



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. 18, No. 6 June 2006

This Month's Meeting...

Thursday, June 8th, 2006 at 8:00 PM

**Phillips Auditorium
Harvard-Smithsonian Center for Astrophysics**

Parking at CFA is allowed for duration of meeting

THIS MONTH'S SPEAKER will be Joshua Semeter, Assistant Professor of Electrical and Computer Engineering at Boston University. Joshua's talk will be titled "Optical Remote Sensing of the Aurora Borealis." The aurora-borealis is a visible manifestation of an interaction between the hot collisionless plasma of the magnetosphere and the cold collision-dominated plasma of the ionosphere. The transition between these regimes occurs over a relatively narrow range of altitudes from ~80 to 200 km—a region readily probed by ground-based radio and optical sensors. It is also this altitude range where most of the energy in the auroral particle flux is deposited as heat, ionization, and, of course, light. This talk will provide a visually stimulating overview of the state of auroral research, with a focus on spectral imaging and multi-sensor analysis techniques. The major outstanding questions in auroral physics will be described in an intuitive fashion, along with a discussion of how emerging sensor technologies—such as electron multiplying CCD's, and phased-array incoherent scatter radar—will contribute to these questions.

Joshua Semeter received his B.S. degree from the University of Massachusetts at Amherst in 1987, and his M.S. and Ph.D. degrees from Boston University in 1992 and 1997 respectively, all in Electrical Engineering. From 1997 to 1999 he served as a post-doctoral fellow at the Max Planck Institute for Extraterrestrial Physics in Garching, Germany, where he studied auroral plasma dynamics using coordinated rocket and ground-based

measurements. From 1999 to 2004 he was a Senior Research Engineer at SRI International in Menlo Park, CA, where his research focused on remote sensing of the high-latitude ionosphere. In September 2004 he joined the faculty of Boston University as an Assistant Professor of Electrical and Computer Engineering.

Please join our speaker 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...

This is my last President's message (though I likely wrote the same about 10 years ago and we never know what the future may hold). It has been an enjoyable and quick year. I'd like to thank the officers and committees that really made it all possible. First, to Mike Hill for his fantastic job on the newsletter each month and other secretary duties, as he's leaving that post. In addition to that, he did much at the clubhouse - organized the glass room, repainted it, and worked on the GT1100 and C-14 projects, and much more. Second, to John Reed, Paul Cicchetti, Steve Clougherty, and all of the clubhouse committee members who worked on so many projects (even in the pouring rain) to maintain and improve the clubhouse and observing facilities. Third, to Virginia Renehan and all of the star party volunteers for organizing, sponsoring, and participating in the many star parties held during the past year. And, all of the other board members - Dan Winchell, Gary Jacobson, Bruce Tinkler, Dave Prowten, Bruce Berger, Eileen Myers, and Bob Collara; and to Anna Hillier. All of you made my job incredibly easy and provided support, guidance, and advice. Thank you all!!

In addition, I'd like to thank Bruce Berger for all his efforts to solicit donations - the GT1100, C-14, CCD camera, software, and so much more. Thanks are due to our anonymous benefactor and of course Software Bisque.

I believe that the club is in excellent hands with the Nominating Committee's proposed slate of officers.

And, I'll continue to be an active member of the Executive Board (as a past president), and to help the club and officers where needed.

Thank you for the opportunity to have served the club as its President this past year.

Bernie Volz, President -

May Meeting Minutes . . .

The May meeting of the Amateur Telescope Makers of Boston started with announcements.

- Paul Valleli announced a silent auction of optics whose proceeds will go to the club. "No guarantees." Mirrors included a 13" f/5.6, a 10 inch f/4 - 4.5 and other windows and diagonals.
- Bob Naeye gave us a Science Update.

