Event Horizon

Volume 29, Number 3
January 2022

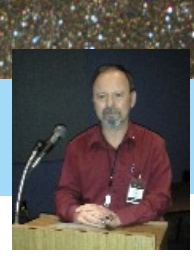
From The Editor

This E.H. is very *Orion*-themed, as seen in this month's HAA Explorers, The Sky, What's Up, and NASA Night Sky Notes.

The HAA's 2020-2021 Financial Statements are also included.

Happy New Year!

Bob Christmas, Editor
editor 'AT' amateurastronomy.org



Chair's Report by Bernie Venasse

Welcome to January. Goodbye 2021!!!

I hope that everyone has had their fill of leftovers! Did anyone get a new belt for Christmas???

A few events to look up for in 2022… There is the Jupiter-Venus appulse in the wee hours of Saturday, April 30; a Lunar eclipse May 15-16 (Sunday-Monday); a Jupiter-Mars appulse May 29 (that's a Sunday morning); and then a great Mercury-Venus-Uranus-Mars-Saturn-Moon line-up across the sky June 18-20 (Friday to Monday); followed by an occultation of Mars by the Moon December 7-8 (Wednesday-Thursday).

John Gauvreau is preparing to begin the 'Astro 101" program. Sessions are planned to begin in January. This has been referred to as the *Beginners Group*, but it is not necessarily aimed at only beginners. Planned topics include:

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Chair's Report (continued)

Telescope types
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Reading the Sky (Seeing and Transparency)
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Stellarium
Lunar observing
Solar observing
Beginning astrophotography

Sign up now by dropping a note to John via: astro101@amateurastronomy.org

On December 12th, a bunch of us went out in the wee hours to try to capture a glimpse of comet Leonard. The group included Ann, Kerry Ann, Chris and Denise, Matthew, and I. None of us were successful in pulling the comet out of the morning sky. It was nice to get together in person even though we had to observe social distancing rules. The 'breakfast after the meeting' took place at the new Wimpy's… 875 Main St West. A great spot.

A few members have inquired about the HAA Observing awards. The HAA award programs are starting to gain some traction with several members accepting the challenges and are working diligently toward their certificates.

Jo Ann Salci has completed our own HAA Rising Star Award. Congratulations, Jo Ann!!! Her award was presented to her during our December Zoom meeting. There is something to be said about being a GOOber. For those of you who aren't familiar with it, that's 'Goal Oriented Observer'. I have just received my certificates for the Astronomical League's Sketching Award and the Binocular Solar System Award. Come on, folks. Join in the fun!!!

Our Next Zoom meeting is scheduled for January 14, 2022 at 7:30pm.

Our guest will be *Dr. Paul Delaney*. Dr. Delaney will be speaking about occultations in his presentation:

"Peek-a-boo: the value of astronomical occultations.
As amateur astronomers, there are countless ways that your observations are invaluable to the pursuit if our understanding of the universe. Planetary and stellar occultations can provide us with insights into orbital parameters, dimensions and thus object shape, the presence of rings and atmospheres, etc. This talk will highlight some of the more famous occultation observations of the past while revealing how just a little time and effort can be both scientifically rewarding and personally very satisfying."

A friendly reminder that all our meetings will be held online through the Zoom platform for the foreseeable future. If you have any questions about joining in, please feel free to get in touch and we will help you. And don't forget that you can always email zoomsupport@amateurastronomy.org, to get help joining the meeting, even once the meeting has started.

Masthead Photo: *Part of the Milky Way dust cloud complex in Aquila,* including *Barnard 138* & *Barnard 139,* by *Bob Christmas.*

Taken October 5, 2021 with a Canon 40D DSLR with a Canon 100mm telephoto lens at f/2.8 and ISO 800. Exposures: 20 x 2 minutes; 40 minutes total. Crop of original image. North is to the right.

Letter to the Editor

I had been keeping track of the progress of the James Webb Space Telescope and right now (9:56 PM on December 28/21) it is about 520,000 miles from Earth and has about 930,000 miles to L2 orbit. Everything seems to be going very well for a mission that has been years, if not decades in the making, and almost did not happen several times throughout its career. This is a project constructed by very serious scientists and technicians who knew what the goals were and whether these were even achievable. It is not something that we cannot accomplish.

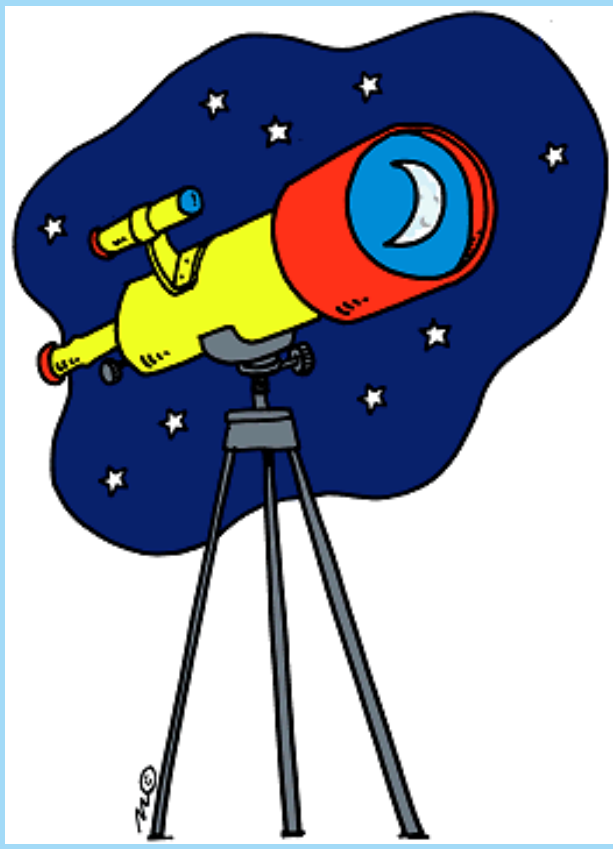
In a book that I have consulted, "The Geometry of Minkowski Spacetime" Gregory L. Naber, the author, poses on page 59, a problem in which a space explorer's point of departure is X1 = 1/g as measured on Earth and after 40 years would be 39 light years or 4.38 years on the spacecraft. If measured on the spacecraft, elapsed time would be 10 to the 17th light years and 10 to the 17th years. Clearly, these times for human flight to stars and other solar systems are likely out of our reach for an interminable amount of time into the future.

However, we have many people in modern society who believe that flight to such far-flung destinations will be possible in a few decades. The same people believe that global warming will be fixed in a few years and then we can return to 'normal' without any major lifestyle changes. Some television shows define "Star Wars" and "Star Trek" as parts of the NASA-ESA space programmes.

This afternoon, I came upon this little piece of 'one bubble off plumb': "Celestis Memorial Space Flights - Est. 1994". As of December 28/2021, they are counting down to a new future where not just NASA can send DNA to the stars, but Celestis will do it for the 'ordinary' citizen--------provided he/she has the $12,000.00 for the cheapest package. So, you stay here on Earth while your DNA tours the universe in your place. ??!! Clearly, this has to be about as nutty as the one-way trips to Mars of about 10 years back. What is very interesting about all of this is that the promoters of these scams seem to disappear into the ether after people get wise to the fact that these trips are not going to happen at all.....and don't!

A modern technological society needs to be far more critical and disbelieving of such drivel.

— Mike Jefferson



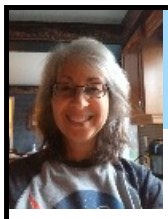
H.A.A.'s Loaner Scope Program

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.



