



## 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. 27, No. 2 February 2015

### This Month's Meeting . . .

Thursday, February 12<sup>th</sup>, 2015 at 8:00 PM  
Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

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



Sunset at Arlington. Image by Dick Koolish

### Understanding the Electric Sun Model, The Earth's Electrical Environment, and Electric Double Layers in Astronomy

This month's speaker is Dr. Michael Clamage. He will share with us new observations of some of the complexities of the Earth's electrical environment. The Sun and Earth are connected in ways very similar to how man-made electrical equipment is connected. These similarities are examined in light of the idea of the entire solar system behaving as a vast electrical transforming apparatus.

Dr. Michael Clamage received his PhD in physics in 1992 from Brandeis University, studying the biological and statistical

behavior of proteins. Prior to that, he spent several years studying binary pulsars at the Arecibo radio telescope. With his brother, he gave traveling lectures about their discoveries in the areas of fractional calculus, fractals, and chaotic systems. Over the past 15 years, he has presented public lectures on such topics as Relativity and Dimensions, Metaphysics in Biology, Transformation in Supernova and Metamorphosis in Biology. Dr. Clamage is currently a scientist with the International Science Foundation working with the SAFIRE (Stellar Atmospheric Function in Regulation Experiment) Project, exploring the role of electric plasma discharge in solar physics.

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 . . .

Final call-to-action for the upcoming course, "Introduction to CCD Imaging"! Designed for those interested in getting involved in imaging (perhaps with our ARIO facility), I'd like to invite you to this course on Saturday, Feb 28, at 1 pm. (Note the new date – a couple of folks requested that I move it.) It'll be held up at the clubhouse, but please drop me a note at [president@atmob.org](mailto:president@atmob.org) if you'd like to come. (I need a head count to ensure we'll have enough space.)

With the right gear, which we have, you can make some good images even from our semi-dark sky site. We'll be covering the basics of what to do once you have captured some data, including:

- Initial image processing with CCDStack
- Deconvolution and DDP
- Techniques in Adobe Photoshop:
  - Data optimization
  - Selections and layers
  - Sharpening
  - Color balancing and adjustments
  - Gradient control

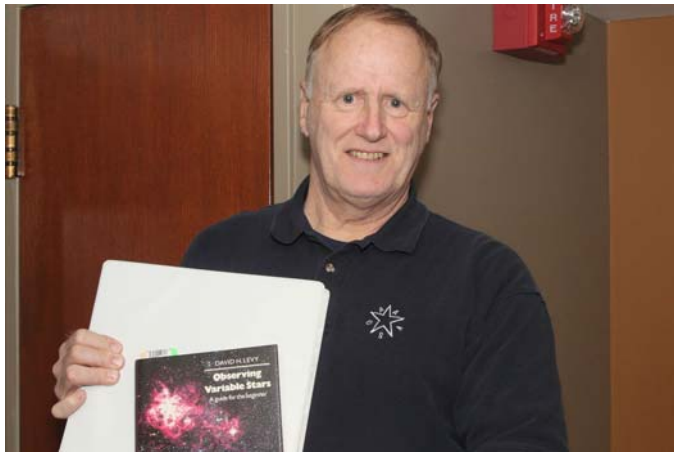
Regards.

~ Neil Fleming – President ~



Digging out. Again. \*

## January Meeting Minutes . . .



Glenn Chaple \*

Minutes of ATMoB meeting held January 8, 2015.

Vice President Glenn Chaple called the meeting to order at 8:00 PM.

- The Secretary's Report of the December 11, 2014 meeting was given by Sidney Johnston.
- Eileen Myers gave the Treasurer's Report.
- Tom McDonagh gave the Membership Secretary's Report.
- Glenn Chaple gave the Observing Committee Report. He mentioned several sky current events. Comet Lovejoy is well placed for observations, Mercury and Venus are close together in the evening sky, and Jupiter re-appears. On January 24<sup>th</sup> three moons will cast visible shadows on Jupiter, and the shadows of Io and Callisto almost merge.
- Steve Clougherty gave the Clubhouse Report. Steve reported that the Club's mirror coating evaporator machine has been transferred to Steve Jaynes (formally of Research Services) where it will be used for parts in his active mirror coating establishment.
- Old Business: none
- New Business:  
Sal LaRicca showed us some dazzling video views of the Sun from the Solar Dynamics Observatory (SDO) [www.helioviewer](http://www.helioviewer).

