



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. 24, No. 2 February 2012

This Month's Meeting...

Thursday, February 9th, 2011 at 8:00 PM
Phillips Auditorium
Harvard-Smithsonian Center for Astrophysics
Parking at the CfA is allowed for the duration of
the meeting.

Member's Presentation Night and Swap

This month's meeting will feature members speaking on different astronomy- or telescope- related topics. This is a good chance to see what your colleagues have been up to.

Also, bring your old equipment and accessories you may want to off-load at the mini-swap meet. If you're looking to buy, this is a great place time to get some deals!

President's Message

The start of the New Year is a point where we can look back on what has happened in astronomy. Here are a few of the important stories from Space.com.

Exoplanets found in the habitable zone

The Kepler program continued to detect a large number of exoplanets, and discovered the first alien planets in their stars' habitable zones (close enough so that water will not freeze but still with moderate temperatures so that water will remain liquid). Not to be outdone, a ground-based telescope at the European Southern Observatory found more than 50 new alien planets, including also one planet that could potentially support life.

Scientists coming close to discovery of the Higgs particle

Researchers at the European Organization for Nuclear Research (CERN) in Geneva, Switzerland, announced on December 13th they had made significant progress in their search for the Higgs

boson particle, and have constrained the mass to a certain bound. The Higgs particle was predicted more than forty years ago, but is evasive and very weakly interacting with regular matter and detectors and has eluded detection for all this time.

A new moon was discovered around Pluto.

A tiny new moon was discovered around the dwarf planet Pluto by the Hubble Space Telescope. So, Pluto stays in the news after being demoted six years ago to being a dwarf planet.

Dark Energy physicists win Nobel Prize

Three astrophysicists, Saul Perlmutter of Lawrence Berkeley National Laboratory and the University of California, Berkeley; Brian Schmidt of the Australian National University and Adam Riess of Johns Hopkins University, won the Nobel Prize in physics this year for their discovery that the universe is not only expanding, but that this expansion accelerating as well and shows no sign of slowing down. This acceleration is attributed to an undetected "dark energy" which is responsible for 73% of the mass of the universe. Together with dark matter, this means that the matter/energy we can see accounts for only about 4% of the total universe.

The Sun finally becomes active again

The Sun has been in an unexpected Solar Minimum for the past few years. This year there was finally a substantial increase in solar activity, which signals the start of the next solar cycle. Three hundred years ago there was a general cooling trend when the Sun's activity unexplainably was reduced (the Maunder Minimum).

Asteroids were in the news several times

The Dawn spacecraft made a close pass by the large asteroid Vesta, and sent back the clearest pictures yet of this object last summer.

And we were startled to learn of a close pass (within the Moon's orbit) of a large, city-block-sized asteroid in November

But for reassurance, we learned from NASA that there are less potentially very damaging size asteroids that once thought (50% less).

The big news from these and other stories is that astronomy continues to make real advances and astronomy topics continue to make the mainstream news and excite the general public. Some of the public will find they have an enduring interest in astronomy. Our challenge is to reach out to these folks and also the general public, to draw them to our club and to give them an opportunity to learn more deeply about astronomy and to practice it.

~ **Bernie Kosicki, President** ~

December Meeting Minutes

Minutes of ATMOB meeting held January 12, 2012.

Bernie Kosicki, President: called the meeting to order at 8:00 P.M.

Dr. Steve Leman, Ph. D. of MIT gave a talk entitled: "Dark Matter, Evidence and Nature."



Photo by Al Takeda

Dr. Steve Leman at the January meeting

Steve explained that the concept of dark matter was introduced as a result of astronomical observations, including the rotation of galaxy clusters beginning in the 1930s by Fritz Zwicky. Rotation rates of individual galaxies are believed to be made possible by dark matter, which holds the galaxy together by gravitational attraction. Gravitational lensing of a distant galaxy by intervening galaxies lying on a sight line to the distant galaxy is explained by invoking the presence of dark matter. Intensity peaks in the Cosmic Microwave Background are explained by acoustic waves in the early universe, and the acoustic waves support the presence of dark matter in the early universe. Numerical simulations of the formation of the present universe from the Big Bang produce a distribution of galaxies and galaxy clusters when dark matter is included in the numerical simulation. An x-ray image of the Bullet Cluster shows hot x-ray emitting gas separated from gravitational concentrations displaced from the gas, and is explained by the presence of dark matter.

