



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. 10 November 2007

This Month's Meeting...

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

Join us this month for what promises to be an engaging talk by Dr. Robert A. Gonsalves, "Phase Diversity Imaging: Real Time Correction of the Atmosphere and Telescope." Phase diversity imaging uses multiple images of an object to combat the deleterious effect of the changes in the atmosphere and telescope. The method uses a model of the imaging system to form a joint estimate of the object and aberrations. It can be used to control an adaptive optic, if one is installed. This method can be used for small objects, as well as for large objects like the sun, the moon, planets, satellites, and galaxies. Dr. Gonsalves will show the mathematical bases for Phase Diversity Imaging, phase retrieval and image deconvolution. He will also show how the method was used to estimate the optical flaw in the Hubble Space Telescope. Finally, Dr. Gonsalves will show how, in principle, phase diversity imaging could apply to any telescope or video camera which has an adaptive optic (possibly, as simple as automatic focus) and some real-time processing capability.

Dr. Gonsalves is an Emeritus Professor in the Department of Electrical and Computer Engineering at Tufts University. He received the B. S. in Electrical Engineering at Tufts and the M. S. and Ph. D. from Northeastern University. At Tufts he taught, did research, and was the department chair. In 2000 he won the university's Leibner Award for Excellence in Education and Advising.

His area of expertise is digital image processing, with applications in the graphic arts, medicine, astronomy, and historical images. In 1990 he used phase diversity to help NASA determine the optical flaw in the Hubble Space Telescope; and he is currently helping NASA design the

optics for Hubble's replacement. Dr. Gonsalves has analyzed home movies for public broadcasting productions on the assassination of John F. Kennedy and on the Loch Ness Monster. He has extensive experience in industry and is the founder and former President of Lexitek, Inc., which builds instruments for innovative research in optics. He is also working with the Harvard-Smithsonian Center for Astrophysics to image planets of nearby stars.

A part-time house builder, Dr. Gonsalves designed and built a contemporary solar home and two neo-colonial homes. He and his wife, Patricia, live in Woburn, MA in an 1840 colonial he rehabilitated in 2004. They have five children and seven grandchildren.

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...

How do you like those Red Sox! A lunar eclipse win in 2004, and this year Comet Holmes! It was in the stars. What an exciting time for Sox fans and amateur astronomers both: watch an inning of baseball – go out to observe the comet – back inside to check the score – back out again to observe. Comet Holmes has been a real treat. Images and descriptions of the comet posted by club members have been terrific. Our own Mario Motta had an image featured in the November 1st online news journal, *Universe Today*. The journal also showcased photos taken by astronomers at the University of Montreal, and UK astronomers who used the powerful Isaac Newton telescope in La Palma. But according to the editor, Mario's photo showing the comet's jet of material was, "the best image seen". I can't wait to see what celestial event and subsequent astrophotos the Patriots might bring during superbowl!

My only disappointment regarding the comet, apart from a few cloudy nights, was the media's failure to report the event. To quote a friend, the comet is "light years" away from the media's interest, but not the public's. Any neighbor I introduced to Comet Holmes was fascinated. To think that a nucleus of 1.6km could generate a coma exceeding the diameter of Jupiter is quite remarkable. I hope everyone has had an opportunity to see this tailless wonder. Sky and Telescope has a page dedicated to the comet with interesting links to photos, history and observing notes from astronomers. They invite you to add your own observations in the comments section. The link can be found at

<http://www.skyandtelescope.com/observing/home/10775326.html>

Some of you may be interested in attending the Space Vision Conference, a national conference of Students for the Exploration and Development of Space (SEDS). SEDS is an organization of students interested in astronomy and space related sciences and activities. The event takes place November 9 – 12th. The conference includes speakers, student research presentations, workshops and a career fair for those interested in working in the space sector. See the following link for information.

