



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. 21, No. 4 April 2009

This Month's Meeting...

Thursday, April 9th, 2009 at 8:00 PM

Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

Parking at CfA is allowed for duration of meeting

The April meeting will feature Mr. Robert Benoit, Manager of the Optical Division and Optical Systems Engineering at SSG Precision Optical in Wilmington, MA. He first spoke to the club on July 2006 and is returning to talk about the Near Earth Asteroid Rendezvous (NEAR) telescope.

Mr. Benoit, with a degree in applied physics, brings 20 years of experience in optical systems project management and is responsible for overseeing all aspects of fabrication of optics for SSG's flight telescope systems. Some of Mr. Benoit's accomplishments include work on the following projects:

- CLAES – a cryogenic IR spectrometer in polar orbit used to characterize the defects in the earth's ozone layer.
- MICAS - a multi wavelength integrated camera and spectrometer on board NASA's Deep Space One spacecraft, which rendezvoused with Comet Borrelly.
- HSI/OMS – a hyper spectral imaging telescope aboard NASA's ill-fated Lewis spacecraft
- CIRRI 1A, SPIRIT 2, – space shuttle and rocket borne cryogenic IR spectrometers used by NASA/DOD to characterize the earth limb
- SBV and SPIRIT 3 – visible and IR telescopes on board the DOD's Midcourse Space Experiment (MSX) spacecraft, used to characterize the earth limb and atmosphere

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...

As I write, "Earth Hour" has just ended and 100 Hours of Astronomy will soon begin. The question came up at our last Executive Board meeting of what the ATMoB will do to support International Year of Astronomy (IYA). The questions should have been "what are we currently not doing to support the IYA?"

We support approximately thirty star parties per year, open up our monthly meetings to the public, field many non-member emails and phone calls on where to observe, how do I use my telescope, etc. All of this is cheerfully done by volunteers in their free time and for no reimbursement! What else can we do? Well, ATMoB member John Sheff arranged with the city of Cambridge for four consecutive nights of sidewalk astronomy this month and Chuck Evans will be hosting a star party for his neighborhood during the 100 Hours of Astronomy. If any member has an idea for celebrating the IYA and needs help from the club, please contact me or one of the executive board members. It is individuals who make things happen, not organizations.

An article on last month's Chelmsford Historic Society star party really struck a chord with me. The Chelmsford Independent gave a short description on how ATMoB member George Paquin got his start in astronomy. While only about a paragraph in length, the story fascinated me and set my mind back to the age of nine when the astronomy bug first bit me.

There wasn't one "ah-ha moment" that led me to astronomy, rather a number of things that happened during that young age. NASA's manned space flight program was in full swing and it captured the imagination of many a youngster. Also a box of books donated to my family had included "The Golden Book of Astronomy". It had seasonal sky charts, some basic astronomy that a child could understand and descriptions and pictures and addresses of the Palomar and Yerkes Observatories to which I wrote and received return, packets of information– a big thrill for a youngster.

Couple all of these events with living in a dark sky area before the advent of today's distractions (malls, cable TV, etc.) and it's small wonder, I found myself spending many nights under the stars with a planisphere and a sleeping bag learning the constellations. Who'd have thought I'd still be this fascinated so many years later?

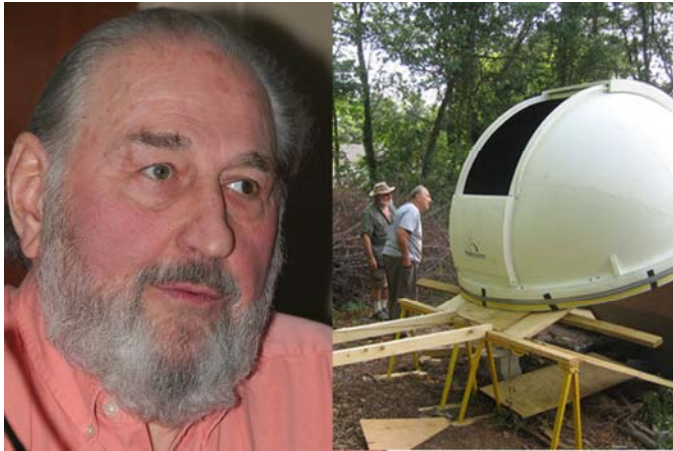
It would be great to hear from members on how our hobby first called to them. If so inclined, drop a paragraph or two to me or Al Takeda and we'll put your experiences in future issues of Star Fields.

