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. 4 April 2011

This Month's Meeting…

Thursday, April 14th, 2011 at 8:00 PM
Phillips Auditorium
Harvard-Smithsonian Center for Astrophysics
Parking at the CfA is allowed for the duration of the meeting.

Protoplanetary Disks and the Hunt for the Youngest Exoplanets

Hundreds of exoplanets have been discovered around nearby stars and a massive effort is underway to find more of them, determine their key properties, and explain demographic trends with models of their formation. But associating the current exoplanet properties with their formation epoch can be problematic, since the formation process is intimately associated with the physical conditions associated with their birthplaces: the disks of gas and dust that orbit young stars. Ideally, the mature exoplanet systems could be compared with their younger counterparts that are "caught in the act" of formation, still embedded in their natal disks. The direct detection of a planet orbiting a young star is currently a challenge. However, some properties of young planets can be inferred indirectly, through their disruptive influence on the structure of the remnant disk material. I will discuss some recent observations that highlight the potential of a new technique that can be used to hunt for very young exoplanets, based on high resolution radio-wave imaging of their associated protoplanetary disks.

Sean Andrews was born and raised just outside Chicago, Illinois. He received undergraduate degrees in physics and mathematics from Northwestern University, and obtained a PhD in astronomy from the University of Hawaii for his work on "Submillimeter-Wave Constraints on Circumstellar Disk Evolution". In the fall of 2007, he came to the Harvard-Smithsonian Center for Astrophysics as a Hubble Fellow. This past fall, he joined the scientific staff of the radio astronomy division at the Smithsonian Astrophysical Observatory. Much of his research work is focused on using high angular resolution radio-wavelength observations to measure the properties of the planet-forming disks around young stars.

President's message…

I'm writing this after just leaving the Winter Star Party (WSP) on West Summerland Key in Florida. One of my main aims in visiting this well known dark-sky site was to see a few of the far-Southern sky objects that are not visible from Westford. The viewing was generally very good for three of four nights, typically with clouds early in the night and clearing later. I saw Omega Centauri clearly for the first time- a huge and bright globular cluster, but only had a peek at the Eta Carinae nebula, which was mostly hidden by low clouds at the horizon. The experience got me interested in seeing a lot more of the Southern hemisphere's sky!

My wife Pat and I drove down and stayed in a B&B located on the beach about 1 mile from the main WSP site. On arrival, we found out that most of other residents at our B&B were also WSP attendees. I decided to join them in setting up my telescope on the beach directly in front of our room at the B&B instead of at the main star party site. This would be much more convenient, since no car traffic is allowed in or out of the main site between dusk and dawn, and it would be a long hike from the beach to the car parked on the highway outside the gate. It was also great to meet, talk with and observe next to these four astronomers- all originally from Virginia and West Virginia and who knew each other. They all planned to use DSLR cameras and short-focal-length wide-field telescopes for imaging (as I planned¬) for ease of setup. No cooled imagers and no star guiding- we would rely only on unguided polar alignment. Clouds coming and going, together with sometimes short rain showers, are part of the environment here, so elaborate and sensitive setups are hard to work with. And as a first-time astro-photographer, I was also looking for simple and effective setups for myself.

There are always unexpected surprises at new sites. While observing during the first night, I heard a crash from the direction where I had placed my open lens box on the patio outside my room (luckily it was on the ground!) Going over to it in the dark, I found that two small key deer looking for food in my lens box and had knocked it over! No damage, and after collecting my lenses that had rolled out I kept my box locked from then on. Any deer we have at Westford keep a respectful distance, unlike these little guys.