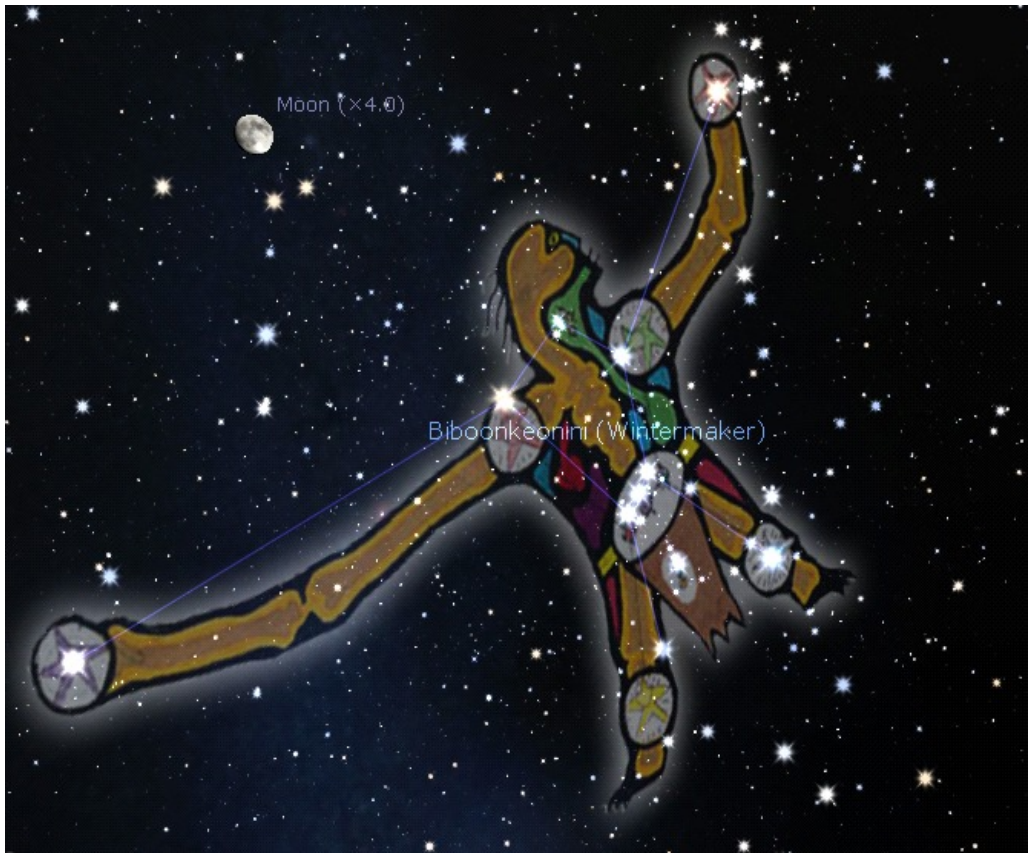
HAA Explorers by Jo Ann Salci

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

We have been exploring the sky for a year already! Let's keep exploring things in the sky we can see with just our eyes! This month the well-known winter constellation ***Orion*** is in the sky…let's explore!

Hunting for Orion!

Orion is an easy-to-find constellation which has the highest number of bright stars than any other constellation. Over the thousands of years that humans have been observing the night sky, many stories about Orion have been created by different cultures. Orion has an hourglass shape and is roughly shaped like a human, complete with shoulders and a waist with a belt. Let's explore!



Wintermaker, or Biboonikeonini

Orion

Images generated using Stellarium

The Ojibwe people see Orion as the Wintermaker, or *Biboonikeonini*. Wintermaker is the spirit that creates winter. Wintermaker's arms extend from Procyon in Canis Minor to Aldebaran in Taurus.

The ancient Syrians named Orion "Al-gebbar", which means "The Giant". Orion is also identified in the Bible, as well as the Greek poems, *The Iliad* and *The Odyssey*. The Greeks have a few different stories about Orion (and there are even more than these!):

- Orion and his hunting dog (Canis Major) chased 7 sisters through the forest. The sisters became frightened and called the God Zeus for help. He turned them into birds and they flew away. Orion is in the sky continuing to chase them (they are the Pleiades – pronounced Plea-uh-dees).
- Orion was a hunter who thought he could hunt anything. The Goddess Artemis challenged him and sent a Scorpion who stung Orion. Before Orion died, he killed it with his club. The Greek Gods placed both Orion and Scorpius in the sky, opposite from each other.

(Continued on page 5)

Because Orion is at the celestial equator, it can be seen by many people all around the Earth's globe. The bright stars in Orion can easily be seen with your own eyes, even in light-polluted areas.

What is most noticeable about Orion are the 3 stars that form a straight line shaping the belt: Alnitak, Alnilam and Mintaka. It appears from Earth that these three stars are in a row, yet they are nowhere near each other, with Alnilam twice as far from Earth than Alnitak and Mintaka!

Image generated using Stellarium

Once you locate those stars, it's easy to find the rest!

Belelgeuse (pronounced Beetle Juice) is the bright reddish-orange star in Orion's right shoulder. Betelgeuse is an old, red supergiant star. It's so big that if it replaced our Sun, the Earth would be inside it…and so would Mars!

The rest of the bright stars in Orion are bluish-looking. Bellatrix is the star at Orion's left shoulder. (Bellatrix Lestrange in the Harry Potter series is named after this star!) Rigel is a bright star at Orion's left foot and Saiph is the star at Orion's right knee.

Below Orion's belt is his sword where the famous Orion nebula, or Messier object #42 (M42) is found. This nebula (or cloud of dust and gas in space) is a place where many stars are being born, and it is often called a stellar nursery. With our eyes, it may look like a faint, fuzzy object.

With a telescope much more detail can be seen!

Because Orion is visible all winter long, you have a lot of time to explore it's many amazing sights!

Image generated using Stellarium

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The Orion Nebula as seen with binoculars and a telescope

Image generated using Stellarium

Astronomy Picture of the Day, Oct 30 2019, NASA
Image Credit: Josep M. Drudis & Don Goldman

On the Hunt for Orion

C	E	N	A	B	J	O	H	U	N	T	E	R	E
S	W	O	R	D	L	A	R	B	O	U	E	N	H
E	A	R	G	A	A	I	I	E	I	W	A	S	N
T	U	T	C	R	I	R	G	T	R	A	I	L	W
M	E	W	E	I	E	E	E	E	O	E	X	D	I
L	C	O	N	S	T	E	L	L	A	T	I	O	N
S	S	L	T	E	L	T	K	G	L	A	R	E	T
Y	I	A	A	N	B	L	E	E	N	L	T	B	E
R	A	E	I	K	N	B	B	U	I	N	A	E	R
I	M	W	K	P	A	E	E	S	T	I	L	L	M
A	N	B	G	R	H	T	B	E	A	L	L	T	A
N	I	I	E	A	E	B	N	U	K	A	E	O	K
L	A	J	H	A	L	O	L	I	L	M	B	T	E
X	E	O	R	R	E	T	L	R	M	A	B	T	R

RIGEL
SAIPH
BELT
NEBULA
CONSTELLATION
HUNTER
OJIBWE
MINTAKA
ORION
SYRIAN
SWORD
ALNITAK
ALNILAM
GREEK
WINTERMAKER
BETELGEUSE
BELLATRIX

Answers on page 8.

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Things to do until next time**:

