



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. 29, No. 6 June 2017

This Month's Meeting . . .

Thursday, June 8th, 2017 at 8:00 PM

Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

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

The Lowell Observatory: Past, Present, and Future



Alvan Clark & Sons 24-inch Refractor at the Lowell Observatory.
Image credit: Lowell Observatory

Lowell Observatory in Flagstaff, Arizona, founded in 1894 by American astronomer Percival Lowell, is one of the oldest observatories in the United States. It was here in 1930 that astronomer Clyde Tombaugh discovered the dwarf planet Pluto.

W. Lowell Putnam, great-grandnephew of Percival Lowell, will talk about the history of the Observatory and the current range of fields studied (extensive). His presentation will include an interview with a Lowell Observatory researcher who gives her answer to "Why be an Astronomer?" and talks of her specialty (Irregular Dwarf Galaxies). Our speaker will discuss planetary studies and show videos of Mars and Pluto flyovers. Putnam will conclude with a discussion of current research that is just underway in the area of exo-planets.

W. Lowell Putnam is serving as the 5th Sole Trustee of Lowell Observatory, having succeeded his father, Bill, in 2013. Putnam also serves as one of seven members of the Board of Trustees of the [Lowell Observatory Foundation](#).

In 1984, Putnam founded Video Communications, Inc. (VCI), a software company specializing in business systems for TV networks, cable channels and local TV Stations. Clients included The Weather Channel, Comcast, Univision and about 25% of the TV stations in the US and Canada. In 2010, Putnam sold the company and became the Trust Administrator for the observatory. He is currently director of PeopleHedge, which is a Boston-based firm dealing in currency exchange.

Putnam holds a B.S. in Psychology from American International College in Massachusetts and is a Life Member of the American Alpine Club and The Nature Conservancy.

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

President's Message . . .

The other night I was flipping through the pages of the August, 1963, issue of *Sky and Telescope*. I once owned every copy of the magazine, dating back to issue #1 in November, 1941. When I picked up the CD set of *Sky and Telescope*, I sold or gave away my entire collection, save one: August, 1963. That was the month and year when a high school friend took me outside to his backyard and gave me a tour of the night sky with his Gilbert 80X reflecting telescope. I've been hooked on astronomy ever since and kept that issue as a memento.

What first caught my attention in this particular issue were the ads. Cave Optical Company was offering a basic 6-inch Astrola for \$194.50. Their competitor, Criterion Manufacturing Company, sold a similar scope - the 6-inch RV-6 Dynascope - for \$194.95. For \$195 Edmund Scientific Company sold yet another 6-incher, plus Orthoscopic eyepieces for \$14.50 each. Telescope makers could purchase a 6-inch mirror-grinding kit for \$11.95. A 10-inch kit ran \$30.75. A. Jaegers put out a 2-page ad, promising a fully mounted and coated 6-inch f/15 refracting telescope objective for \$175. How about a 6mm Orthoscopic eyepiece for \$13.25, a 16mm wide-field Erfle for \$12.50, a 22mm Kellner for \$6.00, or a 32mm Plossl for \$12.50? A. Jaegers had them! Through Herbert A. Luft you could order all three volumes of *Amateur Telescope Making* for a total of \$18.00. *Norton's Star Atlas* cost \$5.25. Oh, for a time machine!

An article titled "Manned Exploration of Mars?" began with the following:

Can we send a man to Mars and return him safely to Earth? When can we expect to do it? Eight hundred engineers and scientists met in Denver, Colorado, on June 6th and 7th (1963) to discuss these questions and heard the answer, "Yes, in the 1970's."

The article "Color in Astrophotography" by George Keene, beginning on page 74, ironically appeared in black and white – *Sky and Telescope* had yet to be printed in color. Bad news for *S&T* subscribers. The cost of a one-year subscription was about to increase to (gasp!) \$6.00.

ATMoB old-timers often look to the decade following the October, 1957 launch of Sputnik I and the interest in outer space that ensued as the "Golden Age of Amateur Astronomy." They were definitely exciting times, but the present could hardly be described as the "Dark Ages of Amateur Astronomy." Thanks to the Dobsonian revolution, I'm able to sky gaze with a 10-inch reflecting telescope that cost me \$550 (a fully-loaded equatorial-mounted 10-inch Cave Astrola went for \$750 back in 1963). In minutes, I'm able to obtain a nice image of the moon, using a smartphone placed at the eyepiece of a 4.5-inch reflector (couldn't do that in '63). I can download and print for FREE a mag 7 star atlas right off the internet. And *Sky and Telescope* is now in color.

