



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. 30, No. 5 May 2018

This Month's Meeting . . .

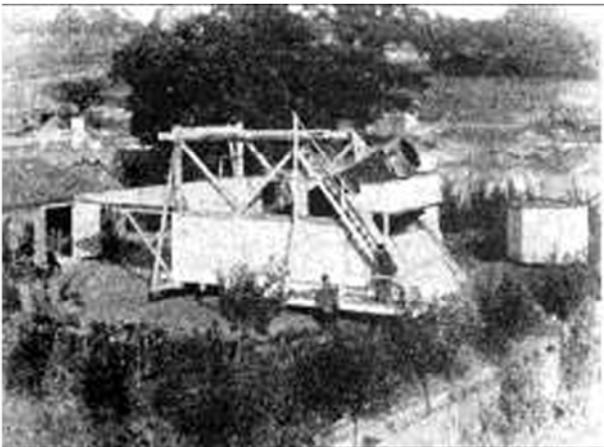
Thursday, May 10th, 2018 at 8:00 PM

Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

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

From Backyard to Mountaintop: The Adventures of History's Best Worst Telescope



Andrew Ainslie Common's 36-inch reflector

Our speaker this month will be Alan Hirshfeld who will talk about his book *From Backyard to Mountaintop: The Adventures of History's Best Worst Telescope*.

The 36-inch reflector of English amateur astronomer Andrew Common made its way from a London backyard to a Yorkshire estate and ultimately to a mountaintop observatory in California. This little-known telescope, built in 1879 and still operating today, revolutionized celestial photography and proved to 19th-century astronomers that the future of cosmic discovery lay in the camera, not the human eye.

Alan Hirshfeld is a Professor of Physics at the University of Massachusetts Dartmouth and an Associate of the Harvard College Observatory. He is the author of *Parallax: The Race to Measure the Cosmos*, *The Electric Life of Michael Faraday*, *Eureka Man: The Life and Legacy of Archimedes*, and most recently, *Starlight Detectives: How Astronomers, Inventors, and Eccentrics Discovered the Modern Universe*. He is a regular science book reviewer for the Wall Street Journal and has written about episodes in the history of science for many magazines.

About *Starlight Detectives*:

Discover magazine - "Top 5 Summer Read"

Scientific American/Farrar, Straus & Giroux - "Favorite Science Books of 2014"

NBC News - "Top Science and Tech Books of 2014"

Kirkus Reviews - "Best Nonfiction Books of 2014"

Nature magazine Books and Arts blog - "Top 20 Reads of 2014"

Boston Authors Club, Finalist - "Julia Ward Howe Prize, 2016"

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.



1883 photo of the Orion Nebula made by Andrew Ainslie Common

President's Message . . .

Spring has arrived, albeit a month later than the astronomically determined date. We say goodbye to frostbite and hello to - bugs. To that end, I offer some fatherly (at my age, more like grandfatherly) advice. If you go outside with telescope to take in the bounty of galaxies in Leo, Coma, and Virgo, be sure to apply a generous amount of insect repellent. And don't forget that the attack isn't just by air (mosquitoes), but also by land (ticks). You'll want to bug-protect your entire body. A shower upon your return indoors will not only keep you from reeking of bug spray, but also wash away any ticks that might have gotten through your line of defense. This advice applies not only to your backyard, neighborhood soccer field, or open area at a public campground, but especially to the ATM of Boston clubhouse grounds. Several of our members have contracted Lyme disease as a result of tick bites during observing sessions there.

At the April meeting, we elected a team of 3 ATM of Boston members (Bruce Berger [chair], James Synge, and Peter Bealo) to the Nominating Committee. The Nominating Committee is currently preparing a full slate of Board members to be voted on at the June meeting. There will be vacancies in the offices of President, Vice President, and Secretary. If you're interested in running for one of these positions, please contact Bruce, James, or Peter.

Clear Skies,

~ Glenn Chaple - President ~

April Meeting Minutes . . .



