



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. 12, No. 1 January 2001

This Month's Meeting...

Thursday, January 11th, 2001, at 8:00 PM
Phillips Auditorium, Harvard-Smithsonian
Center for Astrophysics

This Month's Meeting...

THIS MONTH'S speaker will be Dr. Steve Murray. After receiving a BS in Physics from Columbia, and Ph.D. in Physics from CalTech 1971, Dr. Murray went to American Science & Engineering in 1971 just after the launch of the UHURU satellite, the first X-ray astronomy mission, and so became involved in X-ray astronomy almost from the beginning of the field.

Dr. Murray moved to the Center for Astrophysics in July 1973 when the CfA was first formed as a member of the High Energy Astrophysics Division (one of the original 7). He is presently the Director of the High Energy Astrophysics Division, a position held since 1992. He began working on X-ray detectors in 1972 and developed the first high resolution imaging detector for X-rays. Following a series of sounding rocket flights in the mid 1970's, the detector was part of the Einstein Observatory focal plane - the HRI (High Resolution Imager) that flew in 1978 on the first ever non-solar X-ray telescope. An improved version of the HRI also flew on the ROSAT mission (1990) and operated for almost 9 years. The Chandra Observatory includes a greatly expanded version of this instrument now called the High Resolution Camera which includes a detector optimized for large field imaging, and a second detector optimized for reading out a transmission grating spectrometer.

In addition to work in X-ray detectors, Dr. Murray has been involved in the analysis and interpretation of X-ray observations and sources with particular interests in X-ray emission from clusters of galaxies (he was part of the discovery team that first determined that X-rays were being emitted from hot gas in

clusters). Dr. Murray made the first high resolution image of a supernova remnant (Cas-A) using the Einstein Observatory, also later observed with ROSAT and Chandra. He worked on the study of the Cosmic X-ray Background and carried out Deep Surveys using Einstein, ROSAT and Chandra to understand the sources of this background. He has made X-ray observations of virtually all classes of celestial objects from stars to quasars.

Dr. Murray's talk is called "The Chandra X-ray Observatory - What is it, and What is it Seeing?"

Join us and our most excellent speaker for dinner at 5:45 PM at the Changsho Restaurant located at 1712 Mass Ave. in our fair city, Cambridge.

President's Message...

WHILE I was in Florida visiting my parents, I had a chance to see the Christmas Eclipse. I purchased a pair of solar filters at the Calusa Nature Center and Planetarium located in Fort Myers, FL, which, by the way, has one of Russell Porter's Garden telescopes displayed in the lobby of the planetarium. Since I did not bring a telescope or binoculars, simple visual observing was the preferred method. I must admit that after seeing my first total eclipse in Aruba in 1998, a partial eclipse is still fun to see, but lacks the spectacular power and awe a total eclipse provides. I'm still hoping that by some last minute chance I'll get to go to Zimbabwe to see the total eclipse.

There are lots of planets to be seen now. Jupiter, Saturn and Venus are quite impressive in the evening sky, but the planet I'm looking forward to seeing is Mars when it will be up in June. Earth and Mars will pass closely and Mars will be very bright. For those of you who like to make telescopes, a great planetary telescope to make would be a 6" f/10 reflector. The primary mirror does not have to be parabolized. Since the primary is spherical it could be polished very smooth, and smooth optics are important for planetary work. A trick to optimizing this scope's performance for planetary work would be to use an extremely small secondary. The secondary should only obscure the primary by 8 to 10 percent. (I do not know where to purchase such a small diagonal! Does anyone know where to purchase an elliptical diagonal with a minor axis of 0.48" to 0.60"?) This 6" scope would perform as well as a 5" refractor but with perfect color correction. I would not use a cardboard tube but an aluminum tube to keep the optics in good rigid alignment. Believe it or not, many amateur telescopes have secondaries that vibrate. You can not physically see the secondary vibrate, but if the secondary vibrates by just a few wavelengths of light the image you see through the eyepiece will not appear very sharp. It is important to use a research quality spider for your secondary. Join us on Thursday night at our clubhouse and make a great planetary telescope to use this Summer.

-Bob Collara, President-

December's Minutes...

