



## 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. 32, No. 3 March 2020

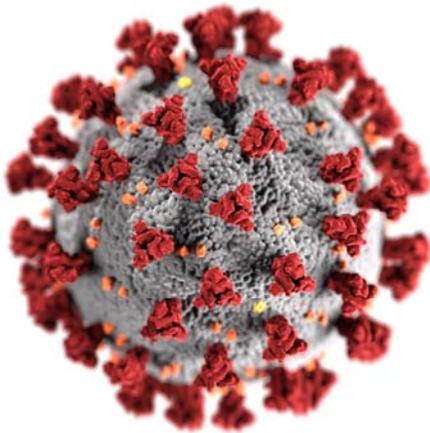
### This Month's Meeting . . .

**MEETING CANCELLED**  
Thursday, March 12<sup>th</sup>, 2020 at 8:00 PM  
Phillips Auditorium

**Harvard-Smithsonian Center for Astrophysics**

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

### MEETING CANCELLED



[Coronavirus disease 2019 \(COVID-19\)](#), Image by CDC/ Alissa Eckert, MS; Dan Higgins, MAM - Centers for Disease Control and Prevention's Public Health Image Library (PHIL)

All external meetings scheduled for the Harvard-Smithsonian Center for Astrophysics have been cancelled **through the month of May** due to concerns over the [Coronavirus](#) outbreak.

Please refer to the [ATMoB](#) website for future meetings. Members should check their email on the ATMOB-ANNOUNCE list for additional information.

Glen Chaple's talk about the Las Vegas Astronomical Society's Observer's Challenge and the Astronomical League's Variable Star Observing Program will be rescheduled.

### President's Message . . .

As many of you may know, I have a love for the etymology of words and names. I believe this passion springs from my father's same love of language, travel and history, which he passed on to his nine children.

The Merriam-Webster Dictionary defines the term "service" as the occupation or function of serving or employment as a servant, a rather circular statement in my opinion. The reference also defines it as work performed by one that serves, helps, or a contribution to the welfare of others.

The first known usage of the term dates to the 13<sup>th</sup> century, derived from the Anglo-French *servise* and from the Latin *servitium* meaning condition of a slave, body of slaves, and from the Slavic *servus*, a common salute or greeting/parting used in European countries that were boundary nations of the Austro-Hungarian Empire.

I persevere on this term as it is now time to consider the election of new Executive Board members. Recently I put out a call for volunteers to *serve* on the Nominating Committee. The role of the Committee is to identify and put forward candidates for each of the open positions on the Executive Board. It is the first of many opportunities to offer your time and effort in shaping the future of our organization. Please reach out to me if you are willing to assist in this process.

At the same time, I suggest every member consider *servicing* on the Executive Board. Unique perspectives help to develop and maintain the Amateur Telescope Makers of Boston as a best in class organization. This endeavor certainly requires passion, insight and new and diverse viewpoints. Please reach out to me or any member of the new Nominating Committee if you have questions or interest in playing a larger role in your club.

Ego humilis servus, mea dominorum et dominarum

Tom

~ *Tom McDonagh – President* ~

## February Meeting Minutes . . .



Dr. Rosanne Di Stefano \*

Minutes of the 928th ATMoB meeting held February 13, 2020, at the Harvard-Smithsonian Center for Astrophysics in the Phillips Auditorium. Club President Tom McDonagh presided and called the meeting to order at 8:05 pm.

- Glenn Chaple read the minutes of the Club's February meeting in Secretary John Harrington's absence.
- Eileen Myers gave the Treasurer's Report.  
Outflow included expenses for 200 gallons of heating oil, reimbursement for 9 work parties, and a phone bill covering two months.  
  
A collection at a recent ATMoB meeting netted \$131, which was sent to Attila Danko for our Clear Sky Chart subscription for our website.  
  
