

Bays Mountain Astronomy Club

☞ *Next Meeting: Feb. 7* ☞

REFLECTIONS

Greetings fellow amateur astronomers!

The second month of the new year is here. While we still have some time before we start our spring StarWatches, this is the time when you should be getting out your telescope and binoculars and getting them ready for the upcoming season. You all know me well enough as an optimist when it comes to thinking that we will have better weather this year for viewing. I know that it is too early to start predicting what the weather will be for the first Saturday of the viewing at Bays Mountain. However, there are other avenues that we could look into this year. Over the past two years, I have gotten to know a bit more about some of your living areas and think that if we have enough interest, maybe we could get a star party at someone's home.

Thank you to all the members who were able to come out to the annual dinner at Jack's City Grill in Johnson City. Dr. Ignace, our keynote speaker, did an awesome job. He brought a copy of his new book that we passed around the room. The second part of the presentation



BY WILLIAM TROXEL

focused on another one of his research projects, space nebulae.

I want to share a few ideas and thoughts for the first part of 2014 and update you on some of the things I am still working on from 2013. First, I am still working on the scout proposal, which would make us the go-to location for the BSA astronomy Merit badge. I would like to have the proposal ready by the spring StarWatches. The second project I've not completed are the videos for the web site. The format is ready, all that is needed is the footage of the meetings, StarWatches, and other events like Astronomy Day. If the weather is on our side this year, I want to get the footage in upcoming months.

Looking ahead to some of our special events this year. One will be Astronomy Day, held on Saturday, May 10 at

Calendar

Special Events
 May. 10 Astronomy Day.

SunWatch
 Every Sat. & Sun., 3 - 3:30 p.m.,
 Mar. - Oct., weather permitting.
 BMACers are always welcome to help.

StarWatch
 7 p.m.: Mar. 1 & 8
 8 p.m.: Mar. 15, 22 & 29
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Bays Mountain Park. This should be a wonderful chance for outreach to the area to introduce not only astronomy, but our club as well. I

hope you will share the date with family and friends as a fun, cheap way to spend an afternoon in May. More details will be forth coming. I cannot end this section without reminding everyone of the spring StarWatch which starts in March. SunWatch also starts in March. Both programs need as many of you as can come out and help the park staff.



*Dr. Richard Ignace at the 2014 BMAC Dinner at Jack's City Grill.
 Photo by Adam Thanz*

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STAR STUFF

BY TERRY ALFORD

February opens with a thin, waxing crescent Moon. If you haven't used that new scope much that you got for Christmas [Ed.: or Chanukah], now would be a good time to study lunar detail, as well as some other interesting celestial objects in the sky this month. On February 14, the Moon is full. Valentine's Day! How sweet. On the morning of the 19th, the Moon is very close to both a bright star and a bright planet. Sneak out of the office or house and scan around the Moon with binoculars or a small scope and you just might find Spica close to the right of the Moon and Mars to the upper left. It is always neat to spy planets and stars in the daytime sky.

The first of this month is the best time to see Mercury in the evening sky. Its greatest elongation was the last day of January, but on February 1, it is still sorta favorably placed about 8° above the horizon. It is magnitude -0.5 and shows a half-lit disk. If you have a steady sky, a scope will show this. Pretty neat. The first time I observed this was about 20 years ago at an outreach event. If I recall correctly, Mercury was a little higher then. But hey, give it a try if the opportunity arises. Try to catch it during the first few days of the month as it will soon disappear below the western horizon. By the end of February, Mercury will be barely visible in binoculars in the pre-dawn sky.

Venus has left the evening sky but is at its brightest in the morning sky. How many people at work will ask "What is that bright light in the east when I was driving here before dawn? A UFO?" Through strong binoculars or a scope, it displays a

thin crescent that grows in thickness through the month. Of course, it will also shrink in diameter from 51" to 33".