The main talk of the evening was presented by Scott Milligan and Mario Motta. They gave an update on the Wingersheek Observatory and Telescope project. Scott began with a discussion of the optical design for the 32-inch telescope that will be housed in Mario's observatory in Gloucester. He mentioned that he had often thought about building a telescope with all-spherical optics and that he would start with a 10-12 inch design. Scott had been to Stellafane and saw Clyde Bone's 20-inch f/5 folding design. "It was an intriguing design but it had double field of view and an excessive central obstruction." Advantages included a perfect on-axis performance with improved off-axis, small central obstruction, fully baffled, without vignetting and an all-spherical design. Scott claims that "it has good color correction as a 6 inch APO." The Modulation Transfer Function (MTF) is better. The Ritchey-Chretien wins but "our design is good." It showed enough promise to be interesting." He convinced Mario to use this design. The process of building the optics started 3 years ago. The blank was received in September 2004 and the rough grinding started on January 2005 and was completed in August of that year. The relay lens elements were designed by Scott but was built outside.

In his basement, Scott, Mario and Mike Mattie set up the plaster tool. Advice, "don't use old plaster and use a mixer." Scott claims to have created the largest silicone pitch lap. After the mirror was ground, an interferogram was taken and an "S" shape appeared whose pattern did not rotate. They found out that the mirror bends under it's own weight. Using a Finite Element Analysis Model to model the mirror deflection, the system was changed to an 18 point floating mount. Artwork of the supporting structure was shown. Some pieces of the support were gathered at the Stellafane swap table and Paul Valleli's basement ("he has satellite parts in his basement").

Currently the optics are finished and the lens cell mechanics are being fabricated. Assembly and cell are 6-8 weeks until completion. Mario commented that "my job was grunt labor". He showed photos of his house the dome being constructed and the surrounding landscape views. His 16-inch scope is currently mounted on the truss assembly. The mirror is currently at United being coated. He stated that it would be 3-4 weeks max before first light.

The business meeting followed with the Nominating Committee chairman, Mario Motta, announcing the club officer nominations.

President	Virginia Renehan
Vice President	Steven Beckwith
Secretary	Al Takeda
Treasurer	Gary Jacobson
Membership	Daniel Winchell
Member at Large	Bruce Tinkler
Member at Large	David Prowten

Secretary report by substitute Al Takeda and the Treasurers report by Bernie Volz. John Reed gave the clubhouse report. He reported muddy conditions. Help is needed at the work party on Saturday, May 13. "Shovels are needed." Virginia Renehan reported on the Astronomy Day events at the Clay Center. Al Takeda showed some images from the event. Bruce Berger returned from the Northeast Astronomical Forum (NEAF) with The Sky 6 and CCD Soft V5 software donated to the club by Software Bisque. Paul Valleli showed some images from NEAF. Howard LeVaux showed some Egypt eclipse and travel images. Bernie Volz showed some Egypt eclipse images.

– *Al Takeda* –

Membership Report . . .

This month we have 3 new members:

NICK HARISKOS of Malden
DAVID RYAN of Watertown
JERRY SKILES of Berlin
– *Dan Winchell* –

On the Naming of Telescope Designs

By Paul Valleli

Technically the relay scope should be named after Jim Howard who derived it at Honeywell Radiation Center in Lexington. (Bought by Lockheed-Martin and now part of BAE Systems.) But Jim is very adverse to optical systems named after people because if one engineer doesn't discover it, another will. Jim is now V.P. of optical engineering at Axsys Technologies, IR Systems Div. and taught Scott Milligan lens design while at Telic Optics. Roger Tuthill also coined the name "Relay Telescope" but he had no idea what he was doing and this was long after Howard's descriptions. Jim agrees that the early masters, such as Galileo, Kepler, Cassegrain, Newton, Herschel, Chre'tien, and Schmidt should be recognized for their early efforts. He draws the line at the Dall-Kirkham, Mersenne, and Pressman-Camichel. They are just variants of the Cass. The Pressman has a spherical primary which is easy to make and was "the Holy Grail" of lens design for many decades, but the FOV is infinitesimally tiny. The relay variant opens up the FOV but still has very tight alignment tolerances. We make bunches of fast ones for airborne use in the mid-IR.

Clubhouse Report . . .

