



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

Vol. 20, No. 3 Mar 2008

This Month's Meeting...

Thursday, Mar. 13th, 2007 at 8:00 PM

Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

Parking at CfA is allowed for duration of meeting

For the past twelve billion years, galaxies have emblazoned the Universe, bringing form to the firmament, light to the void. These gigantic realms, each one containing millions to trillions of stars, delineate an expanding cosmos of wondrous complexity and activity.

Prof. Bill Waller of Tufts University in his talk, "At Home Among the Galaxies," will familiarize us with these magnificent "island universes" -- beginning with our own Milky Way galaxy and moving outward to the primeval worlds that can be barely detected near the edge of space and time. He will conclude by proposing a Galactic Manifesto, whereby we take on our cosmic birthright and the responsibilities that go along with it.

Bill Waller is a Senior Lecturer of Astronomy in the Department of Physics and Astronomy at Tufts University. He carries out a variety of research on star-forming galaxies via observations with ground-based and space-borne telescopes. Much of this research is carried out with mentored students. He is a leader in space science education, with close ties to NASA's educational programs. He is co-author of "Galaxies and the Cosmic Frontier" published by Harvard University Press and is currently working on a book on "The Milky Way -- An Insider's Guide" for Princeton University Press.

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

~ Virginia Renahan ~

President's Message...

No doubt everyone enjoyed February's lunar eclipse. The weather held, and here on the north shore nine amateur astronomers braved the cold to share their love of astronomy with the public as they set up telescopes and binoculars on Gloucester's Stacey Boulevard. They drew a steady crowd all evening — from dog-walkers, to those who had read about the event in the paper, to those who just 'happened by' on foot or by car. Residents, young and old alike enjoyed the evening.

In addition to the beautiful orange hue of the moon in totality, Saturn, Mars, and the stellar nursery of the Great Orion Nebula were visible when astronomers turned their telescopes toward the sky. Two viewing high points — along with the eclipse itself — were the chance to see five of Saturn's moons, which moved as the night wore on, and the moon's landscape itself. The limb of the moon near the crater Tycho could be seen in relief as rough, with spectacular peaks and valleys.

Astronomers came well equipped with telescopes, observing tables and chairs, a scale model of the solar system, and NASA handouts free to all who expressed an interest. They explained about their individual telescopes and treated the crowd to a tour of the constellations visible in the night sky in spite of the glaring lights of the boulevard. Light pollution and dark sky resources were a topic of discussion.

All told, some 125 visitors throughout the evening were treated to views of the night sky they had never seen before. Another guerilla astronomy event is being planning for the Boulevard on March 29 from 8 to 9 p.m. to coincide with Earth Hour 2008.

While Kelly Beatty has said the Earth Hour event did not take wings in Boston, we can still use the opportunity to draw attention to light pollution. And don't forget National Dark Sky Week begins the end of the month www.ndsw.org

This week marked the beginning of the 2008 Merit Badge University program, a scouting educational event co-sponsored by the Boston Minuteman Council and Harvard Friends of Scouting. Scouts had the opportunity to attend classes in over 25 different subjects at Harvard University, including chemistry, music, weather, and astronomy. The astronomy program has grown in popularity, and additional volunteers and instructors are needed. If you have the time and interest in participating as a telescope volunteer or instructor, please let me know. I would be happy to share course outlines and materials, as well as my experiences as an instructor with you. The event is great fun. The students are motivated, eager, and interested in learning about the subject. Volunteers are needed for the April 12th session. Come and share your expertise — you'll have a lot of fun!

It is an exciting time for astronomy on all fronts. The surprises from outer space continue. Scientists studying the harvest of photos from MESSENGER's Jan. 14th flyby of Mercury have found several craters with strange dark halos and one crater with a curiously shiny bottom. Check out the full story at:

http://science.nasa.gov/headlines/y2008/07mar_strangeacers.htm?list1009403

As always, if you have any questions or comments, feel free to contact me.

~ Virginia Renehan, President ~

Feb. Meeting Minutes . . .

E. Sam Palmer, Radio Astronomer and Engineer at the Harvard-Smithsonian Center for Astrophysics, was the featured speaker at the February meeting of the Amateur Telescope Makers of Boston and the Bond Astronomical Club. Palmer gave the group a history of the discovery of interstellar molecular molecules along with his work using Harvard Observatory's millimeter-wave radio telescope located on the roof above that evening's assembled audience at the Philips auditorium.

"Interstellar space is really a hostile environment. There's all kinds of often violent, cosmic rays and everything else that is going to destroy molecules." When CN, CH and CH⁺ were discovered in many old red giant stars most scientist thought it interesting but theorized that they would not last long. Sam called this "a missed opportunity" and very little was done for 27 years.