Clear Skies,

~ *Glenn Chaple – President* ~

Annual Meeting Announcement

THE ANNUAL MEETING of the Amateur Telescope Makers of Boston, Inc. will be June 8, 2017. The election of the 2017-2018 Executive Board will take place at the meeting.

May Meeting Minutes . . .



Kelly Beatty *

Minutes of the monthly meeting held on May 11, 2017, in the Phillips Auditorium at the Harvard Smithsonian Center for Astrophysics. 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.

- Glenn Chaple presented the Observing Report. During the months of May and June there will be a number of double Galilean Moon transits casting shadows on Jupiter. <http://assne.org/2017/04/22/double-moon-transits-of-jupiter-for-may-june-2017/>
<https://www.cfa.harvard.edu/skyreport>

On the morning of June 3rd, Venus will be at greatest Western elongation.

The Sue French Object of Month is NGC 4261, an elliptical galaxy in Virgo.

The Las Vegas Observer's Challenge is M98, a spiral galaxy in Coma Berenices.

The ATMoB pick of the month, suggested by Glenn Chaple, is the Great Red Spot on Jupiter (Mario Motta reports that it is now a very prominent cherry red). Glenn also suggested Melotte 111, an open cluster in Coma Berenices.

The Clubhouse Report was given by Steve Clougherty.

- Announcements:

In appreciation for their help, John Sheff thanked the ATMoB members who volunteered for the Cambridge Science Festival Sidewalk Astronomy event.

Glenn announced that the MIT Haystack Observatory in Westford, MA will be having an Open House on Monday, May 22 at 6:30 pm. Members were encouraged to bring telescopes. An Announce message will be sent with more details.

Glenn announced that there will be an ATMoB Board Meeting on May 25th at 7:00 pm at the Westford Clubhouse. Members wishing to bring up matters for the Board's consideration should contact [Glenn Chaple](#).

- Old Business:

Bruce Berger gave an update on Project CATE (Continental American Telescope Eclipse). ATMoB is providing equipment training to Project CATE members, who will be using this equipment to gather solar data during the August 2017 total Solar eclipse. Arianna Roberts is the lead person for Project CATE in the Boston area. She recently received training in Illinois. ATMoB members Bruce Berger and Tom McDonagh will be providing more training locally at the Westford Clubhouse. More than half of the needed funding has been obtained. Bruce mentioned many ATMoB members have made contributions. A collection for CATE was taken during the meeting, adding an additional \$329.

Glenn conducted a vote to see if we should have a July meeting. The result was favorable. It was noted that July will be the 900th ATMoB meeting.

James Synge gave an update on Project Panoptes. He is fabricating a waterproof casing and mount for a DSLR camera

to be used to find transiting exoplanets. James has been utilizing the machine shop facilities at the Westford Clubhouse after receiving training provided by John Blomquist.

Glenn asked the membership if anyone would like to assist with the fabrication of three telescope replicas. Jim and Rhoda Morris gave a presentation at the April ATMoB meeting, announcing that they will be replicating 3 types of telescopes - Newtonian, Galilean, and Herschel - to be exhibited in China at the world's largest planetarium, now under construction.
http://shanghaiist.com/2016/11/10/shanghai_planetarium_biggest.php

Glenn Chaple and Haldun Menali gave the membership an update on the Astroscan telescope and eyepieces donated to a school in Turkey. ATMoB member Juan Jimenez (who lives in Germany) donated the Astroscan and shipped the scope and eyepieces to Turkey. The ATMoB membership took up a collection to reimburse Juan for the shipping costs. A letter was read from the guidance counselor at the school, expressing appreciation to ATMoB for the donated equipment.

- **New Business:**

Glenn encouraged the membership to post a “selfie” photo of themselves to the ATMoB member directory listing. Currently only a few members have done so. Chris Elledge indicated that members could email him for assistance in posting their photo.

James Synge, chair of the Board Nominating Committee, gave an update on the Board member election process. Glenn Chaple indicated any interested member can run for a Board position by obtaining the signatures of 7 club members, and then notify the Club Secretary in writing 10 days before the June meeting. Secretary Phil Levine confirmed he would let the nominating committee know if any members want to throw their hat into the ring.

