



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

Vol. 18, No. 11 December 2006

This Month's Meeting...

Thursday, December 14th, 2006 at 8:00 PM

Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

Parking at CFA is allowed for duration of meeting

This month's meeting will feature Dr. Max Tegmark, Associate Professor of Physics at Massachusetts Institute of Technology. Dr Tegmark's research is focused on precision cosmology, that is, combining theoretical work with measurements (CMB, gravitational lensing) to place constraints on cosmological models and their free parameters – how the underlying physics (dark matter, dark energy, gravity) can be tested rather than assumed. His research has also included diverse topics such as interpretations of quantum mechanics, predictions of inflation, and parallel universes.

A native of Stockholm, Dr Tegmark studied at the Stockholm School of Economics, and Royal Institute of Stockholm. He earned an MA in Physics and PhD in Physics/Theoretical Cosmology from UC Berkeley. Dr.Tegmark has worked as a research associate at the Max-Planck Institute in Munich, as a Hubble Fellow and member of the Institute for Advanced Study in Princeton and as faculty at the University of Pennsylvania before joining MIT. He has collaborated on the Sloan Digital Sky Survey team, Planck CMB satellite mission, Boomerang CMB polarization experiment, and other CMB projects. In addition to teaching at MIT, Dr.Tegmark has volunteered in Boston and Berkeley area high schools.

In his talk, "The History of Our Universe in One Hour", we'll take a scenic journey through space and time with the help of a cosmic flight simulator. After exploring our local Galactic neighborhood, we'll travel back 13.7 billion years

back to explore the Big Bang itself and learn how state-of-the-art measurements are transforming our understanding of our cosmic origin and ultimate fate. If you have questions about dark matter, dark energy, black holes, parallel universes or other things cosmological, this will be a great opportunity to ask them!

Please join us for dinner with our speaker at 5:45PM at the Changsho Restaurant located at 1712 Massachusetts Ave. in our fair city, Cambridge, MA.

President's Message...

This month we slip into winter's cold grip on December 21st as the Winter Solstice occurs in the northern hemisphere. The sun is at its lowest point in the sky and it will be the shortest day of the year. Brrrrr - the first day of winter approaches. But during some of the longest, coldest nights of the year leave it to Mother Nature to show us some of her brightest stars – Sirius, Rigel, Capella – and what some consider one of the best meteor showers of the season: the Geminids! So even if the weather was a bust for last month's Leonid meteor shower and Mercury Transit, there is still a chance this month to experience another good show.

The Geminid shower officially begins on December 7th, but it doesn't peak until the morning of December 14th when 50 – 80 meteors per hour might be visible. Their radiant point will be the constellation Gemini. The shower will wind down near December 18th when only a few meteors per hour are observed. Check out the American Meteor Society for viewing tips, terminology, etc. at <http://www.amsmeteors.org/showers.html#geminids>

Most of the well known meteor showers, like the Perseids and Leonids, are old. They have been observed for hundreds or even thousands of years. Not so the Geminids. The first Geminid meteors only just appeared in the mid-1800's. Apparently, these early showers were disappointing, with only 10 or 20 visible in an hour. Since then, they have grown in intensity. Today, the Geminids can be one of the more impressive meteor showers. After the Geminids were first recorded astronomers began searching for the parent comet, the source of most meteor showers. In 1983, NASA's Infrared Astronomical Satellite discovered a strange object moving near the Geminid stream. The object identified as an asteroid, now called 3200 Phaethon, turned out to be the parent body of the Geminids. Interestingly, Phaethon has never been caught exhibiting a coma or dust trail, and its spectra looks like an asteroid, but its orbit is that of a comet. It is classified as an Apollo asteroid, but it may in fact be an inactive or extinct comet nucleus. For an interesting bit of Geminid history: <http://meteorshowersonline.com/geminids.html>. The following links including *Frequently Asked Questions, Educational Corner and Asteroid or Comet* might also be useful for those interested in discussing meteors with students and star party –goers:

<http://www.amsmeteors.org/faqm.html>

<http://comets.amsmeteors.org/educate/educate.html>

http://www.windows.ucar.edu/tour/link=/asteroids/asteroid_3200_phaethon.html&edu=high

As you look at some of winters constellations recall Annie Jump Cannon was born on December 11, 1863. Her work laid the foundation for the modern system of classifying stars by spectra.