It was the discovery of the 3° black body background radiation by Penzias and Wilson allowed researchers to reinterpret how molecules could be at the ground state of the first rotational state. Measurements made on the CN molecule on the "part that pitches over" on the black body curve matched the 3° background radiation.

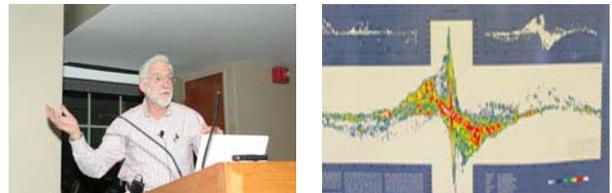
The other thing that occurred was that "gravity collects all of this interstellar material together and into giant molecular clouds. The first was the Orion nebula which was discovered by the Harvard millimeter-wave radio telescope". Subsequent surveys have turned up hundreds of these clouds.

Harvard Observatory's millimeter-wave radio telescope, according to Parker, "was the first telescope that can see something big". It has an acre of degree beam which is a very fine resolution when compared to the entire sky that one is surveying. Other larger dishes map a tiny portion of the sky and would take a decade to produce a similar map. Updates to the receiver have increased the sensitivity by a factor of 20 which translates to a factor of 400 in the integration times. It now takes 3 seconds to get a line in Orion as opposed to 20 seconds before. Palmer stated that "For about 10 years we have been the most sensitive receiver on the planet". The telescope was built in the 1970's and was located on a building at 120th St and Broadway in New York City. In 1986 it was relocated to Harvard College in Cambridge, Massachusetts. Its twin telescope is located in Chile.

Being Valentines Day, Parker used the Rosette Nebula to showcase what is in the molecular clouds. The 6000 solar mass area that is being lit up by the hot OB stars (300 solar masses) is a typical H₂ region. When Harvard's millimeter-wave scope is trained on the optically invisible parent cloud below the Rosette a 100,000 solar mass cloud is seen. The parent cloud drives gases into the Rosette and precipitates more star formation. The main point is that "wherever you see the carbon monoxide concentrate that's where stars are forming. So the carbon monoxide (CO) is a tracer for star formation. And star formation is the tracer for spiral arms." Parker also displayed the first map of the spiral arms of the Milky Way, also done by the above telescope.

In order to figure out some of the unknown lines discovered in space, a laboratory instrument called a 4 inch Transform Microwave Spectrometer is used. It is basically a vacuum chamber with two mirrors that form a cavity. A spritz of gas is introduced and a microwave pulse causes the chemistry to occur as the gas is bouncing between the mirrors that are being cooled to 77° K.

In closing, Parker outlined a project that he was involved in this past year. In observing the shell of gas around the red giant star, IRC10216 (CW Leonis) an unknown line showed up close to the C₆H line. He also found the same lines in the Taurus Molecular Cloud 1 using the Green Bank Telescope (GBT). The GBT spectrum was at a high resolution and determined that it was like hydrogen at the ground state so it had to be a simple molecule. Laboratory measurements determined the line to be the anion C₆H⁻. This has opened up a whole new line of astronomy research.



(L-R) Sam Palmer and the Milky Way in Molecular Clouds

The Secretary and Treasurer reports were given.

Steve Beckwith gave the Membership report for Dave Siegrist.

Virginia Renehan projected the Star party schedule and asked for volunteers.

Virginia presented an "Earth Hour" video to the membership. Started in Sydney, Australia in 2007, the event has cities turning off all non-essential lighting for one hour in the evening. This year Chicago will be the U.S. city that will be turning out their lights on March 29th from 8-9 p.m. This event is sponsored by the World Wildlife Foundation with the goal of protecting the natural environment but Virginia notes that their website has no connection with the night sky as being part of the natural environment.

Virginia also spoke about light pollution being symptomatic of the energy use problem and that members should inform their local representatives about this issue. She also reported on progress in her hometown of Gloucester. The new mayor has asked that Virginia and Mario to identify problem lighting in the city. Mario mentioned that you have to contact your mayor or city council. He

also suggests that you write an Op-Ed piece in your local paper. "If you do those 2 things it's surprising at what traction you get." March 29th also kicks off Dark Sky Week.

Kelly Beatty asked for volunteers for an event to coincide with Earth Hour on March 29th. He has been trying to work with the Boston City Council to organize an event but he has been unable to get the attention of the mayors or the Energy Czar. He is hoping to have a star party for the city of Boston on Boston City Plaza.