Al Takeda mentioned that some items were left in the Clubhouse after the New Year's Eve party. Anyone missing an item is requested to retrieve it.

Fred Ward indicated that he has some extra tools to give to someone who will use them.

Jean LeVaux announced that Howard has a 6-inch refractor that he is unable to use and would like to have help relocating it to a place where it can be used. They also own some

property near Montpelier and Stow Vermont, which has an old schoolhouse on it. They are looking to sell the property.

Vice President Glenn Chaple then introduced himself as the invited speaker. The title of Glenn's talk was "Visual Observing of Variable Stars, An Addict's Story". Glenn has been visually observing and measuring magnitudes of variable stars since March 17, 1971, as documented by a page copied from his notebook. An entry from his notebook, dated August 30, 1976, showed a systematic program of visual observing and reporting to the American Association of Variable Star Observers (AAVSO). Glenn has been a member of the ATMoB since April 1, 1980. Glenn is now a retired middle school teacher.

Glenn's talk began with an image of himself at a young age holding a fish about as long as he was wide. His next slide showed his interest in science fiction and the extraterrestrial beings that might be inhabiting space. The love of the outdoors and his fascination with other worlds led him to observe variable stars.

A great thing about observing variable stars is that you see something happening as stars change their brightness before your very eyes. Watching stars change in brightness can become addictive. One wonders how bright will it be tomorrow and it is hard to wait and see.

As an introduction to variable stars, Glenn's next slides showed the variable star RW Tauri (eclipsing binary) on 1/20/1977. It was quite bright at 6:25 pm, at 7:25 pm it was about half as bright, and at 8:00 pm its magnitude had dimmed to the point that it was not visible, while the background comparison stars remained at a constant brightness in all three images.

Glenn's next slide showed Janet Mattei, who was director of the AAVSO for over 30 years, from 1973 until her death on March 22, 2004. Janet contributed greatly to helping amateur astronomers obtain and preserve scientifically valuable data on the light curves of variable stars.

A variable star is a star which changes in magnitude over time. There are many types and they are classified under different branches.

### VARIABLE STARS - Classification

1. Extrinsic variables
  - a. Eclipsing binary systems
  - b. Rotating variables
2. Intrinsic
  - a. Pulsating stars
    - i. Cepheids
      1. Type I Classical
      2. Type II W Virginis
    - ii. RR Lyrae
    - iii. RV Tauri
  - iv. Long period variables

1. Mira type
2. Semiregular

- b. Eruptive stars (cataclysmic stars)
  - i. Supernovae
  - ii. Novae
  - iii. Recurrent novae
  - iv. Dwarf novae
  - v. Symbiotic stars
  - vi. R Coronae Borealis

Light curves of various stars can be downloaded from the AAVSO website. Most of the light curve observations are made by amateur astronomers. The AAVSO is sincerely thanked for its excellent recording, storage, availability of light curves for simple downloading, and making the data available to professional astronomers.

Glenn then showed a star map showing the Cepheus and Cassiopeia constellations with Delta Cephei indicated. A light curve sketch for Delta Cephei showed the fast rise time of the star magnitude to 3.6, followed by a slow decay to 4.3 magnitude, with the cycle having a period of 5.4 days. Glenn showed the visual magnitudes that he observed plotted on graph paper. The light curves of his visual observations were close to the published curve.

Next Glenn showed a sequence of slides highlighting the star RR Lyrae. He showed a finder chart, a light curve of observations plotted against phase of the variations of the star, followed by his visual observations plotted against phase of the cycle of RR Lyrae. The light curve graphs showed variations in magnitude from 7.4 to 8.2. His visual observations follow closely to the standard light curve.

Next Glenn showed a model of an intrinsic variable of the Mira-Type which are Long Period-Variables. A finder chart was first, and a light curve from 01/23/2010 through 12/18/2014 showed about 5 full cycles with magnitude variations from about 3.5 to about 9.0.

The light curve for Supernovae SN 2014J showed a bright magnitude of about 10.8 on 02/04/2014 and with an approximate linear decline to magnitude 15.5 on 06/01/2014. In four months this bright “new star” had nearly disappeared.

