

# The Mason-Dixon Astronomer



## St\*r Points

### Major Missions to Dwarf Worlds - Part 2

May 2015 – Curt Roelle

There are currently two unmanned U.S. space missions currently at or preparing to arrive at dwarf planets in our solar system. Their names are Dawn and New Horizons and both have been traveling for years on long journeys getting to their target destinations. In April we discussed Dawn. This month we'll turn our attention to New Horizons.

First, let us review what a dwarf planet is. In the old days at the turn of the century – the 21<sup>st</sup> century that is – our solar system had nine planets. This included the six classical planets known since antiquity lying closest to the sun, from Mercury out to Saturn (including the earth), plus three other worlds discovered in the past 234 years – Uranus, Neptune, and Pluto. However, in 2006 the International Astronomical Union (IAU) shook things up by reclassifying them as major and dwarf planets.

According to various rules, available for review by simple web searches, all planets except Pluto fell into the major planet camp. Thus, there are now eight instead of nine major planets. Although Pluto is now considered a dwarf planet, it isn't alone. Several large asteroids have found themselves promoted from “minor planets” to dwarf status. These include Ceres, the largest asteroid in the main belt between the orbits of Mars and Jupiter.

Three other objects located even farther out than Pluto (and their year of discovery) were designated dwarf planets as well: Haumea (2004), Makemake (2005), and Eris (2005). Depending on who you ask there are up to half a dozen or so other small worlds beyond Pluto – all discovered in the current century – which should belong in the dwarf planet category as well.



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## President's Message

May 2015 – Tony Falletta

Hello WASI Astronomers,

May is here greeting us with warmer days and nights. As we speed through of orbit around the Sun leaving winter behind, I find myself and more, sitting outside, optics on hand to get in some great stargazing. Recently I was down in San Jose, Costa Rica for a day and was fortunate to have a nice clear sky at night. San Jose is about 9 degree north latitude so I was able to see some stars and constellations not visible from here at 39 degree north. First, looking north I found it amazing to simply see Polaris so low in the sky. It gave me a true sense of where I was here on planet Earth. Turning my attention to the south I saw for the first time in my life Crux, the Southern Cross. Glancing to the right I spotted Canopus, the second brightest star in the sky. Looking below Canopus I spotted the Large Magellanic Cloud, another first for me! The LMC is a neighboring galaxy of the Milky Way and lies about 180,000 light years away. All in all I had completely enjoyable night under the equatorial skies.

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## May Meeting:

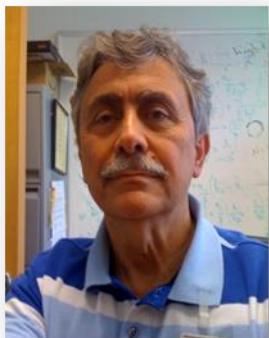
- Wed., May 13<sup>th</sup> – 7:30 pm  
Bear Branch Nature Center
- **Dr. Demos Kazanas**  
“The Multiverse and Other Modern Cosmological Stories”

## Pre-Meeting Dinner

- Wed., May 13<sup>th</sup> – 6pm.
- Harry's Main Street Grill  
65 W Main Street  
Westminster, MD 21157

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## May Meeting – Guest Speaker

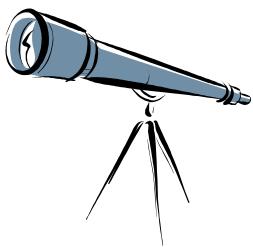
**Dr. Demos Kazanas** (NASA Goddard Space Flight Center)

*"The Multiverse and Other Modern Cosmological Stories"*

Bio:

Dr. Demosthenes 'Demos' Kazanas is an astrophysicist at the NASA Goddard Space Flight Center. His research interest is in high energy astrophysics: Radiation emission from accreting black holes, and neutron stars; structure of accretion disks; pulsar magnetosphere models; and structure of active galactic nuclei. Other interests involve cosmology and the gravitational theory of conformal gravity.

## Upcoming Events From Our Calendars



- ❖ **Soldiers Delight Public Stargazing** May 9<sup>th</sup>, 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills (More information on page 3)
- ❖ **Member's Observing Night** May 9<sup>th</sup>, Sunset, at Bear Branch Nature Center (BBNC) (More information on page 4)
- ❖ **Monthly Meeting** May 13<sup>th</sup>, 7:30 p.m., at Bear Branch Nature Center (BBNC)
- ❖ **Planetarium Show** May 23<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.

