



Monthly Notices of the Everglades Astronomical Society



Naples, FL
October 2016

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President's Message

Let me first thank Chris Pritchard for kicking off our new season. He gave a very thought-provoking and interesting talk on observing our universe. This was the first time he spoke to our group. I hope it is not the last.

We are trying something different for our October meeting. Bart Thomas's ex-student, Mike Pavel, is currently at Harvard. He has agreed to do a Skype presentation from Massachusetts on his research on magnetic fields and star formations titled *Galactic Magnetic Fields and Other Fun Projects*.

If you are a meteor observer, the night sky this month between now and the November meeting will be keeping you busy. The Orionid Meteor shower will peak on the night of October 20 - 21, 2016. The radiant is the club of Orion/Betelgeuse. It is actually a long shower. It started October 2nd and runs through November 7th. The debris from this shower is from Haley's Comet. It is estimated that there will be 20 meteors an hour. These meteors are fast, but faint. Many of them will have persistent trains. This is not the best year for the shower as the moon will be a waning gibbous during the peak hours.

Two lesser known showers are the South Taurids and the North Taurids. These showers are also long showers. The South Taurids run from September 25th through November 25th. The peak is November 4th - 5th. This shower is known for bright meteors and fireballs and averages about 7 per hour.

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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
October 22		12:57 p.m.
October 29	5:33 a.m.	5:28 p.m.

Sky Events

Oct. 8 - First Quarter
Oct. 15 - Full Moon
Oct. 22 - Last Quarter
Oct. 30 - New Moon

Next Meeting

October 11, 2016: Time 7:00 – 9:00 pm
Norris Center, Cambier Park

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OSIRIS-REx is on its way to Asteroid Bennu By Jackie Richards

The OSIRIS-REx liftoff put on a wonderful show for many Floridians unless you were "clouded out" like I was. Club member, Bob Gurnitz, had a front-row seat to this historic event—just look at his awesome picture below.



Launch of OSIRIS REX (a sampling and return mission to asteroid Bennu on 9/8/16). Photo by Bob Gurnitz. Canon SX 50 HS.

On September 8th, Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer (OSIRIS-REx) began its journey to the asteroid Bennu where it will study the asteroid and return a sample to Earth in 2023. In about two years, OSIRIS-REx will reach asteroid Bennu and begin over 500 days of surface mapping the asteroid so the NASA team can determine the site from which to take the sample. Then OSIRIS-REx will move in for a close approach (without landing), and an extended robotic arm will gather the sample. In July 2020 OSIRIS-REx will begin its trip back to Earth, arriving in September 2023.

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Martin V. Zombeck By Bob Gurnitz

Very sadly, EAS Director Martin Zombeck, passed away on September 29, 2016 in Portland, Maine. Martin was a wonderful friend and a supporter of our club. In addition to being a Director, he was also our Webmaster.

Prior to his retirement, Martin had been a senior physicist working on X-ray astronomy at the Harvard-Smithsonian Center for Astrophysics. He is author of the *Handbook of Space Astronomy and Astrophysics* and was diligently in the process of putting together the 4th edition. He is also co-editor of High Resolution X-ray Spectroscopy of Cosmic Plasmas.

Martin received an SB in Physics from MIT in 1957 and a PhD in Physics from MIT in 1969. He was a Director of the MIT Club of Southwest Florida. Martin was also a Vice President of the MIT Class of 1957, Co-chair of the Class of 1957 Reunion Committee, the Class of 1957 Webmaster and was a member of the Delta Upsilon Fraternity.

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Published Articles by EAS Members

Ted Wolfe's article in the Naples News/Collier Citizen on September 20, 2016, Looking Up: A Spiraling carousel of color in deep space.

<http://www.naplesnews.com/story/news/local/communities/collier-citizen/2016/09/20/looking-up-spiraling-carousel-color-deep-space/90738218/>

TO VIEW THE ABOVE ARTICLE, PRESS "CTRL" AND LEFT CLICK BUTTON.

The below link provides previous articles in the Collier Citizen by Ted Wolfe that appeared over past years.

