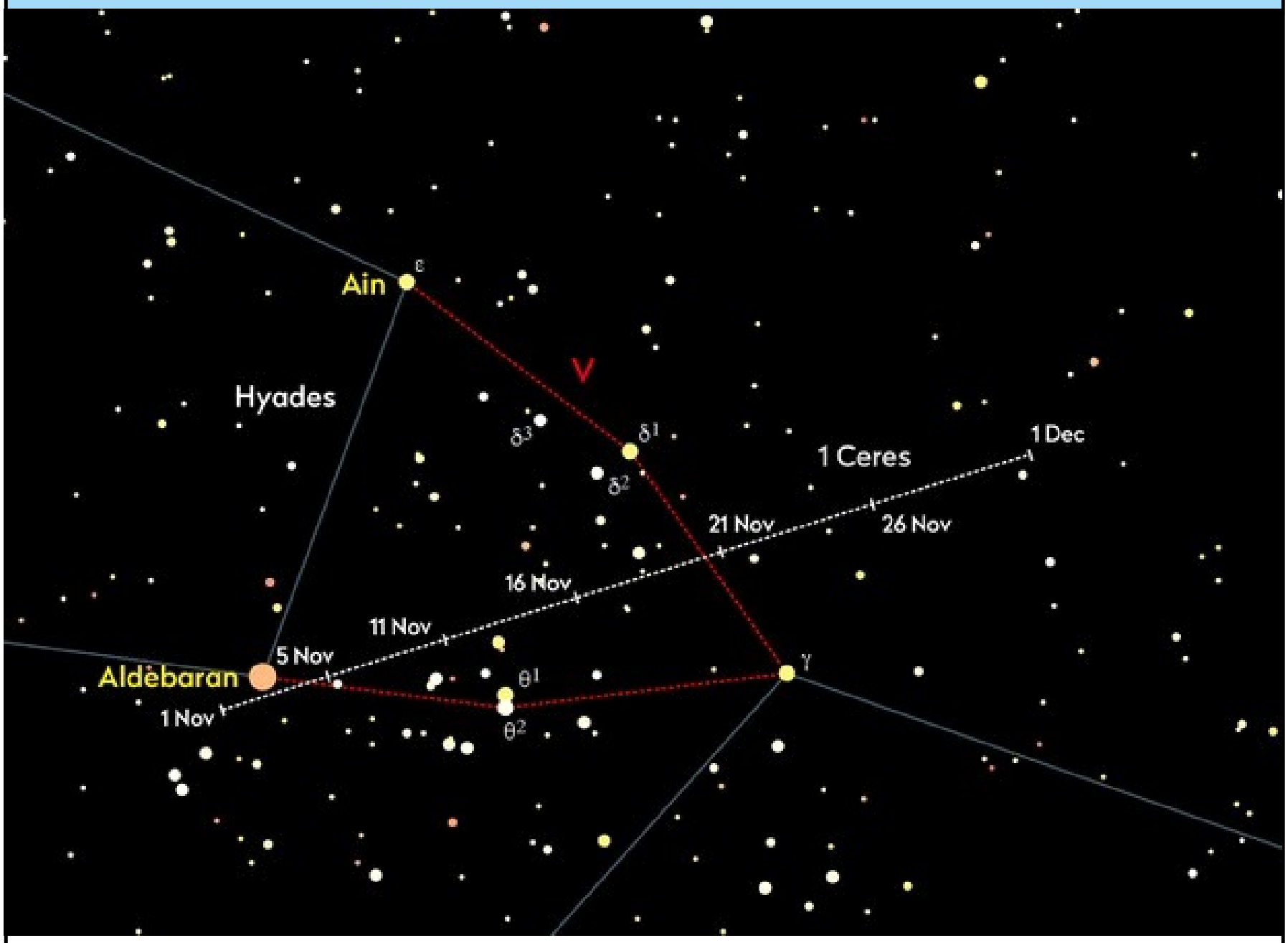


Chart Credit: Pete Lawrence

Minor Planet

November 2021 offers a perfect opportunity to locate dwarf planet *Ceres* as it passes through the *Hyades* cluster in *Taurus*, reaching opposition on 27 November 2021. See above chart.

