



## 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. 11    December 2022

### This Month's Meeting . . .

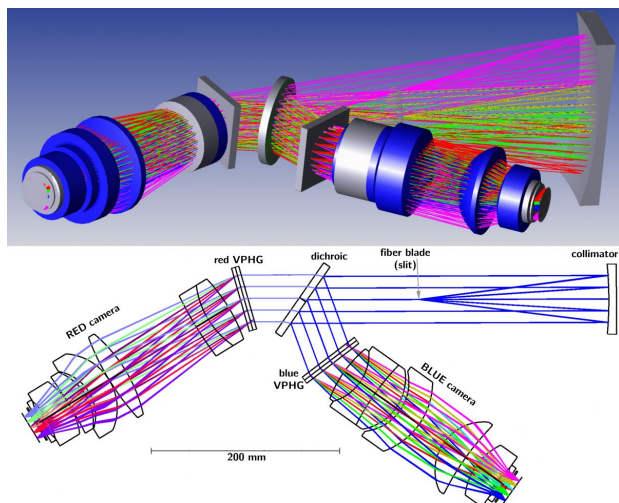
Thursday, December 8th, 2022 at 8:00 PM

Phillips Auditorium

Center for Astrophysics (Harvard & Smithsonian)

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

ATMoB will attempt to simulcast the December meeting.  
Please [select this Zoom link to attend the 958th Meeting of the Amateur Telescope Makers of Boston.](#)



The optical layout of the LLAMAS spectrographs. Image courtesy MIT.

### LLAMAS - 2,400 Little Eyes for One Big Telescope

Our speaker this month is Dr. Gabor Furesz, Principal Research Scientist at the MIT Kavli Institute for Astrophysics and Space Research. He will talk about the [Large Lenslet Area Magellan Spectrograph \(LLAMAS\)](#) instrument.

We live in an exciting era of discoveries, delivered by marvelous space telescopes and observatories. There is the James Webb Space Telescope, and we are going back to the Moon. Not so long ago an MIT built space telescope captivated the minds all over the world, as the TESS mission delivered thousands of new exoplanet candidates. And while that latter project was much smaller than the others, it was still the work of hundreds of scientists and engineers spanning over decades. In a project of that scale usually one person only gets to work on a small piece of the puzzle.

But many of the discoveries coming from these large efforts require even more work after the initial observations, often relying on large “workhorse” instruments that mostly provide spectroscopic follow-up data. The Large Lenslet Area Magellan Spectrograph (LLAMAS) is one such instrument, soon leaving the labs of MIT and going to the 6.5m Magellan telescope in Chile, after 6 years of development. A project of this scale is gratifying; not by grabbing news headlines but by providing a very small group of people the chance to literally touch every component of the instrument, from the conception of the design to the first light at the telescope. Much like an amateur telescope maker (ATM)-build, in such a project one gets very intimate with the whole instrument and for someone growing up with a hobby-astronomer background it's even more exciting. From the first concepts and prototype fiber systems, to the 2,400-element micro lens-fed fiber-array based integral field unit, and the 8 spectrographs that employ 24 very fast ( $f/1.05$ ) cameras, I have been privileged to dream of, design, and then work on every component of this instrument. I'd love to share that journey and the soon nearing end-result with you!

Dr. Furesz writes, “I was born and raised in Hungary, having my first experience with astronomy at age 10, borrowing a 4-inch Newtonian [telescope] from the school library. I was lucky enough that my parents and the great teachers of a local public observatory helped and supported me building my own telescopes, from grinding mirrors to learning darkroom techniques of film photography, then later building my own CCD camera following the iconic yellow cookbook (*Editor: The CCD Camera Cookbook*). That led to me to learn Astronomy at the University of Szeged, Hungary, later earning my PhD in Astrophysics, but I already spent my graduate years with research at the Center for Astrophysics (Harvard & Smithsonian), as a Smithsonian Predoctoral Fellow. At the CfA (2003-14) I got to work on instruments for the 6.5m MMT and got to use multiple telescopes world-wide, all focused on spectroscopy and radial velocity measurements of exoplanets and young stellar clusters. In 2014 I joined the Kavli Institute at MIT where I got to lead multiple smaller and later larger projects, got involved in TESS and now mostly focusing on the LLAMAS instrument.”