Clear Skies,

~ *Stephen Beckwith, President* ~

March Meeting Minutes . . .

The March meeting of the Amateur Telescope Makers of Boston was a “Members Night” which featured talks by Paul Valleli, Mike Hill, Tom Janzen and Dick Koolish.



Paul Valleli spoke about his progress on his backyard observatory. Named the Marrett Pines Observatory he issued a cautionary intimation: “Warning, making your own observatory may be hazardous to your health.”

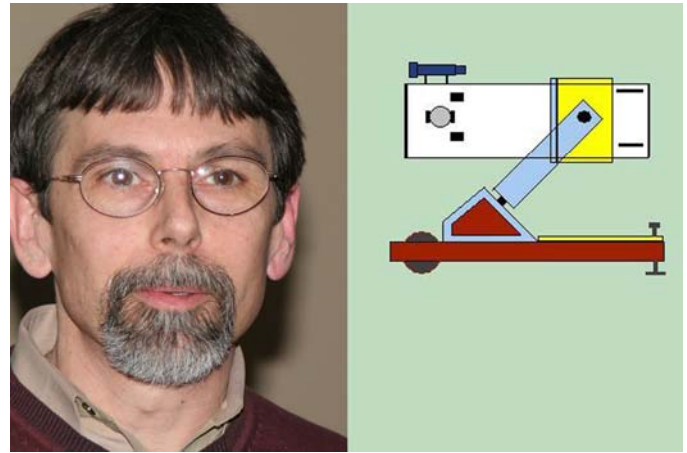
Paul started by showing his first roll-off observatory that he built when he first moved to Burlington in 1974. At the time it housed a Celestron C-8 Schmidt-Cassigrain telescope. After the roof rusted through 10 years ago and later when the ball bearings for the tracks fell out, he decided to tear down the metal structure and build a new observatory.

The original pier and concrete pad were the only structures left when they started the project. By April of 2008 he started to frame up a 10 ft by 12 ft by 6.5 ft structure. In May the structure was ready for the dome and with the help of John Reed and Chase Green they tried lifting it up with an engine hoist and laminated beams to form a crane. Due to the unanticipated twisting of the beams and the marginal safety factor they discarded this method. With the help of Al Rifkin (STM member), Paul proceeded to use a ramp and an electric winch to move the dome to the top of the observatory.

With the dome in place Paul mounted his Meade LX200R scope onto the pier using the aforementioned motor hoist. A 6 inch refractor and other video accessories were added at a later time.

While working inside the observatory, Paul slipped on the polished Italian porcelain glazed tiles that he had installed. This caused a major concussion which required a trip to the hospital. He now has foam floor material on top of the tile.

In conclusion, Paul showed some video that he had shot of the Moon using a Phillips ToUCam.



Mike Hill talked about his 10-inch Newtonian project. He became enamored with fork mounted telescopes such as the Palomar Schmidt telescope and the Lick 120-inch scope. After seeing a particular mount in Patrick Moore’s book, *Astronomical Telescopes and Observatories for Amateurs*, he felt that the fork mount was the system for him.

His first scope that he built was an 8 inch that he took to Stellafane in 1974. This scope has been changed to a truss system and then the mount was turned into an alt/az then to a German equatorial and then back to an alt/az system again.

About ten years ago, Mike decided to build a larger 10 inch system. Five years ago he finished the mirror but the project languished for a few more years. Two years ago he finally decided that it was time to tackle the project.