Meteor Showers via American Meteor Society

Orionids Meteor Shower

Period of activity: October 2nd, 2021 to November 7th, 2021
Peak Night: Oct 20-21, 2021

The Orionids are a medium strength shower that sometimes reaches high strength activity. In a normal year the Orionids produce 10-20 shower members at maximum. In exceptional years, such as 2006-2009, the peak rates were on par with the Perseids (50-75 per hour). Recent displays have produced low to average displays of this shower.

Shower details - ***Radiant:*** 06:20 +15.5° - ***ZHR:*** 20 - ***Velocity:*** 41 miles/sec (swift - 67km/sec)
P***arent Object:*** 1P/Halley
Next Peak - The Orionids will next peak on the Oct 20-21, 2021 night. On this night, the moon will be 100% full.

(Continued on page 17)

What's Up in Awards? October 2021 (continued)

Southern Taurids

Period of activity: September 28th, 2021 to December 2nd, 2021
Peak Night: Nov 4-5, 2021

The Southern Taurids are a long-lasting shower that several peaks during its activity period. The shower is active for more than two months but rarely produces more than five shower members per hour, even at maximum activity. The Taurids (both branches) are rich in fireballs and are often responsible for increased number of fireball reports from September through November.

Shower details - ***Radiant:*** 03:35 +14.4° - ***ZHR:*** 5 - ***Velocity:*** 17.2 miles/sec (slow - 27.7km/sec)
Parent Object: 2P/Encke
Next Peak - The Southern Taurids will next peak on the Nov 4-5, 2021 night. On this night, the moon will be 0% full.

Northern Taurids

Period of activity: October 13th, 2021 to December 2nd, 2021
Peak Night: Nov 11-12, 2021

This shower is much like the Southern Taurids, just active a bit later in the year. When the two showers are active simultaneously in late October and early November, there is sometimes a notable increase in the fireball activity. There seems to be a seven year periodicity with these fireballs. 2008 and 2015 both produced remarkable fireball activity. 2022 may be the next opportunity.

Shower details - ***Radiant:*** 03:55 +22.8° - ***ZHR:*** 5 - ***Velocity:*** 18 miles/sec (slow - 30km/sec)
Parent Object: 2P/Encke
Next Peak - The Northern Taurids will next peak on the Nov 11-12, 2021 night. On this night, the moon will be 55% full.

Leonids

Period of activity: November 3rd, 2021 to December 2nd, 2021
Peak Night: Nov 17-18, 2021

The Leonids are best known for producing meteor storms in the years of 1833, 1866, 1966, 1999, and 2001. These outbursts of meteor activity are best seen when the parent object, comet 55P/Tempel-Tuttle, is near perihelion (closest approach to the sun). Yet it is not the fresh material we see from the comet, but rather debris from earlier returns that also happen to be most dense at the same time. Unfortunately, it appears that the earth will not encounter any dense clouds of debris until 2099. Therefore, when the comet returns in 2031 and 2064, there will be no meteor storms, but perhaps several good displays of Leonid activity when rates are in excess of 100 per hour. The best we can hope for now until the year 2030 is peaks of around 15 shower members per hour and perhaps an occasional weak outburst when the earth passes near a debris trail. The Leonids are often bright meteors with a high percentage of persistent trains.

Shower details - ***Radiant:*** 10:17 +21.6° - ***ZHR:*** 15 - ***Velocity:*** 43.5 miles/sec (swift - 70km/sec)
Parent Object: 55P/Tempel-Tuttle
Next Peak - The Leonids will next peak on the Nov 17-18, 2021 night. On this night, the moon will be 98% full.

(Continued on page 18)

What's Up in Awards? October 2021 (continued)

Geminids

Period of activity: November 19th, 2021 to December 24th, 2021
Peak Night: Dec 13-14, 2021

The Geminids are usually the strongest meteor shower of the year and meteor enthusiasts are certain to circle December 13 and 14 on their calendars. This is the one major shower that provides good activity prior to midnight as the constellation of Gemini is well placed from 22:00 onward. The Geminids are often bright and intensely colored. Due to their medium-slow velocity, persistent trains are not usually seen. These meteors are also seen in the southern hemisphere, but only during the middle of the night and at a reduced rate.

Shower details - ***Radiant:*** 07:24 +32.3° - ***ZHR:*** 150 - ***Velocity:*** 21 miles/sec (medium - 34km/sec)
Parent Object: 3200 Phaethon (asteroid)
Next Peak - The Geminids will next peak on the Dec 13-14, 2021 night. On this night, the moon will be 78% full.

