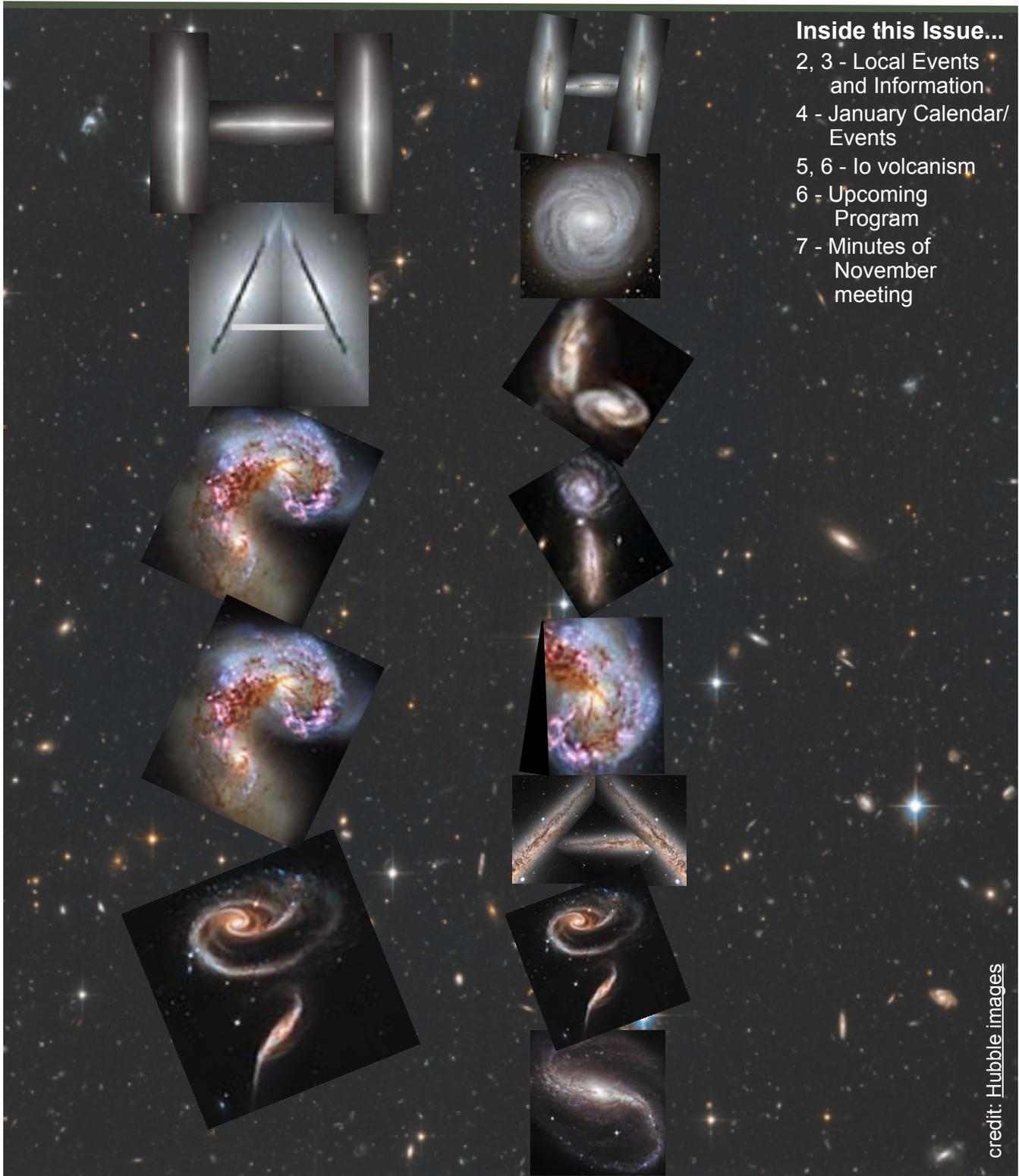


Observer

EVANSVILLE ASTRONOMICAL SOCIETY, INC.