Celebrate her work by pointing out to students those stars that have interesting visual spectral qualities. The sky is full of subtlety. The winter constellations afford views of all the major spectral types: O- Mintaka, B- Rigel, A- Sirius, F-Procyon, G - Capella, K- Aldeberon, and M-Betelgeuse.

In closing, I wish everyone a very Happy New Year! I hope to ring in '07 with many of you at the annual New Year's Eve Party at the clubhouse. The party, spearheaded by Eileen Myers, is another December event which is not to be missed. It is sure to warm everyone's spirits!

~ Virginia Renahan, President ~

Nov. Meeting Minutes . . .

The November speaker was Dr. Owen Gingerich, Professor Emeritus of Astronomy and of the History of Science at Harvard University and a senior astronomer emeritus at the Harvard-Smithsonian Astrophysical Observatory. His talk focused on the planetary definition problem confronting the International Astronomical Union and his involvement in that process.

He realized that this planet definition issue would be a "minefield" when people found out he would be the chair of the group being formed to address this problem. The first person that visited him said that "we can't lose Pluto, little children love Pluto..." . A short time later, another person visited Gingerich and said, "We've got to get this mess straightened out, Pluto has got to go."

To give us a perspective on the whole problem, Dr. Gingerich took us back in history starting with William Hershel's discovery of Uranus and all of the politics and controversies of that time. Later, William Hershel's son John, wrote the leading textbook at that time and in it described a large number of "planets" of which we now know as asteroids. The Royal Astronomical Society relabeled some of these bodies as minor planets. The term "minor planet" in fact had already been used by various national almanacs. Gingerich then related the story of the Neptune's discovery by La Verrier and the disappointments of James Challis. International politics took hold as various names for the new planet were proposed until Neptune was agree on.

Dr. Gingerich then moved on to Pluto's discovery by Clyde Tombaugh. Even from the beginning there were issues with this body. Pluto size has been determined to be 1/400th the size of the Earth so problems were emerging with it's status. What finally brought the debate to a head was the discovery of a larger object than Pluto, designated 2003UB313. Gingerich laid out the major questions, "Does the minor planet Bureau get to name it? Or is it a planet in which a whole different committee of the IAU would name it? So it became a bureaucratic sort of turf situation as to who would do it."

A 19 person committee from the International Astronomical Union (IAU), Planetary Sciences Division worked for a year and a half and could not come up with a definition for a planet. After rumors were circulated by Brian Marsden and friends proposing the minor planet label 10,000 for Pluto, "a great hue and cry arose that this was the first step to demoting Pluto."

Faced with a bombardment of emails and letters, the IAU became nervous and formed another committee. This one would be more broadly based. A criticism of the former 19 member committee was that they "weren't paying too much attention to either a historical or cultural aspects of the naming proposition." The new group would be an international one, having experiences as planetary scientists, writers, journalists and in public relations. Dr. Gingerich would be the chair because "because as you know, I wear two hats, one as an astrophysicist and the other as a historian of astronomy."

The committee, after reviewing the previous committees' recommendation and discussing the issues, came up with two ways that you can define a planet. One way is, "something that the geologists would love is: What it is. What kind of object is a planet?" The other way that dynamical astronomers love is: Where it is. How is it interacting with the other objects around it?" A common consensus was that the object had to be in hydrostatic equilibrium (enough gravity to form a ball). Another proposal was that Mercury through Neptune would be called Classical planets and as a public relation gesture, Pluto would be the prototype of a new category or objects called "Plutons".

Gingerich went to Prague and discussed the resolution with all of the presidents of each division and got a unanimous response. The first hint of a problem came when a press officer said, "the public will only want to know one of two things. Is Pluto a planet and how may planets are there?" The answer caused more confusion and since it did not talk about planetary interactions it caused the dynamicist to gang up on the committee and propose another resolution. Due to the nature of the attendees being mostly dynamacists, the committee's findings were turned over. As Dr. Gingerich noted that "the geologist, the planetary oriented, astronomers tend to go to the international geophysical Union meetings, instead of the IAU meetings."

