



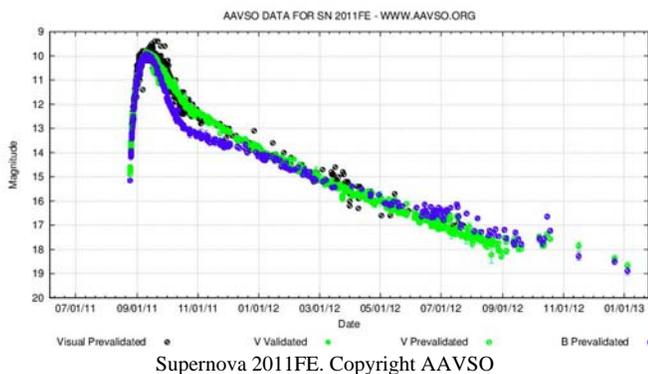
STAR FIELDS

Newsletter of the
Amateur Telescope Makers of Boston
Including the Bond Astronomical Club
Established in 1934
In the Interest of Telescope Making & Using

Vol. 25, No. 2 February 2013

This Month's Meeting...

Thursday, February 14th, 2010 at 8:00 PM
Phillips Auditorium
Harvard-Smithsonian Center for Astrophysics
Parking at the CfA is allowed for duration of meeting



Measuring the Unknown Universe

This month's talk is titled "Measuring the Unknown Universe" and our speaker will be Arne Henden, the director of the American Association of Variable Star Observers (AAVSO). As you all must know by now, the club has a newly outfitted C14 telescope and CCD camera available for the membership. This is perfect for taking images of those deep-sky objects you see on the Net. Did you know that those same deep-sky images are useful to the professional astronomer, or that with a little bit of thought, could be turned into a neat research or science fair project? You don't even have to use this high-end equipment; a simple DSLR on a tripod is adequate to monitor many exciting objects, as was done by the Citizen Sky team for the epsilon Aurigae eclipse that ended last year. This month's talk, which will focus primarily but not exclusively on making observations of variable stars, will cover how to use our new digital equipment, and also your very own DSLR cameras to expand your hobby and interests as well as how to use this to enter into the realm of citizen science and fruitful collaborations with astronomers around the world.

Please join us for a pre-meeting dinner discussion at [Changsho, 1712 Mass Ave, Cambridge, MA](#) at 6:00pm before the meeting.

President's Message...

Although I have been observing the nighttime skies for a long time, and have experienced most aspects of observing that amateurs tend to get involved with, from deep sky objects, to double stars and variable stars, comets and asteroids and all the other objects in our solar system, the most satisfaction I have gotten over the years has been observing variables. I have been observing long period variable stars since 1982. Yes, I know - that IS a long time ago. I don't even like to think about that, but it is a fact. I'm getting up there! Well never mind that. I still have lots of observing ahead of me, and variables will always be my passion. I could never be like some variable star observers that somehow manage to make thousands of measurements every year. My yearly counts were much more humble - in the range of fifty to a hundred. I never had the drive to measure as many as possible at any given time. I just got out there and made whatever observations I comfortably could make while preserving the enjoyment of my time out under the stars. Sometimes I would measure up to ten on any given evening, sometimes one or two but usually somewhere in between. Not a lot but it was, and still is, always relaxing to be out there and make those few observations. I spend time on each one, first finding the star with the star hop method using my favorite reference, *Norton's Star Atlas*, along with the AAVSO variable star atlas and individual finder charts which I have for each star measured. When I first started these charts had to be requested from the AAVSO and were received in the mail a few days later. Today's method, which involves simply going on-line and downloading any chart you want, is much more versatile and efficient. The staff at the AAVSO have worked hard and done such a great job to make the observing/reporting process so much more streamlined and therefore so much more fun, because along with the new download option, you can upload your observations and within minutes go back and see where they fit in the evolving light curve based on all observations in the AAVSO International Database. A good deal of this has come along quite recently, thanks in no small part to the current director of the AAVSO, Arne Henden.