December
2013



Inside this Issue...

- 2, 3 - Local Events and Information
- 4 - January Calendar/Events
- 5, 6 - Io volcanism
- 6 - Upcoming Program
- 7 - Minutes of November meeting

credit: Hubble images

The EAS newsletter, **Observer**, is published monthly. Anyone wishing to contribute articles or photos may mail them to the club's PO box: EAS, PO box 3474, Evansville, IN 47733, or e-mail them to the editor at: gneireiter@wowway.com

Local Events and Information

The **Evansville Astronomical Society** (EAS) is a non-profit organization fully incorporated in the state of Indiana. It has, as its primary goal, the advancement of amateur astronomy. Founded in 1952, the society seeks to:

- 1... maintain adequate facilities for its members and for the public in order to extensively study the skies, and
- 2... promote an educational program for those who wish to learn more about the science of Astronomy.

Meetings are held the third Friday of each month, except June, when the annual EAS picnic is held. The society also sponsors monthly Open House events during the warmer seasons that afford the public an opportunity to tour the observatory.

EAS 2013 Officers and Contacts

President - Scott Conner 812.604.7164
ssconner24@gmail.com

Vice President - Tony Bryan

Secretary - Charleen Kaelin 812.303.1711

Treasurer - Scott Bishop

Counselors - Michael Borman, Kent Brenton, and Ken Harris

Webmaster - Michael Borman

Program Director - open

Newsletter Editor - George Neireiter
812.629.7822 gneireiter@wowway.com

For more information about EAS or directions to the Observatory, visit the club's web page:
<http://www.evansvilleastro.org/>



Telescope mount upgrade status... The mount arrived and is being stored at Scott's work place. In October, Scott created 3D drawings to show exactly where to put the mount on the new pier. Since then, he has fabricated a massively strong metal support structure for the mount, and it is ready for powder coating. Here is his latest update:

"The New mount has been completed, and is ready to get painted. I have someone willing to powder coat it either gray or black for \$50. We need to decide on the color we want. We also are looking at what is needed to start installation. The one piece of equipment we don't have, but would like to have, would be a crane to pull out the old mount. If anyone has any connections to someone with this type of equipment, we can sure use your help in getting it for a very low price if possible. If you have connection, please try them out and let us know ASAP. We will likely do this in early January."

If you haven't contributed financially to the mount project, please help out and make a donation. While there have been some large donations of \$200 or more, your gift of \$25 or \$30, or even \$50, would help us achieve the total cost.

Please send your check to Scott Bishop, Treasurer, at: E.A.S., P.O. Box 3474, Evansville, IN, 47733. Or, even better, come to the next meeting (Dec. 20) and personally deliver your support of E.A.S. and its mission. Thank you.

December meeting and Party... Don't forget that the December meeting is our annual Christmas Party. Everyone is asked to bring a small dish to share. For fun, we will also have our annual Astronomy Quiz. So, come prepared for a good time. I will be the host of the quiz this year.

submitted by Scott Conner

Officer election results... At the November meeting, the following officers were elected/ re-elected:
President - Scott Conner
Vice President - Tony Bryan
Secretary - Charleen Kaelin
Treasurer - Ted Ubelhor
Ted replaces outgoing treasurer Scott Bishop who has served EAS well for many years. Thank you Scott. The other three officers "narrowly" retained their position !

Profile of Ted Ubelhor... A Native of Evansville, Ted resides there with wife Ami and siblings Eli, 18, and Emma, 15. He is employed by the First Security Bank of Owensboro, Kentucky where he is a Senior Vice President.

He has a Finance degree from the University of Southern Indiana.

Interestingly, Ted's doctor first stirred his interest in Astronomy -- his office wall contained a number of photos of Astronomical scenes. This led to the purchase of an 80mm scope and later, an 8" Celestron.