Bernie makes a friend

We are looking forward to returning to Massachusetts (with hopes that some of the snow has melted by now) and trying out my beginning photography “skills” in Westford. I’m sure that my first pictures probably will not turn out very well, but I was able to go through the whole process and get some actual images. And, just as important, I did a fair amount of visual observing too. It was easy to pick out Omega Centauri with binoculars and my small telescope. And there was an opportunity for a small sidewalk star party when one of the non-astronomer guests came down one night to see what was happening on the beach. One woman from our audience left determined to start looking at the skies from her Colorado home, and also was very interested in seeing what she could do about light pollution regulations in her small town. In my case, astronomy at a Southern dark-sky site was a main motivation for this trip, but there were many interesting sidelights, like seeing the exotic wildlife in Florida, visiting and dipping in the ocean at a few great beaches, and meeting new and interesting people. Meeting other astronomers and learning from them is one of the benefits of our hobby. I’ve always found fellow astronomers very easy to talk with and willing to be helpful and sharing of their knowledge. I’m grateful to Mike Hill for taking over the running of the March meeting and giving me the chance to take the month off and visit the WSP. Looking forward to meeting with all of you in April.

Keep looking up,

~ Bernie Kosicki, President ~

March Meeting Minutes . . .

Lecture: “Viewing the Universe with Infrared Eyes: The Spitzer Space Telescope”

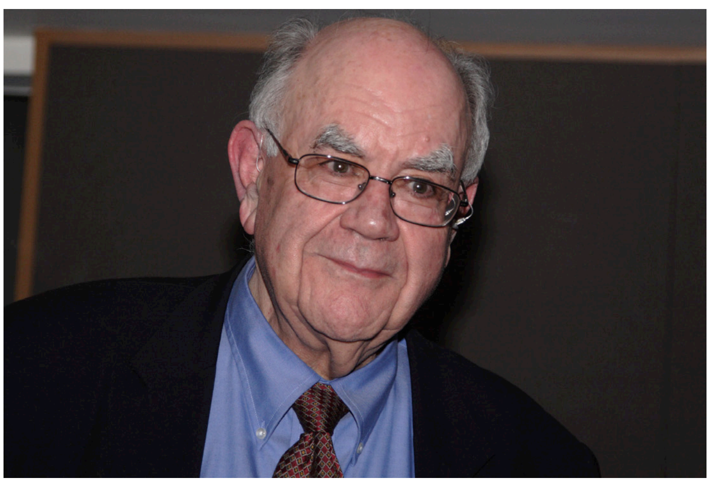


Photo by Al Takeda

Dr. Giovanni Fazio

The March meeting of the Amateur Telescope Makers of Boston featured Dr. Giovanni Fazio, Principal Investigator for the Infrared Array Camera (IRAC) experiment on the Spitzer Space Telescope, one of NASA's Great Observatories. The Spitzer Space Telescope, launched in August 2003, is producing an exciting new view of the Universe seen in infrared light, allowing astronomers to see regions of space invisible to optical telescopes. Spitzer's scientific results include the study of the formation and evolution of galaxies in the early Universe, understanding energy sources in ultra-luminous galaxies, the study of star formation and evolution, observations of exoplanets and their atmospheres, and determining the structure and evolution of planetary disks around nearby stars. After a brief description of the Spitzer mission, results from Spitzer's extragalactic and galactic observational programs were presented, showing many of Spitzer’s very spectacular images.

Dr. Giovanni Fazio is presently Senior Physicist, Harvard-Smithsonian Center for Astrophysics; Lecturer, Astronomy Dept., Harvard University; and a Faculty Member, International Space University, Strasbourg, France. He received BS in Physics and BA in Chemistry degrees from St. Mary's University, Texas, and a Ph.D. in Physics from MIT. Dr. Fazio is a Fellow of the American Physical Society and past chairman of its Astrophysics Division, a Fellow of the American Association for the Advancement of Science, and a Fellow of the Royal Astronomical Society. He is a member of the American Astronomical Society and past chairman of its High Energy Astrophysics Division, and is a member of numerous other scientific organizations. Dr. Fazio has received a number of special awards: five NASA Group Achievement Awards; Russia’s Tsiolkovsky Medal; the UNICO National Marconi Science Medal; the NASA Public Service Medal; the Royal Society of London/COSPAR Massey Award (Gold Medal); the Smithsonian Institution Secretary’s Distinguished Research Lecture Award; and the Astronomical Society of the Pacific’s Muhlman Award to the Spitzer Space Telescope Team.

