



## **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. 23, No. 9 October 2011**

### **This Month's Meeting...**

**Thursday, October 13<sup>th</sup>, 2011 at 8:00 PM**  
**Phillips Auditorium**

**Harvard-Smithsonian Center for Astrophysics**  
Parking at the CfA is allowed for the duration of  
the meeting.

### **Inflationary Cosmology: Is Our Universe Part of a Multiverse? - Professor Alan Guth**

"I will begin by explaining how inflation works, emphasizing how inflation can account for the properties of the cosmic background radiation, which we view as the afterglow of the big bang explosion. This radiation is incredibly uniform, but also has a pattern of faint ripples that are attributed by inflation to the probabilistic behavior of quantum theory. An interesting feature of inflation is that almost all versions of it lead to eternal inflation: once inflation starts, it goes on forever, producing a 'multiverse' of 'pocket universes,' one of which would be our universe. I will then turn to the biggest outstanding mystery in cosmology: the 'cosmological constant,' which is equivalent to attributing a nonzero energy density to the vacuum (i.e., to empty space). Physicists are not surprised that the vacuum energy density is nonzero, but are at a loss to explain why it is so small - theoretical estimates are many orders of magnitude larger. I will explain how the multiverse might help to shed light on this problem."

Alan H. Guth is the Victor F. Weisskopf Professor of Physics and a Margaret MacVicar Faculty Fellow at the Massachusetts Institute of Technology. Trained in particle theory at MIT, Guth held postdoc positions at Princeton, Columbia, Cornell, and SLAC before returning to MIT as a faculty member in 1980. His work in cosmology began at Cornell, when Henry Tye persuaded him to study the production of magnetic monopoles in the early universe. Using standard assumptions, they found that far too many would be produced. Continuing this work at SLAC, Guth

discovered that the magnetic monopole glut could be avoided by a new proposal which he called the inflationary universe. Guth was elected to the National Academy of Sciences and the American Academy of Arts and Sciences. He was awarded the Franklin Medal for Physics of the Franklin Institute, the Dirac Prize of the International Center for Theoretical Physics, the Cosmology Prize of the Peter Gruber Foundation, and the Newton Prize of the Institute of Physics (UK). Guth is still busy exploring the consequences of inflation. He has also written a popular-level book called *The Inflationary Universe: The Quest for a New Theory of Cosmic Origin.*"

### **President's Message**

The saying goes that if you really want to learn about a subject, try to teach it. As a volunteer astronomy teacher for fourth and seventh grades for the past eight years, I found this is true! When I started teaching as a purely amateur, non-professional astronomer, I thought I knew a fair amount about astronomy topics, and that surely I could handle questions that 4th graders would ask. However, sometimes children know a lot more than we expect. I remember once talking to my 4th grade class about how large stars end their lives in a supernova event that usually ends up producing a black hole. One boy, who seemed very interested, asked if this was the only thing that a supernova can produce? Scratching my head, I remembered that the star remnant that was left after the supernova also can end up as a neutron star. "That's right!" the boy said. It was a test! He was testing me to see if I knew what I was talking about! So, besides just giving students the right information, here was another good reason to learn more about my subject, astronomy. So I can pass in-class tests from students!

A few years back, we started talking in class more and more about the birth of the universe- the big bang theory we all have heard of. I wanted to be ready for some surprise questions, like, for example; if the universe started at a single point, as the big bang theory says, and if the speed of light is the maximum speed of anything in the universe, then how come we can see light coming to us from over 13 billion light-years away? How could these galaxies and stars have gotten there without going much faster than the speed of light?

So I tried to learn a little more about the big bang theory, and found out that it had more than a few problems, and that there is an "inflationary universe" theory that is able to address many of these problems. Then I learned that the "inflationary universe" theory was first proposed by Alan Guth in 1981, and a more recent form of it is now embraced by most cosmologists. Physicist Alan Lightman says that, in his view, "the Inflationary Universe theory is the most significant new development in cosmological thinking since the foundational work in the 1920's."

I hope that you attend our meeting this month to hear Professor Guth's review and update of his important theory, which has withstood the tests of time very well since he first proposed it thirty years ago.

Keep looking up,

~ **Bernie Kosicki, President** ~

# September Meeting Minutes

## Minutes of ATMOB meeting held September 8, 2011

Meeting held in Phillips Auditorium, Harvard-Smithsonian Center for Astrophysics.

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

The Secretary's Report of the June meeting was given by Sidney Johnston.

