

# The Mason-Dixon Astronomer



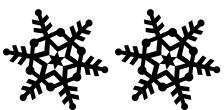
## Dec. Meeting:

- Wed., Dec. 11<sup>th</sup> – 7pm  
Bear Branch Nature Center
- **Holiday Pot Luck**  
Join us for our annual pot luck meal with good friends and good conversation!

## POT LUCK DINNER

REMINDER....

The Holiday Dinner  
Begins at 7pm!



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## St\*r Points

### Will Comet ISON Perform?

December 2013 – Curt Roelle

After waiting for about a year, Comet ISON (C/2012 S1) has finally reached the inner solar system. As I am writing this, two days before Thanksgiving Day, the comet is hidden in the glare of the sun. Over the next few days it should climb back into the morning sky. Will it be visible, how bright will it be, and by what is the best means for locating it?

I, and a couple other friends, tried independently to observe ISON last weekend and this past Monday. We each scanned the horizon during morning twilight for the fuzzy interloper without any luck. The comet was washed out by the bright morning twilight.

On Thanksgiving Day, the comet will graze the sun, rounding it in a near miss by a distance smaller than the solar diameter. I plan to attempt viewing it in broad daylight using a dense dark #14 welding glass held at arm's length to block out the sun's intense glare while looking for ISON in its vicinity with the unaided eye for any indication that ISON will be visible during daytime. I may not succeed, but this is an opportunity I don't want to miss. Of course, great care must be taken because of the comet's angular proximity to the dangerously bright sun.

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## President's Message

December 2013 - Vanessa Thomas

Dear WASIans,

Happy holidays! As in past years, the December WASI meeting this year will be our holiday pot-luck dinner. On behalf of the other officers and the board members, I'd like to invite all WASI members and family members to join us on December 11<sup>th</sup> at Bear Branch for a feast with friends. All we ask is that, if you can, please bring a dish to share with your fellow WASI members. There will be no formal program, just good food and good conversation. We'll also start a little earlier for this "meeting." We'll begin digging in at 7 p.m. (but of course you're still welcome if you can't get there until a little later). I hope you can be there!

And while you're trying to think of great holiday gifts for your friends and loved ones, don't forget that WASI has an online store! You can find WASI t-shirts, sweatshirts, hats, mugs, bags, and more at our CafePress store. The URL is [http://www.cafepress.com/wasi\\_store](http://www.cafepress.com/wasi_store).

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## December Meeting – Holiday Pot Luck Dinner

**>>> Starting at 7pm <<<<**



Once a year we skip the business and the speakers and just enjoy each other's company. The fact that we get to feast on great food and drink is a bonus! Bring a dish to share and join us at Bear Branch. Friends and family are welcome!

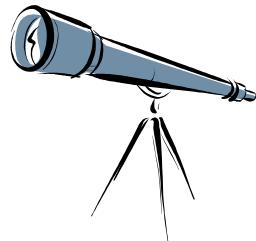
Limited outlets will be available. Please mark your containers and serving utensils with your name in case we need to return them to you.

The fun begins at 7pm, but come when you can. Just know that the food tends to go quickly!

Just to make sure you did not miss it...we begin at 7pm...did I mention that we start at seven?

Hope to see everyone there!

## Upcoming Events From Our Calendars



- ❖ **Comet ISON Programs** December 4<sup>th</sup> and 5<sup>th</sup>, at the Westminster Branch of the Carroll County Public Library – See Article on Page 5 for more information.
- ❖ **Starlight Shopping** December 6<sup>th</sup>, 5 – 10pm., Locust Lane or the Westminster Branch of the Carroll County Public Library – See Star Points Article for more info.
- ❖ **Soldiers Delight Public Stargazing** December 9<sup>th</sup>, 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills
- ❖ **Monthly Meeting** December 11<sup>th</sup>, 7 p.m., at Bear Branch Nature Center (BBNC)
- ❖ **Planetarium Show** December 16<sup>th</sup>, 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.

