



Newsletter of the  
Amateur Telescope Makers of Boston  
Including the Bond Astronomical Club  
Established in 1934  
In the Interest of Telescope Making & Using

**Vol. 18, No. 9    October 2006**

## **This Month's Meeting...**

**Thursday, October 12<sup>th</sup>, 2006 at 8:00 PM**  
**Phillips Auditorium**

**Harvard-Smithsonian Center for Astrophysics**

*Parking at CfA is allowed for duration of meeting*

This month's meeting will feature Dr. Hale Bradt, Professor of Physics Emeritus MIT speaking on "The Instrumental Life of An X-Ray Astronomer: Chasing Neutron Stars and Black Holes." Within a year of earning his PhD in cosmic-ray physics in 1961, the field of celestial x-ray astronomy was born with the launch of a sounding rocket by a local research firm. Dr Bradt moved into the field a few years later and has watched it flourish ever since. He flew rudimentary equipment on sounding rockets and then more sophisticated detectors on satellites. He learned that timing, precision and aperture can be as important as angular resolution and that the x-ray sky was full of surprises. Though he did not know it early on, he was looking mostly at neutron stars and black holes. In his talk, Dr. Bradt will present some of the challenges and adventures of doing x-ray astronomy in both early and more recent times.

Professor Bradt, who founded MIT's sounding rocket program in x-ray astronomy in 1967, was co-I on the MIT SAS-3 mission (launched in 1975), a co-PI on the High-Energy Astronomy Observatory, HEAO-1 (1977), and the PI (through 2001) of the All-Sky-Monitor (ASM) instrument on the Rossi X-ray Timing Explorer, RXTE (1995), now in its 11<sup>th</sup> year of operation. Dr. Bradt also plays the violin, currently sings in a chorale group and used to sail his high-performance 17 ft sailboat (a Mobjack). He is now writing his second textbook, *Astrophysics Processes*, his first being *Astronomy Methods* (Cambridge Univ. Press 2004). ATMOB members take note, Dr. Bradt says he has never made an optical telescope.

Please join us for a pre-meeting dinner at 5:45 PM (seating at 6:00 PM) at the Changsho Restaurant located at 1712 Mass Ave. in our fair city, Cambridge.

## **President's Message...**

On Monday, September 25<sup>th</sup>, I attended the New England Summit on Earth and Space Science Education, sponsored by NASA's New England Space Science Initiative in Education (NESSIE). The purpose of the summit was to share information and discuss how we can improve student learning in science and technology. The event was held at the Museum of Science and included K-12 educators, informal educators, engineers, and area scientists. While statistics regarding student interest and performance in math and science are alarming (China with 600,000 graduates in science and engineering per year compared to United States' 6,000), it was heartening to meet so many people committed to improving student proficiency in these important areas. One topic discussed was the importance of informal learning venues for elementary and middle school students as a means to extend classroom concepts, make science real and engaging. Star parties with hands-on observing, telescope demos, and discussions with students are some of the best ways to cultivate student interest in astronomy and science and motivate their pursuit of science and math related learning and careers.

We have a number of star parties coming up in October and I hope many of you will attend; this includes events in Belmont, Waltham, Lowell, Acton, and Meredith, NH. For new members, come with or without a telescope. Learn what a star party is all about. There are members available to walk you through the paces. Never has improving science education been so important. For some students this is their only opportunity to look through a telescope and use a tool of science. Help spark their interest - open a window on the universe. It is a lot of fun. Check the star party listing on the website for dates, times, directions, and other relevant information. For those planning star parties in your hometown or school district don't forget to check the star party schedule. It is preferable not to have events overlap since our pool of telescope volunteers is limited. Remember that we need volunteers!

At the clubhouse, Dave Siegrist and Ed Los are busy leading Thursday night mirror making sessions. We have several members grinding and polishing mirrors. If you want some excellent guidance and tips on the process, don't miss an opportunity to spend an evening with them - they are a great resource. So too, Bruce Berger can often be found at the C14 on Thursday nights experimenting with astrophotography. He would be happy to share his experiences in this area with those interested.