Arne is a professional astronomer of some significant stature, having been involved with a great deal of design and construction of astronomical instrumentation and the observation of variable stars as well as being heavily committed to pro-am collaboration in the area of astronomical science. This month Arne is going to give our club a special talk on the possibilities of doing real science in the realm of variable stars and other objects. Arne will be focusing on what can be done with modern CCD technology as well as with the DSLR cameras most of us have. I'm an old timer, or at least getting nearer to that title by each passing year, so I will more than likely stick to my visual observations. I thoroughly enjoy that kind of observing. But for some of you, young or old just getting into this hobby, the possibilities of higher level observing are fascinating. Arne will tell us about some of these possibilities and focus a little bit on what can be done with our newest observatory, the ARIO

(ATMoB Research and Imaging Observatory) which is certainly well outfitted for some meaningful modern day science and program collaboration.

~ Mike Hill, President ~

January Meeting Minutes . . .



Dr Bradley Thomson and Southern Polar Lunar Craters. Image by Al Takeda

Minutes of ATMoB meeting held January 10, 2013.
Meeting held in Phillips Auditorium, Harvard-Smithsonian Center for Astrophysics.

- Mike Hill, President: called the meeting to order at 8:00 PM.
- The Secretary's Report of the December 2012 meeting was given by Sidney Johnston.
- Nanette Benoit prepared the Treasurer's Report which was given by President Mike Hill.
- Tom McDonagh gave the Membership Committee Report
- Glenn Chapel gave the Observing Committee Report:
- Steve Clougherty gave the Clubhouse Report
- Mike Hill presented several star party events

Old Business:

- Bruce Berger mentioned several issues with the ATMoB Imaging and Research Observatory (AIRO)

New Business:

- President Mike Hill conducted an election to see if the membership would approve a Motion to add a "Family Membership" to the Bylaws of the ATMoB.
- The Motion passed Unanimously. No Nays and no abstentions were voted.

President Mike Hill introduced Dr Bradley Thomson, a senior research scientist at the Boston University Center for Remote Sensing as the invited speaker.

Dr. Thomson's education includes:

B.S. Harvey Mudd College, 1999.

M.Sc. Geological Sciences, Brown University, 2001.

Ph.D. Geological Sciences, Brown University, 2006.

Dr. Thompson's talk was on the Lunar Reconnaissance Orbiter mission concerning the search for Water Ice on the Moon. Additionally, the talk discussed the geology of the Moon, and many of the surprises which making measurements of Moon geology provides.

The surface of the Moon was formed about 3 billion years ago. The Lunar poles are substantially perpendicular to the ecliptic plane. The Apollo program brought back rocks containing bits of iron, and the iron had no rust. No rust indicates that no water has flowed on the Lunar surface.

Spectra measurements by a satellite put up by India indicates that water in the amount of about 700 parts per million exists in places on the Lunar surface.

A measurement by a Lunar impactor kicked up a spray of debris, and spectra measurements detected water.

At least four types of measurements have attempted to detect water on the Moon. The first are Apollo Lunar rock samples, and a revisit to these old samples is given at:

<http://www.nature.com/ngeo/journal/v4/n2/full/ngeo1085.html>

It is thought that comets hitting the Moon may have brought water to the Lunar surface.

A second type of measurement was by a Lunar Prospector in 1998 which used a neutron spectrometer. Scattering by neutrons may have indicated an excess of hydrogen in the lunar surface. Hydrogen is a particularly good neutron scattering substance because the nucleus of hydrogen atom is a single proton, which has substantially the same mass as a neutron. A NASA web page describes this mission at the link:

<http://nssdc.gsfc.nasa.gov/planetary/lunarprosp.html>.

The neutron spectrometer may have detected water, but a crash of the spacecraft to end the mission did not produce detectable water by optical spectrometers aimed at the crash site.

A third type of measurement was by radar mapping by using the Arecibo antenna as a transmitter and the Greenbank Telescope as a receiver. Radar mapping was taken as a negative result in a search for water at the poles of the Moon. A NASA web page is at:

<http://lunarscience.nasa.gov/articles/release-of-high-resolution-radar-image-mosaic-for-the-moons-south-pole/> and is described further at: <http://www.gb.nrao.edu/epo/GBT/lunardiscovery.pdf>.

A fourth type of measurement used an orbital radar observatory in the Lunar Reconnaissance Orbiter (LCROS) to produce radar maps of the Lunar Surface. Results were consistent with about 0.5% to 5% ice mixed with rock.

