



## 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. 31, No. 8 September 2019

### This Month's Meeting . . .

Thursday, September 12<sup>th</sup>, 2019 at 8:00 PM  
Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

Parking at the CfA is allowed for the duration of the meeting

### Deep Sky Imaging using a DSLR



IC434 Emission nebula with the Horsehead Nebula \*

While the dedicated thermally electrically cooled (TEC) large sensor CCD camera is the instrument of choice for the professional and advanced astro-imager, the prices can be prohibitive for most astrophotographers. The alternative is the DSLR, which can double as a daytime and a nighttime astronomy camera. In this presentation, Al Takeda will discuss the DSLR camera's ability to capture deep sky images. Topics will include the type of DSLR to choose, which lenses would work, adapters needed for a telescope, what targets to choose, the imaging session, and post processing of the images.

Al Takeda is an astrophotographer employing advanced techniques in deep sky imaging. Using small aperture telescopes such as a 180 mm hyperbolic astrograph, a 92 mm apochromatic refractor and a 203 mm Schmidt-Cassegrain he has captured hydrogen alpha gas regions, planetary nebulas and galaxies.

Al does branch out into meteor, comet, planetary, lunar and solar astrophotography. Most of his images are taken under light polluted suburban skies.

He is a member of the Amateur Telescope Makers of Boston and has held the position of Secretary. He is the current newsletter editor and Member at Large. Al is the Manufacturing Manager at the acoustic-audio company, Listen, Inc.

Please join us for a pre-meeting dinner discussion at House of Chang, 282 Concord Ave., Cambridge, MA. at 6:00 pm before the meeting.

### President's Message . . .

In the year since I wrote my first President's Message a year ago, much has happened. For in that time, the earth has covered roughly 584 million miles completing a full orbit around our Sun. At the same time our Sun has traversed almost 4 billion miles in its orbit around the center of the Milky Way. It's humbling to comprehend that our little star will require 230 million years to circle our galaxy. And while we moved almost imperceptibly through the universe, much has happened with the club.

Throughout this last year we have experienced presentations covering a myriad of topics such as exoplanet discovery, galaxy formation modeling, variable star study, black holes, quantum mechanics, space exploration history, and public outreach. Over this coming year, I hope we can hear from experts in extra-planetary sciences, mirror making, near earth orbiting bodies, gravitational wave detection, early universe star formation, imaging and visual observing. Please let me know if you would like to hear of other topics and if you know of specific speakers that may be available to present.

We have made strides over the last year in upgrading our Clubhouse facilities. Mirror making should be bolstered to enable mechanical mirror grinding, polishing and figuring with the addition of the two Mirror-O-Matic machines. Look for a demonstration of the technology at the September picnic. We also plan to fabricate a Bath Interferometer as described by George Roberts during our July meeting. This should greatly facilitate and add to our ability to make fine mirrors. Plans for upgrades to the machine shop are underway and we look forward to the purchase of a 3-D printer to enable telescope making. Continuous improvements are ongoing with our observatories and telescopes. I enjoyed fine views of many deep sky objects with Steve Clougherty and other members on the evening of August 29<sup>th</sup> through the newly upgraded 25-inch Dob. We are lucky to have such resources at our disposal.

All in all, it should be another fantastic 584 million miles around the sun for the Amateur Telescope Makers of Boston. I hope to see you at the club meetings and clubhouse this coming year!

~ Tom McDonagh - President ~

## July Meeting Minutes . . .



Maria Batista's "One small step..." cake \*

Minutes of the 922nd ATMoB meeting held on July 11, 2019 at the Harvard-Smithsonian Center for Astrophysics in the Pratt Room. Club President Tom McDonagh called the meeting to order at 8:00 pm and thanked Maria Batista for bringing refreshments.

- The June meeting minutes were not read.
- Treasurer Eileen Myers gave the Treasurer's report.
- Membership Secretary Chris Elledge presented the Membership Report.
- Vice President Nugent presented the Observer's Report and noted that Mercury will be at greatest western (morning) elongation on Friday, August 9. On Thursday, August 13th, the Perseid meteors will peak. On Tuesday, September 10th, Neptune will be at opposition.

