ATM of BOSTON Established 1934

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. 19, No. 3 March 2007

This Month's Meeting…

Thursday, March 8th, 2007 at 8:00 PM
Phillips Auditorium
Harvard-Smithsonian Center for Astrophysics
Parking at CfA is allowed for duration of meeting

Enjoy a bit of astronomy history this month as we welcome Dr. Daniel W.E. Green, Astronomer at the Harvard-Smithsonian Center for Astrophysics, Editor of International Comet Quarterly, and Director of The Central Bureau for Astronomical Telegrams (CBAT). CBAT is the official international clearing house for information related to astronomical events like new comets, novae, supernovae, and solar system satellites. In astronomy, it is often of great importance that information about a transient phenomenon noted by one observation be disseminated as rapidly as possible so that others can investigate that phenomenon while it is active, a period that is sometimes mere days, hours or less. When the organization first formed over a century ago, it literally used telegrams to notify interested parties of these discoveries, but now uses the most modern communication methods.

Dr. Green, in his talk entitled "The History of the Central Bureau for Astronomical Telegrams," will discuss the development of this central international office for collecting, verifying and announcing newly discovered astronomical objects. Next year will be the 125th Anniversary of Harvard Observatory's designation as the site of astronomical-discovery announcements for the western hemisphere, and this year is the 125th Anniversary of the international Central Bureau. The European and Harvard offices merged into a single center located at Harvard College Observatory in 1965. Dr.Green succeeds Dr. Owen Gingerich and Dr. Brian Marsden as Director of the Central Bureau.

CBAT also maintains a Recent Comet Magnitudes Page which serves as a link between the work of amateur astronomers and the professional astronomical community. Many of you may already be familiar with this aspect of CBAT. Made an astronomical discovery or report lately?

Please join us for a pre-meeting dinner with Dr. Green at 5:45PM at Chang Sho Restaurant located at 1712 Massachusetts Ave. in our fair city, Cambridge, MA.

President's Message…

Amateur astronomy is a hobby that can easily turn into science. Amateur observations of objects such as variable stars, and novae serve to complement the work done by professionals who don't have the time or sustained resources to make necessary observations. Amateurs fill the gaps left by the pros and often contribute significantly to astronomical knowledge.

The American Association of Variable Star Observers (AAVSO) is one organization with strong and effective ties between amateur and professional astronomers. The AAVSO, many of whose members are also members of ATMoB, collects variable star observations made mainly by amateurs and makes the data available to the professional astronomical community. They maintain data archives containing some 13 million observations for 10,000 potentially known and suspected variable stars. AAVSO is also extremely active in education and public outreach with hands-on activities, curriculum models in math and science for high school and college students, and training workshops available. For those unfamiliar with the organization, visit their web site at www.aavso.org

Recently, I had the opportunity to visit the AAVSO's new home in Cambridge. AAVSO has a long history in Cambridge, from its founding in 1911 at Harvard University through the present. In December '06 they purchased and moved into Sky &Telescope's former offices on Bay State Road with strategic plans to improve their ability to deliver the highest and best service and research assistance to the worldwide professional astronomical community. Their building campaign includes plans to add a residence for visiting astronomers, create a conference room for training and meetings, improve facilities for their library and historical archives, and otherwise expand the excellent services they already provide to the scientific and educational communities.

At the Executive Board meeting held on Feb 27th, AAVSO / ATMoB member Gary Walker made a request for a donation from ATMoB for the AAVSO Building Campaign. He mentioned ATMoB and AAVSO's long, extensive connections through cross membership and shared interest in science and education. The Executive Board voted to approve a donation of matching funds up to $500.00 for the building campaign. We're asking ATMoB members to contribute to this very worthy cause, and hopefully we can raise at least $1000.00 to help the AAVSO meet and exceed their goals. This amount will qualify us for recognition on a plaque that will be displayed in the entryway of the AAVSO's new headquarters. Those who wish to learn more about the campaign should visit www.aavso.org/news/49baypress.shtml

If you wish to contribute to this campaign, you may do so through Treasurer Gary Jacobson, or directly at the AAVSO web site's donation page - be sure to mention that you are an ATMoB member so that your contribution can be counted towards the goal of $500.00. As always, if you have any questions, feel free to contact me at vrenehan@gis.net.

