



## 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. 9    October 2022

### This Month's Meeting . . .

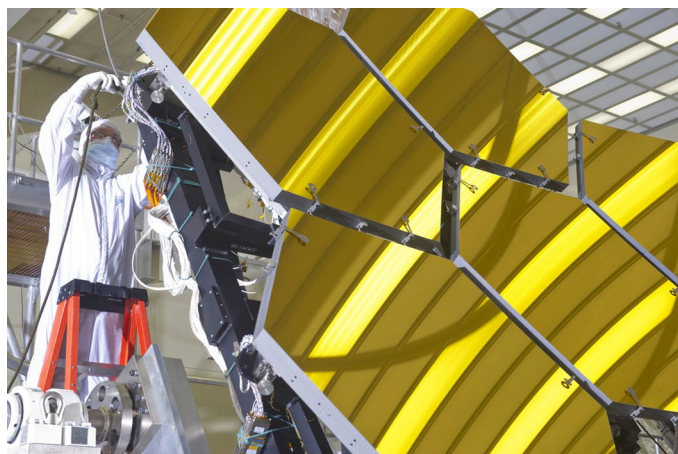
Thursday, October 13th, 2022 at 8:00 PM

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 October meeting. Please [select this Zoom link to attend the 956th Meeting of the Amateur Telescope Makers of Boston.](#)



JWST Cryogenic Testing. Image by Emmett Given, NASA Marshall.

### We Touched Infinity: How We Built the JWST, The World's Greatest Telescope!

Our guest speaker will be Glen Cole, the Chief Engineer in charge of polishing the beryllium mirror segments of the James Webb Space Telescope (JWST). Glen will give us a behind-the-scenes look at how the mirrors were created. He will discuss some of the immense challenges faced while making the mirror segments and show the beauty that resulted.

Glen Cole graduated as a Mechanical Engineer in 1979. A few years later he began to work with his father, a master optician, in the realm of large telescopes. Glen would go on to design and build specialized polishing machines and tools which were used to create two 1.65m parabolas used in Dr. Charles Towns' Infrared Spatial Interferometer. Glen returned to school to earn an advanced degree in Optical Sciences from the University of Arizona, where he worked on making 8.4m telescope mirrors. After graduating he worked on classified lightweight mirrors at Eastman Kodak. In 2004 Glen became the Chief Engineer overseeing the polishing of JWST mirrors. Currently Glen is the lead optical fabrication engineer on the Thirty Meter Telescope.

Glen will be speaking to us remotely over Zoom.

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.

~ Cory Mooney – President ~

### President's Message . . .

We now have a 3D printer available for member use at the Clubhouse. One of my favorite aspects of amateur astronomy is working on and improving the equipment, and 3D printers are great for making all sorts of small detailed parts. I've used my own 3D printer to make finder adapter brackets, GoTo motor mounts, dew heater controller enclosures, battery box panels, lens caps, light shrouds, spacers, knobs, Bahtinov focusing masks, solar filter film cells and even an entire star tracker.

3D printed parts will never be as strong or precise as carefully machined metal parts, and it will always be more practical to fabricate larger structures out of plywood or metal extrusions. What 3D printers really excel at is making small (0.5"- 6") low stress parts with reasonable tolerance requirements (~0.008"). Fortunately a good portion of our amateur telescope making needs fall into this category.

Another great aspect of 3D printing is the designs are digital, and they can be shared all over the world. Online design repositories like [Thingiverse.com](#) are chock full of ready-to-print solutions for our most common telescope problems, like clip-on handpad holsters, solar finders, various adapters, eyepiece plugs, covers, and more. If you're trying to solve a problem, it's always worth checking to see if someone has already solved it and shared their design online.

The real power of 3D printing is the ability to make your own parts, of your own design, bespoke for your scenario. Before you can 3D print your own design, you'll need to digitally 3D model it first, so that model can be used to build the instructions for the printer. It may sound intimidating at first, but there are free computer aided design (CAD) programs like OnShape, FreeCAD, Fusion360, and TinkerCAD. All of these programs have excellent tutorials on YouTube, and strong user forums for learning.

In the coming weeks I will hold some ATMoB training courses providing a detailed overview of the 3D printing process, and a more in depth training on the basics of CAD modeling. So if you are interested in learning how to make your own parts using the club's 3D printer, keep an eye out for the training sessions on the Announce email list.

