



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. 26, No. 11 December 2014

This Month's Meeting . . .

Thursday, December 11th, 2014 at 8:00 PM
Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

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

Resolving the Sun's Hot Corona: High Resolution Solar Imaging in the Extreme Ultraviolet

This month's speaker will be Dr. Kelly E. Korreck, head of science operations for the Solar Wind Electrons, Alphas and Protons (SWEAP) plasma instrument suite aboard NASA's Solar Probe Plus mission to enter the Sun's atmosphere.

Dr. Korreck's research interests include causes of Space Weather, particle acceleration and shock physics in the heliosphere and in supernova remnants. As SAO Project Scientist for the NASA rocket High Resolution Coronal Imager (Hi-C), she managed the funding, technical staff, and construction of the telescope that led to the highest resolution images ever of the Sun's hot atmosphere. She works at the intersection of science and engineering, ensuring the best data from this once in a lifetime mission by optimizing the operations of the instruments and the analysis of the scientific data. Kelly also created the Solar Research Experience for the Undergraduate Internship Program at SAO.

Dr. Kelly E. Korreck earned her B.S. in Physics and her M.S. and Ph.D. in Space Physics from the University of Michigan. She is an astrophysicist in the High Energy Astrophysics Division, and joined the Smithsonian Astrophysical Observatory (SAO) in 2002. She is a researcher in the Solar and Stellar X-Ray Group, which serves as a major partner in the Atmospheric Imaging Assembly (AIA) investigation on the Solar Dynamics Observatory (SDO), the X-Ray Telescope aboard the Hinode solar mission, as well as the telescope for the Transition Region and Coronal Explorer (TRACE).

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 . . .

This month, I'd like to see if some of our members have any interest in helping out in implementing some of the new ideas generated during our "*ATMoB Direction Checkpoint Workshop*". You may recall that this workshop was designed to evaluate the validity of our current activities, and generate ideas for new ones.

Here is a partial list of the items, along with the respective current "owners":

- Create a new web site:
This will be a separate, board-led, initiative.
ATMoB Board.
- Implement social tools like Facebook and Twitter:
Owner?
- Find a location for "open" star parties, regular or solar:
Find a location to do more outreach in the form of "open" star parties, unlike the very directed and specific ones we are restricted to at the Clubhouse location.
Owner?
- Set up some "Solar Star Parties":
Idea: To be done as part of our Saturday efforts at the clubhouse, and announced via our regular "atmob-announce" mailing list?
Owner?
- Hold a series of CCD imaging classes:
Please send me an e-mail if you're interested, along with your desired day of the week and time of day.
Neil Fleming.
- Do some training/classes on how to collect imaging data:
Primarily based on the use of ARIO.
Other approaches/owners also welcome. Please send me an e-mail if you're interested, along with your desired day of the week and time of day.
Neil Fleming.
- Create digital versions of telescope making advice:
Owner?
- Do an electronic "push" of notices of astronomical events:
Two challenges here: The first is generating the content for the upcoming events, the second is to determine how we will distribute that content.
Owner?
- Reach out to people who have scopes, but do not know how to use them:
Owner?
- Create an "organization of organizations" to better liaise with other astronomy clubs:
Owner?

- Create brochures to be available during our meetings and star parties:
Owner?
- Develop a standard telescope specification that people can use to take some of the design work out of the process of building your first scope:
Owner?

Any takers? Any other ideas that folks would like to take lead on?

Regards...

~ Neil Fleming – President ~

November Meeting Minutes . . .



Dr. Arne Henden *

Minutes of ATMoB meeting held November 13, 2014.

Meeting held in Phillips Auditorium, Harvard-Smithsonian Center for Astrophysics.

Neil Fleming, President: called the meeting to order at 8:00 PM.