Next an image showing Nova Delphini 2013 showed a maximum brightness of about magnitude 4.0, with a fast drop in 2 months to about magnitude 11. It was then followed by a drop to about magnitude 12.5 over a time interval of about 12 months.

Glenn’s outline for making visual observations, recording your observations, and reporting your observations to the AAVSO are:

1. PLAN YOUR OBSERVING SESSION
2. FIND THE FIELD FOR THE VARIABLE
3. IDENTIFY THE VARIABLE

#### 4. IDENTIFY APPROPRIATE COMARISON STARS

#### 5. ESTIMATE BRIGHTNESS

#### 6. RECORD YOUR OBSERVATION

- a. NAME AND DESIGNATION OF VARIABLE
- b. DATE AND TIME (J.D.) OF OBSERVATION
- c. MAGNITUDE ESTIMATE
- d. MAGNITUDES OF COMPARISON STARS
- e. IDENTIFICATION OF CHART AND SCALE USED
- f. NOTES (IF ANY)

#### 7. REPORT OBSERVATIONS

A schedule suited for visual observations of different types of variable stars follows.

#### FREQUENCY OF OBSERVATION FOR DIFFERENT VARIABLE STAR TYPES

ONCE PER WEEK (EVERY 5 TO 10 DAYS)  
 LONG PERIOD VARIABLES (MIRA AND SEMIREGULAR)  
 IRREGULAR VARIABLES  
 RV TAURI STARS  
 R CRB STARS - AT MAX

EVERY CLEAR NIGHT  
 CEPHEIDS  
 CATAclysmic VARIABLES (SUPERNOVAE, NOVAE, DWARF NOVAE)  
 SYMBIOTIC STARS  
 R CRB STARS - AT MIN  
 SUSPECTED VARIABLES

EVERY 10 MINUTES  
 RR LYRAE STARS  
 ECLIPSING BINARIES  
 ROTATING STARS

EVERY MINUTE (10 TO 15 MINUTE RUN)  
 FLARE STARS  
 T TAURI STARS

Equipment needed for visual observing includes the following.

- Clipboard and pencils
- Flashlight
- Red filtered flashlight
- Charts and Atlases
- Data Sheets, obtainable by download from the AAVSO [www.AAVSO.org](http://www.AAVSO.org)

The meeting was adjourned at 9:18 PM

~ *Sidney Johnston, Secretary* ~

## Clubhouse Report . . .



(L-R) Bruce Berger and Mike Hill working on the dome shutter. \*

### JANUARY 2015

After a well attended New Year's Eve party and a well deserved rest on New Year's Day, 24 members donated a full Saturday of work at the Clubhouse on Full Moon Saturday, January 3<sup>rd</sup>.

Thank you to Sai Vallabha, Al Takeda, Art Swedlow, John Reed, Cheryl Rayner, Dave Prowten, Eileen Myers, Mike Mattei, John Maher, Brian Maerz, Penny Lucinian, Bernie Kosicki, Dick Koolish, Eric Johansson, Mike Hill, Jim Gettys, Karl Dean, Jeffrey Dean, Nina Craven, Steve Clougherty, Paul Cicchetti, Barbara Bosworth, John Blomquist, and Bruce Berger. The year end party committee started the massive cleanup on Friday. We will report on Saturday's accomplishments.

- Cleanup was finished and decorations and supplies packaged and loaded in cars for off site storage.
- The kitchen equipment was cleaned for lunch.
- Rooms were vacuumed and readied for normal activities.
- Outside, the ladders and saws were positioned for trimming.
- The evaporator room was readied for the evaporator removal.
- Electrical parts were counted, required additions purchased and readied for field installation.
- The sticking ARIO shutter problem was fixed.
- The cracked conduit and outlet on the pole behind the clamshell was replaced and checked.

- Pieces of wooden protection need to be installed to guard sections of the electrical system vulnerable to plow and mowers.
- Snow removal gasoline was purchased.
- The porch GFI problem persists and needs be addressed at the next work session when further assessment is needed.
- Roadside tree trimming along the observing field continued. The importance of a fence of evergreen trees and bushes was discussed, and work proceeded toward that goal.
- A skim coat of plaster was applied to the repaired stairway wall at the house side door. This will lead to the painting of those walls with the return of warmer weather.
- Normal computer system and electronic room checkout/corrections were necessary.

