Westminster Astronomical Society Inc, of Maryland

Volume 33, Issue 1
January 2016

The Mason-Dixon Astronomer

January Meeting:

- Wed., January 13th – 7:30 pm
  Bear Branch Nature Center
- **Annual Business Meeting**

  Elections and other club business.

Pre-Meeting Dinner

- Wed., January 13th – 6pm.
- Harry's Main Street Grill
  65 W Main Street
  Westminster, MD 21157

INSIDE THIS ISSUE:

St*r Points

The Morning Sky's Parade of Planets

January 2016 – Curt Roelle

Maybe you're one of the thousands of lucky persons so loved by someone special who gave them a brand new telescope for Christmas. Even if you bought the telescope yourself for yourself, this description might still apply. Whether your telescope is brand new or old and trusty, this month offers an opportunity to head outside in the early hours before sunrise and see up to four of the eight official planets – five if you count the earth below your feet.

But first, a little basic telescope advice before getting too carried away or frustrated. Using a telescope requires practice. Not just setting it up and using it to find things in the sky, but also training your eye to be patient and to seek details in the object that you're viewing.

So once you unwrapped your new telescope, what is the first thing you should do? I would recommend reading the manual – or at least becoming familiar with it so you can use it to discover solutions when you have questions. Your manual will acquaint you with the parts of your telescope and mount and their proper names. Without such knowledge and understanding it could be difficult for you to describe your telescope issue to someone else, or to exploit any advice you might get.

Sky and Telescope magazine senior editor Alan McRobert has three important tips for new telescope owners worth repeating here. The first tip is to assemble your telescope and mounting indoors before taking it outside into the cold dark night. Plainly, it's a lot simpler to figure out how things fasten together and where the knobs are in a place that's well lit, warm and comfortable. Not only can you better see what you're doing, but you can take your time as you become familiar with the hardware.

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President's Message

January 2016 – Tony Falletta

The New Year is upon us and with it a new chapter for our club. 2015 saw the opening of our long awaited observatory. 2016 will be the year we put the finishing touches on the facility. There are a few outstanding tasks we need to complete including obtaining a solar telescope and completing our connectivity into the Nature Center. A solar telescope will enable all of you who don't have access to a Hydrogen-Alpha telescope to observe the Sun in a whole new light (no pun intended). Connecting the telescope electronically to the Nature Center will enable all of us and our visitors to see what the C-14 is looking at from the comfort of our meeting room and hopefully the Planetarium as well. When these two items (especially the connectivity) are complete, we can look proudly on our club. In the years since I have joined the club, I have to say this has been a very joyful and fruitful year. I eagerly look forward to 2016 as I eye the heavens from the eyepiece of a C-14 telescope.

I wish you all a Happy New Year and want to remind you of January's annual business meeting and election of officers. I encourage everyone to attend and give some serious thought to holding an officer position. Wasi is a great club but that's only because we have great members. We all have a common purpose in being a Wasi member and being an officer allows you step up and help your fellow members get the most out of our organization. If you have at all considered running for a position, I can promise you that you it is a very rewarding experience.

I hope to see you all at the meeting.

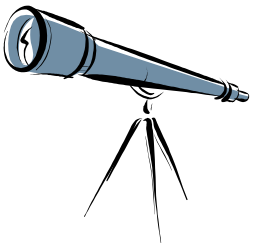
January Meeting – Annual Business Meeting

Annual Business Meeting

This is the one meeting, each year, that is devoted to club business. Now…I know what you are thinking…"Why should I put on my coat and boots…clear off the car…drive all the way to Bear Branch….and listen to business talk?" Well, my astronomical friends…here is why. This is your chance to help shape the club and the direction we will be taking over the next 12 months. During this meeting we will conduct our officer elections. If you are a member in good standing, you may run for any of the offices. We will also discuss several issues related to the observatory projects, outreach, and club programs.

Last year had time to do a quick tour of the planetarium and this would be a good time to tour the new observatory and get any questions answered.

Upcoming Events From Our Calendars



- **Soldiers Delight Public Stargazing** January 9th, 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills
- **Monthly Meeting** January 13th, 7:30 p.m., at Bear Branch Nature Center (BBNC)
- **Planetarium Show** January 30st, 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 the 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.