Tom McDonagh gave the Membership Report. Tom mentioned that there are many new members and that a Brochure to attract new members is being prepared.

Bruce Berger gave the Observing Committee Report. He informs the club:

Two C-14's are in the machine shop.

The Dall-Kirkham mount is now tracking well.

Ongoing new observatory construction is doing well.

A family of porcupines is living under the roll-off roof observatory.

The Schupmann telescope is now mounted on a Losmandy G-11, thanks to John Blomquist.

A new camera is being tested.

Steve Clougherty gave the Clubhouse Report.

Bernie Kosicki mentioned that at last month's picnic, members had an opportunity to visit the lobby up the hill at the Haystack Observatory and view some of the images exhibited there.

Mario Motta, gave a copy of the new book, *Deep Sky Companions: The Secret Deep* to ATMOB. The book by Steve O'Meara with photographs by Mario, contains 109 recommended deep sky objects. Mario showed an image of the Ring Nebula from his new book and also an image of the supernova in M-101. Mario also mentioned that on October 4-8, the American Association of Variable Star Observers (AAVSO) is having a meeting celebrating the 100 year anniversary of the organization.

A talk over the Internet by Tom Field, who was in Seattle, WA, described spectroscopy of stars and nebula. Tom uses a transmission grating which screws into the filter threads of a 1 1/4 inch nosepiece which fits onto a standard telescope eyepiece. The spectrometer used by Tom has a grating with 100 grooves per millimeter. This spacing causes the first order spectrum to have a small diffraction angle, so that both the zero order and the first order fit onto an ordinary imaging chip of an amateur astronomical camera. By using the zero order spectrum to indicate the zero wavelength, and by using a known wavelength of an astronomical object, the spectrum is calibrated from pixel number as it is recorded to wavelength expressed in Angstroms. A computer program written by Tom, called RSpec, is very convenient in analyzing a spectrum taken through an amateur telescope. The program can be downloaded at <http://www.rspec-astro.com>

The program includes reference spectra which can be used to calibrate the spectrum taken using the grating and has reference spectra for many classes of stars. For example, a reference spectrum of Vega provided by the computer program can be used with the amateur's spectrum of Vega to calibrate the amateur's setup. A comparison of reference spectra for various classes of stars permits an amateur to determine the spectral classification of a star for which she/he records the spectrum. A set of videos are available at the above link explaining operation of the computer program and use of the spectrometer.

Also, the spectra obtained can be used to observe emission lines from nebula, observation of methane bands in Neptune or Uranus, to measure the red shift of a receding object such as a quasar, and for other astronomical spectroscopy.

The meeting was adjourned at 9:36 PM.

~ *Sidney Johnston, Secretary* ~

## Clubhouse Report

Continuing from the last Starfields report through the August 20th Work Party, we report here through the September 17th Work Party, and three additional efforts. 28 members donated 79 workdays during 14 visits to our clubhouse. The chronology follows for this reporting period, with the number of members involved in parentheses.

8-25 (3) Schupmann refractor parts were modified in the machine shop; added info extracted from sign-in log for Starfields report. Supplies were inventoried.

8-26 (3) Small pieces of everything not tied down were removed from entire property at the impending approach of Hurricane Irene; all tree trimmings from Work Party chipped; area now storm-proofed.

8-27 (6) Pre-tropical storm securing of all outside equipment. Home Dome tied down to structure with cargo straps; all outdoor chairs, grill, lumber supplies, etc., brought into house or far barn. 17-inch Greg Chase Memorial Hutch secured with plastic inside and tie-downs outside; Ed Knight Observatory north end latches bolted in place. The clubhouse was secured. Tropical Storm Irene passed west of us with destruction/flooding in its path.

8-29 (8) Schupmann pier installed and leveled; 6-inch Schupmann installed in its old location after many years' loss of light. Lumber supplies, chairs and grill moved back to porch locations. First poison ivy spraying before the picnic completed.

8-31 (1) The G-11 mount loaned to the club by John Blomquist for the Schupmann refractor was tested; digital drive worked properly, newly fabricated electric focuser installed and checked – worked slowly.

9-1 (3) Three gallons of Round-Up poison ivy spray applied to three more areas of poison ivy found around the clubhouse. Food and drink supplies purchased with coffee jar money were delivered.

9-4 (11) Since the main Arunah Hill activity was yesterday, September 3rd, needed work activity took place today as follows: the four walls of Home Dome observatory were covered with T-11 sheathing, front wall paint/stain was started with available stain. Roof design was finalized, materials list started with pickup planned next Saturday morning. Grass was mowed and trimmed over entire property for next Saturday's PM picnic.