Early in his career he pioneered the development of gamma-ray astronomy using balloon-borne telescopes, and ground-based detectors. He then lead the development of large balloon-borne telescopes for far-infrared astronomical observations above the atmosphere, as Principal Investigator for the 1-Meter Balloon-Borne Far-Infrared Telescope and also the first infrared astronomical telescope to fly on the Spacelab II flight of the Space Shuttle. In 1984 he was selected as Principal Investigator for the Infrared Array Camera (IRAC) experiment on the Spitzer Space Telescope, one of NASA's Great Observatories. Dr. Fazio was also a Co-Investigator on the Sub-millimeter Wave Astronomical Satellite. His current research interests include the development of infrared instrumentation and the use of infrared array cameras on ground-based and space telescopes to observe galaxy formation and evolution in the early Universe, ultra-luminous galaxies, star formation and evolution, and brown dwarfs.

Why Infrared (IR) Astronomy? Visible light is only a small part of the available spectrum and provides limited point of view. *The Universe is Cold*: Most objects in the universe are too cold to be seen in visible light. We would be missing a lot of information exploring the universe just in visible light. *The Universe is Distant and Expanding*: Visible light gets shifted into IR when coming from long distances. *The Universe is Dusty*: IR radiation can penetrate dusty regions so we can see things obscured in visible light. Heated dust radiates in IR so we can see distribution of dust. *The Chemical Universe*: Many atoms and molecules emit radiation in IR. We can see spectral lines for interesting molecules including organics.

Why observe IR from Space? While there are some narrow IR windows, the earth's atmosphere absorbs almost all of the IR spectrum. The atmosphere emits IR background radiation. Actually, pretty much everything emits IR radiation obscuring the signal by a factor of as much as one million. The telescope can be cooled for optimum performance. This is difficult to do on the warm surface of Earth.

NASA's Great Observatories: Spitzer is one of the Great Observatories designed to cover large portions of the electromagnetic spectrum. Compton studied Gamma Rays, Chandra X-Rays, Hubble Visible, and Spitzer IR. This ability to cover so much of the spectrum, as well as the growing number of mission specific instruments (e.g. Kepler), make this a golden age of astronomy. Discoveries are being made at an amazing rate! The reliability of the current instruments is also an advantage because it allows us to look, then to evaluate and think about what we have seen, then go back for further observations of interesting and surprising discoveries.

The Spitzer Space Telescope Details: First funded in 1984, launched on August 25, 2003 (delayed by the Mars Rover launch) on a Delta Heavy and placed in a very stable Earth trailing Solar Orbit (drift advancing 0.1 AU per year). The satellite is about 4m tall with a mass of about 865kg. Telescope with 85-cm (33.5") mirror cooled to -450F, 3 Focal Plane Instruments cooled to -457F (5K); Mid-IR Camera, Far-IR Camera, Spectrometer. Liquid Helium Lifetime: ~6 years (gave out in 2009). Additional operation possible until 2014 (if funded) when telemetry range and solar interference will prevent operation (until it comes out the other side of the sun in 64 years). $670M Cost. The 20 year development time allowed many technical advancements and issues to be resolved before launch. This included simplifying the actual mechanics of the satellite for reliability and doing a warm mirror launch (only the instruments were cooled). The mirror was cooled to 40K after launch by radiation. Despite the coolant having given out, the excellent shielding and radiational cooling (the tube is at 35K) allow two of the cameras to continue to function and demand is higher now than when all the cameras were working. Light pressure is the only perturbance of the satellite's orbit. 1-2 times a day, the satellite turns to point at Earth to for about an hour download observation data (85-90% on target efficiency). The satellite operates autonomously, receiving operational instructions once a week. Required data processing results in a 2-4 week turn around for received data. Data resolution of galaxies down to dot size means that data is confusion limited. It has a 0.2 arc second pointing accuracy and a pointing range 5° toward and 35° away from the sun steered entirely by gyros without using fuel; dry nitrogen is used to bleed momentum. The Beryllium mirror was particularly hard to grind accurately because it had to be ground at room temperature but its shape is different when cooled. It had to be cooled to check the figure, then calculations had to be made on how to grind it at room temperature so that it would be accurate when cooled. Note on IR imaging detectors: While Hershel discovered IR in the 1800s, it wasn't until the 1960s that scientific instruments with single pixel raster scanning capabilities became practical. Following that, it wasn't until the early 2000s that 2D IR arrays became practical.