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

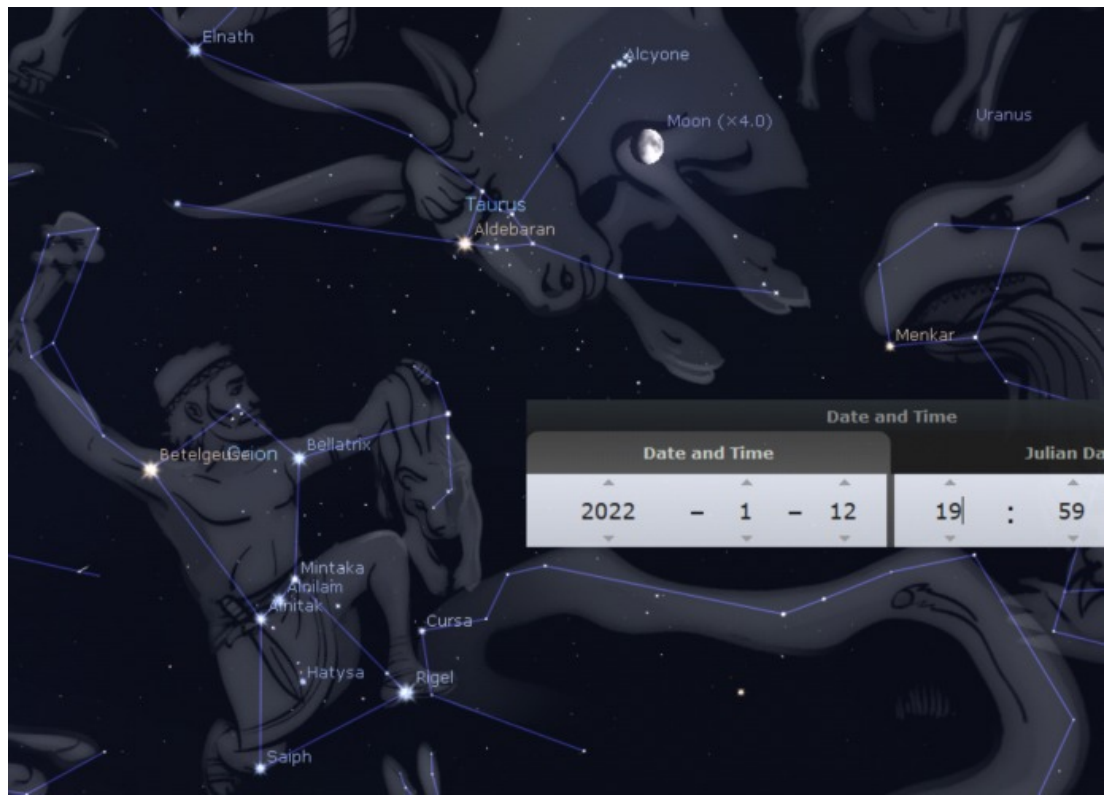
1. ***Visit:*** https://spaceplace.nasa.gov/constellations/en/ to learn more about constellations.

2. ***Visit:*** https://spaceplace.nasa.gov/nebula/en/ to learn more about nebulas.

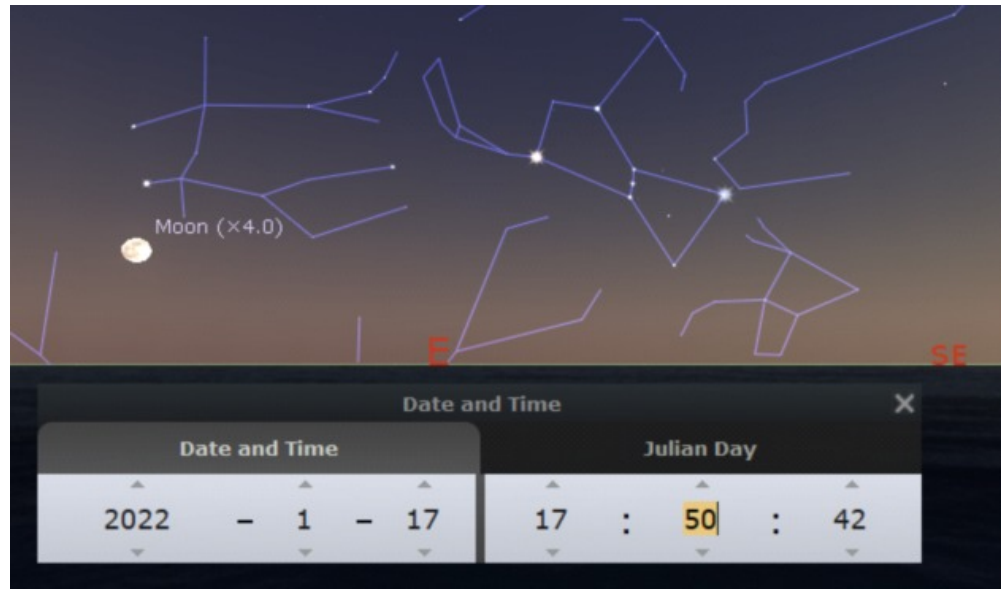
3. ***To make a 3D Orion Constellation***, with adult help, check out: https://astrosociety.org/file_download/inline/b19853a6-cb8e-48a3-9629-e6c8163fe6c7.

During January, check out:

1. ***All through the month of January at about 8:00 p.m.:*** Facing South, you will see the constellations Orion and Taurus. On the evening of January 12th, the Waxing Gibbous Moon is in Taurus just under the Pleiades.



2. ***January 17, 2022 at around 6:00 p.m.:*** You will see the Full Moon and Orion in the East rising at about the same time.



Images generated using Stellarium

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Finally:

Orion's belt is a big waist of space.

Author's Note: ¡Terrible joke! I give it only 3 stars!

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

Thank you to Mi and Ro for reviewing this article! 😊

References:

National Geographic Kids Field Guide: Night Sky, Howard Schneider. 2016.

Exploring the Night Sky. Terence Dickinson, 1987.

https://www.nativeskywatchers.com/articles/Booklet-Ojibwe-10-23-20-v9-screen-version.pdf

Word Search Solution:

The Sky This Month for January 2022 by Matthew Mannering

Last month I talked about comet Leonard. Unfortunately, the comet has turned out to be a bust for northern viewers for several reasons. The weather has been dismal of late so the opportunities to see the comet with a clear sky have been few and far between. It is so low in the sky that twilight (morning and evening) drowns out the light from the comet and for the most part it has been much fainter than anticipated.

In the last week however, the comet has undergone a couple of outbursts of brightness due to its approach to the Sun. Consequently, a few people south of the equator have gotten some very good shots of the coma and what has become a fantastic tail of gas and dust. The tail is now over 60° long! Spaceweather.com has some great images on its comet page that are well worth your time.

If you haven't seen Leonard yet don't feel badly. I have been out at least four times with 10x50 binoculars and have yet to get a glimpse of it. A few people in the club have had more success and have either captured it on a camera or seen it visually.

January 4th marks the day when the Earth is at Perihelion in its orbit around the Sun. This means that in winter we are at our closest point to the Sun for the year. It's a common misconception that because summer is the hottest season, we must be at our closest to the Sun, when we are actually about 5 million kilometers further away. The axial tilt of the Earth has a far greater effect on climate than our distance from the Sun. In fact, in the summer when the northern hemisphere is tilted towards the Sun, Hamilton receives about 3.8 times the energy per square metre than it does in winter.

If you are interested in the dwarf planets in our solar system, this month has a special treat in store. *Ceres*, the largest dwarf planet in the asteroid belt between Mars and Jupiter will be very close to the Moon on the evening of January 12th. Look for eighth magnitude Ceres less than one Moon diameter below and to the right of the Moon. In fact, you can draw an imaginary line from the Pleiades cluster through the Moon right to Ceres. You will need binoculars for this observation. Remember that the average person can only see objects down to magnitude six under pristine conditions let alone in light polluted skies where viewing may be limited to magnitude three or four.

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Taurus, the Pleiades, the Moon and Ceres On January 12

All charts generated using Stellarium

The Sky This Month for January 2022 (continued)

The Moon and Ceres
On January 12

The very next evening (January 13th) is the best day to see the planet *Mercury* low in the western sky. Mercury will be 3.5° down and to the right of Saturn. Find a location with a clear view to the southwest and be in place by 5:45pm to see Mercury while it is still about 8° above the horizon. Jupiter is also in the sky up and to the left of Saturn. Mercury should be visible from about January 8th to the 16th. After the 16th, Mercury will quickly dive back towards the Sun. Inferior conjunction will occur when Mercury is directly between the Earth and the Sun.