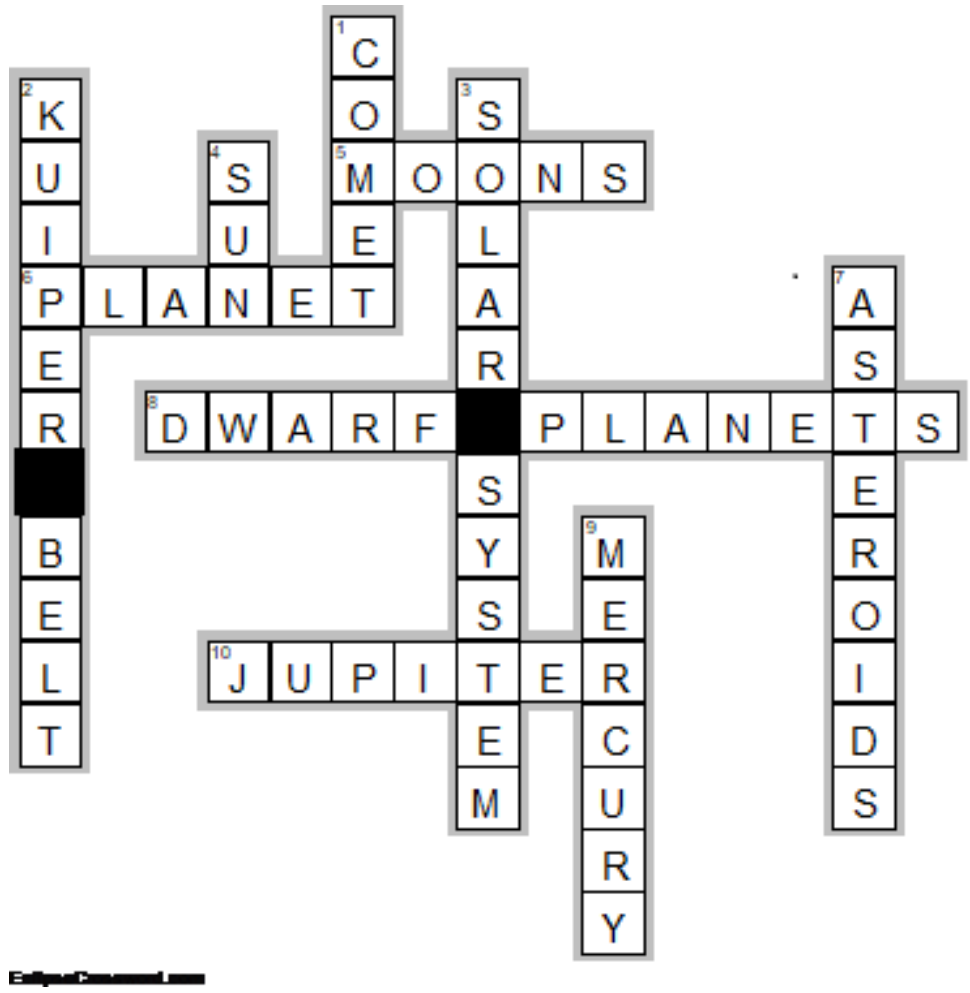
AAVSO Webcast

November 9 Dr. Emily Levesque… Betelgeuse is pretty cool: cosmic questions for our naked-eye neighbour

Please feel free to contact me with any questions or comments at eclipse@amateurastronomy.org

— Bernie

Answers to "Wandering the Solar System" crossword:



