



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. 4 April 2012

This Month's Meeting...

Thursday, April 12th, 2011 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.

In Search of Time

Dan Falk

"Time is at once intimately familiar and yet deeply mysterious. It is thoroughly intangible; we say it "flows" like a river, yet when we try to examine that flow, the river seems reduced to a mirage, for there is nothing in physics corresponding to time's passage. No wonder philosophers, poets, and scientists from Aristotle to Einstein have grappled with the enigma of time for centuries. Canadian science journalist Dan Falk tackles the mystery of time in his recent book, *In Search of Time: The Science of a Curious Dimension* (St. Martin's Press, 2008). In this illustrated talk, Dan will discuss some of the most intriguing aspects of time: how our ancestors first learned to measure it; how we suspect it—and the universe began, and what the "end of time" may hold for us; and a brief look at the physics of time travel and the paradoxes it seems to entail."

Dan is currently spending the academic year here in Cambridge, where he is pursuing a Knight Science Journalism Fellowship at MIT for 2011-12.

President's Message

We are nearing the end of another successful star party season, with a number of other events in March. I want to thank our Star Party coordinator, Virginia Renehan, for her work in coordinating so many of these events over the years, and also thank so many of our members for their continued support of all our star party outreach. Your efforts are what make us successful. Those who attend one of these events know that interest in astronomy is very keen among young people, and a great deal of our public image revolves around our Star Party outreach events. And don't forget that there are probably future members of our club attending some of these Star Parties.

Four star parties were scheduled for March (as of this writing, not all of these have happened yet). Among these the Acton Star Party celebrated the 10th version of this event, and as usual, it was well attended with about 700 enthusiastic participants. Congratulations to the organizers, which include member Steve Feinstein and the Acton STEM-PIP group.

Other notable scheduled March events besides star parties include the annual Messier Marathon, which was described at the March meeting; a New Members Night on March 31 to show our facilities in Westford to interested members (you don't need to be "new" to attend); and a second StarLab training event. Quite a variety of club activities in March!

Our April meeting will include selection of our Nominating Committee, which will produce a slate of candidates for the Annual Meeting in June. Being involved in the club management can be a very rewarding experience (it is for me), and I encourage members to consider volunteering their talents for a board position. If you are interested in finding out more, please let a member of the Nominating Committee know.

~ *Bernie Kosicki, President* ~

March Meeting Minutes

Minutes of ATMOB meeting held March 8, 2012.

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

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

President Kosicki introduced the speaker Alyssa Goodman, Ph. D., Professor at Harvard, Harvard CFA.

Professor Goodman gave a talk entitled "Interstellar Gas and Star Formation with Data Visualization." The talk focused on measuring velocity of components of interstellar gas, known as "dust," and visualizing the measured quantities in a three dimensional representation. A goal is to determine the forces involved in gas cloud collapse to form a star. She is involved in the World Wide Telescope Ambassadors (WWTA) program and

makes use of the WWTa as an aid in data into interactive content representing the measurements of interstellar gas clouds, and to distribute the videos to the public.

A “data cube” is a method of storing data of three or more dimensions in computer storage so that the data can be accessed and used by the astronomer. A cube comprises of two measurements of the position of an astronomical object and other measurements such as Doppler shift and energy (wavelength) of the observed photons. The high end of measured energy includes gamma rays having millions of electron volts (MEV), to x-rays having a few kilo electron volt (KEV) energy. Toward the middle, ultraviolet has a few electron volts energy, and visible light may have an electron volt or so of energy. Infrared, millimeter, and centimeter radio emissions go even lower. In these photon energy ranges Doppler shifts are observed and give line of sight velocities of the emitting cosmic dust.

Grating spectrometers in space borne observatories give Doppler shifts of photons in the ultraviolet, visible and infra-red energy ranges, while ground based telescopes give Doppler shifts in the UV visible and IR energy ranges. In the radio frequencies, antennas separated by meters to thousands of kilometers are connected into interferometers and give high-resolution observations as in addition to Doppler shift velocity measurements. The Doppler shift data give the velocity of the emitting atoms and molecules along a line of sight between the Earth and the astronomical object.

