



as Alexei Leonov, Valentina Tereshkova, Jim Lovell, Neil Armstrong, Bill Anders and Buzz Aldrin attended the event.

Paul and Kathryn showed pictures of the Festival activities and their interactions with the speakers and astronauts, especially with Neil Armstrong and Jill Tarter. Kathryn seemed to be taken under-wing by more than one of the dignitaries. Paul and his family appeared to be totally enjoying themselves at the island resort on the beautiful Canary Island. The list of speakers and their presentations were unbelievable and they definitely offered another perspective of man's activities in space. The speakers were:

- ROBERT WILLIAMS:** Great Challenges Remaining for the Next Half Century.
- LESLIE SAGE:** How Astronomy Has Changed What It Means to be Human.
- JILL TARTER:** Intelligent Life in the Universe: Is there Anybody out There?
- MICHEL MAYOR:** Extrasolar Planets in the Universe: many, Different and Everywhere?
- BUZZ ALDRIN:** My Space Journeys: Moon Walking to Mars Cycling.
- CLAUDE NICOLLIER:** Visits to Hubble
- JACK SZOSTAK:** The Origin of Life on Earth.
- RICHARD DAWKINS:** Exobiology and Religion.
- KIP THORNE:** Black Holes: The Most Luminous Objects in the Universe but No Light!
- SAMI SOLANKI:** Is the Sun to Blame for Global Warming?
- YURI BATURIN:** Earthly Mission of Cosmonauts.
- SERGEI ZHUKOV:** Russian Cosmonautics: Trends for Future Development.
- BILL ANDERS (Apollo 8):** Early American Space Program.
- JIM LOVELL (Apollo 13):** Apollo 13: 'Houston, We Have a Problem'.
- CHARLIE DUKE (Apollo 16):** Apollo: More than an Adventure.
- BRIAN MAY:** What Are We Doing in Space?
- GEORGE SMOOT:** Signals from the Beginning.
- GARIK ISRAELIAN:** Stellar Orchestra in the Acoustic Universe.
- ADAM BURROWS:** Explosive Astrophysics.
- RICH GOLDMAN:** Exploring the Symbiotic Relationship of the Space and Technology Industries.
- JOSEPH SILK:** Creation of the Universe.

Truly, Paul and his family had an adventure of their lives.

Billie Westergard's presentation on "Free Energy" was interesting, unique and offered another perspective to The Big Bang Theory. He discussed the concept of negative energy and how it affects our universe. He showed a proto-car that uses this energy to drive its electric motor. The basis for this presentation was a two part article by Don Hotson entitled "Dirac's Equation and the Sea of Negative energy". Billie believes that a little history and common sense about structure formation in the Universe and our Milky Way clearly discredits the Big Bang Theory. He also presented some information from his paper on "Degenerate Angular Momentum in the Hotson-Westergard Universe Model" and another paper on the "Reconstruction of the Derivation of the Einstein Field Equations of General Relativity" by Robert J. Heaston. The most interesting to me was a reprint on "The top 30 problems with The Big Bang." Billie presented the top 10 problems from that reprint:

- Static universe models fit observational data better than expanding universe model.
- The microwave "background" makes more sense as the limiting temperature of space heated by starlight than as the remnant of a fireball.

- Element abundance predictions using the Big Bang require too many adjustable parameters to make them work.
- The Universe has too much large scale (interspersed "walls" and voids) to form in a time as short as 10-20 billion years.
- The average luminosity of quasars must decrease with time in just the right way so that the average apparent brightness is the same for all redshifts, which is exceedingly unlikely.
- The ages of globular clusters appear older than the universe.
- The local streaming motions of galaxies are too high for finite universe that is supposed to be everywhere uniform.
- Invisible dark matter of an unknown but non baryonic nature must be the dominant ingredient of the entire universe.
- The most distant galaxies in the Hubble Deep Field show insufficient evidence of evolution, with some having higher redshifts ( $z = 6-7$ ) than the highest-redshift quasars.
- The open universe we see today is extrapolated back to near the beginning, the ratio of actual density of matter in the universe to the critical density must differ from unity by just a part of  $10^{59}$ . Any larger deviation would result in a universe already collapsed on itself or already dissipated.

His presentation made one think and you left mystified.

By the time you read this, our Mirror Making event will be over and the Club will start gearing up for the Spring Star Party. Register online for the Party which will be held from April 19 through the 22<sup>nd</sup> (<http://www.delmarvastargazers.org/archive/SG2012/index.html>). Online registration will available through Saturday 21, 2012. Come spend a night with your telescope!

Our next meeting will have Doug Towner talking about his trip to Kitts Peaks and Chuck Jennings about his family's Winter Star Party experience in Florida. Jerry did not present his "Object of the Month" at our last meeting due to the two presentations that we had; thus, Jerry will do last month's "Object of the Month" at our April meeting.