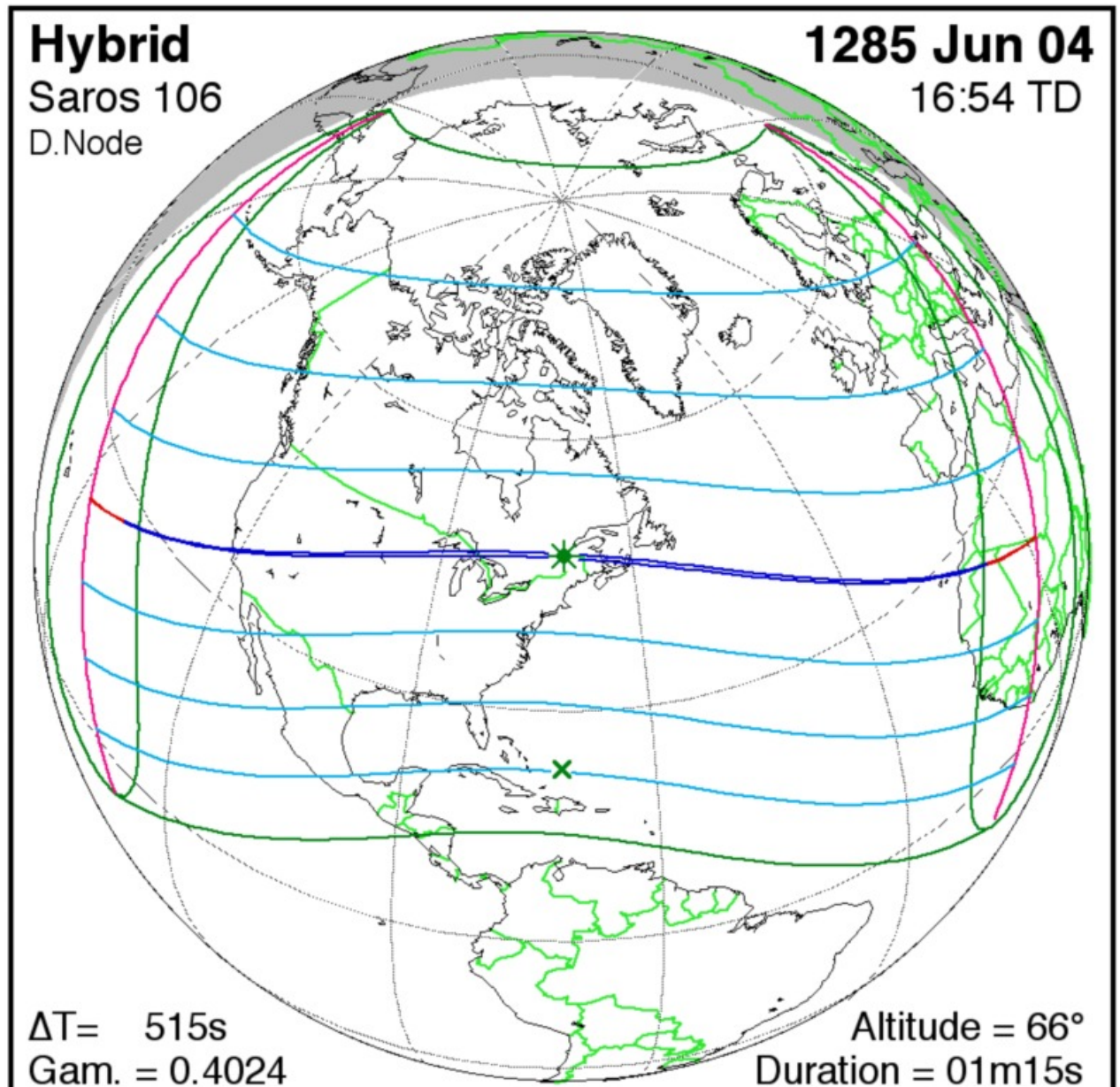
Hybrid Eclipses over Canadian Cities by Ray Badgerow

A hybrid or annular-total eclipse is an eclipse in which the umbra reaches down to the Earth's surface but does not reach as far as the centre. As a result, these eclipses start out as annular, then become total in the middle of the path before reverting back to annular, hence the sequence A-T-A. These eclipses have narrow paths and tend to avoid large population centres, passing over small towns, oceans and other remote areas. The next hybrid eclipse is on Apr. 14, 2023 from the Indian Ocean. The Titanic Eclipse of Apr. 17, 1912 was visible from Paris, France in spite of having a path just 1 km wide!

There are 28 such hybrid eclipses that pass over Canadian territory during the period from 0-3000 AD, surprisingly, a few of them do pass over a few cities (or their future locations):

Date	Places
104 Jun 10	Parry Sound ON
161 May 13	Chatham ON
1285 Jun 04	Sault Ste. Marie ON, Sydney NS
1339 Jul 07	Kamloops BC, Edmonton AB
1717 Oct 04	Lethbridge AB
2164 Mar 23	Victoria BC

www.EclipseWise.com/eclipse.html



EclipseWise.com Canon of Solar Eclipses

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.gov to find local clubs, events, and more!