~ Cory Mooney – President ~

## October Meeting Minutes . . .

ATMoB Meeting #955  
September 8, 2022



Dr. Carrie Nugent, Image courtesy Olin College of Engineering.

This was the first in-person meeting at the Center for Astrophysics (CfA) (Harvard & Smithsonian) after the Philips Auditorium was closed to the public for 2.5 years due to the coronavirus pandemic.

Rich Nugent presented the President's welcome for Corey Mooney who was unable to attend in-person but was able to join us via Zoom. Former ATMoB president, Tom McDonough ceremoniously passed the ATMoB gavel to former president Rich Nugent. Due to the pandemic the gavel was not passed to him during his term. Rich will pass the gavel to our current President, Cory Mooney, at the next meeting in October. He gave a warm welcome to our new Vice President, Christine Zacharer. Thanks to Rich for facilitating our return to the CfA, and to Chris Elledge for setting up a hybrid in-person and Zoom presentation.

- Alva Couch presented the Secretary's report, including summaries of the wonderful talks by Christine Zacharer on model rocketry, and Tom Consi on building a backyard radio telescope.
- Eileen Myers presented the Treasurer's report and reported a net inflow after processing membership renewals and buying filters for the 25-inch Dob.
- Chris Elledge presented the Membership report and welcomed new members Sarah Burns; Laura Campagna; Ignacio Cases, Michael Druar, Sharon Gentges and Alden

MacNulty; Viswanath Natarahan with Anusheya, Pranav, and Vidyasri Viswanath; John O'Neill; Neil Perlin; and John Sheffius.

- Rich Nugent presented the Observer's report. On Sunday, Sept. 11, Jupiter is 1.8 degrees North of the moon. In September both Neptune and Jupiter will achieve opposition. The September Observer's challenge is the planetary nebula NGC 6751. Astro images from Mario Motta and Mark Helton and a sketch by Glenn Chapple of NGC 6751 were shown. October's Observer's Challenge is Messier 39, an open cluster in Cygnus.
- Steve Clougherty presented the Clubhouse report. We had 22 volunteers in June, 27 volunteers in July, and 19 volunteers in August. On all three work parties we cleaned up the upstairs, including the library and office. In July, Phil Rounseville held a mirror cleaning clinic, and we cleaned the 25-inch Dobsonian mirror. All observatories except for the William Toomey Observatory are in full operation. The Clubhouse Committee is putting together a duty roster that will open the Clubhouse for two weekends a month, on both Friday and Saturday nights, rather than three Saturdays per month. We would expect each Clubhouse Committee keyholder to pull duty at the Clubhouse at least two nights a year. The ideal is to open the Clubhouse for the weekends of the New Moon and Last Quarter Moon. First Quarter Moon openings are optional and Clubhouse Committee members can volunteer if they choose.
- MIT says the oil tank "has to go", but they also reported that they will not pay for the oil tank removal and replacement. They quoted a price of \$3300 for removing and replacing the oil tank. MIT advocates replacing the oil furnace with an HVAC system which can potentially cost at least \$20,000. We may be able to postpone the oil tank and furnace replacement until next spring provided that a replacement is ready to use by next spring.
- Peter Bealo reported on ATMoB's 2024 total eclipse plans. Unfortunately the owner of the Bevy Hotel (Hilton), where we booked rooms, tried to put a stop to our room reservations and cancel our existing reservations, in order to offer eclipse packages locally. After protesting to the Hilton Corporate, we were allowed to keep our 23 rooms and reserve 17 more at a considerably higher price. The Better Business Bureaus are advising hotels near the centerline of the eclipse not to book, and state police are considering closing highways on eclipse day. Peter has arranged for the use of a large field for observing, though there is some question as to how we would travel to that field in the presence of planned road closures. People who hold one of the 23 existing reservations may cancel in the next few days at no penalty. The Eclipse committee plan to seek an additional hotel near the centerline.  
***Editor: Most of the members agreed to maintain our reservation with the Bevy hotel.***
- Maria Batista presented the Website Committee report. The committee is working on content, photos, and other changes

that need to be completed before we go live with the new website. Maria reported that there were 3173 unique page views in July and 4274 in August. The top pages other than home included Forums, Calendar, and Photo albums.