July's Observers Challenge object is NGC 6482, an 11.3 magnitude elliptical galaxy in Hercules.

- Steve Clougherty gave the Clubhouse Report
- Vice President Nugent presented the Outreach Report. He announced that there will be a gathering at the Clubhouse on Saturday, July 20, to celebrate the anniversary of the Apollo 11 Moon landing.

The members of the Farrington Nature Linc in Lincoln, MA asked us for help with their Perseid meteor watch on Friday, August 8th.

- Old Business: Tom announced that the executive board has allocated funds to start a Library Telescope program.
- New Business: Tom picked up some posters, maps and other astronomy related material previously owned by Donald Lentz, the former head of the Harvard-Smithsonian Astrophysical Observatory. These items are available to take home.



Alan Sliski \*

### Eclipse Expedition to CTIO in Chile

Alan and his son, David Sliski recounted their successful July 2, 2019 total solar eclipse experience in Chile. They were working with the Solar Terrestrial Program of the Atmospheric and Geospace Science Division of the NSF. Using a grant from Sigma Xi, they were able to purchase a Paramount MyT mount for this project. Using 3 telescopes and a camera lens, Alan and David were able to image and view the 2 minutes and 6 second eclipse. They were set up next to the Cerro Tololo Interamerican Observatory (CTIO).



Cory Mooney \*

### OnStep: GoTo Mount Conversion

Cory Mooney talked about how he converted an old Super Polaris equatorial mount to an OnStep GoTo computer controlled system. Using inexpensive stepper motors, 3D printed parts and open source programs, he was able to make the conversion in a year. The whole kit can be around \$120 if you use low cost or surplus parts. Cory's original controller was placed in a Tupperware container. He has since made a ruggedized box using his 3D printer.

His first light image was M42 taken last November. Cory has imaged M20 (Trifid), M17 (Swan), M16 (Eagle), M106 (galaxy) and M65, M66 (Leo galaxies).



George Roberts \*

### Bath Interferometer

George Roberts described how a Bath Interferometer can test telescope mirrors more accurately than a Foucault knife-edge or a Ronchi tester. Using a diagram, George showed how the interferometer works and how it displays the results.

George's website (<http://g5.org/bath>) has plans to 3D print a Bath Interferometer. He recommends that you should also make an XYZ stage, make a mirror stand, have 2 or 3 tripods, have a test tunnel, a box fan and a DSLR camera and lenses in the range between 50 mm to 100 mm.



Rich Nugent \*

### Lunar Observing: Revisiting an Old Friend

Rich Nugent's goal was to encourage deep sky observers to observe the Moon. He emphasized the geology, comparing the dark basaltic lava of the maria with the bright silica of the highlands. "It's a world!" he exclaimed. His enthusiasm was infectious. It was plain to see that the Moon is Rich's favorite object.

*~ Al Takeda, Member at Large ~*

## Meeting Recordings . . .

The recording of ATMob meeting #922 is available on YouTube: <https://youtu.be/OPKOBkK63oQ>

I would like to thank Alan and David Sliski, Corey Mooney, George Roberts, and Rich Nugent for giving their presentations and allowing us to record them.

This link is to the publicly available cut of the meeting recording. To view the original version of the meetings, please see the Announce Forum on the ATMob Website <https://www.atmob.org>

*~ Chris Elledge – Membership Secretary ~*

## Membership Report . . .

I am pleased to welcome our newest regular members: Douglas Applegate, Glenn Becker, Phillip Carney Goodrich, John Cassidy, Greg Chase, Kyungmin Hahm, Johnathan Hopewell, Rebekah Neuman, Harold Schaefer, Anirudh Sharma, Dan Smythe, and Michele Woodland.

Our newest family memberships are: Elizabeth Cavicchi and Alva Couch; Father and son Ian and Ian Sampson and Meredith Kent; Ademar, Sofia, and Viviane Reis; Eric and Sandy Rose.