So the voting proceeded that removed Pluto and left us with 8 classical planets. Voting also resulted in definitions of dwarf planets that are not defined as planets and a characterization of a planet as "clearing it's zone" in which Dr. Gingerich notes as being "clumsy and almost unteachable". The name (Plutons or Plutoniums) for the class of objects that Pluto would represent was also defeated.

Dr. Gingerich was "very unhappy the way it came out". He reflected on the decision by saying, "you know, science isn't done by voting. It's going to be very interesting to see how this ultimately turns out."

Virginia acknowledged Dr. Irene Porro from the Kavli Institute for Astrophysics and Space Research at MIT and Angela Martinez, doing a student, project: "Is there Color in the Universe?" There were also other students present from the same program doing research investigations using actual Chandra data.

The Secretary's report (Al Takeda), Membership report (Dan Winchell), Clubhouse report (John Reed), Star Party report (Virginia Renahan) were given.

Virginia read a thank you letter from Sullivan Middle School.

Haldun Menali gave a short report on the Geneva star party.

Paul Valleli asked to take a vote on how many people want to include Pluto as a planet.

Virginia mentioned the NELPAG meeting and also brought in a "Glare Buster" light and the book "There Once Was a Sky Full of Stars". She also announced training for the Star Lab in Plymouth. An author that is writing a book on Baxter State Park is looking for amateur astronomers who have observed there. She just wants your account of that vanishing dark sky history.

Charlie McDonald announced the ATMob discount for the book "Star Gazing with Jack Horkimer" he also mentioned that the Reading star parties would be starting up soon.

Virginia mentioned that the Vermont Astronomical Society was broken into on October 27. If you come across any of this on sale please contact the President, Gary Nowak.

Bob Naeye introduced Babak Tafreshi of Iran, the Editor-in-Chief of the magazine Nojum. This monthly magazine has been published for 16 years as a scientific magazine and is the only astronomy magazine published in the Middle East. His website is www.dreamview.net. He is a very dedicated amateur astronomer and Astrophotographer. Babak's astrophotography is mainly wide field nighttime photography. He described the difficulties of publishing a magazine with limited funds. He also talked about the interest of young people in amateur astronomy in Iraq. Most of the telescopes in Iran are in academic institutions and are less than a half a meter in diameter. Professional astronomy is not that advanced but the amateur community is doing much better with 4000 members within 60 astronomy clubs.

Bruce Berger took a business trip to China 3 weeks ago and while he was there, met the Polaris Astronomy Association. It is based in Beijing at one of the universities and has 200 active members. He took over about 30 to 35 pounds of Sky and Telescope and Night Sky magazines and presented it to them. The club is not sanctioned by the University and has no faculty advisor or equipment.

~Al Takeda, Secretary ~

Clubhouse Report . . .

In spite of the short duration of the daylight hours, considerable work was accomplished on Saturday, December 2. The gravel pile was distributed to the driveway low spots visible from the recent rain shower (Dick Koolish, Anna Hillier, Junichi Sano and Chuck Evans). The four sonotubes were put into place and filled with concrete. An insulated box was created around each sonotube and heated with a 60 W bulb (Dave Powten, John Blomquest, Al Takeda, Dick Koolish, Paul Cicchetti).

The unruly tree limbs were removed along the entire length of the roadside of the observing field. These were positioned in eight piles ready for Brian Maerz's chipper expertise (George Paquin, Paul Chicchetti, John Reed). This now gives us back the view down the road necessary to observe the Kennedy Space Center Shuttle launch scheduled for December 7.

Paul Cicchetti's H. Alpha solar scope provided a good view of three prominences and one surface-active area. At 5:28 p.m. all enjoyed a mag minus seven Iridium flare in the southern sky.

And we must report on the excellent lunch of beef stew with noodles, salad, and Scala bread with Brie cheese provided by Eileen Myers, assisted by Art Swedlow. A big thanks to all!

The next work party is scheduled for January 6, 2007, from 10 a.m. to 4 p.m. and the weather may force us to do only inside projects.

The first of many workshops to be held at the end of each month's work party will begin with "Newtonian Collimation" by Phil Rounseville at 3 p.m. And don't forget the New Year's Eve party at the clubhouse earlier that week (see the announcements for both events).