- Kelly Beatty and Rich Nugent presented the Outreach Committee report. Events include a star party at Sunny Meadow Farm in Chelmsford on Wednesday, September 28; another at the Belmont Public Library on Monday, October 3; and a third for the Cub Scouts at the Byam School in Chelmsford on Friday, October 7. Volunteering for these events is a good activity for a new club member. The star parties concentrate on bright easy-to-locate objects such as planets.

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

- New Business: None

Our speaker for the evening was Dr. Carrie Nugent who spoke on the science behind predicting asteroid collisions with Earth. An asteroid collision with Earth is the only kind of natural disaster that we have the technology to prevent. An example is the upcoming [NASA DART](https://www.nasa.gov/dart) (Double Asteroid Redirection Test) mission that will attempt to nudge an asteroid moon into a new orbit via the impact of the spacecraft.

We have discovered 90% of the near-Earth asteroids of more than a kilometer in diameter, but only 1% of the asteroids of one meter diameter or less. Only 10% of the 100 meter to 300 meter asteroids have been discovered. The kilometer sized asteroids are potentially capable of generating an extinction level event such as the one that ended the age of the dinosaurs.

We can locate near-Earth asteroids by analyzing sequences of images of the same patch of sky via machine learning and supercomputing. The asteroids appear to be “stars that move.” The good news is that we can now predict near-Earth asteroid paths for 800 years. Thus, unlike the dinosaurs, we can potentially stop an extinction level impact via a DART-like mission up to 800 years before its predicted impact.

~ *Alva Couch – Secretary* ~

## Meeting Recordings . . .

The recording of ATMob meeting #955 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](mailto:membership@atmob.org))

~ *Chris Elledge - Membership Secretary* ~

## Membership Report . . .

I am pleased to welcome our newest members: Ignacio Cases; Paul, Lily, and Ryan Craig, and Cory Blanchard; Michael

Druar; Kenneth Heide; Ruben and Natalia Salinas; and James Xu.

As of October 1st, 2022 we have 283 memberships covering 361 members. This is broken down as follows:

- 112 Regular Members
- 117 Senior Members
- 8 Student Members
- 44 Family Memberships covering 122 Members
- 2 Honorary Members

Renewals for FY2022-2023 are past due for all members except for members who joined after January 1st this year. Please visit the website at <https://www.atmob.org/renew> to begin your renewal. You may need to login and revisit the link to proceed. If you want a printed newsletter mailed to you each month, then you need to select one of the membership levels that include “with Mailed Newsletter” in the type.

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

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

~ *Chris Elledge – Membership Secretary* ~

## Clubhouse Report . . .



Joe Dechene and Rodrigo Carrillo cutting up discarded furniture. \*

The Clubhouse Committee held its last summer work session for 2022 on Saturday, September 10th. We are thankful to the 21 volunteers that supported this effort.

We had 4 solar telescopes and 1 pair of binoculars set up on the observing field. Members observed numerous prominences and filaments with 3 Hydrogen-alpha scopes. White light solar filtered views of sunspots were observed with a 4-inch Newtonian and a large tripod mounted binoculars. Thanks to Chris Elledge, Phil Rounseville and Christine Zacharer for allowing us to safely observe the Sun.

The grounds were mowed and weed trimmed by our volunteers. This summer’s drought made short work of maintaining the observing field.



A small crew led by Joe Dechene cut up the old furniture from the 2<sup>nd</sup> floor.

Eric Johansson did a thorough cleanup of the William Toomey Observatory.

Bruce Berger, Chris Elledge and Alan Sliski updated the Windows 10 operating system and The Sky X Pro software on the Mittelman - ATMob Observatory Control Room computer.

We would like to thank Eileen Myers for again providing a delicious home cooked meal for lunch.

Thanks to Rich Nugent for hammering out the Clubhouse Committee coverage schedule for the next year. We have a total of 27 "A" members who have volunteered to be available for weekend nights for the upcoming year. Our goal is to allow the Clubhouse and observatories to be available for member use during every clear Friday and Saturday evening during New Moon and Last Quarter Moon weekends, starting in October.