As of August 26th, 2019 we have 361 memberships covering 475 members. This is broken down as follows:

- 163 Regular Members
- 117 Senior Members
- 11 Student Members
- 65 Family Memberships covering 179 Members
- 3 Guest Member
- 2 Honorary Members

Yearly membership renewals were due on September 1st. Memberships that have not been renewed by December 1st will expire.

You can check if you need to renew and start your renewal process on the club website at <http://www.atmob.org/renew>

You can also download the membership application from the website at <http://www.atmob.org/signup> by clicking on the "Download an application" link.

Donations are encouraged during membership renewal to help keep our club running smoothly, our clubhouse maintained, and telescopes in good condition. Donations are tax deductible to the extent allowed by law. If you choose to pay by credit card please consider making at least a small donation since credit card companies take a few percent of your payment to the club.

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

~ Chris Elledge – Membership Secretary ~

## Clubhouse Report . . .



John Stodieck weed whacking \*

### July 2019 Clubhouse Report

Another hot and humid day was prefaced by 75-degrees in the shade when Paul C. got the coffee pot cooking at 9:30 am for the July 13th work party. He was joined by new member Alva Couch, who provided transportation for former ATMoB President Max ben Aaron now residing in Lowell, MA. It was old home week for the next few hours as the group toured the house and grounds for Max to see the improvements made to the "new" observing site created since Max's tenure. Max was very complimentary to his old club, proudly stating, "Many groups around the world would love to have the capabilities we can now provide our members". We reminisced about old members, and Max sends greetings to Ken Launie, Steve Clougherty, Dick Koolish, John Briggs, Marion Hochuli and Tal Mentall, to name a few. Our numbers grew during Max's visit. The following donated their Saturday to our efforts: Maria Batista, John Blomquist, Paul Cicchetti, Nina Craven, Pierre Fleurant, Eric Johansson, Jon Lyna, John Maher, Eileen Myers, Dave Prowten, John Reed, John Stodieck, Art Swedlow, and Al Takeda. THANK YOU. Bruce Berger introduced Ian Andrew Sampson and Ian Albert Sampson to the Clubhouse and the ATMoB Research and Imaging Observatory (ARIO).

Mowing the lawn fell to hand pushed gasoline mowers again (the riding mower was not available) and was accomplished by Maria B., John S., Dave P., and Pierre F., including power edging, raking and composting. It was hot and humid this day, even hotter if you forgot your sweat band.

Later the front door handle was replaced by Dave P.

Nina C. weeded both porch flower beds through the afternoon. The first 2 of 6 sections of trellis from under the porch floor edge were removed by Dave P. and cleaned by Nina C. Nina C. and

John R. cleaned and restained those sections. The remaining sections await staining at the next work session. Lunch was prepared by Eileen M., with Al T. at the grill. Lunch was devoured with a minimum of words.

The machine shop was in use for the entire day.

Eric J. and others worked to develop the best way to secure and store individual mirror projects that will be using the new spin grinding machine.

As the sun set, Tony Costanzo and friend, Tom Consi, Ed Los, Eileen Myers, Venu Venugopal, Carey Connor and Nkosi Muhangi set up telescopes for viewing under clear, moonlit skies. As the sky darkened, four groups of visitors arrived from Haystack and MIT to view through our scopes. By 2:30 am, as our intrepid crew vacuumed the Clubhouse floors, the party ended. It was a long day for Eileen, Nina, John M, Eric, and Al.

Hope to see you at the next work party on Millstone Road in Westford on August 17th. Enjoy Stellafane!



Dave Prowten installing the new secondary spider \*

### August 2019 Clubhouse Report

The August 2019 Work Party opened with Paul Cicchetti preparing fresh coffee at 10 am. A warm 73-degree breeze under cloudy skies encouraged several projects to proceed. Thanks go to the 19 members who accomplished these efforts: Bruce Berger, John Blomquist, John Cassidy, Paul Cicchetti, Steve Clougherty, Joe Dechene, Chris Elledge, Barry Jensen, Eric Johansson, Dick Koolish, Tom McDonagh, Corey Mooney, Eileen Myers, Dave Prowten, John Reed, Phil Rounseville, Art Swedlow, Al Takeda and Mel Townsend.