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.

~ Corey Mooney – President ~

## President's Message . . .

Orion has finally made its appearance over my driveway. I have ~40°-50° horizons with the exception of a couple small notches, one of which is to the SSW. Over Thanksgiving weekend the great Orion nebula finally crossed out from behind the trees around 2:30AM for ~30 minutes, and I finally got to have my first peak of the season. It is always a treat with any equipment.

It was the first nebula I saw when I started out with binoculars years ago, and was one of the first things I excitedly took aim at when I first got a telescope. The view is always astounding, even after years of coming back to look at it, it never gets old. It is one of my favorite benchmark objects, whether it's a new or traded eyepiece, telescope, camera, or lens; the new toy's evaluation never feels complete without taking a comparative look at the great Orion nebula.

Even with Electronically Assisted Astronomy (EAA) live stacking, which could be used to hunt down super faint and obscure DSOs, I always take the opportunity to stop by and take a look at Orion; it's just too magnificent to pass by.



M42. 8-inch f/4 Newtonian telescope, 0.75x Nexus reducer, ASI294MC-P, UV/IR filter, 16s x 29 images, total= 464 seconds. Image by Corey Mooney.

As more and more spectacular winter objects come into view, I wish everyone happy holidays. And for the hardy observers, stay warm out there!

P.S. Don't forget to keep an eye out for photos and videos returning from Artemis 1 around the moon!

~ Corey Mooney – President ~

## November Meeting Minutes . . .

ATMoB Meeting #957  
November 10, 2022



Kelly Beatty. \*

Corey Mooney presented the President's welcome. There has been a massive and explosive return to outreach in the last two months. Corey will try to organize a class on the 3D printer in the coming weeks.

- Alva Couch presented the Secretary's report, including a summary of the wonderful October talk by Glen Cole on making the mirrors for the James Webb Space Telescope and a summary of the ATMoB board meeting on Oct 28, 2022.
- Eileen Myers presented the Treasurer's report, and reported a healthy net inflow via membership dues and small outflows for periodic club expenses.
- Chris Elledge presented the Membership report and welcomed new members AnitaCristina Calcaterra; James Feldman; Robert Hemmes III; Sumeet Keswani; Suriyan, Aroon & Thien Lohavichan, and Christine Liu; Kenneth Scharf; Derek Oakley, Kristopher Teti; and Charles Wright.
- Glenn Chaple and Rich Nugent presented the Observer's report. The membership was shown the November 8, 2022 total lunar eclipse images taken by Bruce Berger, Joseph Rothchild, Mario Motta, Rich Nugent, Chris Elledge, Nazmus Nasir, Doug Paul, Alan Sliski, Sameer Bharadwaj, Bruce Tinkler, William Duane, and a time-lapse lunar eclipse video by Corey Mooney.

On Thursday, Dec. 1, Mars is at opposition, at its closest approach to the Earth, and on Wednesday, Dec. 7 at about 11 pm EST, the Moon occults Mars.

The November Observer's Challenge is NGC 7184. Images by Doug Paul and Mario Motta, and a sketch by Glenn Chaple were shown. The December Observer's Challenge is the triple star Iota Cassiopeiae. An image by Doug Paul was presented.

- Steve Clougherty presented the Clubhouse report. At the work party on October 8th we had 24 volunteers, and on November 5th, we had 19 volunteers. We cleaned out the composting toilet and discarded Clubhouse debris from previous cleanups. John Stodieck cleaned and waxed the clamshell. MIT has given us an extension of one year on dealing with our aging oil tank, subject to installing a spill kit and scheduling periodic inspections by MIT. We are currently considering replacing the oil furnace with a mini split HVAC system that would cost approximately \$20,000 and there is a possibility of an energy rebate of up to \$10,000.

