

# SPECTRUM

Northern Cross Science Foundation Newsletter

June 2016

## Looking Up

**June 2, Thursday**

### General Meeting

7:00 p.m. Astronomy 101

7:30 p.m.– Main Program

**June 4, Saturday**

### Discovery Day

9:00 a.m. - 1:00 p.m.

Pike Lake State Forest

**June 4, Saturday**

### Public Viewing

8:00 - 11:00 p.m.

Harrington Beach

**June 5, Sunday**

### SOLAR Viewing

11:00 a.m. - 3:00 p.m.

Harrington Beach

**June 10, Friday**

### Public Viewing

9:00 p.m.- 11:00 p.m.

Harrington Beach

**June 11, Saturday**

### Public Viewing

9:00 p.m.- 11:00 p.m.

Harrington Beach

**June 16, Thursday**

### Board Meeting

7:30 p.m.

**June 18, Saturday**

### Public Viewing

8:00 p.m.- 11:00 p.m.

Pike Lake Campground

**June 25, Saturday**

### Public Viewing

8:00 p.m.- 11:00 p.m.

Achermann Grove

## SOLAR SYSTEM RULES...BY ERNIE MASTROIANNI

Instead of objects millions of *light years* away, Northern Cross imagers aimed their sensors to targets only millions of *miles* away and even closer during May.

For Chad Andrist, the most spectacular space imaging opportunity happened just above planet earth when an impressive aurora display lit up the sky over Harrington Beach State Park on Mother's Day, May 8.

Andrist was at the observatory collecting dark and bias frames on the club's SBIG astrocamera late Saturday and early Sunday morning when he noticed a glow to the north. It became much more than a glow as the sky exploded in color. He used a used a Hap Griffin-modified Canon 60d with the 18-200mm kit lens, mounted on a Manfrotto/Bogen tripod to capture this aurora display above the Harrington home field. The camera was set at 18mm, f/3.5, ISO 2000, for 15 seconds.

The next day, I photographed the Mercury transit from a Boston park during a family vacation. Low clouds obscured the first contact, but I was able to get some frames shortly afterward with my Questar 3.5, an Imaging Source firewire camera, and a portable setup on a picnic table. With my laptop tethered to my iPhone, I transmitted images to the *Discover* magazine website for publication in near real time. The sun cooperated with some nearby sunspots for scale. This is a two-panel mosaic taken at 8:15 a.m. local time showing Mercury, the sun's limb, and the sunspots AR2542 (top) and AR2543.

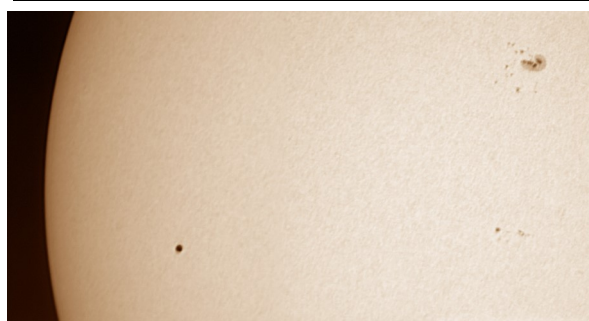
Jupiter has ruled the skies for months and is well-placed for northern hemisphere observers. I combined 800 frames for this photo through my Celestron 9.25 and the same Imaging Source firewire camera. I added color data based on a recent Hubble photograph.

And yes, Mars is closer to earth than at anytime in the last ten years, but in reality, it is very low in the sky and is only a bit more than half the size it was during the spectacular opposition of 2003. I culled about 150 frames out of 1200 during opposition on May 22. Even though steady skies were forecast, shooting through the atmosphere close to the horizon made focusing difficult and steady frames were rare. The color data was added based on NASA and Hubble photographs.

But on a positive note, Mars, Saturn and Jupiter will be well-placed for summer observing and will be pleasing and popular targets for public viewing nights.



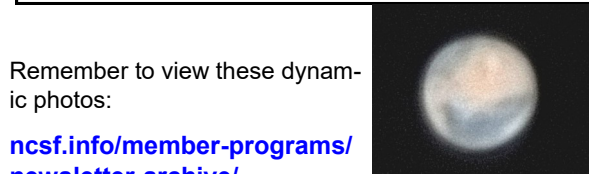
AURORA at HB...Taken by Chad Andrist 5/08/16



MERCURY TRANSIT By Ernie Mastroianni 5/09/16



JUPITER & Mars...By Ernie Mastroianni



Remember to view these dynamic photos:

[ncsf.info/member-programs/newsletter-archive/](http://ncsf.info/member-programs/newsletter-archive/)

## May Meeting Minutes

By Kevin Bert

The May Business meeting of the Northern Cross Science Foundation was held at Unitarian Church North. President Jeff Setzer opened the meeting at 8:30pm and welcomed 22 members and guests. He then asked for standard reports.