Mars rises around 11 p.m. at the start of the month. It rapidly brightens from +0.2 to -0.4 magnitude and grows in apparent size from 9" to 11.5" as the month progresses. Some surface features should be visible depending on aperture and seeing conditions. Rather unfortunately for us, the "Red Planet" is at its summer solstice this month and the northern polar ice cap will be tiny. Still, Mars will be a bright, steady light in the eastern sky this month. Very noticeable. I will admit this now but may deny it later. A couple of years ago my young grandson wanted to see Mars through one of my telescopes. I took him outside with my "kid's scope." A 4-inch f/4 achromat with a binocular objective. Hardly a scope to look at tiny Mars with. But I put the planet in the center of the FOV and de-focused the image until there was a bright orangish disk. He peered through the eyepiece and said "That is where John Carter lives." His dad had just taken him to the movies to see "John Carter on Mars."

Jupiter is the "King of the Planets" and it is in full reign this month. Well up in the eastern sky in Gemini at dark, it shines at around -2.5 magnitude all month long. Steadily held binoculars should show all of the four largest moons as tiny dots and a tiny, whitish disk for Jupiter. Even an 80mm scope will allow you to observe its four largest moons and two major belts. An 8 inch or larger scope may allow you to

view larger festoons and the Great Red Spot.

Saturn rises early in the morning sky as February begins but before midnight as the month ends. If you are a late night observer (or an early morning observer) be sure to view the fifth planet this month. Saturn is in the constellation Libra and it reaches quadrature on the 11th. This can be a more interesting observation opportunity than when the "golden" planet is at opposition. At quadrature, the shadow of the planet is most prominent on the rings. This is a stunning "3-D" sight in a mid-sized telescope. The rings are tilted at an angle of about 23°. In an 8-inch or larger scope, a belt or two, the moon, Titan, and a few other moons are usually visible. The Cassini Division is normally seen. Of course, if you have "super eyes" you might see the spokes in the rings. Nah... better wait for opposition for the spokes.

Uranus is barely visible this month and Neptune is not visible at all.

There are no major meteor showers this month.

HAPPY BIRTHDAY BERNARD LYOT

BY ROBIN BYRNE

This month we celebrate the life of a man whose name should be synonymous with the Sun. Bernard Ferdinand Lyot was born in Paris, France on February 27, 1897 to Alice and Constant Lyot, a surgeon. Bernard attended college at l'Ecole Superieure d'Electricite in Paris to study engineering. While there, his interest in astronomy began. In 1914, he purchased his first telescope, with a 4 inch aperture, and soon upgraded to a 6-inch scope. He even constructed his own dome and set it up near Tours.

Lyot graduated from college in 1918 and got his first job at l'Ecole Polytechnique as a demonstrator in the physics department. Here, he had the opportunity to work with such men as Alfred Perot and Charles Fabry. At the same time, Lyot was taking classes in chemistry, physics and engineering at the University of Paris.

Meanwhile, Lyot took on a second job as the Assistant Astronomer at the Meudon Observatory, which became part of the Paris Observatory in 1926. Lyot left his position at l'Ecole Polytechnique when he was given a full time position as Joint Astronomer of the Observatory in 1929.

It was at Meudon that Lyot began to find his calling. With the encouragement of the observatory's director, Henri Deslandres, Lyot began to put to good use his skills in optics and invention. His first task involved wanting to better study the surfaces of planets. To do this, he invented a

polariscope to measure the amount of polarization of the light being reflected off of their surfaces. He then used this information to determine the characteristics of their surface composition. Lyot conducted his observations at the Pic du Midi Observatory in the French Pyrenees Mountains. Looking at the light from our Moon, Lyot found that the soil is similar to volcanic dust. When studying Mars, he saw evidence for sand

a small amount of dust or slight optical imperfection would scatter the light from the Sun's disk, even when trying to block the Sun, the corona would not be bright enough to see in all of the Sun's glare. In 1930, Lyot ground three lenses, 8 cm in diameter and 2 meters in focal length each, to as close to perfection as was possible at the time. The combination of the lenses and diaphragms, plus the crystal clear

observing conditions at Pic du Midi, allowed Lyot, on July 12 1931, to be the first person to observe and photograph the corona of the Sun without the aid of an eclipse.