- Maria Batista presented the Website Committee report, and reported on the final steps before going live. Users should expect a modern look, as well as responsive design for desktop computers, tablets, and mobile (smartphones). The new website will have a dark theme, as well as more images and content.

- Rich Nugent presented the Outreach Committee report. We're running seven star parties in five weeks with many volunteers. Upcoming star parties are planned for the Boston Public Library (Mattapan Branch) and the Acton Land Trust. For outreach purposes, we would like to identify more people who live in the Boston area or south of Boston.

- Old business:  
<https://smile.amazon.com> is a great way to donate to ATMob while shopping on Amazon.

- New Business:  
Mario Motta reminded us that the [International Dark-Sky Association \(IDA\)](#) of MA will have an annual meeting on November 19, 2022 from 1:30-4:00 PM at Smith College. If you're interested in fighting light pollution, come on down.

Kelly Beatty of [Sky & Telescope](#) described the ongoing enigma of Stonehenge and some recent archeological discoveries. Stonehenge is not alone on its plain. Neighboring structures include the "Durrington Walls" and even a "Woodhenge" from which only post holes remain. The inclusion of igneous bluestone in the Stonehenge pattern has often puzzled archaeologists. Why would the builders go to the trouble of moving stones from the nearest bluestone source more than 100 miles away? Recent discovery of evidence of a "Bluestonehenge" near the Bluestone outcropping seems to indicate that the bluestones were arranged near their quarry before being moved to Stonehenge. As to why Stonehenge was located in its current location, archaeological digs exposed a base chalk layer in which grooves point in the direction of the summer solstice. There is still much to learn, but we now understand a bit more about this archaeological enigma.

~ *Alva Couch – Secretary* ~

## Meeting Recordings . . .

The recording of ATMob meeting #957 is available on YouTube: <https://youtu.be/F0UmgC4KhnQ>

I would like to thank Kelly Beatty for giving his talk.

This link is to the publicly available cut of the meeting recording. 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](mailto:membership@atmob.org))

~ *Chris Elledge - Membership Secretary* ~

## Membership Report . . .

I am pleased to welcome our newest members: Anderson and Ariella Dietrich, Rayssa Pontes, Robert Hemmes III, Sumeet Keswani, Mousa Shaya, and Charles Wright.

As of November 26th, 2022 we have 323 memberships covering 419 members. This is broken down as follows:

- 126 Regular Members
- 133 Senior Members
- 9 Student Members
- 53 Family Memberships covering 149 Members
- 2 Honorary Members

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

~ *Chris Elledge – Membership Secretary* ~

## Clubhouse Report . . .



Dave Wilber (front) and John Stodieck waxing the Clamshell dome. \*

Our monthly work session was held at the Clubhouse on Saturday, November 5th under sunny skies. We had 19 volunteers that were available for a number of tasks.

The final mowing of the year was completed in the morning and the riding mower was picked up for its annual service. Thanks to Rich Nugent for meeting the service vendor upon the

mower's return during the week. Chris Elledge has taken the initiative to complete mowing at each one of our Saturday work sessions, and we thank him for this effort.

Thanks to John Stodieck and Dave Wilber for cleaning and waxing the clamshell dome, which now looks brand new!

James Chamberlain reinstalled our repaired all-sky camera, and members can now access this through our ATMoB website (*Editor: Members log-in to the "About ATMoB/Clubhouse" page*). Thanks so much for this James.

We are grateful to Marsha Bowman for help in cleaning the Clubhouse. She also discarded our collection of "burned out" fluorescent bulbs.

Alan Sliski removed a troublesome bearing and motor assembly which drives our 25-inch equatorial platform. He machined the motor shaft to prevent the set screw from loosening. The assembly was reinstalled and tested last week. I am pleased to report that the equatorial platform worked flawlessly!



(L-R) Rich Nugent and Alan Sliski with the 25-inch EQ motor assembly. \*



Machined flat spot on the EQ motor assembly. \*

Two donated upholstered chairs were placed in the second floor Library and Office/Archive room. Both rooms are now available for our use.