<http://search.naplesnews.com/jmg.aspx?k=looking+up+ted+wolfe>

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Continuation of President's Message (From Page 1)

The North Taurids run from October 12th through December 2nd. The peak is November 12th – 13th. The meteors from this shower are slow and bright and also average about 7 per hour.

On September 26th, I saw a crawling ribbon running across the bottom of the TV screen. It was reporting that scientists have identified three water vapor plumes erupting from Europa. For more information, you can visit the NASA site and see the news video.

I'm looking forward to seeing you at our next meeting.

Clear skies, Denise Sabatini

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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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One Incredible Galaxy Cluster Yields Two Types of Gravitational Lenses

By Ethan Siegel

There is this great idea that if you look hard enough and long enough at any region of space, your line of sight will eventually run into a luminous object: a star, a galaxy or a cluster of galaxies. In reality, the universe is finite in age, so this isn't quite the case. There are objects that emit light from the past 13.7 billion years—99 percent of the age of the universe—but none before that. Even in theory, there are no stars or galaxies to see beyond that time, as light is limited by the amount of time it has to travel.

But with the advent of large, powerful space telescopes that can collect data for the equivalent of millions of seconds of observing time, in both visible light and infrared wavelengths, we can see nearly to the edge of all that's accessible to us.

EAS 2017 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: _____

Phone: _____

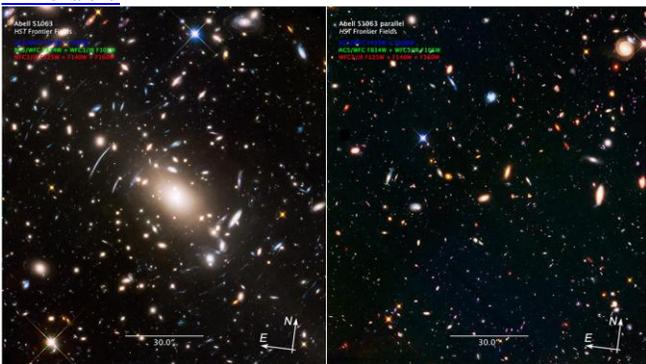
Email: _____

The most massive compact, bound structures in the universe are galaxy clusters that are hundreds or even thousands of times the mass of the Milky Way. One of them, Abell S1063, was the target of a recent set of Hubble Space Telescope observations as part of the Frontier Fields program. While the Advanced Camera for Surveys instrument imaged the cluster, another instrument, the Wide Field Camera 3, used an optical trick to image a parallel field, offset by just a few arc minutes. Then the technique was reversed, giving us an unprecedentedly deep view of two closely aligned fields simultaneously, with wavelengths ranging from 435 to 1600 nanometers.

With a huge, towering galaxy cluster in one field and no comparably massive objects in the other, the effects of both weak and strong gravitational lensing are readily apparent. The galaxy cluster—over 100 trillion times the mass of our sun—warps the fabric of space. This causes background light to bend around it, converging on our eyes another four billion light years away. From behind the cluster, the light from distant galaxies is stretched, magnified, distorted, and bent into arcs and multiple images: a classic example of strong gravitational lensing. But in a subtler fashion, the less optimally aligned galaxies are distorted as well; they are stretched into elliptical shapes along concentric circles surrounding the cluster.

A visual inspection yields more of these tangential alignments than radial ones in the cluster field, while the parallel field exhibits no such shape distortion. This effect, known as weak gravitational lensing, is a very powerful technique for obtaining galaxy cluster masses independent of any other conditions. In this serendipitous image, both types of lensing can be discerned by the naked eye. When the James Webb Space Telescope launches in 2018, gravitational lensing may well empower us to see all the way back to the very first stars and galaxies.

If you're interested in teaching kids about how these large telescopes "see," be sure to see our article on this topic at the NASA Space Place: <http://spaceplace.nasa.gov/telescope-mirrors/en/>



Galaxy cluster Abell S1063 (left) as imaged with the Hubble Space Telescope as part of the Frontier Fields program. The distorted images of the background galaxies are a consequence of the warped space due to Einstein's general relativity; the parallel field (right) shows no such effects. Image credit: NASA, ESA and Jennifer Lotz (STScI)