

SPECTRUM

Northern Cross Science Foundation Newsletter

May 2016

Looking Up

May 5, Thursday

General Meeting

7:00 p.m. - Astronomy 101

7:30 p.m. - Main Program

May 19, Thursday

Board Meeting

7:30 p.m.

Home of Jeff Setzer

May 29, Sunday

Street Festival

Noon - 5:00 p.m.

Port Washington

May 29, Sunday

Astronomy Day

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

Starts at Dusk

Harrington Beach

June 4th, Saturday

Discovery Day

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

Pike Lake State Forest,

June 4, Saturday

Public Viewing

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

Harrington Beach

June 5, Sunday

Solar Viewing

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

Harrington Beach

June 10 & 11, Fri/Sat

Public Viewing Night

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

Harrington Beach

TRANSIT OF MERCURY, MAY 2016

...By FRED ESPENAK, ROYAL ASTRONOMICAL SOCIETY OF CANADA EDITED BY RICK K.

On Monday, May 09, 2016 Mercury will transit the Sun for the first time since 2006. The full transit will be visible from Wisconsin, starting just after sunrise. The transit or passage of a planet across the face of the Sun is a relatively rare occurrence. As seen from Earth, only transits of Mercury and Venus are possible. There are approximately 13 transits of Mercury each century. In comparison, transits of Venus occur in pairs with more than a century separating each pair.

The principal events occurring during a transit are conveniently characterized by contacts, analogous to the contacts of an annular solar eclipse. The transit begins with contact I, which is the instant when the planet's disk is externally tangent to the Sun. Shortly after contact I, the planet can be seen as a small notch along the solar limb. The entire disk of the planet is first seen at contact II when the planet is internally tangent to the Sun. During the next several hours, the silhouetted planet slowly traverses the brilliant solar disk. At contact III, the planet reaches the opposite limb and once again is internally tangent to the Sun. Finally, the transit ends at contact IV when the planet's limb is externally tangent to the Sun. Contacts I and II define the phase called ingress while contacts III and IV are known as egress. Position angles for Mercury at each contact are measured counterclockwise from the north point on the Sun's disk.

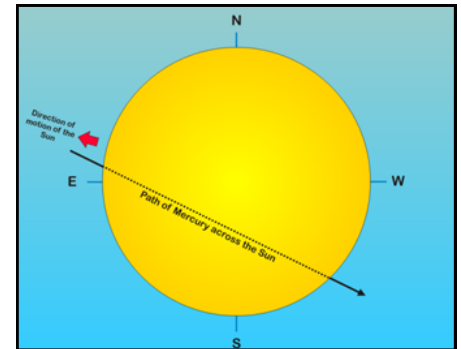
Table 1: Geocentric Phases of the 2016 Transit of Mercury		
Event	Central Daylight Time	Position Angle
Contact I	6:12:19	83.2°
Contact II	6:15:31	83.5°
Greatest Transit	9:57:26	153.8°
Contact III	13:39:14	224.1°
Contact IV	13:42:26	224.4°

Table 1 gives the times of major events during the 2016 transit in Central Daylight Time. Greatest transit is the instant when Mercury passes closest to the Sun's center (i.e., minimum separation). At this time, the geocentric angular distance between the center's of Mercury and the Sun will be 318.5 arc-seconds. The position angle is the direction of Mercury with respect to the center of the Sun's disk as measured counterclockwise from the celestial north point on the Sun.

Observing the Transit

Since Mercury is only 1/158 of the Sun's apparent diameter, a telescope with a magnification of 50x or more is recommended to watch this event. The telescope must be suitably equipped with adequate filtration to ensure safe solar viewing. The visual and photographic requirements for the transit are identical to those for observing sunspots and partial solar eclipses. The illustration below shows the path of Mercury as it transits the Sun on May 9th.

Recurrence of Transits



During the present era, transits of Mercury fall within several days of May 8 and November 10. Since Mercury's orbit is inclined seven degrees to Earth's, it intersects the ecliptic at two points or nodes, which cross the Sun each year on those dates. If Mercury passes through inferior conjunction at that time, a transit will occur. During November transits, Mercury is near perihelion and exhibits an apparent disk only 10 arc-seconds in diameter. By comparison, the planet is near aphelion during May transits and appears 12 arc-seconds across. However, the probability of a May transit is smaller by a factor of almost two. November transits recur at intervals of 7, 13, or 33 years while May transits recur only over the latter two intervals.

Edmund Halley first realized that transits could be used to measure the Sun's distance, thereby establishing the absolute scale of the solar system from Kepler's third law. Unfortunately, his method is somewhat impractical since contact timings of the required accuracy are difficult to make. Nevertheless, the 1761 and 1769 expeditions to observe the transits of Venus gave astronomers their first good value for the Sun's distance.