Thanks to Paul Cicchetti and crew for handling the snow posts installation.

Phil Rounseville, Paul Cicchetti and Chris Elledge had solar scopes set up for viewing during the work party.

I am pleased to report that our Executive board has finalized an agreement with Nashoba Air & BoilerWorks of Littleton to install a new air to air heat pump furnace this winter. In the meantime an oil spill prevention system was installed around the oil tank in the basement. We must now allow our oil tank to have no more than a quarter tank of oil while this conversion takes place. Although expensive, our non-profit club will be entitled to substantial rebates from [Mass Save](#) upon completion of the work. Donations will be solicited from members who would like to contribute to this necessary and worthwhile "green" project.

Thanks to Eileen Myers for providing a homemade delectable lunch!

Thanks to the following member volunteers: Marsha Bowman, James Chamberlain, Paul Cicchetti, Steve Clougherty, Alva Couch, Chris Elledge, Ed Los, Corey and Kiera Mooney, Eileen Myers, Rich Nugent, John Reed, Phil Rounseville, Ken Scharf, Alan Sliski, John Stodieck, Al Takeda, David Wilbur and Christine Zacharer.

Our next work session will be held on Saturday December 10.



Paul Cicchetti (center) leads the snow posts installation. \*

| Clubhouse Friday and Saturday Night Duty Schedule |                       |
|---------------------------------------------------|-----------------------|
| Saturday, Dec. 10                                 | <b>WORK PARTY # 9</b> |
| Friday, Dec. 16                                   | John Stodieck         |
| Saturday, Dec. 17                                 | Eileen Myers          |
| Friday, Jan. 14                                   | Tom McDonagh          |
| Saturday, Jan. 15                                 | Eric Johansson        |
| Friday, Jan. 20                                   | Slav Mlch             |
| Friday, Jan. 21                                   | Nina Craven           |

~ *Clubhouse Committee Chairs* ~

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

## Observer's Challenge\*\* ...

December, 2022

Iota Cassiopeiae Triple Star

AB Magnitudes 4.6+6.9

Separation 2.9"

Position Angle 230°

AC Mags 4.6+9.1

Separation 6.7"

Position Angle 117°



Iota Cassiopeiae, QHY178c camera, 1680mm f/11 lens (150mm aperture), 88K 20msec frames, 1% stacked, 400% scale, North up. Image by Doug Paul.

Backyard astronomers who favor gossamer deep sky targets like galaxies and nebulae eagerly await the dark, ultra-clear nights that bring these “faint fuzzies” to light. The same can’t be said for the double, triple, and multiple star aficionados, as such evenings are also marred by poor seeing conditions which render the splitting of close stellar partnerships all but impossible.

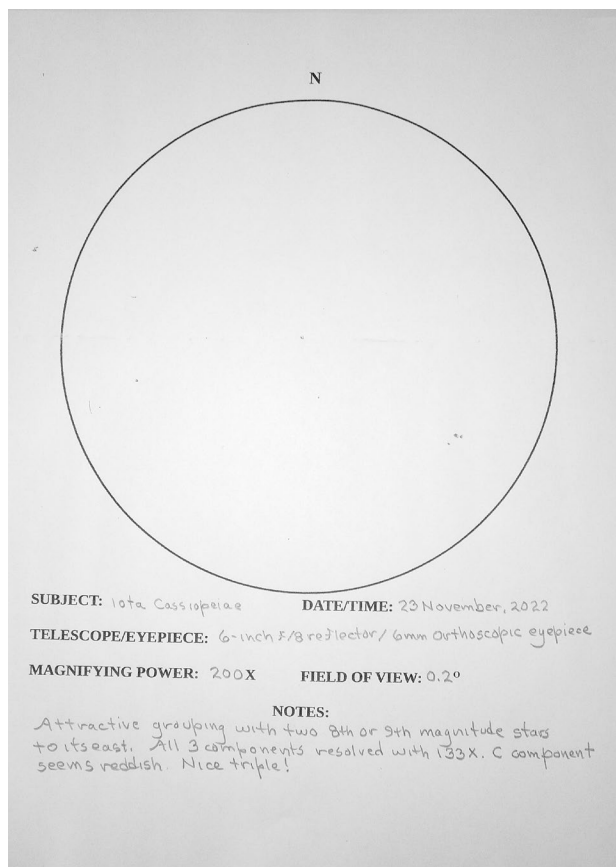
Such is the case with this month’s Observer’s Challenge, the triple star Iota Cassiopeiae. The separations of its three members aren’t the problem. Components A and B are about 3 arc-seconds apart, while a little under 7 arc-seconds separate A and C, separations well within reach of a common 60mm (2.4-inch) refractor. The difficulty lies in the magnitude differences between these stars. The main component, Iota Cassiopeia A (magnitude 4.6), is 8 times brighter than B (magnitude 6.9) and over 60 times brighter than C (magnitude 9.1). You’ll need steady seeing and a reasonably high magnification to bring all three to light.