~ John Reed, Steve Clougherty, and Dave Prowten ~

Clubhouse Saturday Schedule

Dec. 9	Dave Siegrist	John Small
Dec. 16	Steve Clougherty	Bruce Gerhard
Dec. 23	Paul Cicchetti	John Reed
Dec. 30	Bruce Berger	Joseph Rothchild
Jan. 6	Dave Prowten + workshop leader	
Jan. 13	Shilpa Lawande	Nitin Sonawane

Membership Report . . .

We have one new member;

John Schoenherr from Winchester

~ Dan Winchell, Membership Secretary ~

Star Parties, Thank You! . . .

Acton -- On Friday, Oct 27, night at the Acton Star Party we had great volunteers, plenty of telescopes, and an interested and enthusiastic group of town residents. The only thing missing was clear skies. The evening began with fairly clear skies, but after an hour of looking at the Moon, the beautiful double Albireo and other durable objects, the clouds came in and the event ended early.

Over a hundred interested and hopeful star gazers from Acton and the surrounds bundled up and came to NARA Park. Those who came early were rewarded with some good views; the later arrivals were able to talk with the astronomers about telescopes, how to get started, and what you can see and learn as an amateur astronomer. Afterwards, most telescope operators came over to the Kosicki household for refreshments and good talk.

Thank you to Kevin Ackert, Ross Barros-Smith, John Blomquist, Valerie Coffey, Joe Hora, Tom McDonagh, Bob Naeye, Petur Nielsen, George Paquin, Steve Schmitt, Art Swedlow, Al Takeda, Bruce Tinkler, Adam Venti, and several others who came by but didn't get set up because of the weather.

-Bernie Kosicki and Steve Feinstein

Westford -The star party at the Clubhouse last month was a great success even though we didn't see a single star. Some 25 informal educators taking part in an astronomy training hosted by the MOS and Astronomical Society of the Pacific convened at the clubhouse to take part in an evening with ATM's eager to share their knowledge and expertise about things astronomical.

Dave Siegrist gave a fantastic demonstration on mirror grinding. He kept it fun and artfully debunked participant misconceptions. Dave simplified the process without leaving out any of the important bits. Educators and ASP/MOS event trainers were excited about seeing the process first hand – and commented highly on Dave's effective teaching style.

Outside, Dave Prowten, John Blomquist, Mike Hill, and Bruce Berger gave folks a tour of our observatories and telescopes. Inside, Al Takeda, John Reed, Bob Naeye, Bruce Tinkler, Babak Trafreshi, Nanette Benoit, Dan Noren and I talked astronomy and did some activities. And thank you Ed Los and Bernie Kosicki for patiently waiting out the crowds before returning to your Thursday night mirror work.

Chelmsford - Thanks also to Kelly Beaty who spent an evening with the Chelmsford Scouts and their families teaching them about astronomy. Kelly gave a great 20 minute talk on stargazing, cardinal directions, apparent motion of the stars and showed scouts how to use a

planisphere. The weather turned out ok and all went outside to observe Andromeda and some double stars. Parents, scout master and most importantly, scouts had a fantastic time!

Billerica – The star party at the Locke Middle School Monday night was very well attended. Judging by the hot chocolate served, the teacher, Maureen Parker, estimates there were 220 attendees (106 students signed in)! The Moon was nearly Full but that didn't deter the ATM's as they showed the crowd the blue and yellow stars of Albireo, the bright star Vega, the blinding Moon or the Orion Nebula complex.

This has become a favorite event for students at the Locke. Thank you to all those ATM's who volunteered including: Ross Barros-Smith, John Blomquist, Bernie Kosicki (speaker), John Maher, George Paquin, Scott Romanowski, Al Takeda, and David Wallace. It was wonderful!

~ *Virginia Renehan* ~

Astro Trivia...

WE DON'T SEE STARLIGHT IN OUR SCOPES. We often philosophize or romanticize on how our telescope mirrors capture starlight that has traveled incredible distances, focus it in an image, and view it with an eyepiece. This assumes that photons of light act like billiard balls and just bounce off the mirror surface. Actually on the atomic level, this is not what happens at all.