Treasurer Gene DuPree tells the membership that the regular accounts balance is \$11,351.18 and the observatory account balance remains at \$1,042.01. He says that membership dues have continued to come in and almost half have paid for 2016.

Secretary Kevin Bert reports that there was one change in the club roster. Joel Deutmeyer is the latest person to join the club and he is from Cedarburg. The 2016 Astronomical League North Central Regional Convention was held April 29 and 30 at Bloomington Normal IL. The community college where it was held was an excellent modern facility. Considering the overlap of topics on the 2017 eclipse, they were done very well, not repetitive and gave different perspectives. The imaging facility was had some of the best equipment available and the rain held up on Saturday to allow a tour. One highlight was a 12 year old being presented a messier certificate for his achievement made possible with a telescope refurbished by his father.

At the Business meeting of the NCRAL Jeff Setzer placed the NCSF hat into the ring to host the 2020 convention. The last two conventions we hosted were successful and although a challenge, we should be ready to step up once again. If approved it will be confirmed at next year's convention.

Observatory Director Dan Bert reports that he has scheduled a work party to stain the timbers of the roof support structure. The park is providing the materials. The date is May 21<sup>st</sup>.

Jaime Hanson is looking for help on the scheduled fundraising Brat Fry in Germantown. Details are in the May Spectrum. All members are encouraged to participate and should contact him if you are available to help sell or to set up sun viewing telescopes.

Jeff Setzer told the membership that there would be no Concordia Lake Moon Festival this year. There will however be a star viewing event held for LCMS gathering on July 11<sup>th</sup>. Interested members should coordinate with Rob Powell.

Jeff Setzer covered upcoming 2016 events. The public observing season will kick off with the Astronomy Day Port Washington Street festival from Noon till 5:00 pm. Then move to Harrington Beach for an evening of planet and deep sky viewing after 8:00 pm. So brush some of that dust off your telescope and

take it out to help show the crowds some of the wonders of our universe.

With no further business Jeff closed the meeting at 9:00 pm.

## Saturn Opposition 2016...By Rick Kaz

Saturn reaches opposition on June 3<sup>rd</sup> as will be well placed in the southern sky for viewing throughout the summer. Another reason to check out Saturn is the tilt of rings. They are about 26 degrees wide as seen from our Earthly perspective... about as wide as they can be. Saturn's rings were last edge on in 2009, and reach a maximum width of 27 degrees on October 16<sup>th</sup>, 2017 before slowly heading towards edge on again in 2025.

At the eyepiece, Saturn shows a yellowish disk 18" extended to 43" across if you count the rings. Crank up the magnification to over 100x under good seeing, and the black thread of the Cassini division jumps into view. Saturn has 62 moons in all, with +9<sup>th</sup> magnitude Titan being the brightest. Only six moons are readily available to small telescopes.

Watch for a sudden brightening of the planet in early June, known as an 'opposition surge' due to what is known as the Seeliger effect. The effect is subtle, but serves to raise the brightness of the planet by about half a mag.

Also, as Saturn heads past opposition and towards eastern quadrature 90 degrees from the Sun on September 2<sup>nd</sup>, 2016, watch for the shadow of the bulk of the planet, cast back across the rings. **Good luck viewing!**

## Drake Equation Flipped...By Jaime Hanson

The following day after my presentation about SETI at the May NCSF general meeting, an article jumped out at me announcing that the famous Drake equation had been rewritten. Since I billed my presentation as an active protest of the Drake equation, I thought I should give an update on the new math.

The original equation had been written over 50 years ago around the time of the very first organized search for intelligent life at the Greenbank Radio Telescope in West Virginia. While no aliens were found in this one wavelength/two star study, an enormous amount of interest was generated in the scientific community. In 1961, a dozen of the leading planetary scientists and astronomers convened at Greenbank, including Carl Sagan and John Lilly to discuss developing a concerted effort in using radio astronomy to search for intelligent life beyond our planet. It was during this conference that the famous equation authored by Frank Drake was first discussed.

In its original form, the equation was designed to estimate N, the potential number of intelligent civilizations on our observable universe.  $N = R * f_p * n_e * f_i * f_c * L$ . The coefficients are interpreted like so: R is the rate of star formation,  $f_p$  is the fraction of those stars with suitable planets,  $n_e$  is the number of planets per system with a life-sustaining environment,  $f_i$  is the fraction of

planets where life actually gains a foothold,  $f_i$  is the fraction of planets where intelligent life appears,  $f_c$  is the fraction of civilizations that develop technology, L is the length of time during which civilizations are able to emit detectable signals.