There are two new exhibits at the Museum of Science: a planetarium show, "Destination Moon" which explores the geological history of Earth's beautiful Moon, the phenomena that we see from Earth including Moon phases and eclipses, and the vast influence the Moon has had on mythology and art throughout human history, and the "Weatherwise Exhibit", which takes you through the scales of weather - Global, National, Regional, Local, and Personal with interactives and stunning images. At the focus

of the exhibit is a skill called "nowcasting" or short term forecasting (3-6 hour predictions) based on observations of current conditions and a basic understanding of approaching weather systems. Both exhibits are fun and engaging for students and families.

Don't forget about the Mercury Transit coming up on November 8<sup>th</sup>. The event should be visible in our area around 2pm and last until sunset. Go to <http://sunearth.gsfc.nasa.gov/eclipse/OH/transit06.html> for some good information.

Our new website has been up and running successfully thanks to Bernie Volz, Peter Richardson, Henry Houh, Bruce Berger and Brewster LaMacchia, members of the ad-hoc committee that created the site. We hope to use the new site as a tool to facilitate club functions – such as membership renewal and management. This expanded role will require more permanent and steady oversight by a web committee. I have asked Bernie Volz to formally chair the effort. If other members are interested in contributing to the site or participating in a web committee please let me know. Refer to the May '06 issue of Starfields (which can be found on the website) for specific language regarding web committee responsibilities.

As a reminder, the Executive Committee will hold a Board meeting at 7pm on October 19<sup>th</sup> at the Clubhouse in Westford. If you have any questions, comments or ideas to share concerning club matters, feel free to contact me.

*-Virginia Renehan, President -*

## **Sept. Meeting Minutes . . .**

The September meeting of the Amateur Telescope Makers of Boston featured Jim and Rhoda Morris speaking about their detailed reproductions of Galileo's telescopes. The 2 scopes, the leather presentation and the wooden data collecting scopes, are considered to be the most accurate representations in existence. Built for the Griffith Observatory and the Adler Planetarium they allowed us to handle and comment on the duplicate set they had produced for those exhibitors.

This odyssey began with a trip to the Brimfield Antique Show. Here they happened upon a "beautiful tangent galvanometer". This was the start of their buying and selling of this and other antique scientific instruments. Eventually this led to them to supplying period props to film and TV studios. It was at this time that they produced their first Galileo telescope, which was made of a cardboard tube with a simulated leather cover. The Griffith Observatory at this time was expanding their exhibit area and had noticed the prop on Jim's web site. The Morris' were asked if they could produce a replica of the presentation telescope for Griffith. At about the same time the Adler Planetarium placed a request for a reproduction of Galileo's data gathering telescope.

When Jim and Rhoda started to work on the project, they wanted to make the telescopes as close to the originals as possible. Jim is a Physicist and Rhoda is a Chemist. They realized that since Galileo was also an Engineer, experimentalist, Physicist and Chemist, some of their shared experiences could be brought into the process of rediscovering how to make these instruments. Jim stated that, "I think that if you are going to do a historic restoration or a replica, I think it's valuable to have a lot of experience in the very field of endeavor of the person who made the original."

The research for these instruments took them to the IMMS Technical Museum in Florence where the original telescopes were studied, measured and photographed. Galileo made fifty telescopes but only these 2 survive. The staff at the Adler in Chicago also provided assistance. Information on the lenses, especially the optical grinding issues, was provided by Paul Valleli. "So Paul was very helpful and he represents your club. We thank you".

Numerous details on the original were discovered, such as the main body of the tube not being a solid wooden core but rather a stave construction all the way through. By soaking the tube in resin, all the gaps were filled and the body was strengthened. The length was determined to be 94.8 cm using the "Greco" measurement as well as their own measurements. Also the optics included a negative lens, that provided an upright view, which according to the Morris' provided Galileo with a way to market his telescope commercially.

One of the challenges was the application of the gold stamping on the outside of the telescopes. There are 21 figures and 400 stampings. There was little data on this so the photographs were essential for making the dies for each figure. An artist who restores antique books made a special jig to hold and rotate the tube so that the gold could be applied properly.

At the end of the meeting, the membership was allowed to pick up and inspect the reproductions.