Thanks to the following members who volunteered in September. Bill Bakos, Bruce Berger, John Blomquist, Rodrigo Carrillo, Ignacio Cases, Paul Cicchetti, Alva Couch, Joe Dechene, Chris Elledge, Marion Hochuli, Eric Johansson, Paresh Khanapurkar, Dick Koolish, Ed Los, Jonathan Lyna, John Maher, Eileen Myers, Phil Rounseville, Alan Sliski, Al Takeda, Michael Touns and Christine Zacharer.

Our next work session at the Clubhouse will be Saturday, October 8 beginning at 10 am. Projects include; lawn mowing and trimming, cleaning the compost toilet and removing old debris from the front and side porch.

We encourage members to bring their telescope projects to the work session for assistance. Training for members who are interested in using the club telescopes and observatories will also be available.

Hope to see you there!



Solar telescopes and binoculars. \*

Clubhouse Friday and Saturday Night Duty Schedule	
Friday, Oct. 14	Christine Zacharer
Saturday, Oct. 15	Chris Elledge
Friday, Oct. 21	Mike Hill
Saturday, Oct. 22	John Maher
Saturday, Nov. 5	<b>WORK PARTY # 8</b>
Friday, Nov. 18	Joe Henry
Saturday, Nov. 19	Brian Maerz
Saturday, Dec. 10	<b>WORK PARTY # 9 (Tentative)</b>
Friday, Dec. 16	John Stodieck
Saturday, Dec. 17	Eileen Myers

~ *Clubhouse Committee Chairs* ~

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

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

October, 2022

Messier 39 Open Cluster in Cygnus

Magnitude 4.6

Size 31'



M39, Planewave CDK17, f/4.5, QHY600M camera, 6x300s sR, V, B and 25x1s RVB for bright stars, about 1.52 hr. total integration. Mittelman-ATMob Observatory. Image processing by Chris Elledge.

Cygnus is a relatively large constellation centered on the star-rich fields of the Milky Way. It's surprising that it's home to just two Messier objects, the open clusters M29 and M39. The latter, the larger and brighter of the pair, is this month's Observer's Challenge.

Credit for its discovery goes to Charles Messier himself, who observed the cluster on October 24, 1764. Some sources suggest that it may have been seen by Messier's fellow countryman Guillaume Le Gentil 14 years earlier, while others note a possible naked eye observation by Aristotle in 325 BC.

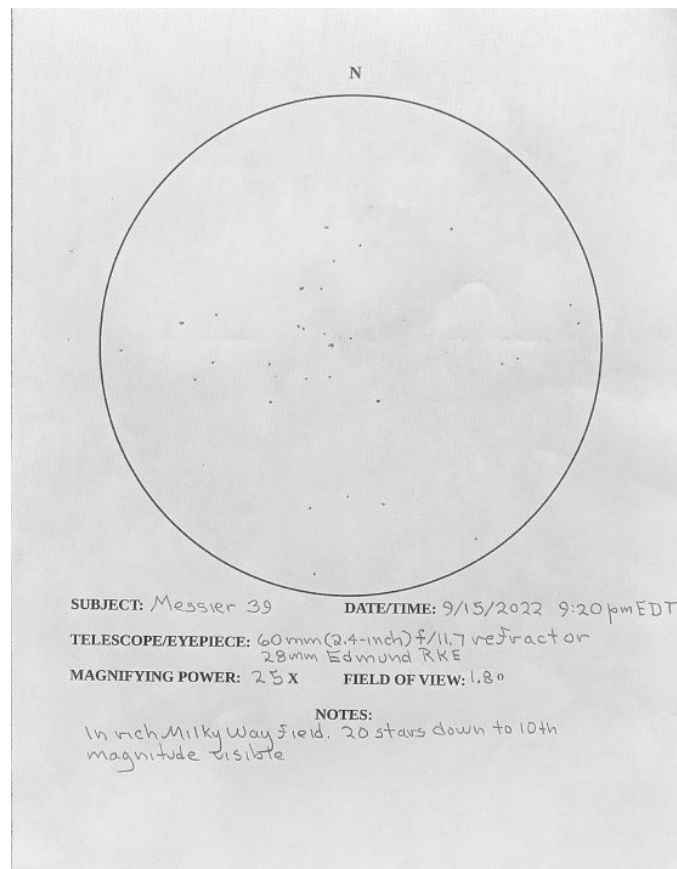
M39 is located at the 2000.0 coordinates RA 21h31m48.0s, Dec. +48°26'00". I found it by star-hopping 3 degrees roughly north of 4th magnitude rho (ρ) Cygni. This star can be found by

tracing an imaginary line from delta ( $\delta$ ) Cygni through Deneb and extending it an equal distance beyond (refer to the two finder charts).