An indication that water ice was detected is given on a NASA web page at:

http://www.nasa.gov/mission_pages/LCROSS/main/prelim_water_results.html

Other NASA web pages referring to the LCROS mission are at:

http://www.nasa.gov/mission_pages/LRO/overview/index.html

Dr. Thomson indicated that the amounts of water detected near the poles of the Moon are sufficient to supply water, and the necessary oxygen by electrolysis, to support a colonization expedition near the Lunar poles.

Near the poles, and due to Lunar librations, there are locations where a colony would not be in darkness for 14 days, and so could remain operational with solar collectors and batteries for an extended stay.

The meeting was adjourned at 9:30 PM

~ *Sidney Johnston, Secretary* ~

Clubhouse Report . . .

JANUARY 2013



Dave Prowten and the Over-roof for the 17" Dob. Image by Al T.

The old year closed with a flurry of activity at the ATMob Clubhouse. Thursday evening mirror grinding continued as did the Friday night Astro. class for members and Saturday night general observing. Following the holidays, four days' of activity commenced with the December 29th work party (16 members donated 7 hours), followed by a Sunday decorating session (7 members donated 13 hours), the Monday's New Years Eve Party (40+ members enjoyed 10 hours) and the Tuesday clean up party (8 members donated 5 hours).

The Dec 29th Work Party started at 10 am and concentrated on the following projects:

- The raised over-roof, planned last work session for the 17" Dob, was constructed and installed on the hutch enclosure (Dave P., Mike D., Paul C., George P., and Dick K.)
- The Home Dome observatory was heated internally to melt the snow and ice from the roof to allow rotation. (Paul C., Al T., and George P.)
- The Clam-shell observatory was cleared of snow/ice; the ice on top being very stubborn (Paul C., Al T., and John M.)
- Larger limbs were cut to allow the debris pile to be moved back with the snow plow; the drive is now clear for plowing the rest of the winter. The chipper is being very stubborn in

its repair effort; so far still refusing to start/run; the effort continues. (Bill T., Mike D., John B., and John R.)

- After lunch, the club's 'Tom Britton Clubhouse' sign was fastened over the meeting room entrance. At least this way the paint will last longer. (Dave P. with several assistants)
- Through all this diverse activity, the attic barn cleanup continued. (Mike H.)

Thinking about that lunch, Bailey Hill spaghetti, Sai's salad, baked chicken & garlic bread was the fare of the day (also available for the next 3 days' activities) (Eileen M., Sai V., Eric J., Dick K., and John R. assisting). Thanks to these members for donating their day: John Blomquist, Paul Cicchetti, Mike Dudley, Mike Hill, Eric Johansson, Dick Koolish, John Maher, Mike Mattei, Eileen Myers, George Paquin, Dave Prowten, John Reed, Art Swedlow, Al Takeda, Bill Toomey, and Sai Vallabha.

For the Sunday decorating effort, thanks to John Blomquist, Nina Craven, Paul Cicchetti, Eileen Myers, George Paquin, Art Swedlow, and Al Takeda. Their work allowed 40+ members to celebrate New Years Eve from Greenwich's to Boston's midnight hour.

Then New Years day found John Blomquist, Nina Craven, Eric Johansson, Julie Kaufmann, Eileen Myers, Art Swedlow, Al Takeda, and Sai Vallabha cleaning the house, packing the decorations, removing the trash, packing the dishes for cleaning at home. We were back in business for Thursday mirror grinding. The club thanks you.

The second work session during this reporting period took place on January 26, 2013 after the coldest weather in over two years (we were spoiled by last years warm winter anomaly). At 10 am the temperature had risen to 17-deg. F; skies were clear.

After the mandatory hot coffee eye opener, activities started slowly as the weather warmed:

- A team led by Steve C., John M., Josh B., and Al T. determined the contents of the three telescope storage rooms, proceeded to prioritize telescope assignment by current condition, and reorganized placement of optical tubes, mounts, and accessories in the three locations for continued assembly, checkout and field testing. This allowed the telescope inventory catalog update to commence; and this process continued well into the evening.
- As the temps climbed and skies remained clear, Paul C. set up a H-alpha filter system to monitor current solar conditions. He was joined by Bill T.'s white light system and together allowed Bill T.'s student Catherine and her father J.T., to learn the art of solar observing. Later, that evening's partly cloudy skies cleared, allowing Phil R. to provide great views of Jupiter and its Galilean moons.
- The recent cold winds and earlier snow clearing by John B. provided clear pads and observatory rails for successful opening of the clamshell and rolloff observatories. Later in the evening Eric J., and Al T. successfully assisted Bill T. to obtain prime focus photos through the Schupmann telescope.