Lyot continued to study the Sun and develop more equipment to gather even more information. He built polarizing filters that let through light with a bandwidth of only 1 Angstrom. This allowed him to identify spectral lines in the corona, some of which had never been observed

before. He also noticed that the lines were quite wide, which indicates that the corona is incredibly hot - much hotter than expected. These filters are now known as Lyot Filters.

Lyot's device for observing the corona by eliminating the glare from the photosphere, which eventually became known as the coronagraph, went through repeated modifications and improvements throughout the 1930's. He was able to observe that the corona rotates with the rest of the Sun, and even made a motion picture of the corona and prominences, which he showed to the International Astronomical Union.

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Bernard Lyot is on the far left. To the right are Jack Wainwright Evans Jr. and Walt Roberts at the High Altitude Observatory, July 1946. Image UCAR.

storms. Lyot also claimed to observe signs of water on Venus - one of his few incorrect discoveries.

It was his observations of Mercury, however, that led Lyot to the area for which he is best remembered. Because Mercury is always so close to the Sun, the glare makes it very difficult to observe. That led Lyot to think about the Sun and ways to block out its light. One of the features of the Sun that was always difficult to observe was the corona, since it was only visible briefly during a total solar eclipse. Because even

NASA SPACE PLACE

Surprising Young Stars in the Oldest Places in the Universe**By Dr. Ethan Siegel**

Littered among the stars in our night sky are the famed deep-sky objects. These range from extended spiral and elliptical galaxies millions or even billions of light years away to the star clusters, nebulae, and stellar remnants strewn throughout our own galaxy. But there's an intermediate class of objects, too: the globular star clusters, self-contained clusters of stars found in spherically-distributed halos around each galaxy.

Back before there were any stars or galaxies in the universe, it was an expanding, cooling sea of matter and radiation containing regions where the matter was slightly more dense in some places than others. While gravity worked to pull more and more matter into these places, the pressure from radiation pushed back, preventing the gravitational collapse of gas clouds below a certain mass. In the young universe, this meant no clouds smaller than around a few hundred thousand times the mass of our Sun could collapse. This coincides with a globular cluster's typical mass, and their stars are some of the oldest in the universe!

These compact, spherical collections of stars are all less than

100 light-years in radius, but typically have around 100,000 stars inside them, making them nearly 100 times denser than our neighborhood of the Milky Way! The vast majority of globular clusters have extremely few heavy elements (heavier than helium), as little as 1% of what we find in our Sun. There's a good reason for this: our Sun is only 4.5 billion years old and has seen many generations of stars live-

some of the oldest stellar swarms in the known universe.

Yet when you look at a high-resolution image of these relics from the early universe, you'll find a sprinkling of hot, massive, apparently young blue stars! Is there a stellar fountain of youth inside? Kind of! These massive stellar swarms are so dense -- especially towards the center -- that mergers, mass siphoning and collisions

between stars are quite common.

When two long-lived, low-mass stars interact in these ways, they produce a hotter, bluer star that will be much shorter lived, known as a blue straggler star. First discovered by Allan Sandage in 1953, these young-looking stars arise thanks to stellar cannibalism. So enjoy the brightest and bluest stars in these globular clusters, found right alongside the oldest known stars in the universe!

Learn about a recent globular cluster discovery here: <http://www.nasa.gov/press/2013/september/hubble-uncovers-largest-known-group-of-star-clusters-clues-to-dark-matter>.

Kids can learn more about how stars work by listening to The Space Place's own Dr.