Eileen also noted that a donation of \$200 to the club will go for new Clubhouse porch chairs.
- Membership Secretary Chris Elledge gave the Membership Report.  
Chris reported that we now have 321 memberships covering 414 members. A breakdown included 138 regular memberships, 116 senior memberships, 8 student memberships, 54 family memberships covering 147 members, 3 guest memberships, and 2 honorary memberships. 3 new members joined ATMoB in the past month.
- Glenn Chaple gave the Observing Committee Report.  
Key upcoming sky events include an occultation of the planet Mars by the Moon on the morning of February 18, and a Venus/Uranus conjunction on the evening of March 8. The Observer's Challenge for February is the emission-reflection nebula NGC 1931 in Auriga. Glenn also discussed the recent fading of Betelgeuse and reported on a recent eclipse of Algol. A Messier Marathon will be held at the Clubhouse on Saturday evening, February 22.
- Steve Clougherty gave the Clubhouse Committee Report.

Steve referred to a pair of January work parties – one on the 4th to clean up after the New Year's party and the other on the 11th that saw 23 members volunteer their help. Highlights of the February 8th work party: Dave Prowten installed insulation on the doors of the polishing room and patched leaks to the outside metal storage shed; the upper barn loft was reorganized; the potholes in the driveway were filled with gravel. Barry Janson and George Roberts installed a fully operational Bath interferometer in the glass room. In addition, a Mirror-o-Matic grinding machine has been moved from the polishing room to the grinding room and a new one has been placed in the polishing room. The next work party will be held on March 7.

- Bill Toomey gave an update on ATMoB Research and Imaging Observatory (ARIO). Variable star work with ARIO is on the increase. A volunteer is needed to help develop an exoplanet program for ARIO. Interested members are encouraged to look into an April course on exoplanet research being held by the AAVSO.
- Rich Nugent gave the Outreach Committee Report.  
Rich began with a tip on how to use your cell phone to locate bright objects like Venus during daylight. Rich has on his iPhone a digital star atlas, digital compass and tilt meter. The method might be helpful for viewing the upcoming Mars occultation which will occur after sunrise.  
  
He then noted that he has been sending out text messages via the app "Remind" to alert ATMoB members of major astronomical events. Information on how to receive these alerts will appear in an upcoming atmob-announce email.  
  
He then mentioned an up-coming star party at the Chenery Middle School in Belmont, and added that future star parties are in the works.
- New Business  
Volunteers are needed to serve on the Nominating Committee. The Committee's duty is to prepare a slate of candidates for the upcoming Board election. Two members have already stepped forward. Four more are needed.  
  
Tal Mental's new address is Newton-Wellesley Center for Alzheimer's Care, 694 Worcester St., Wellesley, MA 02482. ATMoB members are encouraged to write or visit.  
  
ATMoB pins are still available. See Eileen Myers.  
  
ATMoB members who order online items via amazon.com are reminded to make use of Smile.amazon.com to earn funds for the club.
- Old Business  
Sal LaRiccia noted that he was able to convert an electronic file of the club history donated by Paul Valleli to a PDF file. He then talked about the January 25th celebration of the 50th anniversary of Schwamb Mill, site of ATMoB telescope making for 3 years.

President Tom McDonagh then introduced Dr. Rosanne Di Stefano, an astronomer at the Harvard-Smithsonian Center for Astrophysics, who presented the talk Mass Transfer within Hierarchical Triples: New Models for Progenitors of Gravitational Mergers and Type 1a Supernovae. Dr. Di Stefano's noted that, while close binary star systems comprised of a white dwarf and main sequence star or a pair of degenerate stars can produce Type 1a supernovae or mergers that generate gravitational waves, the process can be enhanced by mass transfer from a third star in the system. This transfer not only adds mass to the degenerate stars but speeds up the time for them to merge. A hierarchical triple star is defined as a close binary pair comprised of degenerate stars (white dwarf, neutron star, black hole) in orbit with a third main sequence star. She noted that 15-20% of all stellar binaries are close companions in a hierarchical triple and that 80% of phenomena of interest to astronomers are a result of binary system interactions.

President Tom McDonagh adjourned the meeting at 10:05 PM. Post meeting refreshments were served by ATMob Treasurer Eileen Myers.

*~ Submitted by Glenn Chaple for Club Secretary John Harrington ~*

## Membership Report . . .

I am pleased to welcome our newest members: Patty Christensen and Ellen Marston.

