

The Mason-Dixon Astronomer



July Meeting:

- Wed., July 9th –
7:30 pm
Bear Branch Nature
Center
- **Member
Presentations**

Lick Observatory
Stellar Spectra
Asteroid Occultation

Dinner Before The Meeting!

- Wed., July 9th – 6pm.
- Harry's Main Street Grill
65 W Main Street
Westminster, MD 21157

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St*r Points

Globular Star Clusters

July 2014 – Curt Roelle

Last month we talked about how stars are regularly found to exist in clusters. We focused on the “open cluster” type in which groups of stars form, disperse, and then go on their merry way. Now we’ll look at the other major class of star clusters, the “globular clusters.”

The globular’s name comes from their appearance: They look like a big glob of stars. By big I mean they are very large in comparison to open clusters. The greatest globular clusters are estimated to contain several million stars, whereas the most populous open clusters contain merely thousands.

The name has a bearing on their shape as well: The clusters are spherical, like a globe. They are big round, and nearly symmetrical big balls of stars. They’ve always reminded me of the popcorn balls my grandmothers used to make at Christmastime. In that model, each kernel of popcorn represents a star in the cluster. The cluster’s stars are bound by gravity such that, unlike open clusters, their stars do not disperse over time.

Globular clusters contain some of the oldest known stars. According to the theory of their formation, the globular clusters were some of the first stars to form. Whereas newer stars in the open clusters are being formed from the dust and metals produced in earlier generations of stars, globular clusters have stars that are “metal poor,” an indication of greater age.

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President’s Message

July 2014 – Tony Falletta

Greetings Fellow Astronomers!

The warm summer nights of July beckon us to the stars! I hope you have been able to take advantage of some great stargazing evenings. In mid-June my son and I attended his years Boy Scout summer camp in western Pennsylvania. The days were mostly sunny and warm with the nights for the most part, clear and cool. As I packed for my annual week in tent and a cot I decided to bring along my binoculars and my solar telescope. One of the Merit Badges offer at camp was Astronomy. I figured that since I would be there with some free time on my hands I would help out the Astronomy Merit Badge counselors if they so desired. When I introduced myself to them as a member of WASI and an avid amateur astronomer, they immediately accepted my offer. The Counselors that run the Merit Badges for summer camp are mainly college age students who were quite active as scouts and feel the need to help provide for a great week in the woods for the younger scouts.

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July Meeting – Topics

Member Presentations

“Lick Observatory”

Vanessa Thomas and Curt Roelle will give presentations on the Lick Observatory. Vanessa was there last month and will provide an account of her visit.

“Stellar Spectra and Asteroid Occultation”

Steve Conard will share information on some stellar spectra he’s been collecting from his backyard. He will also give us some details about an upcoming asteroid occultation later this month.

Upcoming Events From Our Calendars

- ❖ **Planetarium Show** July 5th, 7:30 p.m., at Bear Branch Nature Center (BBNC)
- ❖ **Monthly Meeting** July 9th, 7:30 p.m., at Bear Branch Nature Center (BBNC)
- ❖ **Soldiers Delight Public Stargazing** July 12th, 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills
- ❖ **Udvar-Hazy Public Event** August 2nd, 10 a.m. – 3 p.m., at Steven F. Udvar-Hazy Center in Chantilly, VA. Please contact Bob Clark if you can assist.

Join The Westminster Astronomical Society...

Joining WASI gives you a great opportunity to meet fellow astronomers and provides group memberships to the [Astronomical League](#) and the [International Dark-Sky Association](#). Additionally, benefits include access to our [Library](#) (over 500 astronomy-related books), the ability to borrow [club scopes](#), a subscription to the Astronomical League’s *Reflector*, access to members-only observing sessions and sites, and club discounts on astronomical magazine subscriptions.

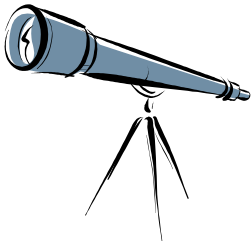
Adult Membership is still only \$25 per year.



NEW THIS YEAR – JUNIOR MEMBERSHIP

Yearly Membership For Anyone Under 18 Is Now Just \$5!
(YES...JUST FIVE DOLLARS!)

<http://www.westminsterastro.org>



St*r Points for July...