My first encounter with M39 came on the evening of November 11, 1977, when I observed both it and M29 with a 3-inch f/10 reflector and a magnifying power of 30X. I was able to prove for myself that M39 is indeed larger and brighter, bright enough to be visible in the scope's primitive 3 x 25mm finderscope. During a small-scope survey of all Messier objects conducted between the years 1996 and 2013, I revisited M39 with a 3-inch f/6 reflector and 39X eyepiece. In my logbook, I wrote "Large, sparse cluster, triangular in shape. Over 2 dozen stars down to 11th magnitude." For a fresh impression of M39, I viewed it on September 15, 2022, with a 60mm (2.4-inch) refractor, again with low power (this time, 25X) to capture its entire Full Moon sized span. I counted about 20 stars, which is two-thirds of the recognized cluster membership.

On all three occasions I sketched M39. Reviewing them, I noticed a common denominator besides the triangular shape. Near the middle was a faint (for my small-sized instruments) double star. A search of the [Washington Double Star Catalog](#) (WDS) identified it as ARN 78, whose magnitude 7.6 and 8.8 components are separated by 50.0 arc-seconds. The WDS listed several other pairs within the bounds of the cluster, all too faint or close for ordinary backyard scopes.

At a distance of 800 light-years, M39 is one of the nearest Messier objects. Its true diameter is around 7 light-years.



M39, 60mm f/11.7 refractor at 25X. East and West are reversed in this 1.8 degree field. Sketch by Glenn Chaple. [Click this link for an enlarged view.](#)



M39, Canon 80D, 400mm f/2.8 lens, ISO 800, 39 x 30sec exposures = ~20min, 1/3 scale. North up. Image by Doug Paul.

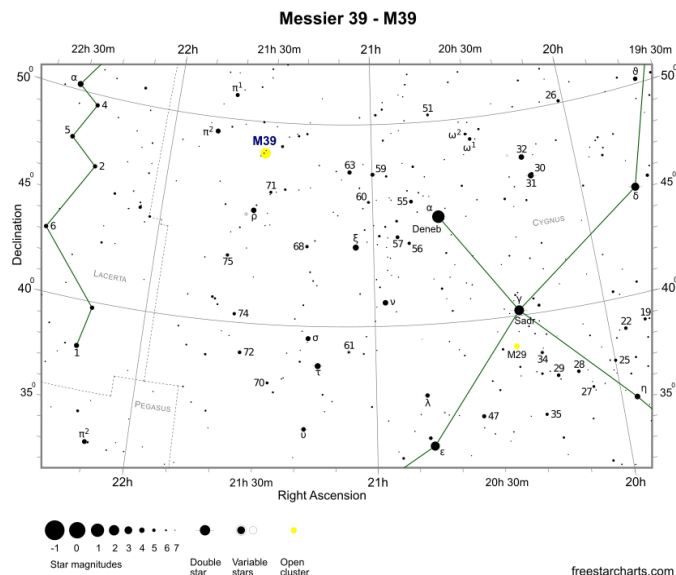


Chart A - [freestarcharts.com](https://freestarcharts.com)



