Monthly Notices of the Everglades Astronomical Society

Naples, FL
August 2014

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President's Message

We had a nice turnout last month for our casual summer meeting at Second Cup at the Mercado, and our August meeting will take place there, as well. We will resume our meetings at the Norris Center in September. I'm sure you are all anxiously awaiting clear skies in the upcoming months so we can get back to observing at the Fak.

Enjoy the rest of your summer.

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
August 16	11:29 p.m.	12:04 p.m.
August 23	4:23 a.m.	5:39 p.m.

Sky Events

August 3 - First quarter
August 10 - Full moon
August 12 - Perseids meteor shower
August 17 - Last quarter
August 25 - New Moon

Next Meeting

August 12, 2014: Time 7:00 – 9:00 pm
Second Cup (at Mercado)
9115 Strada Place

Beautiful Saturn

By Jackie Richards

This summer has been a thumbs down so far for clear skies in the evenings. But we just have to take them whenever we can get them, even if they are on work nights in the middle of the week. That was when Rick Piper, Lori Piper and I took the below image of Saturn using the ASI120MC camera. We took several videos ranging from 45 seconds to a few minutes. The image below was taken for about 50 seconds and consisted of 400 frames. Then we stacked the frames in Firecapture which is a program that is included with the camera software. We found Firecapture to be a fairly user friendly program, but we did struggle with it a bit. And here's a special thanks again to our President, Todd Strackbein, for his help with the camera and the processing. We couldn't have done it without him.

Saturn photo by Rick and Lori Piper and Jackie Richards taken July 17, 2014.
Camera: ZWO ASI120MC; Processed in Firecapture.

We hope to get better pictures when we get clearer nights and as we get more comfortable with the camera and capture program. And we are hoping to get some clear nights for our upcoming Fak viewings. Club member, Chuck Pavlick, has been getting his astronomy/astrophotography fix by imaging the sun since the night sky has not been cooperating. Check out his latest image of the sun below.

The summer is almost over, and that means our nights will be getting clearer soon. Hang in there everyone.

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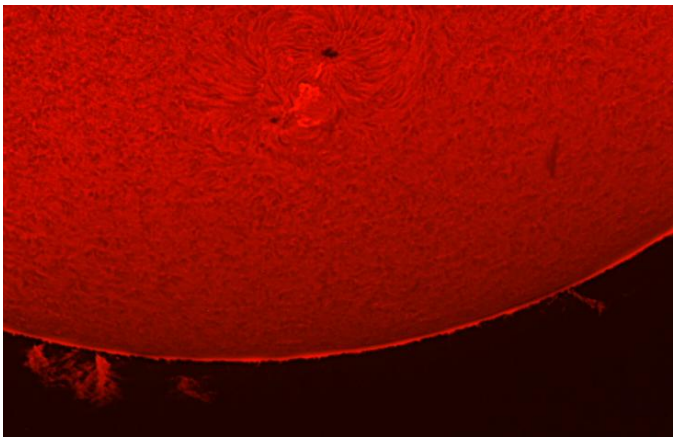
Fak & Other Photos



The Sun taken by Chuck Pavlick 8/8/14.

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The Invisible Shield of our Sun

By Dr. Ethan Siegel

Whether you look at the planets within our solar system, the stars within our galaxy or the galaxies spread throughout the universe, it's striking how empty outer space truly is. Even though the largest concentrations of mass are separated by huge distances, interstellar space isn't empty: it's filled with dilute amounts of gas, dust, radiation and ionized plasma. Although we've long been able to detect these components remotely, it's only since 2012 that a manmade spacecraft -- Voyager 1 -- successfully entered and gave our first direct measurements of the interstellar medium (ISM).

What we found was an amazing confirmation of the idea that our Sun creates a humongous "shield" around our solar system, the heliosphere, where the outward flux of the solar wind crashes against the ISM. Over 100 AU in radius, the heliosphere prevents the ionized plasma from the ISM from nearing the planets, asteroids and Kuiper belt objects contained within it. How? In addition to various wavelengths of light, the Sun is also a tremendous source of fast-moving, charged particles (mostly protons) that move between 300 and 800 km/s, or nearly 0.3% the speed of light. To achieve these speeds, these particles originate from the Sun's superheated corona, with temperatures in excess of 1,000,000 Kelvin!

When Voyager 1 finally left the heliosphere, it found a 40-fold increase in the density of ionized plasma particles. In addition, traveling beyond the heliopause showed a tremendous rise in the flux of intermediate-to-high energy cosmic ray protons, proving that our Sun shields our solar system quite effectively. Finally, it showed that the outer edges of the heliosheath consist of two zones, where the solar wind slows and then stagnates, and disappears altogether when you pass beyond the heliopause.

Image credit: Hubble Heritage Team (AURA / STScI), C. R. O'Dell (Vanderbilt), and NASA, of the star LL Orionis and its heliosphere interacting with interstellar gas and plasma near the edge of the Orion Nebula (M42). Unlike our star, LL Orionis displays a bow shock, something our Sun will regain when the ISM next collides with us at a sufficiently large relative velocity.

Unprotected passage through interstellar space would be life-threatening, as young stars, nebulae, and other intense energy sources pass perilously close to our solar system on ten-to-hundred-million-year timescales. Yet those objects pose no major danger to terrestrial life, as our Sun's invisible shield protects us from all but the rarer, highest energy cosmic particles. Even if we pass through a region like the Orion Nebula, our heliosphere keeps the vast majority of those dangerous ionized particles from impacting us, shielding even the solar system's outer worlds quite effectively. NASA spacecraft like the Voyagers, IBEX and SOHO continue to teach us more about our great cosmic shield and the ISM's irregularities. We're not helpless as we hurtle through it; the heliosphere gives us all the protection we need!

Want to learn more about Voyager 1's trip into interstellar space? Check this out: http://www.jpl.nasa.gov/news/news.php?release=2013-278.

Kids can test their knowledge about the Sun at NASA's Space place: http://spaceplace.nasa.gov/solar-tricktionary/.

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Corrections for July 2014 Newsletter

Photo under Fak Photos was the Lagoon Nebula, not the Omega Nebula.

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Items For Sale or Trade or Wanted:
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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