



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. 11 December 2015

This Month's Meeting . . .

Thursday, December 10th, 2015 at 8:00 PM
Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

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

Type Ia Supernova Progenitors



NASA/ESA/HEIC and The Hubble Heritage Team (STScI/AURA)

Our December speaker is Dr. Stella Kafka, Director of the [American Association of Variable Star Observers \(AAVSO\)](#). Her talk is titled "Type Ia Supernova Progenitors."

Type Ia Supernovae are massive stellar explosions that result from an interaction between a white dwarf and a companion whose mass it accrues in a close binary system. When the white dwarf's mass reaches 1.4 that of the Sun, the supernova occurs. Dr. Kafka has been at the forefront of studies as to the kind of binary systems that produce Type Ia supernovae.

Dr. Kafka is the current Director of the American Association of Variable Star Observers (AAVSO), having been selected to the position in February of this year. When she published her first astronomical research paper 15 years ago, then-Director Janet Mattei was one of her co-authors.

After obtaining her Bachelor's of Science degree at the University of Athens, in Greece, Dr. Kafka moved to Indiana University, where she earned a Master's and a Ph.D. in Astronomy, with a double minor in Physics and Geophysical Sciences. There she received the Hollis and Grete Johnson Award for Excellence in Graduate Student Research. After completing her Ph.D., she held a series of prestigious postdoctoral positions and fellowships, first at the Cerro Tololo Inter-American Observatory in Chile (CTIO, where she received the National Optical Astronomy Observatory Excellence Award), then at Caltech, and finally as a NASA Astrobiology Institute Fellow at the Carnegie Institution of Washington. She has extensive experience gathering, reducing, and analyzing photometric and spectroscopic data; has helped commission two different instruments at the WIYN Observatory in Arizona; and written a data-reduction manual along with more than 40 refereed papers. As a member of the "Stellar Populations" working group for the Large Synoptic Survey Telescope (LSST, the large professional facility that will image the whole sky every few nights starting around 2020), she contributed to the LSST science book.

In addition to serving as the Director of two research and mentorship programs for undergraduates while in Chile, for the past three years Dr. Kafka has been managing editorial, marketing, financial, business development, operations, and production aspects of journals at the American Institute of Physics (AIP). As a journal manager at AIP, Stella successfully oversaw the launch of a new journal and served as a liaison between publishing and research communities.

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 . . .

An obvious plus to belonging to an astronomy club like ATMoB is the ability to meet with other astronomy aficionados (after all, they're relatively rare) on a regular basis. Are there other perks? Read on!

At an ATMoB meeting some years ago, long-time member Tal Mental brought a pair of Barska 15X70 binoculars. He raved about the quality, considering a price that was half that of similar-sized binoculars from name companies like Orion or Celestron. I gave Tal's Barska a try and was sold! I ordered a pair the next day.

When mine arrived, I discovered that the alignment was off. "The price was too good to be true" and "You get what you pay for" were thoughts that crossed my mind. But Tal's Barska worked magnificently. Rather than sending mine back for a

replacement or cash refund, I went to ATMoB's resident telescope/binocular fix-it man, Tony Costanzo. Tony gave me clear instructions on how to make the proper adjustments. I did, and my Barska 15X70s worked magnificently.



15x70 X-Trail Binoculars. Copyright 2015 Barska

A few nights ago, the skies were wonderfully crisp and clear. I decided to relax and put my Barska 15X70 binoculars to work. I toured the clusters of Cassiopeia, including NGC 7789, NGC 457 (the E.T. Cluster), and M52. With a sweep from the foot of Gemini through the heart of Auriga, I picked up in rapid order M35, M37, M36, and M38. Most spectacular was M31, the Andromeda Galaxy. Never had I seen its spiral arms so dramatically – and I was observing from my back yard and its mag-5 skies!

Thanks, Tal and Tony, for helping to make such a memorable evening possible. Thanks also to the many ATMoB members whose help and advice over the years have made for smooth sailing during my cosmic forays. The social aspect of ATMoB membership is nice, but there's so much more!