Dr. Mark Reid *

Summary of the ATMoB meeting held April 12, 2018 at the Harvard-Smithsonian Center for Astrophysics in the Phillips Auditorium. President Glenn Chaple called the meeting to order at 8:00 pm.

Phil Levine read the Secretary's Report.

Eileen Myers presented the Treasurer's Report.

Chris Elledge presented the Membership Report.

The Observing Committee Report was given by Glenn Chaple, Rich Nugent, and John Sheff.

The Clubhouse Committee Report was given by John Reed.

Glenn Chaple and Rich Nugent gave the Mirror & Telescope Making Committee Report.

Rich Nugent and Tom McDonagh presented the Outreach Committee Report.

Voting was conducted for the Nominating Committee, as there are open officer positions for Club President, Vice-President, and Secretary. Bruce Berger, Peter Bealo, and James Syngé were chosen for the nominating committee.

- Announcements:

Glenn Chaple updated the membership about Astronomy Day to be held on April 21 at M.I.T. Haystack Observatory in Westford, MA. Glenn gave a talk entitled: "Getting Started in Backyard Astronomy". Public viewing of the night sky followed.

John Sheff informed the membership about the Cambridge Science Festival being held on April 12-22, with many varied daytime and night events scheduled at the Harvard CfA on Sunday, April 22.

Aaron Sliski mentioned that an SG-4 auto-guider was donated to ATMoB from the Smithsonian.

Kelly Beatty informed the membership about a planned *Sky and Telescope* 2019 total solar eclipse trip. Kelly also made an announcement he will be "semi-retiring" from *Sky and Telescope* after 43 years.

Glenn Chaple discussed "Astronomy on Tap (AoT)", organized by M.I.T. post doctorate candidates, which holds periodic astronomy events in the Boston area. AoT will also be taking part in the Cambridge Science Festival events in April. Check out their website for details: www.astronomyontap.org

Bruce Berger informed the membership about "Acadia Night Sky Festival" will be held September 5-9 in Bar Harbor, Maine. www.acadianightskyfestival.com

Bruce Berger and Kelly Beatty mentioned that the Maine Star Party will be held on August 11-17, in Washington, Maine. www.medomakretreatcenter.com

Mario Motta updated the membership regarding the "Dark Sky" bill in the Massachusetts legislature. He indicating there has been some positive movement in various committees. Mario updated the membership about an LED lighting conference which was held in California, where he debated 3K versus 4K LED with the head of the I.E.S. (Illuminating Engineering Society). He debated the issues and reports that he received much favorable feedback from the conference attendees regarding 3K versus 4K LED lighting.

Glenn Chaple informed the membership about a video produced by BU student Meredith Rumore regarding ATMoB. Meredith attended the March ATMoB meeting and interviewed various club members for materials she used for the video.

- Old Business: none

- New Business: none

Glenn Chaple introduced the guest speaker for the evening, Dr. Mark Reid. His talk was entitled "Mapping the Milky Way".

Dr. Reid's presentation detailed various trigonometric parallax methods used to measure distances to celestial objects throughout history. He outlined different processes by various astronomers that improved the distance estimates.

- Hipparchus in 189 BC attempted to measure the distance to the Moon utilizing trigonometric parallax during a lunar eclipse.

- Robert Hooke (circa 1669) recognized that atmospheric refraction presented accuracy problems when attempting to measure stellar distances via parallax. Hooke attempted to circumvent atmospheric refraction error by constructing a stationary vertical telescope. Unfortunately his results were inconclusive.

- James Bradley (1750) attempted to recreate Hooke's experiment by making rudimentary parallax measurements to gamma Draconis.

Joseph Fraunhofer (1787-1826) was an accomplished optician and the best telescope maker of his time.

- Friedrich von Struve (1836) utilized a 9.5-inch Fraunhofer refractor telescope with a micrometer eyepiece, to make a parallax measurement to Vega.
- Friedrich Bessel (1838), also using a Fraunhofer telescope, determined a parallax measurement to 61 Cygni.