Bruce Berger reviewed the offer from the MIT Wallace Observatory of a 16-inch f/11 telescope and mount (circa 1971). Bruce and Steve Clougherty summarized the issues ATMoB would face to obtain permits, move, repair, and house this telescope. The consensus seems to indicate that ATMoB will pass on the offer. Members who are in favor should contact the Board.

Steve Clougherty mentioned the possibility of purchasing a 25-inch telescope currently on loan to the club. This will be a topic to be discussed at the upcoming Board Meeting.

[#popscope](#) (an urban astronomy outreach group) coordinator Michael O’Shea announced that #popscope recently received a \$1000 donation to help support their organization.

Kelly Beatty informed the membership about the upcoming International Dark Sky Association annual meeting, which will be held on November 10-12, 2017 in Boston.
www.darksky.org/reclaimingthenight/

Ken Launie made a presentation regarding an exhibit at the Harvard Museums of Science and Culture. Admission is free on Sunday from 11-4. Ken mentioned that a number of

historically significant memorabilia will be on display. Annie Jump Cannon’s notebooks, one of the glass photographic plates of Cepheid stars used by Henrietta Leavitt to discover the period-luminosity law, and the Bruce 24-inch astrograph, are some of the items on display.

<http://news.harvard.edu/gazette/story/2017/04/harvard-museums-of-science-cultures-scale-tells-the-story-of-how-and-what-we-measure/>

Glenn Chaple introduced the guest speaker for the evening, Kelly Beatty, senior editor at *Sky and Telescope Magazine*. Kelly’s talk was entitled “Adventures in Chile: 24/7 Astronomy”. Kelly and his visiting group started their trip in Santiago, site of the National Observatory in Chile and the University of Chile. Due to the availability of telescope time, many astronomy students attend the University of Chile for their graduate degree. While at the National Observatory, the group visited a number of facilities including a 12-inch refractor (1933), a 13-inch double refractor (1894), and an 18-inch Cassegrain reflector (2002), now used for public outreach. Because of light pollution in the city of Santiago, most of the scientific research facilities are located well outside the city.

Kelly and his group visited La Serena, Vicuna, and La Silla, north of Santiago, location of the European Southern Observatory, which is the largest professional astronomical organization in the world. La Silla is also the home to the Trappist Dome. The telescope housed here was instrumental in discovering seven planets orbiting an M star. Known as the Trappist-1 system, it contains several earth size planets in the “habitable zone”. Kelly indicated that M type star systems seem to contain more earth sized planets, even more so than “solar type” stars. His visiting group visited a facility where a 3.6-meter telescope is housed, which can attain 0.2 arc second image quality when pointing at zenith. Also visited was the 3.6-meter New Technology Telescope, which pioneered the use of adaptive optics. <http://www.eso.org/public/usa/teles-instr/lasilla/ntt/>

Other facilities visited included a facility housing a 4-meter reflector at CTIO, an old 1.5-meter reflector at Cerro Tololo, the 8.2-meter Gemini Telescope, and a scope currently under construction: the 8-meter Large Synoptic Survey Telescope (LSST). The ALMA antenna array is located in San Pedro on the Chajnantor plateau at an altitude of 5000 meters. There are sixty-six 7-meter and 12-meter dish antennas at this facility.
<http://www.eso.org/public/usa/teles-instr/alma/>

Kelly’s group visited a number of “tourist observatories” in the area of La Serena, and indicated that astronomy tourism is a significant component of the local economy. The path of totality for the 2019 total solar eclipse will pass through this area in Chile. Kelly mentioned arranging for this trip may be problematic due to infrastructure issues, but indicated *Sky and Telescope* will likely sponsor a trip.

Refreshments for the evening were provided by Al Takeda.

Glenn Chaple adjourned the meeting at 9:50 pm.

~ *Phil Levine - Secretary* ~

Board Meeting Summary . . .

May 25, 2017

In Attendance:

President Glenn Chaple, Vice-President Tom McDonough, Treasurer Eileen Myers, Membership Secretary Chris Elledge, Club Secretary Phil Levine, Members-at-Large Al Takeda, Bruce Tinkler, Maria Batista, Past President Bernie Kosicki, Clubhouse Committee Directors Steve Clougherty and Dave Prowten, Observing Committee Chair Bruce Berger. ATMob members Jim Gettys and Clamshell Observatory Manager John Maher.