~ Glenn Chaple – President ~

November Meeting Minutes



Kelly Beatty *

Minutes of the ATMoB meeting held November 12, 2015 in the Phillips Auditorium at the Harvard-Smithsonian Center for Astrophysics.

Eileen Myers distributed 2016 *Astronomy* magazine calendars and 2016 Royal Astronomical Society of Canada Observer's Handbooks to club members who pre-ordered.

- Club President Neil Fleming called the meeting to order at 8:00 pm.
- Phil Levine gave the Secretary's report.
- Eileen Myers gave the Treasurer's report.
- Tom McDonagh gave the membership report. If any members have issues with receiving the Club Newsletter, magazine subscriptions, club dues, contact Tom at membership@atmob.org.
- Glenn Chaple gave the Observing report; Glenn asked the membership if anyone had an interesting observation to report.

Eileen Myers mentioned a very bright bolide at the Clubhouse on Sunday night Nov 8th. <http://www.amsmeteors.org/fireballs/faq7/#1>.

Two members made mention of the "Halloween" asteroid, 2015 TB145. Al Takeda reported that he took images of the asteroid, and plans to add them to the ATMoB website when image processing has been completed.

Glenn then listed a number of interesting objects for observation:

The Leonid meteor shower is prominent on Nov 17-18.

Two upcoming occultations:

On Nov 26 the Moon occults Aldebaran in the early morning hours.

On Dec 7 the Moon occults Venus around noon

<http://asa.usno.navy.mil/SecA/olist15.html>.

The Sue French Sky and Telescope object of the month is NGC 7243 (C16). <http://simbad.harvard.edu/simbad/sim-ref?querymethod=bib&simbo=on&submit=submit+bibcode&bibcode=1999AGAb...15..117B>.

Glenn recommended checking out the Las Vegas Astronomical Society (LVAS) website. The LVAS observing object of the month is NGC7789, an open cluster in Cassiopeia <http://www.lvastronomy.com/observing-challenge>.

The observing object of the month was the Saturn Nebula, NGC7009 <http://messier.seds.org/xtra/ngc/n7009.html>.

- Steve Clougherty gave the Clubhouse report. Much was accomplished during recent work parties to make observing more enjoyable, and help prepare for the upcoming winter months. Steve mentioned now is a good time for members to become more familiar and be certified as users/assistants for the different observatories, see Steve Clougherty if interested. The next work party at the Clubhouse is scheduled for Nov 28th.

- Announcements:
Bernie Kosicki has repaired/refurbished a club telescope, which is being donated to Hanscom Air Force Base for base personnel to use.

Upcoming Star Party Nov 16 at the KANE Elementary School in Marlborough, volunteers always appreciated.

- Old Business: none
- New Business:
Neil Fleming informed the membership he is stepping down as Club President, and Glenn Chaple has assumed the position. The membership gave Neil resounding applause in appreciation for his work as Club President. Neil also mentioned Sidney Johnson is stepping down as Club Secretary, and Phil Levine has graciously volunteered to take on that role. Mike Hill stepped up and thanked Sidney Johnson for his work as Club Secretary, much applause ensued from the membership in appreciation for Sid's contributions.

Eileen Myers let the membership know about the Club's New Year's Eve Party, which falls on the Thursday evening of December 31st. A Pot Luck dinner, live music, dancing, and fun for all attending is forecast.

Tony Costanzo reported that Gary Hand's, Hands on Optics store will be closing but he will continue to process on-line orders.

Mike Hill provided refreshments for the evening.

Neil introduced this month's guest speaker as Kelly Beatty, a *Sky and Telescope* Senior Editor and ATMob member. Before Kelly began his talk, he brought membership up to speed on current status of the Massachusetts Light Pollution Bill.

Kelly Beatty's talk was entitled: "Pluto's Amazing Story". Kelly gave an interesting narrative, which included historical background on the discovery of planets and asteroids in our Solar System, and presented up-to-date information from the New Horizons mission.