9-5 (2) Grounds and observatory inspected. Water bottles delivered. Lots of bees, flies and mosquitoes noted in late afternoon/evening.

9-10 (75+) Many more than 75 members who took time to sign the log book brought so many delicious dishes of food, dessert and drink that the party lasted late into the night when most of the children did not want to leave. A detailed report is located elsewhere, but the learning center staffed by Eileen Myers and Bruce Tinkler, along with the solar telescopes, were a big hit. In the evening telescope viewing was a success. What a wonderful picnic.

9-11 (8) Schupmann motor focus modified, adjusted and reinstalled with improved motion. Post picnic clean up, breakdown, and storage for next year. Knight Observatory vacuumed and 2nd application of poison ivy spray applied. Replaced two field electrical posts damaged during snow plowing last winter. Roof structural framing started on Home Dome observatory.

9-17 (21) September Work Party included continued construction of observatory roof structure. Grass mowed by tractor and push power mowers. Front driveway corner area brush was cut and stacked for chipping. Front tree line trimmed and shaped past the clam shell observatory and debris stacked for chipping. Clam shell structure scrubbed and hosed clean of accumulated dirt. The 8-inch Tanguay Dall-Kirkham mount was re-worked. The 12-1/2-inch Cave mount was temporarily removed while electrical service was lowered and repaired prior to reducing the post height. Home Dome observatory wall white staining completed

9-18 (9) Roof framing completed on Home Dome observatory; awaiting plywood cover. Brush hogging continued. Work in shop continued. Solar scope set up and sun photos obtained.

9-21 (3) Work in shop continued. Tested finder mount on Schupmann refractor.

9-24 (1) Installed 80mm Celestron Rich-field telescope in the new finder mount attached to the Schupmann. The rings are octagonal with spring loaded supports requiring one screw adjustment.

Again a thank you is in order to the following members for their efforts, the number of days donated follows each name: Joshua Ashenberg(1), John Blomquist(10), Barbara Bosworth(1), Bruce Berger(1), Paul Cicchetti(7), Steve Clougherty(1), Nina Craven(1), Stelita Cronin(1), Mike Hill(1), Anna Hillier(1), Eric Johansson(3), Dick Koolish(1), John Maher(5), Roger Marian(1), Brian Maerz(3), Maureen Maerz(1), Eileen Myers(3), Tom McDonagh(1), Sean McDonagh(1), Mario Motta(1), Dave

Prowten(2), John Reed(9), Art Swedlow(7), Al Takeda(5), Bill Toomey(1), Sai Vallabha(5), Vlad Vudler(4), Dave Wilbur(1).

We really appreciate all the effort put out by the picnic committee members and volunteers who made it the best we experienced over the last 25 years. And the accelerated construction schedule set to complete the Home Dome observatory before the snow flies after a start delay from spring to mid-summer. Plus the added workload securing the property for the tropical storm and immediate return to business as usual to allow our Thursday mirror grinding, Friday astronomy class, and Saturday observing sessions to continue. All this took tremendous dedication. And our food prep crew who fed us without a long break from production. Thanks to *all*.

The next work session will continue tree shaping as well as roof application to the Home Dome observatory. The last mowing of the season will need raking and barrowing of clippings to the mulch pile. This and more happens on October 8th, the full Moon Saturday in October. Come on up and join the effort starting at 10am. And as dusk falls we are hoping that more than a few Draconid meteors will be available for your viewing from the clubhouse. What a show it gave us in 1946!

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

### Clubhouse Saturday Schedule

October 15	Berger & Hill
October 22	Mock & Toomey
October 29	Panaswich & Siegrist
November 5	Hopkinson & Small
November 12	Paquin & Prowten <b>Work Party #11</b>
November 19	Swedlow & Vallabha
November 26	Clougherty & Takeda

### Thoreau on Astronomy

Standing on Hunt's bridge at 5 o'clock, the sun just ready to set. I notice that its light on my note-book is quite rosy or purple, though the sun itself and its halo are merely yellow, and there is no purple in the western sky. Perhaps I might have detected a purple tinge already in the eastern sky, had I looked, and I was exactly at that distance this side the sunset where the foremost of the rosy waves of light roll in the wake of the sun, and the white page was the most suitable surface to reflect it.

*Journal, 19 October 1858*

~ **Submitted by Tom Calderwood** ~

## Membership Report

Membership count as of 9/25/2011- 212  
Same time last year – 224  
Peak Membership count for 2011 - 319

Do you have questions about your membership status, Astronomy Magazine or Sky & Telescope subscriptions? Drop me a line @ Tom\_McDonagh@yahoo.com and I will be happy to look into this for you.

