



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. 5 May 2007

This Month's Meeting...

Thursday, May 10th, 2007 at 8:00 PM

Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

Parking at CfA is allowed for duration of meeting



Antarctic Submillimeter Telescope and Remote Observatory

This month we welcome Dr. A. Anthony Stark, Astronomer in the Radio and Geoastronomy Division at the Harvard-Smithsonian Astrophysical Observatory. Dr. Stark was Principal Investigator and designer of the Antarctic Submillimeter Telescope and Remote Observatory (AST/RO), a 1.7 meter diameter telescope that operated at the Pole for a decade. Along with fellow scientist Mark Dragovan, Dr. Stark made some of the first measurements to establish the Antarctic Plateau as a superior observatory site for sensitive radioastronomical observations. He has worked at Amundsen-Scott South Pole Station almost every year since 1986. He is now working on the new South Pole Telescope (SPT). In his talk, "*AST/RO and SPT: A Tale of Two Telescopes on the Antarctic Plateau*", we will hear about these instruments and their science.

The Antarctic Submillimeter Telescope and Remote Observatory (AST/RO) was the first instrument to benefit from the superb submillimeter-wave observing conditions during the frigid South Pole night. Designed as a small (1.7m) prototype for the SPT, it was commissioned in January 1995, and operated for ten years. Both SPT and AST/RO are offset gregorians operating at millimeter and

submillimeter wavelengths. AST/RO's principal mission was measurement of the spectral lines that cool the molecular gas in star-forming clouds throughout the Milky Way. The AST/RO team has shown that the dense gas surrounding the Black Hole in the center of the Milky Way is unstable, leading to quasi-periodic bursts of star formation and eruptions from the Black Hole.

The South Pole Telescope (SPT) is a 10-meter diameter high-frequency radio telescope. It became operational at the South Pole on February 16, 2007. The novel optical design can feed thousands of detectors simultaneously, and thereby achieve unprecedented levels of sensitivity. The initial SPT project is a survey of a 4000 square degree swath of the southern sky at frequencies of 90 and 150 GHz. This will lead to the discovery of many thousands of clusters of galaxies, which will be detected as a shadow against the Cosmic Microwave Background. Many of these clusters will be very distant, and we will therefore see them as they were billions of years ago, in the early Universe. The Universe appears to be filled with a mysterious Dark Energy that dominates large-scale dynamics. Dark Energy is not well understood; determination of its properties is at the forefront of current physics research. It may be a new force of nature, embodied in Einstein's Cosmological Constant, or a poorly-understood aspect of particle physics. Since the evolution and appearance of clusters is sensitive to the balance between gravity and the Dark Energy, the SPT detection of clusters and their study with other telescopes will bring a substantial advance in our knowledge of the Universe.

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

~ Virginia Renahan ~

President's Message...

The weather this month has been pretty dreadful for observing, but in such meager observing times good things do happen. Three cheers to Mario Motta for spearheading the Gloucester Lighting Ordinance which passed the City Council handily on April 17th. Already, other cities and towns are calling in for information on how to proceed with such ordinances in their own communities. It would seem the momentum for a State-wide bill may be building.

The Executive Board met on April 25th to finalize discussion of the Telescope Advisory Committee (TAC) findings and to hammer out a working definition for the restructured Observing Committee. It is our intention that the Observing Committee will be responsible among other things, for membership development and education, hosting such events as training sessions in various aspects of the hobby, as well as taking the lead on establishing a more active telescope loaner program for members. The Board's formal report will appear in next month's newsletter.

The club recently received a wonderful donation for the library from our friends at Sky and Telescope: complete and professionally book-bound issues of S&T from the period 1973 to 2006. Our thanks to Rick Fienberg of S&T for thinking of us, and to Dave

Prowten for pick-up and delivery of the collection. This is a terrific help to Eileen Myers, Anna Hillier and the Clubhouse Committee who have been working to compile a complete collection of S&T magazines for our library archives. On your next trip to the clubhouse give a look at some of the issues contained in these bound volumes. They are full of interesting reading.

