



STAR FIELDS

Newsletter of the
Amateur Telescope Makers of Boston
Including the Bond Astronomical Club
Established in 1934
In the Interest of Telescope Making & Using

Vol. 34, No. 2 February 2022

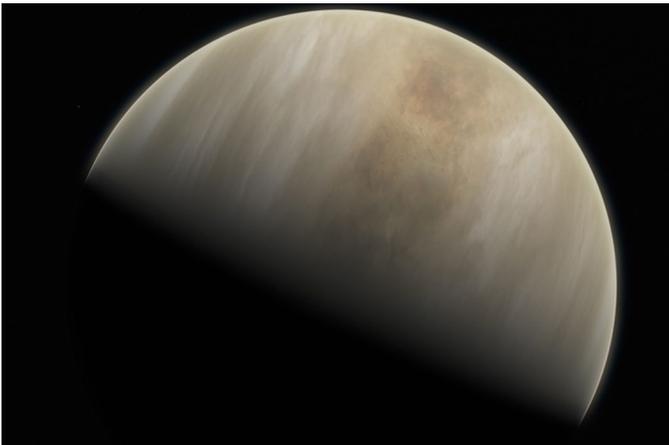
This Month's Meeting . . .

Thursday, February 10th, 2022 at 8:00 PM
[Zoom On-line Meeting](#)

All ATMoB meetings scheduled for the Center for Astrophysics (Harvard & Smithsonian) in Cambridge, MA have been **canceled indefinitely** due to concerns over the [coronavirus](#) outbreak.

We are holding virtual on-line meetings using the Zoom application. Please refer to the [ATMoB website](#) for future meetings. Members should check their email on the ATMOB-ANNOUNCE list for additional information. Please [select this Zoom link to attend the 949th Meeting of the Amateur Telescope Makers of Boston.](#)

Venus as a Potentially Habitable Planet



Venus artistic impression. Credits: ESO (European Space Organization)/M. Kornmesser & NASA/JPL/Caltech.

Our speaker this month is Dr. Sara Seager. Dr. Seager's presentation is titled: Venus as a Potentially Habitable Planet. She writes: "Scientists have been speculating on Venus as a

habitable world for over half a century, based on the Earth-surface-like temperature and pressure in Venus' clouds at altitudes 48-60 km above the Venus surface. The recent and controversial detection of phosphine gas in the atmosphere of Venus has renewed interest in both the Venus atmosphere in general and in the speculative possibility of life in the clouds. Any life would have to persist aloft indefinitely against downward gravitational settling, in order to avoid the destructively hot temperatures beneath the clouds. Recent efforts to re-analyze and re-interpret the decades' old legacy data collected by both NASA's Pioneer Venus and Russia's Venera missions has further highlighted intriguing non-equilibrium chemistry." Professor Seager will discuss the latest on Venus as a potentially habitable planet.

Dr. Sara Seager is a Professor of Physics and Planetary Science at the Massachusetts Institute of Technology. Her research ranges from the detection of exoplanet atmospheres to innovative theories about life on other worlds to development of novel space mission concepts. She was the Deputy Science Director of the MIT-led NASA space mission TESS and is currently focused on developing a Venus Life Finder Mission. Her ground-breaking research earned her a MacArthur "genius" grant, and she is also an Officer of the Order of Canada, a member of US National Academy of Sciences and has Asteroid 9279, currently shining at magnitude +19.7 in the constellation Pisces, named in her honor.

I'll open the meeting at 7:45 p.m. I hope you'll join us!

~ Rich Nugent – President ~

President's Message . . .

As amateur astronomers we also tend to be amateur meteorologists. Not only do I have my favorite TV weather forecasters, but I have several weather apps that I constantly consult to better predict what the sky will look like on any given night. Living in New England you understand how cruel the skies can be. Our average cloud cover runs between 60-70% depending on the time of year. What does that mean to us? We are going to be clouded out more times than not. If you are only able to observe on the weekends and want to observe or image during the dark of the moon you might get one or two nights a year when the sky cooperates. How can we maximize our observing opportunities? We do this by broadening our interests within the hobby.

