



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. 10 November 2012

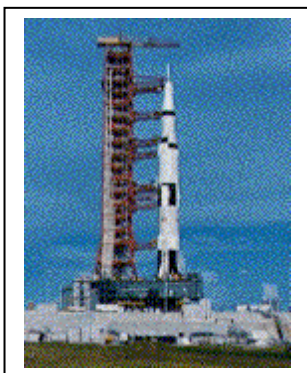
This Month's Meeting...

Thursday, November 8th, 2012 at 8:00 PM
Phillips Auditorium
Harvard-Smithsonian Center for Astrophysics
Parking at the CfA is allowed for the duration of
the meeting.

Please join us for a pre-meeting dinner discussion at Changsho,
1712 Mass Ave, Cambridge, MA at 6:00pm before the meeting.

American Triumph: Project Apollo

This month's speaker will be physicist Jim Hand who worked for Kollsman Instruments and at the MIT Instrumentation Lab during the Apollo years designing and integrating hardware and software for the command and lunar modules including a fifteen million dollar telescope used on the lunar module to assist in navigation. He served in a supporting role during the first lunar landing mission at the Johnson Space Center. His work continued past the Apollo years with technologies developed for Apollo which were finding other applications, most specifically guidance and Navigation of space systems. Jim will speak to us about the history of Apollo and his role as one of the many many people involved in getting the first men to the moon including the work on the lunar module navigation telescope he was responsible for.



President's Message

November 9th of this year marks the 45th anniversary of the first flight of the mighty Saturn V rocket. This was the Apollo 4 mission. We are all more familiar with the Apollo 11 mission that landed on the moon, or the Apollo 13 mission that almost ended in tragedy but turned out to be a mission of great success only because, against all odds, we got the damaged spacecraft back to Earth with all three astronauts alive and well. But there really were so many other important Apollo missions, each one a stepping stone to the next. The success was truly due to the work of so many people that were an active part of the greatest adventure of all time – getting a man to the moon (and back.) The Saturn V was a complex machine and for those of you who got to witness it being launched it was nothing short of a miracle that it could get off the launch pad at all. Most of us are more used to the more recent Space Shuttle launches which seemed to just jump off the launch pad. But the Saturn V took time to gain momentum. It was a more nail biting experience, especially the first one – the one on November 9th, 1967. That was a long time ago but there are still many people that were involved that are still around to talk about it. This month we will be treated to a talk by one them who will talk a little about the history of Apollo and the people involved and one of the key pieces of hardware he was intimately involved with. It was a grand time and followed by many more important space based missions, not manned of course, but equally challenging. These were the planetary probes we are all familiar with. Pioneer, Viking, Voyager, Galileo, Cassini, Messenger, the Mars rovers and New Horizons currently on its way to Pluto – the last planet to be explored. And that is just the big name missions. There have been so many more. But as important as all these are and as interesting as the data and images returned has all been, none inspire the long term enthusiasm that has graced our history as did Apollo. Will there be another time like it? A time that our younger members will talk about 40-50 years from now? Who knows. It will be hard to repeat history. Perhaps a mission to Mars will take the place of our lunar missions as our grandest adventure. If so I think it is still a ways off. For now we can still revel in the accomplishments of Apollo. We can still remember fondly where we were when Neil Armstrong first stepped onto the moon. This month's meeting will be a chance to do just that. Our speaker this month will present an engaging glimpse back to the glory days of Apollo and I hope that many of you will come to remember and for our younger members come to learn of what is possible when a nation comes together to work and support a challenge that at the time must have seemed insurmountable. I guess we proved that not to be the case.

~ Mike Hill, President ~

October Meeting Minutes

Minutes of ATMOB meeting held October 11, 2012.

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

Mike Hill, President: Called the meeting to order at 8:00 PM.

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

Mike Hill gave the treasurer's report prepared by Nanette Benoit.

Tom McDonagh gave the Membership Committee Report.

Glenn Chaple gave the Observing Committee Report.

Steve Clougherty gave the Clubhouse Report.