In their spare time, Ted and his family enjoy traveling.

submitted by Birk Fisher



Ted Ubelhor
EAS Treasurer - 2014

Telescopes and accessories for sale... As mentioned in last month's issue, Mike Borman still has some telescope equipment and accessories for sale. Some of the gear has already been sold. If interested, go to Mike's web page. Here is the link:

<http://www.mborman.org/forsale.htm>

Submitted by Mike Borman

Tour of the International Space Station... Recently a friend sent me a link to a YouTube video featuring NASA astronaut [Sunita Williams](#) giving a [tour of the ISS](#) at the end of her four month stay. The tour is well done and definitely worth your time watching it. Note, the video is about 25 minutes in length -- while long, its much better viewing than most TV shows.

Sunita gives a real sense of what life is like in zero gravity as she floats along from module to module. Williams was launched from Russia in July 2012 as a member of the Expedition 32 crew. She became ISS commander of Expedition 33 in September 2012, only the second woman to achieve that feat. For more on Sunita, [click here](#).

If you are interested in viewing [more about the ISS](#), here is another YouTube video featuring ESA astronaut [Andre Kuipers](#) from Expedition 31. Andre's video is nearly an hour in length but also well worth the time. He gives more detail into routine ISS operations, such as the recycling of urine for drinking water -- hey, water is expensive to bring up from Earth, so every drop

is saved and purified. In addition, a graphic of the ISS appears occasionally in the video showing exactly where you are on the tour.

Also interesting is the difference in sound levels as Andre and cameraman traverse from the USA module into the Russian modules.

Andre gives good insight into the challenge of orientation inside the modules. All four walls are used to their maximum for racks and storage, so it creates issues if trying to think about what is up and down, or left and right. Everywhere, there is use of tape and velcro to hold things in place. Of course, safety is ever present and drills are conducted for dealing with depressurization, fire, or ammonia leaks.

So, who really wants to sign up to be a member of a crew to Mars ?

Comet ISON wrapup... After all the hype and anticipation, it was a rather disappointing conclusion to ISON's visit when it did an Icarus and got too close to the Sun.

If you haven't seen Bruce Gary's article in the December issue of *The Reflector*, it is a good read about comet identification. His extensive observation data can be [found here](#).

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. So, it builds up and releases 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.

However, 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.

From where does the energy for all this come ? Its the result of 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, and yet the tidal forces acting on it cause the world itself to stretch and bend by an astonishing 100 meters at a time !