These astronomical observations all point to the existence of dark matter, pervading the Universe and our galaxy.

Steve explained some experiments currently being undertaken to directly detect the presence of dark matter in our galaxy, including an experiment in which he is involved.

The gravitational interaction is apparently too weak for directly operating a detector to register the presence of a gravity particle. However a version of Supersymmetry, which is described in an extension of the Standard Model of particle physics, suggests that dark matter is in the form of individual particles and these particles interact through the weak force. The weak force is well known as it is responsible for radioactive decay, and is considerably stronger than the gravitational interaction. Accordingly, detectors for dark matter particles have been designed to respond to the weak force interacting between a dark matter particle and ordinary boson matter. The dark matter particles are, accordingly, named WIMPS, which is an acronym for "Weakly Interacting Massive Particles." The detector is expected to interact with the WIMP through the weak force with

neutrons and protons in an atomic nucleus bound in a crystal lattice, and to cause a recoil of the atomic nucleus in the crystal lattice in which the atomic nucleus is bound. The recoil causes a disturbance in the crystal, which is detected electronically and generates a signal, which is readable by a computer.

Background noise in the detectors is severe. The background noise is caused, in large part, by muons created by cosmic rays colliding with atoms of the upper atmosphere. A cosmic ray origins collides with an oxygen or nitrogen atom of the upper atmosphere to produce a strongly interacting pi meson (also referred to as a pion). The pi meson decays radioactively to an electrically charged particle referred to as a mu meson (also referred to as a muon) plus a muon neutrino. The electric charge of the mu meson interacts with electrons of the crystal of the WIMP detector to produce a large background count of events. Much effort in the design of the experiment to detect WIMPS goes into working on how to distinguish the background from interactions, which it is hoped, are due to WIMPS. To protect against mu meson background the detectors are placed deep underground in old mines. Also, background from radioactive decay of naturally occurring radioactive elements such as uranium-235, uranium-238, and lead-210 in the rocks around the mine must be distinguished from WIMP events.

The possibility that two WIMP events have been detected out of thousands of background events is thought to be about 25%, after several years of operating the experiments.

In the event that the experiments turn out to not detect WIMPS with reasonable statistical probability, the result would not rule out dark matter, but could rule out the possibility that dark matter experiences the weak interaction.

The Secretary's Report for the December, 2011 meeting was given by Sidney Johnston.

President Bernie Kosicki gave the treasurer's report.

Glenn Chaple discussed a class to teach finding objects in the sky. The class is scheduled for January 27, alternatively January 28th.

Bruce Berger gave the Observing Committee Report, including the status of the C-14 observatory, the Paramount, electronic components, and the Dall-Kirkham telescope.

John Reed gave the Clubhouse Report. The January 7th work party accomplished quite a few important tasks. The next work party is scheduled for February 4th.

Bernie Kosicki mentioned that a board meeting is scheduled for January 23rd.

Mario Motta mentioned that two couples had dropped out of the November 2012 eclipse trip to Australia, and so vacancies are available.

The new planetarium is not in the clubhouse, mainly due to the size of the planetarium. However, it was set up, tested, and

works. The diameter is about 22 feet and 11 feet tall when inflated by air and takes a large room, possibly a gym.

Mario Motta mentioned that he is cleaning his 32 inch mirror and that he will enclose it in dry air. Surface dust needs to be cleaned from the mirror.

Ross Barros-Smith thanked Eileen Myers for helping with replicating and mailing the newsletter while he was in the United Kingdom.

President Kosicki adjourned the meeting at 9:59 PM.