Bruce Berger reported on the C-14 in the new dome.

Mike Hill mentioned the gift of astronomical equipment by will of member Scott Chizzo who recently passed away.

President Mike Hill introduced Dr. Robert Kirshner as the invited speaker who gave a lecture on the discovery of the accelerating expansion of the universe, and 14 billion years of history.

Bob is Clowes Professor of Science, Professor of Astronomy, at Harvard. He earned his Ph.D. in astronomy at Caltech, performed his post-doctoral research at Kitt Peak National Observatory and then joined the faculty at the University of Michigan for 9 years. In 1986 he moved to the Harvard Astronomy Department serving as Chairman of the Department from 1990-1997 and as head of the Optical and Infrared Division of the Cfa from 1997-2003. Professor Kirshner has written over 200 research papers dealing with supernovae and observational cosmology as well as a popular book titled "The Extravagant Universe: exploding stars, dark energy, and the accelerating cosmos."

The Nobel Prize was awarded in 2011 to two of his graduate students Brian P. Schmidt and Adam G. Riess, along with Saul Perlmutter of California, "for the discovery of the accelerating expansion of the Universe through observations of distant supernovae".

Bob mentioned several important events in the history of astronomy. In 1825 a Daguerreotype of the Moon was taken at Harvard. Edward Charles Pickering, Director of Harvard College Observatory (1877-1919) hired women to scan photographic plates of images of the stars, including Henrietta Swan Leavitt who discovered the period luminosity relation of Cepheid Variables, which discovery provided a tool to measure distances from Earth to the Cepheid variable stars. After the 100 inch Hooker telescope at Mount Wilson became operational (1917) Edwin Hubble discovered Cepheid variable stars on other galaxies and could measure distances to them. These discoveries made the universe much larger than had previously been understood. Additionally Hubble discovered that most of the galaxies are receding from Earth with the velocity of recession greater the further away the galaxies are. Hubble mentioned that supernovas could possibly be used as standard candles to measure the distance from Earth to galaxies.

A supernova is a transformation of a star of ordinary magnitude into a very bright observable spot which can be as bright as an

entire galaxy. Fritz Zwicky first suggested in the 1930s that supernova are produced by collapse of a star into a neutron star. Supernovas are divided into two major classes. Type Ia which are those in which a collapsed star (white dwarf) accretes material from a companion star until it reaches the Chandrasekhar mass limit, at which time it begins to collapse gravitationally, fusion begins again, and the outer layer is blown off. These are all thought to explode with about the same luminosity since they have mass at the Chandrasekhar limit which is about 1.4 Solar masses. So these events involve about the same mass converted into light and make good standard candles. Type II supernovae start with greater mass and collapse into either neutron stars or black holes and so start with different values of mass, and are not all about the same intrinsic luminosity.

The velocity which a supernova recedes from the Earth is measured by the red shift. "z" is used to represent the red shift. So high z supernovas are moving at high velocity away from Earth, and the velocity is measured by the red shift of the spectrum.

The "high z red shift group", of which Bob is a member, was attempting to obtain measures of the slowing down of the Universe's expansion. Instead they found that supernova of high z were dimmer than expected, meaning that they are further away than expected.

Analysis of this result gives the conclusion that the Universe is accelerating its expansion as time goes by.

Something must be causing this acceleration, and it must have the characteristics of energy. It is named "dark energy" as no one has come up with a way to "see" it.

Galaxy clusters and individual galaxies are spinning too fast for the gravity of the visible stars to hold them together. So, some kind of matter which cannot be "seen" must be around the galaxies, and it is named "dark matter". In the 1930s Fritz Zwicky suggested that galaxy clusters need some sort of "dark matter" to hold them together.

Putting the above observations together (acceleration of the expansion of the Universe, rotation rate of galaxies and galaxy clusters, apparent luminosity of distant galaxies), in a cosmological model gives the result that the universe is made up of: 73% dark energy; 23% dark matter; and 4% visible matter which can be "seen".

Accordingly, we are substantially ignorant of 96% of the composition of the Universe.