In analyzing data cubes, Professor Goodman described a technique where gas clouds are modeled. Each of the telescopes used in gathering a cube of data are modeled as a “software telescope.” Software telescopes are then used to analyze the model in all of the different dimensions of the data cube. This output is compared with the actual measurements recorded in the data cube. The model is then adjusted until a good, or best, fit is obtained with the actual measurements stored in the data cube.

Professor Goodman presented videos made by comparing output of software telescopes with cubes of measurement data. The model can be viewed from various angles, and the videos presented images computed by causing the model to rotate. This way a three dimensional version of the dust cloud with stars which have already formed from condensation of the dust are visualized.

An object of this analysis is to study the influence of early stars on the formation of stars, which are just now in the process of being formed. Sir James Jeans, about 100 years ago, developed a model in which a dust cloud condenses under gravitation and resistance to condensation due to temperature effects causes random motion within the dust cloud. The studies presented by Professor Goodman add the influences of starlight from already formed stars on the condensation of the dust clouds. The starlight causes particle ejection by the star, where particles are ionized, producing interstellar magnetic fields. These studies using data cubes, modeling of dust clouds, analysis of models predicted by software telescopes, and comparisons with actual measurements provide new understanding of the condensation of dust clouds into stars and planets.

A single dust cloud produces many stars, giving rise to clusters of stars. Everyone is familiar with open clusters and globular clusters. A result of the studies, we understand that winds from already formed stars have a significant influence in formation of later stars.

The data included radio telescope data on radio wavelength emissions of carbon dioxide and carbon monoxide. These two gasses had different locations and motions in the visualized data. Motions of the dust are influenced by stellar winds, magnetic fields, collisions with old dust of the dust cloud, and possibly turbulence in the fluid motions, which the dust undergoes, and other influences.

Models of these influences can be turned on and off, and the changes in comparisons between the software telescopes and the data in the data cube give a measure of the influences of these various influences.

Contour maps can also be generated giving the densities and velocities of observed atoms and molecules. Such contour maps reveal many interesting influences in the dust cloud. Giant shells of dust of a particular atomic or molecular species are observed in star forming regions of the dust.

Medical imaging methods pioneered for analysis of arteries in the human heart using medical imaging studies were a source of inspiration for the visualization using models, software telescopes, and comparison with actual measurements. The method gives a three dimensional visualization of complex spatial and velocity measurements which greatly assist in interpretation of the imaging data.

Following the talk, a short business meeting was held.

Bernie Kosicki gave Nanette Benoit’s treasurer’s report.

Tom McDonagh gave the Membership Committee Report. Tom mentioned that during the last 30 days eight returning and new members joined.

Bruce Berger gave the Observing Committee Report. Glenn Chapel spoke of the Messier Marathon scheduled for 23 and 24 March. Glenn mentioned a new award, which ATMOB is giving to members who achieve observation of 80 or more Messier Objects during the Marathon.

President Bernie Kosicki presented a schedule of events planned for the next month.

Bruce Tinkler mentioned that the Acton star party is scheduled and 700 people attended the last Acton Star party, and so all members with a telescope are urged to attend.

Steve Clougherty gave the Clubhouse Report in which he mentioned the work party scheduled for 10 March. Also, he mentioned that the Dall-Kirkham and the new observatory will require some work.

Bernie Kosicki mentioned that 31 March is a new members night. Clubhouse orientation for new members will be held.

The meeting was adjourned at 9:45 PM

~ *Sidney Johnston, Secretary* ~

Clubhouse Report

There was a very strong turnout for the March work party at the ATMOB clubhouse on Saturday, March 10. A total of 25 members and guests pitched in and a lot of work was accomplished.

