

The Mason-Dixon Astronomer



St*r Points

Hubble's Silver Anniversary

July 2015 – Curt Roelle

July Meeting:

- Wed., July 8th – 7:30 pm
Bear Branch Nature Center
- **25 Years with Hubble**

Hear how WASI member, Ray Sterner, was involved in the history of this great telescope.

Pre-Meeting Dinner

- Wed., July 8th – 6pm.
- Harry's Main Street Grill
65 W Main Street
Westminster, MD 21157

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The year 2015 is being celebrated as being the 25th anniversary of the deployment of the Hubble Space Telescope (HST) into earth orbit by the space shuttle Discovery.

The history of HST goes back more over four decades prior to its 1990 launch. In the 1940's, astronomer Lyman Spitzer submitted a paper to the Rand Corporation proposing an earth orbiting telescope. Such a telescope would be high above and not impacted by the degrading and filtering effects of the atmosphere. Therefore, it could observe objects and in wavelengths not visible from the surface of the earth.

The idea didn't take off at first. But during the late 1960s and 1970s NASA was developing plans for a Large Space Telescope (LST) with a 3-meter (9.8 foot) diameter mirror. Once the decision was made to launch the telescope aboard the shuttle, the mirror was reduced to eight feet in order for the telescope to fit inside of the space shuttle cargo bay.

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President's Message

July 2015 – Tony Falletta

Hello My Fellow Astronomers!

July is here! As we bask in the wonderful summertime temperatures, one can't help sit outside and enjoy the constellations of the season. On my nights home with good viewing (there never seems to be enough of those), I've always got one of my telescopes and a pair of binoculars ready for a tour of night sky. Lately I've putting my reflector out in front of my house and doing impromptu star parties for my neighbors. This past month I've been getting a real kick out of people's reactions Jupiter, Saturn and even the Moon for the first time through an eyepiece. The next time you're out for a night of stargazing, I encourage you to reach out to passersby and share your passion of the stars.

In observatory news we have officially completed the work to have an official opening of the Blaine F. Roelke Memorial Observatory. The final step in the project was to complete the handicap access to the dome. The final inspection was completed on June 15th for us to get the U&O permit. Our next step is to schedule our official ribbon cutting and dedication. The date is not yet finalized as we need to coordinate with the Carroll County Department of Recreation and Parks and with Bear Branch Nature Center. As soon as a date is decided, we will let you all know. A most likely time frame is end of July or sometime in August. This is truly an exciting time to be a member of WASI.

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July Meeting – Topic

25 Years with Hubble – WASI's involvement in its legacy

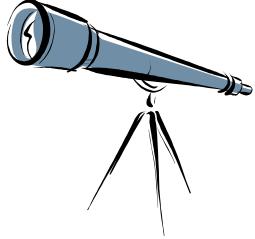


With the year 2015 marking the 25th anniversary of the launch of the Hubble Space Telescope (HST) now is a good time to reflect on WASI's involvement in its legacy. But the WASI connection goes back even farther. At the 1986 annual convention of the Astronomical League (A.L.) in Baltimore, the director of the Space Telescope Institute (STScI) announced a revolutionary new program to make telescope time available for amateur astronomers. The Amateur Astronomers Working Group (AAWG) was formed to encourage amateur astronomers to submit observing proposals for review. WASI member Mike Potter served as the liaison between the director and the AAWG.

Out of the hundreds of proposals submitted, only five were accepted for observation. One of those five was WASI member Ray Sterner's. Ray conducted his observation in person at STScI in 1992. His observation required images up to 40 minutes each during four orbits of HST.

At the July meeting a video will be shown that captured these historic events. The video also includes a PBS interview with Ray. Ray is attending the meeting and will be available to meet members, provide more insider information about the HST, the hypothesis behind his original proposal, and answer questions.

Upcoming Events From Our Calendars



- ❖ **Monthly Meeting** July 8th, 7:30 p.m., at Bear Branch Nature Center (BBNC)
- ❖ **Soldiers Delight Public Stargazing** July 11th, 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills
- ❖ **Planetarium Show** July 25th, 7:30 p.m., at Bear Branch Nature Center (BBNC)
- ❖ **Members Observing** July TBD, Sunset., at Bear Branch Nature Center (BBNC) - See the article on page 3 for more information.

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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The primary mirror was of a light weight honeycomb design ground to a parabolic shape. Unfortunately, the mirror launched aboard the telescope had a flaw that went unnoticed until on-orbit calibration. The mirror suffered from spherical aberration leading to a fuzzy image. Fortunately, the telescope was designed to be serviceable on orbit to install upgrades and replace failing parts. HST went on to undergo five separate servicing missions by space walking shuttle crews.