~ Virginia Renehan, President ~

Feb. Meeting Minutes . . .

The February meeting of the Amateur Telescope Makers of Boston began with a lecture by Dr. Dan Fabricant, Senior Physicist at Harvard-Smithsonian Center for Astrophysics and Project Scientist for the 25-meter, Giant Magellan Telescope (GMT). For more information you can go to the web site: http://www.gmto.org/

Dr. Fabricant began with a comment, "we have just finished the period of very large telescopes and now they are calling the next generation, extremely large telescopes." The consortium includes educational institutions and the business community. The universities involved in this project are the Carnegie Institution of Washington, Harvard University, Smithsonian Astrophysical Observatory, University of Arizona, The University of Texas at Austin University of Michigan, Massachusetts Institute of Technology, Texas A&M University, The Australian National University among others.

The new telescope will hopefully extend our vision in areas such as "understanding the origin and evolution of planetary systems, witnessing the formation of stars, galaxies and black holes and exploring the properties of dark matter and dark energy in the cosmos".

Institutions have just finished building 8- and 10-meter telescopes which have taken advantage of the revolution in CCD technology. "Quantum efficiencies of 100% are now possible with these new detectors. Since you are at your maximum possible efficiency, the only way to get more information is to make your gains of efficiency with the instruments that you have. The only way to get it is do it the hard way which is to collect it with a bigger piece of glass. As a guide, the MMT's 6.5-meter diameter mirror is the largest telescope available to scientists here at the Harvard-Smithsonian Center for Astrophysics." The GMT will have the collecting area of seven 8.4-meter mirrors. Fabricant noted that "it's an order of magnitude and we don't get that that often in astronomy."

Dr. Fabricant then went into a discussion on how the current generation of 8 to 10-meter telescopes was made. The Keck 10-meter scope is a segmented design with smaller 1.8-meter face sheets. These are off axis segments that are part of a parent parabola. The competing design is a single "honeycombed mirror that has a thin face sheet and a thin back sheet and webs which forms a lightweight but very stiff structure." This design is used with the Gemini, Magellan and MMT. These were the only two designs that have survived as contenders for the next generation of large telescopes.

The Giant Magellan Telescope will have a large segmented design which will require a slightly different approach. That technique can be seen with the Large Binocular Telescope, built by the Arizona Mirror Lab, which has been polished to $1/20^{th}$ of a wave. One of the advantages of a structured blank is that it is very stiff. The disadvantage is that the mirror has a lot of additional weight. This has been minimized with a borosilicate blank with a relatively low weight of 10 tons.

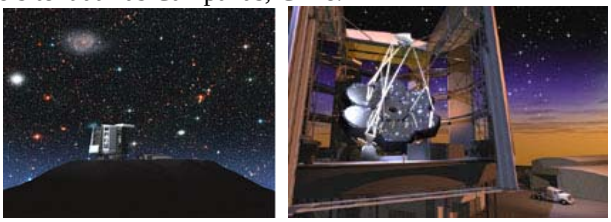
The scope has seven 8.4-meter mirrors and form part of a single surface. The mirror is a near paraboloid and has achromatic optics. "You can think of it as a classical Gregorian telescope." Instruments are mounted at the Gregorian focus. This allows for a very compact design, which minimizes wind loading and a shorter light path to eliminate light losses.

The primary is extremely fast at f/0.7 and the focal length is 18-meters. Fabricant noted "that's already inconveniently long." The Mirror Lab is used to making even faster mirrors. "The mirror is very slightly ellipsoidal, a little bit more than minus one. It also has an ellipsoidal secondary mirror, so this is an achromatic Gregorian. It has a final focal ratio of f/8 and a field of view of 20 arc minutes". The mirrors will be spun cast and the first off-axis primary has been completed at the Arizona Mirror Lab.

The off-axis mirror was the first to be made because it would be the most difficult to polish and test. "This mirror is going to have a lot of astigmatism in it compared to an on-axis mirror and that has to be removed during optical testing". Dr. Fabricant described the polishing technique for the aspheric surface. The Mirror Lab will use a stress lap with actuators attached to it. They will "calculate the surface shape that they are polishing at any given instant and then the lap to that shape and keep it bending as the tool sweeps across the surface." The Lab will soon be set up for testing that first segment.