THE 732nd meeting of the Amateur Telescope Makers of Boston, including the Bond Astronomical Club, was opened by President BOB COLLARA. To honor the holiday season and all things emanating from the North Pole, our own multi-talented

elf TAL MENTALL retold the story of "A Visit From St. Nicholas" as reported by Clement Clarke Moore: " 'Twas the night before Christmas..." Next Tal related a darker story, "The Night I Cremated Sam Magee" by Robert Service, a tale about a gold miner on Christmas day in the bitter cold of the Yukon. The poetry reading continued with BOB COLLARA, who recited "The Star-Splitter", written by Robert Frost. This poem is included in the 1924 Pulitzer Prize winning "New Hampshire" collection, and tells the story of Brad McLaughlin, who

"...burned his house down for the fire insurance
And spent the proceeds on a telescope
To satisfy a life-long curiosity
About our place among the infinities."

The three poems can be found on the Internet:

<http://www.nyise.org/moore/>

http://members.aol.com/acadac/poems/s_mcgee.html

http://www.everypoet.com/archive/poetry/Robert_Frost/robert_frost_the_star_splitter.htm

Bob asked CHARLIE MCDONALD to introduce our guest speaker, Dr. Andrea Prestwich of the CfA, who is working at the Chandra X-ray Center. Charlie related how he had invited Dr. Prestwich to speak at the Marblehead Community Charter Public School - a Project Astro school. With the help of the school principal, her originally planned talk to the school's twenty-five member astronomy club turned into an all school assembly. (Editor's note: Charlie would also like to thank ATMob's Webmaster BREWSTER LAMACCHIA for updating the club's website with a photo taken of the presentation.)

Dr. Prestwich was part of the team which discovered a new, medium-sized type of black hole. She gave an overview of X-ray astronomy, neutron stars, white dwarfs, and black holes, which are accreting binary systems, and explained that X-rays are detected from material as it gets dragged onto these compact objects (6-15 solar masses). It is now believed that what produced the energy seen as a quasar is actually accretion onto a black hole which is millions of solar masses. These quasars occur in the centers of galaxies. The host galaxy around it is much fainter and hard to detect, and often has a red shift of 4. Since looking back in time we don't see many quasars, speculation now is that some or all galaxies sometime in their lives went through a quasar phase. Lurking in the hearts of nearby galaxies must be massive black holes.

She spoke about starburst galaxies which have a higher star formation rate of 1-10 solar masses of material being converted into stars every year, while our galaxy converts one-tenth of a solar mass into a star every year, forming 1-2 stars every year. Starburst galaxies have more high mass stars and star formation is very violent. The stars don't live for very long - ten million years for an O star. There are many supernova explosions. This cumulative star formation is short lived. The starburst galaxies are associated with interactive and merging galaxies. Huge active central black holes in galaxies are often seen to have a star burst going on around them.

Possibly in starbursts, since there is a disproportionate number of high mass stars being formed, some of these stars will form black holes at the end of their life. Perhaps lots of these galactic sized black holes coalesce to form one big black hole,

which since it is heavy it sinks into the center of the galaxy. The black hole swallows stuff and gets bigger and bigger.

M82 is interacting with M81 and is a starburst source. There are overlapping supernova remnants and solar winds which are producing the energy seen in radio images. Chandra sees hot gas from the super winds from the hot stars and point sources of X-rays. One particular spot, not in the center of M82, is variably very bright - 100 times brighter than the black hole sources in binaries in our galaxy. It is probably around 500 solar masses. - mid-way between the black holes seen in our galaxy and the "monsters" seen in the heart of quasars. There may be a connection between starbursts and making "monsters". This might be a "monster" in the making. It may also give a clue as to how quasars formed in the early universe.

At the business meeting the officers present gave their reports. Details were given on the December 25th Solar Eclipse and the New Year's Eve party. DICK KOOLISH showed photos he took at the October work party, including the pouring of cement for the barn floor and the repairing of the section of the observing field dug up by the cement truck. DAVID SCHUH has made a new pitch tester, and using it poured six new laps for members who are polishing mirrors. BOB DUVAL (Editor's note: Bob is making a 6" f/9 for the club) spoke about "Plop" - free software from the University of Toronto which does finite element analysis of a mirror. Plop shows how to build mirror cells that outperform conventional ones by using CAD to optimize the cell design. For information and to download the software, see:

<http://www.eecg.toronto.edu/~lewis/plop/>

Secretary EILEEN MYERS read the minutes of the November 19th executive board meeting. DAVID AUCOIN showed photos of his recent wedding.