He started by drawing up plans for the optical tube section and decided to use a two part sonotube design. Cardboard tubes have various problems with finishing but by using wood filler he was able to hide a lot of rough edges and mistakes.

Next he built and assembled the yoke assembly which contained a section that can rotate the tube. He then moved on to the base and polar axis fabrication and assembly. All of his plans were made to a 1:1 scale so that he could have a proper fit.

Recently Mike made the base which is a wheel barrow style assembly which includes 2x4 pieces of his 120 year old Victorian house. He also drew up plans and recently completed work on the fork assembly.

The telescope system is almost completed and is now ready for the final painting and finishing. Mike noted that “when you build a telescope that you cannot plan everything up front and things happen as you need them.”



Tom Janzen spoke about digital astrophotography with a camera placed upon a German equatorial mount. He has been experimenting with this technique for a couple of years because it is a new challenge in using his camera and to push its capabilities. He has even used some of the astrophotography techniques in his daylight images.

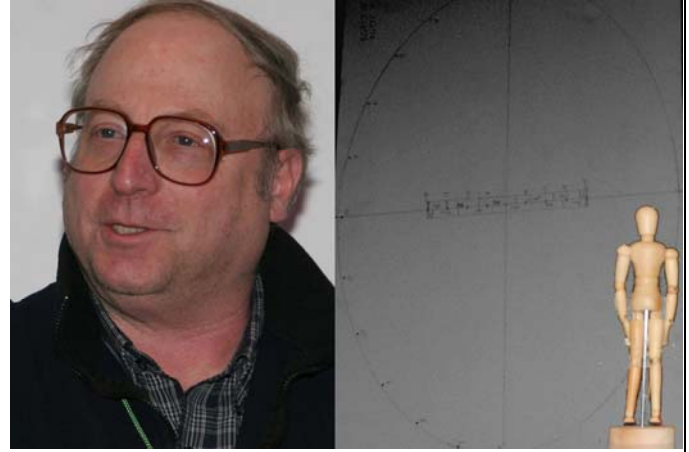
As soon as he purchased his first digital camera, an Olympus C3030, he was taking pictures of the sky. He then purchased an Olympus D5050 and recently he moved to a Canon XSi with a 55-250mm lens. The latest combination gives him a 5.5 degree sky field on the major axis.

Before he acquired a mount he was taking stereograms, lunar eclipses and other night and evening images of short duration. Having a maximum exposure of 15 seconds (Olympus cameras) and using wide angle shots, Tom was able to keep star drifting to a minimum.

In 2006 he purchased the Orion EQ-1 German equatorial mount with a right ascension drive motor/controller for \$160. With this setup and the Canon XT camera, Tom started to learn how to polar align the system to allow him to use the lens at the 250mm range.

Tom showed the group some comet images, a wide field showing the Andromeda galaxy, the Orion nebula, the Moon and constellation images.

Most of his recent images are stacked photos with dark images taken to try to reduce electronic noise from the camera. He uses the free image processing program GIMP to stack and adjust the brightness levels of his images.



Dick Koolish happened to be reading a bulletin board at Robbins Park when he came upon a Friends of Robbins Farm Park notice talking about the construction of a sundial. He emailed the group and offered his services.

The group was trying to build an analemmatic sundial which would allow a vertical object, such as a person, to project a shadow toward the hour numbers on the perimeter of the outer ellipse. Depending upon the latitude the ellipse would be a different shape and the numbers would also be in a different place.

Normally the construction of a permanent sundial is a long term project that would take permissions, funding, presentations to the Parks and Recreation Committee and other legal issues. What the Friends of Robin Park wanted to accomplish was to draw a chalk analemmatic sundial on a big cement area during an event called Field Day being put on by the park. Dick was asked to compute all of the numbers.

Before he presented his results to the group, Dick made a scale model on a foam-core board. "There were no hour lines on his model because lines would radiate from the different positions and would overlap during the year." Dick plotted the points first and drew the ellipse later. He used a small wooden puppet figure to check that the shadow was falling at the proper position. This would simulate the shadow of a 4 foot child reaching the hour points.