Dr. Reid fast forwarded to modern satellite telescopes. The Hipparcos satellite made 118,000 parallax measurements within 100 parsecs of the solar neighborhood with an accuracy of 10 percent. A more recent telescope, Gaia, will measure parallax of 1 billion stars with an accuracy of ~ 20 micro arc seconds.

Radio Astronomy, using Very Long Baseline Array (VLBA) radio telescopes, is able to circumvent dust cloud obstruction and can be used to determine distances beyond the capability of traditional optical telescopes. The VLBA utilizes quasars (quasi-stellar radio sources) and masers (microwave laser-like) emissions as background reference objects to determine stellar parallax. The VLBA angular resolution to objects in the Milky Way has accuracy to within .001 arc seconds. By contrast, angular resolution of the human eye is ~ 40 arc seconds, and the Hubble Space Telescope resolution is ~ .05 arc seconds.

Dr. Reid reviewed the controversy surrounding distance measurement to the Pleiades star cluster. The distance estimate to the Pleiades by the Hipparcos satellite team was ~ 120 parsecs. Ground based telescopes estimated the distance as ~ 131-135 parsecs and the Hubble Space Telescope estimated the distance to be ~ 134 parsecs. The VLBA estimate was ~ 136 parsecs, which seems to question the results of the Hipparcos team. VLBA distance measurement to the Orion Nebula cluster is ~ 414 parsecs.

Dr. Reid is one of the principle investigators of the BeSSeL Survey (The Bar and Spiral Structure Legacy Survey), which utilizes the VLBA to map and formulate a more accurate picture of the Milky Way. Dr. Reid discussed data from current research indicating distance to the center of the galaxy to be ~ 8.34 kpc. Data from the VLBA gave an enhanced portrayal of spiral arm structure in the Milky Way and strong evidence of a central bar at the center. Data analysis also provided an estimate of 240 km/s for the rotational speed of the Milky Way. The size and rotational speed of the Milky Way is estimated to be similar to that of the Andromeda Galaxy. <http://bessel.vlbi-astrometry.org/>

Refreshments for the evening were provided by Eileen Myers.

Glenn Chaple adjourned the meeting at 9:45 pm.

~ *Phil Levine - Secretary* ~

Meeting Recordings . . .

The recording of ATMoB meeting #908 is available on YouTube: https://youtu.be/pESULgaf_wc

I would like to thank Mark Reid for allowing us to record his presentation "Mapping the Milky Way".

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 <http://www.atmob.org>

~ *Chris Elledge - Membership Secretary* ~

Membership Report . . .

I am pleased to welcome our newest members; Crystal Ainge, Alison Dolbear, Pierre Fleurant, Robert Reeve, and John Tuttle.

As of April 23rd, 2018 we have 321 memberships covering 395 members. This is broken down as follows:

- 168 Regular Members
- 102 Senior Members
- 9 Student Members
- 38 Family Memberships covering 112 Members
- 4 Guest Members

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

~ *Chris Elledge - Membership Secretary* ~

Clubhouse Report . . .



Dave Prowten installing the new MoonLite focuser. *

April 2018 Clubhouse Report

April 28th started with mostly cloudy skies and some fog after last night's rain. However, by 9:30 am Eric Johansson opened the Clubhouse for the April work session under partly cloudy conditions and 58 degrees. The warm-up has started! Maybe Spring is finally here. Shortly after, 28 members had arrived to make this a successful work party.

Thanks to the following members: Maria Batista, John Blomquist, Glenn Chaple, Paul Cicchetti, Steve Clougherty, Tom Consi, Skip Gaede, Destin Heilman, Eric Johansson, Dick Koolish, Bernie Kosicki, Raquel Lopez, John Maher, Mike Mattei, Tom McDonagh, Vladislav Mlch, Eileen Myers, Rich Nugent, Dave Prowten, John Reed, Phil Rounseville, Laura Sailor, John Stodieck, Art Swedlow, Al Takeda, Bill Toomey, J.P. Tuttle, and Joe Wolfe. If your name is missing please remember to sign the log book on your next visit.