**Membership is still only \$25 per year.**

<http://www.westminsterastro.org>

## St\*r Points for December...

Continued from Page 1

During early December, the comet will return to the morning sky climbing higher each day. If the tail is still visible it will be sticking above the horizon away from the sun as the comet appears to be moving backwards tail-ward first. This is because the pressure of the solar wind always pushes the particles making up the tail away from the sun.

In morning twilight the comet may be hard to detect and a good chart will save a lot of aggravation. The best place to find an easy-to-use chart is at [SkyandTelescope.com](http://SkyandTelescope.com).

If bright, the comet might be visible in the morning sky as early as November 30 or December 1. Start looking at around 6:30 a.m. by scanning the horizon with binoculars. The comet will be very low so a clear unobstructed horizon and crystal clear sky is a must.

Even if the comet is bright it may be difficult to pick up with the unaided eye. So use binoculars to spot it. Best to use low power wide field binoculars – 7x35, 7x50, 10x50, or even 10x70 for example. The higher the power the smaller the area of the sky you can see with them. You don't want to use binoculars that pinch the field as though you're looking through a pair of straws. You will want binoculars that give you a good crisp focus without blurriness.

Once you have ISON in the binocular, then try and see if you can see it with the unaided eye.

If you have a tripod and a camera capable of taking long exposures, give that a try. Use a number of different shutter speeds – 1, 2, 4, 8, 16 seconds. Vary the aperture and film speed settings and experiment. When you review your images you may be surprised to find a gem among them showing the comet at its best.

If Comet ISON is like Comet 2011 L4 (PANSTARRS) last spring, it will be very photogenic. The photos will look better than the naked eye view of the comet.

Every four days or so ISON will be another 10 degrees higher in the morning sky at the same time. This means that after a week or two it can be viewed earlier in the morning in a darkened sky. However, as ISON moves away from the sun it will also probably rapidly fade.

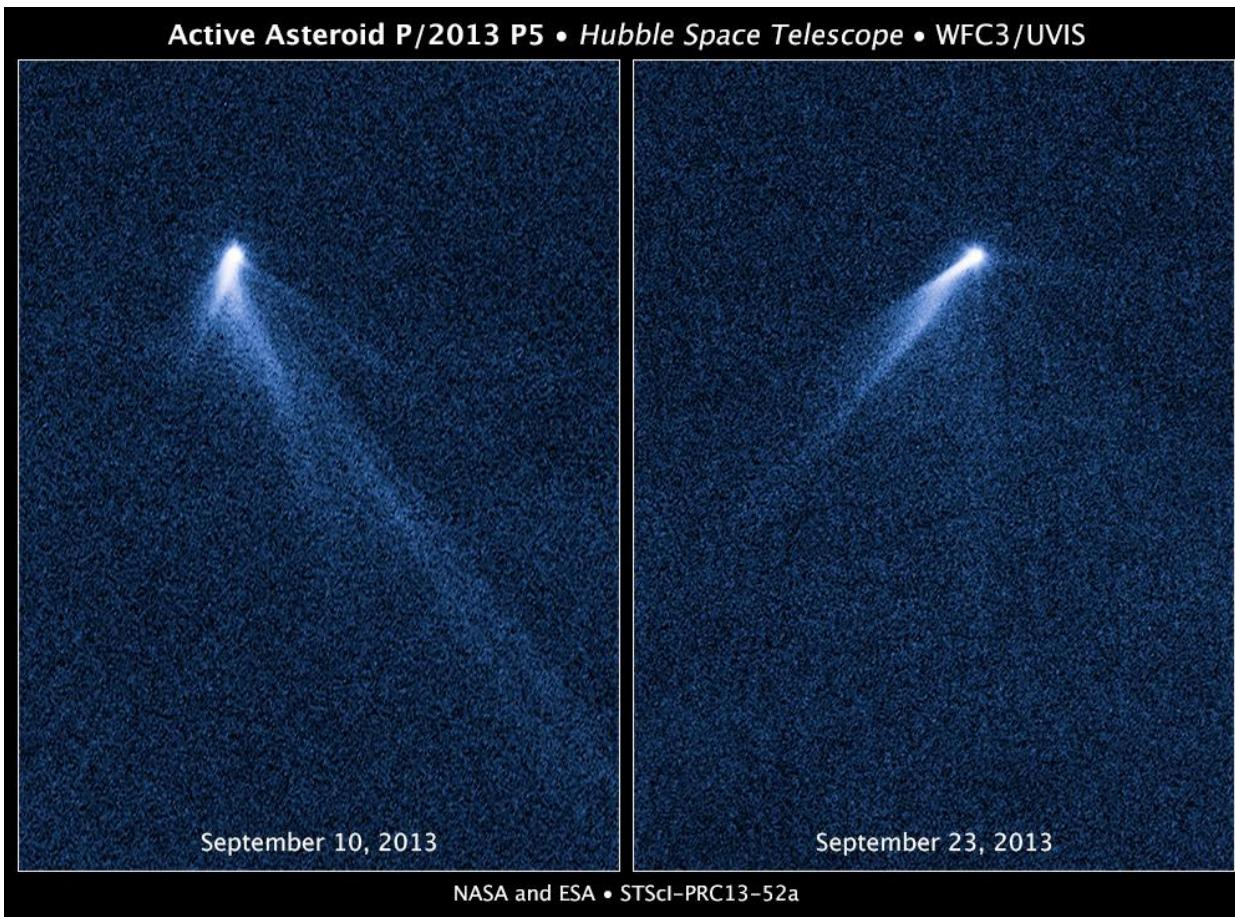
If observing the evening sky is more appealing to you, then come to downtown Westminster on Friday night, December 6. Take a swing by Locust Lane or the Carroll County Library between 5:00 and 10:00 p.m. and you may see members from the Westminster Astronomical Society and their telescopes looking up at the moon or perhaps a Wintery star cluster. The event is "Starlight Shopping" and is being hosted by the City of Westminster Recreation and Parks Department.



