



STAR FIELDS

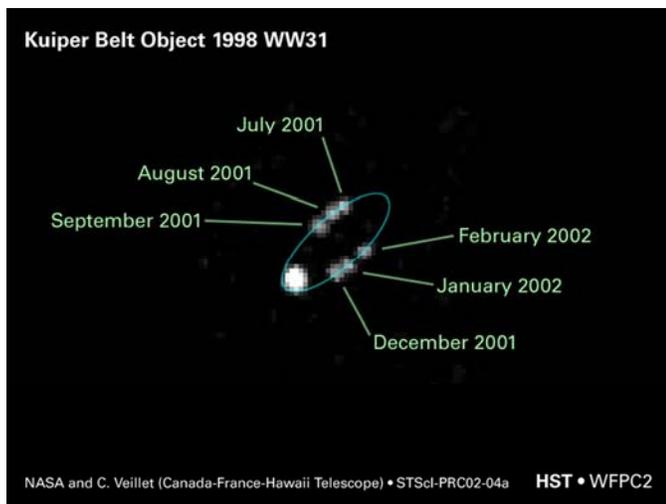
Newsletter of the
Amateur Telescope Makers of Boston
Including the Bond Astronomical Club
Established in 1934
In the Interest of Telescope Making & Using

Vol. 21, No. 6 June 2009

This Month's Meeting...

Thursday, June 11th, 2009 at 8:00 PM
Phillips Auditorium
Harvard-Smithsonian Center for Astrophysics
Parking at CfA is allowed for duration of meeting

Occultations by Kuiper Belt Objects
Dr. James Elliot



Binary Kuiper Belt Object 1998 WW31
Courtesy NASA (STScI) and C. Veillet (Canada-France-Hawaii Telescope)

A stellar occultation occurs when a solar system body passes between a star and an observer. By recording the variations of starlight, one can probe the structure of planetary atmospheres, rings, and limbs with high spatial resolution -- limited only by Fresnel diffraction effects. The atmospheres of the major planets, three of the four planetary ring systems, and numerous asteroids have been probed with stellar occultations. The next challenge for the technique is to observe a stellar occultation by a Kuiper Belt Object (KBO). From observations of stellar occultations by KBOs we can measure accurate diameters, from which we can derive albedos and densities for those objects with known masses (the KBO binaries). With stellar

occultation data we can also probe for close companions and possible tenuous atmospheres. We are engaged in a program to predict and observe stellar occultations by KBOs. Part of this program will involve 10-14 inch telescopes (equipped with high-speed CCD cameras), for which there should be several observable events per year that occur somewhere on Earth. Extensive coverage of the occultation tracks will be important for these events because the prediction error is comparable to the radii of these bodies. Our next opportunity to observe a KBO occultation will occur in the fall of 2009.

Jim Elliot is a professor at MIT, where he has taught observational astronomy for the past 30 years. He observed his first stellar occultation in 1971 (Jupiter occulted Beta Scorpius) and has been hooked on the field ever since. His notable work includes the discovery of the Uranian rings in 1977 and the discovery of Pluto's atmosphere in 1988.

Dr. Elliot received his undergraduate degree from MIT in 1965 and his Ph.D. from Harvard in 1972. Before returning to MIT in 1978, he was a post doc and faculty member in the Astronomy Department of Cornell University.

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

President's Message...

My first year as the club's president is just about over and a number of members have done quite a bit this year -- the two biggest accomplishments are the completion of the clamshell observatory and the new workshop at the clubhouse. There has been quite a bit of Star Parties and public nights the club has supported. All of this takes a tremendous amount of time and effort by many individuals. I am most grateful for the energy and enthusiasm they bring to the club. So, to them and anyone who has volunteered at a club sponsored event, pushed a lawnmower, shoveled snow or wielded a paint brush -- thank you.

In the next fiscal year, we have the challenge of getting the home dome built and the C14 telescope installed in it as well as the Schupmann telescope reinstalled in the Knight Observatory (it will be mounted at the C-14 current location). We're going to need a decent mount for the Schupmann and now that we have the new machine shop in place, I can't think of a better "team" project for the club.