See you at Spring Star Party.

Michael LeCuyer wants to step down as Secretary of the Club. Who is interested in the job? The Secretary duties are:

- Keep minutes of the executive board meetings;
- Maintain an up-to-date roster of members;
- Correspond with other astronomical societies and organizations regarding the club business and astronomical information;
- Receive and relay to the members information of astronomical interest.

It is time to pick a president- elect. The duties are to preside in the absence or inability of the President to preside, or at the pleasure of the President. If you are interested in either office, contact me.

<b>Your 2011-2012 Officers</b>			
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## Observing Time!

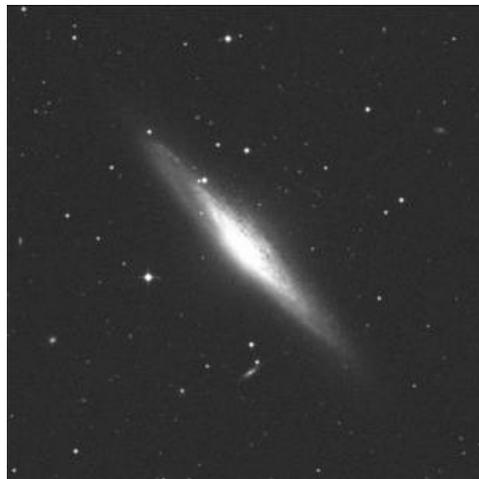
Michael Lecuyer

This month's objects are in keeping with the opening of Galaxy Season as Leo climbs high in the sky with the addition of a remarkable lunar region. This give us something to see when Galaxy Season is temporarily closed by the Bright Light. I have personally observed these objects and so we will not be using any glossy Hubble photos but some DSS photos which are all overexposed and rough but more like with what I see.

### NGC 2683

Our first galaxy is NGC 2683 in Lynx has the nickname ' UFO galaxy' and my notes say "very bright and narrow taking high power." This is a nearly edge on spiral and once thought to lack a bar. However a paper with the prosaic title 'Kinematic and Photometric Evidence for a Bar in NGC 2683' finds a 'figure-of-eight velocity structure' consistent with a boxy core bulge strongly suggesting a central bar. With the galaxy inclined at 75 degrees with a report of at least 80 degrees inclination this bar cannot be directly seen. A Doppler shift of spectral lines near the core indicate a boxy velocity shape indicative of a bar whereas a barless galaxy would have a rounder shape.

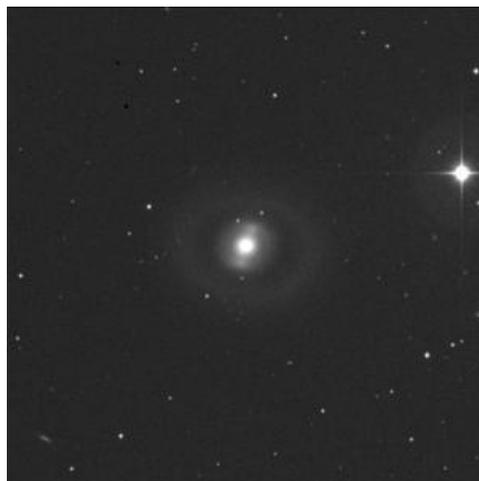
John Herschel discovered it on February 5, 1788 and its in the Herschel 400 list so you can cross this one off. At magnitude 10 with surface brightness of 12.4 a 16 inch telescope will reveal structure, 12" shows the core, and 8" SCT shows that it gradually brightens towards the core with hints of mottling in the central area and finally a 6" scope will only reveal the the central area. It has been seen with 11 X 56 binoculars.



### NGC 2859

NGC 2859 in Leo Minor (RA 8h 24m 18s, Dec +34 deg 31') has a bright core with a flat halo around it and photographically shows a second seemingly detached outer halo hence the name Double Ring Galaxy. This lenticular galaxy is the intermediate stage between a spiral and elliptical galaxy. At 10.6 magnitude it's fairly bright at 85 million light-years away showing a nearly circular disk 4.6' X 4.1'. The faint outer ring is thought to be the remnants of the original spiral arms.

In a paper by Halton Arp, High-redshift object near the companion galaxies to NGC 2859, published in the Astrophysical Journal 240 September 1<sup>st</sup> 1980 he points out "Previous investigations have shown quasars are much more likely to occur near galaxies which are companions to larger galaxies than they are to occur in the general field." "Meanwhile, however, the very important case of NGC 2859, which had quasars next to three out of four of it's companions will be reported here." Sound familiar? If you were at our March 2012 meeting the presentation by Bill Zebuhr who mentioned Halton Arp and his Quasar quest and a hint at an alternative red-shift theory.