MARIO MOTTA announced that the new observatory being built will be named after ED KNIGHT, the "grandfather" of the club. He joined the club in 1952. Ed still has his original receipt, which shows he paid \$5 dues and \$10 for a kit for mirror making. Ed is always ready to use his engineering skills on clubhouse repairs, whether for making a new foundation or repairing the furnace. He has been an active participant in the club for almost 50 years. Ed received a standing ovation.

MARIO announced that he will be the coordination chairman for the IDA (International Dark-Sky Association) meeting which will be held in Fall 2002. There will be international speakers, and the Boston Museum of Science will have special displays on light pollution. It was proposed that the ATMob become a co-sponsor of the meeting. Mario is looking for a few club members to help out, and for any corporate donations. Mario, followed by MATT BENDANIEL, showed some of their most recent astrophotography.

-Eileen Myers, Secretary-

Membership Report...

CONGRATULATIONS TO DAVE and MARYLOU AUCOIN, ATMob's newest newlyweds. Dave reported on his honeymoon cruise, "The weather was always around 75° - 80°, a few showers at night and a very few clear nights. I used the telescope only once and that was on the second to last night of the voyage. But it only showed the objects moving up and down because of the 4 ft. - 8 ft. waves."

As of the December cutoff date for our members to renew, we stand at 321 paid members in the club.

We have several new members this month. We warmly welcome: DAVID AGUILAR, Allston; STEVEN HIRSCH, Arlington; PAUL SOUNTSOV, Chestnut Hill; RACHEL AUBUCHON, Framingham; AARON PRICE, Waltham; DAVID GOLDBIRSCH, Medford; KEVIN SNELL, Chelmsford; MICHAEL SIEDZIK, Chelmsford; JACK LONG, Wellesley; RAMON BENET, Westford; and ROBERT HENLEY, Framingham.

The club wishes to extend its condolences to MARSHA BOWMAN on the loss of her mother.

-John Small, Membership Secretary-

Treasurer's Report...

FOR THE month of November, we had \$1,087.32 in revenue and \$1210.82 in expenses for a net loss of \$123.50 for the month.

As of November 30th, 2000 our assets were:

Checking Account - Regular	\$19,631.54
Investments	\$18,553.21
Total Current Assets	\$38,184.75

Of the total, \$2,229.41 is in the Land Fund and \$160.00 is for clubhouse key deposits.

-Bernie Volz, Treasurer-

Clubhouse Report...

SATURDAY OPEN CLUBHOUSE SCHEDULE

Jan 6	CLOSED	WORK PARTY # 1
Jan 13	John Small	Gary Walker
Jan 20	Dave Richardson	Jim Suslowicz
Jan 27	Eric Johansson	Al Mazurka
Feb 3	Steve Clougherty	Phil Rounseville
Feb 10	OPEN	WORK PARTY # 2
Feb 10	David Prowten	Eileen Myers
Feb 17	Tom Wolf	Bruce Berger
Feb 24	MESSIER	MARATHON
Feb 24	Bruce Gerhard	Art Swedlow
Mar 3	Lew Gramer	Dan Feldkhun

IN SPITE of cold weather and shortened daylight hours, five intrepid members continued to work in the clubhouse at Work Party #10. A grinding room window with a broken frame was replaced. Work started on meeting room repairs. A telescope storage rack, built by DAVID PROWTEN, was installed in the telescope storage room. The day's events were documented by DICK KOOLISH's camera. Thanks go to PAUL CICHETTI, BOB COLLARA, BRUCE GERHARD, DICK KOOLISH, and DAVE PROWTEN.

A big thanks to MIT for plowing the oval driveway around the clubhouse between the Saturday 12/30 snow storm and the New Year's Eve star party. This was accompanied on Sunday afternoon by four hours of snow blowing by PAUL CICHETTI, DAVE PROWTEN, and JOHN REED. This provided a clear parking area on both sides of the clubhouse as well as an expanded observing path on the Milon Observing Field and a large path to the 17".

This area should provide enough room for anyone who wishes to use their telescope at the clubhouse.

The first work party of the new millennium will be on Saturday, January 6th, commencing at 10 a.m.

-John Reed, Clubhouse Director-

Stars Shine New Year's Eve...