Locating Iota Cassiopeia is no problem at all. A 5th magnitude star to the unaided eye, it’s found by tracing an imaginary line from delta through epsilon, both part of the Cassiopeia “W”, and extending it an equal distance beyond.

My first observation of Iota Cassiopeiae was on the evening of October 18, 1971. Encouraged by the fact that I had already split several reasonably close, unequal pairs with my 3-inch f/10

reflector, I decided to give it a try. Despite its faintness the C component was glimpsed at 60X, but B remained elusive, even at higher magnifications.

It was the Observer’s Challenge that brought me back to Iota Cassiopeiae early this past November. On successive evenings, first with the trusty 3-inch and then with a 4.5-inch f/8 reflector, I looked for the B component without success. Skies were clear but slightly turbulent on both occasions. On the third evening, there was the slight haze that often comes with nights of good seeing. Taking no chances, I pulled out a 6-inch f/8 reflector. The one-degree field of my 43X “search” eyepiece showed Iota and two 8th magnitude stars to its east, an attractive sight. A switch to 133X did the trick. All three of Iota’s component stars were visible. I boosted the magnification to 200X and made an eyepiece sketch. The C component seemed slightly reddish to me, an impression later borne out when I learned that it’s an extremely close binary pair comprised of a K spectral class star and a K or M class companion.



Iota Cassiopeiae, 6-inch, f/8 Dobsonian at 200X, 0.2 degree field, Sketch by Glenn Chaple. [Click this link for an enlarged view.](#)

Not only is Iota Cassiopeiae C a tight binary pair, but so is Iota Cassiopeiae A. Each of these sub-arc-second duos was discovered through the magic of modern-day adaptive optics. This remarkable system lies some 140 light years away.



Wide-field chart. North is up; limiting magnitude is 9.0. [thelivesky.com](http://thelivesky.com).

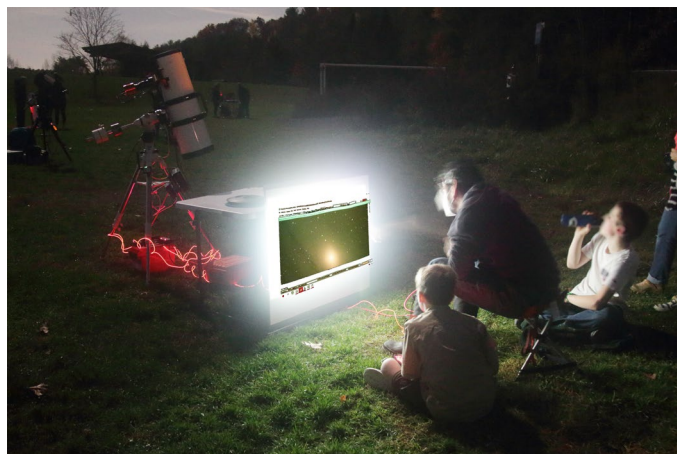
Phil Rounseville, Michael Toups, Venu Venugopal, and Christine Zacharer.