You know I am a proponent of daytime observing. When the Sun is up the sky is filled with extreme light pollution – Bortle 24 skies – where the naked eye limiting magnitude is about -4! So, what can be seen? The Moon, Venus, Mercury, maybe Jupiter and Mars, and the Sun. I don't often mention the Sun, but it is one of my favorite objects to observe. If it's going to be cloudy at night and the Sun is shining in a cloud-free morning sky, I'll get outside and observe it.

I know most of our members are experienced observers and likely already know how to safely observe our nearest star but I'm going to remind everyone to BE CAREFUL when

observing the Sun. There are only a few ways to safely observe it. NEVER try to observe the Sun directly through an unfiltered telescope, no matter how small the aperture! Permanent eye damage will occur almost immediately. Don't forget to cover or even remove your finder scope because no one wants to get burned or have their eyes singed when observing. I use the shadow cast by my scope to judge when it's pointing at the Sun. Sol-finders can be purchased or made. Check out: <https://skyandtelescope.org/2017-total-solar-eclipse/solar-finders/>.

The "white-light" view will show sunspots, faculae, granulation, and limb darkening. At magnitude -26.7, you don't need a lot of aperture for solar observing. Small refractors or stopped-down reflectors offer enough light to project the solar image onto a white surface. Many of the vintage refractors of the '50's and 60's came with a solar projection set up as a standard accessory. The beauty of this method is that a group of observers can watch simultaneously. If you add a circle to the white surface and adjust the solar image to fit the circle, the size of sunspots can be determined. Is there a downside to this method? Of course. With increasing aperture there is more light and heat concentrated by the telescope. As the beam of sunlight nears the focal point of the scope, the temperature is very high. Do you really want to thermally shock your telescope's secondary mirror or that really expensive eyepiece you're using? I'd rather not! So, stop down that big telescope! And, that inescapable thermal energy is the reason that the screw-into-the-back-of-an-eyepiece filters that came with those old refractors should never be used. I would keep them to complete the telescope kit, but I would never use one. It's all that stands between your eye and, well, you know what. Also, never leave an unfiltered telescope unattended. Some inexperienced and unsuspecting bystander might just want to take a look for themselves.

A better method is to use a front mounted solar filter. These are readily available and are cost effective, safe way to cut down the light before it becomes concentrated by the optics. If I'm observing with a group, I always tape the filter to the front of the scope...just to be safe! Again, you don't need a full - aperture filter. Off-axis, smaller aperture filters cost less and still provide bright views.

Another option is to purchase a Herschel wedge. This specialty device works in refractors by taking the place of the diagonal. These are available from a small number of vendors and work by diverting over 95% of the Sun's energy away from the eyepiece. Filters are used to decrease the brightness to a comfortable level. In my setup, the remaining 5% of the light coming out of the wedge passes through a neutral density filter and then a polarizing filter. The light leaving the wedge is polarized so adding a single element polarizing filter allows me to fine-tune the brightness by simply turning the filter. If you really want peace of mind, you can also include an IR/UV cut filter just before the eyepiece. I sometimes add a green filter to help with contrast.

Watching sunspots come and go and change over time is a fun way to keep up with the solar cycle. The Sun's activity