Photo by Nitin Sonawane

THE NEW Millennium was welcomed in at the clubhouse in grand style, at least grand style for amateur astronomers. About twenty-five ATMobers and family members were on hand, eating and drinking (yes, there was a little of the bubbly), watching Mir pass by, Io's shadow transit, drawing lunar craters, answering astro quiz questions, winning prizes, observing many fine celestial objects through the 17", and of course sitting around eating, talking and getting better acquainted. A HUGE thank you to PAUL CICHETTI, DAVID PROWTEN, and JOHN REED for the hours and hours of snow blowing (12" fell Saturday). The observing field, parking lot, and paths all around the clubhouse were cleared and made easy to walk on. Thank you PAUL CICHETTI for judging the lunar crater drawing contest. Thank you MARION HOCHULI for bringing and playing your guitar. Thank you SAI VALLABHA for coming early to help with the setup and the decorations. Thank you DAVE AUCOIN. You are a Master Observer. The views of M42 using Dave's filtered eyepieces were fantastic. Thank you STEVE HERZBERG for pointing out that in the constellation Cassiopeia, Eta Cas B appeared purple/lavender in the 17". Thank you JOHN REED for co-hosting the evening. Thank you to everyone who brought the yummy food. The skies were clear, the food never ran out, and the last partygoers left at 1:30 a.m.

By the way, for all you at the party who kept on nagging me about which time zone's New Year's we were celebrating every hour, here is the list:

- 7 p.m. EST = midnight Greenwich Mean Time - London, Dublin, Lisbon, Casablanca, Iceland
- 8 p.m. EST = midnight Azores, Cape Verde Islands
- 9 p.m. EST = midnight Mid-Atlantic - Palmer Station, Anvers Island, Antarctica
- 10 p.m. EST = midnight Newfoundland, Brasilia, Buenos Aires, Cayman Islands
- 10:30 p.m. EST = midnight St. Johns, Newfoundland
- 11 p.m. EST = midnight Atlantic Time (Canada), Caracas, La Paz
- 12 a.m. EST = midnight Eastern Standard Time. So there!

-Eileen Myers-

Star Party Announcement...

CHARLIE MCDONALD is planning a star party at the Killam School in Reading on Monday, January 29th. Rain dates are set for the next several evenings.

-Rich Nugent, Observing Committee-

Shuttle Atlantis Launch Visibility...

THIS JANUARY, the Space Shuttle Atlantis is scheduled to launch towards a rendezvous with the International Space Station. This up-the-east-coast nighttime ascent will be visible, weather permitting, from the New England area!

Currently set for "no earlier than" January 19th at 2:25 a.m. EST, Atlantis will be visible low (10 to 15 degrees altitude) in the south about 7 1/2 minutes after launch. Remember, main engine cutoff occurs about 8 1/2 minutes into the mission and external tank separation comes only 11 seconds later. After that, you can try to follow the Orbital Maneuvering System engine bursts, but by then the "firefly effect" makes this difficult.

The show is over after 2-3 minutes but, in my humble opinion, well worth the loss of sleep! I'm planning to be at the club meeting in January so we can chat more about all of this then.

-Rich Nugent, Observing Committee-

The Club History is now on the Web for Proofreading only...

THANKS TO BRUCE BERGER, the history of the Amateur Telescope Makers of Boston (including the Bond Astronomical Club), compiled by club Historian ANNA HILLIER, is now on a temporary website and is ready for your proofreading.

E-mail, write, or phone me and I will give you the address of the website. Please proofread the history for content and accuracy, as well as the usual grammar, spelling, etc. Send your comments to me at starleen@ma.ultranet.com or to Eileen Myers, 73 Westcott Rd., Harvard, MA 01451. If you have no Internet access and would like to proofread the history, call me at 978-456-3937 and I will get you a copy to proofread.

We hope that all older members, past presidents, and indeed all past club officers will especially enjoy reading and remembering the details of the history and will add their recollections and comments. The proofreading period will be for five months (through May). The final version will be put on www.atmob.org in June/July. Happy reading!

-Eileen Myers, Secretary-

Total Lunar Eclipse on Tuesday, January 9th...

OBSERVERS IN New England will be able to observe only the final partial phases of the eclipse as the Moon rises. Moonrise is approx. 4:29 p.m. EST. The Moon leaves the Earth's umbra (central shadow) at 4:59 p.m. EST. The Moon leaves the penumbra at 5:58 p.m. EST.

You may recall the hype that surrounded the Full Moon in December 1999 when it was announced that the Moon was supposedly the brightest in a century. It wasn't true. This month there will really be a bright Full Moon. Both the Moon and Earth lie closer to the Sun at this Full Moon, and the Moon lies closer to the Earth, all of which makes it brighter. An even more important factor is the opposition effect. Whenever the Moon lies directly opposite the Sun in our sky it appears brighter. At most Full Moon's, our satellite passes a few degrees from this favored location, but as the January eclipse affirms, the Full Moon lies extremely close to this opposition point, making it exceptionally bright.