- October 7: Chelmsford Cub Scouts at Sunny Meadow Farm: Kelly Beatty, Bob Blumstein, Corey Mooney, Rich Nugent, Venu Venugopal, and Christine Zacharer.
- October 16: Weston High School: Mike Druar, Chris Elledge, and Corey Mooney.
- October 21: The Bromfield School, Harvard, MA: Bruce Berger, Corey Mooney, Rich Nugent, Al Takeda, and Christine Zacharer.
- November 4: Acton Cub Scouts: Kelly Beatty, Bob Blumstein, Tom McDonagh, Rich Nugent, Al Takeda, Marsha Wilcox, and Christine Zacharer.

\*\*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](mailto: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 ~

## Star Party Roundup . . .



Corey Mooney's EAA setup at the Acton Cub Scout Star Party. \*

The outreach folks have been very busy this fall with many star parties in the books and several more scheduled for late November and early December. Participants were treated to views of the Moon, Saturn, Jupiter, Uranus and Neptune and a variety of colorful stars, clusters, nebulae, and the Andromeda Galaxy. Here's a summary of the events and the club members who graciously gave their time and energy to make these events successful:

- September 28: Chelmsford Historical Society and Land Trust: Kelly Beatty, Bruce Berger, Mike Druar, Chris Elledge, Giancarlo Gonzalez, Corey and Keira Mooney, Rich Nugent,



Telescopes at the Acton Cub Scout Star Party. \*

- November 5: Westford Cub Scouts: Kelly Beatty, Corey Mooney, Rich Nugent, and Christine Zacharer.
- November 7: Belmont Public Library: Kelly Beatty, Bob Blumstein, Kai Cai, Chris Elledge, David Hines, Suriyan Lohavichan, Corey Mooney, and Christine Zacharer.

Thanks to everyone for giving up their time to bring a scope and share their love of astronomy with others. If I've missed anyone kindly let me know! I received lots of positive feedback from each of the organizers and many expressed interest in making their evening of astronomy an annual event!

~ Rich Nugent - Public Outreach Committee Chair ~

## Upcoming Star Parties . . .



Eileen Myers refractor, Harvard, MA FiveSparks Star Party. 4 October 2019. \*

- Mattapan Public Library on Tuesday/Wednesday, November 29/30
- Hale Middle School, Stow, MA on Thursday, December 1
- Acton Conservation Trust on Saturday/Sunday, December 3/4

That should conclude our outreach events for the year, but we have already started to set up star parties for the spring. Stay tuned!

~ Rich Nugent - Public Outreach Committee Chair ~

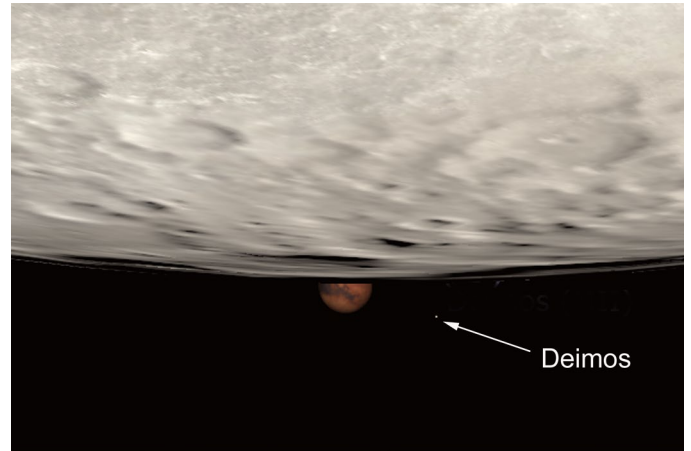
## Mars Occultation . . .



Moon occulting Mars. Image from Stellarium.

On the evening of 7 November 2022, at around 23:00 hrs. EST (4:00 UT, 8 Nov.), the southern edge of the Moon will occult the planet Mars. Observers will have to be stationed north of the northern border of Massachusetts to see the Moon cover Mars.