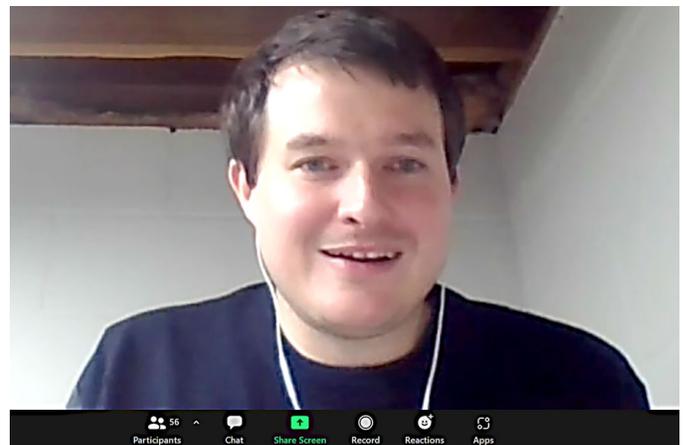
varies over a roughly 11-year period. We are just now emerging from a deep solar minimum with the next maximum predicted for the summer of 2025. Of course, there are other aspects of the Sun you can observe but seeing them require specialized and expensive equipment. Read on.

Some of our members own dedicated, Hydrogen-alpha solar telescopes. These are offered by Coronado (Meade) and Lunt. These telescopes consist of a pre-filter followed by an etalon. An etalon is an interference-type filter designed to allow only a very small fraction of the solar energy pass through it. Mine has a bandpass of <0.7 Angstrom centered on the deep-red, Balmer series emission with a wavelength of 656.3 nanometers, the Hydrogen alpha line. Double-stacked versions offer a bandpass of <0.5 Angstroms. Blocking filters in front of the eyepiece are necessary to further reduce the intensity and prevent eye damage. With these telescopes you can observe solar prominences, dark filaments, and solar flares. When I observe with my scope, I cover my head with a shroud to shield ambient light and I use a bino-viewer. The views are amazing! When the warmer weather arrives I'll bring my setup to Saturday work parties at the Clubhouse. Stop by for a view.

Becoming a solar observer will allow you to expand your observing repertoire while giving you a better chance of observing during any given 24-hour period. Of course, there's more, observing the Sun even if it's cloudy but I'll save that for next month's message. In the meantime, stay safe and be well, my friends.

~ Rich Nugent – President ~

January Meeting Minutes . . .



Matthew East on Zoom. *

ATMoB 948th Meeting Minutes January 13, 2021

Rich Nugent presented the President's welcome. We still have limited observing sessions in the dark of the Moon. If you're vaccinated, you're welcome to come out and observe. Clubhouse access is restricted to the bathroom. The CFA calendar remains closed.

- Alva Couch presented the Secretary's report on last month's business meeting. He also gave a summary of the inspiring presentation by Arne Henden on the many ways we can use the Mittelman-ATMoB Observatory (MAO) in pursuit of scientific knowledge.
- Eileen Myers presented the Treasurer's report and reported inflows from memberships and a generous donation in memory of Ernest Ginneti.
- Chris Elledge presented the Membership report and welcomed new members Roy, Nancy, and Jonathan Chien, Aidan Collins, Doug DeAngelis, Mario Mendes, and Richard Wagner.
- Glenn Chaple and Rich Nugent presented the Observer's report. Venus is 2.2% illuminated on January 15. There are close encounters between the Moon and both Jupiter and Uranus. There was a challenge made to observe or image the minor planet 1994 PC1 at 10th magnitude. The January Observer's Challenge was NGC 1501.
- Steve Clougherty presented the Clubhouse report. A work party on December 18 with 12 members present was abbreviated because of weather. We're in the process of tweaking the drive mechanism on the EQ platform. Bruce Berger and John Stodick picked up the lumber for the MAO deck. Alva Couch arranged for his work organization, [Consortium of Universities for the Advancement of Hydrologic Science, Inc. \(CUAHSI\)](#), to donate three task chairs, four 24" monitors, two dual-monitor stands, and a 2200 watt-hour uninterruptible power supply (UPS) for the MAO control room. MIT has removed the trees on the border of the observing field, allowing viewing nearer to the horizon.
- Alan Sliski presented the Mittelman-ATMoB Observatory report; MAO committee members worked on pre-drilling the deck on Jan 12, and also moved the donated UPS up to the Electronics/MAO control room. Chris Elledge showed images of the NGC 2264 area, as well as the Observer's Challenge object, NGC 1501.
- Kelly Beatty and Rich Nugent presented the Outreach report, and reported that the Boston Public Library wants to buy 12 loaner telescopes, which is more than we have, so we need to acquire more. We will need another "telescope modification party" to make these ready to loan.
- Maria Batista gave the Website Committee Report. The committee is looking for action photographs of people looking through telescopes, star parties, etc. Pictures of people who are not ATMoB members require permission from those people.
- Old business:
<https://smile.amazon.com> is a great way to donate to ATMoB while shopping on Amazon.