Castor and Pollux will lie 8°-10° north of the Moon. The Beehive cluster M44 in Cancer will be 17° to the east. Jupiter, Saturn, and the Pleiades will be visible 50° west of the Moon.

-Eileen Myers-

"Enter the Black Hole"...

HAVE YOU looked at www.atmob.org lately? Double click and fall into Webmaster BREWSTER LAMACCHIA'S newest creation, "Enter the Black Hole". Watch out! You'll recognize some of your friends in there! Thanks Brewster.

ATMoB Camping /Astronomy Trip - January Update...

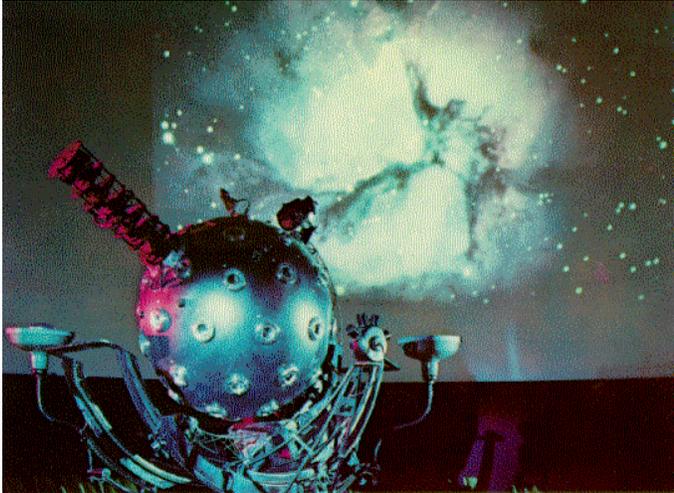
THERE ARE 15 parties (25 people in all) who have signed up for the Baxter trip for various dates within the Thursday, July 12th through Monday, July 23rd slot. The camping fees have been mailed.

Anyone else who is interested may contact me at: steve-mock@excite.com for details or send their fees in directly to the park as part of the ATMoB camping party in the NORTHERN half of the NesowadnehunkField group SITE.

-Steve Mock-

Latest Sunrise on January 4th at 7:14 a.m. Boston...Did you notice?

THE REASON why earliest/latest sunrise/sunset do not coincide exactly with the solstices is because mean solar time is not the same as true solar time. The difference is caused by (1) the inclination of the ecliptic with respect to the celestial equator, and (2) the slight eccentricity of the Earth's orbit: while rotating at essentially constant speed, Earth is traveling faster around its orbit at some times (January) than at others (July), thus changing its angle with respect to the Sun at different rates.



Seymour Planetarium, Science Museum, Springfield, MA

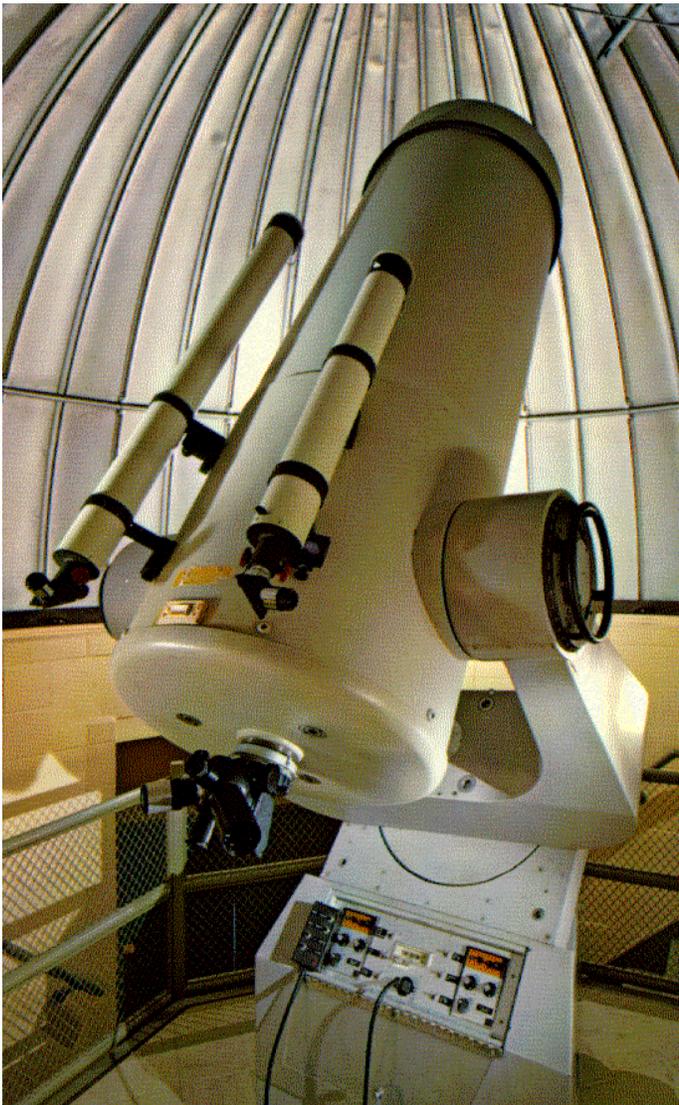
A Visit to the Springfield Science Museum...

