

Bays Mountain Astronomy Club

☞ *Dinner Meeting: Jan. 10* ☞

REFLECTIONS

Greetings Fellow Amateur Astronomers,

HAPPY NEW YEAR! I hope that each of you got everything you wanted from the large, smiling guy that wears the red suit trimmed in white. I know that December offered a few more days that were clear enough to get some more viewing. You all know me well enough that I am starting out 2015 with high hopes that we will have 16 weeks of great weather for the 2015 StarWatches and even our special events. The last few years have not been the best along the lines of public star parties. I am hoping that 2015 will show us the wonders of the Eastern Tennessee skies.

I hope that you were one of the ones that were able to hear our December keynote speaker. We welcomed Christi Whitworth from PARI. Ms. Whitworth talked a little about Radio Astronomy in general and a brief history of PARI's role over the last few years. She then shared about the role that the 18' radio telescope, "Smiley," plays and possible directions that it and the entire campus could be used in the future. Christi's presentation was

BY WILLIAM TROXEL

very informative and the opening of a 3-month presentation saga on radio astronomy. Thank you, Christi, for coming over and sharing with us.

I wanted to write about the details for the next "big" event we will be doing. I am sure you all know about "Astronomy Day" coming on April 25. During the

December business meeting,

I shared with everyone some of the concepts for displays. Here is that list of possible "table topics" to be presented during Astronomy Day-2015.

Club Table: (Club Information Sheet, Club/Park Astronomy Events,

General Astronomy handouts); General Telescope Display: (4 types of scopes, general astronomy equipment); Radio Astronomy Display; Careers / Education in Astronomy Display: (schools, courses, possible professions that one could use astronomy); and solar display: (handouts on our star, the sun, solar scopes [H-Alpha Scope, White Filter, etc]). So far, one person has signed up to help at the tables. I will start contacting you to ask you if you would be interested in helping or hosting one of the displays. The date for the event is April 25, 2015. I want the tables to



Calendar

Special Events

Jan. 10 6:30 p.m. Annual club dinner. Jeremy McLaughlin, Astronomy/Physics Teacher at Sullivan Central High School will speak on "Backyard Radio Astronomy: Significant Research with Insignificant Funds." Giuseppe's Italian Restaurant. See map inside.

SunWatch

Every Sat. & Sun., 3 - 3:30 p.m.,

Mar. - Oct., weather permitting.

BMACers are always welcome to help.

BMAC Meetings

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Feb. 6 Program TBA.

6:30 p.m., Observatory:

Mar. 6 Observatory quick cleaning and other program TBA.

be on the walkway between the parking lot and the Nature Center if the weather is good. If the weather is not good, then we will be inside the lobby around the main entrance. The solar display will be over at the Observatory. Last year, we had about 150 or more people visit with poor weather, so I am planning for about 200 this year. I need 10 members to help this with this event.

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Special Note:

To be more effective and efficient, those that have active e-mail addresses and access to the internet will be acquiring the newsletter electronically. I will be sending out an e-mail to members in which I have an e-mail listed. If you do not receive my e-mail alerting you of the latest issue being posted online by Jan. 7, then please contact me to update our list.

At this time, there are about two or three of you that I know I do not have an active e-mail.

HAPPY BIRTHDAY ERIS

BY ROBIN BYRNE

This month we celebrate the anniversary of the discovery of a little object that caused a huge controversy. In October, 2003, a survey of the outer Solar System was conducted at Palomar Observatory. In charge of the survey were Mike Brown from the California Institute of Technology, Chad Trujillo from the Gemini Observatory, and David Rabinowitz from Yale University. The team used an automated system that scanned images for motion of 1.5 arcseconds per hour or faster.

However, when Sedna was discovered, it only moved 1.75 arcseconds per hour, which led the team to look for even slower moving objects. On January 5, 2005, using an even lower limit for motion, Eris was discovered. The discovery was officially announced the following July.

In September of that same year, using the adaptive optics on the Keck Telescopes, Eris and three other Trans-Neptunian Objects were imaged. The image of Eris showed that it had a moon. Ultimately named Dysnomia, for the Greek goddess of lawlessness, it orbits Eris in a little under 16 days and is roughly 1/8 the size of Eris.