<http://www.spaceref.com/calendar/calendar.html?pid=4421>

As I write this, Daylight Saving Time (or Night Wasting Time) is finally coming to an end, and on Sunday, November 4th, we “fall back” to Eastern Standard Time. It’s been a little odd having daylight hours extend so late in the fall, and sunrises so late in the morning, this new schedule thanks to the Energy Policy Act of 2005. The idea of “saving time” is a source of much confusion for young students, as no daylight is actually saved. Rather, we “shift time”, to have more daylight hours in the evening. The Department of Energy is conducting an energy study regarding daylight saving and Congress will adjust the time schedule accordingly pending the results of the DOE study. So, be sure to write your representative and ask for a change to the “Night Saving!” For an interesting read on all this time shifting check out <http://webexhibits.org/daylightsaving/index.html>

As always, if you have any questions, feel free to contact me at vrenehan@gis.net. Clear Skies and Happy Comet watching!

~ Virginia Renehan, President ~

Oct. Meeting Minutes . . .

The October meeting of the Amateur Telescope Makers of Boston and the Bond Astronomical Club featured Dr. Lisa Kaltenecker, astrophysicist from the Harvard-Smithsonian Center for Astrophysics. Her research is focused on the search for extra-solar planets and the simulation of detectable planetary atmospheres. Dr. Kaltenecker’s talk is *How to Spot a Pale Blue Dot in the Night Sky?* Her discussion focused on the how, why and what we are seeing as we are searching for these other worlds.

Dr. Kaltenecker described how we have discovered as many as 250 interesting planets recently. Most of these worlds are “big planets, Jupiter like planets, some with gaseous atmospheres bigger than Jupiter.” These are relatively easy to find because they are massive enough to cause the parent star to wobble.

Another way to identify a planet is to measure its light curve as it is transiting the parent star. One such professional/amateur collaboration, headed by Greg P. Laughlin, <http://www.transitsearch.org>, has found a number of planets using this method. She described how an Italian amateur using a 0.5-meter (15 inch) scope was able to measure a light curve of a transiting planet and was allowed to have his name as a coauthor in the discovery.

Planets that are Earth sized will have an extremely shallow dip in the light curve as it transits. In February of 2009, the NASA Kepler 1-meter space based telescope will be flown to detect those types of extrasolar planets within a 70 light year distance. The radial velocity data collected by this mission will allow researchers to calculate the size and mass of the planet. Dr. Kaltenecker describes

the map of habitable planets as a similar situation that Columbus had in his maps. “He had a sketchy map with a few islands and continents but his map was missing a lot. Kepler will create a map of our neighborhood in the solar system.”

Detecting those Earth sized planets will still be difficult due to the extreme brightness difference between it and the parent star, which can be up to 1 billion to one photon. Two, 3-meter telescopes, with a 100-meter baseline can be used as an optical interferometer to phase cancel the bright star and observe the planet.

Once you can see the planet, a spectrum can be used to discern its atmospheric components. Some of the more important fingerprints are from Carbon Dioxide (CO₂), Oxygen (O₂), Ozone (O₃) and water (H₂O). Venus and Mars have a CO₂ signature but little else. In order to have life as we know it, certain biomarkers must be present in the spectrum. The Earth for example has CO₂, O₂, O₃ and water (H₂O).

The Earth is the only habitable planet that can be studied and understand how it looks like now. Other planets may not be in our 21st century and will look different. The Earth started with a CO₂ period, followed by a methane period and then stabilized with an oxygen, CO₂, and ozone era that we see now. This situation came about because Earth is in the habitable or “Goldilocks” orbit. If a candidate planet is too close to its parent star, all of the atmosphere would be lost or be in a CO₂ hothouse like Venus. If it were too far away, the O₂ and water would be frozen. Kaltenecker described many different planetary scenarios and how we will interpret the fingerprints.

Dr. Kaltenecker mentioned that “this work is really exciting and really fun. A lot of things have never been figured out but you just go and learn as you go”.



Dr. Lisa Kaltenecker



Artist rendition of other worlds

The Treasurers, Membership Secretary, Secretary and Clubhouse reports were given.

The chairman of the new Observing Committee, Steve Beckwith, talked about how the committee would like to develop the skills of all of the members of the club. To facilitate this, a number of classes will be held at the Clubhouse. There will also be training on the permanently mounted scopes and a program will be set up for the loaner scopes. Steve also mentioned that they will also be putting together a class on how to use your “easy to use” Meade Go-To Telescope.