## President's Message

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In this season of wonder, I thought I'd share with you a couple recent Hubble images that have made some scientists do a bit of wondering of their own. This object is an asteroid, in the main asteroid belt between Mars and Jupiter. But as if to capitalize on all the recent press about comets, this asteroid seems to be impersonating those icy objects from the outer solar system. And it's going just a little overboard. Planetary scientists identify not one or two but six tails on this object, dubbed P/2013 P5. When it was discovered by the Pan-STARRS survey telescope in Hawaii earlier this year, scientists noticed that it looked fuzzy. So they petitioned for a bit of Hubble's time to get a better look at it, and this is what they found. The two images suggest that the object is rotating and the tails are changing direction (the Sun is to the upper right for both images). One conjecture is that the asteroid has recently been spun up fast enough to fling dust off the space rock's surface, which then gets pushed away by the pressure of sunlight into those fingerlike tails. Pretty weird stuff!



As 2013 comes to a close, I wish everyone a wonderful holiday season, and I hope to see many of you at our holiday dinner on the 11<sup>th</sup>.

Vanessa

## Comet ISON Programs...

### WILL COMET ISON DAZZLE OUR SKIES?

Wednesday 12/4/13 6:30 PM



Join Skip Bird from the Westminster Astronomical Society to find out if Comet ISON will be the comet of the century...or just smoke blowing in the wind. What exactly is a comet? You will get the answer to that question, and others, as we explore the world of comets with some unique and entertaining activities. Tonight's program will give you the foundation for understanding what you'll see the following morning at 5 AM at the Astronomy Waits for No Man program at the Westminster library.

### ASTRONOMY WAITS FOR NO MAN!

Thursday 12/5/13 5 AM



Westminster Branch Library is hosting a cosmic fest at 5 AM. Yes, that's 5 AM! If weather permits, this will be a once-in-a-lifetime opportunity to view Comet Ison. Will you be one of the lucky ones? Or will you sleep through what could possibly be the comet of the century? Coffee and doughnuts will be available.