Early in the day a group of members cut dead and storm damaged branches from trees, and removed debris from the lower field to prepare for summer mowing.

A crew of six to seven members helped wheelbarrow gravel to the driveway around the Clubhouse to fill in potholes and low spots from the extensive plowing that took place this winter. Several hours of work were required for this job. Volunteers also raked gravel from the grassy areas adjacent to the driveway and graded the lawn where necessary.

The snow fence was removed and the metal stakes were stored in the upper floor of the barn.

Dave Prowten fabricated a wooden box to accommodate our new Moonlite focuser which he installed on the 25-inch Dobsonian. The upper cage assembly and mirror box were lightly sanded and varnished. The telescope was aligned and is now ready for use. Measurements were taken for a new shroud which will be ordered this month. This work completes the refurbishment of the 25-inch. Training for using this telescope will be available at future work parties.

Lunch was served at 2 pm by our intrepid kitchen crew. The menu featured grilled hot dogs and burgers, a special chicken over rice dish (thanks to Eileen!), salad, baked beans, chili, fried chicken, bread/rolls, garlic bread, and special cheese stuffed baked pastries with ham, and chicken, with a special cheese topping (thanks to Raquel!). Fresh fruit and little tasty Chocolate confections, donuts and cheese coffee cake were also consumed. A big thanks to the clean up crew as outside activities resumed.

John Maher conducted refresher training on the operation of the Clamshell Observatory and 10-inch Meade SCT. He also gave a tour of the Clubhouse facilities to a group of visitors and new members.

Bernie Kosicki, Tom McDonagh, Maria Batista and Steve Clougherty compiled an inventory of surplus telescopes which will be offered to the membership for sale/auction. Please see the article by Bernie in this newsletter describing the equipment currently available.

Al Takeda built an off-axis white light solar filter holder for Raquel Lopez's 8-inch Dobsonian telescope.



Raquel Lopez with her new solar filter. *

As twilight faded the skies were partly cloudy as the nearly full Moon rose behind mid and high cumulus clouds. Many telescopes were set up allowing views of the Moon and Jupiter. Other members were testing various cameras and astronomical instruments on their scopes.

The next work session at the Clubhouse will be held on Saturday, May 26th.

Important Notice: Mirror making sessions will now take place on **Saturday afternoon's beginning at 1:00 pm. Other times may be scheduled. Check your email on the ATMoB-ANNOUNCE list.**

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

Clubhouse Saturday Schedule		
May 5	Nina Craven	Al Takeda
May 12	Steve Clougherty	Jim Gettys
May 19	Paul Courtemanche	Eric Johansson
May 26	WORK PARTY # 6 ** Karl Dean	
June 2	Tom McDonagh	John Stodieck
June 9	Dave Prowten	Eileen Myers
June 16	Paul Cicchetti	John Reed
June 23	Phil Rounseville	Joe Wolfe
June 30	WORK PARTY # 7 ** Sai Vallabha	

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

Clubhouse Evening Schedule

Friday Night Educational Videos	7:00 pm - 10:30 pm #
Saturday Afternoon Mirror Making	1:00 pm - ##
Saturday Night Observing	7:00 pm - ##

Closing time is determined by the organizers
Closing time is determined by the "A" members on duty.

Saturday afternoon mirror making schedules will be posted to the ATMOB-ANNOUNCE email.

Note: The Clubhouse is closed on the 2nd Thursday of the month for our monthly meeting in Cambridge.

Due to inclement weather conditions on Saturday evenings, the "A" members on duty may elect to close the Clubhouse. Please call the Clubhouse at (978) 692-8708 or check for email messages posted to ATMOB-ANNOUNCE.

Sky Object of the Month . . .