The weather links are carefully followed all day to guide each outdoor work effort.

A tour of the house, based on opening/closing procedures, was resumed for new "A" members studying our security procedures. We will continue the tours at each work session. Also, members who have retained Clubhouse keys after stepping down from the "A" member duties are asked to contact John Reed or Steve Clougherty for a key return. New members assuming Clubhouse "A" member duties will need those keys.

At noon, everyone took a break to assist in the moving of the evaporator machine, out through the double doors, and onto the tailgate loader of the truck brought by Steve Jaynes. The system was relocated to allow continued coating of amateur mirrors in our area. It was determined that the cost of repair and new parts was prohibitive and beyond our budget capabilities. Also, the antiquated equipment parts and cold trap supplies were no longer available locally. For members who are interested in the coating process, see a Clubhouse Committee Chair person for the procedure. Floor repair will now proceed more efficiently with the equipment removed.

Our intrepid culinary specialists did it again. A lunch of turkey, dressing, cranberry sauce, baked chicken, spaghetti, salad and garlic bread was served at 2 pm. Cookies, cake and fruit was served for dessert. After that, it was back to work.

It was a productive day. Snow started to fall and the house was closed by 8pm. So as you can see your help would be appreciated at the next Work Session on February 7<sup>th</sup>. There's plenty to do. Coffee at 10 am. See you there.

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

Clubhouse Saturday Schedule		
February 14	Mike Hill	Bruce Berger
February 21	Glenn Meurer	Brian Maerz
February 28	Eileen Myers	Rich Nugent
March 7	<b>WORK PARTY # 3</b> Steve Clougherty + Neil Fleming	
March 14	Nina Craven	Karl Dean
March 21	<b>Messier Marathon #1</b> Art Swedlow + Sai Vallabha	
March 28	George Paquin	Tom Wolf

## Sky Object of the Month . . .

February 2015

NGC 1501 – Planetary Nebula in Camelopardalis



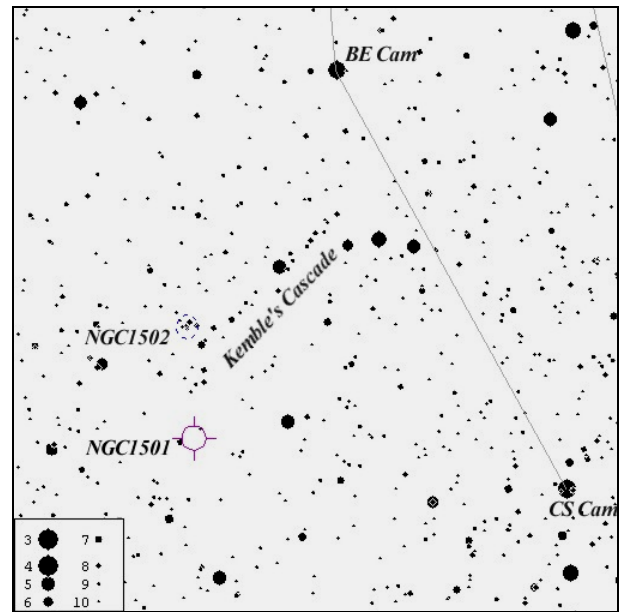
NGC 1501 (13.1-inch f/4.5 reflector at 166X), Sketch by Glenn Chaple

While Go-To technology has gained popularity with backyard astronomers who like to key their telescopes on a sky object with the push of a button, I prefer the no-frills star-hop mode of cosmic travel. Star-hopping lets me see enjoy celestial scenery I'd miss by traveling Go-To. I'll demonstrate my point with a star-hop to the planetary nebula NGC 1501 in Camelopardalis.

Camelopardalis isn't very kind to star-hoppers. This sprawling north circumpolar constellation contains just four stars brighter than 5th magnitude. A star-hop to any sky destination in Camelopardalis usually begins with a bright star in an adjacent constellation. To find NGC 1501, we begin at gamma ( $\gamma$ ) Persei and trace a 12° path between a pair of 4th magnitude stars to Kemble's Cascade (refer to the finder charts below).