Astronomers in the late 1700's and early 1800's used the Titius-Bode Law to mathematically predict the location of previously undetected planets in the Solar System.

http://www.astro.cornell.edu/academics/courses/astro201/bodes_1aw.htm . Application of the Titius-Bode Law seemed to account for 4 "missing" planets in the area between Mars and Jupiter. In the early 1800's, asteroids Ceres, Juno, Pallas and Vespa, were

discovered and given planetary status, until dozens of similar objects were detected in the 1830's, in what we now call the asteroid belt. Thus the current controversy surrounding the status of Pluto is not the first time the astronomical community has been concerned with the topic of planetary debate.

A series of astronomers, including John Herschel, Percival Lowell and William Pickering, believed more planets remained to be discovered, due to observed/perceived irregularities in the orbits of the known planets. Enter Clyde Tombaugh, who at the age of 23 was hired to work at the Lowell Observatory, and given the task of locating a planet beyond Neptune, given the name "Planet X". Utilizing a large astrograph, imaging on large glass plates, and using a binocular blink comparator, Clyde Tombaugh detected Pluto close to the area predicted by Percival Lowell.

Kelly gave a review of events which led to the re-evaluation of Pluto as a planet. In 1976 methane ice was detected on Pluto, which meant Pluto was a small icy planet with a relative small mass, rather than a larger rocky planet. In 1988 an occultation of Pluto indicated there is an atmosphere present, due to a slight slope in the light curve observed. By 1992 a large number of other objects were found in what we now call the Kuiper Belt. In 2005, an object thought to be larger than Pluto was discovered: Eros. Given the increased number of sizable objects in the Kuiper Belt, a full-blown debate ensued as to how to define planetary status.

The IAU has come up with a set of conditions to qualify an object for planetary status: it has to be an object which orbits the Sun, the object has to have enough mass to be round, the object needs to have enough mass/gravity to have cleared the surrounding "neighborhood" of debris.

The remainder of the talk gave an update on highlights of the New Horizons mission. Returned images revealed craters, fissures, cracks, and movement on the surface of icy "slurry". Large mounds with holes on top of icy volcanoes were observed, suggestive of warming from beneath the surface. Kelly indicated that Pluto has an amazing amount of geologic diversity and one would have to retreat all the way back to Mars before finding another body in the Solar System with more diversity. Methane ice can account for the reddish color seen in the images transmitted back. Some areas of Pluto contain ancient craters, other areas are smooth, suggesting material has risen to the surface, and reformed over previous surface area. "Mountains" of methane ice appeared and a cold thin atmosphere seems to cling close to the surface. Carbon monoxide gas was detected, which perhaps will help to reveal even more geologic information in the future. Like Earth and our Moon, Pluto and Charon are locked together in an orbital rotational period, such that the far side surface is not in view. Kelly ended by indicating only 20% of the data from New Horizons has been tapped, with more data yet to be received and analyzed. Next stop for New Horizons is another object further out in the Kuiper Belt with an arrival date of New Year's Day 2019.

The meeting ended 9:30 pm.

~ Phil Levine - Secretary ~

Membership Report . . .

Membership count as of November 25, 2015 is at 267 individuals. This is one more member than at the same time last year. The average number for the year is 299 members.

I get numerous calls and emails each month regarding Sky & Telescope subscription renewal notices. While I enjoy speaking with fellow club members, I do sense the frustration many feel in receiving these notices. I understand the main reason for this occurrence is that S&T prints shipping labels two months in advance. If your membership renewal occurred during this period, you may receive these notices. If you have recently renewed your subscription through the club, it can take from two to three months for renewal notices to stop. Please ignore these notices. You can contact S&T directly at 1-800-253-0245 with questions regarding your subscription. The responding representatives are helpful and have up to date information regarding subscriptions.

Please do contact me if you have not received your monthly issue. Eileen, our treasurer is very diligent and responsive in paying out subscription payments as they arrive and it is very rare for a delay in delivery that can be attributed to club related processing.