Instrumentation Details: *The Infrared Array Camera (IRAC)*: G.G. Fazio, SAO, Principal Investigator, $45M cost, Wide-field imaging, Simultaneous at 3.6, 4.5, 5.8, 8.0 μm, 256X256 pixel array, 30μm pixels (0.8X0.8cm) modified for low background use from defense department sensors. *The Infrared Spectrograph (IRS),* J.R. Houck, Cornell, Principal Investigator, Staring and spectral mapping modes, R=600, 10-20 and 20-40 μm, R=50, 5-15 and 15-40 μm, Imaging/Photometry, 15 μm. *Multi-band Imaging Photometer for Spitzer (MIPS),* G. Rieke, Arizona, Principal Investigator, Small-area photometry, and scan maps for large area surveys: 24, 70, 160 μm, R~15 SED, 50-100 μm. 1-5μm sensors use Indium antimonide (InSb), 5-30μm use arsenic-doped silicon. 2 arc second resolution in near IR.

Unexpected Results: Exoplanet transit studies and high red-shift galaxies. Neither of these were in the scientific agenda. Other discoveries include: Spitzer was the first to detect light from an exoplanet (TrES-1). Must be very stable to image this over hours (signal one in 1,000-10,000). Used to determine planet temperature (also planet TrES-1) and create the first global temperature map of an exoplanet ("Hot" Jupiter, HD 189733b). The hot spot was actually shifted due to the atmosphere/winds and there was detection of water vapor as well. Seeing through dust, Spitzer was able to show the jets of Herbig Haro Object HH46. From the same object, it was able to detect water ice, methyl alcohol, methane gas, silicates, and carbon dioxide ice. Spitzer has also detected prebiotic molecules in the planet zone of young star IRS 46 and AA Tauri, including acetylene, hydrogen cyanide, and carbon dioxide. These detected materials are necessary for DNA. Spitzer has detected new born stars in dust/gas clouds (S171 and AFGL 4029) obscured in visible. Ultraviolet evaporation at the cloud edges make them bright in visible. Dust distributions can be seen from the infrared re-radiation (8μm) of star energy (1-5μm). Spitzer can identify distribution of young stars by class (class I protostars, class II T-Tauri stars, class III photospheres; to go to earlier stages you need longer wavelengths to see colder objects). Spitzer can identify brown dwarves (15 X Jupiter Mass) with planetary disks (OTS 44). These have been determined to act as mini-solar systems and are hard to find even close by and can be parts of binary systems. Spitzer's extended bandwidth allows it to separate stars, hot dust and cold dust. This can make galaxy mass measurements much more accurate (M81) and determine galaxy structure more accurately especially of merging galaxies (M82, Centarus A, M51, NGC 2207/IC 2163, M33, even the center of our own Milky Way Galaxy). IR observations of the Sombrero Galaxy (NGC 4594) peers through the dust cloud to see the center of the galaxy, but also shows concentrated dust re-radiation from the galaxy's disk.

Observations of the Early Universe: Observations of galaxies when the Universe was less than 700 million years old. Looking at the generally recognized history of the Universe, after the appearance of the first atoms at about 400,000 years, and inflation and the dark ages, the first stars appeared at about 400 million years, and the first galaxies appeared at about 1 billion years. Spitzer uses the Lyman Break Galaxy (LBG) and Lyman-Alpha Emitter (LAE) techniques to determine the redshift of galaxies. The initial goal was to see a red shift of Z=3 or about 2 billion years after the big bang. Detection has now been made to

Z=8 or galaxies at about 700 million years after the big bang. These detections are done in conjunction with observations made by the Hubble Space Telescope. What is incredible about this, if you think about it, these detected photons have travelled about 13 billion years before hitting the detector! Detection of stars has been made at about 300 million years which has modified when the expected first stars came into being. Early galaxy formation may also be shifted earlier as a result of these observations. The James Webb Space Telescope will be 100x more sensitive and will additionally refine these age estimates.