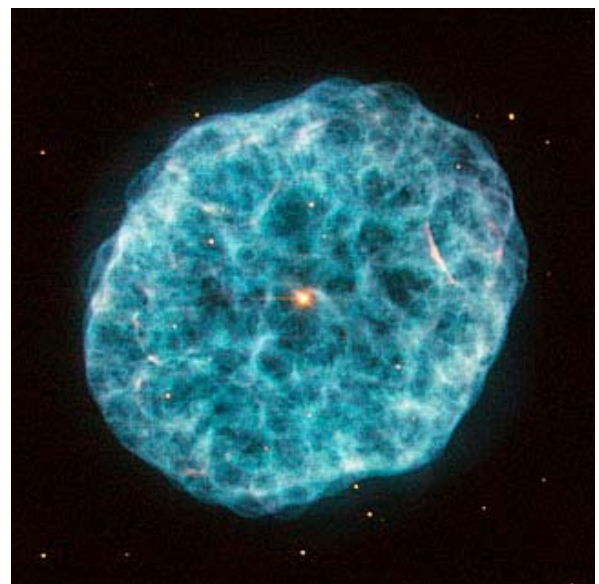
[constellation-guide.com](http://constellation-guide.com) (IAU and Sky and Telescope)



www.astrosurf.com

Kemble's Cascade is a stunning 2 1/2° chain comprised of some 20 magnitude 7 to 9 stars. At its southwest end is the pretty open cluster NGC 1502, punctuated at the center with the eye-pleasing 7th magnitude twins that make up the double star Struve 485. A 1 1/2° push south of NGC 1502 brings us to NGC 1501. Think of it – if we'd traveled to NGC 1501 via Go-To technology, we'd have missed three delightful celestial showpieces!

NGC 1501 is a magnitude 11.5 planetary nebula located about 5000 light-years away. Its slightly oval disk, just under an arc-minute across, can be glimpsed (barely) in a 3-inch scope, but twice that aperture will be needed for a definite sighting. With a 12-inch scope and dark-sky conditions, you should be able to make out the nebula's bluish hue and magnitude 14.5 central star.



ESA/Hubble and NASA

~ Glenn Chaple – Observing Committee and VP ~

## Membership Report . . .

Membership count as of January 25, 2015 is at a healthy 296 individuals. At the same time last year, membership was calculated to be 288 members in good standing.

Our new and returning members include Shashank Araokar, Destin Heilman, Christina Sage, Kyle Hendrie, Aditi Dass, Michael Langlois and Dennis Bechis. Please take the time to introduce yourself to our newest members.

Please also remember to sign up for the ATMOB-Announce and ATMOB-Discuss mailing list for up to date information on club openings and interesting astronomy related discussions.

Contact me with questions regarding this option at: [membership@atmob.org](mailto:membership@atmob.org).

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 ~*

## Dino Argentini – In Memoriam . . .



Dino Argentini speaking at the Springfield Telescope Makers meeting. Photo:Paul Vallei

Dino Enzo Argentini, Jan. 18, 2015, age 90+

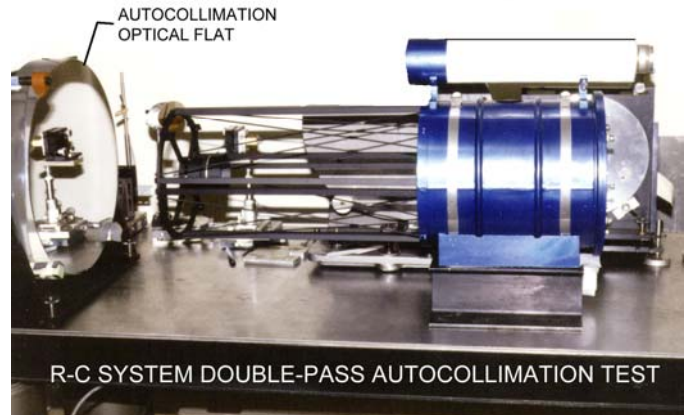
It is with great sadness that I report the passing of my astronomical friend, Dino. Dino was Secretary and then Vice President of the Amateur Telescope Makers of Boston, Inc. in the 1960's. He also was a volunteer who helped organize and administer the annual "Stellafane" (Shrine to the Stars) conventions in Springfield, Vermont.