May 2018

Courtesy LVAS Observer's Challenge***

NGC4236 – Barred Spiral Galaxy in Draco

Mag. 9.7; Size 22' X 7'

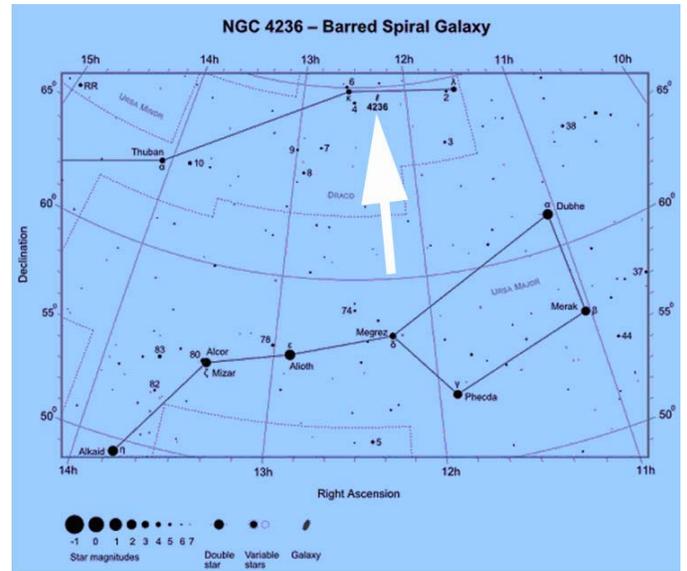


NGC4236. nightskypictures.com

A galaxy with a magnitude of 9.7 should be an easy telescopic target, right? Wrong! Not if the light of said galaxy is spread across an area 21 by 7.5 minutes of arc in size. This is the situation with the barred spiral NGC 4236 in Draco. Testimony to its faintness comes from none other than William Herschel, who discovered it in 1793. He catalogued it as H.V.51 – his 51st Class V (Faint Nebulae) entry.

Nevertheless, NGC 4236 is notable enough to have made it into Patrick Moore's Caldwell Catalog (it's designated as Caldwell 3). Under a truly dark sky, it may be glimpsed with a 4-inch scope. If, however, your observing location is beset with even a mild amount of light pollution, NGC 4236 will challenge a 10-inch instrument.

To locate NGC 4236, look 1 ½ degrees west-southwest of the 4th magnitude star kappa (κ) Draconis. Because of the galaxy's relatively large dimensions and low surface brightness, work with moderately low power. Be sure your eyes are well dark-adapted and use averted vision if nothing is visible with a direct view.



freestarcharts.com

***The purpose of the LVAS Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested, and if you are able to contribute notes, drawings, or photographs, the LVAS will be happy to include them in their monthly summary. If you would like to contribute material, submit your observing notes, sketches, and/or images to either [Roger Ivester \(rogerivester@me.com\)](mailto:Roger_Ivester@me.com) or [Fred Rayworth \(fred@fredrayworth.com\)](mailto:fred@fredrayworth.com). To find out more, click on the following links: [LVAS Observer's Challenge past reports](#) and/or visit the [Las Vegas Astronomical Society website](#).

~ Glenn Chaple for the LVASS ~

Surplus Telescopes Offered to Members . . .

The Clubhouse Committee has decided that a number of telescopes in our inventory are surplus and will be offered for sale. The current ones are as follows.

Binocular telescope. This is an interesting instrument with dual parallel 4-inch Newtonian optical tube assemblies, which are arranged with dual eyepieces set up so that the user, positioned between the two apertures, can see into both at the same time. The mount is ALT-AZ and is fairly rugged and well built, but bulky enough so that it is not a good grab-and-go scope. This is not a good choice as a first telescope but would be of interest to enthusiasts who want to experiment with a moderately large diameter binocular. We will offer the complete binocular telescope as is, (that is, we will not be selling each of the OTA's separately). Diagonals included but eyepieces not. But see the note on eyepieces at the end of this article.



Binocular Telescope *

6-inch mirror mounted in a cell in a cardboard tube (no focuser or diagonal). This should appeal to those who always wanted to try out telescope making. Here is the core of your telescope; make a Dobsonian (or other type of mount), construct a diagonal assembly and add a focuser (or make a helical one) and you're in business!