Weird Ways to Observe the Moon

David Prosper

International Observe the Moon Night is on October 16 this year– but you can observe the Moon whenever it's up, day or night! While binoculars and telescopes certainly reveal incredible details of our neighbor's surface, bringing out dark seas, bright craters, and numerous odd fissures and cracks, these tools are not the only way to observe details about our Moon. There are more ways to observe the Moon than you might expect, just using common household materials.

Put on a pair of sunglasses, especially **polarized sunglasses!** You may think this is a joke, but the point of polarized sunglasses is to dramatically reduce glare, and so they allow your eyes to pick out some lunar details! Surprisingly, wearing sunglasses even helps during daytime observations of the Moon.

One unlikely tool is the humble **plastic bottle cap!** John Goss from the Roanoke Valley Astronomical Society shared these directions on how to make your own bottle cap lunar viewer, which was also suggested to him by Fred Schaaf many years ago as a way to also view the thin crescent of Venus when close to the Sun:

"The full Moon is very bright, so much that details are overwhelmed by the glare. Here is an easy way to see more! Start by drilling a 1/16-inch (1.5 mm) diameter hole in a plastic soft drink bottle cap. Make sure it is an unobstructed, round hole. Now look through the hole at the bright Moon. The image brightness will be much dimmer than normal – over 90% dimmer – reducing or eliminating any lunar glare. The image should also be much sharper because the bottle cap blocks light from entering the outer portion of your pupil, where imperfections of the eye's curving optical path likely lie." Many report seeing a startling amount of lunar detail!

You can **project the Moon!** Have you heard of a "Sun Funnel"? It's a way to safely view the Sun by projecting the image from an eyepiece to fabric stretched across a funnel mounted on top. It's easy to make at home, too – directions are here: bit.ly/sunfunnel. Depending on your equipment, a Sun Funnel can view the Moon as well as the Sun– a full Moon gives off more than enough light to project from even relatively small telescopes. Large telescopes will project the full Moon and its phases, with varying levels of detail; while not as crisp as direct eyepiece viewing, it's still an impressive sight! You can also mount your smartphone or tablet to your eyepiece for a similar Moon-viewing experience, but the funnel doesn't need batteries.

(Continued on page 21)

NASA Night Sky Notes (continued)

Of course, you can join folks in person or online for a celebration of our Moon on October 16, with International Observe the Moon Night – find details at moon.nasa.gov/observe. NASA has big plans for a return to the Moon with the Artemis program, and you can find the latest news on their upcoming lunar explorations at nasa.gov.

Sun Funnels in action! Starting clockwise from the bottom left, a standalone Sun Funnel; attached to a small refractor to observe the transit of Mercury in 2019; attached to a large telescope in preparation for evening lunar observing; projection of the Moon onto a funnel from a medium-size scope (5 inches).
Safety tip: *NEVER use a large telescope with a Sun Funnel to observe the Sun, as they are designed to project the Sun using small telescopes only. Some eager astronomers have melted their Sun Funnels, and parts of their own telescopes, by pointing them at the Sun - large telescopes create far too much heat, sometimes within seconds! However, large instruments are safe and ideal for projecting the much dimmer Moon. Small telescopes can't gather enough light to decently project the Moon, but larger scopes will work.*