Dino is survived by his wife of 61 years, Vivian, whom he loved dearly. Vivian acted as the ATM association Treasurer

during Dino's tenure. He was born in the Bronx, NY on July 4th, 1924. He served in the U.S. Army in the closing year of WWII, protecting the tanks during the assault on Nazi Germany.

After the war, he worked as a research engineer at the Avco Everett Laboratory and was a pioneer in the field of laser weapon systems.

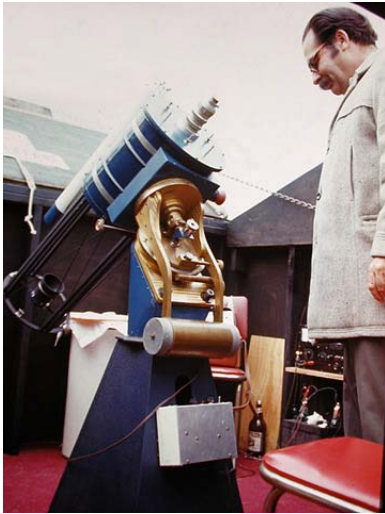
At that time, he and Vivian brought up their children in Danvers, MA. He moved on to Itek Laboratories in Lexington, working on the optical and mechanical problems of aerial reconnaissance. He studied clock making as a hobby. He also studied the design of an advanced telescope concept called the Ritchey-Chrétien, named after the inventors, from the U.S. and France, respectively.



Dino's Ritchey-Chrétien being tested. Photo by Paul Vallei

It is mathematically, one of the best design configurations of all, and is most frequently selected by astronomers for new observatories. The design was selected by NASA for the Hubble Telescope. Dino made a 10-inch Ritchey-Chrétien telescope which won First Place Winner for Mechanical Design and Optical Performance at the 1968 Stellafane Convention run by the Springfield Telescope Makers of Vermont. Dino described the Gaviola test he used at a monthly meeting of the Springfield group and also later, to the Boston association.

He was very active as a Ham Radio Operator - W1N1JN, and a master of music, especially the Hammond Organ. He was a collector of pocket watches and maintained a photographic documentation of each item. He taught Physics, Mathematics, and Astronomy at Brandeis University. He also mastered the Italian language via the internet.



Dino Argentini and his Ritchey-Chretien telescope. Photo by Paul Vallei

He donated his masterpiece telescope to Stellafane via this writer and it is frequently used by visitors from around the country.

In his later years he worked as a watchmaker in Andover, MA, and was qualified as a master horologist, and then retired in Portsmouth, NH. In recent years, he and Vivian resided with their daughter in Beverly, MA.

There will be a private service for his family.

~ Submitted by Paul Vallei ~

## Asteroid (5305) Bernievolz . . .

The asteroid (1978 VS5) discovered by the Palomar Observatory group of E. F. Helin and Schelte J. "Bobby" Bus (University of Hawaii) has been named for ATMob member Bernie Volz.

Congratulations Bernie!

The citation from the IAU (International Astronomical Union) is reprinted below.

The following citation is from MPC 89832:

1978 11 07 Palomar  
89832 Helin, E. F., Bus, S. J.

(5305) Bernievolz = 1978 VS5

Bernard (Bernie) E. Volz (b. 1961) is an American amateur astronomer who served as president of the Amherst Area Amateur Astronomers Association and held several offices in the Amateur Telescope Makers of Boston, including two terms as president. He has organized a number of eclipse expeditions throughout the world.

~ Al Takeda - Newsletter Editor ~

## 2015 Astronomy Conventions . . .

Below is a list of the 2015 dates for "local" astronomy conventions attended by many ATMob members:

### Northeast Astronomy Forum (NEAF)

**Presented by the Rockland Astronomy Club**

Saturday, April 18, 2015 through Sunday, April 19, 2015

SUNY Rockland Community College

145 College Road

Suffern, New York 10901

Highlights: Vendors of telescopes and accessories from all over the world, exhibits, solar observing with all kinds of equipment, lectures, raffle prizes