Our Observing Committee has done a great job giving various seminars on a number of astronomy related topics and the Friday night astronomy classes have been a huge success. Moving forward the classes will continue and, as always, we'll be looking for suggestions for new topics and the people to teach them.

My major goal for the club is simple -- give ALL the members a "hands-on" path for expanding their observing skills and knowledge of astronomy. The metric of success will be having programs and resources in place that allow a

person new to astronomy to start from scratch to eventually be able to do advanced work with CCD cameras or other equipment – all with club resources. However, if you've passed the "starting from scratch" stage in your knowledge, then we'll endeavor to get you to the next step in your goals.

I look forward to working with you in the next year and seeing all of you at upcoming meetings or at the clubhouse.

Clear Skies,

~ Stephen Beckwith, President ~

May Meeting Minutes . . .



The May meeting of the Amateur Telescope Makers of Boston featured Bob Naeye, Editor in Chief of *Sky & Telescope* magazine showing us images of Mars in 3-dimensions (3D).

Bob Naeye started by talking about the various missions that were sent to Mars. The Mariner 9 mission in the 1970s sent pictures of areas that looked like river valleys. This motivated NASA to plan for missions that would search for the evidence of water. After landing on July 4, 1997, the Sojourner rover was the first to test the technology that would be used in the Spirit and Opportunity rovers. While only traveling 300 feet before the mission was terminated it showed that you can operate a rover on Mars, get good pictures, good data and analyze a bunch of different rocks. Bob then showed a few 3-D images of rocks that were analyzed by the rover.

In September 1997 the Mars Global Surveyor began its orbit of Mars. While it was operational "it had found evidence for recent water flow and ancient plate tectonics on Mars. It's been an absolute spectacular successful mission." Arriving on Mars in January 2004, the Spirit and Opportunity rovers' mission is "to follow the water."

Naeye presented the Spirit and Opportunity 3-D images in chronological order describing what was being imaged and the science being performed in their search for evidence of water in the past. A lot of the images were provided by Jim Bell, a planetary scientist from Cornell University. While the 3-D

images from Spirit and Opportunity are impressive, they are useful scientifically and are used for safe navigation around rocks and other hazards.

Spirit at Gusev Crater took almost 300 Martian sols before finding the mineral Goethite, an iron oxide that at least on earth can only be formed by the alteration of precursor minerals in liquid water.

The rover Opportunity on Meridiani Planum immediately discovered the mineral hematite which on Earth only forms in the presence of water. The "Blueberries", little BB-sized nodules, were found all over the site. They are minerals that were dissolved in mineral rich waters and later precipitated out of the water as it evaporated.

Both rovers are still going strong after 5 years.

Bob concluded by talking about the Mars Phoenix lander that has landed in the polar region (72 degree North latitude) and upcoming Mars rover missions.

The red-and-blue 3-D anaglyph glasses were purchased and provided by Nanette Benoit. Dick Koolish explained that 3-D works because our eyes are separated by about 2.5 inches. Each eye sees a slightly different image because they are seen from a slightly different viewpoint. Our brain merges the two images from each eye and perceives depth. The trick in taking 3-D images is that the left eye must view the scene that was taken with the left camera and the right eye must view the scene taken by the right camera. Anyone and any camera can take 3-D images by taking one image and moving over a little bit and taking another image. The picture is then viewed using a stereo viewer, polarizer or a red-and-blue 3-D anaglyph.



Chairperson of the Nominating Committee, Virginia Renhan, gave the nominations for the 2009-2010 Executive board. Please see the "Nominations for 2009-2010" section for details.

Al Takeda gave the Secretary's report, Tom McDonagh gave the Membership Secretary's report and Nanette Benoit gave the Treasurers report.

Steve Beckwith gave the Observing Committee report by first thanking Sidney Johnston for teaching a class on spectroscopy last month. This month Paul Valleli will be teaching a class on evaluating your telescope optics at the clubhouse on May 16.

Bruce Berger has been working with Software Bisque on the Paramount GT-1100. A new drive unit and motors are being installed.