April Meeting Minutes

By Kevin Bert

An Abbreviated Business meeting of the Northern Cross Science Foundation was held at Unitarian Church North. President Jeff Setzer opened the meeting at 9:15pm and welcomed 22 members and guests. He then covered upcoming events. April 23rd is the 50th anniversary for the Manfred Olsen Planetarium. A sit down dinner with entertainment is scheduled. April 29 and 30 are convention dates for the North Central region of the Astronomical League. Bloomington Normal is the destination. May 29th is our main public kickoff event starting in the afternoon at the Port Washington Street Festival. It continues in the evening at Harrington Beach State Park

May 9th is the Mercury transit but no formal public sessions are scheduled. Individuals are encouraged to conduct their own outreach event.

Chad Andrist presented his latest project for the club's imaging telescope. A controller for a dew chasing system is a real necessity in this part of the country and thanks to Chad for the time he spent making this a reality.

A brat fry fund raising is scheduled during a very favorable time on Saturday July 2nd. The Pick & Save store in German-

town will be ready to go from 10:00 to 3:00 and needs your help. Use your membership roster to contact Jaime Hanson to sign up.

Mickey Kazmierski has NASA 2016 Space Place calendar for interested members.

Jeff closed 9:35 p.m.



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.



Contact Jaime Hanson
astrodad@gmx.com

Jaime Hanson has said traditionally this particular Germantown Pick N Save is extremely busy on that day. Here is an opportunity for our club to do some fund raising!

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!"

If you are interested, please contact Jaime at: astrodad@gmx.com or 414-333-6453

Imagers Report...By Ernie Mastroianni

Ice fishing for photons

A couple of novel structures popped up in the Harrington Beach parking lot on the night of April 15-16. Pair of bright blue Clam tents, more commonly seen on frozen lakes sheltering ice fishermen, were keeping Wally Gersmehl and Chad Andrist warm as their scopes tracked the sky.

Inside their tents, the astrophotographers had portable desks, computers, propane heaters, and a much cozier atmosphere than what I had under the open sky at the Plunkett observatory. Chad and Wally say the tents are easy to set up and unfold quickly when removed from their carry sacks.

But there was a downside. A little after 10, a bright fireball streaked over central Illinois and was seen by observers from Missouri to Wisconsin...but not by us. I probably had my eyes glued to the computer screen. Wally and Chad did not notice, and I did not get a report from Jamie, who was also there, albeit without a tent.

But we did get some nice images, even though a waxing gibbous moon lit up the sky. Despite the glow, the Owl Nebula (M97) and M108 appeared bright against a dark sky. I had not photographed this pair in quite some time and used my unmodified Nikon DSLR to shoot it.

Chad photographed M106 earlier in the month, and with 75 minutes of total exposure through four different filters, captured finely resolved detail in M106 as well as six much dimmer galaxies, all with a small 80mm refractor and a new monochrome astro camera.

Finally, for members who have an interest in imaging, we now have a Nikon camera adapter in the tool chest for anyone who has a Nikon and wants to try DSLR astrophotography. An adapter for Canon DSLRs will be coming soon. Even unmodified DSLR cameras can capture excellent deep sky photos, and the learning curve is much faster. I'll be happy to assist any member who wants to try. And even if you just want to learn how the refractor works, I'm available most clear nights. The best way to reach me is by email: emastroianni@wi.rr.com or emastroianni@discovermagazine.com.



M106 by Chad Andrist



M97 and M108 by Ernie Mastroianni

May General Meeting

May 101 Class... *By Kevin Bert*

“Mars at Opposition“

Mars spends most of the time a great distance from the earth and is often a disappointing sight. However every two years Mars reaches a favorable position for viewing and if you have an interest in the red planet it is time to plan. Get the details on this year's event.

Constellation Of the Month

Leo Minor

Main Program... *by Jamie Hansen*

SETI

SETI (Search for Extraterrestrial Intelligence) is a scientific area whose goal is to detect intelligent life outside Earth. One approach, known as **radio SETI**, uses radio telescopes to listen for narrow-bandwidth radio signals from space. Such signals are not known to occur naturally, so a detection would provide evidence of extraterrestrial technology.

Photographing the Moon Without a Telescope

By Rick Dusenbery

Recently, I purchased a Panasonic Lumix DMC-ZS50, a small 12 megapixel camera with a 30X optical zoom lens. Two years ago, I had bought its predecessor, the ZS40 which had the same 30X zoom lens, but with 18 megapixels. I have always been a fan of small quality pocket cameras with long zoom lens, but of course, that means a very small sensor. If you want a big zoom and big sensor in a camera, you must go up in physical size to either a bridge camera or a full DSLR type. By using a larger sensor, higher ISO values can be used with less digital “noise”. This results in higher sensitivities and better low light performance. So one of the drawbacks of a pocket camera is limiting it to low ISO values (100, 200, 400 or so) to keep noise down, with the resulting decrease in low light capability. One other thing that can be done is to decrease the number of megapixels which results in fewer but larger pixel sites on the sensor. This means better sensitivity with reduced noise (but with a drop in resolution). I looked at a lot of test reports on the two cameras, and the conclusion was that the 12 megapixel ZS50 actually had better image quality than the 18 megapixel ZS40. So when Panasonic brought out the ZS50, they wisely backed off on the megapixel count. It seems that 12 megapixels is the sweet spot for small sensor cameras, but apparently, most people want more megapixels (the more, the better!), so this year Panasonic came out with the latest version of this camera; the ZS60, with the return to 18 megapixels (go figure!). Sort of reminds me of the similar situation with telescopes. Sure, you can buy a cheap 60mm refractor that states “750 power” on the box, but you won’t see much, or anything with it!