Junior Membership (under 18) is just $5 per year

http://www.westminsterastro.org

St*r Points for January…

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McRobert's second tip is making sure the first working trip your telescope takes outside should be during the day. Use your telescope to locate distant objects such as trees, power poles and water towers. Learn how to locate distant objects and adjust the focus using different eyepieces and to align the "finder 'scope," if any. What's a finder 'scope, you ask? The "finder" is that small telescope which some telescopes come equipped and that are mounted onto the side of their tube.

The finder is used for locating objects in the sky. With its lower magnification and wider field of view than the main telescope, a finder covers more sky and usually comes with a cross-hair. Use the finder to locate objects by centering them in the cross hair. If the finder and main telescope are aligned properly, the object of interest should also be visible in the main telescope when using a low magnification eyepiece. But if misaligned you may only see black deep space after switching your eye from the object centered in the finder over to the main telescope.

So Mr. McRobert also recommends that you perform the finder alignment process outside during day and on a distant object. Once aligned be careful not to bump the finder out of alignment.

By the way, if you do need to realign the finder at night, relax. Just use a distant light on a radio tower, yard light, or far away porch light on which to align the finder and main telescope. Also, always use your telescope's lowest magnification eyepiece when performing the finder alignment. Once satisfied, tighten down the finder's set screws securely and repeat the process as necessary.

McRobert's first two tips dealt with the hardware. The third tip concerns training the observing eye to comprehend what it's seeing. He recommends spending time with each object and do not rush. To that I would advise having realistic expectations. Don't expect to see a Hubble Space Telescope quality image with any telescope. Those published images have always been highly processed photographs and do not represent a object's visual impression to the human eye through a telescope. Think about what you're looking at. Can you see details in the planets? Can you detect any color? How many stars can you count in that cluster you're viewing?

The moon is simply the best target for any small telescope. It's easy to view in both the sky and through the finder. I would not recommend waiting for full moon. Look at the moon when it is a crescent or gibbous and concentrate on the line separating the illuminated and dark areas – the "terminator" line. This is where the sun angle makes the lunar mountains and craters more visible and whose appearance can be rather striking in any telescope.

Finally, there are several planets visible in the morning sky in January. Jupiter leads the planetary parade and stands high in the southern sky more than halfway up at 5 a.m. on the first weekend of the month. By the end of January, Jupiter remains visible but you'll need to get up earlier because of its apparent westward motion. At month's end it remains well place and high in the south at 3 a.m.

Jupiter's primary attractions are its cloudy pale zones and darker bands as well as its four brightest Galilean moons named, Callisto, Europa, Ganymede and Io.

By 6 a.m. early in the month three more planets are visible in the morning sky. Low on the southeastern horizon is the brightest "star" in the sky, except that it's actually the brilliant planet Venus. In a telescope Venus will show a gibbous phase. Like the moon, Venus exhibits phases to earthly viewers.

Now you can use Jupiter and Venus to find two other planets. About halfway between the two in early January are what appears to be a couple of equally bright stars. The star on the right is Spica in the constellation Virgo. The one on the left is actually the planet Mars. In a telescope Mars is rather small at this time. "Oppositions" of Mars occur approximately every two years, and favorable ones are less common. During January, the distance between Mars and Spica grows.

By the way, Sunday, January 3, 2016 marks the start of the summer solstice in Mars' northern hemisphere. In the coming months Mars' apparent size triples by its next opposition in May.

Also around 6 a.m. in early January, Saturn lies along an imaginary line connecting Jupiter and Venus, approximately halfway between Venus and the Horizon. Although fainter than Venus, Saturn's rings are a delight to any telescope owner. However, because it is so low, the image may be fuzzy because it is being viewed through the thickest part of earth's atmosphere. As the year progresses, Saturn will become better placed in the sky, with the best views coming on the warm nights of June.

Saturn and Venus get closer together, passing one another on January 9. At their closest the two worlds are less than one degree apart and should be visible in the same ultra-low power telescope eyepiece field.

The Blaine F. Roelke Memorial Observatory at Bear Branch is fully operational. The observatory is operated by the Westminster Astronomical Society. An events calendar is available at WestminsterAstro.org.