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

Robert Lembree
James Karos

Charles Leiserson, Jr.
Jun Yang Ramaswamy

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.

Contact: membership@atmob.org, (617) 966-5221

~ Tom McDonagh – Membership Secretary ~

Clubhouse Report . . .



Joe Henry refurbishing the 6-inch Dobsonian *

November 2015 Clubhouse Report

We had a total of 26 volunteers to help out at the November work party which took place on Saturday, November 28th. Outdoor work, including lawn mowing, tree trimming and brush removal, is essentially complete for this year, and we now await the snow!

Several indoor projects were completed this month, thanks to the efforts of many volunteers. Mike Hill tackled the near barn and the Clubhouse attic, which included organizing and cleaning those areas. Surplus telescope equipment has been moved to the clubhouse attic, while the barn loft has been re-organized so that finding hardware, metal stock and other equipment is much easier.

The former "Evaporator Room" has been cleaned and surplus equipment has been moved out. Thanks to Slav for fixing the double door. Two large club scopes have been moved into this area from the first floor telescope room, thus freeing up much needed space. Many thanks to Dave Prowten and Al Takeda for their work. The 1st floor scope room now has a clear work bench with tools for telescope repair, while the second bench holds several eyepiece kits for the club telescopes.

Work has begun on refurbishing club telescopes. Joe Henry worked on the 6-inch Newtonian Dob loaner scope while Dave Prowten assisted one member with a scope balance problem. We would like to continue this telescope rehab effort throughout the Winter and additional volunteers will be needed.

Bruce Berger conducted a training session for the ATMob Research and Imaging Observatory (ARIO) and he plans to offer additional sessions in the near future due to popular demand.

We would like to thank Bruce Berger and Dick Koolish for their recent donations of a new band saw AC cord and a sledge hammer and shovel.

Many thanks go out to the lunch crew for all of the great cooking!

Please note that we will make every effort to keep the Clubhouse observatories and observing pads clear of snow during the Winter months. We will need to ask for your help with shoveling and clearing these areas following any snow storm. Please consider helping out for an hour or two when such a need arises; we will once again make these announcements through the ATMob announce list.

The following members and friends volunteered during the month of November: Bruce Berger, John Blomquist, Glen Chaple, Paul Cicchetti, Steve Clougherty, Karl Dean, Jeffery Dean, Joe Henry, Dick Koolish, Rob, Kat and Margo Lembree, David Long, John Maher, Mike Mattei, Vladislav Mlch, Nkosi Muhangi, Eileen Myers, Dave Prowten, Dan and Julie Sage, John Reed, Phil Rounseville, Art Swedlow, Al Takeda and Sai Vallabha.

The next work party is scheduled for Saturday, Dec 26th.

~ Clubhouse Committee Chairs ~

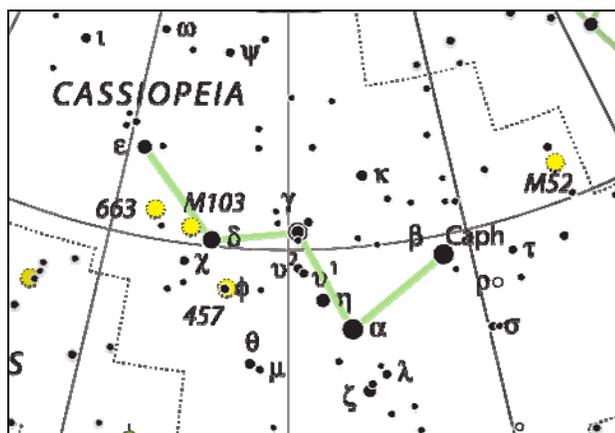
~ Steve Clougherty, John Reed and Dave Prowten ~

Clubhouse Saturday Schedule		
Dec 5	Paul Cicchetti	John Reed
Dec 12	Eric Johansson	Tom McDonagh
Dec 19	Steve Clougherty	Glenn Meurer
Dec 26	WORK PARTY # 13 Prep. for New Year's Eve	
Dec 31	New Year's Eve Party	

Sky Object of the Month . . .