At any rate, I had been looking for several clear nights in a row to test my ZS50 using the moon as my test subject. Finally last week, the weather cooperated with four clear nights in a row, starting with the moon at First Quarter on April 14th. I set the camera on Manual with Auto Focus and Image Stabilizer on. Setting the Aperture at a mid value of f 5.6, I took a series of shots at shutter speeds of about 1/100 to 1/400 of a second. I simply held the camera to my eye, (unlike most small cameras, this one had a view finder) without the benefit of a tripod.



All these photos are JPEGs which I downloaded to my computer and made minor adjustments and cropping using Windows Photo Gallery (included free with Windows 7). The photos shown are oriented as viewed straight on with the naked eye or with binoculars (or a telescope with an image-erecting eyepiece).

The first photo is one day after First Quarter and highlights the bright eastern edge of the ray crater Tycho right on the terminator. The large crater Clavius is below but still mostly in shadow. Up above, the Apennine Mountain Range is coming into view. The second photo is one day later. Now Tycho really stands out, with Clavius fully in view with some detail visible on its floor. And coming into view about midway on the terminator is the prominent ray crater Copernicus.

The next step is to try the ZS50 at the eyepiece of my telescope for even closer more detailed photos. Meanwhile, if you have a mega-zoom camera, Try shooting the moon with it. You might be surprised at the results!

RELATED INFO

[An NCSF Welcome to Joel Deutmeyer!](#)



Leaders for Public Viewing

May 29

Port Washington

Kevin Bert

May 29

Astronomy Day

Gene & Charlotte Dupree

June 4

Pike Lake State Park

Gene & Charlotte DuPree

June 4

Harrington Beach

Leaders Needed

June 5

Harrington Beach

Leaders needed

June 10

Harrington Beach

Gene and Charlotte DuPree

June 11

Harrington Beach

Leaders Needed

Observatory Notice

Dan Bert\Observatory Director

We need a few individuals to help stain observatory timbers and paint doors for the end of May. The date hasn't been set yet.

Contact me at: dbert64@gmail.com or 262-357-1973

Star Parties!

WOW

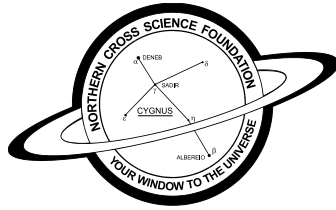
June 2nd through 5th
Hartman Creek State Park
www.new-star.org

NORTHWOODS STARFEST 2016

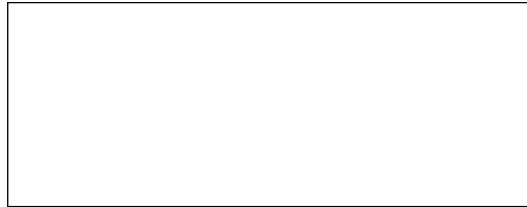
Hobbs Observatory
Beaver Creek Reserve
Fall Creek, Wisconsin
August 5-7, 2016

www.cvastro.org

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**Jim & Gwen Plunett
OBSERVATORY**



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Mars Opposition - May 22nd

Starting in May, Mars invades the evening skies of the Earth, as it heads towards opposition on May 22nd. Not only does this place Mars front and center for prime time viewing, but we're headed towards a cycle of favorable oppositions, with Mars near perihelion, while Earth is near aphelion.

Not all oppositions of Mars are created equal. Mars orbits the Sun once every 687 days, and Earth catches up to Mars about once every 26 months. The oppositions of Mars follow a roughly 15 year period from one favorable cycle to the next.

Mars will appear 18.6" in size at closest approach, the largest we've seen since 2005. The 2014 opposition only reached 15.2", and the next one on July 27th, 2018 approaches the historic 2003 opposition within an arc second, featuring Mars as a 24.3" disk.

Mars starts off the month of May rivaling Jupiter (which passed opposition on March 8th) at magnitude -1.5. The planet then reaches a brilliant magnitude -2.1 on the night of opposition, and doesn't drop back down below magnitude -1 until June 28th.



Billboard...By Rob Powell

Have you seen this mural? About ten years ago, an artist approached B&E General Contractors, and asked to create a billboard mural on the side of one of their properties. The company kept no records about the identity of the artist, but recalls that they reimbursed him about \$200 for the materials. The building can be seen when exiting I-43 at Green Bay Avenue (southbound), and looking west.

SPECTRUM

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NCSF supports the **International Dark Sky Association**

This Issue, along with back Issues of SPECTRUM, can be found on the NCSF Web Site.
<http://www.ncsf.info>

Spectrum Newsletter
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Please send your Questions, Suggestions, Articles, and photos to:
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