As of February 27th, 2020 we have 325 memberships covering 418 members. This is broken down as follows:

- 139 Regular Members
- 116 Senior Members
- 8 Student Members
- 54 Family Memberships covering 147 Members
- 6 Guest Members
- 2 Honorary Members

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

*~ Chris Elledge – Membership Secretary ~*

## Meeting Refreshment Assignment . . . 2020

Mar. - Glenn Chaple

Apr. - Chris Elledge

May - Al Takeda

Jun. - TBD - A volunteer from the membership is requested

Jul. - Tom McDonagh

## ATMoB Research and Imaging Observatory Science Team February Report . . .

We received a nice letter from the Commonwealth School in Boston thanking us for mentoring one of their students with his project using ARIO. We have two students who have shown an interest in starting projects in March. If you know of any other students who would like to do a science project in astronomy, please let me know. I was a judge for the Massachusetts State Science Fair at MIT for a number of years, and in that time only saw two science projects on astronomy. One was on variable stars and the other was on spectra of a comet. The comet spectra project won a sizable scholarship to UMass Amherst.

We continue to take variable star measurements with ARIO, and are hoping to add exoplanet observations starting in May.

We currently have three members of the ARIO Science Team taking AAVSO online courses. The first course is "Variable Star Classification and Light Curves" which started 2 March, the second is "Exoplanet Observing" which starts 6 April. One member is taking "How to Use VStar" starting 4 May. VStar is an AAVSO data analysis tool. Other members have expressed interest in taking these online courses, so the list of member participation may grow. If you would like to join us in these courses or just helping with ARIO, please let us know. You can find out about these courses at <https://www.aavso.org/carolyn-hurlless-online-institute-continuing-education-choice>.

John Harrington has volunteered to set up a spectroscopy project for ARIO. In support of this, a number of our members are planning to attend the AAVSO spectroscopy workshop next November. This will be a significant addition to the scientific capabilities of ARIO.

*~ Submitted by Bill Toomey ~*

## Meeting Recordings . . .

The recording of ATMob meeting #928 is available on YouTube: <https://youtu.be/PAQlabIuejE>

I would like to thank Dr. Roseanne Di Stefano for giving her presentation and allowing us to record it.

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 ~*

## Outreach Report . . .

March 2020



Chenery star party participants: (Left to Right) Keith Davies, Sandra Lobo, Joseph Rothchild, Jim Zebrowski, Corey Mooney, Bob Toop, Rich Nugent, Ben Warinner, Peter Warinner, Bob Phinney, and John Harrington

It was a dark and stormy night, but the indoor component of the Chenery Middle School's star party was a great success! Bob Phinney and Jim Zebrowski had elaborate displays set up, while Corey Mooney had his interactive space simulator up and running. Keith Davies and his wife, Sandra Lobo brought books and a loaner Starblast telescope from the Belmont Public Library to bring awareness to those resources. John Harrington, Rich Nugent, and Joseph Rothchild set up telescopes for indoor viewing, and Bob Toop gave a presentation about iPhone apps. APOD pages were projected onto a big screen for discussion. ATMoB members Peter Warinner and his son Ben were also on hand. Ben is very interested in learning the art of mirror making. Say hi if you see him at the Clubhouse.

We do have some other star parties coming up. Please consider volunteering as the experience can be very rewarding.

Here they are:

- March 30: Sudbury Valley Trustees, Harvard, MA
- April 1: Match Public Charter School, Jamaica Plain, MA
- May 2: New England Sci-Tech, Natick, MA
- May 2: Farrington Nature Center, Lincoln, MA

We are currently organizing several star parties for the late summer and early fall. Stay tuned!

~ Rich Nugent - Vice President and Outreach Chair ~

## Astronomy Day . . .

New England Sci-Tech will host a public Astronomy Day event on Saturday, May 2, at 16 Tech Circle, Natick. We would love to have ATMoB join us with solar and night telescopes, mirror grinding demos, and anything else you would like to offer. Plans include indoor astronomy activities and planetarium shows as well as outside telescopes. See our Astro Day web page <https://www.nescitech.org/astronomy-day/> for details and to sign up. For questions, contact Bob Phinney or Rusty Moore at [info@nescitech.org](mailto:info@nescitech.org).