December 2015

Messier 52 – Open Cluster in Cassiopeia



IAU/Sky and Telescope

If you're a fancier of open star clusters, Cassiopeia is the place to be. Among the best of the Queen's numerous open cluster offerings is Messier 52.

In binoculars and finder scopes, M52 appears as a fuzzy patch and remains mostly nebulous when viewed with small-aperture telescopes. My 3-inch f/10 reflector at 30X shows a triangular haze about 10 arc-minutes across and interspersed with a handful of tiny stellar specks. An 8th magnitude star located at the westernmost apex of the triangle gives M52 an appearance not unlike that of the "Wild Duck" Cluster, M11. The similarity isn't coincidental. Like M11, M52 is extremely rich and densely packed. Many dozens of stars, from magnitudes 9 to 13, greet the eye of anyone viewing M52 with a large scope and moderately high magnification. In all, the cluster contains about 200 stars.

You can find M52 by tracing an imaginary line from Shedir (alpha [α] Cassiopeiae) to Caph (beta [β] Cassiopeiae) and extending it about 6 degrees beyond. M52 lies less than a degree south of the 5th magnitude star 4 Cassiopeiae and appears in the same low-power field.

M52 was discovered by Charles Messier on September 7, 1774. Its exact distance is uncertain, but a commonly-stated value of 5000 light years yields a true diameter of about 19 light years.



freestarcharts.com

~ Glenn Chaple – Observing Committee ~

Lunar Eclipse Star Party . . .



Total Lunar Eclipse. Image by Bruce Tinkler. September 27, 2015

I had planned to have a nice quiet night photographing the lunar eclipse from the Estabrook School field in Lexington, MA, however, when I got there, there were probably 50 or so parents and students from the school already there! No, it was not a school event. It turns out that it was also the Chinese celebration of Autumn. They had informally gathered to celebrate and watch the eclipse together.

So I did what I usually do, and set up a telescope and binoculars on a tripod for them to use, and offered some ideas on the eclipse and astronomy in general, often in regards to questions they asked me. It was like a star party!

Here is the newsletter where we included Mr. Tinkler's photos and anecdotes. <http://lps.lexingtonma.org/Page/2934>. Please extend our sincerest thanks to him on behalf of our school community. I was so touched that he would share with us so generously.

Most sincerely,
Sandy
Sandra A. Trach | Principal
Estabrook School
117 Grove Street, Lexington, Massachusetts

~ Submitted by Bruce Tinkler - Member at Large ~

Happy New Year

Get Ready
to
PARTY

New Year's Eve Party at the ATMoB Clubhouse

WHERE CAN YOU go to celebrate First Night of 2016 with your family and friends and not have to drop a bundle of money? The ATMoB Clubhouse in Westford of course!



Festivities on Thursday, December 31st will start at 6:30 pm and will go on past midnight. You can arrive at any time since there will be 8 opportunities 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 (7PM local time), and continuing hour after hour through Eastern Standard Time (midnight local time), with a couple of half hour celebrations in between.



Please come and join the fun, and bring your family and friends. Pot luck dinner, so please bring something to share: an appetizer, salad, entrée, dessert... Folks will be arriving and leaving all evening. There will be plenty of non-alcoholic beverages. No RSVP is needed.

The clubhouse will be warm. Moonrise will be around 11PM, allowing plenty of time to take a peek at your favorite winter stars and galaxies, so bring your telescope or look through a club scope. Don't forget your warm observing clothes and boots. The forecast looks good (ok, so it is a bit too early to know) but the party is on even if cloudy or rainy.



There will be easy line dancing again this year, led by Julie Kaufmann, and we are hoping to have live music again too.



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

Hosted by Eileen Myers, Al Takeda, and the Clubhouse Committee Revelers

Public Outreach Event at The Center School in Stow, MA . . .