Virginia Renehan announced some of the upcoming star parties. We always need your help so please sign up.

A star party at the Clubhouse will be held for the American

Institute of Aeronautics and Astronautics (AIAA) on Friday, Nov. 9th at 6:15 p.m. Volunteers are needed to show the group how to observe the night sky.

Eileen Myers reported that she has made progress on putting together many decades of *Sky and Telescope* magazines for the Clubhouse Library.

Virginia announced that this year marks the 50th anniversary of the Launch of Sputnik and also Anna Hillier's 50th anniversary with the club. A plaque and a Sputnik T-shirt were presented to Anna in appreciation for 50 years of dedicated service to the club. Paul Valleli also received a Sputnik mug as an appreciation from the club.

Anna gave a short talk on her contribution on Project Moonwatch. She described the moment of discovery as Sputnik passed through the field of her scope. After the data from her observation was submitted, she learned that she had been the first to view the new satellite. She also discussed her interview with *Sky and Telescope* magazine and the Moonwatch article she wrote for the Society of Amateur Scientists.

Paul Valleli announced that Ken Launie is the new President of the Antique Telescope Society. Paul described the construction of the Moonwatch scopes. They were war surplus binocular objectives (7x50mm) with Erfle eyepieces which gave a 7 degree field. This allowed a several second view as the satellite passed overhead. He described the cloudy and cold weather conditions during that period. The team included ATMob members and Ham radio operators who strung up wires and they were able to hear Sputnik beeping as it passed. He described this as an exciting time.

Brian Marsden announced that in commemoration of the 50th anniversary of spaceflight the 100,000 asteroid discovered would be named "Astronautica" by the IAU committee.

Virginia talked about the web site solarweek and Astronomy Education Review (AER) is looking for write ups on innovative or improved hands on demos.

Bernie reminded the members going on the 2009 Eclipse trip that there is a meeting on Oct 27th at the CFA at 7 p.m.

Mario Motta was invited to speak at an International Dark Sky (IDA) convention in Quebec. He noted that there is a whole 60 km. region of Quebec that is an international "dark sky preserve". He showed a few photos of before and after the towns changed to full cut-off fixtures.

Dick Koolish reported on a few events that he and Ken Launie attended. The first was the meeting of the Scientifics Instruments Commission. This group is dedicated to the history and preservation of scientific instruments. Dick showed his pictures of the side trip to the Museum of Steam and Wireless. They also went to the

Yale Observatory to see the scopes and their collection of scientific instruments. They then went to the Antique Telescope Society meeting in Greenville, South Carolina. At the University of Virginia, McCormick Observatory they were able to visit the 26 inch Clark refractor. They also went down to the South Carolina State museum to see a display of 25 antique telescopes. He also showed some images from the Skyscrapers Convention in Rhode Island.

~ Al Takeda, Secretary ~

Clubhouse Report . . .

October Work Parties

The clubhouse observing field's normal use has increased by the sudden appearance of the much brightened Comet Holmes in Perseus. Even the full moon did not detract from visual and photographic observations of this unusual apparition. But the full moon also indicated that the October work party was held on October 27th and continued onto October 28th. The rain on Saturday forced tree trimming to Sunday. Only one tree remains to be topped. Trimming stopped due to the high winds later on Sunday afternoon. The tree debris piles were chipped on Saturday and were replaced with new limbs by Brian Maerz, John Reed, and David Prowten on Sunday. Thanks to the tree saw loaned by George Paquin and chipper loaned by Brian Maerz.

On Saturday the 20" split ring mount was removed from the Knight Observatory and the reflector was stowed under plastic on blocks at the side wall; thanks to Dave Prowten, John Blomquist, Steve Beckwith, Al Takeda, Sidney Johnson, Mike Mattei, Steve Clougherty and John Reed. Also thanks to Gary Walker for the phone consultation. Steve Beckwith is constructing the new Dobsonian mount for the 20". Some floor modifications will follow.