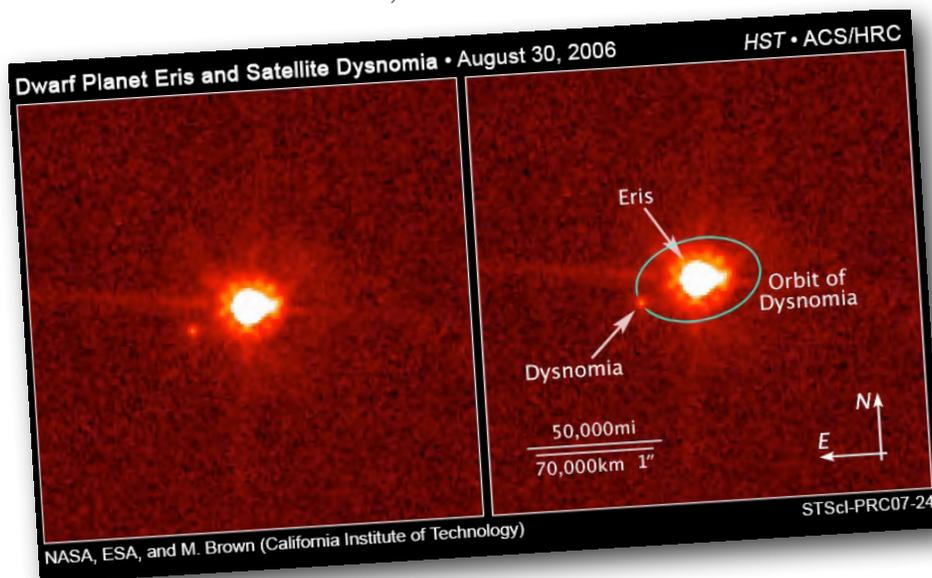
Estimating the diameter of Eris proved to be difficult. At a current distance of 97 Astronomical Units, the angular size of small bodies is

below the resolution of most telescopes. Even for the Hubble Space Telescope, it would be right at its limit, so estimates are largely based on expected reflectivity. Combining that with the apparent brightness leads to an estimated size. The first estimated diameter was 2397 km, which is larger than Pluto at 2368 km. Earth, on the other hand, has a diameter of 12,742 km. Using the Spitzer Space Telescope, the diameter was found to be closer to 2600 km,

have a mass of 1.66×10^{22} kg, which is 27% larger than Pluto's mass. Combining this with the size estimates provides an approximate density of 2.52 g/cm^3 , which implies a much higher rock composition than that found in Pluto, which is thought to be roughly half rock and half ice.

The orbit of Eris is highly elongated and tilted. Its distance from the Sun ranges from 38 AU (closer than Pluto) to 98 AU (beyond the outer edge of the Kuiper Belt), which affects its surface temperature. At its closest to the Sun, it warms to -217°C , while at its most distant, it chills down to -243°C . The large orbit of Eris translates into an orbital period of 557 years for one trip around the Sun.

Spectroscopic studies indicate the surface is covered with frozen methane, which is similar to Pluto. At its current distance, any atmosphere is frozen onto the surface, so there is speculation that as Eris returns to its closest approach of the Sun, the ice will sublime into an atmosphere, potentially revealing a rocky surface.



both estimates within each other's margin of error. It wasn't until 2010, when Eris experienced an occultation, that a more accurate measurement could be made. This time, Eris came in at 2326 km, or just slightly smaller than Pluto, although even estimates of Pluto's size are approximate due to its atmosphere.

While the diameter is still in doubt, its mass is on much more solid ground. Because of being able to observe the orbital motion of Dysnomia around Eris, the mass can be determined. Eris was found to

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NASA SPACE PLACE

Keeping an Eye on Storms and More**By Kieran Mulvaney**

In late July 2013, Tropical Storm Flossie barreled furiously toward Hawaii. The question was not if it would strike, but when and where it might do so.

During the afternoon hours of July 29, forecasts predicted landfall later that week on the state's Big Island; however, by the time residents of the 50th state awoke the following morning, things had changed. NOAA's

Central Pacific Hurricane Center warned that the islands of Oahu, Molokai and Maui were now at a greater risk.