This month VP Steve Beckwith and Membership Secretary, Dan Winchell are hosting New Member Orientation at the clubhouse, on May 19th. If you have recently joined the club or if you've never been to the clubhouse, come on by! Tour the facilities and meet other members. All members welcome.

Kelly Beatty made mention of a new event also on May 19th, International Sidewalk Astronomy Night. Go to: <http://home.earthlink.net/~sidewalkastronomy/>.

For those interested in astronomy education, the next Project ASTRO orientation workshop is set for June 29th and 30th. Project ASTRO partners astronomers with classroom teachers to bring hands-on astronomy activities directly into the classroom. Adopt a class for a term or school year – make periodic visits as the class touches on astronomy topics. It's fun and very rewarding. Go to <http://hea-www.harvard.edu/astro/> for complete details. The workshop is free and some fantastic educational materials are provided including "Universe at Your Fingertips" by the Astronomical Society of the Pacific. If you have any questions don't hesitate to drop me a line – or contact Cathy Clemens, whose contact info is given in the above link.

At the April monthly meeting the membership voted Eileen Myers (chair, with most votes), Steve Clougherty and Art Swedlow to serve on the Nominating Committee '07. For those of you new to the club, this Committee is responsible for recommending a slate of Executive Board officers for the coming year, and presenting the slate at the May meeting, on which the membership will vote at the June Annual Meeting. This year, Dan Winchell is stepping down as Membership Secretary. We will greatly miss his positive and welcoming way with new and old members alike. Dan has taken the Membership Secretary position to a new, more efficient level as he and the Web Committee have automated many of the tasks previously done manually and via pony express. We wish Dan well as he takes on new volunteer responsibilities at his daughter's school. Thank you for a great job, Dan!

If anyone is interested in volunteering for this office please feel free to contact one of the Committee members. They will present their recommendations at the upcoming meeting, but in the meantime can answer any questions you may have regarding club offices. For detailed descriptions of Executive Board positions you can also refer to the January, February and March '06 newsletters on the website library page.

Again, we welcome your ideas. As always, if you have any questions, feel free to contact me at vrenehan@gis.net.

~ Virginia Renehan, President ~

April Meeting Minutes . . .

The April meeting of the Amateur Telescope Makers of Boston began with a talk by Dr. Katharine Reeves, Astrophysicist in the Solar and Stellar X-ray Group at the Harvard-Smithsonian Center for Astrophysics. She reported on the Hinode (Solar-B) spacecraft which consisted of the Solar Optical Telescope (SOT), EUV Imaging Spectrometer (EIS) and the X-Ray Telescope (XRT) projects. This international collaboration, which included the Smithsonian Astrophysical Observatory (SAO) and the Japan Aerospace Exploration Agency, was put together to study the sun's magnetic, ultraviolet and x-ray environment. Dr. Reeves's principal work was on the XRT so she focused on that part of the mission.

Hinode was launched from the Uchinoura Space Center in Kagoshima, Japan on September 23, 2006 and was placed in a Sun-synchronous polar orbit, 600 km in altitude, following the day/night terminator. This allows for continuous monitoring of the Sun for its 3 year mission.

The XRT design is an optimized Wolter-I grazing incidence optics with an aperture of 35 cm and a focal length of 2.7 meters. It has a band width of 2 to 200 Angstroms. The visible light optics of the XRT has a field of view of 30 minutes and the wavelength is 4305 Angstroms (G-band). The camera is a back illuminated 13.5 micron, 2048 by 2048 pixel CCD chip. The mirrors and filters were fabricated by the SAO and the camera and electronics were made by the Japanese.

Dr. Reeves stated that the "XRT has some new capabilities that are really driving some interesting science. It has an unprecedented combination of fields of view and image resolution. We have one arc second pixels and we can image the whole sun with our CCD. The extremely large dynamic range allows you to see detail in the active region. The results are quite stunning."

