

The Mason-Dixon Astronomer



February Meeting:

- Wed., February 11th – 7:30 pm
Bear Branch Nature Center
- **Steve Conard**
New Observatory operation briefing.
- **Slava Murygin**
"Pocket" analemma project.

Pre-Meeting Dinner

- Wed., February 11th – 6pm.
- Harry's Main Street Grill
65 W Main Street
Westminster, MD 21157

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St*r Points

Jupiter, Venus, and Mars

February 2015 – Curt Roelle

Jupiter remains well placed and at its best and closest for the year. Rising at sunset and setting at sunrise, Jupiter is up all frigid night. Later in the month, the moon, Venus and Mars join together forming a nice trio in the evening sky.

Jupiter is one planet that a person can never get tired of watching. It has the largest apparent disk of any solar system planet that has easily visible surface features. Its bands, belts, red spot, and satellite moons have been featured in this column many times over the years. Best time to view it is starting at 10 p.m.

The “great red spot” (or simply GRS) has faded for the past couple of decades. When I turned my first telescope toward Jupiter on a warm summer evening I recall the impression of seeing an almost blood red oval on the planet. These days, the GRS has faded and changed color. Some would call it a salmon pink spot. It’s so faint that unless you know it’s there, it is easy to miss.

To assist in identifying it, Sky and Telescope magazine (skyandtelescope.com) has a Java computer language applet that calculates times when the GRS is transiting (halfway across) Jupiter’s disk (registration is required). Just key in a date, or select current date, and the application displays the times of the next three GRS transits. You can get your telescope out at that time and have a look to see what the GRS looks like.

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President's Message

February 2015 – Tony Falletta

Greetings My Fellow Astronomers,

Welcome to February! So far this winter has not been as frigid as last year. It is my hope that spring gets here before a strong winter wrath can make an appearance. At our January meeting, we had our yearly elections. All of the 2014 Officers were re-elected back into their current positions. My officers and I are thankful for the chance to continue serving this fine group of astronomers. As we all know, an Observatory has been a long time goal for this club. Our members have spent a lot of years raising the funds needed to make this happen. As my Officers and I began our term in 2014, we knew that we needed to make a concerted effort to finally realize our goals. Through a series of events, which we are all quite familiar with, we now stand on the threshold of a fully operational domed observatory. This is an exciting time to be a member of WASI. As we move into the operational phase of the observatory, I urge all of you to reach out to the Secretary, Steve Conard, who will be implementing the training of the observatory telescope. It is our intent that all of our membership be fully versed in the use of the telescope and dome so they may enjoy using them independently and during our future club observing events.

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February Meeting – Guest Speakers

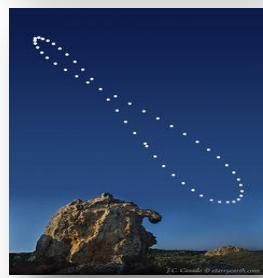


Steve Conard

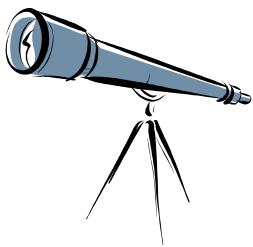
WASI Observatory Committee (OBSCOM) member Steve Conard gives a presentation covering the basics of observatory operations, including its equipment including the computerized German Equatorial mounting. Steve is beginning to prepare a curriculum for training members and volunteers to operate the observatory themselves.

Slava Murygin

WASI member Slava Murygin offers a brief tech talk concerning his “pocket” analemma project. If time permits he may also share some images of his recent visits to Florida’s Kennedy Space Center and Griffith Observatory in California.



Upcoming Events From Our Calendars



- ❖ **Monthly Meeting** February 11th, 7:30 p.m., at Bear Branch Nature Center (BBNC)
- ❖ **Soldiers Delight Public Stargazing** February 14th, 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills
- ❖ **Planetarium Show** February 28th, 7:30 p.m., at Bear Branch Nature Center (BBNC)