**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 May...

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Space probes have visited all eight major planets. The most famous of these was Voyager II. Launched by the United States in 1977, Voyager II flew past Jupiter in 1979, Saturn in 1981, Uranus in 1986, and Neptune in 1989. But no spacecraft from any nation has ever visited Pluto.

In 2006 that changed with the launch of New Horizons. New Horizons was the fastest spacecraft ever launched and covered the same distance from Earth as the moon's orbit – a journey that took Apollo astronauts three days – in less than nine hours!

During its long historic journey, New Horizons passed by several other solar system bodies. These included our own moon as well as an asteroid, plus a sling shot maneuver past Jupiter. New Horizons is scheduled to encounter and fly past Pluto this coming July, 9 ½ years after its launch.

At Pluto's distance, the sun is about 1,500 times fainter than from Earth. If powered by the sun, New Horizons would need enormous solar panels. Instead, it is fueled by the decay of radioactive plutonium via a radioisotope thermoelectric generator (RTG). A similar power source was employed to power the lunar surface experiments left by the Apollo missions.

New Horizons has a wide array of scientific instruments on board. Imagers include a visible and infrared imager named Ralph, an ultraviolet imager called Alice, and a telescopic imager known as LORRI. There are also sensors for detecting dust, energetic particles, and plasma from the solar wind.

Pluto has several moons. The first moon to be discovered was Charon in 1978. Nix and Hydra were discovered in 2005, less than a year before the launch of New Horizons. Two other moons were discovered after launch – Kerberos in 2011 and Styx in 2012.

Astronomers have long wanted to get a close-up look of the ninth planet, and it will finally happen on July 14 when New Horizons sails past Pluto and its ensemble of moons. Unfortunately, between launch and New Horizons' encounter with its target world, the same astronomers no longer consider Pluto to be a major planet.

## Public – Free Star Party Saturn's Rings with Lunar Accompaniment Saturday, May 9, 2015 Soldiers Delight Natural Environment Area 5100 Deer Park Road, Owings Mills, MD

**Star Parties begin at 8:00 PM.**

Saturn will grace the evening sky. The ringed planet will be in opposition (closest view from earth).  
Selena (the moon) will be just past full so will provide a nice view of her western side.



## President's Message

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Here at BBNC we await the U&O for the Blaine F. Roelke Observatory. Member Steve Conard has been coordinating training of the observatory and telescope and I recently participated in the training class. I found it quite enlightening and a lot of fun. If you haven't yet decided to get checked out on the observatory and telescope, get in touch with Steve. Operating a 14" SCT will give you great views and bring tremendous satisfaction to the astronomy bug in you.

For this month, I just would like to entice you with some personal favorite deep space objects. In Coma Berenices lies the Coma Cluster. This is a nice binocular object that spans about 4 degrees of sky. Over in Cancer, take a look at M44, The Beehive Cluster. Also a binocular object, it shines at about 3<sup>rd</sup> magnitude. Low in the southern sky in Centaurus is Omega Centauri, the largest known globular cluster. It looking though a telescope, you'll see what looks like a faint star but actually contains about 1 million stars. Lastly, grab your sombrero and wander over to Virgo. I love finding M104, the Sombrero Galaxy there shining at 8<sup>th</sup> magnitude. Under a dark sky and large enough telescope, it makes me smile every time! See you at the next meeting or maybe at the observatory.

Clear Skies,

Tony Falletta

## Member's Observing Night

Submitted By: Steve Conard

Our first monthly member's observing night was held on Saturday, April 11th. 5 members attended. We mainly used the club's color Mallincam on the C-14 to observe various galaxies in UMa and Leo. M51 and M82 were impressive sights!

We also were lucky enough to see a low probability asteroid occultation of a fairly bright star early in the evening. Time permitting, we'll show the resulting video at the May meeting. A time inserter has been loaned to the observatory to allow members to time their own lunar and asteroid occultations with the Mallincam--contact Steve Conard if you are interested in learning how to do this.

Our second monthly member's observing will be on Saturday, May 9th. Sunset will be at about 8:10 PM, and moonrise is after midnight. Again, this will be an opportunity for members to practice observatory operations, while getting some observing in at the same time. No official skills demonstrations for score will be done that night.