*Reminder: Please remit your membership dues payment ASAP!*

The Amateur Telescope Makers of Boston, Inc. is a 501(c)3 organization. Donations are gladly accepted and are tax deductible to the fullest extent allowed by law. Consider making a tax-deductible contribution to the club today.

Donations made to the Clubhouse Fund help to defray the cost of special projects such as the building of a new dome to house our robotized 14-inch Schmidt-Cassegrain Telescope. Progress on this project is coming along nicely. Please feel free to stop by the clubhouse soon to check on the buildout progress. This instrument and all of the telescopes housed at the clubhouse are available for use by all members.

Please seek out and welcome our new and returning members:

Caitlin Drechsler	David Ronnow
Tyler Delabarre	Ross Henriques
Gregory Getchell	Judith Tavano
Joseph Zarba	Sarah Chmielewski
Chris Rode	

Please feel free to contact me with any questions regarding your club!

*~ Tom McDonagh, Membership Secretary ~*

## Annual Club Picnic Report

Quoting Sai Vallabha, “Yesterday’s ATMoB picnic, in my opinion, was one of the best picnics I’ve ever attended and enjoyed totally from start to finish. Hats are off to John Reed and Eileen Myers for coordinating such a huge and wonderful event, and making it a grand success. I’ve never seen that many people, and also that many new people and kids showing up and staying for such a longtime.”

It appeared as if the kids and the parents didn’t want the event to end. Most kids left, very reluctantly.

The kids kept everybody busy and on their feet, asking Eileen and Bruce Tinkler tons of questions; demanding hotdogs and burgers from Eric; bothering John Maher for training on opening the Dall Kirkham dome. Thanks to a timely donation, 17 kids made refractor telescopes; 8 kids made pocket solar systems. The biggest hit of the day was viewing a huge solar flare through the hydrogen-alpha solar scope set up by John Blomquist. He was

joined later by white light viewing through scopes set up by Paul Cicchetti, Wayne Wagner, Phil Rounseville and Tom Lumenello. Another favorite was sitting in the driver’s seat of a member’s Back to the Future DeLorean time machine (minus the plutonium and flux capacitor).” Evening observing was provided by John Maher using the Dall-Kirkham, by Sai and Al using the 17-inch Dob giving a view of Comet Garradd, and by John Blomquist, Wayne Wagner and Phil Rounseville, who set up their telescopes to share viewing with picnic attendees.

Of course, there were so many people who helped and contributed to the success of the event, but special mention goes to: Al Takeda, Julie Kaufmann and Sai Vallabha, who both showed up very early and took over responsibility of so many tasks; Eric Johansson, who never moved away from the grill and greeted visitors - all day; Bruce Tinkler for educating and entertaining the kids; Bill Toomey for leading a huge group of people and kids up the hill for a wonderful walk; Julie and Sai who organized the food setup, cleanup, and storage. Al, Sai, Julie, Eileen, Art and team for pre and post event clubhouse cleaning, set up, breakdown and storage of tent & tables; and John Blomquist for pre-picnic mowing.

It was an amazing, memorable event. The fact that folks were reluctant to leave also said a lot. A big well done to the team, and a big thank you to our membership who came out in droves. We now know we have plenty of young people interested in astronomy and a picnic. Thank you to everyone who brought the delicious food and desserts. Thank you Eileen for your support and carrying the load for many years to allow this day to happen.

The best quote of the day came late from Greg Chase when he saw Art’s signs warning of yellow jacket nests: “Yellow Jackets can’t read!”

Clubhouse Directors John Reed, Steve Clougherty, Dave Prowten

*~ Eileen Myers, Steve Clougherty, and Dave Prowten~*

## Picnic Thanks

A big thank-you to Eileen Meyers (the organizer) and everyone else (a big group of active members) who contributed to our grand Club Picnic in September. This was one of the most successful and well-attended picnics I can remember, and shows the enthusiasm of our members! There were informal tours of visitors around the clubhouse grounds, a lot of interest in our observatories, well-attended children’s activities, a walking tour to the top of the hill to see the radar sites, and of course, a lot of good food!

So, thanks to all of you who made this happen!

*~Bernie Kosicki~*

## Board Meeting Announcement

There will be a board meeting on Wednesday, October 19, starting at 7:30pm in the clubhouse. The main topic of discussion will be the report of the Strategic Planning Committee.