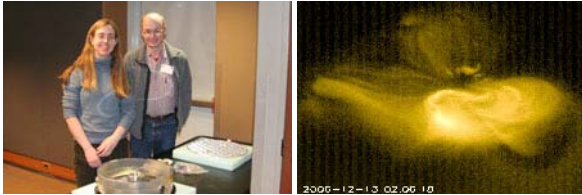
The membership was then shown some movies of solar flare activity for one Harrington rotation (a complete rotation of the sun). Other movies of coronal loops and flux tubes were also shown.

Reeves noted that flares occur in active regions which correlate to sunspots. She reminded us that we are in "solar minimum. Not really the best time to be a flare physicist." Even with this liability, XRT has been able to image X-flares.

Dr. Reeves then talked about "magnetic reconnection because that's what drives solar flares. Magnetic reconnection happens when field lines of two different magnetic fields get pushed together and then they change their topology. You get an energy release source and then you get soft x-rays that are due to the heat from this energy source which evaporates plasma from the chromosphere into these loops and it starts to glow in the extreme ultraviolet and the x-rays."

Reeves noted that “most of the data for this mission has been embargoed till the end of May. That was an agreement we reached with the Japanese. They want to keep the data private for the first six months of the mission so that we can calibrate it.”

An engineering model of the mirror was brought in by Dr. Reeves, courtesy of one of the SAO engineers.



Dr. Katharine Reeves (left) with an XRT mirror (foreground) and a XRT flare image (right). Copyright © 2006-2007 Solar-B Project/NAOJ

Voting for the Nominating committee took place.

The business reports were given by the Membership Secretary, Dan Winchell, Treasurers report by Gary Jacobson, Clubhouse by Steve Clougherty and the Secretaries report by Virginia Renehan.

Virginia noted that the club is part of the Night Sky Network and we have received an educational kit to do public outreach. The kits are meant to address conceptual difficulties that students have with distance and scale. She has volunteered various ATMob members to try out a test kit from the Astronomical Society of the Pacific. Virginia demonstrated the "Pocket model of the solar system" to the membership.

Eileen reported that Anna will be making a 2nd hardbound printing of the club history book. If you want a copy please contact Eileen. She also thanked Jerry Sussman for donating the complete Sky and Telescope magazine set for 2006. Sky and Telescope will also donate to the club, bound volumes of back issues of the magazines.

Secretary, Al Takeda announced the results for the nominating committee. Committee Chair – Eileen Myers and members Steve Clougherty and Art Swedlow.

Virginia gave a remembrance for Bruce Gerhard who passed away on April 3. Some images of Bruce at the clubhouse work parties, star parties and the 2003 Egypt solar eclipse trip were shown.

Virginia talked about upcoming star parties and asked for volunteers for the Clay Center star party.

Gary Jacobson gave a description of the Charles River event. He is trying to get a solar viewing party together from 10:30 to 3:30 on April 29.

Dick Koolish also reminded the membership that there is another event later on in the year called the Cambridge River Festival.

Mario Motta talked about the light pollution ordinance that he and Virginia worked on for the Gloucester city council. They will be collecting as many ordinances as possible and will be placing them on the NELPAG site. He is asking the members to forward light pollution bills that have passed to him so that these can be used as references for other groups around the country. The MA state bill, No 808, has been re-filed.

Mario talked about the passing of Dorrit Hoffliet. She was formally the director of the AAVSO and was best known for working on the Yale bright star catalogue.

Virginia mentioned that the Executive board is having another meeting on April 25th to discuss the Telescope Advisory Committee's report.

Happy birthday greetings were given to Mario, Dave Siegrist and Art Swedlow.

Paul Valleli announced that Matt Arsenal, his Eagle Scout candidate, has completed his video on light pollution. It is being shown on the Burlington Cable access channel. Paul also recalled that when he worked at the Harvard observatory, 53 years ago as a student, that he was mentored by Dorrit Hoffliet.

Paul also showed images of his trip to the Winter Star Party. He also reported that he saw the Russian satellite explosion.

~ *Al Takeda, Secretary* ~

Membership Report . . .

