



# Monthly Notices of the Everglades Astronomical Society



Naples, FL  
May 2014

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## President's Message

We will be soon entering into the season where the summer weather patterns bring us rain and higher humidity in the late afternoons. That usually means we will get some good seeing later in the evenings for planets. Make sure you take advantage to observe Saturn and Mars. Both will be nicely positioned for most of the summer. Saturn and the moon make wonderful targets that always leave lasting memories with first-time viewers. Consider sharing the view with your neighbors and especially with our young future astronomers.

This past month we had our EAS annual picnic on April 19<sup>th</sup>. We had a good size crowd considering we already lost some of our great members to their summer homes, the weather was questionable and it was Easter weekend. Next season we will try to schedule our picnic earlier and give more notice. Jackie is attaching a few pictures later in the newsletter so be sure to check them out.

Also as mentioned in the past two newsletters, the EAS is still planning on working with the YMCA Naples to share our passion for astronomy in their summer camp programs. This will likely include providing a daytime solar and nighttime lunar viewing in conjunction other activities. The YMCA also would like to offer a science/astronomy-related class during summer camp. Locating teachers has presented a greater challenge than anticipated. If you have a teaching background and are interested please contact me. Details are yet to be set and contingent on support. The time to jump in and volunteer is now!

At this Tuesday's meeting, we have a special guest who will be giving the presentation. Diana Umpierre of the International Dark Sky Association (IDA) of South Florida will be presenting on the efforts by the IDA to preserve our skies for future generations. Most of us are aware that Diana has been working closely with the National Park Service coordinating and participating in viewing sessions with South Florida Astronomy Clubs. Diana has also been giving large group presentations at various locations to increase awareness,

working with municipalities and others to establishing standards for outdoor lighting, distributing IDA literature, etc. This should be a very interesting presentation and a concern of every member. Please come and show your support for Diana who is truly making a difference.

Clear Skies,  
President Todd Strackbein

## 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
May 24	2:40 a.m.	3:29 p.m.
May 31	8:04 a.m.	9:41 p.m.

## Sky Events

May 6 - First quarter  
May 14 - Full moon  
May 21 - Last quarter  
May 23 - Linear Meteor Shower (from 100-1,000 per hour  
May 28 - New Moon predicted)

## Next Meeting

**May 13, 2014: Time 7:00 – 9:00 pm**  
At the Norris Center, Cambier Park

## Fak Picnic and Linear Meteor Shower By Jackie Richards

We had another successful Fak picnic this year with over 20 people in attendance. See pictures below from the picnic. Some of the objects viewable at this time of year (which we viewed the night of the picnic) are: Omega Centauri, the

largest globular cluster in the Milky Way galaxy which is 15,800 light years away in the constellation Centaurus; M81 and M82 which are 12 million light years away located in Ursa Major; the Ring Nebula which is 2,283 light years away in the constellation Lyra; the Orion Nebula which is about 1,500 light years away; M101/Pinwheel galaxy (see Chuck Pavlick's picture under "Fak Photos" below) which is 21 million light years away in Ursa Major and may more incredible objects, including the usual several meteors we see on a normal viewing night.

the constellation Camelopardalis, which follows Ursa Major in its circumpolar path around Polaris. During the evening of Friday night, May 23, into Saturday morning, May 24, some astronomers and meteor experts are predicting that the Camelopardalid meteor shower could rival the Perseids meteor shower. While no one is really certain what kind of meteor shower we will get, predictions are varying from over 100, to over 200, to over 1,000 per hour. The U.S. and South Canada will be in the best position for viewing this meteor shower. I think that's worth pulling another all-nighter.

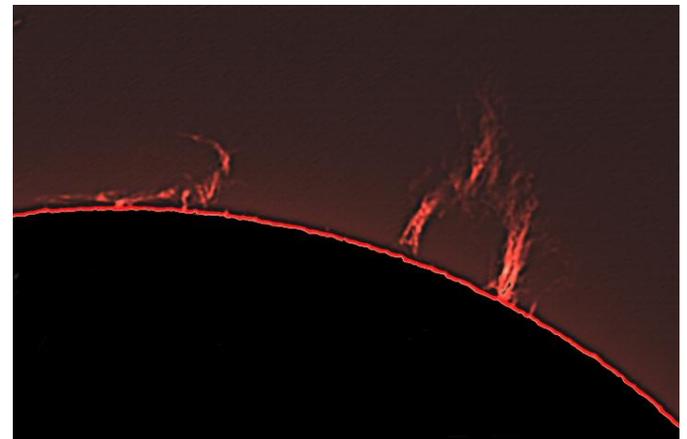
This above information was derived from NASA, [www.earthsky.org](http://www.earthsky.org) and [www.space.com](http://www.space.com). Let's hope they are right!

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## Fak & Other Photos



Todd Strackbein, Fak Picnic, 4/19/14  
Photo by Rick and Lori Piper.