Summary: The Spitzer Space Telescope (85-cm mirror) has changed our view of the universe. Spitzer has detected the first light from a planet around another star and measured properties of its atmosphere. Spitzer has enabled us to see into interstellar dust clouds and to have a new view of how stars like our sun were born and evolve. Miniature solar systems may exist around brown dwarfs. We are now able to dissect a galaxy into it component parts: stars, dust, star formation regions and for the first time measure the mass of stars in a galaxy. Spitzer has detected galaxies less than ~800 million years old and for the first time measured the stellar mass and ages of stars in the galaxies. These results imply that the stars in these galaxies formed several hundred years earlier.

Note/Questions: Ground-based 1-2 µm IR imaging is quite good, and the 8m VLT does observations in this band, but Spitzer is still better.

Links:
http://www.spitzer.caltech.edu

http://en.wikipedia.org/wiki/Spitzer_Space_Telescope

http://www.aerospaceguide.net/telescope/spitzer.html

http://www.cfa.harvard.edu/ast/homepages/fazio.html

March ATMoB Business Meeting: (9:30pm)

Prior to the Dr. Fazio's lecture, ATMoB member Bob Naeye spoke for 22 minutes to provide us with an update on the Kepler mission. First he informed us that there would be a feature article on Mario Motta's "Dream" observatory in the upcoming issue of Sky and Telescope. Bob articulated many facts about the Kepler mission:

Kepler is looking for transiting planets. It was launched on March 7th, 2009 for a 3.5 year mission to observe 156,000 target stars in Cygnus and Lyra down to 12-13 magnitude with a 37" telescope. It's field of view is 105 square degrees. The project has announced 1,235 planet candidates around 997 host stars. 90% of these are likely to be real planets, not observational artifacts. 170 of these are multiple planet systems. (expected 98-99% real). Of these, 115 are double planet systems, 45 are three planet systems, 8 are 4 planet systems, and 1 each for 5 and 6 planet systems. 15 planets have already been confirmed with radial motion studies. Interesting planets to note: Kepler 10b is 1.4x diameter of earth and 4.6x the mass of Earth. The six planet system, Kepler 11, is amazing with its alignment of 6 planets which we can see transit, 5 of which are at a distance inside the orbit of Mercury. Two of those are about 13x mass of Earth, two are 4.5x radius of earth. These planets are not very dense at 0.5 to 3x the density of water (Earth is 5.5x). The star of this system is about 8 billion years old and it appears that the long term stability of this system is very good (billions of years). Also, surprisingly, none of the planets are in resonant orbits. Another system, however, Kepler Object of Interest (KOI) 730 has 4 planets in an 8-6-4-3 locked resonance. Of the 1235 planet candidates, 68 are about Earth size, 288 are super Earths, 662 are Neptune size, 165 are Jupiter size, and 19 are super Jupiter size. Also noteworthy, 54 are in the habitable zone and 5 of those are Earth size. These observations lead to some interesting statistical conclusions: There are probably 50+ billion planets in the Milky Way, 500 million of which are in the habitable zone. There is a 44% chance that a star will have a planet and a 17% chance it will be a multi-planet system. 6% host earth size planets, 17% super Earth size, 17% Neptune size, and 4% Jupiter size. It is still early to find outlying planets, which are less probable to be found because fewer will be in our field of view.

Bob informed us that the legacy and power of the Kepler Mission will be in the statistics it provides us with including he frequency of earth size and earth size planets in the habitable zone. Kepler will help us fill in factors of the Drake Equation. Bob indicated that he will be back in a year to provide another update!

Following the meeting, Bruce Berger said a few words about the recent passing of Dr. James Elliot. Dr. Elliot was known by many ATMoB club members. He was an occultation pioneer, and was involved in the occultation expedition several members assisted with. He assisted with one member's PhD Thesis, he flew with Kelly, he was best man at another's wedding. He was meticulous in his observations. This is why he was able to discover the rings of Uranus. For memorial information, please consult the links below.