- The Secretary's Report of the October 9, 2014 meeting was given by Sidney Johnston.
- Eileen Myers gave the Treasurer's report.
- Tom McDonagh gave the Membership Report.
- Glenn Chaple gave the Observing Committee Report
- Steve Clougherty gave the Clubhouse Report. Steve mentioned that the evaporator was being examined for a decision to give it away or to sell it.
- Announcements: Paul Valleli mentioned that the installation of LED street lights along Route 128 in Woburn did not cure a glare problem.
- Old Business: Eileen Myers mentioned that she had sold out of Royal Astronomical Society of Canada Handbooks.

- New Business: None

President Neil Fleming introduced Dr. Arne Henden, Director of the American Association of Variable Star Observers (AAVSO). Dr. Henden will be retiring from the Directorship of the AAVSO effective January 2015. The AAVSO is one of the few organizations where amateur astronomers do research useful for professional astronomers.

The talk described various activities of the organization. The first activity discussed was the AAVSO Photometric All Sky Survey (APASS). Its principal goal is to obtain position (RA and DEC) of all stars down to magnitude 17. Magnitudes of each star are obtained in five (5) filter bandwidths. The filters used are the Johnson B and V, plus the Sloan g' , r' , i' . Twin 20-inch telescopes are mounted in observatories in a plurality of locations in both the Northern and Southern hemispheres. The plan is to cover the full sky from North to South Poles.

Links to the passbands of the Bessell filters are under the heading "Bessell" at the commercial link of Optec, Inc:

http://www.optecinc.com/astrometry/catalog/ifw/ifw_wheels.htm

Response functions of some Sloan imagers are given at the link:

<http://arxiv.org/pdf/1002.3701v1.pdf>.

The result of the survey is to provide position and magnitudes of known stars for comparison with observation of variable stars. More information about APASS is available at the link: <http://www.aavso.org/apass>.

There are many variable stars scattered throughout the sky and members of the AAVSO monitor many of these stars. When a significant change in magnitude of a variable star is noted, professional astronomers are notified. The professionals then turn their large telescopes to the variable to perform further studies.

Some variable stars do not change on a regular schedule and so the amateurs provide a valuable service to professional astronomers by directing them to an active variable. Then by using large telescopes with a spectrograph, or using an orbiting observatory, the professional can make observations while the variable is active. By studying active variables, the astronomers gather data to help explain why and how the variable star varies in magnitude.

A light curve is a plot of the magnitude of a star versus the date (or time) for a rapidly varying star. These curves are a plot of a time series of observations of a particular astronomical object using a particular filter. Observers submit observations of a variable star to a database maintained by the AAVSO. The submission includes the type of filter being used and the magnitude observed. These measurements can be made "visually" with no filter; photographic acquisition using blue, green, or red filters from an ordinary digital camera; or imaging with a monochrome camera that uses specialized filters with a

well defined bandpass, such as the Bessell or the Sloan filters. This observational data is added to a database maintained by the AAVSO whose software has produced light curves for over a half a million of variable stars.

An exemplary plotted light curve for the star Mira is at the link: <http://www.aavso.org/lcg>.

Dr. Henden showed us two images of a globular cluster taken a few hours apart. Using comparator software the RR Lyra stars in the cluster blinked on and off. *"Very impressive!" Editor*

The AAVSO offers many programs for various skill levels:

- Comprehensive guides are available for observing and recording variable stars using visual, CCD or DSLR camera techniques.
- AAVSO members can apply for and be granted observing time on an AAVSO telescope.
- Members can monitor cataclysmic variable stars. Cataclysmic variables are double stars where one of the stars accretes material from its companion. After the star receiving the material reaches a critical amount of material it burns off the material causing an extreme increase of magnitude. Cataclysmic variables are very interesting to astronomers who study the phenomena. Amateurs have the option of monitoring dozens to hundreds of known cataclysmic variables. When one flares up in brightness, professional astronomers with big telescopes are notified and then turn those scopes to the identified target.

Arne has done much in helping to establish the APASS calibration system. The ATMob thanks Arne for his contributions to the AAVSO, and wishes him a happy retirement observing stars.