Removing the 20 inch scope from the split ring. Photo by Al Takeda

The rear house and barn scraping were started by Steve Clougherty and Steve Schmitt but the rain prevented any painting. The meeting room projection screen repair was continued by Al Takeda and Dave Prowten. Contact was made with the MIT personnel to relay problems about the water pump. An inspection was completed on Sunday and parts were put on order. The pump is continuously running because the pressure switch is not operating properly. We can turn the water pump electrical switch

on temporarily to build pressure and use the water as usual; however it is recommended that the switch be turned off after any use to prevent the motor from burning out. Stay tuned.

A tasty lunch was prepared for the crew by Art Swedlow, Eileen Myers, and Sai Vallabha. The new grill is working well. After lunch this team presented a 75th birthday cake and gift to "Star Geezer in Chief", JR, with an appropriate musical score! (This was enjoyed by all). This team cleaned up after lunch and then the unstoppable E. Myers cleaned the entire downstairs. She would appreciate any and all help in keeping it clean!

The next work party is 10 A.M. Saturday, November 24th. Please mark your calendars. Any time you can contribute will be appreciated by everyone.

Clubhouse Saturday Schedule

Nov 10	Steve Clougherty	Chuck Evans
Nov 17	Phil Rounseville	Brian Leacu
Nov 24	WP#12: Paul Cicchetti	
Dec 1	Ed Budreau	Gary Jacobson
Dec 8	Eric Johansson	Brian Maerz

~ *John Reed, Steve Clougherty, and Dave Prowten* ~

Star Party Thank You's . . .

Plaistow, NH – Well, we pulled off another successful Pollard School star party!! Thank you one-and-all for schlepping your equipment up from as close as Forrest Street and as far as Fitchburg, MA. John (Blomquist), you are one great guy to come all that way EVERY year for our kids. This year it seems as though we had more families than ever, and everyone certainly had a good time AND learned something. My estimate is 350 people this year, anyone else have a guess?? Dick Goudreault, our host, gave 6 hay rides where his prior record was 5...and he turned away people. Saturday seems to be easier on families than a week night. Steve and Neil - great activities and presentations. Same time next year??

~*Peter Bealo*

Geneva Cliffs Dorchester- Thank you to John Sheff and Haldun Menali for their efforts at the Geneva Cliffs event. Unfortunately, clouds rolled in and the moon was all that was visible, but the interest level was high. Participants patiently waited for a break in the clouds as John and Haldun gave an informal talk on the formation of the Moon and life cycle of stars. 20 neighborhood folks participated in the event. All had a great time and they are eager to have us return in the spring!

Prospect Hill Waltham – I just wanted to say thanks to you and John Blomquist, George Roberts and ATMob for a great evening! It was a big success! I wanted to send a

quick note and share a link to our local paper where there is a nice article about the event.

<http://www.dailynewstribune.com/homepage/x1549400897>

We had an excellent turnout. More than expected. I tried to keep it to 30 but people just showed up at the last minute. I think we had about 50. Again, many thanks!

~ *Frank Fitzgerald*

For Sale . . .

1) Orion Skyview Eq. Mount with RA, Dec motor drives, and controller. Polar scope included. Can take a medium size scope (refractor). - \$200.

2) A 7X14 Cummings Table Lathe, not used much, like new- \$300.

3) Astrovid 2000 Video camera (650 line Resol.) with 800 line horiz, resolution monitor – asking \$175

Call Paul Cicchetti 978-433-9215 if interested.

Best of the Internet . . .

Mike Mattei of the newly formed Observing Committee has created a list of links that he uses and recommends as a professional in the field of astronomy. You can find them at www.atmob.org under Library then Articles then Club authored documents, or

<http://www.atmob.org/library/articles/bestofinternet.php>

~ *Eileen Myers* ~

Astro Trivia . . .

THE PERFECT SOLAR STORM and the largest in recorded history occurred on September 2, 1859. A solar flare/mass ejection was so large that blood-red auroras engulfed the world and were seen as far south as the tropics. The magnetic storm caused compasses and other sensitive magnetic instruments to malfunction. Telegraphic communications were disrupted. In fact, telegraph operators in Boston disconnected their battery supplies and operated their telegraph lines to the west coast from the current induced in their lines by the magnetic storm.