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>



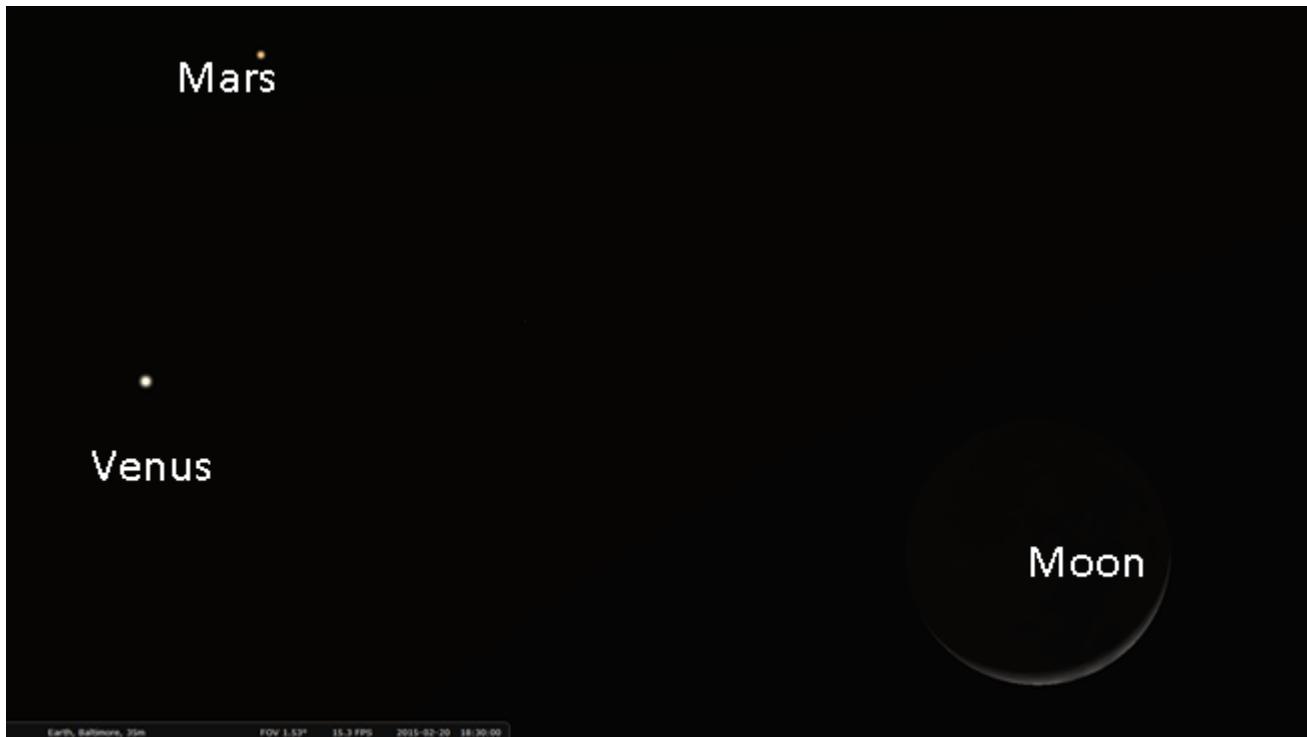
St*r Points for February...

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Same thing goes for Jupiter's four bright Galilean satellites, or moons. S&T has an application for them as well. It graphically depicts the configuration of moons around Jupiter that will appear in a telescope's eyepiece at the specified time. You can even rotate it to match the view in your telescope. It is a great resource for identifying which moon is which. Their names are Io, Europa, Ganymede, and Callisto.

Currently, through a telescope, Venus is showing a large crescent phase in the evening sky. Although Venus' apparent angular diameter is actually larger than Jupiter's as February begins, it is featureless. However, Venus will be in a tight formation with the moon and Mars on the evening of Friday, February 20. A very thin crescent moon appears about two degrees (about 4 moon diameters) to the right of bright Venus at 6:30 p.m. ET during twilight in the west. A little over half a degree (about 1 moon diameter) above Venus is faint ruddy Mars. The triple conjunction will make a splendid sight in binoculars. About a half hour later at 7:00 p.m. the darker sky makes Mars easier to see, although the trio will be much lower on the horizon.

Mars has been in the news lately because of the discovery of a missing lander from Earth. Contact with the United Kingdom's Beagle 2 Mars lander was lost during the landing sequence 11 years ago. The loss has been shrouded in mystery ever since. Had it crashed? Did it fail upon landing? The speculation went on and on. But NASA's Mars Reconnaissance Orbiter high overhead has managed to image the partially deployed lander on the surface of Mars. Now, if they can only figure out why it didn't fully deploy the mystery will be completely solved.



Mars, Venus and the Moon in the western sky during evening twilight on February 20, 2015. (Image created using Stellarium)

President's Message

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Over in Taneytown, we are awaiting on the City to get back to us on the specifics of bringing in a roll off roof observatory. It remains our hope to get this project moving sooner than later. Member Erich Bender remains our point man with Taneytown and is continuing to get this project off the ground.

In Manchester, we are working with Charlottes' Quest Nature Center to help them get the best structure to house the Discovery reflector telescope we have. They are currently exploring the options of a shed type structure to house the telescope. Member Bob Clark has been working diligently with the Manchester folks in their "quest"!

With all we have going on with the various observatories, I will be soon sending out a survey to all the members. I believe it is a good time like to get your opinion and feedback about these past efforts and future endeavors for WASI. I don't yet have a date set to for sending out the survey but you should be receiving an email about it in the near future.