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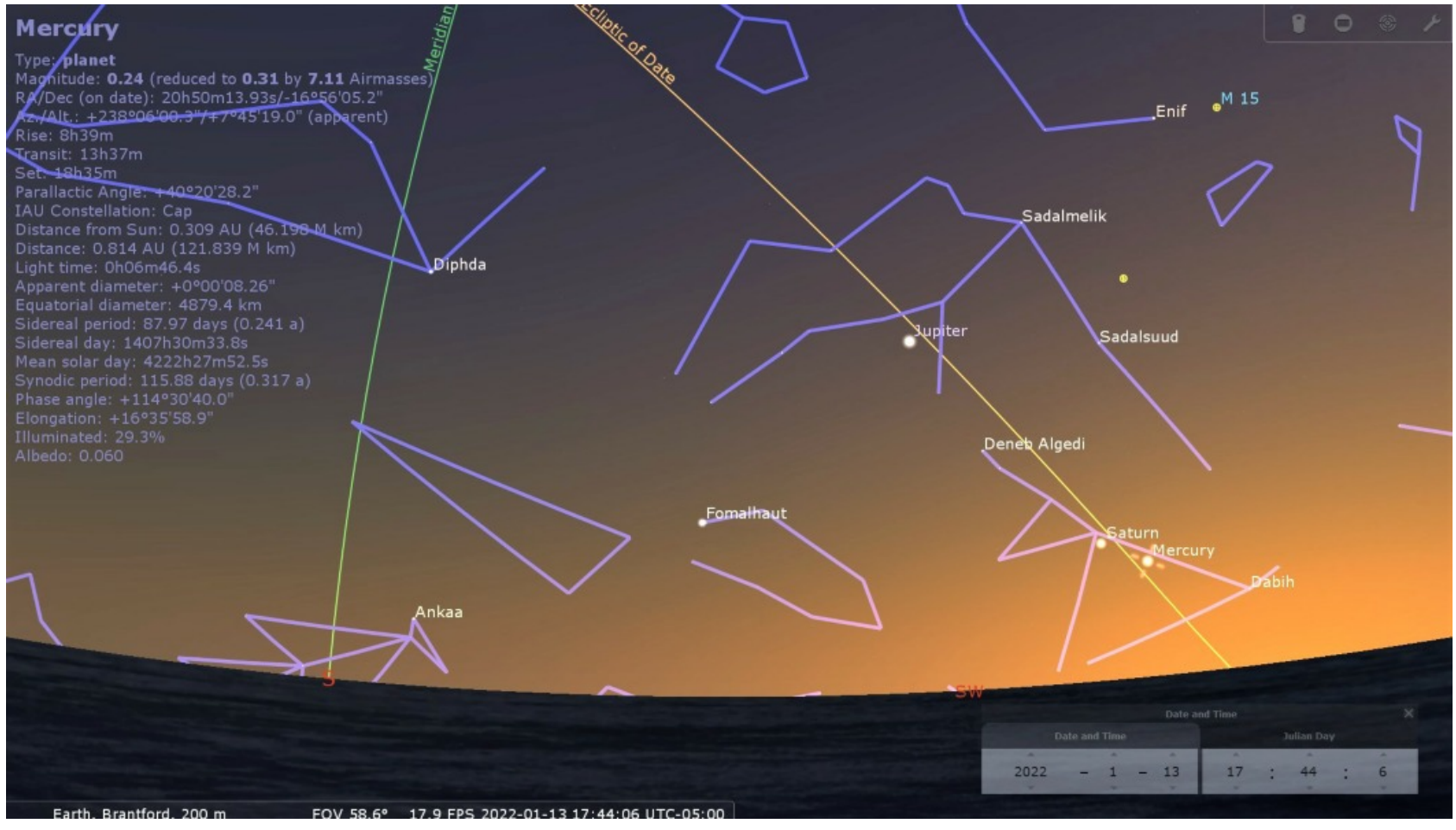

The Sky This Month for January 2022 (continued)

Another great winter treat is watching for the minima of *Algol*. Algol is one of the brightest stars in the constellation Perseus. It is a trinary star system with one of the stars eclipsing Algol every 2.87 days. When the eclipse happens, the brightness of Algol drops from magnitude 2.1 to a minimum magnitude of 3.3 for about four hours. This may not seem like a big change, but each magnitude translates to a 2.5 times difference in brightness. So, the dimming of Algol from magnitude 2.1 to 3.3 equates to a 3-fold change in brightness. This is an easy observation that can be done naked eye; no astronomy gear required!

I have noticed an issue with the minima times given in the 2022 RASC Observer's Handbook. The times listed as centre points for the Algol minima are different by about 40 minutes later than the times given in the Sky and Telescope magazine. Therefore, to increase your chance of seeing Algol's minima, I would go with the earliest time you find in any resource – handbook, magazine or online. Remember that the times given for astronomical events are often listed in Universal Time (Greenwich Mean time) rather than in Eastern Standard Time. This means you must remember to subtract five hours from event times listed for the winter months.

Image Credit: Joe F Gafford / Cloudynights

How about an observation that is just for fun? There is a small star cluster with the very catchy name of *NGC 2169* (left) in the constellation of Orion. When you look at this cluster with a 100mm or larger telescope, you should see the outline of the number '37' or, if you are looking at it upside down, the letters 'LE'.

As you can see in the chart below, the cluster resides in the raised arm of Orion. Star hop from Betelgeuse up Orion's arm and look for the cluster less than 1° from both Xi and Nu Orionis.

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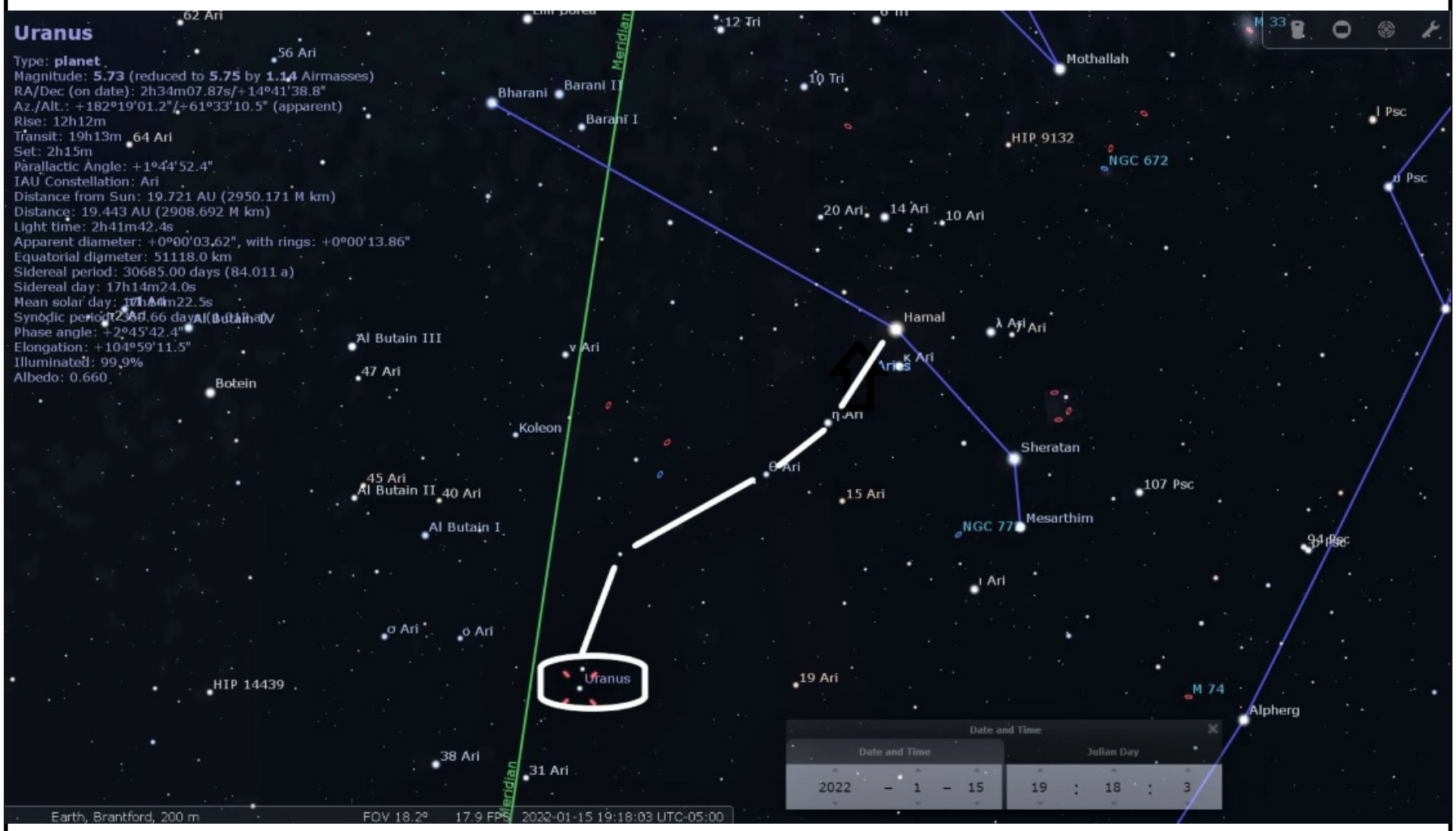
The Sky This Month for January 2022 (continued)

I found this observation in a great article called ‘A Winter Scavenger Hunt’ in the January 2022 Sky and Telescope magazine. It has descriptions of thirteen interesting targets in the area of sky from Canis Major up to Perseus.