ON DECEMBER 8, 2000 JOHN REED and I were invited by Springfield Stars amateur astronomers Richard Sanderson and Jack Megas to tour the museum and the visiting Hubble Space Telescope exhibit. Richard is the museum's Curator of Physical Science and Jack lectures in the Planetarium and is well known to amateurs as a major participant in The Conjunction held every summer in Northfield, MA.

Having never been to Springfield before, I found the openness of the city surprising and was particularly impressed with the arrangement of four museums and the city library on a quadrangle in the heart of the city. After a great lunch in a Lebanese restaurant with our hosts, we visited the Science Museum. Although small, it is attractive and well laid out, featuring an Eco-Center, African Hall, Dinosaur Hall, Mineral Hall and Planetarium.

We first visited a very attractive and interactive exhibit of the Hubble Space Telescope on tour from the Smithsonian Institution and the Space Telescope Science Institute. It featured a six foot model of the Hubble, displays of stunning images taken with the scope, and interactive learning centers. Next we got a tour of the Seymour Planetarium - the first American-made optical planetarium, designed by Dr. Frank Korkosz and opened in 1937. Jack and Richard demonstrated many of the beautiful special effects such as auroras, panoramas of the surface of Io, etc., which they use in planetarium shows. Later in the day, we attended a star show in the planetarium, seeing the refurbished Korkosz "single ball" instrument put through its paces. Our final visit was to the observatory on the roof of the museum. There we saw the 20-inch SCT donated and built by the Springfield Stars Club. The mirror was made, like the ATMoB 20-inch, from one of the five test banks for the 200-inch Palomar telescope. It was completed in 1973. They had to grind down an irregular Pyrex pour (more like a chunk) into a circular mirror blank. . Our 20" may have been a later pour. (Editor's note: Does anyone know of any written or oral history concerning the early stages of our 20" blank?) Besides being used by club members, this scope is open for public sky viewing on a regular basis. If you want to see the HST exhibit, head out to Springfield soon because the exhibit will only be there through January 28th.

-Ted Poulos-



20-inch Reflecting Telescope, Science Museum, Springfield, MA

 ATTENTION
 February *Star Fields* deadline is SUNDAY, January 28th
 email articles to ATMoB Secretary/*Star Fields* Editor
 Eileen Myers at starleen@ma.ultranet.com
 Articles from members are always welcome.

POSTMASTER NOTE: First Class Postage Mailed January 5, 2001

Amateur Telescope Makers of Boston, Inc.
c/o John Small, Membership Secretary
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Westford MA 01886-4225

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How to Find Us...

Web Page www.atmob.org

MEETINGS: Held the second Thursday of each month (September to July) at 8:00PM in 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 mid-afternoon 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 farm house 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 January...

Subtract 5 from UT to get EST.

Wed Jan. 3 - Quadrantid meteors peak..

Sat Jan 6 - Saturn 2° N of Moon

Tues Jan. 9 - Full Moon, **Total Lunar Eclipse**. Moon is in Gemini. See article inside this issue.

Wed Jan 10 - Moon reaches its second closest perigee distance of the year (357,130 km). Extra high tides.

Mon Jan 15 - 6:36 UT Double shadow transit on Jupiter - Io, Ganymede.

Mon Jan 15 - 5 UT Venus 1.8° NW of asteroid Juno.

Wed Jan 17 - Mars 4° S of Moon.

Fri Jan 26 - Mercury 3° N of Moon. Look for half-lit phase. of Mercury.