Fabricant spoke about "adaptive optics because it's a big part of making this telescope." The system will have to use a bunch of lasers ("laser constellation") because a single laser would not sample correctly at the edge of the aperture. The secondary mirror will be performing the wave front corrections. The secondary will be a few millimeters thick and will be driven by voice coil actuators (loudspeakers) correcting over a hundred times a second.

The telescope completion date is tentatively set for 2016 and they hope to site it at Las Campanas, Chile.



Giant Magellan Telescope - Carnegie Observatories. Artwork by Todd Mason, Mason Productions. Copyright © 2007, GMT Consortium

The business meeting began with reports by Secretary Al Takeda, Treasurer Gary Jacobson, Membership Secretary Dan Winchell and Clubhouse Director Dave Prowten.

Eileen has placed 2 loose-leaf notebooks in the clubhouse in which members can add astro-photos or club related newspaper clippings.

Bill Toomy reported that 4 people were using the C-14 until 2:00 a.m. on the night of the DSI workshop.

Steve Beckwith congratulated John Maher for his training session with the Meade DSI camera. Bruce Berger was also congratulated for his C-14 workshop. Bruce Berger then recognized Mike Hill for his assistance with those sessions.

The Chelmsford Town Wide star party was rescheduled for the next day but it turned out to be a bust with more scopes then attendees.

Virginia reported on the successful Star Party at the John D. O'Bryant School at Roxbury Crossing.

Dick Koolish reported on an event at the Cummings School in Somerville in which John Hopkins, Dan Winchell and Dick Koolish put on a program for 90 people.

Virginia reported on the Mercury Surface, Space Environment, Geochemistry and Ranging project. It is a scholarship program to generate interest among high school students. The program requires a certain high-level academic standing and the application requires a written report on the Messenger mission on what you think it means for space exploration. See Virginia for details.

Kelly Beatty announced that there will be a meeting of NELPAG on Sunday, February 25 at 5 p.m. at the Center for astrophysics (CFA). He also mentioned that the dark sky legislation has been re-filed in the Massachusetts legislature. For questions see Kelly or call him at (617) 864-7360 ext 148 or skytonight.com

Virginia mentioned that NASA and the Astronomical Society of the Pacific have a new astronomy education prototype kit being introduced and the ATMoB has been asked to test it. Volunteers were requested.

Eileen Myers announced that the Messier Marathon would be held on February 17 at the clubhouse. Steve Clougherty would be running this event.

Virginia noted that on March 3 there would be a total lunar eclipse, the work party and the Schmidt-Cassagrain collimation workshop at the clubhouse.

Dick Koolish announced the Model Engineering Show at the Charles River Museum in Waltham on February 17. He also mentioned that Mercury is at greatest elongation.

Bruce Tinkler mentioned that WGBH's Science Club will have a free event at the Thirsty Scholar, at 70 Beacon Street in Somerville. Brian Marsden will be the guest speaker at 6 p.m. on February 13.

~Al Takeda, Secretary ~

Membership Report . . .

We have four new members to the club this month;

Richard Bartlett from Tyngsboro
Nina Craven from Dedham
Barry Jensen from Windham, NH
Brian Marsden from Cambridge

~ Dan Winchell, Membership Secretary ~

Clubhouse Report . . .

Cold weather returned for the February 3rd work party (2007, #2) with another day for indoor projects. Dave Prowten installed the new locking mechanism to prevent the roof from rolling and striking the C-14 when the wind is blowing. It is imperative that people using the Ed Knight Observatory use this device to prevent damage to the scope.

Chef Reed made his famous "Bailey Hill" sauce, slow simmered red sauce with lots of meats, sausages and vegetables. Chef Eileen made the pasta, salad, garlic bread, all prepared at the clubhouse. Cheese and chocolate chip cookies were served for dessert. Clubhouse Committee member Eileen did the monthly shopping for sodas and other clubhouse supplies.

Steve Clougherty, John Reed, Chuck Evans and David Wilber ran electrical conduit and wiring to the far barn for light fixtures in preparation for the Workshop Project. John Reed, Paul Cicchetti, John Blomquist, John Maher and Al Takeda performed electrical servicing work on the "Telescope Shed".