In a practice session he determined solar noon and using a plumb bob marked a spot on the cement. He marked 3 more spots to create the North-South line. They marked out a grid and computed the numbers and plotted the X/Y to get the points.

The completed dial was about 10-12 feet in one direction and about eight feet in the other.

Mario Motta did an impromptu presentation showing some images from his visit to Alan Delman's home in Arizona. Alan is a long-time member of ATMoB and was present that evening. His new home is situated near 3 major observatories, the Wipple Observatory, Kitt Peak Observatories and Mount Lemmon. Mario concluded with an image of Alan in an interesting costume.

Alan Delman "thanked the group for all of the knowledge and great speakers, the Clubhouse and everything."



(L-R) Mario Motta welcomes Alan Delman to the March meeting

Al Takeda gave the Secretary's report on last month's meeting and the Executive Board meeting results from February 17, 2009.

Membership Secretary, Tom McDonagh, reported that there were 314 total members. Tom made a plea for the membership to find new members and to invite them to join.

Steve Beckwith presented the Treasure's report.

Clubhouse Committee Chairman, John Reed gave the Clubhouse report. He repeated the names of the volunteers listed in last month's *Star Fields* and thanked them for their help. Work continues on the workshop and a lot of indoor work is progressing. Another work party is scheduled for the weekend of March 14th.

Steve Beckwith gave the Observing Committee report. A "Youth Night" will be taking place at the Clubhouse. If a member has younger relatives that might be interested in astronomy, bring them up to the Clubhouse once a month to learn about the sky. The plan is to have this take place on the first quarter moon Saturday of every month.

In response to the town of Groton planning to place a lighted ball field less than a mile away from the Clubhouse, Bernie Volz and Bernie Kosicki attended a town meeting and read the club's position to be included into their meeting minutes.

Another meeting was taking place in Westford because an auto dealership was being proposed in that town. John Small, Kelly Beatty, Gary Jacobson, Eric Johansson and Glenn Meurer met with the town and the representative from the auto dealership. The planning appears to be early in the process so our input may have a beneficial effect.

Announcements:

Earth Hour and the Messier Marathon - March 28.

Tom McDonagh reported that the town of Acton was the 1st Earth Hour town in Northeast.

Mario Motta announced that the American Association of Variable Star Observers (AAVSO) has placed their entire "Hands on Astrophysics" program (for school systems) online. The program that used to cost \$200 dollars can now be downloaded for free. Please inform your local teachers that this resource is now available. www.aavso.org.

Mario is also meeting with Senator Creem on March 27th to discuss the Dark Sky Bill.

Joseph Rothchild reports that the Space Shuttle launch is now scheduled for Sunday, March 15th.

Charlie McDonald has some NASA materials to pass out. One is called "Star Child" which is good for children K-12. He also mentioned that NASA also has a [catalog](#) of items that are being given away for free (only charging the shipping cost).

John Sheff mentioned that he and Kelly Beatty made a presentation to the Cambridge city council about light pollution. The city is also going to take part in Earth Hour.

John also announced that he has opened up the 9 inch refractor on the roof for observing Saturn.

~ Al Takeda, Secretary ~

Clubhouse Report . . .

MARCH 2009

March gave some relief from winter's grasp. The last snow pile dwindles as this report is submitted. Mud is now with us; some firming under foot has been noted. Spring? The work session on Saturday March 14th started with the temperature near freezing. Twenty-two (22) members signed the log during the day and their help is greatly appreciated. The accomplishments included:

- The sky and telescope binding project was completed by Eileen Myers, Nina Craven, Dave Siegrist, and Sai Vallabha.
- The office cleanup continued by Anna Hillier, Eileen Myers, and Nina Craven.
- Application of joint compound continued in the near barn by Mike Hill, Bruce Berger, and Dave Prowten. Several additional sessions were undertaken to smooth and sand the walls and ceiling.
- Gravel was added to the driveway soft spots by John Blomquist, John Maher, and Dave Siegrist.