The meeting was adjourned at 9:52 PM.

~ *Sidney Johnston, Secretary* ~

Clubhouse Report . . .



Sai Vallabha clearing away tree branches. *

NOVEMBER 2014

During the November work party we had a total of 17 members lend a hand with a variety of projects.

Penny L. fixed a broken electrical circuit in the observing field while Steve C. and Sergio S. transformed a metal step ladder into a wide-base three legged ladder to accommodate uneven terrain in the observing field.

Eric J. and Dick K. assisted with the annual assembly of the snow fence, complete with red reflectors.

Bruce B. and Glen M. fixed a faulty solar battery for the ATMob Research and Imaging Observatory (ARIO).

John M. cleaned and waxed the clam shell dome.

Al T. fixed the broken lens cap for the Meade 10-inch scope.

Dave P. and Paul C. replaced a 10-foot section of the front porch and replaced it with pressure treated wood.

Other members spent several hours trimming and hauling tree limbs from the East side of the observing field. An invasive patch of Japanese knotweed was cut down on the West side of the field and hauled away.

John R. and Paul C. spent several hours into the evening completing the Clubhouse duty calendar for the upcoming year.

The revised opening/closing procedures for the clubhouse is now complete and will be posted on the ATMob website and at the clubhouse shortly.

Many thanks to the lunch crew who cooked a nice meal for all who volunteered this month!

Thanks to the following members who helped during the November work party: Penny Lucinian, Sai Vallabha, Cheryl Rayner, Joshua Ashenberg, Dick Koolish, Paul Cicchetti, John Reed, Steve Clougherty, Al Takeda, Eileen Myers, John Maher, Sergio Sermonivich, Glen Meurer, Nina Craven, Bruce Berger, Bill Toomey, Eric Johansson, along with friends and new members; Olivia and Louis Martinez, Heidi and Bart Smith, Louis Antonucci, Regina Holzman and Robert Schmidly.

~ *Clubhouse Committee Directors* ~

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

Clubhouse Saturday Schedule

December 13	Eric Johansson	John Reed
December 20	Steve Clougherty	Al Takeda
December 27	CLOSED	
December 31	NEW YEAR'S EVE PARTY	
January 3	WORK PARTY # 1	
January 10	Paul Cicchetti	John Reed
January 17	Jim Gettys	Phil Rounseville

Membership Report . . .

Membership count as of November 24, 2014 is at 261 individuals. This is 13 more members than at the same time last year. 27 members have renewed their membership this month. If you have renewed, thank you!

The membership renewal period began in June and ended on September 1st. Please contact me ASAP to renew your membership. If you are a new or returning member in the 2014 calendar year, renewal payment is not required. If you have questions regarding your membership status, please contact me.

A new class of membership is available this year. Consider a Family membership for yourself and direct family members.

The renewal process can be completed on-line using PayPal. No PayPal account is required. Follow the link below, login using your email address on record with the club. Direct PayPal payments can also be sent to membership@atmob.org. If you cannot gain access to the website, please contact me before renewing online.

<http://www.atmob.org/members/person.php?frid=renewals>

Renewal checks may also be mailed:

ATMoB
c/o Tom McDonagh
48 Mohawk Drive
Acton, MA 01720

The renewal form can be downloaded from the following link:
<http://www.atmob.org/about/join.php>

Contact me if you require a renewal form and do not have access to a computer / printer by phone (617-966-5221) or mail.

If for any reason you are not receiving the Star Fields newsletter, please do not hesitate to contact me.

Don't delay, renew today!