Mowing the grass and observing field was accomplished twice by John B. once the riding mower was repaired. Both cuttings were raked and composted by Mel T

Eric J., Barry J. and Tom M. continued to tune the developing grinding/polishing machines in the old kitchen and back porch area. Lack of lighting was solved by Eric J. installing 2 new LED overhead fixtures.

Meanwhile in the Ed Knight Observatory, Steve C., Phil R. and Dave P. gathered to install a more rugged and braced secondary spider assembly fabricated by Astrosystems to remove vibrations generated by any accidental jolt to the 25inch OTA. It checked out AOK; the problem was solved.

All this effort was possible by the special lunch created by Starleen and crew that kept those engines going. Thank you all. And to the clean up crew too.

Since the work of bringing the Big Yellow Dob back to life started several work parties ago, most of the cleaning led to needed repairs, priming/painting and test fitting. The 16-inch Yellow Dob (built by Dennis diCicco in the 70's with the donated full thickness Coulter mirror) had been reassembled on the Reed's front porch. The remaining triangle support base and wrapped and boxed mirror were transported today to join those assembled pieces. We were unable to find the 4" minor axis secondary or the original 10" jet engine bearing races and captive bearing assembly which gave the super smooth azimuth positioning remembered. By the end of August, John Briggs saw the assembly, and loaded his van with the rebuilt Yellow Dob pieces. It, along with several other notable telescopes, are on their way to John Briggs' Telescope Lyceum in Magdalena, NM for historical display. These historic optics will be used at the Enchanted Skies of New Mexico star party.

Thanks to Mike Mattei for checking for historical accuracy, to Paul Valleli for surface and bulk glass data, and mirror preservation and packing, to Dave Prowten for repairing and reproducing the optical tube assembly, and to Dennis di Cicco for the saving the slides and relating the original creation process that made the first East Coast Dob a reality. It now can help educate many generations.

Clubhouse Saturday Schedule		
Sept 14	<b>WORK PARTY # 9 **</b> John Maher	
Sept 21	<b>Volunteer Needed</b>	John Stodieck
Sept 28	Steve Clougherty	Jim Gettys
Oct 5	John Panaswich	George Paquin
Oct 12	<b>WORK PARTY # 10 **</b> Glenn Chaple	

\*\* Closing time for the Clubhouse is determined by the work crew

Clubhouse Evening Schedule	
Friday Night Educational Videos	<b>ATMoB-Announce</b>
Saturday Night Observing	7:00 pm - ##
# Closing time is determined by the organizers	
## Closing time is determined by the "A" members on duty.	

~ Clubhouse Committee Chairs ~  
~ Steve Clougherty, John Reed and Dave Prowten ~

## Observing Challenge . . .

August 2019

Messier 11 (NGC 6705) Open Cluster in Scutum

Mag: 5.8

Size: 14'



Mario Motta, MD (ATMoB)

If prolonged squinting at our recent spate of Observer's Challenge 11th magnitude galaxies has left you with a severe case of eye strain, you'll appreciate this month's "eye-opener" - the open cluster Messier 11. Slightly brighter than 6th magnitude, M11 is visible to the unaided eye from dark-sky locations.

M11 is a small (only about ¼ degree in diameter) but rich stellar assemblage. It contains nearly 3000 stars, 500 of which are magnitude 14 or brighter.