Bob Naeye also spoke about the recent passing of Leif Robinson. Leif worked with Sky & Telescope from 1962 until 2000, as editor in chief from 1980 through 2000. He grew the circulation and stature of the magazine and used the magazine to foster professional-amateur collaboration. He promoted individual amateurs including our own Mario Motta. Bob interned with Sky & Telescope in 1991 and has memories of Leif's management of the magazine. He was instrumental in the establishment of Sky and Telescope's Eclipse Trips. He wrote about optics. He was also an avid birder. Leif was also on the board of the Astronomical Society of the Pacific and involved in the production of it's Mercury magazine. He believed in integrity, and the importance of serving the reader. Bob finished with the hope that we can live up to his legacy. For memorial information, please consult the links below.

Following both of these announcements, Mike Hill lead the club in observing a *moment of silence*.

James Elliot and Leif Robinson

James Elliot, 1943-2011
http://www.nytimes.com/2011/03/11/us/11elliot.html

http://www.skyandtelescope.com/news/home/117732023.html
http://www.boston.com/yourtown/cambridge/articles/2011/03/07/james_elliot_67_eminent_astronomer_helped_students_discover_their_potential/
http://tech.mit.edu/V131/N11/elliotobit.html
http://www.universetoday.com/83963/james-elliot-discoverer-of-uranus-ring-system-dies/
http://steves-astrocorner.blogspot.com/2011/03/dr-jim-elliot-discoverer-teacher-mentor.html
http://www.voy.com/221392/59969.html

Leif Robinson, 1939-2011
http://www.skyandtelescope.com/about/pressreleases/111647934.html
http://www.skyandtelescope.com/news/117072938.html
http://www.scientificamerican.com/blog/post.cfm?id=leif-robinson-19392011-a-pioneer-of-2011-02-28
http://www.astronomy.com/~/link.aspx?_id=f5769ae3-b3a5-40f3-8313-5688f4d925f1
http://www.universetoday.com/83630/sky-telescope-magazine-editor-emeritus-leif-j-robinson-passes-away/

Bernie Kosicki was unavailable for tonight's meeting as he was travelling back from the Winter Star Party. Mike Hill stepped up to lead the meeting.

Bruce Tinkler provided the Secretary's Report.

Mike Hill put the treasurer's report up on the screen. He indicated that Nanette would be at the meeting next month. He also indicated that we should see more expenses in the next month or so due to budgeted project money being spent.

There was no Membership Report.

Bruce Berger provided the Observing Committee Report. There was no Messier Marathon because of weather, another attempt will be made in April. We need some faith for good weather this time! The observing committee has also been preparing ideas for projects the next budgeting process including a warm room.

Steve Clougherty provided the Clubhouse Report. The summary in the newsletter is very good as usual. The next upcoming work party is on March 19th. We are moving from snow season to mud season. Steve noted members need to be very careful driving onto the field during this time. Trying for April 1st and/or 2nd for the next Messier Marathon.

Club Events & Announcements were presented by Mike Hill:

Feb 18~Jul 29	Astronomy Course "Understanding the Universe", Westford Clubhouse
Mar 14	Healey School Star Party, Somerville MA
Mar 17	Veritas Christian Academy, Wayland, MA
Mar 19	March Clubhouse Work Party #3, Tom Britton Clubhouse, Westford, MA
Mar 25	UMass Boston Community, Youth Astronomy Apprenticeship Star Party
Mar 26	Image Processing Training with Neil Fleming, Remote/Internet Meeting
Apr 11	Lexington Public School Star Party, Lexington MA
Apr 14	ATMoB Mtng: Protoplanetary Disks and the Hunt for the Youngest Exoplanets
May 1	Urban Astronomy in Cambridge, Cambridge MA
May 14	Astronomy Day, Clay Center Observatory, Brookline MA
May 21-26	AAS & AAVSO Joint Meeting

Other announcements:
Mario Motto announced that he would be without use of his telescope for two weeks. He has removed the primary mirror for recoating. The new coating will be a silvering which will provide 99% reflectance.

Howard LeVaux has broken his hip and had surgery. He is appreciative of the cards which were sent.

Ross Barros-Smith provided apologies for the late availability of the newsletter. He explained that it was due to a variety of circumstances all coming together at once.

Paul Valleli showed pictures of the recent ISS and STS-133 pass over Boston. This was the fair well mission for the Discovery space shuttle. The pass reached 87°, the 2 second separation indicated a distance of about 150 miles with the shuttle leading. He indicated it was a very satisfying view of the two satellites in a satellite observing career which goes back many decades.