Agenda:

- ARIO update by Jim Gettys: Improvements and repairs made, possible need for recollimation, new dome power supply and a battery backup for the router.
- Monthly meeting intro by the club President. The intro to be left to the discretion of the President.
- Offer from MIT Wallace Observatory of their 16-inch telescope. The Board decided to pass on the offer due to housing, permit and repair issues.
- Purchase of Steve Mock's 25-inch Starsplitter II telescope: The Board voted to add \$6K to the budget over a 2-year budget cycle for a possible purchase.
- Refreshment Schedule for 2017-2018 was finalized.
- Budget for 2017-2018: The Board voted to approve the budget.
- Additional topics: The President set up a 3 member committee to review the Clubhouse two person rule. Membership Secretary Chris Elledge reminded the board that membership dues are up for renewal on June 1st, and are due by the end of August.

Meeting Recordings . . .

The recording of ATMob meeting #898 is available on YouTube: <https://youtu.be/piJFRgTwD4c>

I would like to thank Kelly Beatty for allowing us to record his presentation "Adventures in Chile: 24/7 Astronomy".

From now on, I will be providing the link to the publicly available cut of the meeting recordings in Star Fields. 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 ~

Nominations for 2017-2018 . . .

By popular vote at the April meeting, the 2017 Nominating Committee was selected. The results were: Chairperson: James Synge and members: Mike Hill and Eileen Myers.

The 2017 Nominating Committee has proposed a slate of nominations to be voted on at the Annual Meeting in June. The nominees are:

President: Glenn Chaple
Vice President: Tom McDonagh
Secretary: Phil Levine
Membership Secretary: Chris Elledge
Treasurer: Eileen Myers
Member at Large: Maria Batista
Member at Large: Al Takeda
Member at Large: Bruce Tinkler

~ 2017 Nominating Committee ~
James Synge (Chair)
Mike Hill
Eileen Myers

Per Articles IX of the ATMob Bylaws: "Members shall have the right to offer additional nominations from the floor of the annual meeting, provided only that a suitable written notice, containing the name or names of the person or persons to be nominated from the floor at the annual meeting, and the signatures of at least Seven members, is filed with the Secretary not less than ten (10) days prior to the date of the annual meeting."

Clubhouse Report . . .



Sergio Simunovic repairing the damaged Clamshell Observatory motor *

May 2017 Clubhouse Report

Our monthly work session at the ATMob Clubhouse was held on Saturday, May 13. There were approximately 20 volunteers who helped out with a number of projects.

During the early part of the month the grass had grown quite tall, so several volunteers manned the two power mowers which we own. After working in shifts, and after approximately 4 hours of continuous work, the entire property had been mowed. The only area neglected was the lower field past the 17-inch shed. Two volunteers also used the weed trimmer around the various buildings and structures. Many thanks go out to the crew who helped with this necessary task.

Other members helped finish the painting of the second floor hallway ceiling. A slow leak in the ceiling of the second floor library was discovered during the work session and it was traced to a possible problem with the chimney flashing. Further investigation will be done to identify the specific problem and make the necessary repairs. No damage has occurred as a result of this slow leak.

Work continued on the clamshell dome motorized winch which had stopped working earlier this month. A new switch was installed on the motor, yet the problem still persists. Sergio S. and John M. worked well into the evening to correct this problem. Unfortunately the clamshell observatory is still off-line as of Memorial Day weekend. An announcement will go out once the observatory is back on-line. *Editor: The Clamshell winch motor and wiring has been repaired and the observatory is back in operation.*

Bill Toomey brought his 8-inch Dob for cleaning and alignment.

Mirror grinding took place in the afternoon.

Many thanks to the lunch crew for all of their efforts during the work party.

The next work party will be held on Saturday, June 10.

We would like to thank the following volunteers for all of their efforts the month: Marsha Bowman, Paul Cicchetti, Steve Clougherty, Paul Courtemanche, Nina Craven, Chris Elledge, Skip Gaede, Eric Johannsen, John Maher, Mike Mattei, Eileen Myers, Dave Prowten, John Reed, Brian Rusch, Sergio Simunovic, John Stodieck, Art Swedlow, Al Takeda, Bill Toomey and Sai Vallabha.

Important Notice: Due to changing work schedules and commuting times for our optical experts, the Clubhouse **WILL NOT** be open on Thursday evenings. Mirror making sessions will now take place on **Saturday evenings beginning at 7:00 pm. Other times may be scheduled. Check your email on the ATMOB-ANNOUNCE list.** We hope that you will have patience with us as we transition to this new time period.