- Basement cleanup/old wood removal continued by Paul Cicchetti, John Blomquist, Tom Calderwood, John Maher, Eric Johansson, and Dick Koolish.
- Snow fence repair was completed by Dick Koolish and John Reed.
- The 20" Shapley reflector optical tube was removed from its rocker box, and mirror removed from the cell to allow recoating by Research Services in Revere Beach. This took the efforts of Dave Prowten, Steve Clougherty, Al Takeda, Paul Cicchetti, John Blomquist, John Maher, Art Swedlow, Tom Calderwood, Dick Koolish and John Reed. The boxed mirror was placed in the truck and delivered by Ed Knight, Art Swedlow, and John Reed to Don and Steve Jaynes the following Monday. The successfully applied overcoated aluminized mirror was picked up the following week and returned to the observatory by Dave Prowten and John Reed. Cleanup of the system precedes the anticipated return to the optical tube and remounting at the next work session.
- Paul Valleli donated several items to the clubhouse: tree loppers, B&D skill saw, large radius compass, Steel rule, adjustable micrometer, and height transfer stand. Thank you Paul for thinking of the club.
- The last Bailey Hill spaghetti lunch of this season was served by Sai, Art, Eileen, Nina, Eric, Al and John; was enjoyed by all. Next month starts Burgers & Dogs on the grill lunches. Join us!

More members are using the clubhouse; the Thursday mirror activities, the Friday Astronomy class, and Saturday night observing continue to be supplemented by the clear-night call of the sky. Thanks to all our volunteers who make this possible and secure.

We rely on the sign-in-log to ensure this report is accurate. Many folks share their talent on multiple projects. We may have missed some details, so keep us on track by signing in when you visit the club's house and note what was accomplished on the log sheet for that date. Thanks for your attention to this.

The next work session is **Saturday, April 11th** at 10AM. Outside/grounds, observatory, and inside projects will provide plenty of work for all of us who can volunteer a few hours. See you on **APR. 11!**

Work Party Rescheduling . . .

Work Party #5 which was originally scheduled for May 9th has been rescheduled for **Saturday, May 2nd** due to a scheduling conflict with the Clay Center Star Party.

Messier Marathon . . .

The Clubhouse will be hosting a Messier Marathon on New Moon Saturday, April 25th.

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



(L-R) John Blomquist, John Maher, Dick Koolish and Dave Prowten lift the telescope structure away from the 20 inch mirror. Image by Al Takeda

Clubhouse Saturday Schedule

Apr 11	John Maher, Art Swedlow–Work Party	
Apr 18	Shilpa Lawande	Nitin Sonawane
Apr 25	John Blomquist	Bill Toomey
May 2	Gary Jacobson-John Small -Work Party	
May 9	George Paquin	John Reed
May 16	Brian Leacu	Phil Rounseville
May 23	Brian Maerz	Sai Vallabha
May 30	Chuck Evans	Tom Lumenello
	ATMoB 75th Anniversary Picnic	

Membership Report . . .

Membership as of 4/1/2009 - 318 members.

The club is always looking to recruit new members. If you know of any individual that may enjoy the benefits and camaraderie associated with membership, please feel free to invite them to a monthly meeting. You can also forward their contact information to me via the membership@atmob.org address.

The Amateur Telescope Makers of Boston, Inc. is a 501(c)3 organization. Donations are gladly accepted and are tax deductible to the extent allowed by law. While the deadline for 2008 charitable donations has past, please consider making a tax-deductible contribution to the club when planning for 2009 and beyond.

All members are encouraged to seek out and welcome our new and returning club members:

Angelike Triant
Brian McDonagh

Fred Pinkerton
Cathy Longley-Cook

~ *Tom McDonagh, Membership Secretary* ~

Monthly “Youth Nights” . . .