Celestron 14-inch Schmidt-Cassegrain- C-14-f/11. This large 14-inch OTA (optical tube assembly) was previously used in the club's roll-off observatory. Mirror coatings are in good shape, and there was extensive work done to the focuser assembly to stabilize it. This scope is heavy (about 40+ pounds) and is meant to be permanently mounted in an observatory with a large mount, very similar in scale to the ATMoB Research and Imaging Observatory (ARIO) which has a newer C-14. The sale includes a storage trunk.



Celestron C-14 SCT

Department store scopes (most with 0.96" eyepieces). These refractor scopes use smaller diameter eyepieces and diagonals, which are harder to use than the standard 1 1/4" optics. But they have decent objective lenses (about 60 mm) and do work. One of these might be just the thing to get your feet wet with if you currently don't have a telescope, or maybe you know a budding young astronomer who actually wants to look at astronomy

objects vs. downloading pictures from the internet. We will offer these for free (but will gladly accept any donation that the recipient wants to offer the club). No more than one telescope per member. Look for an announcement in the near future inviting interested members to register for a lottery.



Meade 10-inch Schmidt-Cassegrain, f/10, including a tripod and hard plastic storage case. The electronics of this mid-80's-era scope is not repairable; offered as-is for use as manual visual telescope (or the new owner might consider buying new fork/electronics assembly from Meade, possibly finding third-party components, or even replacing the fork mount with a German Equatorial mount). The mirror is in good condition. It is technically "portable", but not very convenient to move around to different locations. Here is an opportunity to get the optical tube, mount and tripod (but not electronics) of a telescope that currently sells for about \$2000. We plan to offer this telescope for member auction in the very near future (or it already may be offered by the time this article is published).

Orion 90 mm refractor includes ALT-AZ manual tripod with slow motion controls and bag. No eyepiece or diagonal or finder (but see below). The cost of new scope is \$259 including diagonal, eyepieces and finder, but no bag. This would make a fine first scope if you don't have one yet- easily portable yet with a large enough diameter to see some fairly dim objects. We plan to offer this in the near future for auction (or it already may be offered by the time this article is published).

All of these telescopes are available to be viewed by interested members. Please contact Steve Clougherty stvclougherty@gmail.com or Bernie Kosicki kosicki@verizon.net to arrange an inspection. The club also invites interested parties to make an offer on these telescopes even before they are announced for auction. Again, contact Steve or Bernie if you are interested.

In addition to surplus telescopes, the club also has a collection of surplus eyepieces and diagonals that will be offered at attractive prices to members in the near future. Look for an announcement in future *Starfields* and on the email Announce list.

~ Submitted by Bernie Kosicki ~

April Outreach Report . . .

Bob Toop and John Stodieck have been helping out with an astronomy class being offered at the Groton Community Center. On April 2nd I presented my "Observing Satellites" talk there, and later that week Bob and John hosted the students at an observing session at the Clubhouse.

A Popscope event was held at the Boston Children's Museum on April 6th.

Kelly Beatty hosted a screening of *The City Dark* at the Chelmsford Library on April 18th. Bruce Berger and other members of ATMob set up scopes for the attendees.

While many of us were attending NEAF (Northeast Astronomical Forum) on Astronomy Day (April 21), Glenn Chapel gave his presentation, "Getting Started in Backyard Astronomy" to about 50 attendees at an open house at the M.I.T. Haystack Observatory in Westford, MA. Afterwards they got to look through binoculars and telescopes set up by about a half-dozen club members. Some folks interested in the ATMob stopped by the Clubhouse on their way home. Thanks to Maria Batista, Glenn Chaple, Corey Mooney, Bob Toop and Brian Zemba for participating.

The following evening, John Sheff held an observing session at the Center for Astrophysics as part of this year's Cambridge Science Festival. Many thanks to Julie Kaufmann, Phil Levine, Corey Mooney, John Sheff and Dan Winchell for helping out.



