Monthly Notices of the Everglades Astronomical Society

Naples, FL
April 2014

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President's Message

It sure is great to be getting some consistently better weather these past weeks. I know my equipment needed the dusting off since attending the Winter Star Party. For the most part we had successful events with some rain, clouds and poor weather forecasting interfering with some. Jackie is attaching event pictures later in the newsletter so be sure to check them out. This month a notable event is the Conservancy's 50th Anniversary Earth Day Celebration on April 19th. We hope to continue with our outreach events into the summer months this year so stay tuned for opportunities to help out.

For those interested, the 2015 Annual Winter Star Party in the Keys will be held February 16-22, 2015. Also as mentioned in the last newsletter, the EAS will be 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 with other activities. The YMCA also would like to offer a science/astronomy related class during summer camp week(s). If you have a teaching background and are interested, please contact me ASAP. Details are yet to be set and will be highly contingent on support.

This Tuesday's meeting, long-time member, Rick Piper, will be giving a presentation on comets. During the business portion of the meeting, we will be discussing possible dates for our annual picnic at the Fak. This is a great time to share some food, discussions and look through other members' scopes. Let's make this picnic the biggest ever. Also coming up is Astronomy Day this year which is May 10, 2014 (and on October 4, 2014). Come prepared to give us your input with ideas on how to share our passion with the public.

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
April 19	11:21 p.m.	9:30 a.m.
April 26	4:00 a.m.	4:38 p.m.

Sky Events

Apr 7 - First quarter
Apr 15 - Full moon
Apr 15 - Total Lunar Eclipse
Apr 22 - Last quarter
Apr 22 - Lyrids Meteor Shower
Apr 28 - New Moon

Next Meeting

April 8, 2014: Time 7:00 – 9:00 pm
At the Norris Center, Cambier Park

Outreach Programs and Volunteers

By Jackie Richards

This has been the busiest season for EAS members volunteering their time and telescopes for the outreach programs.

Rick Piper inspiring our youth at the Art in the Park solar event on 4/5/14. Hydrogen alpha solar telescope. Photo by Jackie Richards

Besides the outreach programs, our club President, Todd Strackbein, and club member, Mike Hardin, were instrumental in making the 2014 Winter Star Party (WSP) a success. Todd was part of the WSP hosting staff and he hauled the SCAS (Southern Cross Astronomical Society) trailer from Miami to the WSP site. He helped set up and dismantle the vendor tents and hauled the trailer back to Miami.

Mike Hardin, Managing Partner of Istar Optical, was the vendor coordinator for the 2014 WSP and was responsible for all donations made for door prizes. Istar Optical donated a 150 mm f/8 refractor as one of the door prizes. And we all know that the fabulous door prizes are one of the highlights of the WSP. Having so many club members involved in outreach programs and willing to help out whenever necessary is part of what makes a great astronomy club, which we are lucky enough to have.

Ted Wolfe (hydrogen alpha solar telescope) and Charlie Paul (white light telescope) - Art in the Park solar event on 4/5/14. Photo by Jackie Richards.

Denise Sabatini and Mike Usher sharing knowledge and club info at the Art in the Park solar event on 4/5/14. Photo by Jackie Richards

Over the last six months or so, we have had many back-to-back outreach programs and even multiple events on the same nights. The club was present at the Corkscrew Sanctuary's monthly After Hours event from October through March; Big Cypress National Preserve from January through April; Lover's Key Open House solar event in December; Lover's Key Park honor of volunteers event in February; Naples Botanical Gardens in January; Collier Regional Science Fair in January; Collier-Seminole State Park in March; Boy Scout Camporee at Camp Miles in February; Sanctuary Gulf Club in February and Art in the Park at Cambier Park in February, March and April. The club also committed to several events which were cancelled due to clouds or rain. If you are interested in volunteering your time at any future event, please contact Charlie Paul. No telescope is required.

Corkscrew Sanctuary in October 2013. Rick Piper on far right. Photo by Lori Piper.