Steve Clougherty gave the Clubhouse report to the membership. The 20 inch in the Ed Knight observatory is now operational with a newly coated mirror.

Ross Barros-Smith talked about the Cambridge Science Festival and another event at the MIT Stata Center that his students are putting on.

Mario Motta talked about (1) some light pollution testimony that he and Kelly Beatty gave to the Energy Committee. He also reported on some misinformation being put forward by the lighting industry. (2) Mario reported on the U.S. Senate and House sponsorship of a light pollution bill. (3) He has been inundated with light pollution letters after he was showcased in *Sky and Telescope* magazine.

Steve Beckwith mentioned that Virginia Renehan, John Sheff and Dan Winchell have been working with the Harvard College Observatory and their education department to help 5 schools in the area with help from the National Science Foundation. The program will give the teachers and students an introduction to the tools needed to become a scientist, engineer or programmer. They are asking for volunteers to help a couple of times per month for a few hours per day. It is an after school program and will start around 3:30 pm. If anyone is interested please contact Virginia or Steve Beckwith.

Bruce Berger gave an update on the new Machine Shop construction. He talked about the installation of electrical power, wall insulation, sheet rock installation, lighting, heat and donated items.

Ken Launie talked about the Antique Telescope Society meeting at the Detroit Observatory, University of Michigan in Ann Arbor. The 12.5 inch Fitz telescope and observatory were both restored 10 years ago. They also visited Cranbrook Institute of Science, a science museum for kids. Afterward they visited the McMath-Hulbert Solar Observatory.

~ Al Takeda, Secretary ~

Nominations for 2009 - 2010 . . .

Nominations for the Executive Board are:

President -	Stephen Beckwith
Vice President -	Bernie Kosicki
Secretary -	Al Takeda
Membership -	Tom McDonagh
Treasurer -	Nanette Benoit

Member at Large - Chuck Evans
Member at Large - Bruce Tinkler

Per Articles IX of the ATMoB Bylaws: Members shall have the right to offer additional nominations from the floor of the annual meeting, provided only that a suitable written notice, containing the name or names of the person or persons to be nominated from the floor at the annual meeting, and the signatures of at least Seven members, is filed with the Secretary not less than ten (10) days prior to the date of the annual meeting.

~ Al Takeda, Secretary ~

Clubhouse Report . . .

The next work session at the ATMOb clubhouse in Westford will be held on Saturday June 13 beginning at 10:00 AM.

Work continues on the near barn and much of the electrical work has been completed by John Small. Bruce Berger and Mike Hill will be applying a second coat of epoxy to the workshop floor. During the next session on 6/13, framing inside the 4 holer may begin. The foundation will need mortaring and John Reed will need two volunteers for this project.

Leveling work will continue in the basement. Pegs will be installed and pre-finishing construction work will begin. Assistance will be needed for this project along with basement clean up.

Both the porch floor and clamshell observatory floor will need recoating to extend the life of the wood flooring. Volunteers will be needed to apply deck paint which will be purchased prior to the session on 6/13.

Scraping and staining of the West side of the clubhouse will continue.

Lawn mowing and tree trimming will also be on the agenda for this work session. Gravel may need to be leveled and potholes filled on the clubhouse driveway.

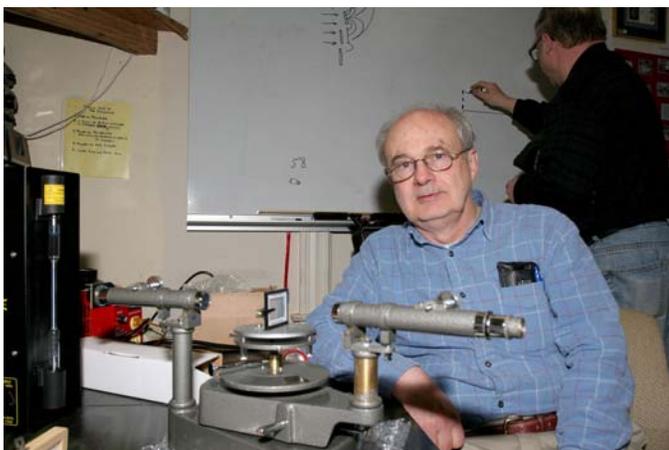
Pressure treated plywood will be purchased ahead of the next session in order to rebuild the bulkhead doors. If time permits the wood will need to be painted.