~Bernie Kosicki~

## Sky Object of the Month

$\beta$  Cygni (Albireo) – Double Star in Cygnus

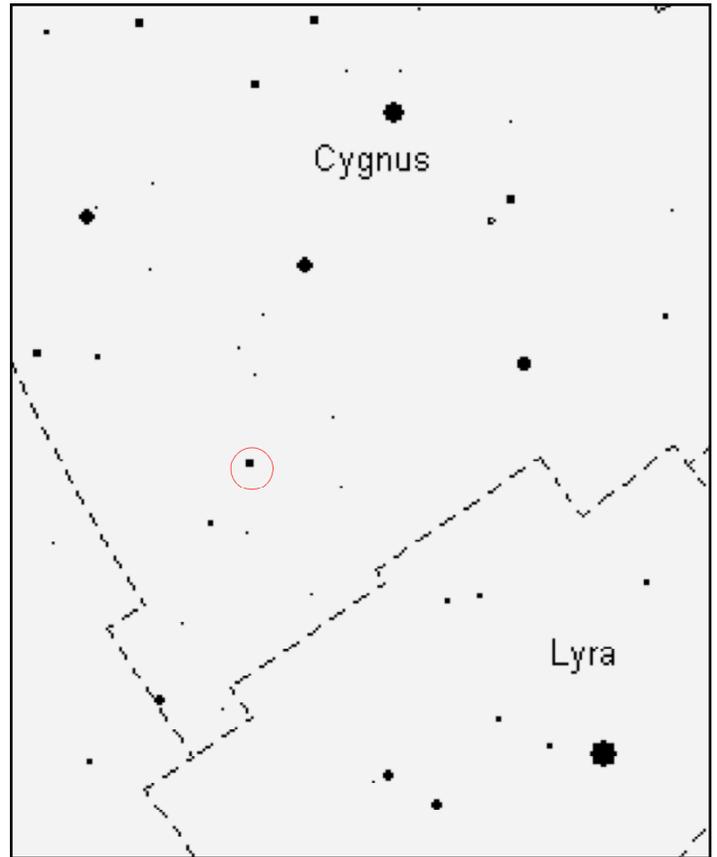
October is a colorful month, with autumn foliage at its peak here in New England. There's a splash of color in the northern sky as well, and it's epitomized by the beautiful double star beta ( $\beta$ ) Cygni, better known as Albireo.

This stellar showpiece combines a magnitude 3.3 star of spectral class K8 with a 5.5 mag B9-type star. The differences in spectral class yield contrasting colors or yellow and blue, more poetically described as "topaz and sapphire." A generous 34 arc-second separation makes Albireo an easy target for small-aperture telescopes. In fact, the colors seem more intense in a 4-inch telescope than in a 10-inch. Albireo is a "must" target for autumn star parties, and is sure to surprise and delight the viewer who assumes all stars are white.

Albireo was first observed by Flamsteed in 1681. In 1976, the spectroscope revealed that the brighter component (Albireo A) is an extremely close binary pair. The companion is similar to Albireo B, and lies a mere 0.4 arc-seconds away – an impossible split for all but the largest optical telescopes. On his "Stars" website ([stars.astro.illinois.edu/sow/sowlist.html](http://stars.astro.illinois.edu/sow/sowlist.html)), Jim Kaler notes, "From Albireo B, Albireo A would appear as brilliant orbiting orange and blue points about half a degree apart, the K giant shining with the light of 35 full Moons, the close class B companion at about half of that". For an interesting "live" view of Albireo, check out the YouTube video clip at [www.youtube.com/watch?v=YkTHKR7UBKw](http://www.youtube.com/watch?v=YkTHKR7UBKw)

There has been some debate as to whether Albireo A and B form a true binary system or are merely optically aligned. At a distance of over 385 light years, the two are physically separated by 60 times the diameter of our solar system. Recent measures show that they are, indeed, traveling together and must have an orbital period of many thousands of years.

Albireo is the most-observed double star in the northern sky, but is it the most beautiful? Next month, we look at a serious challenger. Can you guess its identity?



*Albireo highlighted in red (above) and as seen through a small telescope (below).*



~ Glenn Chaple ~

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**November Star Fields DEADLINE**

**Noon, Sunday, October 23**

**Email articles to the newsletter editor at  
[newsletter@atmob.org](mailto:newsletter@atmob.org)**

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**POSTMASTER NOTE: First Class Postage**

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**How to Find Us...**

**Web Page [www.atmob.org](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.

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