This overnight recalculation was thanks to the Day/Night Band viewing capabilities of the Visible Infrared Imaging Radiometer Suite, or VIIRS, on board the Suomi National Polar-Orbiting Partnership (Suomi NPP) satellite. VIIRS is able to collect visible imagery at night, according to Mitch Goldberg, program scientist for NOAA's Joint Polar Satellite System (JPSS), of which Suomi NPP is a part. That means it was able to spot some high-level circulation further north than expected during the nighttime hours. This was an important observation

which impacted the whole forecast. Without this forecast, said the Hurricane Center's Tom Evans, "we would have basically been guessing on Tropical Storm Flossie's center."

Polar-orbiting satellites, like Suomi NPP and the future JPSS-1 and JPSS-2 (scheduled for launch in 2017 and 2021, respectively), sweep in a longitudinal path over Earth as the planet rotates beneath them—scanning the globe twice a day. VIIRS, the imager that will be aboard all the JPSS satellites, images 3,000 km-wide swaths on each orbit, with each swath

term changes too—things like, "the patterns of sea surface temperature, or coral bleaching," says Goldberg. They are even used by the World Bank to determine how much energy is burned off and wasted from natural gas flares on oil drilling platforms.

While scientists are excited by the JPSS series' wide range of capabilities, the ability to address pressing immediate concerns is, for many, the most tangible value. That was certainly the case in July 2013, when thanks to Suomi NPP, authorities had ample time to close

ports and facilities, open shelters, activate emergency procedures, and issue flash flood warnings. Despite heavy rains, high surf, and widespread power outages, accidents and injuries were few. By the time the storm passed, Hawaii was soaked. But it was largely unharmed.

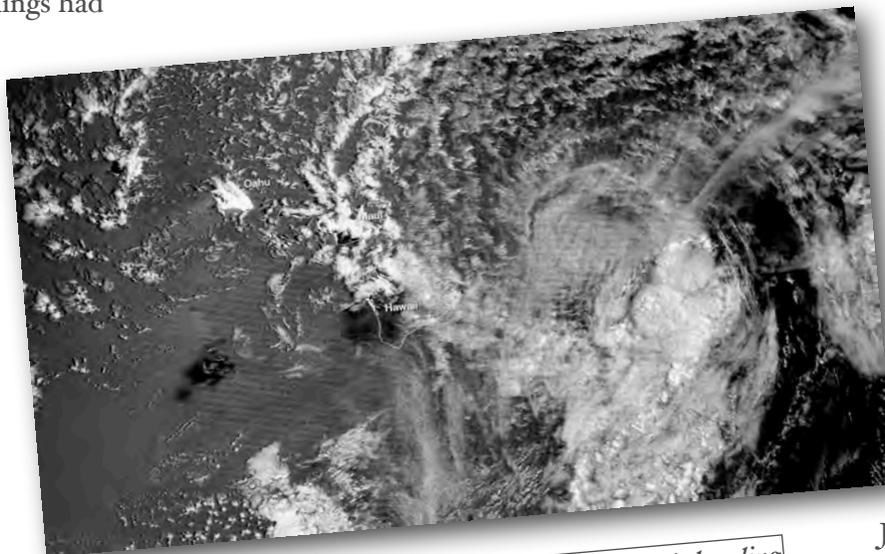
Learn more about

JPSS here: [http://](http://www.jpss.noaa.gov)

www.jpss.noaa.gov.

Kids can learn all about how hurricanes form at NASA's Space Place: [http://](http://spaceplace.nasa.gov/hurricanes)
[spaceplace.nasa.gov/](http://spaceplace.nasa.gov/hurricanes)
[hurricanes](http://spaceplace.nasa.gov/hurricanes)

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



S-NPP captured this image of Tropical Storm Flossie heading toward Hawaii using its VIIRS Combined Day-Night Band sensor. Credit: NOAA.

overlapping the next by 200 km to ensure uninterrupted global coverage. This high-resolution, rapidly updating coverage allows researchers to see weather patterns change in near real-time.

Instruments on Suomi NPP allow scientists to study such long-

MISCELLANEOUS

Reflections

(continued from page 1)

We will also have a StarWatch that night, this will also be a big attendance event. I would like to have 5 club members to help me host/man this event. Here are the details for the event:

12:30 p.m. – 4:30 p.m. - Displays, Demonstrations & Information (free!): Walkway in front of Nature Center (inside Nature Center, if raining.)