Happy New Year…

An Open Letter of Thanks from the WASI Board of Directors Chairman

Reprinted from the WASI_ASTRO Yahoo Group Mailing List – Sent 12/31/2015

All Members,

The year 2015 has been great thanks to all of our members and volunteers that do so much work for our organization. From Jim Reynolds running the planetarium at BBNC to Skip Bird doing the shows at Soldiers Delight, from Steve Conard directing things at B.F. Roelke Memorial Observatory at BBNC and its 14" telescope to Bob Clark and the observatory at Charlottes Quest in Manchester and its 15" telescope, and all the volunteers that help with these and other events, fairs, open houses, and star parties, or by donating materials or cash when needed to come up with some service, instrument or other hardware is needed. Our existence and reputation would not be what it is without you.

This year I especially would like to than Frank Roelke, son of our late charter member Blaine F. Roelke, and Nancy, Blaine's wife. Frank has done such a marvelous and almost miraculous job of channeling his Father's love of the starry sky, as well as his appreciation of his fellow club members and the people of Carroll County where he formally owned an observatory on a farm near Keymar. Frank refurbished Father's observatory and its steel dome where it now sits at BBNC. On behalf of us all I want to thank Frank for everything he's done.

Frank also donated Blaine's C-14 telescope to the club. Thanks to our volunteers and donations from members (including Frank again!) and others the telescope has also been refurbished with a new modern computer-controlled Equatorial mounting and a motorized pier. The telescope and observatory are a beautiful combination.

Also this year the observatory at Manchester's Charlotte's Quest Nature Center was opened. Bob Clark has been spearheading that effort almost singlehandedly. In the past couple of years, Bob has also constructed Analemmas at the Manchester location as well as at Hoffman's Ice Cream store in Westminster.

Thanks also to our 2015 officers -- Tony Falletta (president), Christian Ready (VP1), Jim Reynolds (VP2), Vanessa Thomas (treasurer), and Steve Conard (secretary) -- and my two fellow board members Brian Eney and Dave Gede. I also want to thank Dave for editing our Mason-Dixon Astronomer newsletter for the past several years. Looks like Dave will be turning that job over to Christian starting with the March issue.

There are others I would like to thank (and I think you know who you are) but this is getting long winded. Just let me say Happy New Year to everyone.

Curtis Roelle
Chairman

NASA's Space Place

How will we finally image the event horizon of a black hole?

By Ethan Siegel

One hundred years ago, Albert Einstein first put forth his theory of General Relativity, which laid out the relationship between spacetime and the matter and energy present within it. While it successfully recovered Newtonian gravity and predicted the additional precession of Mercury's orbit, the only exact solution that Einstein himself discovered was the trivial one: that for completely empty space. Less than two months after releasing his theory, however, the German scientist Karl Schwarzschild provided a true exact solution, that of a massive, infinitely dense object, *a black hole*.

One of the curious things that popped out of Schwarzschild's solution was the existence of an event horizon, or a region of space that was so severely curved that nothing, not even light, could escape from it. The size of this event horizon would be directly proportional to the mass of the black hole. A black hole the mass of Earth would have an event horizon less than a centimeter in radius; a black hole the mass of the sun would have an event horizon just a few kilometers in radius; and a supermassive black hole would have an event horizon the size of a planetary orbit.

Our galaxy has since been discovered to house a black hole about four million solar masses in size, with an event horizon about 23.6 million kilometers across, or about 40 percent the size of Mercury's orbit around the sun. At a distance of 26,000 light years, it's the largest event horizon in angular size visible from Earth, but at just 19 micro-arc-seconds, it would take a telescope the size of Earth to resolve it – a practical impossibility.

But all hope isn't lost! If instead of a single telescope, we built an *array* of telescopes located all over Earth, we could simultaneously image the galactic center, and use the technique of VLBI (very long-baseline interferometry) to resolve the black hole's event horizon. The array would only have the light-gathering power of the individual telescopes, meaning the black hole (in the radio) will appear very faint, but they can obtain the resolution of a telescope that's the distance between the farthest telescopes in the array! The planned Event Horizon Telescope, spanning four different continents (including Antarctica), should be able to resolve under 10 micro-arc-seconds, imaging a black hole directly for the first time and answering the question of whether or not they truly contain an event horizon. What began as a mere mathematical solution is now just a few years away from being observed and known for certain!

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Note: This month's article describes a project that is not related to NASA and does not suggest any relationship or endorsement. Its coverage is for general interest and educational purposes.

