



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. 20, No. 2 February 2008

This Month's Meeting...

Thursday, Feb. 14th, 2008 at 8:00 PM

Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

Parking at CfA is allowed for duration of meeting

What we see depends on how we view it. This month join E. Samuel Palmer, radio astronomer and engineer at the Harvard-Smithsonian Center for Astrophysics, as he takes us on an astrophysical side trip to show us the interstellar "stuff" he and his colleagues at the CfA observe in outer space that we can't see with our telescopes. Using molecular line spectroscopy both in the lab and with radio telescopes, E. Samuel Palmer and colleagues are able to learn more about the properties of dense molecular clouds and the initial conditions and early stages of star formation within these clouds.

Mr. Palmer's millimeter-wave radio telescope on the roof over Phillips Auditorium is the only active research telescope physically located at Harvard Observatory. This telescope can see and interpret interstellar CO, a molecular mass tracer for what it can't see, that is molecular hydrogen, which constitutes most of the mass in giant molecular clouds. The CO cloud survey done over the course of several decades using this telescope has played an important if not dominant role in our understanding of the distribution and properties of star forming molecular clouds in our galaxy and its nearest neighbors. It is considered the most extensive, uniform, and widely-used survey of star-forming molecular clouds to date.

Unlike many astronomers, the success of Mr. Palmer's telescope keeps him close to home. "Everybody else gets to travel to Arizona, Hawaii, Chile and even the South Pole, not to mention low Earth orbit!" The short commute to his telescope from his main campus office at Pierce Hall leaves Mr. Palmer time to develop instrumentation for laboratory work in microwave and laser spectroscopy on

exotic molecules of astrophysical interest. This, in fact, occupies most of his time.

Mr. Palmer, also a lecturer at Harvard University Extension School, teaches two introductory astronomy courses, and serves on the Science Advisory Panel of the Department of Education at the Center for Astrophysics. Covering all the bases, he is also a fellow amateur astronomer, observing the handful of stars occasionally visible from his home in Arlington.

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 Renehan ~

President's Message...

For those who attended last month's meeting you know it was quite extraordinary. I wish all members could have been there. We had a special visitor, a budding young amateur astronomer from Chile, who was visiting Boston for regular follow-up medical treatment for brain cancer. Regaining his sight after several surgeries, Felipe was hooked on observing the night sky. He thought he was coming to the meeting to hear our speaker and meet other amateur astronomers. Not so. The young man's doctor had contacted Kelly Beatty seeking advice on where in Boston his patient's family could purchase a telescope since none were available in Chile. They were heading home in three days. Knowing there were no stores in Boston and time was short, Kelly put out an email on the ATMoB list server. Literally overnight, members of ATMoB and the North Shore Amateur Astronomy Club (NSAAC) rallied to send this young man home with donations of books, binoculars, eyepieces, a telescope, and other accessories. He and his family were stunned and moved to tears by the outpouring of support that night. Thanks to all those who made a donation. Special thanks to Kevin Ackert, ATMoB member and president of NSAAC, who organized the telescope donation. It was an incredible show of generosity on the part of both clubs, and I for one felt proud to be associated with such a terrific bunch of people. Astronomy propels us across so many borders.

Last year at one of our monthly meetings we had a panel of folks from NELPAG speak to our group about light pollution and ways we all might participate in saving our night sky. This March we have another opportunity to act up and promote awareness of light pollution and astronomy. Earth Hour 2008, a campaign started in Sydney, Australia in 2007, will take place on March 29th from 8 – 9pm.

In 2007, 2.2 million people in Sydney took part in the first "Earth Hour". Individuals switched off lights and non-essential appliances and the city darkened several icons such as the Sydney Opera House and the Harbor Bridge. The combined efforts of 2.2 million people resulted in a 10% drop in energy use, nearly double what had been predicted. This year on March 29th, companies, individuals and cities all over the world will participate in Earth Hour 2008, to help focus attention on energy use and global warming. Chicago is the main US city planning to participate.