For those of you interested, our Outreach Coordinator, Wayne "Skip" Bird is always looking for an extra hand to help out and even lead the many outreach events that are forthcoming. Outreach is one of those services we provide to the public that is truly symbiotic. We show the public some cool astronomical stuff and we get the chance to have a new member. I personally find outreach to be a lot of fun...so if you've never participated, give it try!

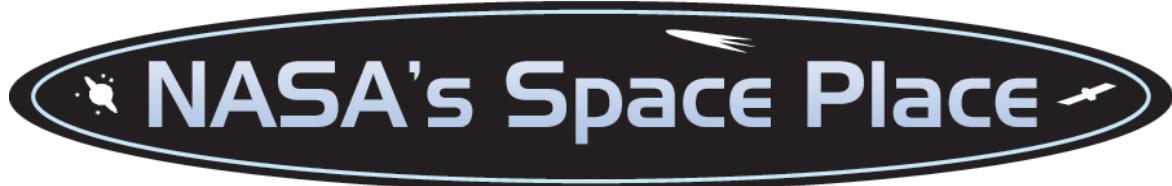
In 2014, my monthly messages have concluded with a "Tony's Astronomy Target of the Month". For 2015 I will continue this format but with a slight change. Instead of choosing a target like constellation, asterism, star clusters or stars on a specific month's meridian, I will be keeping things closer to home. With that said, for February, my Observation of the Month is the Moon and Planets. On February 6, Jupiter is at Opposition with it fully illuminated. A good telescope will show Jupiter's cloud bands. A decent pair of binoculars will reveal Jupiter's Galilean moons. On February 22, Venus and Mars will be in conjunction, appearing very close together. They will be within only half a degree of each. Look at the western sky right after sunset.

On February 27th, the Moon will be at 1st quarter. At 8 days old, the terminator splits our satellite nicely so take a stroll along it terminator. Starting at the top, we see Mare Frigoris (Sea of Cold). From there working your way down, you'll run into the Plato Crater. Plato is a bright crater with a bright rim which cast a nice shadow on its smooth dark floor. Leaving Plato, we move further down the terminator, through Mare Imbrium (Sea of Rain), past the Archimedes crater which has the largest walled plain in the Sea of Rain. At the bottom of this sea lies Montes Apenninus (Apennine Mountains). Just at the base of these mountains is the Hadley Rille (trench or groove). It is a noteworthy spot because this is where Apollo 15 touched down. The actual landing site is on a dark plain between the mountain range and the rille. Moving down the terminator, we see Sinus Aestuum (Bay of Billows). This Bay is a large lava plain just east of Copernicus. Running further down from there brings us to the east side of Mare Nubium (Sea of Clouds), which shows a string of craters, one of which is quite small but distinguishable by very pronounced central peak. This crater's name is Alpetragius. The last stop on our stroll is in the southeastern part of Mare Nubium. It is called Rupes Recta (Straight Fault). It is more commonly known as the Straight Wall. It is 1-2 miles wide and about 70 miles long. When the Sun rises over the Wall when the terminator has moved to west in the central part of Mare Nubium, a shadow is cast along its entire length. It's one of those sights I always enjoy.

Thanks for reading and I hope to see you all at our next meeting.

Clear Skies,

Tony Falletta



Minor mergers have massive consequences for black holes

By Dr. Ethan Siegel

When you think of our sun, the nearest star to our world, you think of an isolated entity, with more than four light years separating it from its next nearest neighbor. But it wasn't always so: billions of years ago, when our sun was first created, it very likely formed in concert with thousands of other stars, when a giant molecular cloud containing perhaps a million times the mass of our solar system collapsed. While the vast majority of stars that the universe forms—some ninety-five percent—are the mass of our sun or smaller, a rare but significant fraction are ultra-massive, containing tens or even hundreds of times the mass our star contains. When these stars run out of fuel in their cores, they explode in a fantastic Type II supernova, where the star's core collapses. In the most massive cases, this forms a black hole.

Over time, many generations of stars—and hence, many black holes—form, with the majority eventually migrating towards the centers of their host galaxies and merging together. Our own galaxy, the Milky Way, houses a supermassive black hole that weighs in at about four million solar masses, while our big sister, Andromeda, has one nearly twenty times as massive. But even relatively isolated galaxies didn't simply form from the monolithic collapse of an isolated clump of matter, but by hierarchical mergers of smaller galaxies over tremendous timescales. If galaxies with large amounts of stars all have black holes at their centers, then we should be able to see some fraction of Milky Way-sized galaxies with not just one, but *multiple* supermassive black holes at their center!