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

Clubhouse Saturday Schedule		
June 3	Tom McDonagh	Volunteer Needed
June 10	WORK PARTY # 6 John Reed & Sai Vallabha	
June 17	Dave Prowten	John Stodieck
June 24	Phil Rounseville	Joe Wolfe
July 1	Bruce Berger	Joe Henry
July 8	WORK PARTY # 7 George Paquin & John Small	
July 15	Glenn Meurer	Rich Nugent
July 22	CLUBHOUSE CLOSED STELLAFANE	
July 29	Brian Maerz	John Panaswich
August 5	WORK PARTY # 8 John Maher & Eileen Myers	

Clubhouse Evening Schedule	
Friday Night Educational Videos	7:00 pm - 10:30 pm #
Saturday Night Mirror Making	7:00 pm - ##
Saturday Night Observing	7:00 pm - ##
# Closing time is determined by the organizers	
## Closing time is determined by the "A" members on duty	
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 messages posted to ATMOB-ANNOUNCE.	

Membership Report . . .

I am pleased to welcome our newest members: the family Maneesh, Sidharth, and Shubh Dwivedi; Pat and Bob Hamilton; Mark Berdachowski; and returning former member Dan Smoody.

As of May 22, 2017 we have 336 memberships covering 410 members. This is broken down as follows:

- 190 Regular Members
- 96 Senior Members
- 7 Student Members
- 36 Family Membership covering 110 Members
- 7 Guest Members

June 1st is the beginning of our renewal period. This is our first time going through the renewal process with the Club Express website, so we appreciate your patience with any problems that we may discover. Members with an email address registered with the club should receive an email notifying them of their need to renew.

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

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

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

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

~ Chris Elledge – Membership Secretary ~

Sky Object of the Month . . .

June 2017

Courtesy LVAS Observer's Challenge***

NGC 6015 – Draco

Mag. 11.1; Size 5.4' X 2.3'

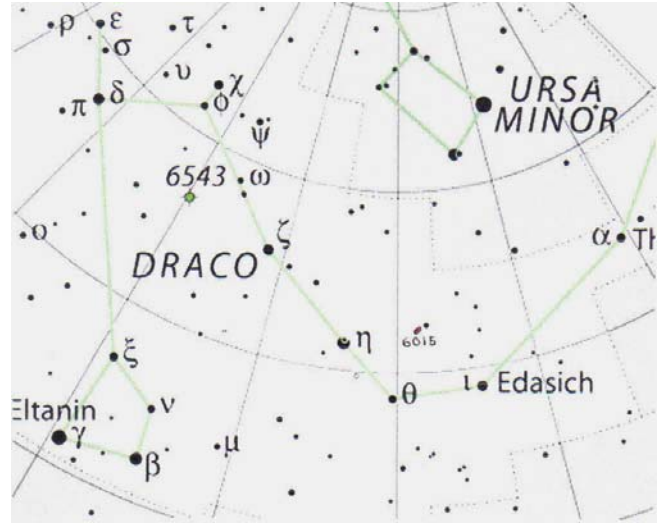


<http://www.astrophotos.net>

This month's LVAS Observer's Challenge, the spiral galaxy NGC 6015 in Draco, was discovered by William Herschel on the evening of June 2, 1788. Herschel catalogued each of his finds into eight categories. This one was designated H.III 739 - the 739th object in Herschel's Category III (Very faint nebulae).

And there's the challenge. What is the smallest scope that can capture this 11th magnitude galaxy, and how much detail can be picked up with large-aperture instruments? You'll find NGC 6015 by concentrating on an area about one-half degree ESE of a 5th magnitude star that forms a parallelogram with eta (η), theta (θ), and iota (ι) Draconis.

Estimates of the distance to NGC 6015 vary from 38 million to 50 million light years. If we accept a median distance, the galaxy is approximately ¾ the diameter of our Milky Way.



constellation-guide.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:RogerIvester@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 ~

Newsletter Corrections . . .

The meeting announcement for May 2017 should have been "Adventures in Chile: 24/7 Astronomy".

The title for last month's minutes should have been "April Meeting Minutes".

The Heads up for the Month notice should have read: "Eastern Daylight Time (EDT)".

Editor: * Photos by Al Takeda unless otherwise noted.

July Star Fields DEADLINE

Sunday, June 25th

Email articles to Al Takeda at

newsletter@atmob.org

Articles from members are always welcome.