2 p.m. – 4:00 p.m. - Solar Viewing (free!): Observatory

8 p.m. – 10 p.m. - Nighttime Viewing (free!): Observatory

It is not too late to start talking about becoming more involved in the events we have during the year. I am so proud of our club, and over the years I have seen how much each of you enjoy being a part of this wonderful club. I know that we each have different things we enjoy doing in the very broad hobby we call Amateur Astronomy. I want to make it one of my goals for this year to bring more of the lesser known aspects of our hobby to light. StarWatch & SunWatch viewing is a great start. Sign up to help at one or more events and bring your expertise to share with everyone. I will have the sign up sheets starting at the February meeting so you can start signing up to be a host / floater. Remember, being a host / floater does not mean that you will be so busy that you cannot enjoy observing the sky.

I will be sharing with you a big club project that I hope we can develop and do as a club at the February meeting. I will also be

sharing a little teaser about it at the January Meeting. I think it will be something that several of you will be interested in becoming involved.

This year, I want to continue to offer you some suggestions for constellations for consideration, however I want to focus on some single points within the constellation that may help you to narrow your focus more. January, of course, we know Orion is the major object that we all enjoy looking for, however a lot of people focus on the Great Orion Nebula. Another nebula that can offer a lot of interest and is just as beautiful, is NCG 1981. This group of stars is located one degree north of the Great Orion Nebula at the northern edge of the NGC 1973, 75, & 77 complex. This bright, scattered cluster contains at least 40 stars covering a half-degree area. The cluster has a few stars of 6th magnitude, with most 7th to 9th magnitude. The outer cluster stars are grouped in ragged rows to the north and east. Using a 50mm set of binoculars at a dark site shows a dozen or so mag 6-9 stars. Using a 90x, 10-inch Dob, you should be able to see up to 20 stars. (Ref. Illustrated Guide to Astronomical Wonders, p. 344) Should you want to research this nebula a bit more in detail, check out Stellarium (a free Program for any platform) or SkySafari Pro. I want to remind everyone to be sure to dress warmer than you would as we are in the the winter season!

January's meeting will feature Jeremy McLaughlin, Astronomy/ Physics Teacher @ Sullivan Central High school. His topic will be "Backyard Radio Astronomy: Significant Research with

Regular Contributors

WILLIAM TROXEL



William is the current chair of the club.

TERRY ALFORD



Terry is a founding member since 1980 and has been chair many times. He has worked as an astronomy lab instructor at ETSU since 2001.

ROBIN BYRNE



Robin has been writing the science history column since 1992 and was chair in 1997. She is an Associate Professor of Astronomy & Physics at Northeast State Community College (NSCC).

ADAM THANZ



Adam has been the Editor for all but a number of months since 1992. He is the Planetarium Director at Bays Mountain Park as well as an astronomy adjunct for NSCC.

Insignificant Funds" January 10, 2015 @ 6:30pm at Giuseppe's Italian Restaurant in Kingsport, TN. Hope to see each of you at the annual dinner.

Until next time, Clear Skies...

Happy Birthday

(continued from page 3)

The discovery of Eris caused a great upheaval in the astronomical community. With a size, potentially, larger than Pluto, should Eris be called a planet? If not, then what is a planet? This conundrum ultimately led the International Astronomical Union to develop an official definition for a planet in 2006. The final decision was that a planet must orbit the Sun, be large enough to pull itself into a rounded shape, and massive enough to clear its orbit of similarly sized objects. That last criterium was the doom not only for Eris, but also for Pluto, since both objects share their orbits with the Kuiper Belt. A new category of Dwarf Planet was then created for objects like Pluto and Eris, which orbit the Sun, are gravitationally round, but which share their orbit with other objects. In addition to being called a dwarf planet, Eris can include among its titles: Plutoid, Trans-Neptunian Object, Kuiper Belt Object, and a Scattered Disk Object.

When it was first discovered, Eris only had a catalogue number for its name, 2003 UB₃₁₃. After all of the turmoil created by the new definition for a planet, it seemed appropriate to name it after the goddess of strife and discord. According to Mike Brown, “[Eris] stirs up jealousy and envy to cause fighting and anger among men. At the wedding of Peleus and Thetis, all the gods were invited with the exception of Eris, and, enraged at her exclusion, she spitefully caused a quarrel among the goddesses that led to the Trojan War.”