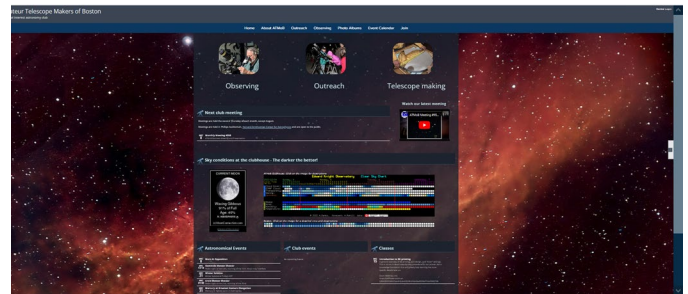
According to Stellarium, if you are near Nashua, New Hampshire, you may be able to witness a grazing occultation.



Mars and Deimos Grazing Occultation. Image from Stellarium.

~ Al Takeda - Newsletter Editor ~

## ATMoB Web Page Refresh . . .



I would like to give a shout out to Maria Batista and the Web Page Committee members for their hard work in refreshing the look of the ATMoB web pages.

Thanks to: Maria Batista, Kai Cai, Glenn Chaple, Chris Elledge, Corey Mooney, Keira Mooney and Paul Norris.

~ Al Takeda - Newsletter Editor ~

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

**January Star Fields DEADLINE**  
**Sunday, December 25<sup>th</sup>**

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

Articles from members are always welcome.  
\*\*\*\*\*

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

#### EXECUTIVE BOARD 2022-2023

PRESIDENT: Corey Mooney

|             |                    |                |
|-------------|--------------------|----------------|
| VICE PRES:  | Christine Zacharer | (978) 804-3795 |
| SECRETARY:  | Alva Couch         | (781) 350-8810 |
| MEMBERSHIP: | Chris Elledge      | (781) 325-3772 |
| TREASURER:  | Eileen Myers       | (978) 456-3937 |

MEMBERS AT LARGE: Alan Sliski  
Kai Cai

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|-----------|--------------|----------------|
| 2020 - 21 | Rich Nugent  | (508) 935-8158 |
| 2018 - 20 | Tom McDonagh | (617) 966-5221 |
| 2015 - 18 | Glenn Chaple | (978) 597-8465 |

#### COMMITTEES

|            |                  |                |
|------------|------------------|----------------|
| CLUBHOUSE: | John Reed        | (781) 861-8031 |
|            | Steve Clougherty | (781) 784-3024 |
|            | David Prowten    | (978) 369-1596 |

OBSERVING: Bruce Berger (978) 387-4189

#### NEWSLETTER

|                   |              |                                                                |
|-------------------|--------------|----------------------------------------------------------------|
| EDITOR:           | Al Takeda    | <a href="mailto:newsletter@atmob.org">newsletter@atmob.org</a> |
| ASSOCIATE EDITOR: | Eileen Myers |                                                                |

#### PUBLIC OUTREACH

|                  |                 |                                                              |
|------------------|-----------------|--------------------------------------------------------------|
| COMMITTEE CHAIR: | Rich Nugent     | <a href="mailto:starparty@atmob.org">starparty@atmob.org</a> |
| 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 8:00 PM in the Phillips Auditorium, Center for Astrophysics (Harvard & Smithsonian), 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 on Last Quarter and New Moon Fridays and Saturdays from 7 p.m. to late evening (see duty schedule). 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 phone #: (978) 692-8708.

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## Heads Up For the Month . . .

*To calculate Eastern Standard Time EDT subtract 5 from UT.*

Dec 1 Mars at closest approach  
Dec 7 Full Moon, Mars at Opposition  
Dec 7 Mars occulted by the Moon [4 UT 12/8] (23 hrs. EST)  
Dec 14 Geminid meteors peak  
Dec 16 Last Quarter Moon (Moonrise at midnight)  
Dec 21 Winter Solstice  
Dec 22 Ursid meteors peak [22 UT] (17 hrs. EST)  
Dec 23 New Moon  
Dec 29 First Quarter Moon (Moonset at midnight)