The first servicing in 1993 by space shuttle Endeavour added corrective optics to bring the telescope's image into focus so that the telescope was finally able to perform to its original expectations. Subsequent shuttle missions servicing Hubble occurred in 1997 and 1999 (Discovery), 2002 (Columbia), and 2009 (Atlantis).

The HST is directed from the Space Telescope Science Institute (STScI) on The Johns Hopkins University Homewood campus, in Baltimore. If you like impressive landmark images, you should visit the gallery at the Hubble Heritage web site (heritage.stsci.edu).

There is an individual in Carroll County whose claim to fame when it comes to HST is fascinating. Prior to launch, the first STScI director, Riccardo Giacconi, offered HST access to amateur astronomers. The process wouldn't be easy, however. HST is not your average backyard telescope that you drag out and start poking around the sky with.

Amateurs wishing to use the HST was required to submit a proposal just as any professional astronomer is required to. A committee was formed to review the hundreds of amateur astronomy proposals received. In the first round, five amateur astronomers were selected. One of them was Woodbine resident Ray Sterner.

Ray made his observation in 1992, and I was lucky enough to attend his observing session live at the STScI. His target was a faint cluster of galaxies. His observations consisted of long duration exposures of up to 45 minutes each over the course of four orbits of HST— a six hour session!

A video recapping Ray's HST observation will be shown at the July 8 meeting of the Westminster Astronomical Society, at 7:30 p.m. at the Bear Branch Nature Center on John Owings Road north of Westminster. Ray will also be present to answer questions. The meeting is free and the public is invited to attend.

What Was It?

From the WASI Facebook Page June 23, 2015

Original Post

 **David Gede**
June 23 at 12:10am

Ok astro friends. Just watched something very interesting and not really sure what it was.

I was out just watching the northern sky for aurora. Went out at about 11:10 pm. At about 11:25 I saw two satellites on the same path come out of the NNE headed to the SW. They were about 1-2 degrees apart and both disappeared at the same point very near the pointer stars in Ursa Major. Now if those had been it I would not be asking a question here.

About 10 mins later a small cloud appeared in the west. I noticed it as I scanned the sky for aurora. It was moving quickly to the NNE. As I approached the handle of the Big Dipper, suddenly a bright spot appeared in the center. It was big enough and bright enough to be the ISS. It was also traveling at the right speed across the sky. But it was enveloped in the cloud. At some points it looked very much like the fan shaped Orion Nebula. The cloud always seemed to be brighter in front of the direction of travel. At times the cloud would completely obscure the central light. The size of the cloud at its highest point was about 1-1.5 degrees and seemed to be slightly oblong. It faded as it got to about 20 degrees above the Northern horizon.

Any clues what I saw? I suspect it was the ISS or a another very bright satellite...but what was the cloud? Water dump?

Responses

 **Vanessa Thomas** I have no idea. But I just checked the Heavens Above website, and it doesn't show that there was an ISS pass for Westminster at all tonight. (I don't know what town you live in, but if there isn't a pass for Westminster, there wouldn't be one for any nearby towns, either.)

There are a few satellites listed around 11:25 p.m., but only one that should've moved from NNE to SW: the Helios 1A rocket. I don't know why it would've appeared as two separate satellites, though, unless it broke up. (A quick Google search didn't turn up anything to suggest it had.)

The second object makes me think of an Iridium flare, which can brighten dramatically and then fade away. The latest one for tonight would've been around 11:24, though, which would've been about 10 minutes too early for your object. (And they're not usually accompanied by co-moving clouds.)

But anyway, I recommend you check out Heavens-Above.com and look for the time you saw the objects (you can enter a previous date) for your location, and see whether anything matches what you saw.



Heavens-Above

Satellite predictions and other astronomical data customised for your location.

HEAVENS-ABOVE.COM

June 23 at 12:32am · Like · 3

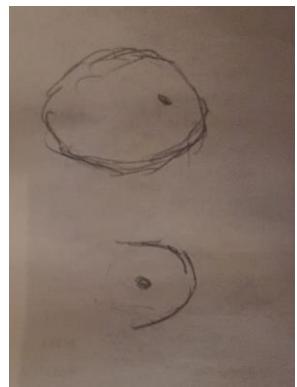
 **Brian Eney** Skip Bird saw the same thing! He called to research it. I cannot find anything official, but it almost sounds like fuel dump of a rocket or high aircraft.

June 23 at 12:47am · Like · 3

 **Wayne Bird** we tried to take a picture but it did not come out. it almost looked like the coma of a comet in its shape. it went behind some trees as it neared the big dipper and never reappeared. no auroras yet?