An interesting side note is that modern SETI has tweaked the description of L, which had previously been defined as the length of time a technological civilization was able to survive before extinction. In any case, the obvious shortcoming of the Drake equation is that we have no way of estimating several of the coefficients with any degree of accuracy. Estimates of N vary widely, from Carl Sagan, who estimated the number to be in the millions, Frank Drake, who estimated N to be around 10,000 to more pessimistic folk who estimate the number to be 1, us. None of these predictions can be excluded nor proven correct.

The SETI community is aware of the futility of gaining more precision on the unknown parameters and it has been an albatross on SETI marketing. So, Adam Drake of the University of Rochester and co-author Woodruff Sullivan of the University of Washington have flipped the old equation on its head. The new form is estimating the reciprocal of N in order to estimate the probability that intelligent life beyond earth does not exist. The new equation is written like this:  $A = N_{ast} * f_{bt}$  where A is the number of intelli-

gent species that have ever formed in the history of the universe,  $N_{ast}$  is the number of habitable planets for a given volume of space, and  $f_{bt}$  is the probability of life evolving into a technological species.

Layering on the history of the universe to the possible outcomes automatically multiplies the result by 13.8 billion. According to Messrs. Drake and Sullivan, the current estimate of A, the number of intelligent species throughout history is in the tens of trillions, and the odds of humans being the lone intelligent species in the universe ever is 1 in 10 billion trillion. If we narrow the volume of space down to just the Milky Way galaxy, the probability rises to 1 in 60 billion. In other words, it would be implausible not to believe in intelligent life other than our own existed in the universe.

This result is much better for SETI marketing. Maybe that helps justify funding, however, in my view, this new equation carries the same basic flaw as the original: we only have one data point, one technological species: us. The Kepler spacecraft has provided a tiny bit more information about the abundance of planetary systems and planets within liquid water zones. However, we still have yet to have the breakthrough discovery that would yield answers on life beyond our own no matter which equation SETI offers.

## June General Meeting

101 Program ...by Kevin Bert

### "Pronunciation Guides"

You say potato, I say potato. You hear a lot of variations on many of the words we use in this hobby. We will take a look at the pronunciation of some of the more common words used in the skies above from the Astronomical League. Get handy reference pages too.

Main Program... by Jack Heisler

### "Cold War Astronomy"

**Constellation of the Month: Virgo**

### The Mercury Transit of May 9th, 2016

By Rick Dusenbery

Monday, May 9th started out partly cloudy in the east, but the rest of the sky looked fairly clear, so I began preparations to observe today's long-awaited Mercury transit of the sun. It was not possible to view the beginning stages; Contacts I and II owing to the low angle of the sun and the thin cloud cover. I set up my telescope outside my apartment in West Bend around 9:00 A.M. and took my first look. Wow! There was Mercury; a bold black dot against the surface of the sun along with a few sunspot groups. Actually it appeared a bit larger than I had anticipated, and of course it was much more distinct than any of the sunspots. Several neighbors stopped by for a look as I began to photograph this somewhat rare event with my trusty Panasonic Lumix DMC-ZS50 compact camera simply held to the eyepiece. I ended up taking about 100 images. Of course only a few of them turned out to be keepers.



By now the sky had largely cleared and I moved operations over to Ridge Run Park where I was joined by a friend; Tom Beineke and a

few others. Tom took the photo of me looking at Mercury and the sun through my eight-inch Dob fitted with a Baader safety film solar filter. Mercury was slowly moving closer to the sun's edge as shown in the cropped photo. Throughout this event, I used a variety of eyepieces: 20mm (60X), 15mm (80X), and 9mm (133X).

By now, clouds were beginning to move in, so I returned home to finish observing the transit from there. Since I missed the first two Contacts, I was hoping to catch Contacts III and IV, but the clouds had other ideas! At 1:35 P.M., Mercury appeared to be about one planet diameter from the sun's edge. Two minutes later, the gap had closed to about half the planet's diameter. Clouds prevented me from seeing Contact III, but my next brief look at 1:40 P.M. revealed Mercury neatly bisected by the sun's edge. Then it was the clouds turn again and they took care of Contact IV! My next look was at 1:42

P.M. and Mercury was no longer visible, so the show was over but at least I got to see most of it. Now I'll have to wait until 2019 for the next

transit; however, there is a far grander event coming in 2017; I wonder what that could be??



By Rick Dusenbery

### NCSF Fundraiser Event!

#### "Brats, Burgers and Solar Scopes"



Germantown Pick N Save

N112 W16200 Mequon Rd.

Saturday, July 2, 2016

10 a.m. to 3 p.m.