- New Business:
The election schedule for 2022 includes the following monthly activities:
 - April: Announce candidates for Nominating Committee, vote on members.
 - May: Announce slate of candidates.
 - June: Election of club board members.

Our January speaker was Matthew East whose talk title was "Exquisite Stability for Large Space Telescopes". He spoke on the problems of making future large space telescopes, including successors to the James Webb Space Telescope, that are stable enough to produce usable images. A key component of future space telescope proposals is a "star coronagraph" that blocks a star to expose the environment around it, including exoplanets. The next proposed mission, the Nancy Grace Roman Space Telescope, will use an internal coronagraph 1000 times more sensitive than anything previously attempted. To make a coronagraph of this precision work, we need to make all optics very still, on the order of picometers. The goal of the Roman coronagraph is to be able to resolve nearby objects one billion times dimmer than the star they orbit.

The technical challenge of creating such precise stability is daunting. A "stability budget" is based upon multiple factors, including the order of static and dynamic stability to be achieved, affordability, mass to be placed into space, and the ability to produce the required components on a reasonable time schedule. At the time a space telescope is deployed, stability depends upon glue that is still curing. At the required level of stability, things need to be accounted for that was not significant before, including temperature control in the millikelvin range and the thermal load that results from slewing from one star to another!

~ *Alva Couch – Secretary* ~

Membership Report . . .

I am pleased to welcome our newest members: Evelyn Bagley; Rodrigo Carrillo & Beatriz Sanchez; Roy, Nancy, & Jonathan Chien; Aidan Collins; & Doug DeAngelis.

As of January 30th, 2022 we have 336 memberships covering 426 members. This is broken down as follows:

- 142 Regular Members
- 132 Senior Members
- 9 Student Members
- 51 Family Memberships covering 141 Members
- 2 Honorary Members

Please contact me if you need any help with renewing or logging into the website.

~ *Chris Elledge – Membership Secretary* ~

Meeting Recordings . . .

The recording of ATMob meeting #948 is not available publicly. To view the member only recording of the meeting please see the Announce Forum on the ATMob Website <https://www.atmob.org/forums> or ask me for a link (membership@atmob.org)

~ *Chris Elledge - Membership Secretary* ~

Clubhouse Report . . .



New lower horizon for the Clamshell observatory, thanks to MIT. *

Our monthly Clubhouse work session scheduled for January 15 was canceled due to the Covid-19 Omicron surge. We are discussing the possibility of whether or not to hold the February session, and a decision will be made within the next week, at which time an announcement will be made.

Several members continue to work on Clubhouse related projects. Rich Nugent, John Stodieck and Steve Clougherty replaced the faulty bathroom fan earlier this month. The MAO team continues to calibrate the automated observatory and have had successful imaging sessions. Observing sessions has taken place during the month when conditions allow. Members are welcome to use the observing field, but the Clubhouse will remain closed except for bathroom access.

We are very much looking forward to returning to normal!

~ *Clubhouse Committee Chairs* ~

~ *Steve Clougherty, John Reed and Dave Prowten* ~

Observer's Challenge** . . .

February, 2022

M42 - Emission Nebula in Orion

Magnitude 3.6

Size 70'x60'

M43 - Emission Nebula in Orion

Magnitude 9.0

Size 20'x15'



M42 and M43. 1 hour total of H- α , OIII, and SII, with 32-inch Telescope, and ZWO ASI 6200 camera. Image by Mario Motta.