All programs require registration and will take place at the:

Westminster Branch Library:



50 East Main Street  
Westminster, MD 21157



The solar system is a pretty busy place. It's got all kinds of planets, moons, asteroids, and comets zipping around our Sun.

But how did this busy stellar neighborhood come to be?

## Space Place in a Snap!

NASA's Space Place is pleased to announce a new way to learn about science—[Space Place in a Snap!](#) These brief, narrated stories are engaging and entertaining, and they come with a downloadable poster, too. In our first episode, we tackle the question of how our solar system came to be the place it is today. Check it out: <http://spaceplace.nasa.gov/solar-system-formation>.

You can also find great interviews from our Space Place Live! series as well as Space Place in a Snap! at the [NASA's Space Place You Tube channel](#) at: <http://www.youtube.com/user/nasaspacesplace?feature=watch>.

## 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](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 this holiday season!





## The most volcanically active place is out-of-this-world!

By Dr. Ethan Siegel

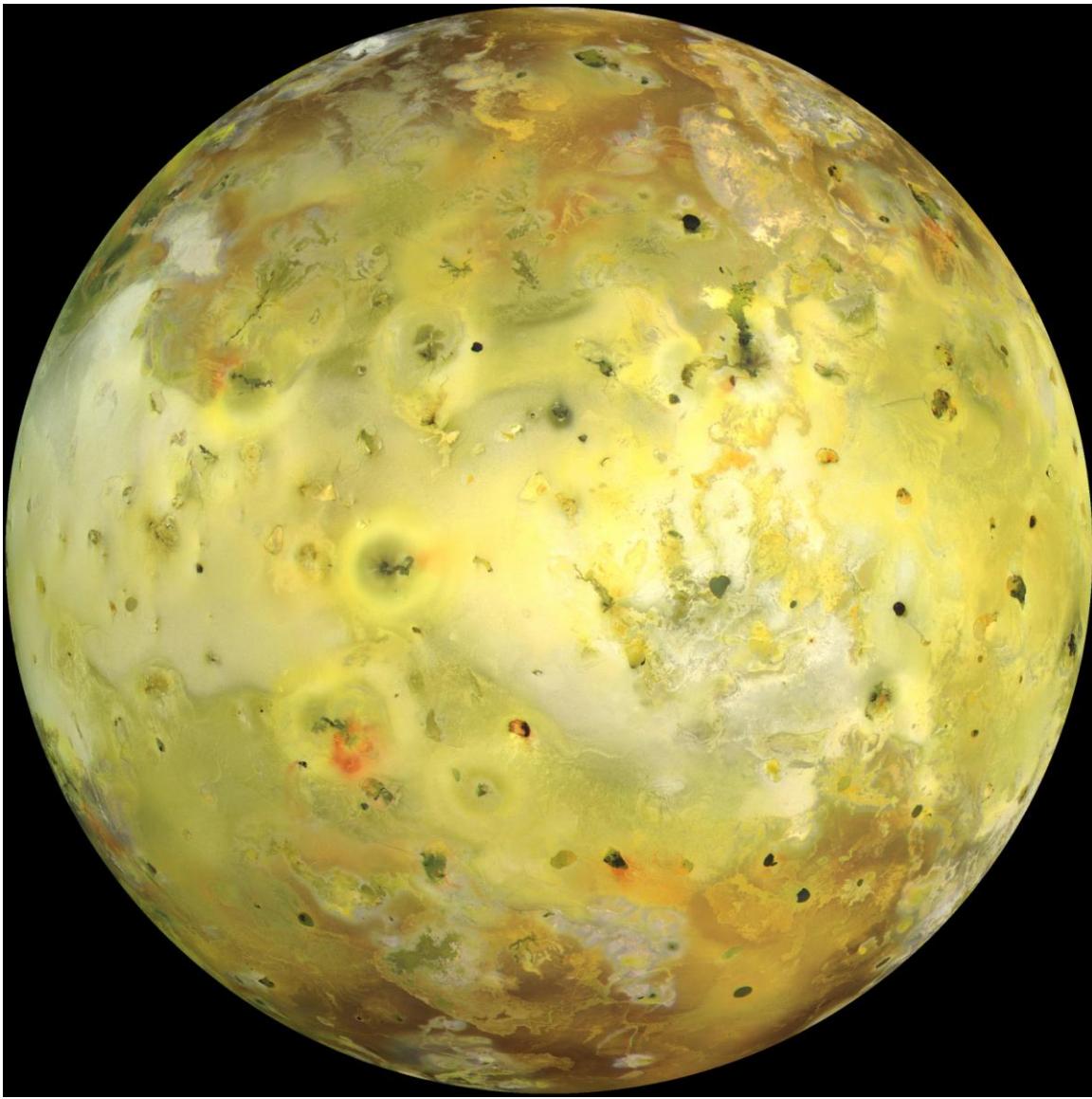
Volcanoes are some of the most powerful and destructive natural phenomena, yet they're a vital part of shaping the planetary landscape of worlds small and large. Here on Earth, the largest of the rocky bodies in our Solar System, there's a tremendous source of heat coming from our planet's interior, from a mix of gravitational contraction and heavy, radioactive elements decaying. Our planet consistently outputs a tremendous amount of energy from this process, nearly three times the global power production from all sources of fuel. Because the surface-area-to-mass ratio of our planet (like all large rocky worlds) is small, that energy has a hard time escaping, building-up and releasing sporadically in catastrophic events: volcanoes and earthquakes!