- Inside the clubhouse, the basement support system project, started as part of the attic roof renovation, continued with a new lolly column being placed on the cured concrete footing at the bottom of the stairs. This eliminated the cluster of temporary columns and supports making passage difficult. The split in the basement door was repaired and fitted to easily open and close. This was completed by Dave P., who also provided a new shelf in the kitchen for storage of equipment at a safer height for the cooks.
- Meanwhile Karl and Jeffery D. continued mirror polishing under Phil R.'s mentoring. Bill R. and Nina C. received the clubhouse opening, closing, and responsibility briefing from John R to become new "A" committee members. Joshua B. and Bill T. received the clamshell and Meade LX-200 operation checkout, required of all member users, from John M. Bruce B. stopped by to check the MIT internet connection that was down earlier in the week.
- It is important that all "A" members using the clubhouse check the oil tank quantity after each use before they lock the house. Last Thursday the house was warmed for mirror grinding, but the oil ran dry during the night, and was found by chance Friday afternoon. Several calls to Healey Oil filled the tank and provided required furnace checkout to allow relighting for Friday nights Astro class. This forced 2 round trips from the city to Westford and return. We need your eyes to allow for smooth operation. It is instructional to see that the clubhouse was used 16 of 26 days in January before the oil was depleted. The tank was almost one half full on New Years eve.
- A dead battery caused some added work load for the intrepid lunch crew. Without Sai V. and Art S., the team of Eileen M. and John R. assisted by Nina C. worked steadily to meet the 2 pm lunch time. Bailey Hill pasta, garlic bread, baked chicken and Eileen's salad provided the food needed on this cold day. Steve C.'s girl scout cookies topped off the repast. Cleanup was efficiently handled by Eileen and Nina.

A big thank you to 23 members and guests who made this day possible: Joshua Ashenberg, J.T. and Catherine Amirault, John Blomquist, Joshua Brown, Steve Clougherty, Nina Craven, Paul Cicchetti, Eric Johansson, Sameer Marathe, Mike Mattei, John Maher, Eileen Myers, David Prowten, John Reed, Phil Rounseville, John Small, Al Takeda, Bill Toomy, Karl and Jeffery Dean, Bruce Berger for stopping by, and Bill Robinson later for training and first night of duty. The next work session is scheduled on full moon Saturday, February 23, 2013 starting at 10 am. Basement cleanup and drain layout will be joined with continued work on telescope checkout upstairs. Please join us in a day of activity, work and enjoying our hobby. See you then.

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



Thursday Night Mirror Making. (L-R) Drew Prescott, Phil Rounseville, Andy Fyfe, Larissa Fyfe, George Paquin, Ed Los, Mike Hill. Image by Bruce Berger

Clubhouse Saturday Schedule

Feb. 9	B. Toome+M. Hill Messier Marathon	
Feb 16	Brian Maerz	Glenn Meurer
Feb 23	Myers + Nugent WORKPARTY #2	
Mar 2	Steve Clougherty	Neil Fleming
Mar 9	Steve Clougherty+Rich Burrier Messier Marathon #2	
Mar 16	Art Swedlow	Sai Vallabha
Mar 23	George Paquin	Tom Wolf
Mar 30	Henry Hopkinson + Dave Prowten WORKPARTY #3	

Membership Report . . .

Please take the time to seek out and welcome our new and returning club members:

Bob Familiar
 Sameer Marathe
 Sharon Kabelitz
 Rick Breen
 Ali Allison
 Phil Papadopoulos
 Michael Kathe

The Amateur Telescope Makers of Boston, Inc. is a 501(c)3 organization.

Consider making a year-end donation to the club, as these are tax deductible to the fullest extent allowed by law.

membership@atmob.org

~ *Tom McDonagh – Membership Secretary* ~

First New Year's Resolution Accomplished . . .