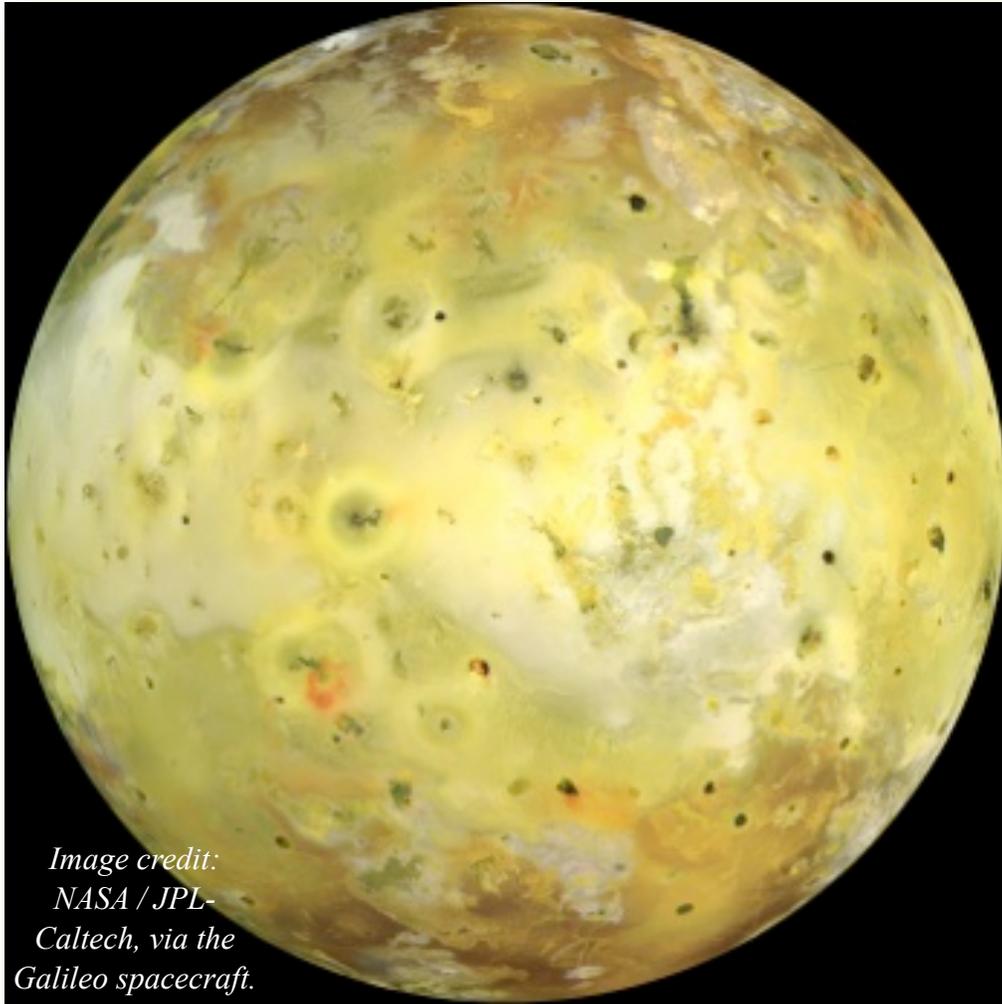
This stretching and bending generates not only cracking and fissures, but also heats up the interior of the planet, the same way that rapidly bending a piece of metal back and forth causes it to heat up internally. When a path to the surface opens up, that internal heat escapes through quiescent lava flows and catastrophic volcanic eruptions ! The hottest spots on Io's surface reach 1,200 °C (2,000 °F) as compared to the average surface temperature of -163 °C (-261 °F). Io is home to the most extreme temperature differences from location to location outside of the Sun.

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.

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>.

Jupiter's moon Io.



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

Upcoming Program...

December

Date: Friday the 20th, Holiday Party
(Please bring a small dish to share)

Presenter: Scott Conner

Topic: Astronomy Quiz



EAS OBSERVER NEWSLETTER

EAS Meeting Minutes -- November 15, 2013

The meeting was CALLED TO ORDER by President Scott Conner at 7:35 pm with 16 people in attendance.

It was moved and seconded to APPROVE the MINUTES of the previous month as printed on the EAS Internet page. (WWW.EVANSVILLEASTRO.ORG)

Vice-President Tony Bryan announced the following UPCOMING EVENT:

??????????????

Visitors included the Gibsons.

The annual Christmas Party and Astronomy Quiz is at 7:30 pm in the Observatory with quizmaster, Scott Conner.

Scott Bishop announced that the club is now out of the CD business and that the Pimco investment is a good one. Also, he announced that he has wall calendars available for sale for \$7.00 each.

Special Projects: The president stated that the metal support for the Paramount ME II is finished. It is now going to be sent for powder coating. Scott needs to know what color people want. It can be Black or Gray.

Tony Bryan said that the Crane Educational partnership with EAS is still being considered.

There were two events planned in early November for observing with the public about astronomy. One had to be cancelled because of the weather. The other one, at the Tell City Library, was able to have a program for two guests and the family of the library director. They did give us a check for \$25 for our efforts.

Scott also mentioned that Mitch Luman has asked to move some of our meetings in the beginning of the coming year to the new planetarium at the Evansville museum when it opens up. We will be exploring this idea, so keep your eyes on the newsletter.

Elections of officers resulted in the following:

President - Scott Conner
Vice President – Tony Bryan
Secretary – Charleen Kaelin
Treasurer – Ted Ubelhor

Next, Charleen Kaelin report on “What’s up this month?”

PROGRAM for Tonight- “Comet ISON” By Scott Conner

The meeting adjourned at 8:15 pm.

Respectfully submitted,

Charleen Kaelin
EAS Secretary