June 23 at 1:13am · Like · 3

Drawings courtesy Skip Bird



President's Message

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For July, with this warmer weather, I like to point your attention to some of my favorite objects. Jupiter and Venus have been riding the sky together for the month of June. As we move in to July, those planets move to the western sun setting sky and Saturn is taking center stage. July will see magnificent Saturn high in the sky with its rings at an awesome 24 degrees of tilt. The Moon is always a crowd pleaser for me and curious people walking past my scope. The other planet (or should I say, dwarf planet) I need to mention is our wonderful little Pluto. Pluto is at opposition on July 6th. Of course trying to see this 14th magnitude speck of light is quite the challenge. The most important thing to know is that a truly historic event is occurring on July 14th when New Horizons spacecraft is going to give us all a first close up look of our dwarf planet. New Horizons launched from Cape Canaveral back on January 19th, 2009. After 9 ½ years it is on the doorstep to Pluto. It won't, however, be stopping in for coffee. The spacecraft's speed is so fast (about 8 miles per second!) it will be a flyby of the Pluto system. It will be in data gathering mode as it speeds past and after the flyby it will be sending all its information back to Earth. For the 1st time since Pluto was discovered we will know what it looks like. Not even the Hubble Space Telescope has been able to give us any detailed look.... Exciting indeed.

Thanks for reading. See you at our next meeting.

Clear Skies,

Tony Falletta

Member's Observing Night

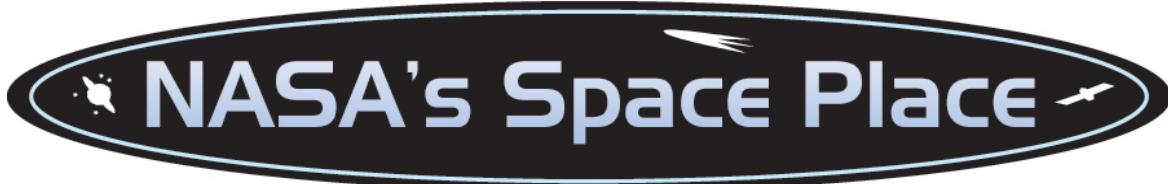
Our last attempt at group observing was clouded out, the date of the next opportunity is unknown due to the observing chairman being "a little busy" with his day job on New Horizons for about the next month. Once a date is chosen, it will be announced on the Yahoo group.

This brings up an area we need a volunteer for-- an alternate host for member's observing nights. The alternate host would substitute for the observing chairman a few times a year, allowing us to have more regularly schedule events of this type. If you are qualified for observatory operation, and interested in this volunteer role, please contact steve.conard@comcast.net

Observatory Operation and Training News

The next basic observatory training class will tentatively be held on July 3rd in the evening. If you are interested in attending, please email Steve at steve.conard@comcast.net. Please check the yahoo group for additional details.

For those interested in being trained to time lunar and asteroid occultations, there will be an opportunity to do this the evening of August 6th. The asteroid Jovita will pass in front of a 11.5 magnitude star in Aquila, effectively blinking the star out for as long as 6 seconds. This occurs at 9:16 PM, with the predicted path centered on Bear Branch Nature Center. Steve will use the observatory to observe this event, and if people are interested, he'll give a mini-class on how to do it. As always, Steve has 2 sets of loaner timing equipment should you want to time it yourself. Contact Steve at the above email address if you are interested in learning more about this.



No Surprise! Earth's Strongest Gravity Lies Atop The Highest Mountains

By Ethan Siegel

Put more mass beneath your feet and feel the downward acceleration due to gravity increase. Newton's law of universal gravitation may have been superseded by Einstein's, but it still describes the gravitational force and acceleration here on Earth to remarkable precision. The acceleration you experience is directly proportional to the amount of mass you "see," but inversely proportional to the distance from you to that mass squared.

The denser the mass beneath your feet, the stronger the gravitational force, and when you are closer to such a mass, the force is even greater. At higher elevations or even higher altitudes, you'd expect your gravitational force to drop as you move farther from Earth's center. You'd probably also expect that downward acceleration to be greater if you stood atop a large mountain than if you flew tens of thousands of feet above a flat ocean, with nothing but ultra-light air and liquid water beneath you for all those miles. In fact this is true, but not just due to the mountain's extra mass!

Earth is built like a layer-cake, with the less dense atmosphere, ocean, and crust floating atop the denser mantle, which in turn floats atop the outer and inner cores of our planet. An iceberg's buoyancy is enough to lift only about one tenth of it above the sea, with the other nine tenths below the surface. Similarly, each and every mountain range has a corresponding "invisible mountain" that dips deep into the mantle. Beneath the ocean floor, Earth's crust might be only three to six miles thick, but it can exceed 40 miles in thickness around major mountain ranges like the Himalayas and the Andes. It's where one of Earth's tectonic plates subducts beneath another that we see the largest gravitational anomalies: another confirmation of the theory of continental drift.