Bob Naeye commented on the Pluto decision by the IAU and showed a few cartoons.

The standard business reports were given.

Bylaw changes were approved by a voice vote. Please refer to the July 2006 newsletter for the text of the changes.

Mario announced some details on the 2009-eclipse trip to China. The cost will be around \$1100. He also showed his 3 inch focuser that he had just finished on the previous night. It is capable of holding 25-30 lbs.

Paul Valleli announced that the Winter Star Party (Feb 12-17) is accepting registrations. He is also working on the 16 in. DOB mirror to reduce stress and weight. Paul is also working on a 2 in. concave mirror for the Schupmann. He also announced that his company is moving to Nashua and that a fair number of optical flats and reference optics might be available to the club. He will need a crew of people, on a 5 day notice, to help pick up these items. He announced that Springfield has decided to make brass

paperweights of Porter's original castings for \$100 to help defray some of the costs of the Hartness House telescope museum.

Anna Hillier has finished a prepublication history of the ATMs.

Eileen Myers spoke about John Davis and his asterism talk at The Conjunction Convention.

- Al Takeda --

## Membership Report . . .

We have two new members to the club;

Nanette Benoit from Gloucester  
Maynard Morin from South Weymouth

Membership dues should be paid up by September 1st.

- Dan Winchell -

## Clubhouse Report . . .

While Dave Prowten and John Blomquist scraped and painted the South side of the house, Eileen Myers and Karen Swedlow painted the second coat of paint on the East barn wall. So started the Sep 2006 work party. By the end of the day the first of 3 barn windows was rebuilt, painted and covered with plywood by Paul Cicchetti, Eric Johansson, and John Reed; the barn loft window was rebuilt and painted by Virginia Renehan, Eric J., and Bruce Gerhard; Mike Hill continued barn loft reorganization/cleanup; and Bruce G. finished his electrical investigation.

John Maher manicured the lawn especially around the observing pads to prevent "sinking"; this followed Brian Maher's 6+ hours of heavy cutting and weed whacking on Friday. Anna Hillier and Virginia Renehan continued the office and library upgrade. Meanwhile Steve Clougherty and Paul C. performed the annual outhouse ceremony. The very vital efforts of Eileen M., Sai Vallabha, and Art Swedlow provided a feast of dogs and burgers that kept the crew's energy at peak value.

Steve C., Dave P., and John R., assisted by Paul C., completed the site survey for the replacement of the Dennis DiCicco doghouse with the Don Dilworth clam shell domed observatory. It was a beautiful day with solar observing at its best. A huge thank you to all for a great work party.

The next work party is Saturday, October 7th @ 10 a.m.. We need to continue the painting while the weather holds; tackle the installation of storm windows over the 2nd floor

windows; trim the trees down the road side of the observing field; and dig the sonotube holes for the clamshell support structure. Food will be an important part of the festivities as we send Sai off on his trip with a delectable lunch. Come on out and join us in our efforts to be ready for the farmer's almanac predicted big winter of observing (no mosquitoes!!).

- John Reed, Steve Clougherty, and Dave Prowten-

## Clubhouse Saturday Schedule

Oct. 7	Closed -Work Party	
Oct. 14	John Drobot	Steven Herzberg
Oct. 21	Ed Budreau	Eileen Myers
Oct. 28	Brian Maerz	Suslowicz
Nov. 4	Closed -Work Party	
Nov. 11	Eric Johansson	Mike Hill

## Executive Board Meeting . . .

The Executive Board will be meeting on October 19<sup>th</sup> at 7 p.m., at the clubhouse in Westford, to discuss club business and proposals.

- Al Takeda --

## Newsletter Corrections . . .

Sept 06: Paul Vallesi's and Ross Barros-Smith's names were misspelled.

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**October Star Fields deadline  
Sunday, Oct. 29<sup>th</sup>**

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

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## Update on Turkish ATMs: One Year Later. . .

I hope you remember my short presentation and my article about the Turkish ATMs on Star Fields last fall.

[http://www.atmob.org/newsletters/NL\\_Sep05web.pdf](http://www.atmob.org/newsletters/NL_Sep05web.pdf)

I ended up bringing mirror making materials and mirror blanks donated by ATMoB to the ATM group last March, when I and my wife had a trip to Turkey to enjoy the total solar eclipse (that was a fantastic event on its own right).