Ring in the New Year at the ATMoB Clubhouse. Image by Al T.

Have fun – that was our first New Year's resolution for 2013. It was cloudy, but so what. Those who came to the club's New Year's Eve party did just that - party. The live music and the dancing were lots of fun. Thanks go to Ed Los for playing his fiddle, and to Claude Galinsky who played his guitar, and later sang some wonderful ballads.



Claude Galinsky plays a ballad to the group. Image by Al T.



Line Dancing in the Kitchen. Image by Al T.

Thanks also go to Julie Kaufmann who played all kinds of recorded dance music and taught us all some very easy line dances. The funny hats and necklaces were the subject of many

jokes, and celebrating each hour with flashing lights added to the atmosphere.

We also had fun at the annual cleaning-the-clubhouse-and-putting-up-the-decorations party, with its traditional menu of fresh, warm bagels and lox (plus this year's special treat of homemade gravlax thanks to George Pacquin and his son) along with sliced red onions, capers, lettuce, tomato, and cream cheese, and at the next day's annual taking-down-the-decorations-and-cleaning-up party, with its traditional menu of the finest of leftovers, especially the desserts. Thanks go to the official Special Events Committee of Julie Kaufmann, Nina Craven and Eileen Myers and to all of the other hosts and assistants including Al Takeda, Dr. Art Swedlow, Nina Craven, Julie Kaufmann, Eric Johansson, John Reed, Sai Vallabha and John Blomquist.

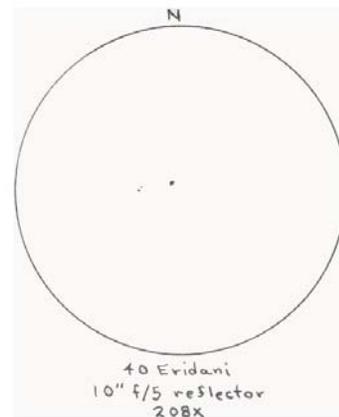


Eileen welcomes 2013. Image by Al T.

~ Eileen Myers, Special Events Committee Chair ~

Sky Object of the Month . . .

Feb. 2013 - 40 Eridani – Triple Star in Eridanus



This month, we travel 16.5 light-years to the remarkable triple star 40 Eridani (aka Keid and omicron2 Eridani). This system merits must-see status by virtue of the fact that one of its members is the most easily-seen white dwarf in the night sky. Trekkies would add that the primary, a K1 dwarf not unlike our sun, is orbited by the planet Vulcan - home world of the starship Enterprise's first officer Spock.

A small-aperture telescope and magnification of 50-60X shows two stars – the yellowish 4th magnitude primary (designated 40

Eridani A) and a faint 9th magnitude companion (40 Eridani B) some 83 arc-seconds away. This ordinary-looking speck is a white dwarf with half the mass of the sun packed into a body whose diameter is only half again that of the earth. One cubic inch of its matter would weigh 4 tons!

The white dwarf has a companion of its own, located about 9 arc-seconds away. Discovered by William Herschel in 1783, 40 Eridani C is an 11th magnitude main sequence red dwarf which can be glimpsed with a 6-inch telescope and magnification of 150X or more. Viewed with a large-aperture Dob, the colors – yellow for A, white for B, and pale red for C – are amazing!

40 Eridani B and C are separated by an average distance of 35 Astronomical Units (slightly less than the gap between the sun and Neptune) and orbit each other in a 252 year cycle. They lie 400 Astronomical Units (about 37 billion miles) from 40 Eridani A, circling this star in a period estimated to exceed 7000 years.

You may not have the starship Enterprise to transport you to the 40 Eridani star system, but a good backyard telescope will put you in the neighborhood. Would you like to get even closer? A wonderful piece of artwork by Andrew Taylor takes us to the surface of a planet (Vulcan, perhaps?) orbiting 40 Eridani A. View it online at fineartamerica.com/featured/the-triple-star-system-40-eridani-andrew-taylor.html.



Finder chart from Cartes du Ciel

Your comments on this column are welcome. E-mail me at gchaple@hotmail.com.

~ Glenn Chaple – Member at Large ~

American Textile History Museum Star Party . . .

In cooperation with the *Suited for Space* exhibition being held at the American Textile History Museum in Lowell, Massachusetts, members of ATMoB participated in an indoor astronomy program and an outdoor solar star party.