Following last month's (April 18) concrete pour, several work sessions were required to remove forms, replace sod around each pour, and finish the binocular mount pour. Then on April 29, Eileen Myers, Susan Mudgett, and John Maher removed all debris and soil necessary for the far-barn pour. Additional work sessions on May 4, 8, and 10 allowed all sites to be completed except the house North wall walk and the 4-holer stabilizing walk. The May 13 Full Moon work party took place during the continuing flooding rains which afflicted New England. During the 5 inch rain the entire North wall job was completed by Bernie Kosicki, Jun Ichi Sano, John Maher, and Al Takeda. Drain channels allowed for removal of flood waters. In addition Virginia Renehan, Nanette Benoit, and Dave Prowten finished the 4-holer dig and construction. Stone was barrowed into all forms; rebar installation was completed during the storm. Finally skies cleared and allowed the second pour to be completed after a strenuous day's work on May 18th. A total of 11 cubic yards of concrete was used to complete the 2005-06 effort delayed by early winter arrival last year. A special thank you and a job well done! to: J. Blomquist(3), P. Cicchetti, B. Gerhard(3), K. Goedicke, B. Kosicki(3), H. LeVaux, J. Maher(5), E. Johansson, S. Mudgett, B. Maerz, E. Myers, D. Prowten(2), J. Reed(6), V. Renehan, N. Benoit, J.I. Sano(2), A. Swedlow, A. Takeda, S. Vallabha(3). The June 10 Work Party will remove all forms, replace sod, start the re-sloping of the parking area, and start rebuilding the far barn front door. See you then. And thank you again!

J. Reed, P. Cicchetti, and S. Clougherty.

Clubhouse Saturday Schedule

June 3	Chuck Evans	Eric Johansson
June 10	Closed -Work Party	
June 17	Bruce Berger	Joseph Rothchild
June 24	Henry Hopkinson	Richard Burrier
July 1	John Small	Dave Siegrist

The Telescope Makers of Boston

Years ago, amateur telescope making had a different attraction than it does today. Factory made telescopes were not as common or as inexpensive. To really get a good large scope you just had to build your own. The telescope making evolution was accompanied by a complementary mix of vendors for the parts and supplies that were part of this hobby. Now of course telescopes, very good ones in fact, have become very affordable and one would be hard pressed to build a better one. Most of us don't possess the tools or equipment to build to that level. Of course anyone with a basic woodworking shop does possess the means to build a nice telescope but to compare to what you can purchase today one questions the point. Why build a telescope? Well maybe as adults with limited time, means, and ability we shouldn't. But I think we should encourage teenage boys and girls and young adults to do just this; to build their own telescopes. Why do I say this? I say this because there is so much to be gained from this - more than just the acquisition of a telescope. They can be introduced to the basics of optical, mechanical, electrical, maybe even civil engineering as part of this pursuit. (I'm stretching here a bit but it is true that if one were to go on and build an observatory, civil engineering principles could come into play.) We are all concerned about the dearth of engineering graduates in our American Universities. We all wish we could do more to combat this with our education and public outreach. And we do a good deal now in this regard with our many excellent star parties. But to encourage telescope making, as does our namesake as a club, we could complement the star party experience with something more far reaching than just looking through an eyepiece. A homemade telescope, however simple, can evoke a really serious sense of pride and accomplishment. And the various disciplines touched upon might just lead to a more committed interest in science and engineering. Whenever we do star parties if you have a homebuilt telescope and can attend, please consider doing so with your masterpiece. And let the kids know that you built it and perhaps encourage the ones that really notice and show an interest to make one for themselves. The ones that do will certainly appreciate the night skies all the more when probing it with an instrument crafted by their own hands. Every time I bring my 8" reflector, one that I have had since I first built it at age 15 (with many retrofits), I get so many inspired comments from people young and old. I don't push it on them but I certainly let it be known that there are many options. Amateur Telescope Making is possible still and it still has a viable purpose - one more important now than ever.

Michael Hill

Outgoing Secretary (2002 - 2006)

July Star Fields deadline
Saturday, July 1st

POSTMASTER NOTE: First Class Postage Mailed June 2nd, 2006

Amateur Telescope Makers of Boston, Inc.
c/o Dan Winchell, Membership Secretary
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FIRST CLASS

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HISTORIAN: Anna Hillier (781) 861-8338

OBSERVING: Virginia 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 Daylight Time (EDT) from Universal Time (UT) subtract 4 from UT.

June 3 First Quarter Moon

June 11 Full Moon

June 15 Mars is centered in the beehive cluster

June 17 Mars passes Saturn (within 33' at 6:25 UT on the 18th)

June 18 Last Quarter Moon

June 25 New Moon