Monthly youth nights will be starting at the ATMoB Clubhouse on May 2nd and will continue on the Saturday that is nearest the first quarter moon of the month. This will not be a star party. The goal will be modest: show the sky to the kids and give them a solid understanding of what they’re observing (i.e. telescopes, moon phases, double stars, nebulae, etc.).

Each evening will begin inside in the library with a discussion on basic astronomy and, weather permitting, a follow-up under the stars and at the eyepiece of a telescope.

1. The program is open to the relatives of members ages 9 to 17.
2. All children must be accompanied by an adult who is responsible for the safety and behavior of the children they bring.
3. The Youth Nights are NOT open to the general public.
4. Please sign-up in advance via the calendar section of the website AND send an email to the people below with the ages of the children that will be attending. This information is important for planning the appropriate program for younger and older children.

Steve Beckwith: stevebeckwith@comcast.net

Virginia Renehan: vrenehan@gis.net

Bernie Kosicki: Kosicki@verizon.net

Spectroscopy Seminar . . .

ATMoB member Sidney Johnston will be teaching a class in basic spectroscopy at the ATMoB Clubhouse on Saturday, April 11th at 4:30 pm. The class will be hands on and Sidney will bring several diffraction gratings and his spectroscope.

Below is a description of what to expect.

- 1A. We will observe diffraction using diffraction gratings.
- 1B. We will become familiar with first order diffraction using the grating of 1,000 lines per millimeter, and with higher orders of diffraction using the gratings having fewer lines per millimeter.
- 1C. We will work with the grating equation if there is interest, which is:

$$N(\text{wavelength}) = (D) \text{Sin}(\text{angle of diffraction})$$

Where D is the spacing between openings of the grating., in meters, or more usually in nanometers - so, bring your calculator.

2. Using the spectrometer and one of the gratings, we will observe the spectra of:
 - a. Hydrogen, Oxygen, Neon, Mercury, and the molecule carbon dioxide using gas discharge tubes.

- b. The continuous spectra of a hot body, a light bulb filament, will be observed.

- c. A fluorescent light bulb.

- 3A. With one of the gratings, we will calibrate a spectrometer using Hydrogen for known photon energies (H alpha - red, H beta - blue, and H gamma - violet).

- B. With this calibration, we will measure the wavelength of photons obtained from Oxygen and Carbon Dioxide, to see if we can spot the carbon lines.

Advanced reading on light and spectra in a physics textbook (college freshman or high school) will be recommended.

This class is for ATMoB members only.

~ Submitted by Steve Beckwith ~

Sky Object of the Month - April 2009 Saturn’s Moons . . .

Every fifteen years, thanks to the nuances of Earth’s and Saturn’s orbits, Saturn’s rings appear edge-on to our line of sight. During a “ring plane crossing” these incredibly thin ornaments virtually disappear in all but the largest telescopes.

We might bemoan the loss of Saturn’s rings (they are a major draw at public star parties), but without the glare they produce, we can better view Saturn’s retinue of moons. 8th magnitude Titan is the easiest and can be glimpsed in a common 60mm refractor. Rhea (magnitude 9.5), Tethys (10.0) and Dione (10.2) will require 4 to 6 inch scopes. An adventurous skygazer, using a telescope in this size range, might try for magnitude 11.5 Enceladus.

Now that Saturn is past opposition and well-placed in the evening sky, take the opportunity to view and identify some of those moons you’ve never before seen. A moderately high magnification will increase contrast and make the fainter moons more readily visible. Carefully sketch the field, then go inside to confirm your “kills.” If you’re fortunate enough to own a copy of the RASC *Observer’s Handbook 2009*, turn to pages 245-248 for a graphic showing the positions of Saturn’s major moons at any date and time of the year. You can also use *Sky and Telescope’s* interactive Saturn moon finder. Go to www.skyandtelescope.com, scroll down to “Interactive Observing Tools,” click on “Saturn’s Moons,” then submit the date and time of your observation. You’ll need to register to obtain this service, but it’s free.

Take advantage of the current Saturn ring-plane crossing. We won’t experience another until 2025!