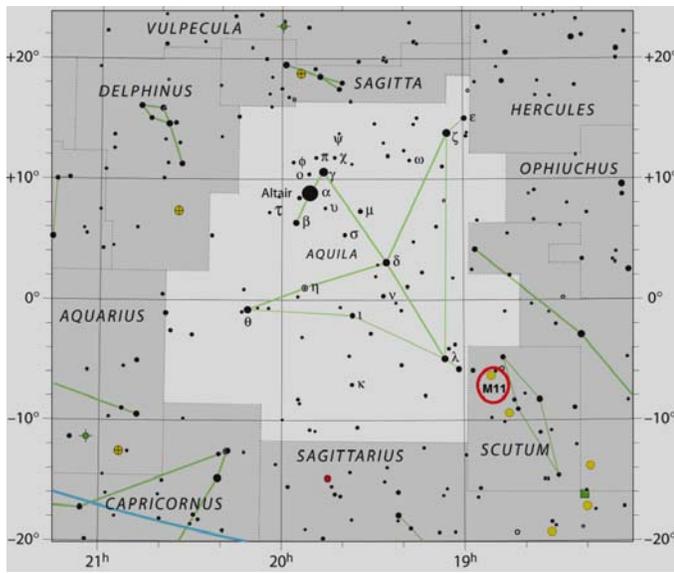
Using 10X50 binoculars on a hazy and humid summer evening, I had no trouble spotting M11 just southwest of a sleigh-shaped asterism comprised of the stars 14, 15, lambda (λ), and 12 Aquilae, plus eta (η) and beta (β) Scuti. It took on a grainy appearance when viewed with my 4.5-inch f/8 reflector - especially when averted vision was used. No need for averted vision when I turned my 10-inch f/5 reflector on M11! A grainy haze became a splash of dozens of stars brighter than 12th magnitude. A 9mm Nagler wide-field eyepiece, which yielded 139X and a 0.6 degree field, provided the best view

So what sort of challenge would a naked eye cluster offer? Where M11 is concerned, I'd focus on its nick-name, the "Wild Duck" Cluster. The moniker arises from the cluster's supposed V shape, reminiscent of a flock of migrating ducks. I just don't see it, and the images by Mario Motta and Doug Paul bring to mind a circular flock of starlings or blackbirds. What do you see?



Doug Paul (ATMoB)

M71 was discovered by the German astronomer Gottfried Kirch in 1681 and catalogued by Messier in 1762. It lies about 6200 light years away.



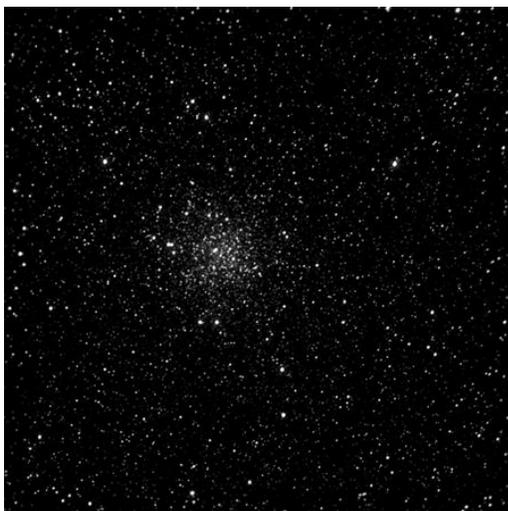
www.messier-objects.com, IAU, and Sky & Telescope

**September 2019**

M71 – Globular Cluster in Sagitta

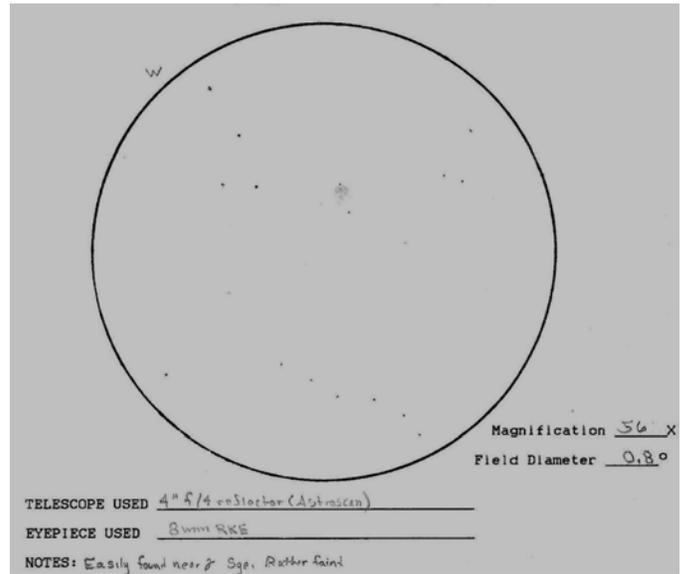
Mag: 8.2

Size: 7.2'



M71. Image by Mario Motta, MD

For the second consecutive month, the Observer’s Challenge features a Messier object – this time, M71 in the constellation Sagitta, the Arrow. An 8th magnitude object, it’s much fainter than last month’s Challenge, the open cluster M11 in Scutum.