If you are coming, please bring a list of about 5 objects to view (Messier, NGC, doubles, carbon stars, etc). Since we were mostly video last time, we'll use eyepieces this time.

Member's telescopes are very welcome and the observatory's C-14 will also be in use. Note that the observatory is well equipped with power outlets on the outside for you to power your telescope with, and a concrete pad has also been provide on the south side that can accommodate 2 or 3 telescopes. Feel free to move the picnic tables if they are on the pad.

As usual, doughnuts will be provided, but bring your own drinks.

## Observatory Operation and Training News

As the demand for the observatory basics class has dwindled, we will now only hold them when there are requests. If you'd like to take the basics class, email Steve at [steve.conard@comcast.net](mailto:steve.conard@comcast.net) or corner him after a future meeting. There are still quite a few people who have taken the class, but need to demonstrate their observatory skills in order to become a qualified operator. Again, contact Steve to arrange a mutually convenient time to do this.



Observatory Training Class on March 28th, photo by Tom Renn

## 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!



## A Beautiful Day For Volunteering!

Rain had been forecast for Sunday, April 26, 2015 in Baltimore, but for reasons only Mother Nature understands, the day dawned sunny and cloudless and stayed that way all day. It was a good thing, too, since one of Patapsco Valley State Park's major outdoor programs was scheduled for that day. Noted as PVSP's prime annual event for showing off its many beautiful, fascinating and nature-filled assets, and for recruiting additional volunteers into the park's fold to help promote those assets, Patapsco Valley State Park's *Family Fun Day* at the Avalon area of the park seemed a success in every way.

Soldiers Delight Conservation, Inc., the Friends group for Soldiers Delight Natural Environment Area in Owings Mills, hosted a table at the Avalon area of PVSP, where SDCI president Laura Van Scyoc, vice president Lynell Tobler, and Department of Natural Resources Wildlife and Heritage biologist, Paula Becker, held forth all afternoon under brilliant skies, talking to visitors about the importance of conservation efforts ongoing at Soldiers Delight NEA in Owings Mills, introducing passersby to a collection of invasive plants and instructing them on the significant advantages of landscaping with native vegetation, letting children dress up in genuine firefighting gear so they could shoot water at a painted "fire" to simulate controlled burns which are conducted at Soldiers Delight to reduce migration of invasive plant species and encourage germination of native grasses, and answering questions about the unique serpentine barrens ecosystem which runs through northwestern Baltimore County, where it plays host to a variety of globally rare plants and animals.



The Westminster Astronomy Society, which holds monthly stargazing programs at a nighttime "viewing field" on Soldiers Delight property, also had a booth at the event, where families took turns looking at the sun through a special telescope designed to protect the eyesight while showing off our nearest star's brilliance and occasional solar flares.

There were also animals on display from Soldiers Delight's aviary, where rehabilitated, non-releasable raptors and other animals are housed. As a barred owl and red-tailed hawk perched on branches in their exhibit, visitors watched as a naturalist let a giant black rat snake wind itself around her arms and neck. Brave children were even allowed to pet the snake!

Elsewhere, Patapsco Valley State Park manager Rob Dyke's son, Connor, led a program teaching children how to create "edible birdhouses" covered in peanut butter and birdseed. Local boy scouts gave out ice cream sandwiches. Children and adults tried their hand at disc golf, an athletic activity which can be enjoyed on the disc golf course set up at PVSP's McKeldin area.

Members of the park's mounted and bicycle patrols displayed their respective modes of transportation, although the horses seemed to attract more attention than the bicycles. And the ever-popular hayride, led by park ranger Andy Rinta aboard a John Deere tractor pulling a large, straw-filled wagon, was packed from the beginning of the event to the very end. Under brilliant skies and a gentle breeze, a good time was had by all.