It's interesting there does not seem to be any correlation mentioned by the Earth Hour sponsor, World Wildlife Federation

(WWF), between turning off lights to save energy and turning off lights to preserve the night skies. Yet, one of WWF's stated mission goals are to stop the degradation of the planet's natural environment. Deleterious effects of light pollution on the natural environment are not specifically stated. The Earth Hour initiative speaks loudly to individuals worldwide who are concerned about climate change, but it also speaks to those of us who wish to reduce light pollution and preserve the night skies for future generations. These critical issues go hand-in-hand and for this reason I encourage everyone to consider participating in Earth Hour 2008, in whatever capacity you are able. From 8pm to 9pm on March 29th, 2008, turn off all lights and non-essential appliances. Consider speaking to your local town council about reducing energy usage in your community during that hour. Visit the Earth Hour site to learn more about the initiative. www.earthhour.org The Earth Hour date also coincides with National Dark Sky Week www.ndsw.org

As a component of Earth Hour here in the Boston area, Kelly Beatty hopes to have a public star party in Boston that night, possibly on the City Hall Plaza. If anyone is interested in participating, please take a minute to sign up for the event on the website star party calendar. It would be helpful if Kelly was able to tell the Mayor's office in advance that we could deliver on a star party if one was desired.

Yes, Mario Motta and I were deputized by Gloucester's new Mayor and the Energy Committee to go out and get the bad city lights! We are gathering a posse together including several folks from the Gloucester Area Astronomy Club (GAAC). If anyone would like to join us after observing some fine night, drop us a line.

Don't forget the total lunar eclipse on February 20th. The Moon will be situated in the sky near Saturn and the bright star Regulus in Leo. It should prove to be a beautiful sight. Weather permitting; the eclipse will be visible from start to finish with the umbral phase lasting just under an hour. A group of us in Gloucester will take to streets and set up telescopes on the main boulevard in our ongoing effort to promote astronomy locally. Come join us.

In closing, I want to include one activity for kids young and old. Would you like to name the next great space telescope? Here's your chance. NASA is inviting the general public to suggest a new name for the Gamma-ray Large Area Space Telescope (GLAST) before it launches in mid-2008. The full story is available at: http://science.nasa.gov/headlines/y2008/08feb_namethatlescope.htm?list1009403 . While you are there, follow the link to the GLAST mission home page and its education/outreach section for fun and interesting activities for your family or young students. Try out the simulator!

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

~ Virginia Renehan, President ~

Jan. Meeting Minutes . . .

The January meeting of the Amateur Telescope Makers of Boston and the Bond Astronomical Club featured Dr. Charles Lada, Associate Director of the Radio and Geoastronomy Division at the Harvard-Smithsonian Center for Astrophysics. His talk titled, "The Search for Stellar Origins from Antiquity to the 21st Century," chronicled "man's quest to understand the origins of the stars and planets" from ancient writings to the latest scientific inquiry.

The oldest references to the origins of the stars and planets that he was able to find were passages in the Bible. There are also other creation stories that were Mesopotamian, ancient Egyptian and Native American Indian to name a few. Dr. Lada is not a theologian but is a scientist and was more interested in the "scientific creation myth".

The beginning of the scientific journey began over a millennium later in Athens, Greece between the times of the Persian and the Peloponnesian wars. A philosopher named Anaxagoras was convicted and sentenced to death for merely suggesting that "everything has a natural explanation," and that "the sun, the moon, and all the stars are stones on fire." Anaxagoras was one of the very first people to come up with this statement.

It would be centuries before Greece would embrace and champion the "scientific cosmos" through the teachings of Plato, Socrates, and Aristotle. By the time of Ptolemy, a Greek astronomer in Roman times, Aristotle's ideas had become accepted. Dr. Lada read a translation from Ptolemy's book, *Almagest*, which "summarized all Greek knowledge". One of the passages stated that "earth too, taken as a whole was sensibly spherical". Dr. Lada is quick to point out that this fact was known since 500 – 600 B.C. It also had the earth at the center because everything else in the sky appeared to be spinning around it in perfect circular orbits. "Aristotelian physics that we know it today is completely wrong but nonetheless it was pretty good. It was so good that the explanation has been around for 3000 years."