M71 Sketch by Glenn Chaple

M71 was discovered some time in 1745 or 1746 by the Swiss mathematician/astronomer Philippe Loys de Chéseaux. When Charles Messier learned of its independent discovery by fellow comet hunter Pierre Méchain in the summer of 1780, he observed the object for himself and entered it into his catalog.

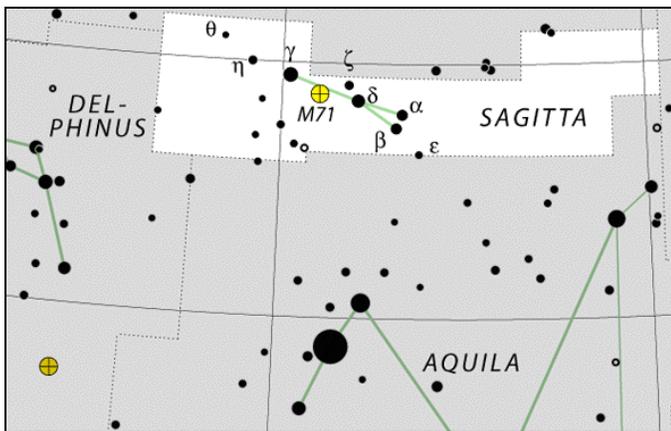
Finding M71 is an easy task, especially once you locate Sagitta. This little constellation lies 10 degrees north of the first magnitude star Altair in Aquila. Once you’ve found Sagitta, make a medium power (50-75X) search of an area slightly south of the midpoint between gamma (γ) and delta (δ) Sagittae. As mentioned earlier, M71 is rather faint. Sweep slowly and make your observation from a reasonably dark site. I first saw M71 on a clear summer evening in 1977, using a 3-inch f/10 reflector, and then re-observed it 20 years later with a 4-inch rich-field scope. In both instances, a magnification of around 60X was used, and the cluster appeared as a faint unresolved blob. Recently, I returned with a 10-inch f/5 Dob and a magnifying power of 140X. This time, M71 was resolved, with a dozen or so magnitude 12-13 stars gleaming through the haze.

As late as the 1970s, astronomers debated as to whether M71 was a rich open cluster like M11 or a sparse globular cluster similar to M68 in Hydra. The consensus today is that M71 belongs to the latter group. Its 13,000 light-year distance translates to a true diameter about 27 light years.



M71 Image by Doug Paul

After paying your respects to M71, I advise you to rest your eyes. Next month, we return to the “faint fuzzies!”



M71 Finder Chart (IAU and *Sky & Telescope*)

The purpose of the Observer’s Challenge is to encourage the pursuit of visual observing and is open to everyone who is interested. Contributed notes, drawings, or photographs will be published in a monthly summary. Submit them to Roger Ivester ([rogerivester@me.com](mailto:rogerivester@me.com)). To access past reports, log on to <https://rogerivester.com/category/observers-challenge-reports-complete/>

~ Glenn Chaple ~

## Outreach Report . . .

### Summer 2019

Summer is usually a quiet time for outreach but we attended a Perseid Meteor event at the Farrington Nature Center in Lincoln, MA on August 9th. Some folks managed to see a few meteors but bright moonlight was keeping the numbers down. Telescopes were provided by ATMoB members Pierre Fleurant, Bruno Leung, Eileen Myers, Rich Nugent, Ademar Reis and John Stodieck. Besides the moon, attendees viewed Jupiter, Saturn, some colorful double stars, and several bright deep sky objects.