The indoor program consisted of an exhibit of various types of telescopes, an introduction to the planisphere, a NASA Night Sky Network Pocket Solar System activity and a discussion of the sky spectrum.

The outdoor program allowed the public to view the Sun through a 60mm Lunt Hydrogen Alpha telescope (loaned by ATMoB member Fred Ward), a white light Herschel Wedge scope and a solar projection telescope.

Thanks to Kelly Beatty, Bruce Berger, Bob Familiar, Brewster LaMacchia and Tom Lumenello. All images by Bruce Berger.



Tom Lumenello



Bob Familiar observing through a white light Herschel Wedge



(L-R) Kelly Beatty and Director of Interpretation David Unger.

~ Bruce Berger – Observing Committee Chair ~

6.1-inch f/1.25 Telescope . . .



6.1-inch f/1.25 Wide Field Refractor. Image by Mario Motta

Some time ago I saw at Surplus Shed (a reseller of used or surplus optics) a government built 6.1-inch triplet, at f/1.25!!! I figured at the low price of \$125.00 why not try it out and make a really short wide field telescope. I initially tested it and it actually didn't look too bad, but since I had a busy year, I put off the project. I recently got back to it, and I realized that in order to have any focuser I needed a very wide opening or it would vignette badly. An ordinary 2-inch focuser would lose much of the incoming cone of light. Fortunately, I happened to have a very large 3+ inch focuser that I originally built for my 32-inch scope. I used it for a while but later replaced it with an electronic focusing focuser. The attachment opening in fact is 3.7 inches, and the barrel diameter is 3 inches. This would do nicely. So I built the connection from the lens to a nearly 7-inch cell barrel, and machined them to mate nicely.



6.1-inch f/1.25 Wide Field Refractor. Image by Mario Motta

I quickly discovered that focusing a very steep light cone is incredibly difficult. It has to be right on, no leeway, or it will be out of focus. After a few adjustments I thought that the image was actually quite nice. With a 30mm, 82-degree eyepiece, it has a nearly 10-degree field of view, with some edge spherical aberrations noted. Much of the field was good however, and I saw no color! (It is a very well made triplet!). The field was wider than my 7x50 binoculars (which is 7-degrees), and clearly brighter. However, a 6-inch f/1.25 system has a very large exit pupil....25mm in fact...so much of the light would be wasted. I

tried to use a teleneegative lens, but could not bring it to focus well enough. I then tried it with a 2x Barlow and it works nicely.

In this configuration it is a 6.1-inch f/2.5 system, has a field of 5-degrees, 12x power, and remains a very, very bright field. The exit pupil is still large, but better now. Looking through it is like looking through a small window. It is very heavy...lots of glass and metal in a very small package. But....I plan on mounting it piggyback on my 32-inch scope as a super wide field viewer. It will complement my 6-inch f/7.4 triplet refractor, and on this mount, weight is not a problem. The total weight is 17 pounds and the total length is only 12 inches, though with the barlow it is now 14 inches. I know, kinda crazy, but....its also fun to look through. When visitors ask where the scope is pointing, it will be easy to just say; "Look through this one!" and they can clearly see the surrounding star field.

~ Submitted by Mario Motta ~



Clamshell Snow Cone. Image by Al T.

March Star Fields DEADLINE
Sunday, February 24th

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

Articles from members are always welcome.

POSTMASTER NOTE: First Class Postage Mailed Feb. 5th, 2013

Amateur Telescope Makers of Boston, Inc.
c/o Tom McDonagh, Membership Secretary
48 Mohawk Drive
Acton, MA 01720
FIRST CLASS

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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 listen to WBZ (1030 AM)

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 Standard Time (EST) from Universal Time (UT) subtract 5 from UT. (Daylight Saving Time – Subtract 4-hr)

- Feb 16 Mercury at greatest E. elongation 18° (evening) Best this year
- Feb 17 First Quarter Moon (Moonset at midnight)
- Feb 25 Full Moon
- Mar 4 Last Quarter Moon (Moonrise at midnight)
- Mar 7 Comet C/2011 L4 PanSTARRS – Evening, Western Horizon
- Mar 10 Daylight Saving Time starts
- Mar 11 New Moon