Yet volcanoes occur on worlds that you might never expect, like the tiny moon Io, orbiting Jupiter. With just 1.5% the mass of Earth despite being more than one quarter of the Earth's diameter, Io seems like an unlikely candidate for volcanoes, as 4.5 billion years is more than enough time for it to have cooled and become stable. Yet Io is anything but stable, as an abundance of volcanic eruptions were predicted before we ever got a chance to view it up close. When the Voyager 1 spacecraft visited, it found no impact craters on Io, but instead hundreds of volcanic calderas, including actual eruptions with plumes 300 kilometers high! Subsequently, Voyager 2, Galileo, and a myriad of telescope observations found that these eruptions change rapidly on Io's surface.

Where does the energy for all this come from? From the combined tidal forces exerted by Jupiter and the outer Jovian moons. On Earth, the gravity from the Sun and Moon causes the ocean tides to raise-and-lower by one-to-two meters, on average, far too small to cause any heating. Io has no oceans, yet the tidal forces acting on it cause the world itself to stretch and bend by an astonishing **100 meters** at a time! This causes not only cracking and fissures, but also heats up the interior of the planet, the same way that rapidly bending a piece of metal back-and-forth causes it to heat up internally. When a path to the surface opens up, that internal heat escapes through quiescent lava flows and catastrophic volcanic eruptions! The hottest spots on Io's surface reach 1,200 °C (2,000 °F); compared to the average surface temperature of 110 Kelvin (-163 °C / -261 °F), Io is home to the most extreme temperature differences from location-to-location outside of the Sun.

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Just by orbiting where it does, Io gets distorted, heats up, and erupts, making it the most volcanically active world in the entire Solar System! Other moons around gas giants have spectacular eruptions, too (like Enceladus around Saturn), but no world has its surface shaped by volcanic activity quite like Jupiter's innermost moon, Io!



*Io. Image credit: NASA / JPL-Caltech, via the Galileo spacecraft.*

*Download photo here: <http://photojournal.jpl.nasa.gov/catalog/PIA02308>*

*Learn more about Galileo's mission to Jupiter: <http://solarsystem.nasa.gov/galileo/>.*

*Kids can explore the many volcanoes of our solar system using the Space Place's Space Volcano Explorer: <http://spaceplace.nasa.gov/volcanoes>.*