A successful clubhouse workshop was conducted by John Maher for the Meade DSI camera started at 4 p.m. and lasted until 2 a.m.

For the Mar. 17 New Moon weekend, the Messier Marathon will take place at the Clubhouse. Make your plans to stay late and make sure that you have a good star chart if you want to capture all of the Messier objects.

Work Parties (#3 and #4) will be on Sat., March 3rd and March 31st starting at 10 a.m. Inside work will be the agenda for the day. Work on the near and far barns, library/office, and general cleanup are slated.

~ John Reed, Steve Clougherty, and Dave Prowten ~

Dave Prowten installs the new roof latch. Image by Al Takeda

Clubhouse Saturday Schedule

Mar. 3	Dave Prowten + workshop leader	
Mar. 10	Rick Burrier	Mike Hill
Mar. 17	Steve Clougherty	Steve Mock
Mar. 24	Paul Cicchetti	Bruce Gerhard
Mar. 31	Al Takeda + workshop leader	
Apr. 7	Henry Hopkinson	Eric Johansson

Meade DSI Workshop…

At the Feb 3rd work party, club members Bill Toomey, Joseph Kristl, Glenn Meurer, John Maher and Sidney Johnston participated in the Meade DSI workshop. The class started with an inside session and then moved to the Ed Knight Observatory with the C-14. The session was a success and the participants shut down the observatory at 2:00 a.m.

Inside session for the Meade DSI Workshop (l to r) Bill Toomey, Joseph Kristl, Glenn Meurer, John Maher and Sidney Johnston . Image by Al Takeda.

~ Al Takeda ~

Clubhouse Workshop…

Introduction to Visual Variable Star Observing

On Saturday, March 31st Glenn Chaple will run a workshop on Visual Variable Star Observing. Glenn will cover the nature of stars, how to make an estimate of the brightness of stars, and how you can send your estimates to the American Association of Variable Star Observers (AAVSO). The workshop will run from 6:30 PM to 7:30 PM at the Tom Britton Clubhouse in Westford. Don't forget to bring your warm clothing and boots so you will be all set for making estimates immediately after the workshop. You don't need to bring a telescope, but you might bring a small one or binoculars if you want to try estimating with them. There will be a few experienced variable star observers present to help you. Remember to bring a small red flashlight, notepad and pen to use when writing down your estimates. In addition to doing real science, some of the skills you will develop from variable star observing are handy tools for any visual deep-sky observer to have, such as star hopping, estimating magnitudes and organized log keeping.

To reserve a space go to the Events – Clubhouse section of www.atmob.org. If you need to phone in your reservation you can reach workshop coordinator Eileen Myers at 978-456-3937. Due to available space at the clubhouse, this workshop is limited to 12 attendees.

~ Eileen Myers ~

Star Parties, Thank You!. . .

Reading Star Party

A big thank you for ATMoB's Hayg Boyadjian, Ted Carlman, Charle McDonald, Robert Cohen, Chuck Evans, Steve Feinstein, Mike Hill, Brewster LaMacchia, Howard LeVaux, Ed Los, Eileen Myers, John Reed and David Wilbur for putting on a great program at the Coolidge Middle School in Reading on January 31st. This event brought together all of the 5th grade elementary students of the Reading community into one consolidated Star Party. Over 500 students, parents and guardians were able to hear Brian Marsden give two talks on "Comets, Asteroids and the Down-Grading of Pluto". The attendees then went outside to look through our members scopes.

~Charlie McDonald~

Butler Middle School - Star Party Thank You!

I just wanted to say thank you and your club members for setting up such a terrific Star Party for the Butler Middle School. It was nice to see our students and their families experiencing such a wonderful event together. My favorite part was listening to the conversations as they listened to the presentation by Kelly in the Library, or they came in from viewing the skies through your incredible telescopes. Many of the families that came this year were new and have never even looked through a telescope before. One of the students said, "Mrs. Sutton when you told me about the

telescopes I really thought you were exaggerating.....wow, I guess you weren't!"