Lastly, for planetary observers, *Uranus* is well positioned for viewing by binocular or telescope. The chart below shows you a good way to star hop from Hamal in the constellation of Aries. The stars used to hop to Uranus are all magnitude 6 and the hops between stars are less than 4°.

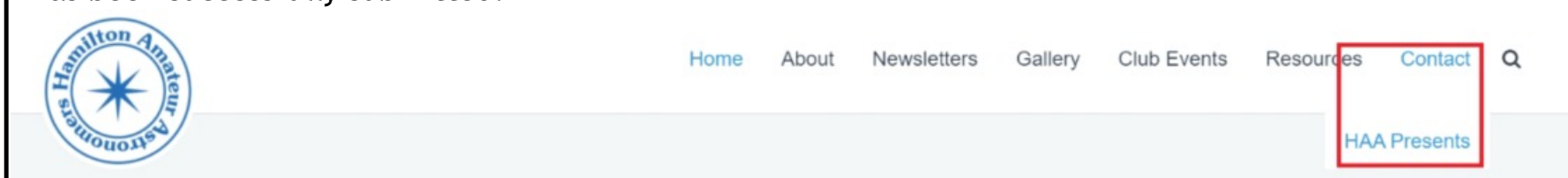


In closing, a Happy New Year to you all from Janice and me. Stay safe, stay well, don’t panic and carry on. I’m sure this will be the year we get together for some observing and fun.

“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.

What's Up in Awards? January 2022 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.

Observing Award Recipients

We would like to give recognition and congratulations to any member who completes an award program regardless of the sponsoring organization.

Congratulations to the following:

HAA
Rising Star Awards
001 Jean Jefferson
002 Kevin Salwach
003 Jo Ann Salci (November 2021)

RASC
Explore the Moon
Swapna Shrivastrava
Explore the Universe
Swapna Shrivastrava

Astronomical League
Bernie Venasse
Binocular Double Star Observing Program 143
Binocular Variable Star Observing Program 051
Binocular Solar System Observing Award 183-B
Sketching Observing Program 052

HAA Rising Star Observing Award

January
Constellations: Auriga, Orion, Taurus
Stars: Aldebaran, Betelguese, Capella, Rigel
Double stars: Gamma Lepus
Object Pairs: M42, M43
Messier objects: M35, M42, M45

February
Constellations: Gemini, Canis Major
Stars: Pollux, Sirius
Double stars: Castor, Aludra (eta Canis Majoris)
Object Pairs: NGC 2437, NGC 2438
Messier objects: M35, M42

(Continued on page 14)

What's Up in Awards? January 2022 (continued)

Pathways Observing Program

Observable this season: January, February, March
Group D,
Winter Constellations: Find, observe, sketch: *Taurus, Orion, Gemini.*
Stars: Find, observe, sketch: *Capella, Sirius, Betelguese.*
Asterisms: Find, observe, sketch: *Head of the Whale, Winter Triangle, Winter Hexagon.*
Planet: Any one planet that is remaining in the list.

HAA Messier Objects Observing Award

January Messier targets

M33 This is a very large (about the size of the full moon) face-on spiral galaxy in the constellation Triangulum. The best and easiest views of M33 can be found with a pair of binoculars. Look for a large, round hazy patch of light with little detail at first glance. M33 can be glimpsed with the naked eye in dark clear skies. Finding M33 in a telescope can be a challenge because of its size. Use the widest field eyepiece you have and look for a change in light level to identify the galaxy.

M103 This is a fairly small, sparse open cluster in Cassiopeia. Through a telescope the cluster is very sparse, four bright stars amidst the slight glow of much fainter companions.

M52 A small to mid-aperture telescope will begin to resolve this cluster. Look for a triangular patch of light with some stars clearly resolved, but most of the cluster members provide only a hint of graininess.

M76 Known as the Little Dumbbell, this planetary nebula in Perseus is one of the dimmest objects in the catalogue. Look for a small, faint, oblong patch of light. Not a very obvious object, if you don't see it at first try varying magnifications in an attempt to bring it out. Fortunately, M76 is located near a bright star which aids in locating the correct field to search.

M34 This is a large and bright, but sparse open cluster located in Perseus. Visible as a faint patch of light to the naked eye, it is quite obvious and easy to resolve in binoculars. In fact, binoculars provide a better view of this cluster than most telescopes.

M74 This galaxy in Pisces is a smaller and fainter version of M33, a face on spiral galaxy with low surface brightness. M74 is arguably the most difficult object to find in the Catalog. You will need very dark, clear skies to easily see it, anything less than perfect conditions will make M74 nearly impossible to find. Look for a very faint fuzzy star, which is the bright central condensation, surrounded by a very faint glow. Try all of your tricks on this one; star hop to the correct field, try varying magnification, tap the scope to detect the galaxy through its motion. If all of the above fail, try again another night or seek darker skies.

M77 This is a small faint galaxy in Cetus. Through a telescope look for a fuzzy, oval shaped patch of light, bright in the center, fading towards the edges.

February Messier targets

M1 The Crab nebula is a supernova remnant in Taurus. It is a hazy patch in small telescopes, large scopes can resolve some detail. It is difficult but possible to see in binoculars.

(Continued on page 15)

What's Up in Awards? January 2022 (continued)

M45 The Pleiades are a large open cluster in Taurus. Easy to resolve six stars naked eye. Binoculars provide the best view. Large telescopes can show some nebulosity.

M35, M37, M36, M38 A series of open clusters in the winter milky way. M35 is in Gemini, the others are in Auriga. All can be seen naked eye as faint fuzzy stars, binoculars reveal fuzzy patches, low power telescopes can resolve these rich clusters.

M42, M43 M42 is the great Orion Nebula. It can be seen as small fuzzy patch naked-eye. Binoculars show some detail, and the view is superb in most any scope. M43 is a small region of nebulosity next to M42, and probably requires the use of a telescope to view. Use low to moderate powers for the best view of this pair.

M78 A small reflection nebula in Orion, a tough binocular object. Best viewed in a telescope at moderate powers.

M79 One of the smallest and dimmest globular clusters in the catalog. A tough binocular object in Lepus, best viewed in a telescope at moderate powers.

The Planets… January 2022 via (BBC) Sky at Night Magazine

Mercury Evening planet, best in first half of January. Near Venus on 1 Jan, and Saturn 14 Jan.

Venus Inferior conjunction on 9 Jan, thereafter a morning object, blazing at mag. -4.5 at the end of the month.

Mars Morning planet, slowly brightening. Rises nearly two hours before the Sun for much of January.

Jupiter Bright evening planet, best at the start of January. Waxing crescent Moon nearby on 5 and 6 Jan.

Saturn Evening planet. Near Mercury mid-month. Lost after 20 Jan.

Uranus Dim evening planet, best seen at the start of the month.

Neptune Evening planet, deteriorating in visibility throughout January.

The Planets… February 2022 via (BBC) Sky at Night Magazine

Mercury Dim morning object, not well placed. Best seen just before mid-month.

Venus Bright morning planet, rising over two hours before sunrise. Near Mars at end of February.

Mars Brightening morning object, near Venus towards the end of February.

Jupiter Bright evening planet, rapidly lost to the twilight during the month.

Saturn Saturn lines up with the Sun in the sky on 4 Feb and is unlikely to be seen this month.

Uranus Mag. +5.8 Uranus loses altitude during February but remains a viable target.

Neptune The evening twilight catches up with Neptune this month, the planet is lost from view.