Mike Hill mentioned that the 9 inch refractor on the CFA roof was available for viewing.

The meeting was adjourned at 9:30 PM by President Mike Hill

~ *Sidney Johnston, Secretary*

Membership Report . . .

Membership count as of 10/21/2012: 237
Same time last year: 244

Membership renewal payments are now overdue as of September 1st. The renewal process can be completed on-line using Paypal. No Paypal account is required. You can also just give me a call! 617-966-5221.

<http://www.atmob.org/members/person.php?frid=renewals>

Renewal checks can also be mailed:

ATMoB
c/o Tom McDonagh
48 Mohawk Drive
Acton, MA 01720

I will be available at November 8th club meeting in Cambridge if you wish to renew at that time. Drop me a line at membership@atmob.org and I'll keep an eye out for you. Thanks to all of those that have renewed already! **New members as of 2012 are not required to renew till 2013.**

Bored and tired of the same old humdrum? If so, head over the clubhouse on Thursday (closed on club meeting nights) and Saturday nights for observing when weather permits. Plenty of scopes and knowledgeable folks are on hand to help you enjoy the night sky.

Please take the time to seek out and welcome our new and returning club members:

David Feinzeig Jeffrey Kurtz Daniel Christianson David Feinzeig
Michael Dudley Ji-Young Park David Brazzell Cassandra Robeson
Daniel Temple Kassandra Ducharme Zachary Setmire

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.

~ *Tom McDonagh – Membership Secretary* ~

Report from Acadia

During August and September, I spent four weeks at Acadia National Park as an astronomy volunteer. One of the most enjoyable projects was working up a binocular observing activity for our big star parties. I chose a set of objects visible in 8x32 binos, and I mounted a green laser pointer on my own. Whenever I had a target in my field, I would activate the laser's momentary switch to throw up a beam that people could follow. The participants would lie on their backs, feet to the SSW. I started by picking a bright star for them to establish focus (I had them leave the diopter adjustment alone - setting it seemed to cause confusion). Then I had them try averted vision on an open cluster.



That done, I gave a sky tour, starting with double stars: epsilon Lyra and omicron Cygni, then the asterisms Collinder 399 (coathanger) and Kimble's Cascade, and then the northern coalsack. Next, globular clusters M13, M92, M8 (and maybe M10/M12) (you roll over or briefly stand up to see M8). Then on to open clusters M39, NGC 4756, and 4665. You then swing everyone around to the east for the finale: the double cluster and M31, maybe tossing in the alpha Perseus association. People really enjoyed this activity, I think because they got to spend 30-40 minutes actually observing - operating an instrument themselves - rather than being passive supplicants at someone else's telescope.

Tom Calderwood

Thoreau on Astronomy

It may not be in the Greenwich almanac or ephemeris, but it has an important place in my Kalendar. So surely as the sun appears in Libra or Scorpio, I see the conical winter lodges of the musquash rising above the withered pontederia and flags.

Journal, 16 October 1859

Clubhouse Report

Occasionally the work session date moves from its Full Moon Saturday slot to allow members to participate in another astronomical event. This happened due to the AstroAssembly annual gathering at Seagrave Observatory on September 29th this year. Those in attendance learned of new discoveries and new possibilities in the coming years for citizen science participants. Our work party thus took place on October 6th; and started early when the first of 18 members hit the ground running. Activities included:

* John Blomquist mowed the entire area with his riding mower, assisted by several other members.

* Bill Toomey, assisted by student Catherine Amirault and her father J.T. Amirault, were deep into brush cutting by opening time. First the driveway entrance was cleared of growth and dead limbs; this was followed by tackling the area to the rear of the far barn assisted by Joshua Brown and John Reed. Several new piles of debris now await chipping in front, and tall piles of brush for the chipper are in the rear. Burnable debris awaits the second use of Fred Taylor's trailer. BTW, Catherine is Bill's second student earning community service school credit by helping the ATMob maintain observatories.