### NGC 2419

This has the appearance of a galaxy in a sea of galaxies but it's not. NGC 2419 is one of the most distant globular clusters in our galaxy; in fact, until recently it was thought that it might not be a permanent part of our halo at all, and was referred to as "The Intergalactic Wanderer". Turns out its neither wandering nor intergalactic but orbiting the Milky Way beyond the Magellanic Clouds currently nearly twice as far away as the Large Magellanic Cloud orbiting in around three billion years



and about 275 light-years from the Sun and 300 thousand light years from the galactic center. You can find it at RA 07 38 08.5, Dec +38 52 52 in Lynx at magnitude 9.1. It looks very much like a faint face on galaxy in my 12" scope. There is a bright star just to the west and nothing much else around so identification can be certain. John Herschel (Bill's brother) discovered it and described it as pretty bright, pretty large, slightly extended 90°, very gradually brighter middle, 7th or 8th magnitude star 4 arcmin distant in direction 267°."

At an apparent size of 5 arc-minutes its hard to believe it to be 400 light-years across (nearly three times the diameter and thirty times the volume of Omega Centauri, with its own ten to fifteen million solar masses, suggests NGC 2419 could have a mass of three or four hundred million solar masses, more than many 'dwarf' galaxies. Even if the density is less it has almost a hundred million solar masses and larger than any other Milky Way globular. If it were as close as Omega Centauri it would be a 3<sup>rd</sup> magnitude fuzzy ball nearly two degrees in diameter and the most spectacular object in the northern sky. It sure looks like a galaxy out there in Galaxy country.

### NGC 2415

A real galaxy with the distinction of having two supernovas go off within two years as 1998Y and 2000C. It too is found in Lynx at a dim Mag 12.40 as an irregular blue compact galaxy at 652 million light-years away with a slightly ellipsoidal shape and irregular core and nebulosity about it. You can find it on most charts at RA 7h 36m 53s Dec 35° 13' 59'' and in the sky nearly a minute across.

The second supernova were initially thought to be another outburst of the first since the objects were positioned very closely but it turned out to be new.

One description says "Round, slightly N-S elliptical, even brightness galaxy" and another "Pretty bright, considerably small, round, very gradually very slightly brighter middle, mottled but not resolved, almost planetary nebular". It certainly looks like a planetary but its 175 million light-years away. It's suggested that minimum scope needed to find it is an 8" which I'm happy to know since that's the size of scope I first found it as a "face on galaxy, evenly lit, no core."



### Lunar :Aristarchus Plateau

Something to look at when the moon is closing in on full and is also known as L11 on the Lunar 100 list. The Aristarchus Plateau is probably the most interesting area geologically on the moon's surface with most lunar features found in its square shape. The prominent Aristarchus crater pulls you right to it with it's brilliant white crater in the north-west of the moon - even visible with earth-shine because its relatively recent at only 450 million years old, not old enough for space weathering to have turned it gray and younger even than the Copernicus impact. It is a geologically interesting area - a flat plateau, huge rille carved by lava, fields of volcanic ash and surrounded by flood basalts.



This area is home to the most lunar transient phenomena with 122 reports by 2007 with changes in coloration and the obscuration of features. Alpha particles are emitted by the decay of Radon-222 with a half life of only 3.8 days so its either continuously active at a low lever or occasionally explosive.

There are a number of secondary craters around it caused by the ejecta from the original impact. It is one of the highest reflectance craters and ejecta of any area and the area around it is covered in pyroclastic deposits from volcanoes have average depths of 10 to 30 m. The largest sinuous rille (valley) on the moon lies here, Vallis Schroteri is 140 km long starts at 6 km wide and narrows to 500 meters as it winds around the roughly

square 'continent' that is the plateau. The source basin, 6 k wide and 10 k long forms the Cobra's Head feature.

Other features include the Herodotus Omega volcanic dome found due south of the Herodotus crater, a flooded crater paired with Aristarchus. Colors like green and violet can be seen as a quadrangle west northwest of Aristarchus and "even an inexperienced observer can see it" says one article. The mountain range Montes Agricola are a chain 160 km long paralleling the north edge of the plateau. North of Shapiaprelli crater to the west of the plateau are the Oceanus Procellarum rills called Dorsa Bernet. Herodotus Mons is a mountain with a base of 5 km north-west portion of the plateau. Marius Rima: south of the plateau - the sinuous rille starts at the Marius crater and winds 250 km long and maximum width of 2 km. Rupes Toscanelli: fault at the eastern edge of the plateau.