After the Dark Ages the Renaissance period renewed questions on what mechanism was driving the Greek "Prime Mobile". Copernicus decided that the Sun centered universe would make it easier to explain. The lack of parallax, noted by Tycho Brahe, was a problem until Kepler and Galileo proved him right. Copernicus knew that if there was no parallax then the stars must be very far away. If they are very far away then they must be very bright, perhaps as bright as the Sun. If they are as bright as the Sun then, as Descartes suggested, "the stars were in fact other Suns."

The next big advance in understanding the origin of stars and planets came from a musical composer, optician and astronomer named William Herschel. Settling in England after fleeing the 7-Years War, Herschel continued a composing career while at the same time building telescopes. It was with one of these scopes that he discovered the planet Uranus which allowed him to gain a lifelong pension to do astronomy. He soon was building larger telescopes and with the assistance of his sister, Carolyn, who is an astronomer in her own right, discovered more than 2500 nebulae. His observation of a planetary nebula "proved to him that nebulae

are not systems of stars but was gaseous.” He began to classify the nebulae and proposed the idea that this is “where stars and planets come from”. This idea united Isaac Newton’s physics with what he saw in the sky. His revolutionary concept was “that the universe changes and evolves with time.”

The debate as to whether the nebulae were stars or gas was settled when an American astronomer attached a spectroscope to a telescope and found that they were different. While it solved one riddle it seemed to contradict the star formation theory put forward by Herschel and LaPlace.

Most of the great thinkers of astronomy in the early and mid-20th-century thought that “most stars are created at the beginning of the universe.” This was proved to be wrong when William Thomson (Lord Kelvin) “discovered the law of thermodynamics. He showed that the sun could last 10 billion years if in fact it was slowly collapsing and converted its energy, into luminous energy.”

The next breakthrough came in 1925, at Harvard University, when Cecilia Payne-Gaposchkin wrote a PhD thesis that said that “the stars had uniform composition and it is only of the sort of energy, the temperature of the star that determined what the spectrum of the star looks like.” Her second result was that the “stars are primarily made of hydrogen”. According to Dr. Lada, it was this second theory that was rejected by Dr. Henry Norris Russell and in order to have her thesis published she retracts it even though she always believed it.

In 1935 at a conference in Washington, Hans Bethe, who had worked out the proton-proton fusion cycle of nuclear burning, was informed that Cecilia Payne-Gaposchkin’s hydrogen model would produce the proper temperatures not the iron/nickel model that Russell believed. “Bethe got up there and he told everybody what he had done and it was instantaneously accepted”. Simply put, the sun is giant thermonuclear reactor that will last 5 billion years.

It was in 1951 that saw the discovery of the 21 centimeter line of atomic hydrogen gas between the stars by Harold Ewen and Edward Purcell at Harvard. This meant “that the raw material still exists for star formation”. Dr. Lata stated that “Herschel was right. Star formation is an ongoing process and is subject to direct empirical study.”



Dr. Charles Lada and the Prime Mobile

A special presentation and donations were made by members of the ATMoB and the North Shore Amateur

Astronomy Club (NSAAC) to Felipe R., a young boy from Chile undergoing follow-up cancer treatment in Boston. See the President’s report for details.



(L-R) Kevin Ackert presents donations to Felipe.

The treasurers report was projected on the screen due to the absence of Gary Jacobson. The Secretary had no report due to the cancellation of December’s meeting because of a bad snow storm.

Virginia mentioned some of the upcoming star parties.

A New Member Night was announced for Thursday, Jan. 17th by Virginia and Observing Committee Chairman, Steve Beckwith.