Lumber and lag bolts will also be purchased to frame the foundation for the Home Dome observatory. Measuring and cutting 2x12's may also begin on 6/13.

Lunch will be served for all who volunteer on June 13. Hope to see you there!

~ Clubhouse Committee ~

~ John Reed, Steve Clougherty and Dave Prowten ~



Sidney Johnston teaching the class on spectroscopy. Image by Al Takeda

Clubhouse Saturday Schedule

June 13	Bruce Berger, Mike Hill (Work Party)	
June 20	Ed Budreau	Rich Burrier
June 27	Eileen Myers	David Siegrist
July 4	John Blomquist, A Takeda- Work Party	
July 11	Paul Cicchetti	Henry Hopkinson
July 18	Steve Clougherty	Rich Nugent
July 25	Eric Johansson	Glenn Meurer
Aug 1	Bernie Kosicki	Steve Mock
Aug 8	Bill Toomey, Tom Wolf- (Work Party)	

Membership Report . . .

Membership as of 6/1/2009 - 332 members.

Sky & Telescope subscription processing now takes between 6 and 8 weeks. To avoid an interruption in service, please renew your membership at least a month before your ATMoB membership anniversary.

The Amateur Telescope Makers of Boston, Inc. is a 501(c)3 organization. Donations are gladly accepted and are tax deductible to the extent allowed by law. While the deadline for 2008 charitable donations has past, please consider making a tax-deductible contribution to the club when planning for 2009 and beyond.

All members are encouraged to seek out and welcome our new and returning club members:

Steve Smith
Dominick Witkowski
Stephen Witkowski

Welcome!

membership@atmob.org

~ Tom McDonagh - Membership Secretary ~

Astronomy VIP . . .

In the April issue of Sky and Telescope, the National Park Service ran an advertisement for volunteers to staff its astronomy outreach program:

(<http://www.nature.nps.gov/air/lightscapes/astroVIP>).

I applied, and have been accepted. I will be spending almost all of August at Acadia National Park, running star parties and conducting a survey of the park's outdoor lighting. I'll put together a full report for the club later this year.

~ Submitted by Tom Calderwood ~

Photos Needed . . .

Historical ATMoB photos are requested for a digital slide show that will be presented during the 75th Anniversary picnic. The images should be of historical and present members, ATMoB events, star parties, work parties; ATMoB trips and humor (keep it clean).

I would like them to be in electronic form if possible (JPEG, medium to high resolution, and smaller than 1 Megabyte each). If you don't understand that gibberish, tell me and we can try to work out an arrangement.

If you only have prints, slides or negatives, let me know and we will try to accommodate you.

Please, only submit **10 (ten) images per person**. I can make an exception if the photos are especially unique.

You can submit JPEG images using CD-Rs, USB flash sticks, DVD-Rs, Compact Flash and SD Cards and 3.5 inch floppy disks.

DO NOT EMAIL THEM TO ME! My account cannot handle the load and will fill up immediately. You may send me a link to your photo page and I can download the images.

The organizers of the slide show will determine which images will be used and the final presentation will be archived as part of the club's history.

I can accept submissions at the June and July regular meetings and at the ATMoB Clubhouse work parties.

Please dig into your closets, attics and electronic archives and help make this show a success.

Thanks.

~ Al Takeda, Secretary ~

Thoreau on Astronomy . . .

Even the motto "Business before friends" admits of a high interpretation. No interval of time can avail to defer friendship. The concerns of time must be attended to in time. I need not make haste to explore the whole secret of a star; if it were vanished quite out of the firmament, so that no telescope could longer discover it, I should not despair of knowing it entirely one day.

Journal, 17 June 1840

~ Submitted by Tom Calderwood ~

Sky Object of the Month – June 2009

44 Bootis . . .

Rule #1: Never write about a deep-space object you haven't seen.