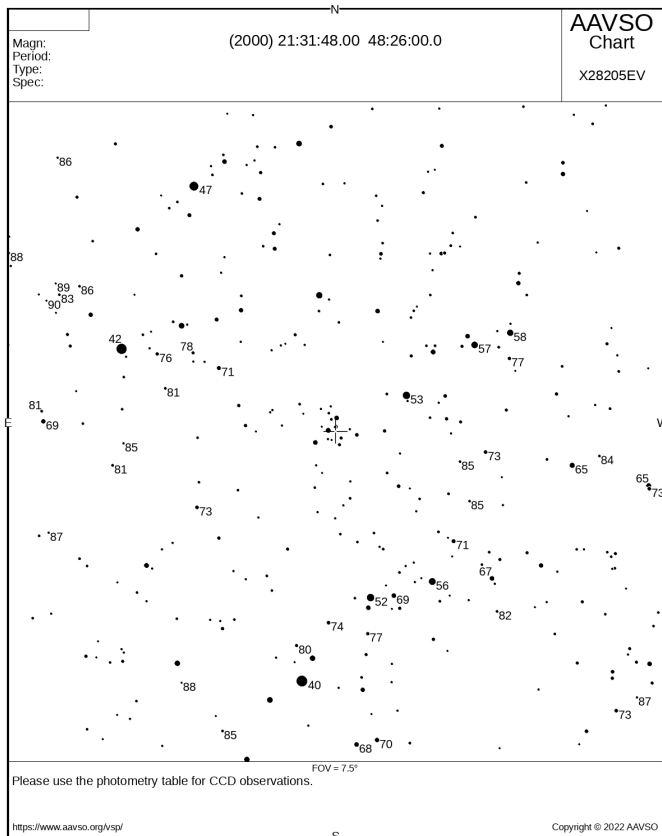


Chart B - Created using the AAVSO's Variable Star Plotter (VSP). Numbers are stellar magnitudes, decimals omitted. The magnitude 4.0 star is rho (ρ) Cygni. Stars plotted to 9th magnitude. North is up in this 2 by 4 degree field.

**\*\*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 ~*

## For Sale . . .

Farpoint 14" Universal Dovetail Plate (Losmandy D-series size)  
 - in good condition with usual wear, asking \$50

Bogen 3063 Fluid Head with quick release plate - very good condition, asking \$50

Home-made observing chair, somewhat similar to Cat's Perch design. Free to good home!

Anyone interested can contact me at:  
[john.harrington50@gmail.com](mailto:john.harrington50@gmail.com) or 617-678-4029.

*~ Submitted by John Harrington ~*

## Star Parties . . .

I can tell the COVID pandemic is waning by the number of star party requests we are receiving. I am not booking any more events for now. Here's the current list of upcoming events we have been asked to support:

Friday, October 7: Chelmsford Cub Scouts @ Sunny Meadows Farm in Chelmsford (Cloud date Nov. 4)

Wednesday, October 19: Weston School System (Cloud date October 25)

Friday, October 21: The Bromfield School in Harvard, MA. (Cloud date TBD)

Tuesday, November 1: Mattapan Public Library

Friday, November 4: Acton Cub Scouts @ NARA Park in Acton. (Also the cloud date for Chelmsford Cub Scouts)

Saturday, November 5: Westford Cub Scouts

We can only support these outreach events with your help. If you live in or near the town or if your scope is portable enough to travel with it, PLEASE consider helping at these events. Each is listed on the club's event calendar and registration is recommended.

Thanks in advance!

*~ Rich Nugent - Public Outreach Committee Chair ~*

## Chelmsford Star Party . . .



Chelmsford Star Party. Image by Bruce Berger.

Here's a report on the Chelmsford Star Party held on Tuesday, September, 27th. We had between 130-160 guests and 11 ATMoB volunteers.

Speaking on behalf of all of the volunteers from ATMoB, we had a great time!

I find it a thrill to witness someone's "Wow Moment" on their first glimpse at the rings of Saturn, or the bands and moons of Jupiter. Corey's live demonstration of Electronic Assisted Astronomy (EAA) is always a draw, and the live images of the Andromeda Galaxy on the big screen were absolutely stunning!

Chris also set up his EAA Unistellar eVscope.

Kelly and Rich love sharing their deep knowledge of the science and lore of the night sky. Their combined experience is astronomical!

When Phil, Michael T. and I shared that our scopes are home-made, a few interested visitors may join our club and try telescope making themselves.

Venu's telescope was a big draw and he let us know that he really enjoyed doing this for fellow Chelmsford people.

Christine's huge binoculars were a big hit. I love looking through them because the view is almost 3 dimensional.

Giancarlo had an 8-inch reflector on an equatorial mount.

Our newest member Mike D. got to use his new 12-inch telescope and enjoy his first star party, all in the same day.