~ *Sidney Johnston, Secretary* ~

Clubhouse Report

The New Year started off with a bang at the ATMoB Clubhouse. Another successful New Year's Eve Party provided a convenient way to toast the New Year with fellow amateurs from each time zone from Europe to Boston. In between toasts and sky checks, the array of food available for tasting was fabulous. A big thank you to all who donated time and munchies for all to enjoy. After the ensuing cleanup effort by the host members, the first Work Session of 2012 took place on the Full Moon Saturday of January 7th. Twenty three members donated their day to keeping the clubhouse humming. The activity summary follows:

- The Home Dome Observatory door frame construction was tackled by a team led by Dave P. and Paul C.
- Snow fence repair was handled by a team led by Steve C.
- Observing field electrical circuit repair was completed by a team led by Kelly B., Al T., and John R.
- Gravel and stone dust was wheel barrowed from the storage pile, providing dry access to the Home Dome observatory entry platform, by a team led by Kelly B. and Joshua A.
- Downed tree and shrub debris was transported to the chipping pile at the driveway entrance; the tree causing the Internet disruption was trimmed to promote growth south of the connection. This team was led by Joshua A., Kelly B., Paul C. and JohnR.
- The side porch phone connection was repaired by Al T. and John R.
- In the basement, sanding on the observatory's exterior door was continued by the team led by DaveP.
- Checkout continued on the 10" Meade donated by Tal Mentall mated with the donated Alt/Az mount by a team led by John M. and Al T.
- Paramount checkout/repair continued in the shop by a team led by Bruce B.

- Autoguider checkout/testing continued on the field unit with the PC continued by Nina C., John B. and Al T.

- Updating of the 6" Schupmann continued in the Knight Observatory by the team of John B. And Gerald S. Reports are that excellent collimation was achieved with initial star tests very encouraging. Testing continues. Please do not change setting during these tests.

- Checkout of the Clamshell observatory Dall-Kirkam system, delayed by the field electrical work, will resume at the February work party, as well as checkout of the 20" Shapley dob Newtonian in the Knight observatory.

The H-alpha telescope solar views were provided by Paul C. A new sledge hammer was donated by Dick K and was used in the snow fence repair. The hearty meal was served by the team led by Sai V., Nina C., Art S., Eric J., Cindy G. And Eileen M. Good hot food really makes the last half of the work day possible. Temperatures in the 50's also helped this day's success.

Thanks to these members for this success: Joshua Ashenberg, Kelly Beatty, Bruce Berger, John Blomquist, Paul Cicchetti, Steve Clougherty, Nina Craven, Harry Drake, Jim & Charlie Getty, Cindy Gilbert, Eric Johansson, Dick Koolish, John Maher, Eileen Myers, Dave Prowten, John Reed, Phil Rounseville, Gerald Sussman, Art Swedlow, Al Takeda, Sai Vallabha, and Vladimir Vudler.

The February work session is scheduled on full moon Saturday Feb 4th. Projects will include infrastructure and telescope upgrading as indicated above. Starting with hot coffee at 10am, you are invited to join us in a day of successful work efforts.

~ *Clubhouse Committee Chairs* ~
~ *John Reed, Steve Clougherty and Dave Prowten* ~



Photo by Al Takeda

Kelly Beatty and John Reed engaged in the chainsaw massacre of a branch.

Clubhouse Saturday Schedule

February 4	Panaswich & Small
February 11	Berger & Hill
February 18	Leacu & Rounseville Work Party #2
February 25	Myers & Nugent
March 3	Clougherty & Fleming
March 10	Budreau & Burrier Work Party #2
March 17	Swedlow & Vallabha
March 31	Paquin & Prowten
April 7	Siegrist & Sonowane

Thoreau on Astronomy

Speaking about the weather and the fishing with E. and I. Garfield on the 8th, I was amused to hear these two young farmers suddenly disputing as to whether the moon, if that be it, was in the Feet or the Head or elsewhere. Though I know far more of astronomy than they, I should not know at once to find out this nonsense in an almanac. Yet they talk very glibly about it, and go a-fishing accordingly. Again, in the evening of the same day, I overtook Mr. Prichard and observed that it was time for a thaw, but said he, "That does not look like it," pointing to the moon up in the west. "You could hang a powder horn upon that pretty well."