Steve B. announced that there would be a collimation workshop for Newtonian and Cassegrain telescopes by Phil Rounseville on Sat, Jan 26th at the Clubhouse.

Virginia has gotten a hold of some NASA DVD’s. If anyone is interested in viewing these please contact her.

Steve Clougherty gave the Clubhouse report with snow removal being the number one priority. The near barn interior will be the focus of the next work party.

A telecon was announced for Feb, 5 as part of the Night Sky Network. Initiatives for Dark Skies and light pollution will be discussed.

A “Star Count” will take place between Feb. 25th and Mar. 8th.

On Jan. 28th and 29th, Virginia and Eileen Myers will be doing demonstrations with the Astronomical Society of the Pacific for the National Science Teachers Association Conference at Boston University.

John Sheff announced that Brian Marsden will be speaking at the Center for Astrophysics (CfA) next week. He also announced that a total lunar eclipse will occur on Feb 20th and the CfA will be planning a get together for that event.

Paul Valleli announced that Ed Knight donated a very valuable, original condition, 1st edition of “*Amateur Telescope Making*”. He wanted it given to the club to be used for any benefit we can get out of it. It will be auctioned by March with a \$50 reserve. Please

contact the treasurer, Gary Jacobson with your bid before the March meeting. A winner will be announced at that time.

Paul also had 35 objectives that his company was discarding. They are 90mm in diameter, f/3. They can make an excellent wide field refractor in combination with a 1 inch eyepiece. He is selling them for \$5 a piece. The proceeds will benefit the Club's treasury.

~ Al Takeda, Secretary ~

Clubhouse Report . . .

A review of the sign-in log at the clubhouse shows attendance since last month's report topped 180. Again the club appreciates the repeated efforts by Clubhouse Committee members to clear snow to allow scheduled openings to happen. The numbers were: Thursday night mirror grinding at 40, Friday's Astronomy course at 60, Saturday's observing and inside activities over 70, and an unrecorded number of observers utilizing the Milon Observing Field when the house was not open. This is the best reward the Clubhouse and Observing Committees can receive for their volunteer time invested.

This month's Work Party took place on January 19, attended by J. Blomquist, P. Cicchetti, S. Clougherty, R. Koolish, J. Maher, T. Mentall, E. Myers, D. Prowten, D. Ryan, A. Swedlow, A. Takeda, and W. Toomey.

Big thanks to Tal Mentall for the donation of a second snow blower at a critical time. The big blower caught a large stone and later sheared a pin while the little blower chugged on. Also, thanks to Dave Aguilar for the box of astronomical parts delivered by Dick Koolish; and to Tom Calderwood for the 2008 calendar.



Clearing snow from the Milon Observing field.

The big snow blower quit at a most inconvenient time- as the Thursday evening crew tried to keep up with the snowfall. Since we have no heated area for equipment maintenance, the ice buildup in the chute was removed during Saturday's daylight and that's when the rock

jammed in the auger was found. Snow removal resumed until a sheer pin let go which then was replaced. The two blowers finally removed the frozen mix with considerable effort. Additional work was done on the C-14 with the installation of a new dew heater system and a red backlit computer keyboard.

New red lights were installed in all observatory buildings; we have found a new source for 25 watt red lights with ceramic coatings on the internet. The local electric vendors were not able to continue supplying our needs. A barbequed burger and dog lunch was served courtesy of chefs Swedlow and Myers. We must remember to remove the drippings in the future to keep the excitement level down a bit. Everything was very tasty and kudos to the chefs.

The next Work Party is scheduled for February 23rd. We bet snow removal will again be on the menu; but we'll replace outlet covers in the field to eliminate the GFI trip problem that may be starting. Dave will need help on the near barn renovation and depending on the temperature, the sculpting of the new walk to the near barn could continue. Stay tuned for announcements on the ATMob website. Clear skies!