(Continued on page 16)

What's Up in Awards? January 2022 (continued)

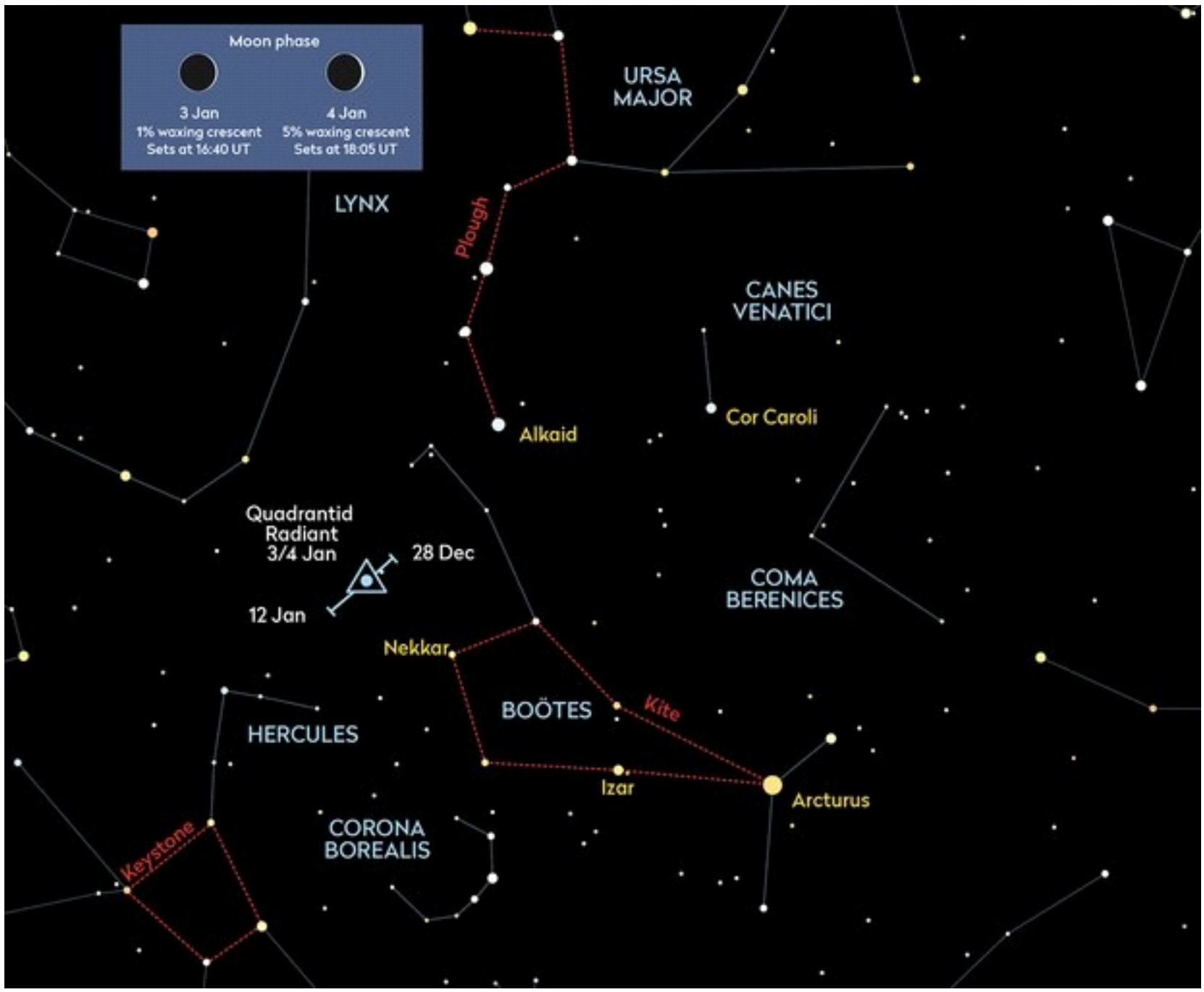
Meteor Showers via American Meteor Society

Quadrantids

Period of activity: December 26th, 2021 to January 16th, 2022
Peak Night: Jan 2-3, 2022

The Quadrantids have the potential to be the strongest shower of the year but usually fall short due to the short length of maximum activity (6 hours) and the poor weather experienced during early January. The average hourly rates one can expect under dark skies is 25. These meteors usually lack persistent trains but often produce bright fireballs. Due to the high northerly declination (celestial latitude) these meteors are not well seen from the southern hemisphere.

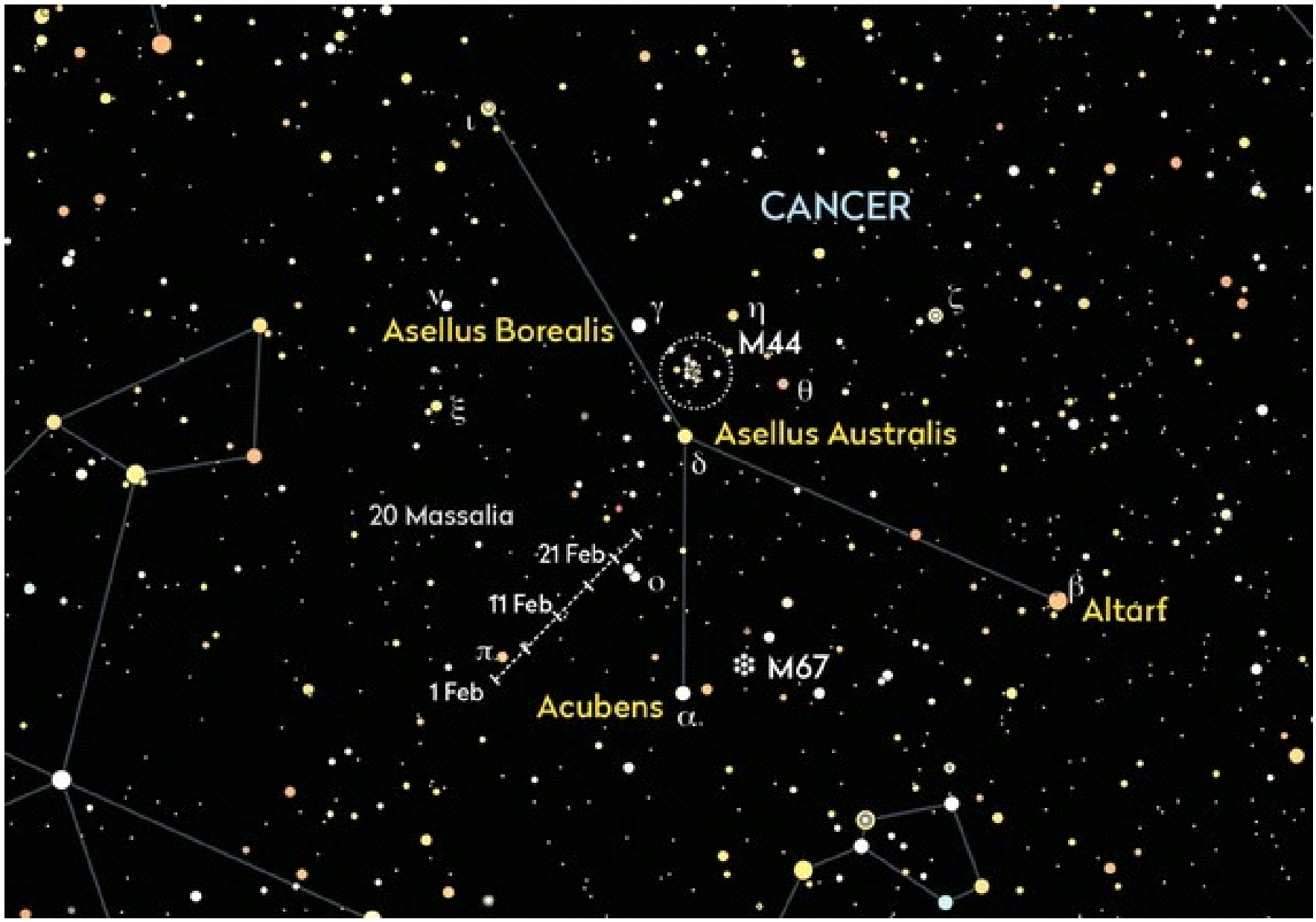
Shower details - Radiant: 15:20 +49.7° - ***ZHR:*** 120 - ***Velocity:*** 25 miles/sec (medium - 40.2km/sec) - ***Parent Object:*** 2003 EH (Asteroid)
Next Peak - The Quadrantids will next peak on the Jan 2-3, 2022 night. On this night, the moon will be 0% full. *(Continued on page 17)*



This year's Quadrantid peak is well timed with the Moon being new on 2 January.
Credit: Pete Lawrence

What's Up in Awards? January 2022 (continued)

Minor Planet 20 Massalia



Minor planet 20 Massalia reaches opposition on 20 February, when it can be seen shining east of the Beehive cluster, M44, at mag. +8.5. Credit: Pete Lawrence

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

— Bernie

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.