We have four new members this month:

Jeremy Brown from Cambridge
Alan Earls from Franklin
Daniel Green from Cambridge
Katherine Snell from Nashua, NH

Sky and Telescope renewals can now be done directly with the publisher. You must be a member to receive the club subscription rate and membership status will be checked by Sky and Telescope annually. Members can still renew their subscriptions through the club. New members need to do their initial Sky and Telescope subscription through the ATMOb. You can add on any number of months to your subscription if you want to change your renewal date but please do that through the publisher.

~ *Dan Winchell, Membership Secretary* ~

Clubhouse Report . . .

Approximately 12 members and half as many guests arrived at the ATMOb clubhouse on Friday evening April 20 in response to an announcement which was sent to the membership that afternoon. Most arrived at sunset, and many got a good view of

Venus which was well placed in the early evening Western Sky. By nightfall, the sky became remarkably clear. All four stars in the bowl of the little dipper were obvious by 8:30PM, and the seeing was quite steady. Saturn was well placed throughout most of the night. Magnitude estimates for the zenith were 5.5.

A total of 10 telescopes were set up on the Dennis Milon memorial observing field, ranging in size from a 5" SCT to a 25" DOB that I used. Given the clarity of the night sky galaxies were the objects of choice. Many of us viewed the Messier galaxies in Leo and Virgo and a good number of NGC objects were seen along with them. "Challenge" objects were targeted as well. The large scopes picked up NGC 2537, the "bear paw" in Lynx, along with the Abel galaxy cluster (426) in Coma Berenices. Several member galaxies could be seen in the wide field eyepieces. The Virgo cluster of Galaxies were a real treat; The usual M objects such as M58,59,60, 84,86 87 90,91 were easily picked up and, the "Markarian chain" of galaxies, arcing through the central area of the Virgo cluster were observed by several of our members. A couple of globular clusters were seen later in the evening, specifically M3 in Canes Venatici and M5 in Serpens.

The most telling aspect of the observing session that night was the fact that only one person left before 1 AM! Every effort will be made in the future to announce "red light" observing sessions in advance at the clubhouse. I hope to see many more of you there in the coming months.

~ Steve Clougherty ~



Variable Star Observing Workshop (l-r) Nanette Benoit, Virginia Renehan, Bill Toomey, Ross Barros-Smith, Marsha Bowman, Grace Cho and Glen Chaple

Clubhouse Saturday Schedule

May 12	Dave Siegrist	Art Swedlow
May 19	Bill Toomey	Tom Wolf
May 26	Bruce Berger	Mike Hill
June 2	Al Takeda + workshop leader	
June 9	Ed Budreau	Rich Burrier
June 16	Steve Clougherty	Steve Mock



John Reed installs a new electrical fixture at the Clubhouse

~ John Reed, Steve Clougherty, and Dave Prowten ~

Star Parties, Thank You! . . .

April did not bring the best of weather but even with the weather and school vacation we did manage to squeeze in several star parties. Thank you to those volunteers who remain so dedicated to public education and outreach! Your participation is greatly appreciated.

April 19th Dana Hall School, Wellesley – John Blomquist, John Maher, George Roberts and Al Takeda.

Hey Virginia, Even with the clouds, we had a good time. The 4 guys that came were wonderful! And some of the kids were jacked just to see the scopes'. I greatly appreciate all of your time (and their time) and I would like to do this every year. We serve a great full dinner meal every night at 5:45 and I would certainly like your people to come have dinner before the party itself. Any idea of when I can schedule a party for next fall!?!? Thank you so much for all of your time!

Gary Fadden

April 21st Danhey Park, Cambridge with AAVSO – John Blomquist, Grace Cho, Haldun Menali, Nina Craven, Al Takeda. Kick off for Cambridge weeklong Science Festival.



AAVSO Star party participants. (l-r) Al Takeda, Nina Craven, John Blomquist, Haldun Menali's wife, a visitor and Haldun Menali

April 24th Bowman School, Lexington - clouded out the first night but then.....

A big THANKS to your ATMoB dedicated astronomers. Almost ALL returned on Tuesday to help with our Planet Party: John Blomquist, John Maher, John Reed (arrived at end from RI), Bruce Tinkler and Al Takeda.