Virginia announced that the Nation Science Teachers Association (NSTA) Science Education will take place on March 28-29. The event is for formal and informal science educators.

Steve Beckwith gave the Observing Committee report. He made a special congratulation to Phil Rounseville for his collimation class.

Steve mentioned that the C-14 is having problems with "dropped communications" and is being worked on by the Clubhouse Committee. He mentioned that the C-14 is available to all members but you must be trained on it before it can be used. Regular training classes will be offered. Most importantly, if there is a problem, do not try to fix it but let John Mahre or John Reed know that there is an issue.

Steve has only received 2 responses to his inquiry about purchasing a college level DVD astronomy class that John Mahre is currently showing at the Clubhouse. If you are interested please contact Steve Beckwith.

Another class that Observing Committee is working on is "How to Balance your Mount Properly".

Steve announced that it is the 1st quarter Moon and that if it is clear on the following day that the Straight Wall can be seen. The best time to see this feature is when it is an 8 day old moon or one day after the 1st quarter. It is a shadow feature located just inside the terminator at about the center of the Moon.

Steve Clougherty gave the Clubhouse report. He reported that most of the time was spent with snow removal. The machine shop project in the near barn will be the focus of the next work party if the snow does not interfere.

Steve C. announced that a Messier Marathon will take place at the Clubhouse on March 8 if the weather cooperates.

Mario mentioned that he will be having a 1 hr. meeting with Representative Dempsey who is the chair of the Energy Committee. He will be presenting his Powerpoint on light pollution to get the bill moving.

Virginia thanked Gary Jacobson for this evening's refreshments. Kelly Beatty announced that he brought some free posters.

Paul Valleli showed some images from his trip to the Winter Star Party.

Paul also reported on his examination of an original Porter Garden telescope (Serial# 10) that was trying to be auctioned by the Calusa Nature Center and Planetarium in Fort Myers, Florida. The instrument has major condition problems in that it was dropped in the past and the casting is bent inward and the optics are missing.

~ Al Takeda, Secretary ~

Clubhouse Report . . .



Dave Prowten clearing the driveway

February brought the snowfall totals at the Clubhouse much closer to a record high. The warm-ups between storms did not melt the icy slush and areas of slick ice remain a problem. Compounding this safety issue was the loss of the once around pass of the snowplow truck after the mid-month. Buckets of sand and ice-melt are on the front porch -- Please use them! Remember that rain in Boston usually means snow, ice or freezing rain in Westford. We are attempting to find a solution to this problem. In the meantime bring a snow shovel with you to the Clubhouse. The rain on March 4-5 may remove the remaining snow but could leave an icy surface depending on the melting, drainage and the water table level. Stay tuned.

February found 180 member sign-ins on the logbook. Thursday's mirror grinding had 13 with 2 inclement weather closings. Friday's Astronomy class had 45 with one snow cancellation. Saturday's shoveling, inside activities, and observing had 70. These were supplemented by 17 members viewing the Feb 20th total lunar eclipse from the Clubhouse and two visits by Steve Mock's Bentley Astronomy students, adding 31 attendees.

The February Full Moon work session, held on Feb 23rd, was made possible by 14 members: Steve Beckwith, Bruce Berger, John Blomquist, Steve Clougherty, Mike Hill, Sydney Johnson, Dick Koolish, John Maher, Dave Prowten, John Reed, Sergio Simunovich, Art Swedlow, Al Takeda and Sai Vallabha. Before lunch, snow removal was the big effort. Eight inches of snow blocked us in all directions. Both snow blowers and all shovels

were in use. Driveway clearing was followed by the partial parking area and partial observing area snow removal. A hearty spaghetti, salad, garlic bread, and baked chicken lunch followed, set out by Art, Sai, and John R.

After lunch, the near-barn cleaning continued and old/broken weather proof electrical box covers were replaced throughout the observing field. Steve Clougherty donated a 40mm f.l. Vernonscope 2inch Erfle eyepiece for use with the C-14; also included were two star atlas donations: an Uranometria and Star Atlas 2000. THANK YOU Steve.

The C-14 control problems continue to be tackled by a team of members led by John Maher. A special thanks to Steve Morlock for his many hours of testing, configuring, and documenting the progress.



Steve Morelock working on the C-14

The next work session is on March 22nd from 11 a.m. to 5 p.m., under the direction of Dave Prowten and Steve Clougherty. An announcement on our website will be forthcoming, but snow removal and barn work will continue depending on this March's weather. SEE YOU THERE!