Thank you to Sara Kurland (Chelmsford Historical Society), Scott Venier (Chelmsford Conservation Land Trust), Phil Stanway (Chelmsford Open Space Stewardship) and all the other volunteers. You did a great job getting the word out, keeping headlights away from the scopes, and providing refreshments. We hope this isn't our first time working with the great people at the Chelmsford Historical Society, the Chelmsford Conservation Land Trust and the Chelmsford Open Space Stewardship.

Thanks to our ATMob volunteers: Kelly Beatty, Bruce Berger, Michael Druar, Chris Elledge, Giancarlo Gonzalez, Corey Mooney, Rich Nugent, Phil Rounseville, Michael Toups, Venu Venugopal and Christine Zacharer.

~ Bruce Berger - Observing Committee ~



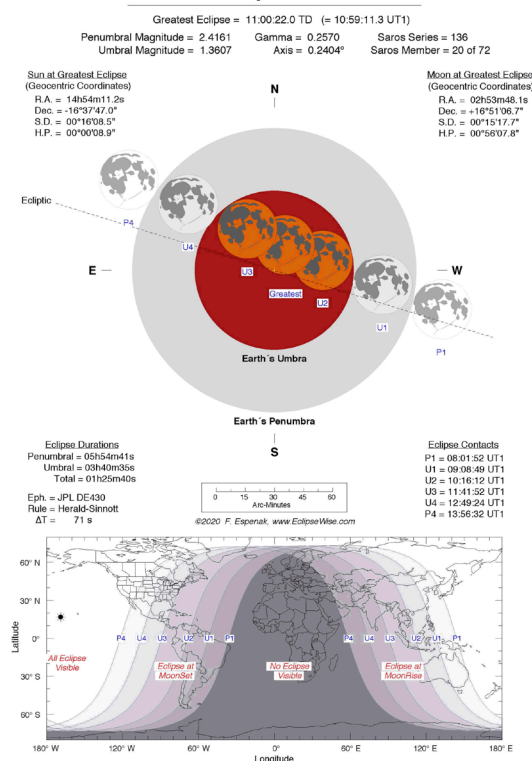
Total Lunar Eclipse. 20 February 2008. Image by Al Takeda\*.

## Total Lunar Eclipse ...

A total lunar eclipse will occur on [Tuesday, 8 November 2022](#).

Penumbral Begins	P1	08:01:51.7 UT (03:01:51.7 EST)
Partial Begins	U1	09:08:48.6 UT (04:08:48.6 EST)
Total Begins	U2	10:16:12.2 UT (05:16:12.2 EST)
Greatest Eclipse		10:59:11.3 UT (05:59:11.3 EST)
Sunrise		11:28:35 UT (06:28:35 EST)
Total Ends	U3	11:41:51.7 UT (06:41:51.7 EST)

### Total Lunar Eclipse of 2022 Nov 08



COURTESY OF 21<sup>ST</sup> CENTURY CANON OF LUNAR ECLIPSES, FRED ESPENAK, ASTROPixels PUBLISHING, 2020

[Eclipse Prediction](#) by Fred Espenak, [www.EclipseWise.com](http://www.EclipseWise.com)

~ Al Takeda - Newsletter Editor ~

Editor: \* Photos by Al Takeda unless otherwise noted.  
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**November Star Fields DEADLINE**  
**Sunday, October 23<sup>rd</sup>**

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

Articles from members are always welcome.  
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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

SECRETARY: Alva Couch

MEMBERSHIP: Chris Elledge (781) 325-3772

TREASURER: Eileen Myers (978) 456-3937

MEMBERS AT LARGE: Alan Sliski  
Kai Cai

#### PAST PRESIDENTS:

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 [newsletter@atmob.org](mailto:newsletter@atmob.org)

ASSOCIATE EDITOR: Eileen Myers

#### 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 8:00 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 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 phone #: (978) 692-8708.

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## Heads Up For the Month . . .

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

- Oct 2 First Quarter Moon (Moonset at midnight)
- Oct 8 Mercury at greatest western (morning) elongation, 18 degrees
- Oct 9 Full Moon
- Oct 17 Last Quarter Moon (Moonrise at midnight)
- Oct 21 Orionid meteors peak
- Oct 25 New Moon
- Nov 6 Daylight Saving Time ends
- Nov 8 Full Moon
- Nov 8 Total Lunar Eclipse [08:01 - 13:56 UT] (03:01 - 08:56 EST)