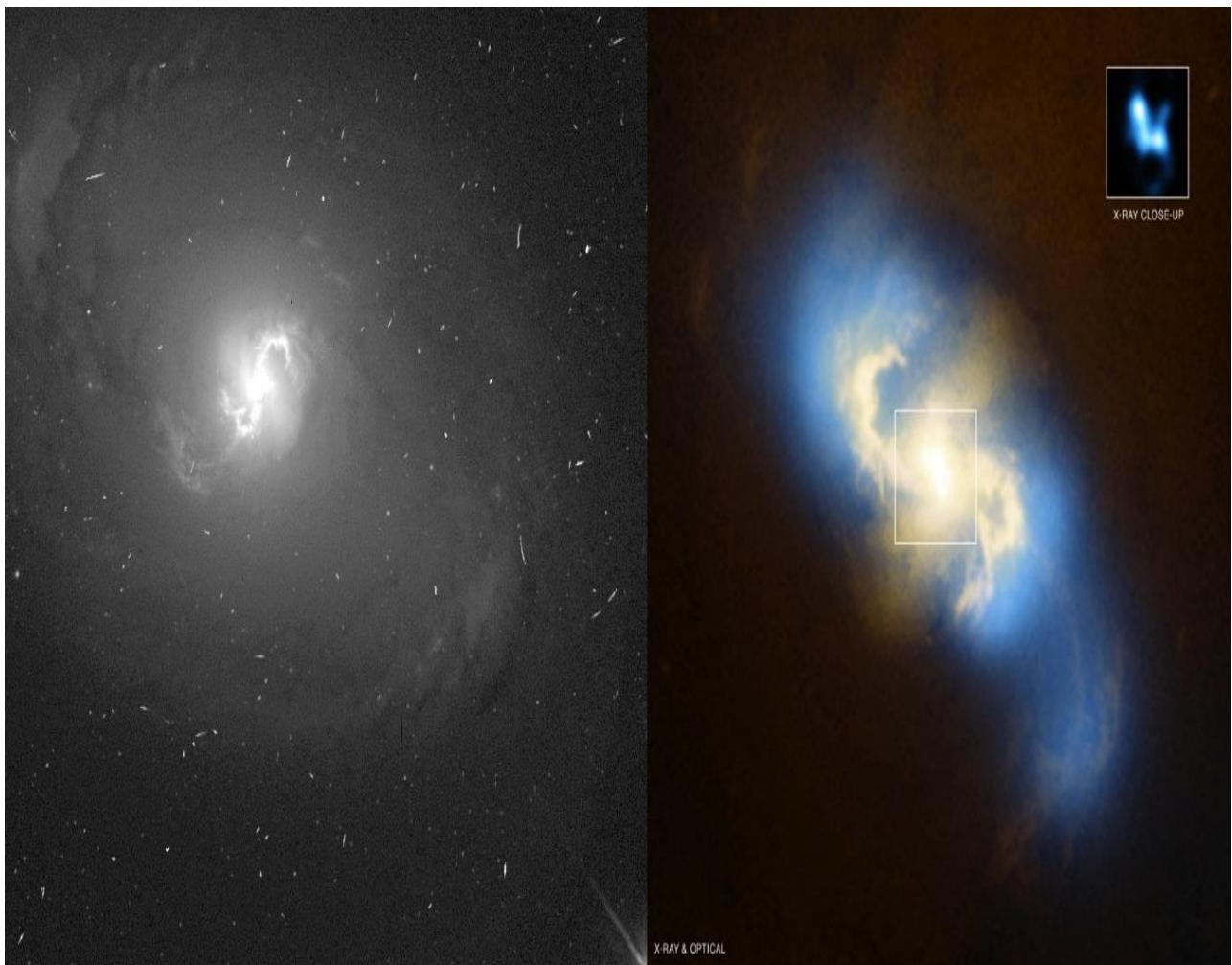
It was only in the early 2000s that NASA's Chandra X-ray Observatory was able to find the first binary supermassive black hole in a galaxy, and that was in an ultra-luminous galaxy with a double core. Many other examples were discovered since, but for a decade they were all in ultra-massive, active galaxies. That all changed in 2011, with the discovery of two active, massive black holes at the center of the regular spiral galaxy NGC 3393, a galaxy that must have undergone only minor mergers no less than a billion years ago, where the black hole pair is separated by only 490 light years! It's only in the cores of active, X-ray emitting galaxies that we can detect binary black holes like this. Examples like NGC 3393 and IC 4970 are not only confirming our picture of galaxy growth and formation, but are teaching us that supermassive relics from ancient, minor mergers might persist as standalone entities for longer than we ever thought!

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Check out some cool images and artist reconstructions of black holes from Chandra:

<http://chandra.harvard.edu/photo/category/blackholes.html>

Kids can learn all about Black Holes from this cool animation at NASA's Space Place: <http://spaceplace.nasa.gov/black-holes>.



Images credit: NGC 3393 in the optical (L) by M. Malkan (UCLA), HST, NASA (L); NGC 3393 in the X-ray and optical (R), composite by NASA / CXC / SAO / G. Fabbiano et al. (X-ray) and NASA/STScI (optical).