Along comes a photon of starlight--an incredibly small and insubstantial thing. It speeds toward the aluminum mirror coating which is, of course, composed of atoms. These are most empty space consisting of a tiny nucleus surrounded at quite some distance away by a fog of circling electrons. What does the photon do? What exactly is it going to bounce off, in good pool-ball fashion, when it hits the mirror? The tiny nucleus or the vague cloud of electrons? If either were the case, the vast majority of photons would pass straight through. The mirror would be essentially transparent with just a tiny fraction of the light bouncing back.

In fact, light doesn't bounce off the mirror at all. What happens is much more interesting. Light is electromagnetic energy. As its electric field gets close to an electron, they interact. The electron absorbs the photon of light, eats it up, becoming more energetic in the process. It takes a quantum leap. But electrons in the higher energy states are unstable. Soon it gets rid of the extra energy by pulsing out a new photon of light. The photo shoots back from the mirror surface toward your eye. The "reflected" photon is totally different photon from the incoming one of starlight. So instead of seeing starlight, we are seeing the light from aluminum atoms! Regardless, most of us would agree that the viewing experience is a wonderfully rewarding one.

The above is a paraphrasing of a section from the book, *The God Effect* by Brian Clegg, St. Martin's Press, 2006.

~ *Ted Poulos* ~

Workshop on Collimation of Newtonian Telescopes...

Have you ever noticed that someone else's telescope may out perform yours even though they are identical scopes? Why? The difference is usually in the collimation - the adjustment of the alignment of the optics. The mirrors must be lined up properly for the telescope to deliver a good image to the eyepiece. Even if the optics in one telescope are slightly better than the optics in a similar scope, often the one with the better collimation will be the better performer.

To help club members learn how to get better performance from their Newtonian telescopes, Club Member Phil Rounseville has agreed to share some of his extensive knowledge of optics and to teach a workshop entitled "How to Collimate a Newtonian Telescope". The workshop will be held on Saturday, January 6, 2007 starting at 3:00 p.m. at the Tom Britton Clubhouse in Westford. Due to the size of the clubhouse, and because each attendee will get individual assistance directly after the workshop, the class size will be limited to 12 students.

Please email Eileen Myers at starleen@charter.net or call 978-456-3937 to reserve a space in the class. Students should bring their telescopes to collimate right after the workshop. Don't forget the rest of your gear and warm clothing. Each student should also bring an empty 35mm film canister, which will be made into a collimation tool.

~ Eileen Myers ~



Owen Gingerich and Minor Planet 134340



Babak Tafreshi - Editor-in-Chief of the magazine Nojum



John Reed and the Westford Chainsaw Massacre



Dave, John and Paul prepare the forms for the concrete pour

January *Star Fields* deadline
Friday, Dec. 29th

Email articles to Al Takeda at
secretary@atmob.org

Happy New Year

Get Ready to PARTY

New Year's Eve Party at the ATMoB Clubhouse



WHERE CAN YOU go to celebrate First Night of 2007 with your family and friends and not have to drop a bundle of money? The Tom Britton Clubhouse in Westford of course! Festivities on Sunday, December 31st will start at 6:30 pm and will go on past midnight. You can arrive at any time since the opportunity to shout "Happy New Year" will be every hour on the hour, starting with the Greenwich New Year's and continuing with each time zone through Eastern Daylight Time New Year's. Please come and join the fun and bring your family and friends. Bring something tasty to share (entrée type dishes would be very welcome) since folks will be arriving and leaving all evening.



There will be plenty of non-alcoholic beverages. The clubhouse will be warm, and the Moon along with your favorite stars and galaxies will be joining us too, so bring your telescope. The forecast looks good (ok, so it is a bit early to know) and the party is on regardless of the weather. Don't forget your warm observing clothes and boots. We will also have indoor games, quizzes, songs, and PRIZES so do join us to welcome in 2007 together. Any questions, email Eileen at starleen@charter.net or 978-461-1454 (day) or 978-456-3937 (evening).

Co-Hosts, Clubhouse Committee Members Eileen Myers and Art Swedlow



POSTMASTER NOTE: First Class Postage Mailed December 8th, 2006

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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.

Dec. 4 Full Moon
Dec. 12 Last Quarter Moon
Dec. 14 Geminid Meteor Shower peaks - 11 hrs. UT (6 hrs. EST)
Dec. 20 New Moon
Dec. 22 Winter Solstice, 0:22 UT
Dec. 27 First Quarter Moon