Bruce Berger also presented ISS and solar floating filament pictures.

Recent media exposure with pictures for ATMoB:
http://belmont.patch.com/articles/image-gallery-night-exploring-at-the-sky-party#photo-5027997
http://acton.patch.com/articles/stars-come-out-for-acton-boxborough-fourth-graders

Refreshments were provided by Bruce Tinkler, with additional amazing pastries provided by Ken Launie, and much appreciated set up assistance by Bruce Berger.
Meeting adjourned 10:00pm.

~ Bruce Tinkler, Secretary ~

Clubhouse Report . . .

Snow A successful work party was held on Saturday March 19. Since the weather was cooperated, a lot of outdoor work was tackled. Members Steve C. Joshua A. Chris M. Wayne W. and Eric J. used the two 35 ft. ladders and trimmed trees along the Eastern side of the observing field. Approximately 5 hours was spent trimming from 6 to 10 feet from the tree tops using branch clippers and a branch saw. The limbs and clippings were then dragged to a site well south of the observing field allowing street access to a chipping machine.

Mike Hill spent a considerable amount of time moving various items from the barn attic to the 3rd floor of the clubhouse. The barn attic is much neater as a result, and the 3rd floor of the clubhouse is accessible to surplus equipment which is now stored there.

Eileen Myers handled mixing the compost mixture for the outhouse and filled the nearly empty bin with a good supply which will last many months.

Al Takeda shoveled heavy gravel and filled the largest potholes and trenches which were carved into the driveway from a very active plowing season.

Lunch was prepared by John Reed, and Sai V. Eric J. Art S. Eileen M. and Nina C. handled serving and clean up.

Photo by Al Takeda

Steve Clougherty standing on a step ladder while holding something sharp in his hands.

Many thanks to the following members for helping out on the 19th: Joshua Ashenberg, Bruce Berger, Dick Koolish, Al Takeda, Chris Marr, Sai Vallabha, Steve Clougherty, Art Swedlow, Eric Johansen, John Maher, Wayne Wagner, Eileen Myers, Nina Craven, Mike Hill and John Blomquist.

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

Clubhouse Saturday Schedule

April 16	Siegrist & Sonowane
April 23	Takeda & Toomey **Work Party #4**
April 30	Maher & McDonagh
May 7	Clougherty & Mock
May 21	Cichetti & Reed
May 28	Maerz & Panaswich

Thoreau on Astronomy . . .

At 10pm the northern lights are flashing, like some grain sown broadcast in the sky.

Journal, 22 April 1852

~ Submitted by Tom Calderwood ~

UMass Boston Star Party . . .

ATMOB volunteers Dan Winchell and Neil Fleming joined Ross Barros-Smith and the Youth Astronomy Apprenticeship for a public observing session at UMass Boston hosted by the physics department. The star party saw about 75 attendees, including participants from other area universities and members of the local community who traveled out to the peninsula just for this event! In addition to ATMOB's presence, one of Ross' interns at his astronomy outreach program, Kenneth Cottrell, manned a telescope. He shared views of the sky through a 6" dobsonian built by Tom Calderwood that he had previously donated to the program. Thanks goes out to our cold volunteers and to Tom for passing along the equipment!

~ Ross Barros-Smith ~

J. Douglas Brown…

Paul Valleli informed us that longtime member Doug Brown passed away on October 11, 2010. Paul writes, "Doug was a member of ATMoB from 1938, but then dropped out during WWII. He then rejoined in 1958 and has been on the mailing membership since then. He was truly an avid amateur astronomer and accomplished entrepreneur." Paul notes that due to "failing eyesight, he donated his Celestron C-8 to the club via then-President Bruce Berger. However, he was still able to photograph wildlife in the vicinity."

Bruce also adds, "Paul Valleli and I traveled together to Winter Star Party 2005 and made a point of visiting Doug at his beautiful condo in Naples. He showed us scores of nature photographs and was a gracious host. I gave him my Stellafane cap and an ATMoB shirt. We occasionally corresponded by email but that dropped off in the past couple of years. I'm very happy that the telescope he donated was adorned with a brass plaque bearing Doug Brown's name, and that long time members like Paul and

Anna may continue to refresh our memories of members like Doug Brown."