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Young stars and open clusters exist in the spiral arms of our Milky Way galaxy. The globulars, on the other hand, are located closer to the galaxy's central hub, the so-called halo region. There are some 150 known globular clusters in the Milky Way. Therefore, globular clusters are more commonly viewed in the summer when we are looking toward the center of the Milky Way in the southern night sky.

Typically, the larger the galaxy, the more globular clusters it contains. The largest galaxies may have globular clusters numbering in the thousands.

The Milky Way's largest globular cluster is Omega Centauri, in the southern constellation Centaurus. At its highest, it just barely peeks above the horizon in Westminster making it difficult to locate. The best views I've enjoyed of Omega Centauri were from the tropics. Places like South America, Mexico, and aboard cruise ships in the southern Caribbean Sea in places including such the Windward Islands -- such as Grenada, and the Netherlands Antilles.

For those of us in the temperate zone of the northern hemisphere the foremost globular cluster is Messier 13 in the constellation Hercules. M13 was discovered in the 17th century by Sir Edmund Halley of Halley's Comet fame. It's easy to locate with binoculars and a star chart once you know how to locate Hercules' four-star "keystone" asterism. The globular is located between two of the stars. In binoculars M13 looks like a fuzzy star.

Another fairly easy to find globular is M22 just off the lid of the teapot asterism in the constellation Sagittarius. Again, a simple star chart or online guide showing the constellation as well as the globular cluster will help you locate it with binoculars.

A small telescope is all you need to actually resolve the brighter globular clusters into individual stars. When I was in high school, the first "deep sky" object I saw through my telescope, which wasn't an ordinary star or planet, was the globular cluster M3 in Canes Venatici, the hunting dogs.

One good thing about globular clusters is that their compact size gives them good surface brightness making them relatively easy to locate from moderately light polluted areas. When I first moved to Maryland I lived in light polluted Montgomery County for two years. During the summer I used to observe globular clusters from my south facing balcony with a small telescope.

WASI CafePress Store...

Ever wonder where all that great, WASI logo, gear comes from? Well...wonder no more!

Visit our CafePress store http://www.cafepress.com/wasi_store and find dozens of items with our logo. Items such as hats, shirts, mugs, baby clothes, dog clothes, clocks, cell phone cases, license plate frames, and much, much more.

A portion of each sale comes back to the club. So help the club and get some really cool things for yourself or your loved ones!



President's Message

Continued from Page 1

On a couple of nights they had planned for a star party so I showed up, set up my 15x70 binoculars and tripod and helped conduct the star party. I was also able to give the boys and adults leaders there a basic stargazing "101" talk. During the day I set up my PST and gave a talk about the sun. All said and done, I got in some great camping, boating and astronomy too. It truly was a fun week for me!

Back here at home, there is some great news. We now have a signed MOU with the county for our Blaine Roelke Observatory! Frank Roelke is working diligently with the BBNC and the County to begin the construction and installation of the Observatory. It is hoped that by September we will have a fully operational domed observatory in place. This will truly be an asset to the club which all our members will have access to. While the construction and installation phase goes on the Observatory committee is working to put into place Observatory rules in time for its grand opening. WASI Secretary Steve Conard has put out an initial draft for us to review and amend. I encourage any club member interested in help formalize this document to attend an Observatory Committee meeting and voice input. The success of our operational rules depends on as much input from as many members as possible. Please look to Observatory Committee Chairman Curt Roelle for our next meeting date.

Over in the Taneytown, a few members of our Observatory Committee met with City Officials to present our plans for our Roll-Off Roof Observatory. I spoke with WASI member (and designated Taneytown Observatory Director) Erich Bender and he relayed to me that City Officials are quite interested in this project. More meetings are planned to work out the details. The big picture here is we are moving in a forward direction for our Roll-Off Roof Observatory. As with our BBNC project, I encourage any member interested our planned Taneytown observatory to contact Curt or Erich or me.