Also please tell John we appreciate the information he shared regarding the "McNaught Website". We saved it under our favorites on the Parent Center Computer and many of our students and their parents have enjoyed the incredible pics..... Thank you so much Virginia.

Sincerely,

Carol Sutton

Parent Liaison Butler Middle School

Thanks to ATM's Kelly Beatty, John Blomquist, Ed Los, John Maher, George Paquin, Al Takeda, and Dave Wallace.

~ Virginia Renehan

Astro Trivia…

ON THE EQUINOXES, night and day are supposed to be of equal duration, but according to almanac sunrise and sunset times, daytime is longer by 8 to 10 minutes depending upon your latitude. How come? First of all, the moment of the equinox occurs when the geometric center of the sun crosses the celestial Equator. But the standard definition of sunrise is the time when the Sun's upper limb is just breaking the horizon, and sunset when the upper limb is just disappearing below the horizon. This adds one Sun semi-diameter (about 16 arc min.) at both sunrise and sunset, extending the duration of daylight by a little over 2 minutes.

The other factor is atmospheric refraction, which causes the Sun's rays to bend around the horizon. As a result, we see the Sun about 34 arc minutes higher at both sunrise and sunset, adding roughly 4 minutes to the time the Sun is above the horizon.

In the spring, the days get longer as we approach March 20, and the date of equal day and night occurs several days before the equinox, about March 17 at latitude 40 degrees. Conversely, in the fall it takes several extra days for the time when the Sun is seen above the horizon to shrink to 12 hours. The date falls on about September 26 at latitude 40 degrees.

ACCORDING TO FRED HOYLE he did not coin the term *Big Bang* to ridicule the theory. "The BBC was all radio in those days, and on radio, you have no visual aids, so it's essential to arrest the attention of the listener and to hold his comprehension by choosing striking words. There was no way in which I coined the phrase to be derogatory; I coined it to be striking, so that people would know the difference between the steady state model and the big bang model."

*The above items are from **Mad About Modern Physics**, by F. Potter & C. Jargodzki, John Wiley & Sons, 2005.*

~Ted Poulos~

Exectutive Board Meeting...

There will be an Executive Board Meeting on Tuesday, March 27th, 7 p.m. at the clubhouse in Westford. The meeting is open to the membership.

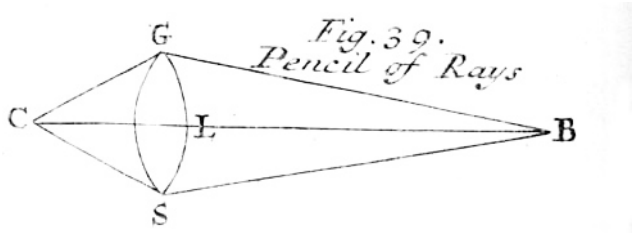
Webcam solar imaging at the clubhouse. (l to r) Art Swedlow and Paul Cicchetti.

For Sale…

Pentax ist film SLR with 28-90 lens, almost new. Cost $395 now $130. Joseph Rothchild. 617-964-6626.
Joseph.Rothchild@Lahey.org

Newsletter Corrections…

February 2007 – John Blomquist should have been mentioned as a graduate of the C-14 / Paramount Training session.



From the Table of Opticks, from the 1728 Cyclopaedia, Volume 2.
A publication in the public domain.

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April *Star Fields* deadline
Saturday, Mar. 31st

Email articles to Al Takeda at

secretary@atmob.org

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POSTMASTER NOTE: First Class Postage Mailed March 5th, 2007

Amateur Telescope Makers of Boston, Inc.
c/o Dan Winchell, Membership Secretary
20 Howard St.
Cambridge, MA 02139-3720

FIRST CLASS

EXECUTIVE BOARD 2006-2007

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	David Prowten	(978) 369-1596
HISTORIAN:	Anna Hillier	(781) 861-8338
OBSERVING:	Virgina Renehan	(978) 283-0862

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

Mar. 1 Moon passes 0.5 degrees from Saturn (evening)
Mar. 3 Full Moon, Total Lunar Eclipse (Moon rises in eclipse)
Mar. 11 Last Quarter Moon
Mar. 18 New Moon
Mar. 20 Vernal Equinox
Mar. 25 First Quarter Moon