On Monday, November 23rd, four ATMoB members helped out new ATMoB member Li Zeng at a public outreach event which Li led for The Center School, an elementary school in Stow, MA with grades Pre-K to 5. Telescopes were set up by Paul Courtemanche (who brought 3 observing instruments and used them all), Michael Brown, Eileen Myers, Bob Toop, and Li Zeng. The event was for the entire school student population (and parents), and the teachers appreciated our support with their first annual Astronomy Night. You may remember that Li Zeng is a 6th year PhD graduate student in the Astronomy Department at Harvard University, and he was our guest speaker at the April ATMoB meeting in the Phillips Auditorium. Those of us who set up early went inside and watched an awesome Prezi presentation which contained some important solar system knowledge.

The thank you emails sent out after the event were heartwarming. They explain why we do star parties for kids.

Dear Karen (2nd grade teacher and organizer), Eileen, Robert, Paul and Michael,

Thanks a lot for organizing and helping out the observation tonight!

We have inspired a lot of kids and we hope their momentum in astronomy will carry on.

Really appreciate all your help!

Special thanks to Christine, the Media Relations Manager at CfA, for guidance and support, and to my beloved Pali teacher, Beatrice, for making the connection happen!

Li Zeng

...and another thank you...

Thank you all so, so much for a wonderful experience for the children (and grownups) last night. It was a fantastic evening which I am sure will have inspired many of the children's imaginations. They are very lucky to have had the chance to learn from you all.

Karen and Li, thank you so so much, it was a huge success, fun and perfectly pitched for the little ones to understand and learn.

Christine, thank you very much for being open to doing this and for all you contributed to it. The fruit idea was great (scale of the solar system using fruit), I'm sure some time when they're eating or having PE in the cafeteria/gym, some of them will remember the spaced out fruit and think about it!

Eileen, Robert, Paul and Michael, thank you so much for coming out and letting us use your wonderful telescopes, and

talking to the students. I won't forget that view of the moon's craters for a long time.

I'm so happy that my children and many of Stow's young children were able to have that experience.

Thank you!

Beatrice Chrystall

~ Submitted by Eileen Myers - Treasurer ~

Comet C/2013 US10 (Catalina) . . .

For the early risers among us, an aberration in the form of a "hairy star" is rising to meet the dawn. Comet C/2013 US10, discovered by the Catalina Sky Survey, is visiting us for the first and last time. The comet has already passed perihelion and has brightened to 5th magnitude.

The diagram below traces the comet's path from December 6th thru January 1st at 5 am EST. C/2013 US10 will be getting higher in the sky but will be getting dimmer as we approach the end of the year 2015.



Path of Comet C/2013 US10 (Catalina) from Stellarium

~ Al Takeda – Newsletter Editor ~

Editor: * Photos by Al Takeda unless otherwise noted.

**January Star Fields DEADLINE
Sunday, December 27th**

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

Articles from members are always welcome.

POSTMASTER NOTE: First Class Postage Mailed December 5, 2015

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

EXECUTIVE BOARD 2015-2016

PRESIDENT: Glenn Chaple (978) 597-8465

VICE PRES:
SECRETARY: Phil Levine (781) 956-6509
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
2010 - 12 Bernie Kosicki (978) 263-2812
2006 - 08 Virginia Renehan (978) 283-0862

COMMITTEES

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 Standard Time (EST) from Universal Time (UT) subtract 5 from UT.

Dec 7 Venus 0.7 deg. South of Moon. Occultation 17:41-18:45 UT

Dec 11 New Moon

Dec 14 Geminid Meteors peak (18:00 UT, 13:00 EST)

Dec 18 First Quarter Moon (Moonset at midnight)

Dec 21 Winter Solstice

Dec 23 Ursid Meteors peak (02:00 UT (21:00 EST Dec 24))

Dec 25 Full Moon

Jan 2 Last Quarter Moon (Moonrise at midnight)

Jan 8 Quadrantid Meteors peak (8:00 UT, 03:00 EST)