Rule#2: Ignore Rule #1.

In the early 1970s, during my tenure as a "rookie" backyard astronomer, I observed double stars with relentless abandon. My instrument of choice at the time was a 3-inch f/10 reflecting telescope, made by Edmund Scientific. For a reference, I chose the 1966 edition of *Norton's Star Atlas*.

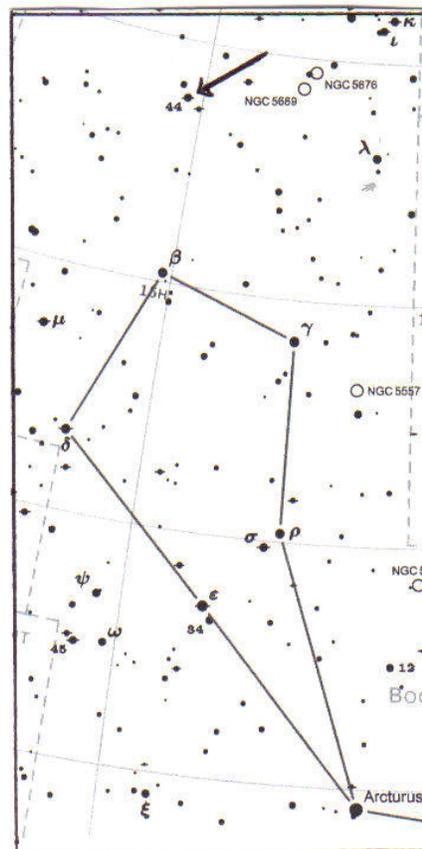
One evening, I decided to dine on double stars in the constellation Bootes. According to *Norton's*, one particular pair, 44 Bootis, had a separation of 2.6 seconds of arc – close, but not impossible in a 3-inch scope. To my surprise and disappointment, I couldn't split the pair – not that night or on subsequent evenings. Had I read *Norton's* more carefully, I would have seen a note describing 44 Bootis as a binary pair that was closing. I would later learn that its magnitude 5.3 and 6.2 components were separated by a mere 0.4 arc-seconds at the time of my futile attempts.

Fast forward four decades to the present. 44 Bootis, whose 210-year orbit is highly inclined to our line-of-sight, has opened up. Orbital data indicate that its component stars are separated by 2.2 arc-seconds. Time for a feast!

I haven't yet seen 44 Bootis, at least not double. But I'll be outside this month trying. Although a 2+ arc-second separation is within reach of a 3-inch, I'm going "loaded for bear." My instrument of choice this time will be a 5-inch f/12 Maksutov-Cassegrain telescope, paired with an eyepiece that magnifies at least 150X. To be safe, I'll conduct the observation on a night of above average seeing. Instead of my reporting what I ultimately see, check out 44 Bootis for your self, and we'll compare notes.

Your comments on this column are welcome. E-mail me at gchaple@hotmail.com.

~ Glenn Chaple ~



Finder chart for 44 Bootis.
From Mag-7 Star Atlas
(Copyright Andrew L. Johnson)



John Reed showing Hydrogen Alpha views of the Sun on Astronomy Day at the Clay Center. Image by Al Takeda

July Star Fields DEADLINE
Saturday, June 27th

Email articles to Al Takeda at
secretary@atmob.org

POSTMASTER NOTE: First Class Postage Mailed June 7th, 2009

Amateur Telescope Makers of Boston, Inc.
c/o Tom McDonagh, Membership Secretary
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OBSERVING AND PUBLIC OUTREACH

STAR PARTY COORDINATOR:
Virginia Renehan starparty@atmob.org

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 Daylight Time (EDT) from Universal Time (UT) subtract 4 from UT.

June 13 Mercury at Greatest Western Elongation (Morning)
June 15 Last Quarter Moon
June 20 Moon is 0.5 deg. N. of the Pleiades
June 21 Solstice
June 22 New Moon
June 29 First Quarter Moon
July 7 Full Moon -- Penumbral Lunar Eclipse