* The clamshell was prepared for the removal of the 8" Dall Kirkam Tanguay reflector on the old (malfunctioning) Boston ATM mount. Dave Prowten and John Maher were assisted by John Blomquist, Steve Clougherty, and Al Takeda in reconfiguring the old into a new pedestal to receive a new scope. Originally Tal Mentall's donated 10" Meade (with excellent optics) was chosen as replacement and sent out for repair of its drive system. During the interim, a most generous equipment donation was made to our club through the will of member Scott Chizzo. His thoughtfulness allows us to work toward a fully functional telescope in the clamshell observatory. Work now continues on the installation of the LX200GPS 10" Meade compound reflector.

* The machine shop stayed busy preparing and reconfiguring components for the new Chizzo telescope clamshell installation. The Criterion pedestal is being incorporated; Dave Prowten, John Maher, John Blomquist and Joshua Brown were seen working the machines through late day. Al Takeda provided a photo inventory of the donated items.

* The Chase hutch housing the 17" Wray dobsonian reflector was scraped, primed, and then received its final coat of white latex paint, through the efforts of Eileen Myers and Steve Clougherty. Eric Johansson and Paul Cicchetti lent a hand at several locations.

* Work continued on the C-14 mount in the home dome observatory by Bruce Berger and Tom McDonagh, assisted by Sergio Simunovic and reluctant mascot 'Leo'.

* As the threatening skies spared us any heavy rain, Steve Clougherty and John Reed worked to restore the composting facility to normal conditions. Normal operations appear to have been achieved and new procedures will be posted. As evening approached, supplies used during this day's efforts were replenished from local vendors.

Once again the team was spared starvation through efforts of Eric Johansson on the grill, Nina Craven assisted by Catherine Amirault creating the salad, and Nina Craven setting a well stocked table of dogs and burgers with all the trimmings, thus

ensuring the **next work session** will be held on the next full moon **Saturday, October 27th**. Some efforts start earlier, but we open by 10:00 AM. Come on up and join us as we keep the facility humming. Thursday mirror grinding, Friday member's Astronomy class, and Saturday night observing continue.

~ *Clubhouse Committee Chairs* ~

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

Naming of our Newest Observatory

After reviewing several names and ideas that were submitted by members, the executive board voted and approved a name for our newest observatory housing the C14 mounted on a computer controlled Paramount equatorial mount. The name that we settled on is the **ATMoB Research and Imaging Observatory (ARIO)**. The final touches on this new facility are being made and it should become usable very soon.

Clubhouse Saturday Schedule

Nov 10	Henry Hopkinson, John Small
Nov 17	Mike Hill, Dave Prowten
Nov 24	Art Swedlow, Sai Vallabha
Dec 1	Gary Jacobson, Nitin Sonowane
Dec 8	Paul Cicchetti, Tom McDonagh
Dec 15	Steve Clougherty, Al Takeda
Dec 22	Eric Johansson, John Reed

2013 RASC Observer's Handbook...

40 copies of the 2013 RASC *Observer's Handbook* were ordered. I plan to sell them at the November 8th monthly meeting. Any leftover copies will be available at the December meeting. Handbooks will be \$20 each.

The guide is published annually by The Royal Astronomical Society of Canada (RASC) and is regarded as the standard reference for data on the sky. The first handbook was published in 1907, making this its 105th year of publication. The 2013 guide has 352 pages. The 24-page section called "The Sky Month By Month" has an extensive listing of events for each month of the year. See <http://www.rasc.ca/handbook/> for more details.