Almost all of this can be seen with a refractor objective as small as 80mm. There are a couple of detailed maps available at <http://www.lpi.usra.edu/resources/mapcatalog/LM/lm38/> (the western map) and <http://www.lpi.usra.edu/resources/mapcatalog/LM/lm39/> (the eastern map) to help with the terrain. I spent a couple of hours exploring this small area from the Cobra Head to Herodotus Mons and the Montes Agricola. This is a really tightly packed region.

### **The Solar System in April**

**Mercury** is visible mid-month just before dawn. **Venus** sets 3-4 hrs after sunset all month, so it's a good time to get an eyeful. **Jupiter** slowly drops below **Venus** all month, setting less than 1 hr. after Sol by month's end. **Mars** is at opposition, so now is a good time for a look-see—it's hanging in Leo, getting ready to stop it's retrograde on the 15<sup>th</sup> and start heading East. **Uranus** and **Neptune** might be seen in early dawn, if you're lucky. **Saturn** reaches opposition on the 15<sup>th</sup>, just 5° east of Spica. If you want to find the 8<sup>th</sup> planet, **Terra**, just look under your feet.

## ***The Delmarva Stargazers*** are pleased to announce the ***Star Gaze XVIII*** ***Star Party***

When: Thursday, April 19, 2012 through Sunday, April 22, 2012.

Where: Tuckahoe State Park's Equestrian Center near Queen Anne, MD.

For more information see : [www.delmarvastargazers.org](http://www.delmarvastargazers.org)

Join us under the stars for camaraderie, fun, and the wonders of the night sky

The story goes that a butterfly flapping its wings in Brazil can, over time, cause a tornado in Kansas. The "butterfly effect" is a common term to evoke the complexity of interdependent variables affecting weather around the globe. It alludes to the notion that small changes in initial conditions can cause wildly varying outcomes.

Now imagine millions of butterflies flapping their wings. And flies and crickets and birds. Now you understand why weather is so complex.

All kidding aside, insects are not in control. The real "butterfly effect" is driven by, for example, global winds and ocean currents, polar ice (melting and freezing), clouds and rain, and blowing desert dust. All these things interact with one another in bewilderingly complicated ways.

And then there's the human race. If a butterfly can cause a tornado, what can humans cause with their boundlessly reckless disturbances of initial conditions?

Understanding how it all fits together is a relatively new field called Earth system science. Earth system scientists work on building and fine-tuning mathematical models (computer programs) that describe the complex inter-relationships of Earth's carbon, water, energy, and trace gases as they are exchanged between the terrestrial biosphere and the atmosphere. Ultimately, they hope to understand Earth as an integrated system, and model changes in climate over the next 50-100 years. The better the models, the more accurate and detailed will be the image in the crystal ball.

NASA's Earth System Science program provides real-world data for these models via a swarm of Earth-observing satellites. The satellites, which go by names like Terra and Aqua, keep an eye on Earth's land, biosphere, atmosphere, clouds, ice, and oceans. The data they collect are crucial to the modeling efforts.

Some models aim to predict short-term effects—in other words, weather. They may become part of severe weather warning systems and actually save lives. Other models aim to predict long-term effects—or climate. But, long-term predictions are much more difficult and much less likely to be believed by the general population, since only time can actually prove or disprove their validity. After all, small errors become large errors as the model is left to run into the future. However, as the models are further validated with near- and longer-term data, and as different models converge on a common scenario, they become more and more trustworthy to show us the future while we can still do something about it—we hope.

For a listing and more information on each of NASA's (and their partners') Earth data-gathering missions, visit [science.nasa.gov/missions/earth.html](http://science.nasa.gov/missions/earth.html). Kids can get an easy introduction to Earth system science and play Earthy word games at <http://spaceplace.nasa.gov/ecosphere>.

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*



CloudSat is one of the Earth-observing satellites collecting data that will help develop and refine atmospheric circulation models and other types of weather and climate models. CloudSat's unique radar system reads the vertical structure of clouds, including liquid water and ice content, and how clouds affect the distribution of the Sun's energy in the atmosphere. See animation of this data simulation at [www.nasa.gov/mission\\_pages/calipso/multimedia/cloud\\_calip\\_mm.html](http://www.nasa.gov/mission_pages/calipso/multimedia/cloud_calip_mm.html).

Mirror Making 2012 photos  
by Pj Riley and Dennis Dellies



**How to Join the Delmarva Stargazers:** Anyone with an interest in any aspect of astronomy is welcome  
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 Do you need the newsletter snail mailed to you (Y/N)? \_\_\_\_\_  
 Please attach a check for \$15 made payable to Delmarva Stargazers and mail to Kathy Sheldon, 20985  
 Fleatown Rd, Lincoln, DE 19960. Call club President Lyle Jones at 302-736-9842 for more information.