A memorial service was held on Nov. 20, 2010.

A website remembering Doug with photos and a summary of his achievements is online at http://www.jdouglasbrown.net

Photo from jdouglasbrown.net

Doug Brown

~Submitted by Paul Valleli and Bruce Berger; edited by Ross Barros-Smith~

Sky Object of the Month…

April 2011

NGC 2903 – Spiral Galaxy in Leo

To the deep-sky aficionado, spring means one thing – galaxies. Dozens of these island universes are within the grasp of small-aperture telescopes, while a 10-inch Dob can corral thousands. The constellation Leo is home to some of the brighter spring galaxies, including five listed in the Messier Catalog. One, however, escaped the eye of the French comet-hunter, even though it's visible in binoculars from dark-sky locations.

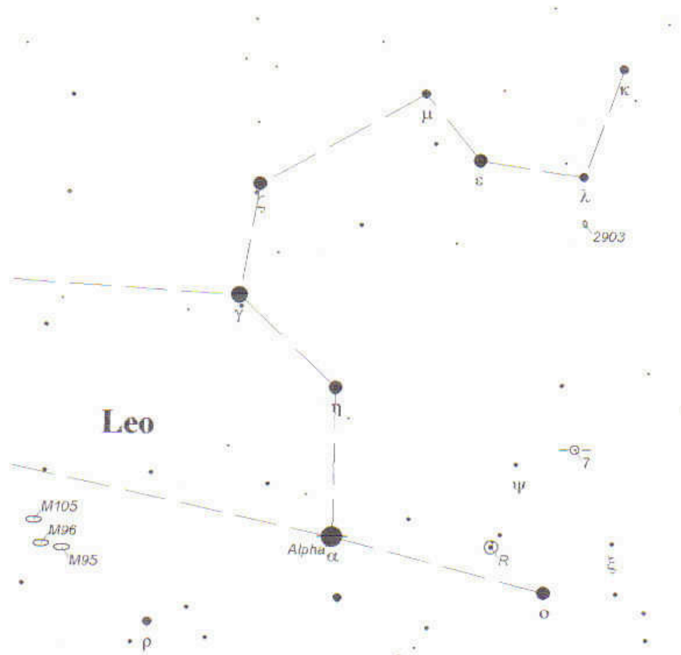
What Messier missed, William Herschel found. In 1784, during one of his all-sky surveys, he came upon a smudge of light 1 ½o south of lambda (λ) Leonis in the "Sickle" of Leo. To him, the object seemed double, so he catalogued the pair as H I 56 and H I 57 - number 56 and 57 in category I (Bright Nebulae). Their modern-day designations are NGC 2903 and 2905.

Like our Milky Way, NGC 2903 is a spiral galaxy intersected by a central bar. NGC 2905 is a stellar knot in one of the galaxy's spiral arms. NGC 2903 appears to be slightly more than half the size of the Milky Way and lies between 20 and 25 million light-years away.

I first viewed NGC 2903 in April, 1977 after reading about it in Walter Scott Houston's "Deep Sky Wonders" column. Houston described it as a 9th magnitude galaxy with 11' by 4.6' dimensions, adding that NGC 2903 should be visible in a 2-inch finder. Here was a deep-sky target I could observe with the only telescope I owned at the time - a 3-inch f/10 reflector. Sure enough, that little scope and a 30X eyepiece brought NGC 2903 to light. With little effort, I was able to make out a definite nebulous patch, slightly oval in shape. I saw no evidence of NGC 2905.

NGC 2903 appears on the lists of both the Saguaro Astronomy Club's 110 best NGC and the RASC's finest NGC Objects. Check it out for yourself and see if it belongs on your list of favorites.

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



~ Glenn Chaple ~

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May *Star Fields* DEADLINE
Noon, Sunday, April 24thh
Email articles to the newsletter editor at newsletter@atmob.org
Articles from members are always welcome.

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POSTMASTER NOTE: First Class Postage

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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.