Let’s hope that the still lingering controversy over the definition of a

planet doesn’t lead to a full-out war in the astronomical community. Instead, may we rejoice in the spirit of discovery and appreciate the part of the scientific method that involves modifying old ideas in the face of new evidence. Regardless of its title, Eris is a part of our Sun’s family, and that’s all that matters.

References:

Eris (dwarf planet) - Wikipedia
[http://en.wikipedia.org/wiki/Eris_\(dwarf_planet\)](http://en.wikipedia.org/wiki/Eris_(dwarf_planet))

Eris (dwarf planet)

Solar System Exploration:

Planets: Dwarf Planets: Eris:
 Overview

https://solarsystem.nasa.gov/planets/profile.cfm?Object=Dwa_Eris

Eris, the largest dwarf planet by
 Marc Delehanty

Astronomy Today

<http://www.astronomytoday.com/astronomy/eris.html>

2015 Texas Star Party - Sign up Now!

The great tradition of dark sky observing continues with the 37th Annual TEXAS STAR PARTY, May 10-17, 2015!

Staying on the Ranch in housing, RV, or camping? Staying off-site in other accommodations? Everyone needs to enter the TSP drawing, held in late January.

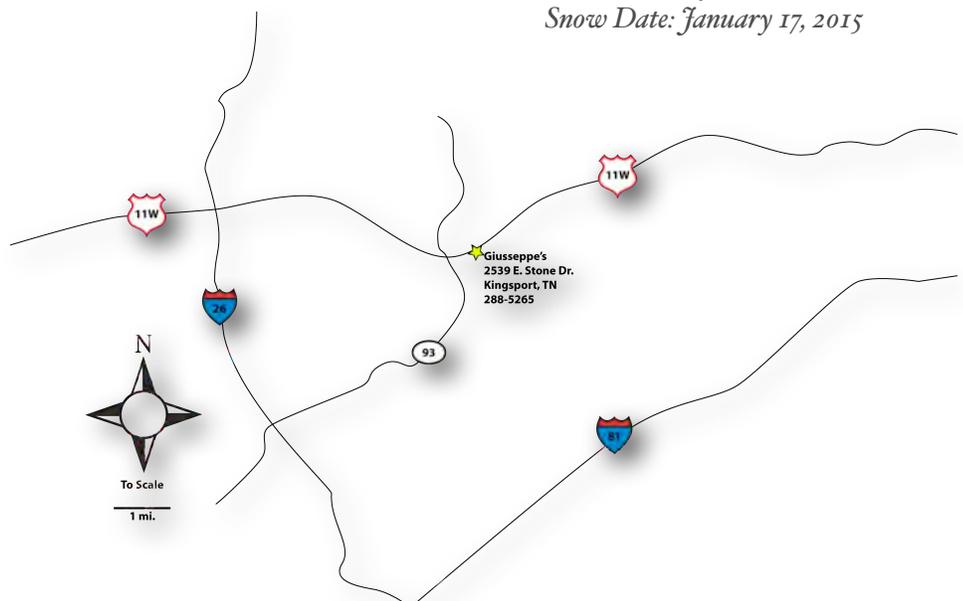
You should submit a Registration/Reservation Request Form to ENTER THE TSP DRAWING before January 21, 2015. This will provide you the highest possible chance of being selected as one of the 500 people who will be able to attend TSP this year.

Follow this link to get started!

<https://texasstarparty.org/get-started/>

Annual Dinner Location:

Giuseppes
 2539 East Stone Drive
 Kingsport, TN 37660
 Date: January 10, 2015
 Snow Date: January 17, 2015



The Bays Mountain Astronomy Club



Edited by Adam Thanz:
thanz@kingsporttn.gov

Dues:

The Bays Mountain Astronomy Club requires annual dues for membership. It covers 12 months and is renewable at any time.

Rates:

\$16 /person/year

\$6 /additional family member

If you are a Park Association member, a 50% reduction in fees is applied.

Find out more at our website:

<http://www.baysmountain.com/astronomy/astronomy-club/>

🍏 Made on a Mac!

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