Journal, 10 February 1856

~ **Submitted by Tom Calderwood** ~

Membership Report

Membership count as of 01/23/2012 is at 274 individuals
Same time last year: 279

Fun Facts:

Longest standing member 1952: William Knight.

Newest member 2012: Bastien Guerin

Editor's note: A membership report was not provided for the November, 2011 issue. Tom has provided the following count and new members for that month:

*Membership count as of 10/30/2011- 243 (+22 from last month!)
Same time last year – 246*

Mark Genero

George Stumpf

Chad Elliott

Mehran Namazi

David Wolfendale

Peter Von Thuna

~ **Tom McDonagh, Membership Secretary** ~

New Year's Eve Thank You

The start of Year 2012 was greeted at the Tom Britton Clubhouse in Westford with telescopic views of Jupiter, great food, music, dancing girls, and plenty of conversation, punctuated by hourly celebratory noise! Thank you to the outstanding team of Nina Craven, Eric Johansson, Julie Kaufmann, Ed Los, Eileen Myers, John and Monique Reed, Phil Rounseville, Art Swedlow, and Al Takeda. A good time was had by all.

~ *Eileen Myers* ~

Sky Object of the Month

Asteroid 433 Eros

Last November, astronomers were treated to a fly-by of the near-Earth asteroid 2005 YU 55. An 11th magnitude object, 2005 YU 55 raced across the sky at an astounding rate of one degree every 10 minutes. Viewing the event required a telescope of 6-inch aperture or larger.



Image courtesy NASA

Eros

Very rarely does a near-Earth asteroid become bright enough to be seen with small backyard scopes. A notable exception is the asteroid 433 Eros. The number "433" indicates that Eros was the 433rd asteroid to be found and catalogued – the honor going to the German astronomer Carl Witt, who spotted Eros in August of 1898. Eros is normally a faint object, but every few decades it passes near enough to brighten to 7th or 8th magnitude. One of those favorable apparitions is currently underway.

Around the time of its nearest approach on January 31, Eros will be 16.6 million miles from earth - 80 times more distant than 2005 YU 55 was during its November visit. Eros' motion, therefore, won't be as frenetic, but you'll detect a definite displacement in a matter of minutes, especially when Eros passes a background star.

During the 20th century, studies of Eros hinted that it might be an elongated body. In 2000, Eros was visited by the NEAR Shoemaker spacecraft, which orbited and imaged the asteroid for a year before making a soft landing on its surface. NEAR Shoemaker confirmed that Eros is indeed elongated, with dimensions of 22x8x8 miles.



Sketch by Glenn Chaple

Near occultation of kappa (κ) Geminorum by 433 Eros on January 23, 1975 (observations made at 15 minute intervals) at 45X with 4.5-inch reflecting telescope.

Eros' last close encounter was in 1975. It won't be a small-scope target again until 2056, so you won't want to miss this opportunity. For more information about the Eros encounter, refer to the February, 2012, issues of Astronomy (pages 48 and 49) and Sky and Telescope (page 52). For a printable finder chart, log on to:

http://media.skyandtelescope.com/documents/WEB_Feb12_Eros.pdf

New Year's Eve Photos



Photo by Al Takeda

Midnight at the Clubhouse, welcoming in 2012



Photo by Art Swedlow

A rare glimpse of the other side of the camera



Photo by Art Swedlow

Host Eileen takes event hospitality seriously

**March Star Fields DEADLINE
Noon, Sunday, March 18
Email articles to the newsletter editor at
newsletter@atmob.org**

POSTMASTER NOTE: First Class Postage

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How to Find Us...

Web Page: <http://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.