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

~ Submitted by Glenn Chaple ~

Thoreau on Astronomy . . .

In running a line through a wood-lot in the southwest part of Lincoln today, I started from an old pine stump, now mostly crumbled away, though a part of the wood was still hard above ground, which was described in his deed of 1813 (forty-six years ago) as a pine stump. It was on the side of a hill above Deacon Farrar's meadow.

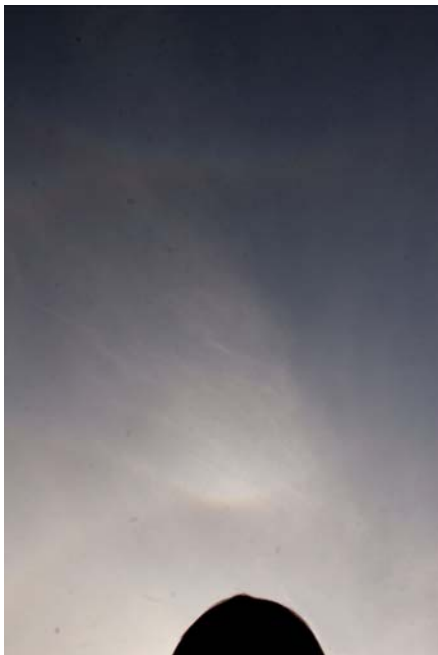
Mr. Haines, who travelled over the lots with us this very cold and blustering day, was over eighty. "What raw blustering weather!" said I to my employer to-day. "Yes," answered he. "Did you see those two sun-dogs on Saturday?" They are a pretty sure sign of cold and windy weather.

Journal 5 April 1859

~ Submitted by Tom Calderwood ~



Atmospherics at the Clubhouse: Saturday, 14March2009, 4:35:01 pm. – Al T.



Atmospherics at the Clubhouse: Saturday, 14March2009, 4:34:21 PM. – Al T.



Eileen Myers showing the Moon at the Harvard Star Party. 31Mar2009. Al. T.

Harvard, MA Star Party . . .

A clear and warm Tuesday evening greeted students, teachers and parents of Harvard's 3rd grade classes as the ATMob members showed the attendees the celestial wonders of the spring skies.

The 5 day old Moon with its craters was a crowd pleaser early in the evening. Later, as darkness fell, the Orion nebula, the Pleiades star cluster, open clusters and the edge on rings of Saturn became a hit.

Later club members were treated to pizza and homemade cookies by our hosts Judy Moore and the PTO.

Thanks go to John Blomquist, Michael Brown, Neil Fleming, John Maher, Eileen Myers, John Reed, Phil Rounseville and Al Takeda for setting up their telescopes. Thanks also to Brewster LaMacchia for setting up his "solar system walk".

~ Submitted by Al Takeda ~



Neil Fleming also observes the Moon at the Harvard Star Party. 31Mar2009.

**May Star Fields DEADLINE
Saturday, May 2nd**

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

POSTMASTER NOTE: First Class Postage Mailed Apr. 6th, 2009

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

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OBSERVING AND PUBLIC OUTREACH

STAR PARTY COORDINATOR:
Virginia Renehan starparty@atmob.org

How to Find Us... Web Page www.atmob.org

MEETINGS: Held the second Thursday of each month (September to July) at 8:00PM in the Phillips Auditorium, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge MA. For INCLEMENT WEATHER CANCELLATION listen to WBZ (1030 AM)

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

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

Heads Up For The Month . . .

To calculate Eastern Daylight Time (EDT) from Universal Time (UT) subtract 4 from UT.

Apr 9 Full Moon
Apr 17 Last Quarter Moon
Apr 22 Lyrid meteors peak, 10 hrs. UT
Apr 24 New Moon
Apr 26 Mercury at greatest eastern elongation (20 deg.) Evening
May 1 First Quarter Moon
May 2 Venus at greatest illuminated extent, 26% lit (mag. -4.7) Dawn
May 9 Full Moon