Closing this month's message is "Tony's Astronomy Target" for July. The selected target is Scorpius which is on Meridian on July 20th. Starting at the head, take a look at Beta Scorpii. This star, also known as Graffias, is actually a double star. At 2.6 and 4.9 magnitude, both stars appear as blue-white in color. This double star will show the split at about 50x. Moving from Graffias, work your way towards Antares. On the way try to spot M80. This very compact Globular Cluster needs a dark sky to be seen. Just before reaching Antares lies very closely M4. This Globular Cluster is about 6700 light years from Earth making it the closest one. At 5.8 magnitude, M4 will look like a fuzzy patch through binoculars and a telescope will reveal individual stars. As stated, it lies right next to Antares, the Heart of the Scorpion. This red supergiant is the 16th brightest star in the night sky. It is much larger than our sun. If it were placed in our solar system, its diameter would be larger than the orbit of Mars. Antares got its name due to its red color, similar to Mars. The Greek name for Mars is Ares (the god of war). Antares means rival of Ares. Down near the tail of Scorpius lies M6 and M7. M6 is known as the Butterfly Cluster. This beautiful 4.8 magnitude Open Cluster resembles the shape of a butterfly. M7 is a very large 3.5 magnitude Open Cluster. It is so large in the sky that a good pair binoculars is the instrument of choice. Finally, since it is July, I would be remiss if I didn't redirect you to one more object. On meridian on July 25th lies Hercules. In Hercules you will spot quite easily M13, the Great Cluster. At magnitude 5.7, this stunning Globular Cluster can be spotted with the naked eye and its million plus stars are a sight to behold in binoculars and even more so in a telescope.

That's all for now. Enjoy these warm summer evenings and all that the summer night sky has to offer. I hope to see you at our next meeting. Don't forget to bring your telescope or binoculars along. Last month's meeting was met with cloudy skies but with any luck, we just might be able to do a little observing!

Clear Skies,

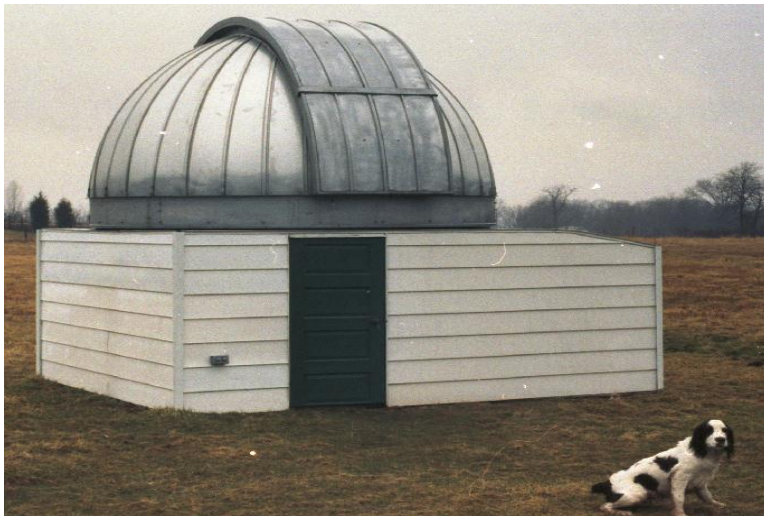
Tony Falletta

Observatory Update

If you have not been paying attention, you may have missed what we are doing with the observatory project(s). I thought I would give you a quick update on where we stand. You can get a bit more detail if you read the President's message this month.

If you were not aware our observatory project is no longer a single project. It is now at least two, and possibly three, projects. All in Carroll County and all are working simultaneously.

The primary project is still located at Bear Branch but has changed significantly from our original plan. The primary reasons for the change are opportunity and partnerships. Currently Frank Roelke is partnering with Carroll County and WASI to move his family's refurbished domed observatory to Bear Branch Nature Center. Most of the details have been worked out and, with luck, the building could be in place by the fall.



An older photo of the Roelke observatory that will be refurbished and re-located to Bear Branch Nature Center

The second project the club is pursuing is in Taneytown. With the help of former WASI president Erich Bender, we are moving forward with plans for a large roll off roof building on some new, city owned, property. We are still in the negotiation phase with the town council, but things are looking very promising at this location.

The final project is a bit more shaky, but still moving slowly ahead. This project involves an observatory, of undetermined size, at Charlotte's Quest nature center in Manchester. We have had some preliminary talks with the town and the nature center. Everyone seems to be excited about the prospect, but the details have yet to be ironed out.

Columbus youth receives honor.

A blast from the past and some good information about the AL Messier Club.