How to View the 2017 Solar Eclipse Safely

A solar eclipse occurs when the Moon blocks any part of the Sun. On Monday, August 21, 2017, a solar eclipse will be visible (weather permitting) across all of North America. The whole continent will experience a partial eclipse lasting 2 to 3 hours. Halfway through the event, anyone within a 60- to 70-mile-wide path from Oregon to South Carolina (<http://bit.ly/1xuYxSu>) will experience a brief total eclipse, when the Moon completely blocks the Sun's bright face for up to 2 minutes 40 seconds, turning day into night and making visible the otherwise hidden solar corona — the Sun's outer atmosphere — one of nature's most awesome sights. Bright stars and planets will become visible as well.



Looking directly at the Sun is unsafe except during the brief total phase of a solar eclipse (“totality”), when the Moon entirely blocks the Sun's bright face, which will happen only within the narrow path of totality (<http://bit.ly/1xuYxSu>).



The only safe way to look directly at the uneclipsed or partially eclipsed Sun is through special-purpose solar filters, such as “eclipse glasses” (example shown at left) or hand-held solar viewers. Homemade filters or ordinary sunglasses, even very dark ones, are not safe for looking at the Sun. To date three manufacturers have certified that their eclipse glasses and hand-held solar viewers meet the ISO 12312-2 international standard for such products: Rainbow Symphony, American Paper Optics, and Thousand Oaks Optical.

- Always inspect your solar filter before use; if scratched or damaged, discard it. Read and follow any instructions printed on or packaged with the filter. Always supervise children using solar filters.
- Stand still and cover your eyes with your eclipse glasses or solar viewer before looking up at the bright Sun. After glancing at the Sun, turn away and remove your filter — do not remove it while looking at the Sun.
- Do not look at the uneclipsed or partially eclipsed Sun through an unfiltered camera, telescope, binoculars, or other optical device. Similarly, do not look at the Sun through a camera, a telescope, binoculars, or any other optical device while using your eclipse glasses or hand-held solar viewer — the concentrated solar rays will damage the filter and enter your eye(s), causing serious injury. Seek expert advice from an astronomer before using a solar filter with a camera, a telescope, binoculars, or any other optical device.
- If you are within the path of totality (<http://bit.ly/1xuYxSu>), remove your solar filter only when the Moon completely covers the Sun's bright face and it suddenly gets quite dark. Experience totality, then, as soon as the bright Sun begins to reappear, replace your solar viewer to glance at the remaining partial phases.



An alternative method for safe viewing of the partially eclipsed Sun is pinhole projection. For example, cross the outstretched, slightly open fingers of one hand over the outstretched, slightly open fingers of the other. With your back to the Sun, look at your hands' shadow on the ground. The little spaces between your fingers will project a grid of small images on the ground, showing the Sun as a crescent during the partial phases of the eclipse.

A solar eclipse is one of nature's grandest spectacles. By following these simple rules, you can safely enjoy the view and be rewarded with memories to last a lifetime. More information:

eclipse.aas.org

eclipse2017.nasa.gov

POSTMASTER NOTE: First Class Postage Mailed June 4, 2017

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

EXECUTIVE BOARD 2016-2017

PRESIDENT:	Glenn Chaple	(978) 597-8465
VICE PRES:	Tom McDonagh	(617) 966-5221
SECRETARY:	Phil Levine	(781) 956-6509
MEMBERSHIP:	Chris Elledge	(781) 325-3772
TREASURER:	Eileen Myers	(978) 456-3937
MEMBERS AT LARGE:	Bruce Tinkler	(781) 862-8040
	Al Takeda	(508) 494-7877
	Maria Batista	(617) 347-3730
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2012 - 14	Mike Hill	(508) 485-0230
2010 - 12	Bernie Kosicki	(978) 263-2812
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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	newsletter@atmob.org

PUBLIC OUTREACH

STAR PARTY COORDINATOR:
Virginia Renehan starparty@atmob.org

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.

Jun 9 Full Moon (Smallest in 2017)
Jun 15 Saturn at opposition
Jun 17 Last Quarter Moon (Moonrise at midnight)
Jun 19 Double shadow transit on Jupiter, 22:04 - 22:38 EDT
Jun 21 Summer Solstice
Jun 23 New Moon
Jun 30 First Quarter Moon (Moonset at midnight)
July 9 Full Moon
July 10 Pluto at opposition