Volunteering my time at these events is just as fulfilling to me as spending hours at the Fak viewing and imaging my favorite sky objects. Most children (and many adults) have never even looked through a telescope before, and it's a wonderful feeling when you hear their first response of amazement, and you know they are actually seeing what you are showing them. That never gets boring. M.C. Hammer says it best in his song "Can't Touch This." While this song has a different meaning to everyone, it has different meanings to me, depending on my mood when I listen to it. But the last time I heard this song, it reminded me that not too many things come close to my enjoyment of astronomy and how much fun I've been having with astronomy since I joined the EAS.

Charlie Paul and Rick Piper setting up at Corkscrew Sanctuary in October 2013. Photo by Lori Piper.

Rick Piper giving a presentation on amateur astronomy at Corkscrew Sanctuary in October 2013. Photo by Lori Piper.

Big Cypress Preserve on 4/5/14. Photo by Jackie Richards

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Fak Photos

Thor's Helmet by Chuck Pavlick at the WSP 2014. William Optics FLT 110 f7; Hap Griffin Modified Canon 1000d; AP mach 1 w/PHD autoguiding, 50mm w/starshoot 1; twelve @ 600 seconds; ISO 1600; Captured in Nebulosity; Processed in Pininsight.

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; Captured in Nebulosity; Processed in Pixinsight.

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Old Tool, New Use: GPS and the Terrestrial Reference Frame

By Alex H. Kasprak

Flying over 1300 kilometers above Earth, the Jason 2 satellite knows its distance from the ocean down to a matter of centimeters, allowing for the creation of detailed maps of the ocean's surface. This information is invaluable to oceanographers and climate scientists. By understanding the ocean's complex topography—its barely perceptible hills and troughs—these scientists can monitor the pace of sea level rise, unravel the intricacies of ocean currents, and project the effects of future climate change.

But these measurements would be useless if there were not some frame of reference to put them in context. A terrestrial reference frame, ratified by an international group of scientists, serves that purpose. "It's a lot like air," says JPL scientist Jan Weiss. "It's all around us andis vitally important, but people don't really think about it." Creating such a frame of referenceis more of a challenge than you might think, though. No point on the surface of Earth is truly fixed.

To create a terrestrial reference frame, you need to know the distance between as many points as possible. Two methods help achieve that goal. Very-long baseline interferometry uses multiple radio antennas to monitor the signal from something very far away in space, like a quasar. The distance between the antennas can be calculated based on tiny changes in the time it takes the signal to reach them. Satellite laser ranging, the

second method, bounces lasers off of satellites and measures the two-way travel time to calculate distance between ground stations.

Weiss and his colleagues would like to add a third method into the mix—GPS. At the moment, GPS measurements are used only to tie together the points created by very long baseline interferometry and satellite laser ranging together, not to directly calculate a terrestrial reference frame.

"There hasn't been a whole lot of serious effort to include GPS directly," says Weiss. His goal is to show that GPS can be used to create a terrestrial reference frame on its own. "The thing about GPS that's different from very-long baseline interferometry and satellite laser ranging is that you don't need complex and expensive infrastructure and can deploy many stations all around the world."

Feeding GPS data directly into the calculation of a terrestrial reference framecould lead to an even more accurate and cost effective way to reference points geospatially. This could be good news for missions like Jason 2. Slight errors in the terrestrial reference frame can create significant errors where precise measurements are required. GPS stations could prove to be a vital and untapped resource in the quest to create the most accurate terrestrial reference frame possible. "The thing about GPS," says Weiss, "is that you are just so data rich when compared to these other techniques."

Artist's interpretation of the Jason 2 satellite. To do its job properly, satellites like Jason 2 require as accurate a terrestrial reference frame as possible. Image courtesy: NASA/JPL-Caltech.

You can learn more about NASA's efforts to create an accurate terrestrial reference frame here: http://space-geodesy.nasa.gov/.

Kids can learn all about GPS by visiting http://spaceplace.nasa.gov/gps and watching a fun animation about finding pizza here: http://spaceplace.nasa.gov/gps-pizza.

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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: _____

Address: _____

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Phone: _____

Email: _____