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A combination of instruments aboard NASA's Gravity Recovery and Climate Experiment (GRACE) satellites, including the SuperSTAR accelerometer, the K-band ranging system and the onboard GPS receiver, have enabled the construction of the most accurate map of Earth's gravitational field ever: to accelerations of nanometers per second squared. While the mountaintops may be farther from Earth's center than any other point, the extra mass of the mountains and their roots – minus the mass of the displaced mantle – accounts for the true gravitational accelerations we actually see. It's only by the grace of these satellites that we can measure this to such accuracy and confirm what was first conjectured in the 1800s: that the full layer-cake structure of Earth must be accounted for to explain the gravity we experience on our world!

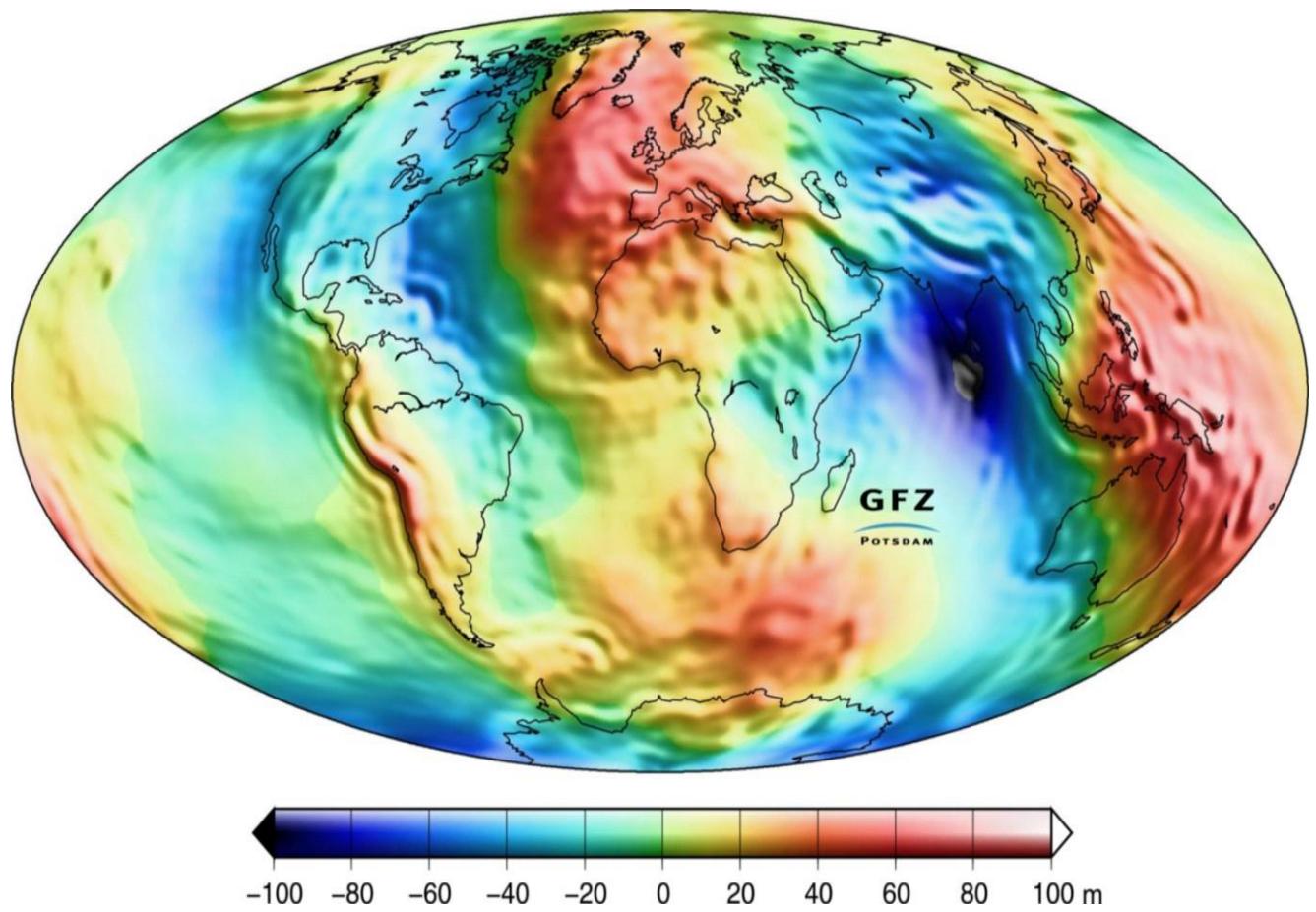


Image credit: NASA / GRACE mission / Christoph Reigber, et al. (2005): An Earth gravity field model complete to degree and order 150 from GRACE: EIGEN-GRACE02S, Journal of Geodynamics 39(1), 1–10. Reds indicate greater gravitational anomalies; blues are smaller ones.