Special thanks to Fred Taylor who kindly donated his time and trailer to haul our new refrigerator to the site. The fridge was donated by Brian Maerz and his wife. They also helped with removal of the old fridge. Eileen Myers coordinated the effort to fill the fridge after arranging the shelves of soda and food. She spent a considerable amount of time cleaning dishes, vacuuming and disposing of trash during the work session. Thanks go out to Eric J John R and Sai V for the cooking and clean up.

The pro dome project is now weather tight with the installation of the new wooden door. Dave P and Paul C framed and installed the door while Sergio machined the rollers for the dome sliding door. Bruce B, Glenn M and John B dry-fitted the aluminum mid-pier that Larry S had our friends at Lincoln Labs make to our specifications. This unit will form a union between the base pier and the Paramount GT1100. Bruce B and Glenn M bored two large holes into a new base pier, also donated by Lincoln Labs, so that cables from the mount, telescope and cameras could neatly be routed inside the pier and under the floor to the workstation.

The 17.5" DOB was re-collimated and cleaned by Sai V Steve C and new member Ed Barden. A new velcro and felt mirror cell cover will replace the worn plastic cover next week after it is stitched.

Phil R, Ed B, John M and Steve C spent several hours cleaning and re-collimating the Dall-Kirkham telescope. The secondary has been re-aluminized and the baffle and mirror cell assembly were pulled out and checked for proper alignment. Phil reports that preliminary star testing on that night showed a considerable improvement. Final tweaking will be completed by the end of March.

Harry Drake continued his efforts at cataloging the vast collection of books, charts and posters that are housed at the clubhouse. We expect to have a few boxes of such items available at the April meeting in Cambridge for all attendees.

The far barn clean up continued during the work session. A large stack of old lumber and trash was piled out back and will be cut up and hauled away in the near future.

Mike Hill and Joshua Ashenburg got an early 8:30 AM start on cleaning the polishing room. Mike cleaned all the shelves of clutter and organized the tooling and supplies used for polishing

projects and Joshua cleaned and painted the Hindle Grinding machine used for polishing of mid to large size mirrors.

Thanks to the following members for a very successful work party:

Joshua Ashenberg, Mike Hill, Harry Drake, Sai Vallabba, Anna Hillier, Chase Green, Ed Barden, Paul Cicchetti, Steve Clougherty, Dick Koolish, Al Takeda, John Maher, Bruce Berger, John Reed, Fred Taylor, John Blomquist, Eileen Myers, Glenn Meurer, Brian Maerz, Mrs. Maerz, Tom Wolf, Eric Johansson, Marion Hochuli, Sergio Simunovic, Phil Rounseville, Dave Prowten.

~ *Clubhouse Committee Chairs* ~

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

Clubhouse Saturday Schedule

April 7	Siegrist & Sonowane
April 14	Takeda & Toomey
April 21	Maher & McDonagh
April 28	CLUBHOUSE CLOSED NEAF and Clay Center Astronomy Day
May 5	Clougherty & Fleming Work Party #5
May 12	Jacobson & Johansson
May 19	Maerz & Panaswich
May 26	Cicchetti & Reed

Thoreau on Astronomy

However much we may admire the orator's occasional bursts of eloquence, the noblest written words are as far behind and above the fleeting spoken language as the firmament with its stars is behind the clouds. There are the stars, and those who can may read them. The astronomers forever comment on, and observe them.

"Reading," Walden

~ *Submitted by Tom Calderwood* ~

Membership Report

Membership count as of 03/19/2012 is at 292 individuals
Same time last year: 290

Please seek out and welcome our newest members!

Rhonda Morris
Eugene McAuliffe
Victoria Saucier
Rohan Garg

Joe Estes
Jeffrey Dean
Robert Estes
Ramya Parasuram

Member News:

Our own Shilpa Lawande, Vice President of Software Engineering for Veritca was named by Mass High Tech as one of the 2012 Women to Watch honorees.

~ *Tom McDonagh, Membership Secretary* ~

Star Party Report: Acton, March 5th

Wow, what a night! The 10th Annual Acton and Boxboro 4th Grade Star Party was a huge success. Mother Nature provides spectacular views of Mercury, Venus, Saturn, the Moon, Mars, and a whole lot more.

