



# Monthly Notices of the Everglades Astronomical Society



Naples, FL  
December 2013

**Officers: President:** Michael Usher; **VP/Secretary:** Todd Strackbein; **Treasurer:** Bob Gurnitz  
**Newsletter Editor:** Jackie Richards ([jmrichards2005@yahoo.com](mailto:jmrichards2005@yahoo.com))  
**Home Page:** <http://naples.net/clubs/eas> **Webmaster:** Martin Zombeck ([mvz@alum.mit.edu](mailto:mvz@alum.mit.edu))  
**Fack Coordinator & information on viewing:** Charlie Paul ([cpaul651@earthlink.net](mailto:cpaul651@earthlink.net)) 410-8192

## President's Message

Unfortunately Comet ISON's trip around the Sun turned out to be a suicide dive, but there are other comets to watch out there - you can read all about it in Jackie's accompanying article.

They must be having trouble getting attendees at next February's Winter Star Party, I got an e-mail from them offering me a free gift for any others I talked into attending for the first time. I think it would be great to have more club members attend!

This is my last month as club president; it has been fun but it's time to hand the reigns over to the next one. I'm sure you will feel right at home next year in Todd's capable hands.

Clear Skies,  
President  
Mike Usher

## Dates for the "Fak"

Usually the best times to go out to the Fakahatchee Strand viewing site are moonless nights. Below is a list of upcoming Saturday nights that you will often find fellow club members out there enjoying the skies with you (weather permitting).

Date	Moonrise	Moonset
December 28	3:01 a.m.	2:23 p.m.
January 4	9:43 a.m.	9:42 p.m.

## Sky Events

- Dec. 2 - New moon
- Dec. 9 - First quarter
- Dec. 13 - Geminids Meteor Shower (up to 60 multi-colored Meteors per hour-- Dec. 13-14 peak)
- Dec. 17 - Full moon
- Dec. 25 - Last quarter

## Next Meeting

December 17, 2013  
Time 7:00 – 9:00 pm  
At the Norris Center, Cambier Park

## Comet ISON? NO – Comet Lovejoy By Jackie Richards

Some of us were lucky enough to have gotten a glimpse of Comet ISON during its journey toward the sun, but unfortunately, Comet ISON did not survive. There were, however, many other comets to see this past month, including Comet Lovejoy, shown in the photo below. The photo was taken shortly before dawn on November 30<sup>th</sup>. Lovejoy was at about 6<sup>th</sup> magnitude the last week of November and could be seen through binoculars. Club member, Bob Francis, was the first to spot Comet Lovejoy with binoculars in mid-November. Other comets that were visible during November were Comets Encke and Linear, but I don't believe any club members saw them.



Comet Lovejoy taken by Rick Piper and Jackie Richards at Rick's backyard observatory on 11/30/13. Orion 80 mm Refractor, f5, Canon XSi, ISO 1600, 1 min. 45 secs.

Below is a picture of Comet ISON taken during October. You'll need to put your glasses on and then look for the little smudge mark slightly to the left and slightly below the center. Yup, that's ISON. Not much to brag about, but we did get a picture.



Comet ISON taken by Rick Piper and Jackie Richards in October.

## Fak Photos



Heart Nebula taken by Chuck Pavlick on 11/29/13 at the Fak. Orion EON 72 w/field flattener; AP Mach 1, SBIG 8300c, 7 @ 720 seconds.



## 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.

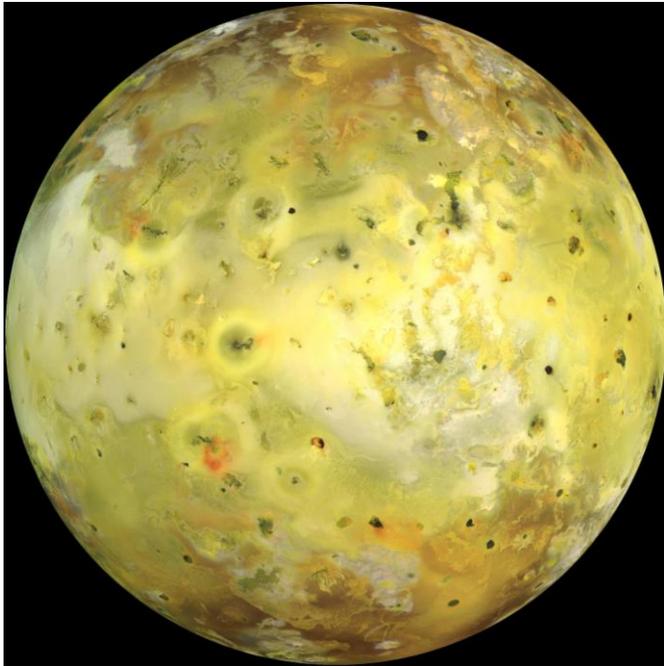
Because the surface-area-to-mass ratio of our planet (like all large rocky worlds) is small, that energy has a hard time escaping, building-up and releasing sporadically in catastrophic events: volcanoes and earthquakes!

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.

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>.

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## KIDS ASTRONOMY CLASS

Looking for volunteers to create a class for two age groups – 5 to 6 and 9 to 11

I need several people to write a syllabus and two (hopefully with experience teaching children) to teach the classes

Classes will be held at the YMCA

I have talked with the president of the YMCA and he likes the idea

YMCA is rebuilding from a fire, if we need anything special installed we can ask now.

Preliminary plan:

Classes held on Saturday's  
Approximately 24 kids  
Five classes 50-60 minutes each

Each class will have

Star charts shown on large flat screen TV  
Lecture on Astronomy History  
Astronomy Projects  
Astronomy games

Class time

20% lecture  
20% Tapes/u tube  
20% Projects

I will interface with the YMCA and make sure everything in room time, facilities and advertisement are in place but need:

Assistance in making up curriculum, I have a sample  
Someone who can teach children

If you are interested call Joe O'Brien at 239-417-5678  
or e-mail [joeobrien1@comcast.net](mailto:joeobrien1@comcast.net)

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**Items For Sale or Trade or Wanted:**

[http://www.naples.net/clubs/eas/equipment\\_sales.html](http://www.naples.net/clubs/eas/equipment_sales.html)

**Useful links (software, telescope making, telescope and equipment suppliers, astronomical data sources, iPhone and iPad Apps and more):**

<http://www.naples.net/clubs/eas/links.html>

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## EAS 2013 DUES

For the bargain price of only \$20.00 per family, all this can be yours this year:

- Meet with your fellow astronomy enthusiasts at least 10 times a year;
- Learn about astronomy and telescopes. Check out our club scope;
- Many opportunities to view planets, nebulae and other celestial objects (even if you don't have your own telescope); and
- Enjoy the many astronomy programs at our regular monthly meetings.

**Don't miss out!** Fill out this form (please print clearly) and send it with your \$20 check to the Everglades Astronomical Society, P. O. Box 1868, Marco Island, Florida, 34146.

Name:

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Address:

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Email:

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