At this time, astronomers had no clue as to the true nature of the sun and its connection to auroras and magnetic disturbances on Earth. Furthermore, astronomers were primarily concerned with making better star charts for navigation by mapping the precise location of stars--astrophysics was not yet born. If you want to read a very wonderful account of this solar storm, the astronomy of the period, and how eventual astrophysics came about, I would suggest *The Sun Kings* by Stuart Clark, Princeton University Press, 2007. Clark was the former editor of Britain's most popular astronomy magazine, *Astronomy Now*, and writes in a very readable fashion.

~ *Ted Poulos* ~

Dark Sky Project . . .

Fellow star watcher, Gene Harriman, an amateur astronomer in Plymouth, MA started a web project on Google maps to list dark sky observing sites in New England. Like many of us, he is looking for places in New England to go for a weekend getaway to do some dark sky viewing. He has created a one-stop web resource folks can use to find these spots. He is asking for us to send in any dark sky locations we may know about. What he has listed so far can be found at:

<http://maps.google.com/maps/ms?hl=en&ie=UTF8&cd=1&msa=0&msid=114863451440437703349.00043dcb27418eee53a7d&ll=43.149094,-70.949707&spn=5.738709,10.217285&z=7&om=1>

Gene's vision is to have a public Google map showing New England's dark sky sites. Each location will have contact info, site info, and a link to the local weather and clear sky clock. Google maps provide drive to directions. If anyone would like to contribute to the list, please contact Gene at gene.harriman@verizon.net or call him at (508) 747-8198.

Three Hands-On Seminars in November . . .

The Observing Committee has announced three workshops to be held in at the clubhouse this month. The first is on November 10th and is on is a session taught by Glenn Chapel visual variable star observing. The second and third workshops are on November 17th and are on drawing and imaging Mars and will be led by Mike Mattei and John Boudreau. Sign-up and additional information is posted on our website in the club calendar.

If you'd like to attend or have questions, but don't have access to the calendar. Please contact Steve Beckwith (978-779-5227).

~ Steve Beckwith, John Maher and Mike Mattei ~

Video Astronomy Course . . .

I will be running a Video Astronomy Course called *Understanding the Universe "An Introduction To Astronomy 2nd Edition"* (Taught by Professor Alex Fillipenko, University of California, Berkley). This will be shown at the clubhouse on Thursday nights and probably some Saturday nights depending on interest and Clubhouse availability. Explore everything there is in the Universe in 96 lectures, each 30 minutes long. This course is designed for new members with little or no experience in Astronomy and would be a refresher for advanced Amateur Astronomers. Dates and times will be given on the atmob.org website. For more info:

<http://www.teach12.com/ttcx/coursedesclong2.aspx?cid=1810&pc=Science%20and%20Mathematics>

~ John Maher ~

Sputnik Retrospective . . .

Last month's meeting was a treat for me, featuring sputnik retrospectives by Anna Hillier and Paul Valleli, two ATM's who were part of the birth of the Space Age. Then a presentation by Dr. Lisa Kaltenegger, who's on the cutting edge of extra-solar planetary science made it apparent how far the science has come. Who would have thought that in 50 short years, we'd have the tools in space be able to "see" exoplanets, when at the time of the launch of Sputnik, we were just lobbing stuff into space to see what would happen!

I imagine most people can remember where they were when Armstrong first set foot on the Moon, but not the smaller steps by so many that it took to get him there. Anna and Paul's participation in Project Moonwatch represents just one of those smaller steps towards the Moon. How exciting it must have been to be part of such a large international cooperative, linked by common interests across continental and cultural boundaries! For amateur astronomers like Anna and Paul, at that time it wasn't yet the "Space Race", just the dawn of a new era in astronomy and science!

~ Nanette Benoit ~



(L-R) Virginia Renchan, Dr. Lisa Kaltenegger, Anna Hillier and Paul Valleli.
Photo by Ken Launie

**Dec. Star Fields deadline
Sat., Dec 1th**

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

POSTMASTER NOTE: First Class Postage Mailed Nov. 6th, 2007

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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.

Nov 9 New Moon
Nov 17 First Quarter Moon
Nov 18 Leonid Meteor shower (peaks at 04:00 UT)
Nov 24 Full Moon
Dec 1 Last Quarter Moon
Dec 14 Geminid Meteor shower (peaks at 17:00 UT)