The Columbus [Nebraska] Telegram

October 2, 1974, p. 29

The regular September meeting of the Prairie Astronomy Club in Lincoln was the setting for the presentation of the Messier Certificate to Curt Roelle of Columbus. This award is given by the national Astronomical League and automatically places Curt in the Messier Club, sponsored by the League to recognize amateur astronomers who have observed objects in Messier's famous catalog. A membership certificate is awarded to one who has observed 70 or more of the catalogued objects. A select few who have observed all 107 objects on the list may have their certificate endorsed as "honorary members." Again Roelle joins these select few.

As of February, 1974, 195 certificates had been issued and only 77 endorsed for honorary membership in the United States. The skills acquired while seeking all the objects, provide practice for both beginning and experienced observers. Few professional astronomers can claim to have seen the entire group of objects. Curt related that most of his observations were found with his own six-inch Newtonian reflector telescope but a few were first viewed through the Club's 12.5-inch reflector. He later found them on his own telescope so that all objects were viewed through his personal telescope.

He devoted two years of searching the heavens to complete the catalog list which consists of galaxies, star clusters, nebulae, globulars, and open clusters. Due to seasonal changes in the night sky, observations are necessary throughout the year. Curt says his alarm clock has been set for nearly any hour of the early morning and sub-zero temperatures, snow covered ground and summer insects are obstacles that amateurs can overcome.

A growing interest in astronomy prompted Curt to join the Lincoln Prairie Astronomy Club about three years ago. After receiving this coveted certificate, he now plans to further his interest in Astronomy by combining with another interest which is photography. So, sometime in the future, he will attempt astro-photography as his new goal. Curt is a senior at Columbus High School and his parents are Mr. and Mrs. Wayne B. Roelle.



A Glorious Gravitational Lens

By Dr. Ethan Siegel.

As we look at the universe on larger and larger scales, from stars to galaxies to groups to the largest galaxy clusters, we become able to perceive objects that are significantly farther away. But as we consider these larger classes of objects, they don't merely emit increased amounts of light, but they *also* contain increased amounts of **mass**. Under the best of circumstances, these gravitational clumps can open up a window to the distant universe well beyond what any astronomer could hope to see otherwise.

The oldest style of telescope is the refractor, where light from an arbitrarily distant source is passed through a converging lens. The incoming light rays—initially spread over a large area—are brought together at a point on the opposite side of the lens, with light rays from significantly closer sources bent in characteristic ways as well. While the universe doesn't consist of large optical lenses, **mass itself** is capable of bending light in accord with Einstein's theory of General Relativity, and acts as a *gravitational lens*!

The first prediction that real-life galaxy clusters would behave as such lenses came from Fritz Zwicky in 1937. These foreground masses would lead to multiple images and distorted arcs of the same lensed background object, all of which would be magnified as well. It wasn't until 1979, however, that this process was confirmed with the observation of the Twin Quasar: QSO 0957+561. Gravitational lensing requires a serendipitous alignment of a massive foreground galaxy cluster with a background galaxy (or cluster) in the right location to be seen by an observer at our location, but the universe is kind enough to provide us with many such examples of this good fortune, including one accessible to astrophotographers with 11" scopes and larger: Abell 2218.

Located in the Constellation of Draco at position (J2000): R.A. 16h 35m 54s, Dec. +66° 13' 00" (about 2° North of the star 18 Draconis), Abell 2218 is an extremely massive cluster of about 10,000 galaxies located 2 billion light years away, but it's *also* located quite close to the zenith for northern hemisphere observers, making it a great target for deep-sky astrophotography. Multiple images and sweeping arcs abound between magnitudes 17 and 20, and include galaxies at a variety of redshifts ranging from $z=0.7$ all the way up to $z=2.5$, with farther ones at even fainter magnitudes unveiled by Hubble. For those looking for an astronomical challenge this summer, take a shot at Abell 2218, a cluster responsible for perhaps the most glorious gravitational lens visible from Earth!

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Learn about current efforts to study gravitational lensing using NASA facilities:

<http://www.nasa.gov/press/2014/january/nasas-fermi-makes-first-gamma-ray-study-of-a-gravitational-lens/>

Kids can learn about gravity at NASA's Space Place: <http://spaceplace.nasa.gov/what-is-gravity/>



Abel 2218. Image credit: NASA, ESA, and Johan Richard (Caltech). Acknowledgement: Davide de Martin & James Long (ESA/Hubble).