Submitted by Eileen Myers

Sky Object(s) of the Month – November 2012

Struve 2816 and 2819 – Triple and Double Stars in Cepheus by Glenn Chaple

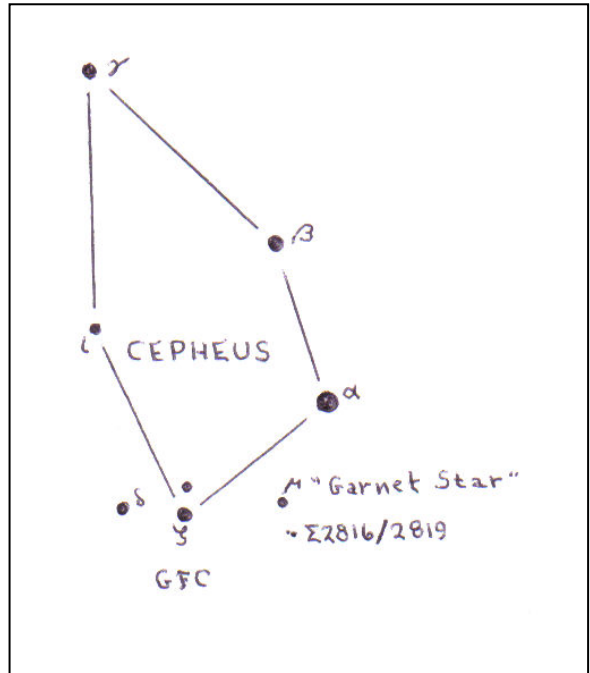
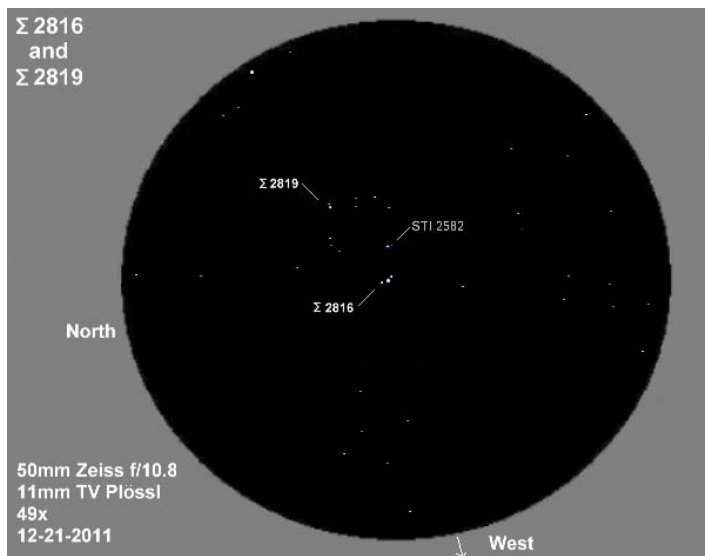
There's something hypnotic about a double star – two gleaming points of light shining bravely through the surrounding darkness. A triple star is even more mesmerizing. Place a double star and triple star in the same eyepiece field, and the visual effect is stunning. This is what greets the eye when you view the triple/double star combo Struve 2816 and Struve 2819.

Struve 2816 and Struve 2819 are among the 3000-plus double and multiple stars catalogued by the Russian astronomer F.G.W. Struve in the 1820s and 30s. They lie in Cepheus, about a degree south of mu (μ) Cephei (Herschel's "Garnet Star").

The triple star Struve 2816 consists of a magnitude 5.7 primary flanked by two 7.5 magnitude stars at distances of 12 and 20 arc-seconds. Just 12 arc-minutes away is Struve 2819 - a magnitude 7.5 and 8.5 duo, separated by 13 arc-seconds.

Struve 2816 and Struve 2819 appear together even in the eyepiece field of large-aperture Dobs, but I find the most eye-pleasing views are through small-aperture scopes. Large instruments clutter up the field with a distracting number of faint background stars. Struve 2816 and Struve 2819 are part of the wide open cluster Trumpler 37 which, in turn, is immersed in the huge emission nebula IC 1396.

The accompanying finder chart/ photograph and eyepiece sketch come from the Starsplitters website (<http://bestdoubles.wordpress.com>), a wonderful collaboration by amateur astronomers John Nanson and Greg Stone. It's a must-visit blog for the double star enthusiast!



December *Star Fields* DEADLINE
Noon, Sunday, November 25th
Email articles to the newsletter editor at
newsletter@atmob.org

POSTMASTER NOTE: First Class Postage

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STAR PARTY COORDINATOR:
Virginia Renehan starparty@atmob.org

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 ATMob Observatory and 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.