This month's Observer's Challenge is (drum roll) M42/M43, the Orion Nebula! You might ask why a deep-sky object that's easy to find (it's in the Sword of Orion) and see (it's bright enough to be viewed with binoculars) would be considered a challenge.

Let's begin with M42, the brighter of the two. It was discovered in 1610 by the French astronomer Nicolas-Claude Fabri de Peiresc and cataloged by Charles Messier on March 4, 1769. Binoculars and small-aperture telescopes will reveal the bright northeast part of M42, which resembles the outspread wings of a celestial eagle. One challenge is to visually capture the nebula's faint southerly region. Because M42 spans 85' by 60', you'll want to work with a low-power, wide-field eyepiece. A second visual challenge is to detect M42's greenish hue. I've seen it with a 13.1-inch f/4.5 scope, but not with a 4.5-inch. What is the smallest aperture that will reveal this subtle hue? Find out, and forward your result to Challenge coordinator Roger Ivester.

Being fainter and thus overshadowed by M42, M43 eluded detection until reported by Jean-Jacques Dortous de Mairan in 1731. Messier entered it in his catalog on the same date as M42. It is separated from M42 by a dark, dusty lane and surrounds the irregular variable star NU Orionis (magnitude range 6.5 to 7.6). The nebula's published magnitude of 9.0 might be on the low side, as I've seen M43 with a 60mm refractor. Admittedly, it was small and faint, and only visible when I ramped up the magnification to 140X to remove M42 from the field of view. What I saw was a roundish haze surrounding NU Orionis. In larger instruments, M43 will take on a comma shape.



M42 wide field. Canon Ra, 600mm f/4.0 lens, ISO 200, 104 subs x 30sec = 52 min. total exposure, 1/4 scale, North up. Image by Doug Paul.



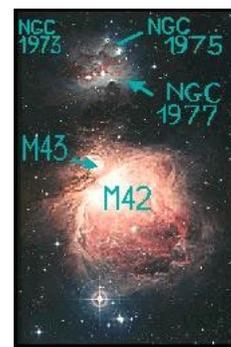
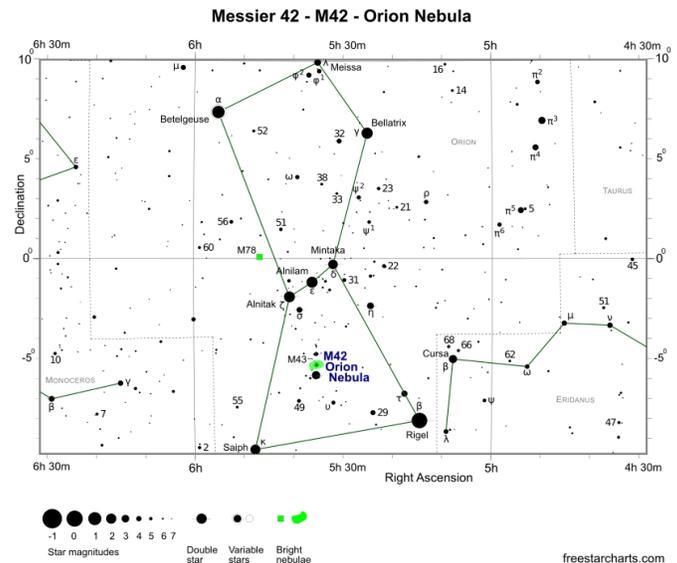
Trapezium. Canon Ra, 600mm f/4.0 lens, ISO 200, 10 subs x 8sec = 80 sec. total exposure, 4x scale, North up. Image by Doug Paul.