We probably had 150 people, though, and it was so exciting that I didn't have time to count each one (my little 2" refractor was also in demand to see the Moon). Here are a few comments from kids the day after:

"You could see the rings around Saturn. It was really cool, but it didn't look like what I thought a planet would look like. It looked like a bright, white sticker."

"I was amazed that even though Venus is so close, you could see Saturn better than Venus."

"It was so cool to use the big telescopes. One of them had a laptop hooked up to it and the person controlling it could zoom into the planet."

"I thought it was interesting because I never knew you could see all the rings on Saturn."

"I think the coolest planet or moon to see was Saturn because of its rings."

"The planet party was so fun! I saw Saturn and all its pretty little rings, and Venus too! The coolest thing though was the Moon because it looked so close up like you would see on a picture on Google!"

Clearly our kids and parents were hooked on "the real thing"! Please forward my thanks to your members who came 2 nights. I appreciate your coordination.

Best, Fran

April 27th Evening with the Stars II, Harvard CfA, Cambridge - Nanette Benoit, Dick Koolish, Virginia Renehan, and John Sheff.

Hi, Ginny -- Many thanks again for co-hosting our event last night! I really appreciate all the effort you put into it, especially bringing those wonderful handouts. Everyone had a fantastic time! When you have a moment, would you please email me the snail mail addresses of the ATOMB members who came last night? I would really like to send thank-you notes. Wishing you clear skies, Karen

April 28th Astronomy Day at Clay Observatory - Victor Anderson, John Briggs, Anna Hillier, Dick Koolish, Marek Kozubel, Brian Lecau, Bob Phinney, George Roberts, Joe Rothchild, Phil Rounsville, Bruce Tinkler, Paul Valleli, and Dan Winchell. Solar observing, rocket launches, several large kites. The weather cooperated for a brief time -- enough for observing a large sunspot and Venus in gibbous phase. Inside, planetarium shows, telescope making, various activities and raffles. An enjoyable day.

April 28th Cambridge Science Festival Harvard CfA, Cambridge - CfA Science Ed staff and scientists and ATMoB volunteers John Sheff and Virginia Renehan. Closing day of the Cambridge Science Festival. Kids and parents were treated to tours of the Great Refractor, mirror grinding demos, micro observatory, solar observing, radio

astronomy, hands-on astronomy activities galore, and HS student presentations. Fun science at its best!

~ Virginia Renehan ~

New Member Orientation...

Don't forget.....a new member orientation, including a tour of the clubhouse, observatories and telescopes will take place on Saturday, May 19th at 6:30pm. All new members (and those who have never been to the clubhouse) are cordially invited to attend. Observing will follow, weather permitting.

If any of our veteran members would like to help out during the orientation with a special presentation or demonstration, please contact us with your ideas. If you just want to stop by and introduce yourself, feel free.

For all those that plan to attend please sign-up via the ATMoB website <http://www.atmob.org/events/displayevent.php?act=add&id=123&pid=8> or email or phone Steve Beckwith at stevebeckwith@comcast.net, 978-779-5227). Refreshments will be served. Hope to see you there!

~ Steve Beckwith – Vice President ~

Workshop Follow-up ...

A follow-up to the class "Getting Started in Astrophotography" will be announced soon. The attendees from the 1st session will be contacted by email to schedule an imaging session at the Clubhouse.



Moon – Canon G1, 3.3 Megapixel, afocal with a 8.5x44 binoculars on a tripod, 1/250th sec, f/8, ISO 400, April 30, 2007.

June Star Fields deadline
Sat., June 2nd

Email articles to Al Takeda at
secretary@atmob.org

POSTMASTER NOTE: First Class Postage Mailed May 9th, 2007

Amateur Telescope Makers of Boston, Inc.
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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.

May 2 Full Moon

May 10 Last Quarter Moon

May 15 New Moon

May 20 Venus is 1.7 degrees South of the Moon, 1 UT (9 pm EDT)

May 31 Full Moon

June 8 Last Quarter Moon