When I met them again to hand the materials over, we also had a brainstorming session on how to further promote the ATM movement in Turkey. I proposed setting up a discussion list in Turkish where ATMs can share their knowledge and help newcomers. They suggested to launch a website where experienced ATMs would write articles on every aspect of mirror and telescope making, and to make this site as the prime resource on ATM in Turkish language. Guess what? We went ahead with both proposals! Since April 2006, the discussion list for 'ATM Turk' (that's how we call the group) has been active on Yahoo ([http://tech.groups.yahoo.com/group/ATM\\_Turk/](http://tech.groups.yahoo.com/group/ATM_Turk/)), and already more than 1,200 + messages have been posted! The informational website (<http://www.atmturk.org/>) has also been enlarging by contributions from many members every day.

These activities rekindled their motivation, and so far at least three members of ATM Turk completed working either on their mirrors or built their Newtonian scopes! After gaining more experience, some of them are also planning to build more complex optical systems, such as Cassegrains and even Maksutovs!

Even more encouraging, three members organized an ATM workshop at the 9th Annual National Astronomy Fest (<http://www.biltek.tubitak.gov.tr/etkinlikler/gozlemgozlem06/index.htm>) and gave a presentation on how to grind telescope mirrors from plate glass. The interest was unprecedented and we believe many more amateurs have been hooked to ATM now.

Among many other endeavors they are undertaking, I can cite making their own diagonal mirrors (at least, one of them so far); making metal mirrors using stainless steel disks; experimenting with producing homemade pitch by using the formula given in John Strong's book, "Procedures in Applied Optics" (1989): coal tar, pine tar, beeswax and venice turpentine!

Another milestone for Turkish ATMs will be the workshop to be organized next summer. The Istanbul Kultur University that hold the first amateur astronomy symposium in 2005, will organize the second one in July 2007. This time, a 2 or 3-day ATM workshop will also be included where an

experienced ATM from overseas will train and provide hands-on experience to this enthusiastic group of people!

As Mike Hill described on the display he prepared and that can be seen at the clubhouse, these folks have the same enthusiastic look on their faces as Russell Porter and his friends had at the turn of the last century! All in all, ATM movement in Turkey is going strong and Turkish ATMs appreciate the continuing support of ATMoB and fellow ATMs.

-- *Haldun I. Menali, Member* --

## Astro Trivia. . .

**Some Incredible Sun Facts.** Our Sun is 92% hydrogen. Its core is 10 times the density of gold and its temperature approaches 16 million degrees. Some 700 million tons of hydrogen is fused into 695 million tons of helium every second. The 5 million tons of the mass that is lost is converted along the way into energy (mostly x-rays) that eventually reaches us as sunlight, solar wind flow, and other forms of solar radiation. Blowing at 800,000 to 5 million miles/hour, the solar wind carries about 1 million tons of matter into space every second. Although this is a lot of mass, the solar wind is very tenuous--millions of times less dense than our atmosphere.

**How The Word Telescope Was Born.** According to author Hirshfeld in his book, Parallax, Prince Federico Cesi and his scientific society held a banquet outside of Rome in April, 1611 in honor of Galileo. After dinner, Galileo thrilled the assembled guests by pointing one of his spyglasses at the moons of Jupiter and the stars of the Milky Way. The host, Federico Cesi, announced that Giovanni Demisiani, mathematician to Cardinal Gonzaga, had devised a name for Galileo's spyglass, one that more aptly conveyed the instrument's capabilities and differentiated it from its crude, low power cousins. The name, Cesi explained, was a melding of two words in Demisiani's native Greek: tele, meaning "far away," and skopeo, "to look." Henceforth, Galileo's instrument would be known as the telescope.

**Tonight As Any Night**, writes Hirshfeld in Parallax, only an infinitesimal fraction of the star's (Gamma Draconis) photons are swept up by my telescope. Others sprinkle the Aqueduct around me like fairy dust, their luminous energy dissolving into the ground as minuscule pulses of heat. Still others leave Gamma Draconis in directions that carry them nowhere near the Earth; some of these might be streaming into a telescope or sprinkling an aqueduct on another world. Nature is profligate with its starlight. Most is not destined for sentient consumption, but falls dumbly onto dust grains in outer space or flies unhindered through the void.