OBSERVE the MOON

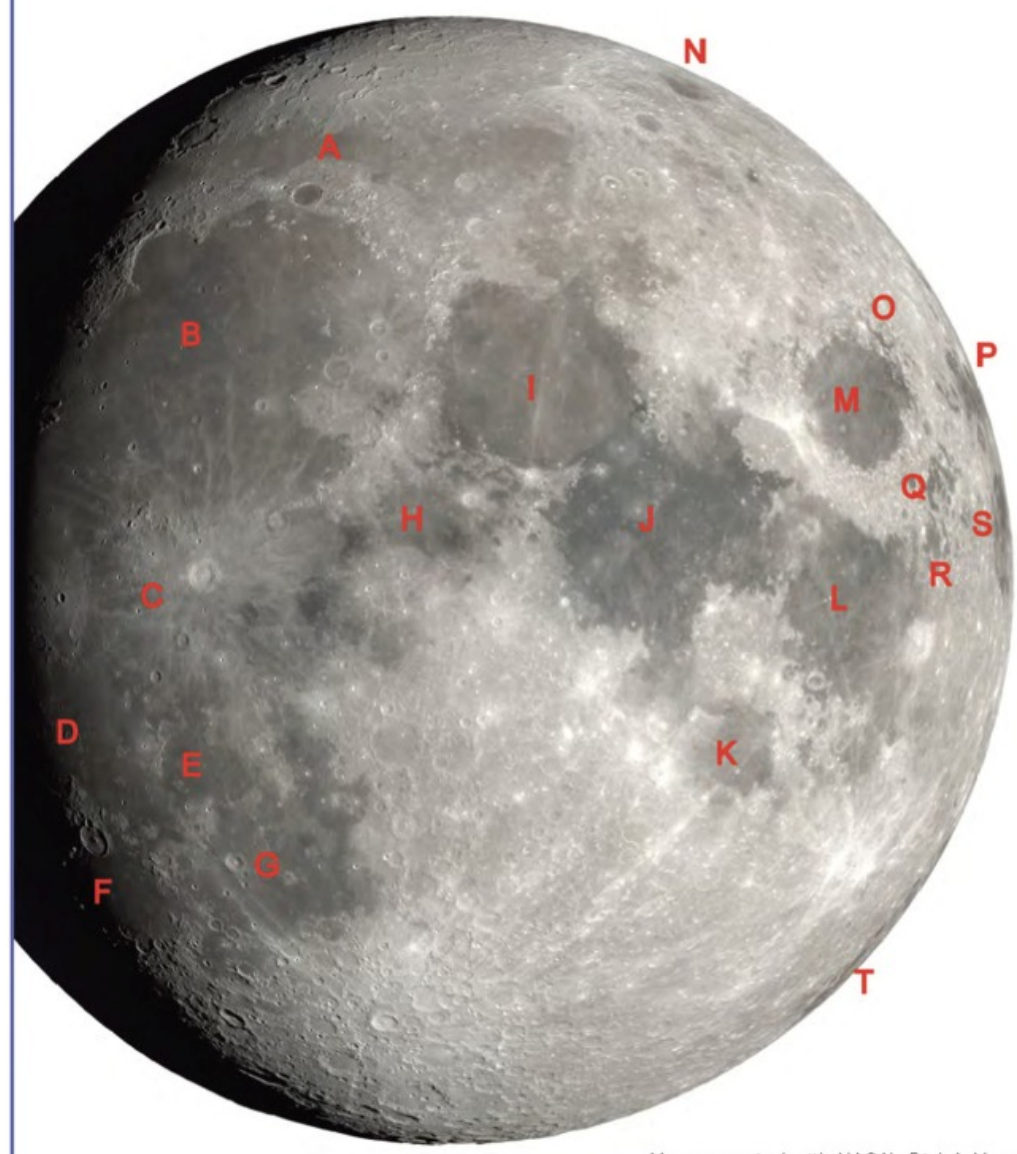
International OBSERVE THE **MOON** NIGHT 2021

SATURDAY 16TH OCTOBER

NORTHERN HEMISPHERE MOON MAP WITH LUNAR MARIA (SEAS OF BASALT)

Moon Map
This map was created for International Observe the Moon Night 2021. It depicts the Moon as it will appear from the northern hemisphere at approximately 11:00 PM EDT on October 16, 2021 (3:00 AM UTC on October 17).

Lunar Maria (Seas of Basalt)
You can see a number of maria tonight. Once thought to be seas of water, these are actually large, flat plains of solidified basaltic lava. They can be viewed in binoculars or even with the unaided eye. Tonight, you may be able to identify 18 maria on the Moon. This includes four seas along the eastern edge that are often hard to see. Because of libration, a slight apparent wobble by the Moon in its orbit around Earth, tonight we get to peek slightly around the northeast edge of the Moon, glimpsing a sliver of terrain normally on the Moon's far side.



Map generated with NASA's Dial-A-Moon (https://svs.gsfc.nasa.gov/4874)

A. Mare Frigoris (Sea of Cold)
B. Mare Imbrium (Sea of Rains)
C. Mare Insularum (Sea of Isles)
D. Oceanus Procellarum (Ocean of Storms)
E. Mare Cognitum (Known Sea)
F. Mare Humorum (Sea of Moisture)
G. Mare Nubium (Sea of Clouds)
H. Mare Vaporum (Sea of Vapors)
I. Mare Serenitatis (Sea of Serenity)
J. Mare Tranquillitatis (Sea of Tranquility)
K. Mare Nectartis (Sea of Nectar)
L. Mare Fecunditatis (Sea of Fertility)
M. Mare Crisium (Sea of Crises)
N. Mare Humboldtianum (Humboldt's Sea)
O. Mare Anguis (Serpent Sea)
P. Mare Marginis (Border Sea)
Q. Mare Undarum (Sea of Waves)
R. Mare Spumans (Sea of Foam)
S. Mare Smythii (Smyth's Sea)
T. Mare Australe (Southern Sea)