After speaking with all the teachers several days after the party to figure out how many of their students actually came, we now estimate that over 800 people attended this year's party – it was packed. The excitement and energy, inside and outside, were palpable.

Outside we had 6 telescopes and a couple of binoculars set up (we could have used more) and inside we had two Starlabs, a mirror grinding demonstration, Galileo, an Astronomy information desk, Mars rover presentation, sky chart reading, space arts and crafts, and so much more! It was just grand, the best star party ever.

In the words of Eileen Sullivan, the Acton science curriculum specialist and school organizer of our 4th grade star party for 10 years, “[ATMoB] created a life-long lover of the skies, and I'm sure he is not the only one.” Eileen was referring to a story from one of the Acton School Librarians who said:

“...that after her son's visit to the star party when he was in fourth grade he got so excited that they bought him a telescope. He still uses it today and now, in high school, takes photos of the sky through his telescope.”

That story alone should be enough to encourage each and every ATMoB member to take a moment to share knowledge and expertise by volunteering at a local school star party.

Please take the time to review the local coverage and photos from the event.

Local press coverage:

<http://www.wickedlocal.com/acton/news/education/x453928853/Acton-schools-host-star-party>

Dave McCormick's (official photographer of the 4th Grade Star Party) photos:

http://davidmccormick.smugmug.com/Groups/Acton-Boxborough-PIP/20120305-Acton-Star-Party/21804807_84R4nP#i=1738516432&k=SSmGJ4q

Thank you to all the volunteers from ATMoB and beyond including Eileen Myers, Bernie Kosicki, George Roberts, Ross Barros-Smith, Tom McDonagh, Phil Rounseville, John Maher,

John Reed, Michael Maglothin, Bruce Tinkler, Bob Phinney, Bob Naeye, Alan MacRobert, David Siegrist, and non-ATMoBers: Gary Green, Amanda Smith. Please forgive any omissions to this list.

Thank you. I hope to see even more of you next year.

~ *Steven Feinstein* ~

Astronomy Day Preparations and Volunteers

Can you believe this will be the Clay Center Observatory's 9th year partnering with ATMoB to host the annual National Astronomy Day for the greater Boston public?

Between 1,000 and 1,500 people attended in the past two years, and this year may be bigger. We have been listed with the Cambridge Science Festival as one of their final events of their week of science in April. Astronomy Day is Saturday, April 28 this year, and although it happens to coincide with NEAF, we hope you will join us instead. We need your help to provide outdoor telescopes, solar and night, as well as indoor science exhibits. We open rain or shine, so please join us indoors even if the weather is not favorable.

Please register your exhibit, telescope or other, on the website so we may plan for what you need – tables, electricity, food, etc. Go to <http://www.claycenter.org>, Public Events page, Exhibitor sign-in. Thank you for your participation!

2012 Astronomy Day Schedule

- 4:00** - Outdoor events begin with rockets, kites, solar telescopes
- 5:00** - Indoor events run from 5:00 pm to 8:30 pm - science exhibitors
- 7:00** - Indoor Kite Flying in the Hockey Rink 7-9 pm - kites that need no wind!
- 8:00** - Sunset, night telescopes set up
- 8:30** - Viewing of the first-quarter moon, Saturn, Jupiter, Mars, Venus
- 10:00** – Adjourn

~ *Bob Phinney* ~

A New Resource for the Amateur Astronomer – Telescopedia.com

Telescopedia.com is a new non-commercial “wiki” style website created to provide a source of practical information for both newcomers and experienced amateur astronomers.

When I first started with this hobby, I assumed that there would be a number of websites on the Internet where amateur astronomers could find easy to read uniform overviews of concepts and practices in the hobby and to exchange ideas. To my surprise such websites don't quite exist. There are some

helpful offerings scattered around the 'Net but they often require extensive background knowledge of a particular subject area or lack useful depth. I can only imagine how many newcomers have been put off by this, as it seems quite odd that a very technical hobby has so few highly accessible resources on the Internet.