Looking for another challenge? At the heart of M42 is theta-1 (θ 1) Orionis, a stunningly beautiful multiple star birthed from the surrounding nebulosity. The four brightest members, all hot and massive O- and B-type stars, form a lop-sided diamond known as the Trapezium. Labeled A to D in order of increasing right ascension, they shine at magnitudes 6.7, 7.9, 5.1, and 6.7, respectively. A and B are eclipsing binaries, the former, bearing the variable star designation V1016 Orionis, fading to magnitude 7.5 every 65.4 days, the latter (BM Orionis) dipping to 8.5 every 6.5 days. Galileo discovered the three brightest members (A, C, and D) in 1617. The fourth (B), was

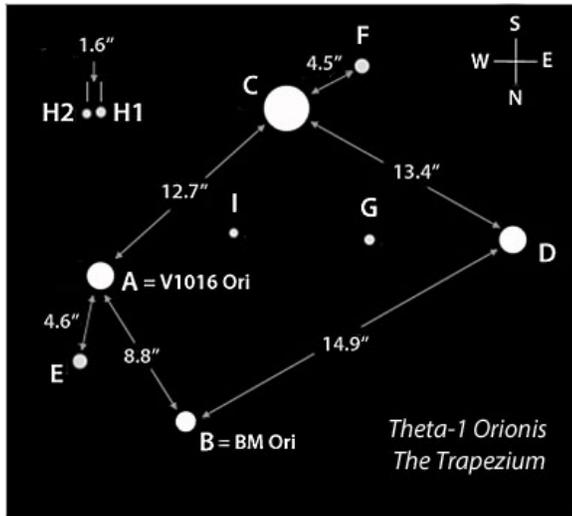
discovered by the French astronomer Jean Picard in 1673. It can be difficult in a small-aperture scope, especially at the low magnification needed to view the entire Orion Nebula. If seeing conditions allow for a magnification of 200X or more, a 6-inch telescope will reveal two more stars, E (magnitude 10.3) and F (magnitude 10.2). Four other members G, the tight double H1 and H2, and I are extremely faint at magnitudes 14.5 to 15.5 and require large scopes and optimum seeing conditions. These are a true challenge!

Oh yeah- here's a final challenge. See if you can view the Orion Nebula, its gaseous wreaths embracing a diamond-like clutch of newborn stars, and not feel a sense of awe and wonder.

The Orion Nebula lies some 1350 light-years away. Cosmically young, it is just 2 or 3 million years old. The stars in the Trapezium are even younger, perhaps no older than 300,000 years. M42 and M43 have linear diameters 23 and 7.5 light-years, respectively, while the brightest stars in the Trapezium span a distance of about 1.5 light-years.



SEDS Messier Database



Trapezium chart. Credit *Sky & Telescope Magazine*.

**The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'll be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to Roger Ivester (rogerivester@me.com). To find out more about the Observer's Challenge or access past reports, log on to <https://rogerivester.com/category/observers-challenge-reports-complete/>.

~ Submitted by Glenn Chaple ~

19 Objects for February . . .

Here is a list of 19+ objects you might want to get outside and observe during February. Some are easy but some are challenging! If you revisit some of the December and January objects and add some of your favorites, you'll have an excellent observing list! Just remember...it's cold out there so bundle up!

Solar System Objects:

Jupiter is still visible in the early evening but is low in the SW. **Uranus** is in Pisces at magnitude 5.9; Larger apertures will show some of its moons.

Use your planetarium software or *Sky & Telescope's* website for finder charts.

Venus is now over 30° from the sun and is easy to observe in SE at dawn. You may want to try observing it during the daytime.

Multiple Stars:

Lambda Orionis: magnitudes 5.6/10.7; Separation is 32"; What colors do you see?

Iota Orionis: 2.8/8.8; 11.6"; Impressive!

Sigma Orionis: 3.8/6.8; 9.5" and 6.6; 12.8': A very impressive triple star! Look for the tight double, Struve 761, just 3' to the northeast!

k Puppis: 4.4/4.6; 9.9" (Also cataloged as HD 61555); Very impressive pair of white stars! This beauty lies 3 degrees west and a little south of magnitude 3.8, Xi Puppis.