Clubhouse Saturday Schedule

Feb 16	John Panaswich	Dave Siegrist
Feb 23	John Reed – Work Party	
Mar 1	Richard Burrier	Glen Meurer
Mar 8	Steve Clougherty	Steve Mock
Mar 15	Henry Hopkinson	Eric Johansson

~ John Reed, Steve Clougherty, and Dave Prowten ~

Knights Observatory C-14 Availability . . .

The C14 in the Knight Observatory is available for each ATMob member's use after they have been trained on the instrument, computer and the software driving the instrument. In the event you are using the instrument and you find some type of problem, do not try to correct it yourself. Instead, please notify John Maher of any problems you have encountered and he will coordinate assigning the proper person(s) to resolve the issue.

This "hands-off" policy will insure that troubleshooting is occurring in a controlled fashion by assigned people. This also includes changing the balance of the C-14 and mount. Recently, the mount was balanced after it was found to be out of balance. It is now balanced for visual observing. Members, who need to change the balance for instrument packages (CCD), should contact John Maher, Steve Beckwith or Mike Mattei for instructions on how to balance the mount for that package and also return it to the visual balance configuration.

~ The Clubhouse and Observing Committees ~

Observing Committee Report . . .

Approximately fifteen people attended the telescope optical collimation class held January 26th at the clubhouse. Very special thanks goes to Phil Rounsville for giving this class and helping walking through the ins and outs of collimating Newtonian and SCT optical configurations.



Phil Rounsville showing the members how to adjust a Newtonian.

As mentioned elsewhere in the newsletter, the C14 is available to all members who have been trained to run the instrument. Another training session will be held this month. In addition, we will be holding a “balance your equatorial mount” seminar in February too. Keep an eye on your email for a notice from ATMoB Announce for the dates, times and details. As always, we’re looking for ideas for classes. Please contact Steve, John or Mike with any suggestions.

~ Steve Beckwith, John Maher and Mike Mattei ~

Membership Report . . .

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

Hillary Mastropaul West Newton, Ma

~ Dave Siegrist – Membership Secretary ~

Historian’s Corner . . .

Thanks to all those members for listening to my story of Project Moonwatch. I was overwhelmed by the standing ovation.

I wasn't quite sure which I enjoyed more the 50 year membership award or the Sputnik t-shirt.

Best to all,

~ Anna Hillier – Historian ~

Astro Trivia . . .

THE NAME PLUTO for the now demoted 9th planet was suggested by an 11 year old English girl, Venetia Burney. She was passionately interested in classical mythology and astronomy, and she suggested that the Roman equivalent of Hades might make a good name for the newly discovered object at the edge of the solar system. Her grandfather passed the suggestion on to a professor of astronomy at Oxford. He then cabled the suggestion to colleagues in America. Almost immediately the name was greeted with enthusiasm and was officially adopted on May 1, 1930.--*Lives of the Planets* by Richard Corfield, Basic Books, 2007.

THE NEW HORIZONS spacecraft was launched to Pluto on Jan. 19, 2006, at the start of what would be the fastest transit of the solar system ever. At engine shutdown, the spacecraft was already traveling at 36,000 mph, the fastest spacecraft ever built.

SCIENTIFIC EXPLANATIONS of the workings of the world, from atom to the Big Bang are all *models*, the scientific equivalent of a *metaphor*. Metaphors (and models) can be misleading if taken too literally.-- *The God Effect* by Brian Clegg, St. Martin’s Press, NY 2006.

~ Ted Poulos ~



John Maher with the C-14 in the Ed Knight Observatory.

**Mar. Star Fields deadline
Sat., Mar 1st**

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

POSTMASTER NOTE: First Class Postage Mailed Feb. 12th, 2008

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

Feb 13 First Quarter Moon
Feb 16 Mars is 1.6 degrees south of the Moon
Feb 20 Full Moon. Total Lunar Eclipse.
Feb 24 Saturn at opposition
Feb 25 Mercury is 1.3 degrees north of Venus
Feb 28 Last Quarter Moon
Mar 7 New Moon