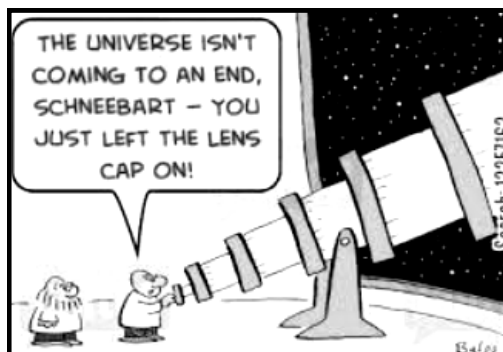
Jaime has said traditionally this particular Germantown Pick N Save is extremely busy on that day. Here is an opportunity for our club, one and done.

From Jaime:

"We will be serving burgers, brats, hot dogs, soda and chips.

**We need volunteers, Solar Scopes and some long folding tables.**

And for yourself, bring water, sweat towels, hats, sunscreen, sunglasses, fatigue mats, portable fans anything that will make you comfortable!"



## RELATED INFO

### Leaders for Public Viewing

#### June 4

Pike Lake

Al Steinberg

#### June 4

Harrington Beach

Ernie Mastroianni

#### June 5

Harrington Beach

Nolan Zadra

#### June 10

Harrington Beach

Gene and Charlotte DuPree

#### June 11

Harrington Beach

**Leaders Needed**

#### June 18

Pike Lake

Gene and Charlotte DuPree

#### June 25

Achermann Grove

Gene and Charlotte DuPree

### Star Parties!

#### WOW

June 2nd through 5th  
Hartman Creek State Park

[www.newstar.org](http://www.newstar.org)

Registration later February

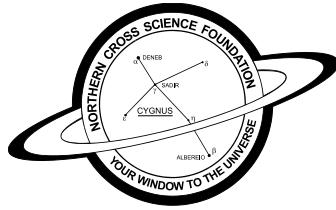
### NORTHWOODS STARFEST 2016

Hobbs Observatory  
Beaver Creek Reserve  
Fall Creek, Wisconsin  
August 5-7, 2016

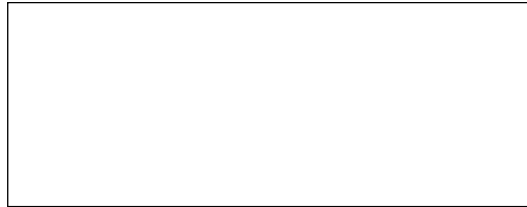
[www.cvastro.org](http://www.cvastro.org)



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**Jim & Gwen Plunkett  
OBSERVATORY**



### 2016 Board of Directors

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**Jack Heisler**  
862 Fall Rd.  
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[harch@wi.rr.com](mailto:harch@wi.rr.com)

Large 14.5 inch F5.6 dobsonian truss style telescope that can be transported in most cars. Great for deep sky viewing but also shows the Cassini division in Saturn easily. Also can be moved in the field with custom attached 2 wheel system. Has DOB driver attachment.

Accommodates 2 inch and 1 1/4 inch eyepieces. Has cords to secondary eyepiece for dew system. Also, black shroud to keep out light and dew on the main mirror. Custom made by Jim Mulherin - expert mirror maker - of Torus Optical now OMI. Have over \$4000 into this telescope and am looking for best offer for only about 1/2 that amount. Get now for the Mars and Saturn opposition and the summer observing season.

### For Sale



### Astronomical Society Eclipse 2017 Workshop

The Astronomical Association of Southern Illinois would like to invite you to the next American Astronomical Society Eclipse 2017 workshop to be held on the campus of **Southern Illinois University Carbondale, Friday, June 10 and Saturday, June 11, 2016**. The workshop will feature two days of top national speakers presenting and hosting break out sessions on the 2017 eclipse. Individuals involved in eclipse event and outreach planning are encouraged to attend as a full participant and take part in all sessions including the closed sessions on Day 2. All other sessions will be open to the general public, which must register in advance. Day 2 will also include a Citizen CATE Experiment workshop open to registered participants and public.

#### Registration costs:

General Public \$10 Day 1, \$12 Day 1 and Day 2  
Citizen CATE Workshop only (Day 2) \$20  
Full Participant: \$180 (includes all meals, sessions, and local transportation)  
Student Participant: \$80 (Includes all meals, sessions, and local transportation)

#### More information and registration info at:

<http://conferenceservices.siu.edu/conferences/eclipse-workshop.html>  
<http://eclipse.siu.edu/about-the-eclipse/american-astronomical-society-eclipse-2017-workshop/>

### SPECTRUM

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NCSF supports the **International Dark Sky Association**

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<http://www.ncsf.info>

**Spectrum Newsletter**  
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Please send your Questions, Suggestions, Articles, and photos to:  
[rickkaz@charter.net](mailto:rickkaz@charter.net)

Newsletter Editor & Publisher  
- Rick & Mickey Kazmierski

#### Monthly Meeting Information

7:00 p.m. Astronomy 101  
7:30 Main Program  
Unitarian Church North  
13800 N. Port Wash. Rd.  
Mequon, WI 53097