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!

Hunting the Hunter: Observing Orion

David Prosper

If you are outside on a clear January night, it's hard not to notice one distinctive star pattern above all: Orion! While we've covered Orion in earlier articles, we've never discussed observing the constellation as a whole. Perhaps you've received a new telescope, camera, or binoculars, and are eager to test it out. Orion, being large, prominent, and full of interesting, bright objects, is a perfect constellation to test out your new equipment and practice your observing skills - for beginners and seasoned stargazers alike.

In Greek mythology, Orion is a strong hunter, with numerous legends about his adventures. Being such a striking group of stars, cultures from all around the world have many myths about this star pattern. There are so many that we can't list them all here, but you can find a wonderful interactive chart detailing many cultures' legends on the Figures in the Sky website at figuresinthesky.visualcinnamon.com.

What sights can you see in Orion? Look above the variable orange-red supergiant "shoulder star" Betelgeuse to find the stars making up Orion's "club", then move across from Betelgeuse towards the bright star Bellatrix (Orion's other "shoulder") and the stars of his bow and arrow - both essential tools for the Hunter. Many interesting sights lie near Orion's "belt" and "sword". Orion's belt is made up of three bright giant stars forming an evenly spaced line: Alnitak, Alnilam, and Mintaka. Move from the belt stars towards the stars Rigel and Saiph (Orion's "feet" or "knees") to arrive at Orion's distinctive Sword, parts of which may appear fuzzy to your unaided eyes. Binoculars reveal that fuzz to be the famed Orion Nebula (M42), perched right next to the star Hatysa! Diving in deeper with a telescope will show star clusters and more cloud detail around the Nebula, and additional magnification brings out further detail inside the nebula itself, including the "baby stars" of the Trapezium and the next-door neighbor nebula M43. Want to dive deeper? Dark skies and a telescope will help to bring out the reflection nebula M78, the Flame Nebula (NGC 2024), along with many star clusters and traces of dark nebula throughout the constellation. Very careful observers under dark clear skies may be able to spot the dark nebula known as the Horsehead, tracing an equine outline below both the Belt and the Flame Nebula. Warning: the Horsehead can be a difficult challenge for many stargazers, but very rewarding.

This is just a taste of the riches found within Orion's star fields and dust clouds; you can study Orion for a lifetime and never feel done with your observations. To be fair, that applies for the sky as a whole, but

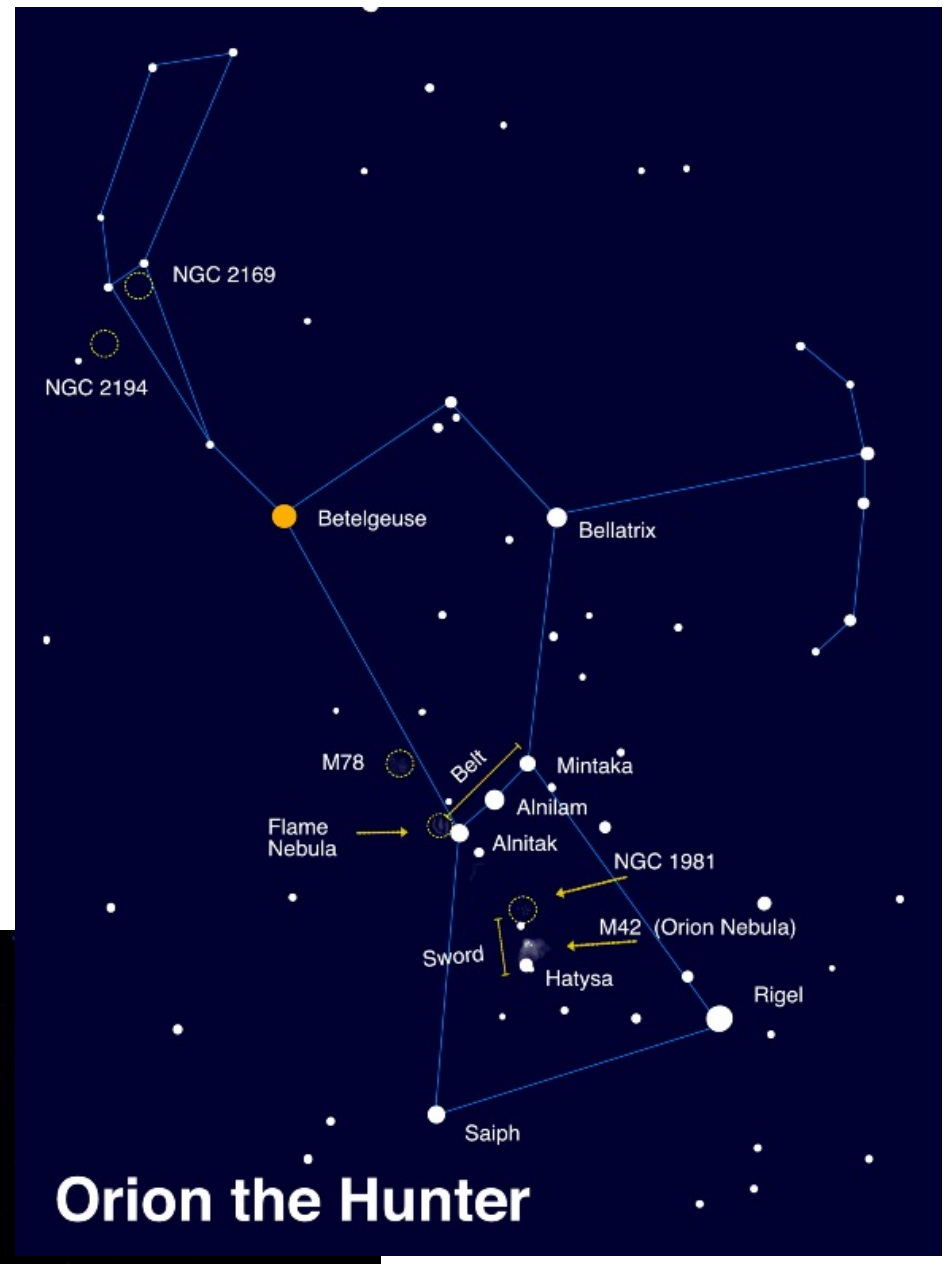
(Continued on page 19)