Also **Northeast Astro-Imaging Conference**

Thursday, April 16 & Friday, April 17, 2015

<http://www.rocklandastronomy.com/neaf.html>

### StarConn

**Presented by the Astronomical Society of Greater Hartford**

**with the kind and generous cooperation of the Astronomy**

**Department of Wesleyan University**

Saturday, June 6, 2015

Wesleyan University in Middletown, Connecticut

Highlights: Lectures, swap tables, vendors, raffle prizes

<http://www.asgh.org/starconn/index.htm>

### Connecticut River Valley Astronomers Conjunction

Friday, July 10, 2015 through Sunday, July 12, 2015

Some ATMob members stay over Friday night to observe; some go only for the day on Saturday

Northfield Mountain Recreation and Environmental Center

99 Millers Falls Road (Route 63), Northfield, MA 01360

Highlights: Solar observing, dark sky observing, lectures, swap tables, raffle prizes

<http://www.philharrington.net/astroconjunction/>

### Stellafane Convention

**Presented by the Springfield Telescope Makers**

Thursday, August 13, 2015 through Sunday, August 16, 2015

Springfield, Vermont

Highlights: Dark sky observing, solar observing, lectures, mirror grinding and telescope making demos, swap tables, raffle prizes

Workshop at the Hartness House to be announced

Thursday, August 13, 2015

Springfield, MA

[www.stellafane.org](http://www.stellafane.org)

~ Eileen Myers - Treasurer ~

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

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**March Star Fields DEADLINE**

**Sunday, February 22<sup>nd</sup>**

**Email articles to Al Takeda at**

[newsletter@atmob.org](mailto:newsletter@atmob.org)

**Articles from members are always welcome.**

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**POSTMASTER NOTE: First Class Postage Mailed February 11, 2015**

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	<a href="mailto:president@atmob.org">president@atmob.org</a>
VICE PRES:	Glenn Chaple	(978) 597-8465
SECRETARY:	Sidney Johnston	(978) 505-9169
MEMBERSHIP:	Tom McDonagh	(617) 966-5221
TREASURER:	Eileen Myers	(978) 456-3937
MEMBERS AT LARGE:	Bruce Tinkler	(781) 862-8040
	Al Takeda	(508) 494-7877
PAST PRESIDENTS:		
2012 - 14	Mike Hill	(508) 485-0230
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2006 - 08	Virginia Renehan	(978) 283-0862
<b>COMMITTEES</b>		
CLUBHOUSE :	John Reed	(781) 861-8031
	Steve Clougherty	(781) 784-3024
	David Prowten	(978) 369-1596
OBSERVING:	Bruce Berger	(978) 387-4189
NEWSLETTER	Al Takeda	<a href="mailto:newsletter@atmob.org">newsletter@atmob.org</a>
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<b>PUBLIC OUTREACH</b>		
STAR PARTY COORDINATOR:	Virginia Renehan	<a href="mailto:starparty@atmob.org">starparty@atmob.org</a>

**How to Find Us...**

**Web Page [www.atmob.org](http://www.atmob.org)**

**MEETINGS:** Held the second Thursday of each month (September to July) at 8:00PM in the Phillips Auditorium, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge MA. For INCLEMENT WEATHER CANCELLATION see [www.atmob.org](http://www.atmob.org) and check your email on the ATMOB-ANNOUNCE list.

**CLUBHOUSE: Latitude 42° 36.5' N Longitude 71° 29.8' W**

The Tom Britton Clubhouse is open every Saturday from 7 p.m. to late evening. It is the white farmhouse on the grounds of MIT's Haystack Observatory in Westford, MA. Take Rt. 3 North from Rt. 128 or Rt. 495 to Exit 33 and proceed West on Rt. 40 for five miles. Turn right at the MIT Lincoln Lab, Haystack Observatory at the Groton town line. Proceed to the farmhouse on left side of the road. Clubhouse attendance varies with the weather. It is wise to call in advance: (978) 692-8708.

**Heads Up For The Month . . .**

**To calculate Eastern Standard Time (EST) from Universal Time (UT) subtract 5 from UT.**

Feb 11 Last Quarter Moon (Moonrise at midnight)  
Feb 18 New Moon, Jupiter at opposition  
Feb 21 Uranus 0.3 deg. S. of Moon - Occultation  
Feb 24 Mercury at greatest western elongation, 27 deg. (morning)  
Feb 25 First Quarter Moon (Moonset at midnight)  
Mar 5 Full Moon  
Mar 8 Daylight Saving Time begins  
Mar 13 Last Quarter Moon (Moonrise at midnight)