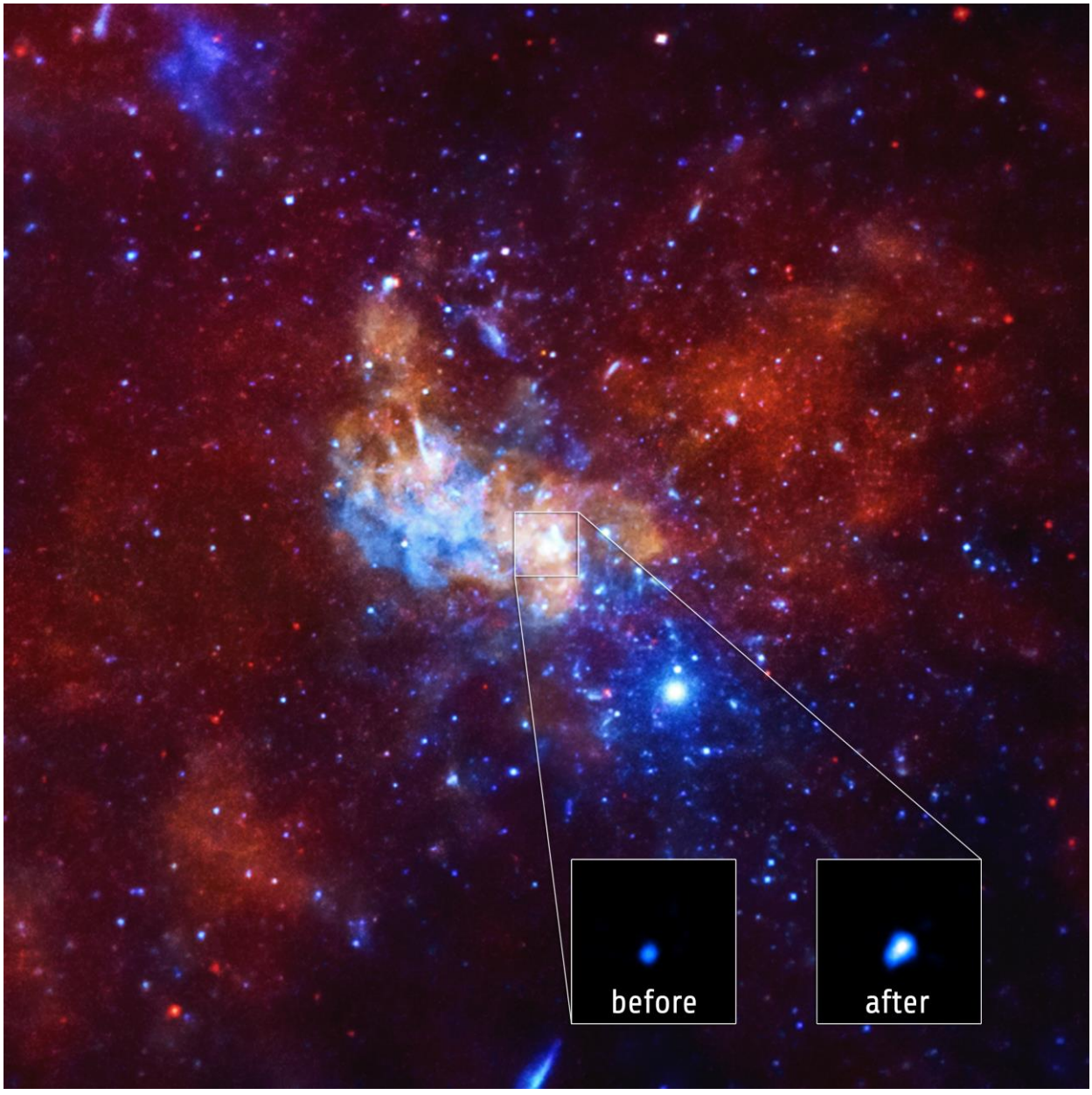

Image credit: NASA/CXC/Amherst College/D.Haggard et al., of the galactic center in X-rays. Sagittarius A is the supermassive black hole at our Milky Way's center, which normally emits X-ray light of a particular brightness. However, 2013 saw a flare increase its luminosity by a factor of many hundreds, as the black hole devoured matter. The event horizon has yet to be revealed*