~ Submitted by Bob Phinney ~

## Clubhouse Report . . .



Chris Elledge working on the Mirror-O-Matic grinding machine \*

### February 2020 Clubhouse Report

The ATMoB Clubhouse was opened by Chris Elledge one minute before 10 o'clock on Saturday, Feb 8<sup>th</sup> under a partly cloudy sky at 29 deg F with an icy terrain. This day's accomplishments were made possible by 25 members who volunteered part of or their entire day to help out. A big THANKS goes out to: John Blomquist, Steve Clougherty, Alva Couch, Tony Costanza, Carly Conner, Chris Elledge, Pierre Fleurant, Eric Johansson, Ed Los, Jon Lyna, John Maher, Tom McDonagh, Vladislav Mlch, Keira Mooney, Eileen Myers, Rich Nugent, Dave Prowten, John Reed, Phil Rounseville, Steve Scampini, John Stodieck, Al Takeda, Joe Tansey, Bill Toomey, and Venu Venugopal .

While surface conditions remained icy, several members took up heavy shovels, chopping hoe, and pick, to break the heavy ice layer and provide access to surrounding buildings. This was led by Chris E., who was helped by Alva C., John S., Al T. Thanks to all for this effort.

Changes were made to the locations of the mirror making machines.

The Mirror-O-Matic (MoM) machine is now in the Grinding Room. The control panel box was re-mounted above the MoM.

The spin grinding machine is in the Activity Room. This location will now allow for the spin grind unit to hog out initial curves with the operator in a fixed position. Several barrels were moved from the Activity Room to the barn loft storage area.

The Polishing Room will be cleaned and readied for the arrival of Barry Jenson's donated MoM unit, which will be dedicated to polishing.

Curve generating, fine grinding, and polishing, now in separate rooms, will be possible. Stay tuned.

Meanwhile the donated equipment & scope parts were moved from the Library to the ATM storage shelves in the barn loft.

This was a big job led by Rich N., Kiera M., Tom M. and Al T., supported by Tony C. and Steve C., with assistance from the rest of the gang. See Steve C. for the latest location of ATM parts.

Eileen M.'s turkey chili over quinoa was an outstanding lunch along with Bill T.'s still warm home baked hearty white bread. Thanks to Eileen and crew for creating and serving a delicious lunch, and to all who helped with setup and cleanup. We were hungry for sure, and it was good.

Later as things quieted down, Eric J. and John R. applied Kilz primer paint to the insulation sheets installed on the surface of the outside exterior doors of the Polishing Room. This effort should be completed before the next work party in March. A planning discussion was held about plumbing the Polishing Room sink.

With the ice removed, the metal shed roof leakage was checked. Further work will be needed at the next work party to find the leaks.

Later in the evening skies co-operated somewhat as several members set up scopes. ARIO was opened and Bill T. and Eileen M. made variable star measurements into the early morning.

The next work session will be held on Full Moon Saturday, March 7<sup>th</sup>. The Clubhouse duty roster schedule will apply for the remaining 2020 work parties. We'll need help on March 7th, when we anticipate moving in Barry's MoM machine into the Polishing Room. Eastern Daylight Time starts at 2 AM the next day. Stay tuned and Clear Skies to all. Thanks again for your help

<b>Clubhouse Saturday Schedule</b>		
Feb 29	Eileen Myers	Rich Nugent
Mar 7	<b>WORK PARTY # 3</b> Chris Elledge and Slav Mlch	
Mar 14	Nina Craven	Brian Maerz
Mar 21	<b>Messier Marathon # 2</b> George Paquin and Tom Wolf	
Mar 28	Mike Hill	Eric Johansson
Apr 4	<b>NEAF Convention</b> Glenn Chaple and Dave Prowten	
Apr 11	<b>WORK PARTY # 4</b> Pierre Fleurant and Art Swedlow	
Apr 18	Tom McDonagh	Bill Toomey
Apr 25	John Maher	Henry Hopkinson