With Telescopedia, I'm hoping to reverse this scarcity. Our goal is to create a centralized resource of practical knowledge that an amateur astronomer may need to know in one place. Presently articles are being composed to provide a technical introduction to the telescope. We also hope to prepare helpful how-to content in the very near future.

The website currently maintained by myself with the help of some early, but such a small group has no chance to collect and organize all information relevant to the amateur astronomer. I would like to ask the readers of this newsletter to consider offering their help in building the content of the website and update it as things change in the hobby. Feel free to visit the site or even send questions and suggestions to darkmatt3r@gmail.com.

~ *Gustaf Prins, Telescopedia.com Founder and Webmaster* ~

Green Laser Incident

To all Members who observe up at the clubhouse:

It was recently brought to my attention that the folks up at Haystack were contacted by the FBI concerning an incident a couple of weeks ago where an overflying commercial aircraft was targeted by a green laser pointer coming from the haystack area. This aircraft was at considerable altitude so the laser had to have been quite powerful and likely illegal. In addition the targeting was sustained indicating it was not a random accident. Although it is highly unlikely this was due to one of our members it was deemed necessary to speak to the club about it just in case and to make us aware of the fact that this incident occurred and has been reported. The people up at haystack do engage in research involving lasers but in a very controlled manner. Any time they will be shooting lasers, the FAA is notified and planes are re-routed around the area. This incident certainly was not due to their activity. Please be aware that the ATMob has a strict Green Laser policy in effect and if you use these devices you must adhere to this policy. It can be found on our web site at <http://atmob.org/library/policies.php>.

It is possible that the source of this event was from the neighboring area - by someone not associated with the club at all. If you happen to see lasers shooting up from the area surrounding the clubhouse please report this to one of the board members of the club. Again, there is no blame being placed on the club but this event is of great concern to the people up at Haystack. Hopefully this will be a one time incident.

~ *Mike Hill, Vice President* ~

Sky Object of the Month

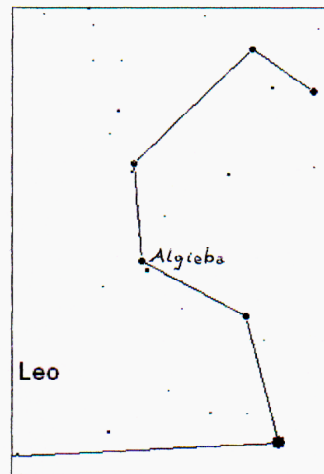
Double Star Gamma (γ) Leonis – Algieba

One of the finest double stars in the spring sky – indeed, in all the heavens – is gamma (γ) Leonis. Its proper name, Algieba, comes from the Arabic Al Jabbah, "The Lion's Mane."

Discovered by William Herschel in 1782, Algieba is comprised of magnitude 2.4 and 3.6 stars currently separated by 4.6 arc-seconds. They form a slowly widening binary system with an orbital period estimated at between 5 and 6 centuries.

Algieba is easily located - it's the brightest star (after Regulus) in the "Sickle" of Leo. The pair is marginally resolved in small-aperture telescopes with medium power. On an evening of steady seeing, I barely split Algieba with a 3-inch reflector at 60X. A clean split, however, requires a magnification of 100X or more.

What makes Algieba so visually striking are its rich golden-yellow hues, indicative of its K0 and G7 spectra. Some observers note a slight greenish tinge to the companion. Do you agree?



(Left) Finder Chart for Algieba [from Cartes du Ciel] and (Right) Photograph of Algieba from the website of award-winning British astrophotographer Damian Peach. Check out his amazing images at <http://www.damianpeach.com>.

~ *Glenn Chaple* ~

May Star Fields DEADLINE

Noon, Sunday, April 22nd

**Email articles to the newsletter editor at
newsletter@atmob.org**

POSTMASTER NOTE: First Class Postage

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OBSERVING AND PUBLIC OUTREACH

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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.