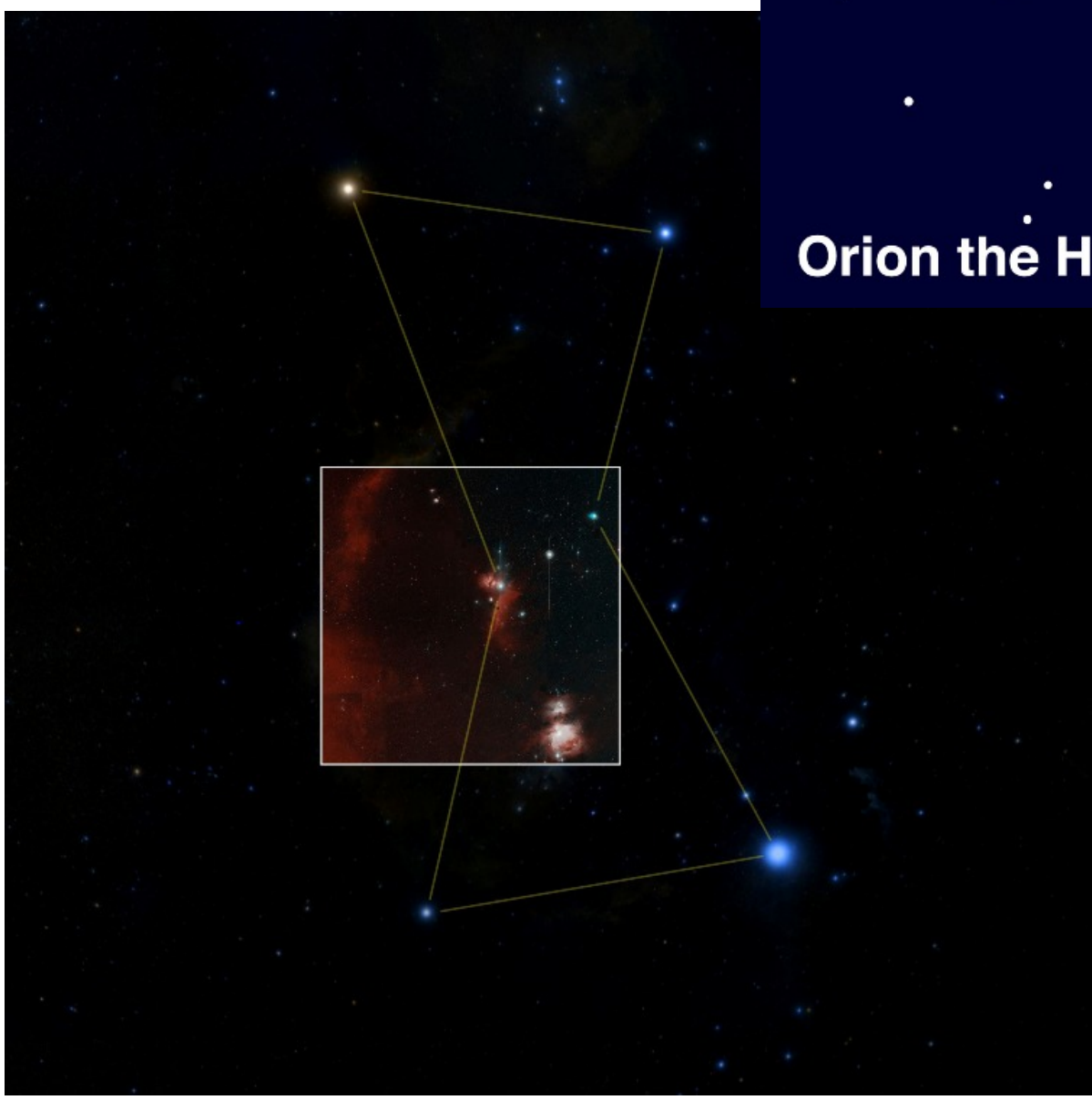
NASA Night Sky Notes (continued)

Orion has a special place for many. New telescopes often focus on one of Orion's treasures for their first test images. You can discover more of NASA's research into Orion's stars - as well as the rest of the cosmos - online at nasa.gov.

Northern Hemisphere observers can find Orion during January evenings in the east/southeast skies. Can you spot the Orion nebula with your naked eye, in Orion's sword? How does it look via binoculars or a telescope? What other details can you discern? Please note that some deep sky objects aren't listed here for clarity's sake. For example, M43, a nebula located directly above M42 and separated by a dark dust lane, is not shown. Orion's Belt and Sword are crowded, since they star-forming regions! You can read more in our November 2019 article Orion: Window Into a Stellar Nursery, at bit.ly/orionlight.

Image created with assistance from Stellarium.





The inset image is the "first light" photo from the Zwicky Transient Facility, a large survey telescope designed to detect changes in the entire night sky by detecting "transient objects" like comets, supernovae, gamma ray bursts, and asteroids. For many astronomers, amateur and pro alike, Orion is often the "first light" constellation of choice for new equipment!

Image Credit: Caltech Optical Observatories

2020-2021 Financial Statements by Ann Tekatch

CASH FLOW

Income	31-Oct 2021	31-Oct 2020
Memberships	$4,905.00	$3,970.00
HAA Calendars	$2,035.00	$2,840.00
Clothing Sales	$0.00	$750.00
50/50	$0.00	$287.00
Cash Donations	$80.00	$200.00
Total Income	**$7,020.00**	**$8,047.00**

Expenses	31-Oct 2021	31-Oct 2020
Insurance	$975.08	$1,157.76
EH Newsletter	$0.00	$0.00
Brochures/Promotion	$0.00	$0.00
HAA Calendars	$1,803.35	$2,293.90
RASC Handbooks	$0.00	$596.93
Donations Outgoing	$1,000.00	$955.00
Depreciation Expense	$424.53	$355.87
PO Box Rental	$190.97	$190.97
Speakers Allowance	$115.68	$150.00
Office Supplies	$24.86	$31.62
Postage	$140.63	$64.32
Public Education	$764.40	$575.75
Hall Rental	$0.00	$988.52
Miscellaneous	$712.09	$562.89
Website	$240.58	$247.31
Total Expenses	**$6,392.17**	**$8,170.84**
Surplus/Deficit	**$627.83**	**-$123.84**

(Continued on page 21)

2020-2021 Financial Statements (continued)

BALANCE SHEET

Assets	31-Oct 2021	31-Oct 2020
Bank	$11,999.50	$11,674.48
Cash	$0.00	$0.00
Inventory	$0.00	$0.00
Prepaid PO Box Rental	$195.49	$190.97
Prepaid Mailing Expense	$0.00	$0.00
Prepaid Liability Insurance	$0.00	$0.00
Prepaid Hall Rental	$0.00	$0.00
Accounts Receivable	$0.00	$0.00
Prepaid Banquet Expenses	$0.00	$0.00
Prepaid Calendars	$0.00	$0.00
Total Current Assets	**$12,194.99**	**$11,865.45**
Fixed Assets	$0.00	$0.00
Equipment	$2,032.03	$1,788.74
Total Fixed Assets	**$2,032.03**	**$1,788.74**
Total Assets	**$14,227.02**	**$13,654.19**
Liabilities	**31-Oct 2021**	**31-Oct 2020**
Deferred Membership Revenue	$2,910.00	$2,965.00
Accounts Payable	$0.00	$0.00
Total Liabilities	**$2,910.00**	**$2,965.00**
Equity		
Opening Balance	$10,689.19	$10,813.03
Adjustments	$0.00	$0.00
Donated Equipment (Book Value)	$0.00	$0.00
Current Year	$627.83	-$123.84
Closing Balance	$11,317.02	$10,689.19
Total Liabilities and Equity	**$14,227.02**	**$13,654.19**

(Continued on page 22)

PROFIT & LOSS

Revenue (Net)	31-Oct 2021	31-Oct 2020
Membership	$4,905.00	$3,970.00
Calendars	$231.65	$721.25
Cash Donations	$80.00	$200.00
50/50 Draw	$0.00	$287.00
RASC Handbook Sales	$0.00	$153.07
Clothing Sales	$0.00	$750.00
Net Revenue	**$5,216.65**	**$6,081.32**

Depreciation Table	31-Oct 2021	31-Oct 2020
Opening Balance	$1,788.74	$1,414.08
Depreciation Full Year	$357.75	$282.82
Donated Equipment	$0.00	$0.00
Additions	$667.82	$830.53
Sales	$0.00	$100.00
Net	$667.82	$730.53
Depreciation Part Year	$66.78	$73.05
Total Depreciation	**$424.53**	**$355.87**
Closing Balance	**$2,032.03**	**$1,788.74**

UPCOMING EVENTS

January 14, 2022 - 7:30 pm — Virtual Online H.A.A. Meeting. Our main speaker will be *Dr. Paul Delaney* of York University. *Topic:* Occultations.

Due to the COVID-19 Coronavirus pandemic, 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.

We hope to return to in-person meetings very soon!

2021-2022 Council

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

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

The Harvey Garden HAA Portable Library

Contact Information

E-mail: library@amateurastronomy.org