MOON.NASA.GOV/OBSERVE #ObserveTheMoon

You can download and print NASA's observer's map of the Moon for International Observe the Moon Night! This map shows the view from the Northern Hemisphere on October 16 with the seas labeled, but you can download both this map and one of for Southern Hemisphere observers, at: bit.ly/moonmap2021 The maps contain multiple pages of observing tips, not just this one.

Eye Candy the Members' Image Gallery

The Elephant Trunk Nebula (IC 1396), by **Peter Wolsley.** Taken through an 8" Schmidt-Cassigrain telescope with a NQHY294C camera. 27 x 10 minutes = 270 minutes of total exposure time.

The Moon and Venus, September 9, 2021, by **Bob Christmas.** ½ sec @ ISO 400 & f/4 with Canon 40D.

Eye Candy the Members' Image Gallery

Albireo (Beta Cygni),
by **Brian Whitman**

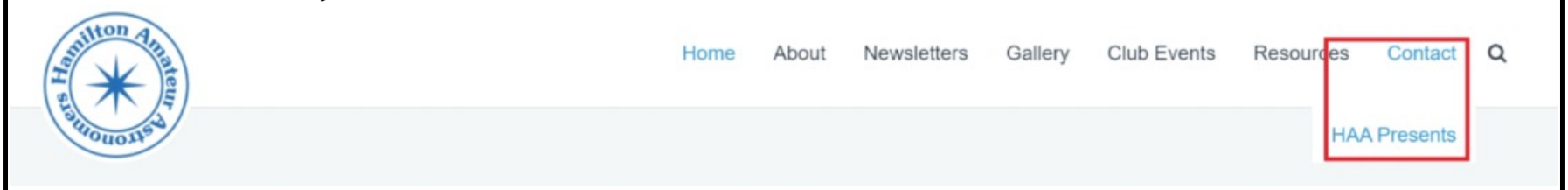
Taken through an 8" Schmidt-Cassigrain telescope with a Nikon 5600 DSLR

1 second exposure, ISO 25,600

"HAA Presents"

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

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



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 Helps Hamilton

While during the pandemic, the H.A.A. hasn't been able to collect 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.

In that spirit, we encourage you to continue making donations directly to your local food banks.

Hamilton Food Share
Hunger. It's just unacceptable.

UPCOMING EVENTS

October 8, 2021 - 7:30 pm — Virtual Online H.A.A. Meeting for members. Our main speaker will be *Laurie Rousseau-Nepton*, a resident astronomer at the Canada-France-Hawaii Observatory. This is also our Annual General Meeting. The meeting will be conducted on the platform Zoom. Be on the lookout for an invitation e-mail with a meeting link.
You may download the Zoom app for various platforms from Zoom's Download Center

Due to the COVID-19 Coronavirus pandemic, Hamilton Amateur Astronomers meetings continue to be held online for the time being.

2020-2021 Council

Chair	John Gauvreau
Second Chair	Jim Wamsley
Treasurer	Ann Tekatch
Digital Platforms Director	Christopher Strejch
Membership Director	Leslie Webb
Observing Director	Matthew Mannering
Education Director	Jo Ann Salci
Event Horizon Editor	Bob Christmas
Recorder	Brenda Frederick
Secretary	Denise White
Publicity Director	Mario Carr
Councillors at Large	Barry Sherman Bernie Venasse Melissa Whitman Mike Jefferson Steve Germann Sue MacLachlan Swapna Shrivastava

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

Follow us!

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

www.amateurastronomy.org

General Inquiries:
secretary@amateurastronomy.org

Membership:
membership@amateurastronomy.org

Meeting Inquiries:
chair@amateurastronomy.org

Public Events:
publicity@amateurastronomy.org

Observing Inquiries:
observing@amateurastronomy.org

Education:
education@amateurastronomy.org

Newsletter:
editor@amateurastronomy.org

Digital Platforms Director:
webmaster@amateurastronomy.org

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

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

The Harvey Garden HAA Portable Library

Contact Information

E-mail: library@amateurastronomy.org