The folks at Waitt’s Mountain Park in Malden, MA are holding another evening of Sunset, Storytelling, and Stargazing on the

evening of September 7. Unfortunately, this conflicts with our annual picnic. Last October, we supported this event along with members from the New Hampshire Astronomical Society (NHAS). The event was well attended with clear views of the sky. Please note that equipment needs to be carried up the hill from a very small parking area. The organizers had volunteers to help with equipment. If anyone is interested in volunteering please contact me directly ([nugentrp@gmail.com](mailto:nugentrp@gmail.com)) and I’ll send you information.

We’ve received a request to support an event on the Town Common in Harvard, MA on the evening of Friday, October 4th. Registration on the club’s event calendar is recommended. Bernie Kosicki is the contact for this event.

On Saturday, October 5th, New England Sci-Tech will be hosting an Astronomy Day event at their Tech Circle location in Natick, MA. They’ve asked for our support during the afternoon and evening. Demos, speakers and telescope observing will take place from 4:00 pm - 10:00 pm. Set up time is 3:00 pm. The event has been posted on the club’s event calendar and registration is recommended. Please note that this event conflicts with this year’s AstroAssembly hosted by the Skyscrapers club in North Scituate Rhode Island. If you’re not attending AstroAssembly, please consider volunteering for this event. The organizers are going to advertise the event with the hope of increasing attendance. ATMoB members supporting their Spring Astronomy Day had a wonderful time.

October 5th is also this year’s International Observe the Moon Night. If you are not at AstroAssembly or celebrating Astronomy Day, why not treat your family, friends, and neighbors to views of the moon! You might just spark some new interest in astronomy!

I’m sure the organizers of these events will consider the risk of mosquito-borne illnesses when deciding to go or no-go their events. The risk of EEE and West Nile will likely continue to increase until we experience the first hard frost of the season. When attending any of these events or when observing in your own yard or at the clubhouse, please take appropriate precautions and use insect repellants containing DEET. More info can be found at [mass.gov](http://mass.gov)

~ Rich Nugent - Vice President and Outreach Chair ~

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

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**October Star Fields DEADLINE**  
**Sunday, September 22<sup>nd</sup>**

**Email articles to Al Takeda at**  
[newsletter@atmob.org](mailto:newsletter@atmob.org)

**Articles from members are always welcome.**

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**POSTMASTER NOTE:** First Class Postage Mailed September 10, 2019

Amateur Telescope Makers of Boston, Inc.  
c/o Chris Elledge, Membership Secretary  
99 College Ave  
Arlington, MA 02474  
**FIRST CLASS**

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Steve Clougherty (781) 784-3024  
David Prowten (978) 369-1596  
OBSERVING: Bruce Berger (978) 387-4189  
NEWSLETTER Al Takeda [newsletter@atmob.org](mailto:newsletter@atmob.org)

**PUBLIC OUTREACH**

COMMITTEE CHAIR: Rich Nugent [starparty@atmob.org](mailto:starparty@atmob.org)  
STAR PARTIES: Bernie Kosicki  
Laura Sailor  
John Harrington

**How to Find Us...**

**Web Page [www.atmob.org](http://www.atmob.org)**

**MEETINGS:** Held the second Thursday of each month (September to July) at 8:00PM in the Phillips Auditorium, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge MA. For INCLEMENT WEATHER CANCELLATION see [www.atmob.org](http://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 open every Saturday from 7 p.m. to late evening. 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. It is wise to call in advance: (978) 692-8708.

**Heads Up For the Month . . .**

**To calculate Eastern Daylight Time (EDT) from Universal Time (UT) subtract 4 from UT.**

Sept 5 First Quarter Moon (Moonset at midnight).  
Sept 10 Neptune at opposition  
Sept 14 Full Moon  
Sept 21 Last Quarter Moon (Moonrise at midnight)  
Sept 23 Autumnal Equinox  
Sept 28 New Moon  
Oct 5 First Quarter Moon (Moonset at midnight)  
Oct 8 Draconid meteors peak  
Oct 13 Full Moon