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

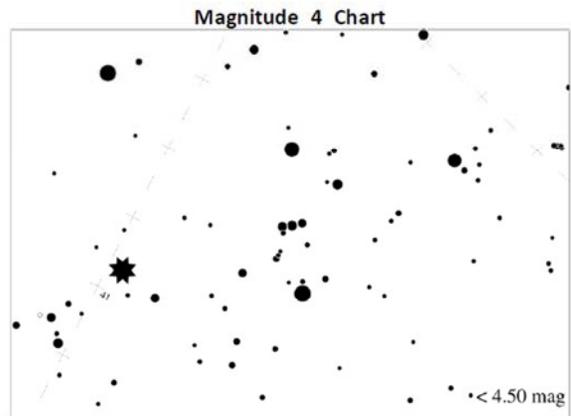
<b>Clubhouse Evening Schedule</b>	
Friday Night Educational Videos	<b>ATMoB-Announce</b>
Saturday Night Observing	7:00 pm - ###
# Closing time is determined by the organizers	
## Closing time is determined by the "A" members on duty.	



(L-R) Pierre Fleurant and Phil Rounseville observing the Sun

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

## Show Your Love for the Stars! . . .



Magnitude 4 star chart. Courtesy of Globe at Night.

How much do you love the stars? Would you do a fun, simple nighttime activity to prove it?

Now in its 15th year, "Globe at Night" (GAN) is a crowdsourced effort to measure levels of light pollution worldwide. The project team is urging dark sky lovers everywhere to participate during the next two sets of Moon free evenings: February 14-23 (theme: "Love your stars") and March 14-24 (theme: "Pi in the sky").

It's easy to participate in Globe at Night - no equipment or experience is necessary! Instead, all you need are your own eyes; a clear, moonless sky; and a simple sky chart to help you determine what stars are visible to you. You can download the sky chart — and the simple instructions for making and reporting your observation — from [Globe at Night's website](#).

I'm throwing down a challenge to IDA-MA. Right now only [7 night-sky measurements](#) have been submitted to GAN from our state since January 1st. We can do so much better! Let's commit

to submitting at least 200 GAN measurements statewide by the end of this year! Get more details at the [IDA - MA website](#).

Clear skies,

~ Submitted by Kelly Beatty ~

## ATMoB Members Will Be Stars in Japan . . .



John Bishop being interviewed by NHK TV \*

In January, President Tom McDonagh was contacted by Nippon Hoso Kyokai (NHK). NHK is Japan's national broadcasting organization, i.e. Japan's public TV. It is funded by viewers' payments of a television license fee. NHK operates two terrestrial television channels, four satellite television channels, and three radio networks.

Why did Japanese public TV contact Tom? They wanted to interview ATMoB members who observe with Takahashi telescopes.

Tom knew several members who used Takahashi. He emailed them and asked if they would be willing to be interviewed by Takayo Nagasawa, the U.S. based TV producer of NHK TV. Five club members agreed to contact NHK.

On Saturday, February 15, James was interviewed at his home. James has a subscription to use a remote observatory to image the sky. The instrument in the observatory is a Takahashi.

On the following day, Sunday, February 16, John Bishop, Phil Rounseville, Al Takeda and Eileen Myers met the NHK film crew at the Westford Clubhouse. John, Phil and Al were filmed setting up their telescopes.

John set up his Takahashi Mewlon 210 Dall-Kirkham scope. Phil showcased his 60mm Takahashi refractor, configured for both solar and nighttime observing. Al set up his Takahashi Epsilon-180 hyperbolic astrograph imaging setup.

Each of us was asked why we chose that particular telescope, what we observe with our equipment, and what motivates us to be an amateur astronomer.

As night approached each of us was filmed using our telescopes.

Later, during a break in filming, Eileen invited the NHK crew into the Clubhouse for some refreshments and gave them a tour of the building and observatories.

When the filming was completed, Takayo Nagasawa presented each of us a small gift to thank us for our participation.

The NHK film crew told us that next they are heading to Botswana, Africa to interview Steve O'Meara.

The interviews will be broadcast on NHK TV in April. Producer Takayo Nagasawa promised us that she will send a copy of the broadcast.