Solar prominences of our sun taken by Chuck Pavlick on 4/6/14.



Club Members enjoying food and talk in anticipation of darkness for viewing. Fak picnic 4/19/14. Photo by Jackie Richards.



Leo Triplet by Chuck Pavlick. Fak 3/21/14. Telescope: WO FLT 110 w/flattener; Mount: AP Mach 1; Camera: SBIG 8300c; three @ 600 seconds; Guide scope: Orion mini guide scope, Orion mini guider, PHD Guiding; Captured in Nebulosity; Processed in Pixinsight.

But that was nothing compared to what is being predicted for the upcoming new Camelopardalid meteor shower, when the Earth moves through streams of debris of Comet 209P/Linear. Comet 209P/Linear was discovered in February 2004 and completes one trip around the sun about every five years. Reportedly, all of the trails ejected between 1803 and 1924 fall within the Earth's path this May. Meteors will radiate from

Correction in last month's newsletter. The image by Chuck Pavlick was M106, not the Leo Triplet.



M101/Pinwheel galaxy by Chuck Pavlick on 4/27/14. Telescope: William Optics FLT 110 f/7 w/field flattener; Mount: AP Mach 1; Camera: SBIG 8300c; 10 @ 720 seconds; Guide scope: Orion mini guide scope; Orion Starshoot 1; PHD Guiding; Captured in Nebulosity, Processed in Pixinsight.

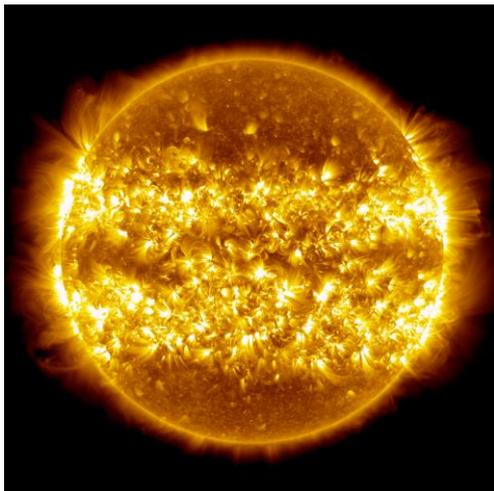
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## The Power of the Sun's Engines

By Dr. Ethan Siegel

Here on Earth, the sun provides us with the vast majority of our energy, striking the top of the atmosphere with up to 1,000 Watts of power per square meter, albeit highly dependent on the sunlight's angle-of-incidence. But remember that the sun is a whopping 150 million kilometers away, and sends an equal amount of radiation in all directions; the Earth-facing direction is nothing special. Even considering sunspots, solar flares, and long-and-short term variations in solar irradiance, the sun's energy output is always constant to about one-part-in-1,000. All told, our parent star consistently outputs an estimated  $4 \times 10^{26}$  Watts of power; one *second* of the sun's emissions could power all the world's energy needs for over 700,000 years.



That's a literally astronomical amount of energy, and it comes about thanks to the hugeness of the sun. With a radius of 700,000 kilometers, it would take 109 Earths, lined up from end-to-end, just to go across the diameter of the sun once. Unlike our Earth, however, the sun is made up of around 70% hydrogen by mass, and it's the individual protons — or the nuclei of hydrogen atoms — that fuse together, eventually becoming helium-4 and releasing a tremendous amount of energy. All told, for every four protons that wind up becoming helium-4, a tiny bit of mass — just 0.7% of the original amount — gets converted into energy by  $E=mc^2$ , and that's where the sun's power originates.

You'd be correct in thinking that fusing  $\sim 4 \times 10^{38}$  protons-per-second gives off a tremendous amount of energy, but remember that nuclear fusion occurs in a *huge* region of the sun: about the innermost quarter (in radius) is where 99% of it is actively taking place. So there might be  $4 \times 10^{26}$  Watts of power put out, but that's spread out over  $2.2 \times 10^{25}$  cubic meters, meaning the sun's energy output *per-unit-volume* is just  $18 \text{ W} / \text{m}^3$ . Compare this to the average human being, whose basal metabolic rate is equivalent to around 100 Watts, yet takes up just 0.06 cubic meters of space. In other words, **you emit 100 times as much energy-per-unit-volume as the sun!** It's only because the sun is so large and massive that its power is so great.

It's this slow process, releasing huge amounts of energy *per reaction* over an incredibly large volume, that has powered life on our world throughout its entire history. It may not appear so impressive if you look at just a tiny region, but — at least for our sun — that huge size really adds up!

Check out these “10 Need-to-Know Things About the Sun”: <http://solarsystem.nasa.gov/planets/profile.cfm?Object=Sun>.

Kids can learn more about an intriguing solar mystery at NASA's Space Place: <http://spaceplace.nasa.gov/sun-corona>.

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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 2014 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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