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

Bill McHenry
Sepideh Emami

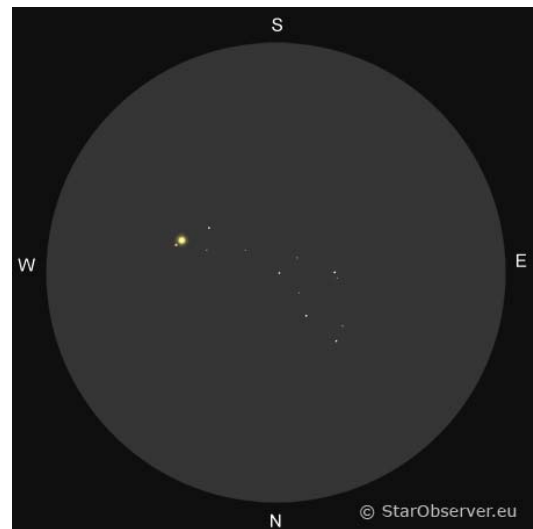
The Amateur Telescope Makers of Boston, Inc. is a 501(c)3 organization. Donations are gladly accepted and are tax deductible to the fullest extent allowed by law. Consider making a tax-deductible contribution to the club during your estate and tax planning this year. Many companies make matching contributions at an employee's request. This is a simple way to make your donation go twice as far.

~ Tom McDonagh – Membership Secretary ~

Sky Object of the Month . . .

December 2014

Eta (η) Cassiopeiae – Double Star in Cassiopeia



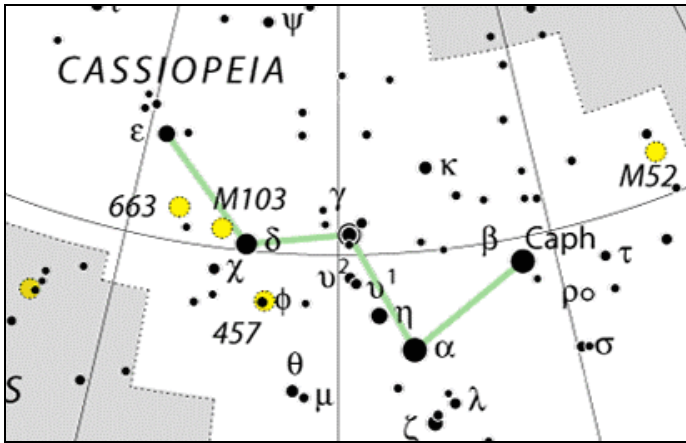
www.starobserver.eu

The spotlight this month goes to the binary star Struve 60, better known as eta (η) Cassiopeiae (or Achird, if you prefer its Arabic name). Details first.

William Herschel discovered the duplicity of eta Cassiopeiae in 1779. At the time, the magnitude 7.4 companion was 11.3 arc-seconds east-northeast (position angle 62°) of the magnitude 3.5 primary. Since then, it has traveled $\frac{3}{4}$ of the way around the main star to its current location $13.2''$ to its northwest (P. A. 323°). A complete orbit takes about 480 years. Eta Cas A is a main sequence G0-type star - a virtual twin of our sun, similar in mass and size. Eta Cas B is a M0-type star with about $\frac{2}{3}$ the sun's mass and size. The pair lies 19.4 light years away.

Now for the neat stuff. Eta Cas sports a color contrast so stunning that James Mullaney and Wallace McCall included it in their 1960s Sky and Telescope series "The Finest Deep-Sky Objects." I have no reason to argue the selection. After viewing eta Cas with a 90 mm f/11 refractor at 167X, I wrote, "Striking colors! Primary golden yellow; companion pale red." Sissy Haas, in her book *Double Stars for Small Telescopes*, considers it a showcase pair. Check it out and see if you agree.

Before putting your telescope away, stand back and take a good naked eye look at eta Cas and its neighbor gamma (γ) Cas. Visually a magnitude brighter than eta Cas, gamma appears to be much closer. It's an illusion. Gamma Cas is actually nearly 30 times farther away. Move this blue-white sub giant next to eta Cas, and it would shine at a dazzling magnitude -5.5. Remember, eta Cas is a twin to the sun. If it (or our sun) were moved to the same distance as gamma Cas, it would be a 12th magnitude speck.



constellation-guide.com, courtesy IAU + Sky & Telescope

~ Glenn Chaple – Observing Committee and VP ~

Pollard School Star Party Thanks . . .