Colorful Stars:

R Leporis: One of the reddest stars carbon stars in the sky. Variable: magnitude 5.5-11.7; reddest at minimum brightness. Currently around 8th magnitude. Also known as **Hind's Crimson Star**

h 3945 (145 Canis Majoris): Nugent's favorite Star. The winter Albireo. Striking colors!

Variable Star:

Algol (The Demon Star): This eclipsing binary is due to make a conveniently timed minima on 11 February (10:31 PM ET) and 14 February (7:21 PM ET).

Galactic Clusters:

M35/NGC2158 (Gemini): Outstanding. M35 is visible in binoculars. 2158 lies 26' to the south west.

Planetary Nebulae:

NGC 2022 (Orion): Magnitude 11.7. Easy to locate. Don't let the magnitude scare you away!

NGC 3922 (Gemini) The Eskimo Nebula: Bright, easy...very Nice! Magnitude 10.5 central star.

Of course, UHC/OIII filters help with these objects.

Emission Nebulae:

NGC2359 (Thor's Helmet): Located about 8.5 degrees NE of Sirius, this object responds very well to UHC and OIII filters.

Reflection Nebulae:

M78: A bit of a challenge from suburban skies. Note the pair of 10th magnitude stars embedded in the nebula.

NGC 1999: Even more challenging...but visible with an 8-10" scope under suburban skies. Can you see the keyhole? It's not a dark globule but a hole blown out by nearby, energetic star!

Galaxies:

NGC 1023: Magnitude 8.6, elliptical galaxy in Perseus. Look for nearby carbon star, UY Andromeda.

NGC 2841: Magnitude 9, flocculent spiral galaxy in Ursa Major. Easy to locate; bright.

February 2021 Observer's Challenge:

M42/M43: The Great nebula of Orion. Two thumbs up for this bright emission nebula and star forming region. Visible to the naked eye as a hazy patch of light. Telescopes reveal its splendor. Can you see colors? Green light is from excited oxygen atoms. Hints of red might be visible with larger apertures. Pay attention to the Trapezium. Look for the fifth and sixth stars! How many stars can you see? Responds well to UHC filters!

If you are unfamiliar with the location of any of these stars or deep sky objects, Google search for the object's R.A. and Dec. then consult your star atlas. Except for the solar system objects, these objects are plotted in *Sky & Telescope's Pocket Sky Atlas*. (k Puppis is plotted but unlabeled).

~ Rich Nugent – President ~

Mini Messier Marathon for February . . .

From: <http://www.messier.seds.org/xtra/12months/m-feb.html>

M1: The Crab nebula is a supernova remnant in Taurus. It is a faint, hazy patch in small telescopes, large scopes can resolve some detail.

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. Look for the open cluster, NGC 2158 just to the west of M35.

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. Look for green color. Responds very well to UHC & OIII filters.

M78: A small emission 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.

Bundle up and enjoy these objects! Please remain healthy by getting vaccinated and following the guidelines to stay ahead of this pandemic!

Clear skies,

~ Rich Nugent – President ~

Paul J. Courtemanche In Memoriam . . .



Paul Courtemanche at the 2016 Stellafane Convention. Image by Eileen Myers.

Paul was a long-time member of the Amateur Telescope Makers of Boston, which is where I met him. Whenever Paul was at our Clubhouse in Westford, MA he always took time off from his astronomy activities to update me on his personal activities. He told stories about his astronomy outreach, running, and his studies at UMass Lowell. He enjoyed talking to club members and encouraging them to do more outreach. He was trained to be on Saturday night duty so others could set up telescopes and observe. He took time to visit a club member who was in hospice, staying for several hours to talk and comfort him. At the 2014 Stellafane Convention (Springfield, VT) Paul won Second Place Mechanical and Third Place Craftmanship for his 250-mm f/5 Binoculars - a one-of-a-kind instrument that Paul made with two 10-inch mirrors (see photo). Paul won First Place - Small Optical for his 8-inch f/9 Newt-Dob at the 2015 Stellafane Convention, and he gave a wonderful talk at the 2016 Stellafane Convention titled "Constructing Large Binoculars". Folks asked him lots of questions and eagerly took turns looking through those binoculars all that night. He was a kind-hearted soul, always exciting to talk to, and always supporting others. And he will always be remembered for his dazzling smile.