Marc: <http://spaceplace.nasa.gov/podcasts/en/#stars>.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Globular Cluster NGC 6397. Credit: ESA & Francesco Ferraro (Bologna Astronomical Observatory) / NASA, Hubble Space Telescope, WFPC2.

and-die, while globular clusters (and the stars inside of them) are often over 13 billion years old, or more than 90% the age of the universe! When you look inside one of these cosmic collections, you're looking at

MISCELLANEOUS

Reflections**by William Troxel***(continued from page 1)*

Check out the website for details or contact me, I will be happy to share details with you.

Please remember to pay your dues. Bays Mountain Astronomy Club is a great club. We need each and every one of you. You are Bays Mountain Astronomy Club. I believe in our members, our programs, and the future. Should you need more proof of the role that amateur astronomers play in the world of astronomy, check out sites like: Backyard Astronomy @ backyard-Astro.com and Exoplanet @ exoplanet.com. There are many more, but these are just two I've discovered. The web is full of sites that we can see the work of amateurs just like you and I. I encourage you to look for ways that you can contribute to the efforts. Now I want to share the details of the February meeting. Darlene Denis, Mars One Applicant, will be the featured speaker. I hope that you will invite your friends and neighbors to come out to hear her presentation. Don't forget February 7, 7 p.m. I hope to see the room full.

Until then, clear skies.

Happy Birthday**by Robin Byrne***(continued from page 3)*

Liot's work with the Sun won him many honors, including election to the French Academy of Sciences in 1939, and, in the same year, the Gold Medal of the Royal Astronomical Society. Liot was also named the Chief Astronomer at

the Meudon Observatory in 1943. In 1947, he received the Bruce Medal, and in 1951, the Henry Draper Medal from the National Academy of Sciences.

On February 25, 1952, Liot was observing a total solar eclipse near Khartoum, Sudan. A few days later, while traveling back to Paris, he suffered a massive heart attack. Bernard Liot died April 2, 1952 near Cairo, Egypt.

Bernard Liot continues to be remembered in a variety of ways. There are craters named Liot on both the Moon and Mars, plus an asteroid named 2452 Liot. More appropriately, the Bernard Liot Telescope is a 2 meter Cassegrain that has been housed at Pic du Midi since 1980. In 2007, an echelle spectropolarimeter was added, which allows for the study of the magnetic fields of stars.

Starting back up in March, Bays Mountain will once again host SunWatches every clear Saturday and Sunday from 3-3:30 p.m. Although the Park does not have a coronagraph yet (ahem... hint, hint), what we can observe and share with the public about the Sun has been aided by the work of this month's honoree: Bernard Liot.

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<http://www.phys-astro.sonoma.edu/BruceMedalists/Liot/>

LCAS - Bernard Liot by Jay Bitterman
http://www.lcas-astronomy.org/articles/display.php?filename=bernard_liot&category=biographies

Bernard Liot
http://www.astro.umontreal.ca/~paulchar/grps/histoire/newsite/bioliot_e.html

The Liot Project
<http://liot.org/background/coronagraphy.html>

Regular Contributors**WILLIAM TROXEL**

William is the current chair of the club. He serves as activities coordinator for a local retirement living community.

TERRY ALFORD

Terry is also a founding member since 1980 and has been chair many times, as well. He has worked as an astronomy lab instructor at ETSU since 2001.

ROBIN BYRNE

Robin has been writing the science history column since 1992 and was chair in 1997. She is an Associate Professor of Astronomy & Physics at Northeast State Community College (NSCC).

ADAM THANZ

Adam has been the Editor for almost all of the years since 1992. He is the Planetarium Director at Bays Mountain Park as well as an astronomy adjunct for NSCC.

The Bays Mountain Astronomy Club



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Dues:

The Bays Mountain Astronomy Club requires annual dues for membership. It covers 12 months and is renewable at any time.

Rates:

\$16 /person/year

\$6 /additional family member

If you are a Park Association member, a 50% reduction in fees is applied.

Find out more at our website:

<http://www.baysmountain.com/astronomy/astronomy-club/>

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