Marion Hochuli. Image by Peter Bealo

I would like to thank ATMoB members that helped out at the October 30th Pollard School Star Party in Plaistow, NH. The sky magically cleared at 6 PM for the event, then clouded up again by 8:30 at closing.

We had ~150 kids and an equal number of parents. Hayrides were provided and a chemistry magic talk. Good time was had by all!

Thanks to Bruce Berger, Marion Hochuli, Brewster LaMacchia, Alan Sliski and Peter Bealo.

~ Submitted by Peter Bealo ~

New Year's Eve Party at the Clubhouse in Westford . . .

Wednesday, December 31st
starting at 6:30 PM

Say a final goodbye to 2014 and a welcoming hello to 2015. The eating and festivities will start at 6:30 PM on Wednesday,

December 31st, and will continue past midnight. Arrive at any time, since there will be 8 opportunities in all to shout "Happy New Year". Noisemakers and cheers will ring out each time the New Year crosses a time zone, starting with Greenwich Mean Time (7 PM local time), and continuing hour after hour through Eastern Standard Time (midnight local time), with a couple of half hour celebrations in between.

Stop by with your family and friends. No RSVP is needed.

Please bring something tasty to share. Entrée type dishes are always very welcome. Folks arrive and leave all evening and the party seems to start again with each new group. There will be plenty of non-alcoholic beverages.

The clubhouse will be warm and the party is on regardless of the weather. Don't forget your warm observing clothes and boots, and bring a telescope and camera if you like. The club's observatories will be open for observing too. There will be a 9-day-old Moon and there will be deep sky wonders to gaze upon depending on the weather.

We will also have line dancing led by Julie Kaufmann and hopefully live music again this year.

Any party suggestions or questions are welcome, so please email them to Eileen at starleen@charter.net or call at 978-501-6342 (day) or 978-456-3937 (evening).

For one set of directions to the ATMoB Clubhouse in Westford, see the last page of the ATMoB newsletter, or go to www.atmob.org and click on ATMoB Clubhouse at the bottom of the Home page. There are, of course, many other routes that may be shorter for you.

Please come and have fun and thank the members of the New Year's Eve Committee: John Blomquist, Nina Craven, Eric Johansson, Julie Kaufmann, John Maher, Eileen Myers, Cheryl Rayner, John & Monique Reed, Art Swedlow, Al Takeda, Sai Vallabha, . . .

~ Submitted by Eileen Myers, Treasurer ~

Corrections: November 2014 Meeting Minutes title should have been "October Meeting Minutes". In the Clubhouse Report, the next work party date should have been "December 6".

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

January Star Fields DEADLINE
Sunday, December 21st

Email articles to Al Takeda at
newsletter@atmob.org

Articles from members are always welcome.

POSTMASTER NOTE: First Class Postage Mailed December 10, 2014

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

EXECUTIVE BOARD 2014-2015

PRESIDENT:	Neil Fleming	president@atmob.org
VICE PRES:	Glenn Chaple	(978) 597-8465
SECRETARY:	Sidney Johnston	(978) 505-9169
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	Al Takeda	(508) 494-7877
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	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 Standard Time (EST) from Universal Time (UT) subtract 5 from UT.

Dec 14 Last Quarter Moon (Moonrise at midnight), Geminid meteors peak
Dec 21 New Moon, Winter Solstice
Dec 28 First Quarter Moon (Moonset at midnight)
Jan 4 Full Moon
Jan 8 Mercury and Venus are 1-deg. apart (evening dusk)
Jan 13 Last Quarter Moon (Moonrise at midnight)
Jan 20 New Moon
Jan 24 Triple Shadow Transit on Jupiter. 06:28 UT (01:28 EST)