~ Submitted by Al Takeda ~

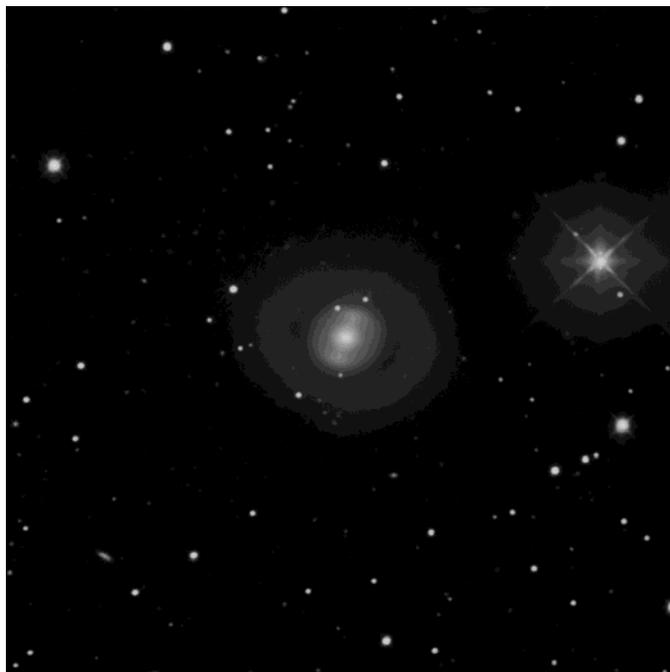
## Observer's Challenge . . .

March 2020

NGC 2859 – Barred Lenticular Galaxy in Leo Minor

Mag: 10.9

Size: 4.6' X 4.1'



NGC 2859. Taken with 32-inch f/6 scope and SBIG STL 1001E camera, 1 hour imaging time. Image by Mario Motta, MD

Occupying a barren region between Ursa Major and Leo is the obscure constellation Leo Minor. *Sky and Telescope's Pocket Sky Atlas* plots a dozen galaxies within its boundaries. Among the more interesting is the 11<sup>th</sup> magnitude NGC 2859. Located at the extreme western edge of Leo Minor at coordinates 9h 24.3m, +34° 30.8', this barred lenticular galaxy is an easy star-hop from

the 3<sup>rd</sup> magnitude star alpha ( $\alpha$ ) Lyncis (see accompanying finder charts).

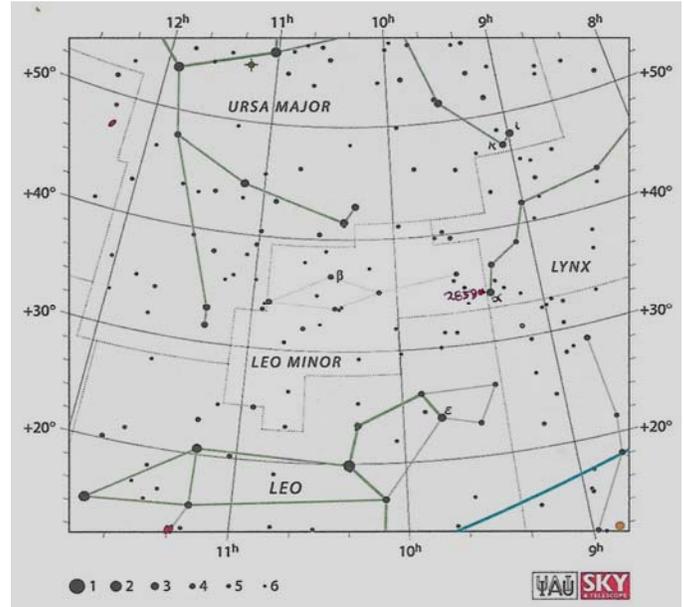


NGC 2859 , Stock Canon 80D, 400mm f/2.8 (142mm aperture) lens, ISO 800, 72 subs x 30 sec = 36 min total exposure, FOV 19'x15'. Image by Doug Paul