Lynell Tobler  
4/27/15



## Is the Most Massive Star Still Alive?

By Ethan Siegel

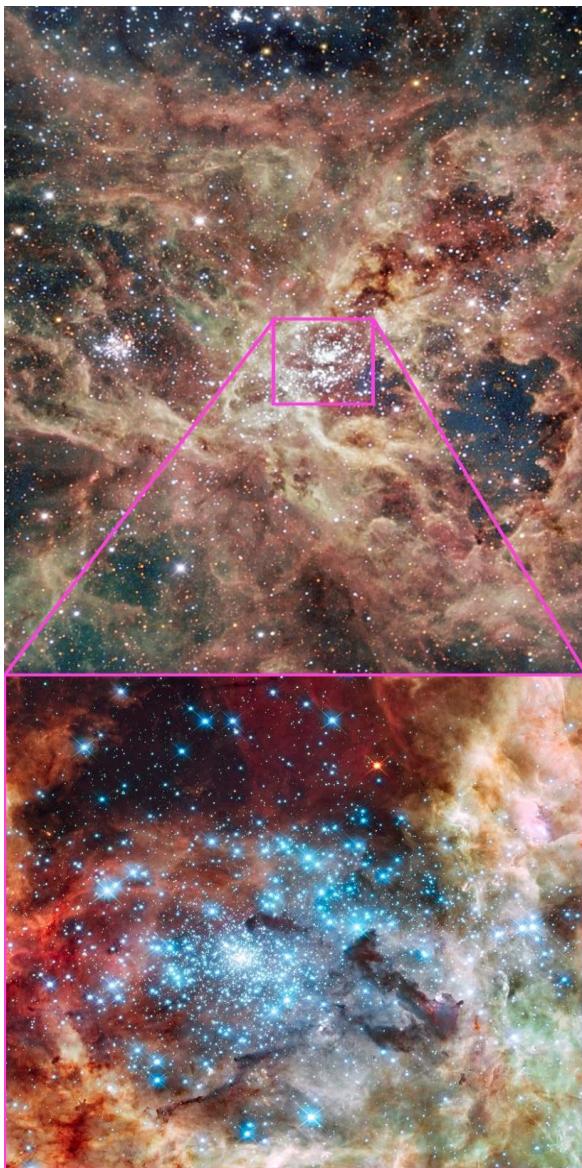
The brilliant specks of light twinkling in the night sky, with more and more visible under darker skies and with larger telescope apertures, each have their own story to tell. In general, a star's color correlates very well with its mass and its total lifetime, with the bluest stars representing the hottest, most massive and *shortest-lived* stars in the universe. Even though they contain the most fuel overall, their cores achieve incredibly high temperatures, meaning they burn through their fuel the fastest, in only a few million years instead of roughly ten billion like our sun.

Because of this, it's only the youngest of all star clusters that contain the hottest, bluest stars, and so if we want to find the most massive stars in the universe, we have to look to the largest regions of space that are actively forming them right now. In our local group of galaxies, that region doesn't belong to the giants, the Milky Way or Andromeda, but to the Large Magellanic Cloud (LMC), a small, satellite galaxy (and fourth-largest in the local group) located 170,000 light years distant.

Despite containing only one percent of the mass of our galaxy, the LMC contains the Tarantula Nebula (30 Doradus), a star-forming nebula approximately 1,000 light years in size, or roughly seven percent of the galaxy itself. You'll have to be south of the Tropic of Cancer to observe it, but if you can locate it, its center contains the super star cluster NGC 2070, holding more than 500,000 unique stars, including many hundreds of spectacular, bright blue ones. With a maximum age of two million years, the stars in this cluster are some of the youngest and most massive ever found.

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At the center of NGC 2070 is a very compact concentration of stars known as R136, which is responsible for most of the light illuminating the entire Tarantula Nebula. Consisting of no less than 72 O-class and Wolf-Rayet stars within just 20 arc seconds of one another, the most massive is R136a1, with 260 times the sun's mass and a luminosity that outshines us by a factor of *seven million*. Since the light has to travel 170,000 light years to reach us, it's quite possible that this star has already died in a spectacular supernova, and might not even exist any longer! The next time you get a good glimpse of the southern skies, look for the most massive star in the universe, and ponder that it might not even still be alive.



Images credit: ESO/IDA/Danish 1.5 m/R. Gendler, C. C. Thöne, C. Féron, and J.-E. Ovaldsen (L), of the giant star-forming Tarantula Nebula in the Large Magellanic Cloud; NASA, ESA, and E. Sabbi (ESA/STScI), with acknowledgment to R. O'Connell (University of Virginia) and the Wide Field Camera 3 Science Oversight Committee (R), of the central merging star cluster NGC 2070, containing the enormous R136a1 at the center.