Clubhouse Saturday Schedule

Mar 15	Henry Hopkinson	Eric Johansson
Mar 22	Dave Prowten – Work Party	
Mar 29	Bernie Kosicki	Rich Nugent
Apr 5	Paul Cicchetti	Art Swedlow
Apr 12	Mike Hill	John Maher

~ John Reed, Steve Clougherty, and Dave Prowten ~

Membership Report . . .

We have had one new member join over the last month:

Edward Boynton of Lowell, Ma

~ Dave Siegrist – Membership Secretary ~

Meade LXD75 GEM Repair . . .

After the completion of the February 23rd Work Party a few members gathered around to found out why a member's Meade LXD75 German Equatorial Mount (GEM) had excessive backlash in the right ascension axis. Mike Matti and John Blomquist disassembled the mount to fix the problem. This is a photo record, with a few descriptions, of that process. Images by Al Takeda.



With the LXD75 in the counterweight down position (No counterweights, bar or scope) remove the 2 hex head screws on each side of the plastic housing.



Remove the hex screw between the latitude adjusting screw and the polar scope.



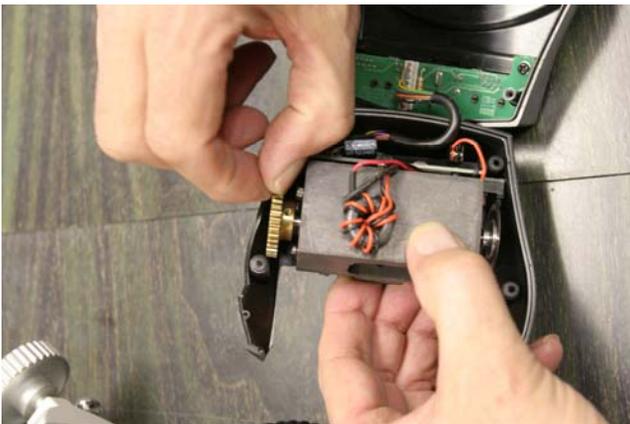
Remove the plastic housing from the mount.



Check for end play on the shaft and make sure that the gear setscrew is tight and is positioned on the flat part of the shaft. The 3 hex screws that you see here are the worm adjusting screws.



Using a small Phillips screwdriver remove the 4 screws that hold the housing in place.



The gear that Mike is holding was extremely loose and this caused the sloppiness whenever the drive was engaged. Watch that you do not damage the encoder wheel on the right side. Tighten and reinstall by reversing the directions above.

~ Al Takeda ~

Star Party Thank You! . . .

Thanks to all the ATMoB members attending, making the Annual Acton star party another brag-about experience. I had a great time and always look forward to this Star Party.



(L-R) Neil Fleming and Tom McDonagh with his new Dob

Highlights for me included: First light for my new 10" Dob! Many folks asked questions regarding the different scope designs. They seemed pretty perplexed initially by my open tube Dob. It was easy to point out the simple workings of a simple scope; Great views of the Great Orion Nebula for the time it was visible. The Trapezium was easily seen and I had a lot of contrast to see the dust and gas of the Nebula. Saturn was a giant hit with the parents and kids. My wide-field scope put things in perspective next to Scott's planet killing refractor. The humbling Saturn experience drove me off to the Bee Hive cluster, where I parked for most of the night. The kids loved "driving" the Dob to get an idea as to the extent of the open cluster.

When things wound down I was able to split Mizar and Alcor with the 14 Arc second split of Mizar and it's companion easily seen. I did not try to split the Mizar double double with the murky conditions being what they were.

The chill and cornbread was welcomed once the scopes were put to bed. Stories of past Acton Star parties were shared over the remaining coffee before heading home. My favorite was of Bruce Berger climbing the Douglas building to cover and especially offending light with his coat to save the day.

Special thanks again to all the ATMOB members. The Acton PIP and Acton Outdoor Lighting Education Committee spearheaded by Stephen Feinstein did a great job in organizing and running the show. Sorry if I forgot to mention anyone. Looking forward to next year already!

Best regards,

~Tom McDonagh~

Correction: Feb. 2008 Newsletter. Kelvin said that "the Sun has not illuminated the Earth for 100 million years" not 10 billion years.

April Star Fields deadline
Sat., Mar 29th

Email articles to Al Takeda at

secretary@atmob.org

POSTMASTER NOTE: First Class Postage Mailed Mar. 11th, 2008

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c/o Dave Siegrist, Membership Secretary
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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.

Mar 14 First Quarter Moon
Mar 17 Moon 0.3 degrees North of M44 (Beehive Open Cluster)
Mar 20 Vernal Equinox
Mar 21 Full Moon
Mar 29 Last Quarter Moon
Apr 5 New Moon
Apr 12 First Quarter Moon