-- *Ted Poulos*--

# Red Light Etiquette...

Seasoned Observers and Old Hands to the hobbies of observational astronomy, astrophotography, and imaging should already be well-versed in the practice of Red Light Etiquette. Here's a short reminder for both Newcomers and Old Timers alike on the whats, whys and hows.

## What Is Red Light Etiquette?

Red Light Etiquette is the avoidance of all extraneous light sources except dim red light while you and others around you are engaged in astronomical observing, photography and imaging: especially important when involving dim objects.

## Why Practice Red Light Etiquette?

For visual astronomy, we practice Red Light Etiquette to optimize observers' visual sensitivity: allowing them to observe more objects, dimmer objects, and more detail in observed objects. Similarly, for astrophotography and imaging, we practice Red Light Etiquette so that stray light does not interfere with the photographic / imaging process.

## How do Courteous Astronomers Practice Red Light Etiquette?

Barring issues of safety, minimize the use of all lights. Yes, this even pertains to red lights! When observing at night, it's really not that dark outside; there is the light of stars, [Moon,] planets, airglow, and artificial light pollution. Just two or three minutes outside in an observing area will give most people the time needed to dark-adapt enough to see other people's faces and equipment without the use of any extraneous sources of light: preserving night vision for things astronomical. Another way to say this – Lights [even red lights] should not be used as an excuse for one's impatience to dark adapt.

If you do have a need for extra light during an observing / imaging session, please make sure that it is:

**Red** - Deep red monochromatic [pure] light is best for preserving dark adaptation.

In a pinch, a red-filtered white light source may do, but be aware that this will compromise the dark adaptation of yourself and others. The reason: most red-filtered white light sources still contain other wavelengths of light [in particular blue-green light.] Our retina's night vision cells [known as "rods"] peak in sensitivity in the blue-green range of the spectrum and are not very sensitive to the red. Since we're trying to avoid non-astronomical light sources that compromise our night vision and visual sensitivity, keep it pure red.

**Dim** – Use your red light at the lowest intensity as is possible.

The brighter the red light, the greater the loss of dark adaptation

**Infrequent** - Whenever possible, use your dark-adapted eye NOT a light source.

Turning off lights when not in use will maintain your night vision extremely well and it saves on batteries too.

**Aimed Downwards** - Do not aim lights into people's faces or onto their equipment. A hands-free headlamp is not an appropriate tool for astronomy when it shines into other people's eyes. Reflected glare off someone's astronomical equipment while you check it out unannounced is often not appreciated

**Cover Up, Turn Off, Close Up** - Turn off ALL lights when not in use.

a) Cover up those pesky LED's associated with your equipment; electrical tape or duct tape works well.

b) Computer screens should be dimmed, reddened, and aimed away from visual observers.

c) Motor vehicle inside and outside lights can be a big nuisance: try to arrive and set up before dark.

(At the very least, turn off or cover up dome lights and other interior lights, and don't forget to inform others in the observing/imaging area before entering or leaving in your vehicle.)

d) Lit tobacco products in an observing / imaging area are [obviously] a no-no in more ways than one.

(Smoke is bad for lungs and optics!!)

e) Close building doors securely behind you when entering and exiting to prevent light leakage.

Save Your Precious Night Vision And That Of Others For Things Astronomical!!

-- Steve Mock --

**POSTMASTER NOTE:** First Class Postage Mailed October 6<sup>th</sup>, 2006

Amateur Telescope Makers of Boston, Inc.  
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## FIRST CLASS

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OBSERVING: Virgina Renehan (978) 283-0862

## 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 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.*

Oct. 7 Full Moon  
Oct. 10 Moon 0.7 degrees N. of Pleiades - 6 hrs. UT  
Oct. 17 Mercury at greatest elongation E (25 deg.) Evening sky  
Oct. 22 New Moon  
Oct. 29 Daylight Saving Time ends  
Oct. 29 First Quarter Moon