Corey Mooney at the CFA, Cambridge Science Festival. Image by Phil Levine.

At NEAF, Kelly Beatty and I had a long discussion about some exciting future outreach activities the club might be interested in pursuing — stay tuned!

As always, outreach activities require volunteers. Please consider helping out.

If you've never helped out at a star party you should consider giving it a try! We are always looking for volunteers - novices to experts - to help out! Get in touch with me or any of our three star party coordinators: Bernie Kosicki, Laura Sailor, and John Harrington or send an email to starparty@atmob.org. Outreach is

fun and rewarding and can inspire kids of all ages to look up and marvel at the universe around us.

~ Outreach Committee Chair: Rich Nugent ~

Jupiter at Opposition . . .

Wednesday, May 8, 2018

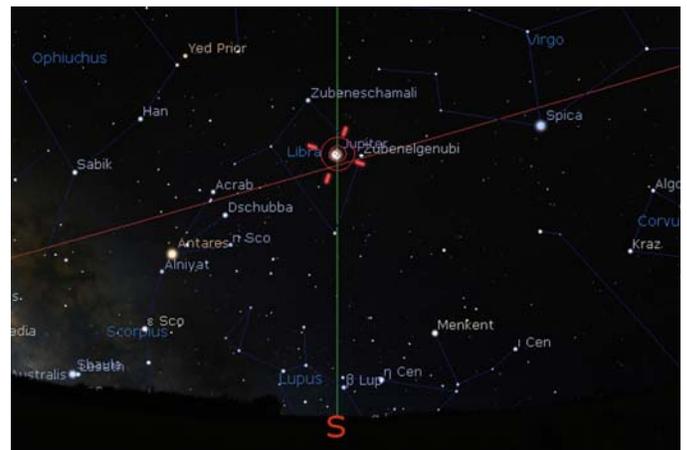
This month Jupiter will be directly opposite of the Sun in the constellation of Libra (the scales). The planet will be visible for most of the night reaching its highest point of 31 degrees in altitude around local midnight.

Jupiter will shine brightly at magnitude - 2.5 and will have an equatorial diameter of 43.8 arcseconds.

Look for the planet 4 degrees east of the 3rd magnitude star Zubenelgenubi.

A pair of binoculars will allow an observer to see its four brightest moons - Io, Europa, Ganyamede and Callisto. A small telescope will reveal the planet's dark equatorial belts and its brighter zones.

Observe Jupiter when it has climbed to 30 degrees above the horizon to prevent atmospheric distortion.



Jupiter at Opposition. Stellarium.

~ Al Takeda -Member at Large and Newsletter Editor ~

Editor: * Photos by Al Takeda unless otherwise noted.

**May Star Fields DEADLINE
Sunday, May 20th**

**Email articles to Al Takeda at
newsletter@atmob.org**

Articles from members are always welcome.

POSTMASTER NOTE: First Class Postage Mailed May 6, 2018

Amateur Telescope Makers of Boston, Inc.
c/o Chris Elledge, Membership Secretary
99 College Ave
Arlington, MA 02474
FIRST CLASS5

EXECUTIVE BOARD 2017-2018

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Steve Clougherty (781) 784-3024
David Prowten (978) 369-1596

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NEWSLETTER Al Takeda newsletter@atmob.org

PUBLIC OUTREACH

COMMITTEE CHAIR: Rich Nugent starparty@atmob.org
STAR PARTIES: Bernie Kosicki
Laura Sailor
John Harrington

How to Find Us...

Web Page 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 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.

May 7 Last Quarter Moon (Moonrise at midnight)
May 8 Jupiter at opposition
May 15 New Moon
May 21 First Quarter Moon (Moonset at midnight), Lyrid Meteors peak
May 29 Full Moon
May 31 Saturn 1.6 degrees south of Moon
Jun 6 Last Quarter Moon (Moonrise at midnight)
Jun 15 New Moon