~ Eileen Myers - Treasurer and Associate Newsletter Editor ~

Editor: The partial obituary below was copied from the Douglas & Johnson Funeral Home web site.

<https://www.douglasandjohnson.com/obituary/paul-j-courtemanche>

Paul J. Courtemanche, 42 of Burlington, MA passed away on Sunday, January 23, 2022 in Burlington. He was born in Methuen, MA, a son of Nancy (Lanctot) Trainor and the late Paul C. Courtemanche.

Paul greatest passion was astronomy. He was a Stellafane Award winning amateur telescope maker and a member of the Amateur Telescope Makers of Boston. He is what he referred to as a sidewalk astronomer; setting up his telescopes for public viewing at Hampton, Salisbury, and Revere beaches, along with Boston Common, NYC, Hogback mountain, and the StangeCreek, Wormtown, and Fantasia music festivals. He gave thousands of people the chance to share in his love of viewing the heavens above, many for the first time. He also enjoyed the outdoors hiking, trail running, canoeing, and challenged himself earning a black belt in Kenpo karate, running a marathon and a few triathlons. He graduated Magna Cum Laude with a B.S. in Physics from UMASS Lowell and his Capstone project was a wheelchair mounted, fixed eye piece rotating telescope for disabled stargazers.

In lieu of flowers memorials may be directed to the National Alliance on Mental Illness, NAMI, 331 Montvale Ave, 2nd Floor, Woburn, MA 01801, 617-580-8541.

Correction . . .

Matthew East, lead Astrophysics Mission Architect at L3Harris Technologies, does not have a doctorate degree.

*Editor: *Photos by Al Takeda unless otherwise noted.*

March Star Fields DEADLINE

Sunday, February 20th

Email articles to Al Takeda at

newsletter@atmob.org

Articles from members are always welcome.

Amateur Telescope Makers of Boston, Inc.
c/o Chris Elledge, Membership Secretary
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How to Find Us...

Web Page www.atmob.org

MEETINGS: Zoom On-Line Meetings until further notice. Meetings held the second Thursday of each month (September to July) at 8:00 PM. For meeting details go to www.atmob.org and check your email on the ATMOB-ANNOUNCE list.

CLUBHOUSE: Latitude 42° 36.5' N Longitude 71° 29.8' W

The Tom Britton Clubhouse is currently closed. It is the white farmhouse on the grounds of MIT's Haystack Observatory in Westford, MA. Take Rt. 3 North from Rt. 128 or Rt. 495 to Exit 33 and proceed West on Rt. 40 for five miles. Turn right at the MIT Lincoln Lab, Haystack Observatory at the Groton town line. Proceed to the farmhouse on left side of the road. Clubhouse attendance varies with the weather.

Heads Up For the Month . . .

To calculate Eastern Standard Time (EST) from Universal Time (UT) subtract 5 from UT.

Feb 1 New Moon

Feb 8 First Quarter Moon (Moonset at midnight)

Feb 12 Venus at greatest illuminated extent, dawn (mag. -4.9) (40 deg.)

Feb 16 Full Moon

Feb 16 Mercury at greatest western (morning) elongation (26 degrees)

Feb 23 Last Quarter Moon (Moonrise at midnight)

Feb 27 Mars 4 degrees North of Moon

Feb 28 Mercury 4 degrees North of Moon

Mar 2 New Moon

Mar 7 Uranus 0.8 degrees North of Moon

Mar 10 First Quarter Moon (Moonset at midnight)