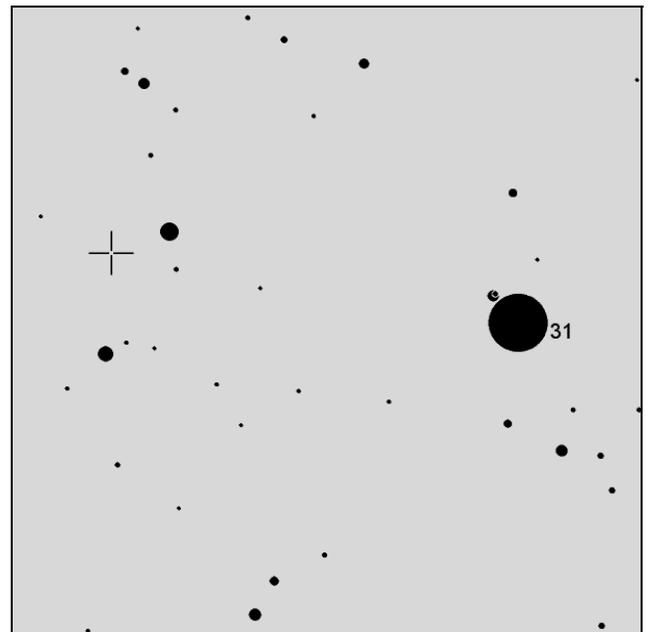
Alpha Lyncis itself is a spectral class F7 giant that displays a striking golden yellow hue. NGC 2859 is located 40' east of this star and just 6.5' ESE of 7<sup>th</sup> magnitude HIP 46083. In his “Deep Sky Wonders” column in *Sky and Telescope*, Walter Scott Houston described a “sky drift” method of finding deep sky objects located at a similar declination and east of a bright star. You capture the star in the eyepiece field and wait until your target drifts into view. The technique worked perfectly for NGC 2859. I placed alpha Lyncis near the northern edge of the eyepiece field and waited. Lo and behold, within a few minutes HIP 46083 and then NGC 2859 glided into view!

I viewed NGC 2859 with 4.5-inch (at 150X) and 10-inch (208X) reflectors under slightly light-polluted suburban skies with a limiting magnitude of 5. The 4.5-inch revealed a concentrated, almost stellar nucleus surrounded by a haze that required averted vision. The 10-inch brightened NGC 2859, but failed to reveal two features that make this galaxy so intriguing – a pair of bars running essentially north and south of the central core and an outer detached ring. I yearned not for a bigger scope, but for darker skies! ATMob members Mario Motta and Doug Paul managed to image both, but can any of you visually detect them?

NGC 2859 was discovered by William Herschel on March 28, 1786. It lies some 83 million light years away, which means that the light striking your retina left when dinosaurs still ruled the earth.



Finder chart from <https://www.constellation-guide.com/>



NGC 2859 finder chart, adapted by Glenn Chaple from AAVSO Variable Star Plotter (VSP). The magnitude 3.1 star (decimal omitted) is alpha ( $\alpha$ ) Lyncis. North is up in this 1 degree field.

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/>

~ Submitted by Glenn Chaple ~

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

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**April Star Fields DEADLINE**  
**Sunday, March 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 March 9, 2020

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

**EXECUTIVE BOARD 2019-2020**

PRESIDENT:	Tom McDonagh	(617) 966-5221
VICE PRES:	Rich Nugent	(508) 935-8158
SECRETARY:	John Harrington	
MEMBERSHIP:	Chris Elledge	(781) 325-3772
TREASURER:	Eileen Myers	(978) 456-3937
MEMBERS AT LARGE:	Maria Batista	(617) 347-3730
	Alan Sliski	
	Al Takeda	(508) 494-7877
PAST PRESIDENTS:		
2015 - 18	Glenn Chaple	(978) 597-8465
2012 - 14	Mike Hill	(508) 485-0230

**COMMITTEES**

CLUBHOUSE:	John Reed	(781) 861-8031
	Steve Clougherty	(781) 784-3024
	David Prowten	(978) 369-1596
OBSERVING:	Bruce Berger	(978) 387-4189
NEWSLETTER	Al Takeda	<a href="mailto:newsletter@atmob.org">newsletter@atmob.org</a>

**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 8:00PM 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.**

Mar 2 First Quarter Moon (Moonset at midnight)  
Mar 8 Daylight Saving Time begins  
Mar 9 Full Moon  
Mar 16 Last Quarter Moon (Moonrise at midnight)  
Mar 19 Vernal Equinox  
Mar 23 Mercury at greatest western (morning) elongation (28 degrees)  
Mar 24 New Moon  
Mar 24 Venus at greatest eastern (evening) elongation (46 degrees)  
Apr 1 Last Quarter Moon (Moonrise at midnight)