

SPECTRUM

Northern Cross Science Foundation Newsletter

December 2016

Looking Up

December 1, Thursday

General Meeting

7:30 p.m.
Business Meeting
Board Elections



Holiday Potluck Party!
(Bring a dish)

**And White Elephant
Gift Exchange!**
(See Pg-3)



December 15, Thursday

Board Meeting

7:30 p.m.
Jeff Setzer Home

Scheduled Public Viewing for Winter, 2017.

January 21, Saturday

Candlelight Snowshoe Hike

6:00p.m. - 9:00 p.m.
Horicon Marsh

February 4, Saturday

Candlelight Ski & Hike

6:00 p.m. - 9:00 p.m.
Harrington Beach

February 11, Saturday

Candlelight Ski & Hike

6:00 p.m. - 9:00 p.m.
Pike Lake State Forest

"Super Moon" of November 14th was the Largest Since 1948" By Guy Pirro



Seen from the roof of the Memorial Library on the University of Wisconsin - Madison campus, a Super Moon rises in the nighttime sky behind the "Wisconsin" statue atop the dome of the Wisconsin State Capitol. (Image Credit: Jeff Miller - University Communications, UW - Madison)

The full Moon has a reputation for trouble. It raises high tides, it makes dogs howl, it wakes you up in the middle of the night with beams of moonlight stealing through drapes. If a moonbeam wakes you up on the night of November 14th, 2016, you might want to get out of bed and take a look. November's full Moon was a "Super Moon," and is as much as 14 percent bigger and 30 percent brighter than other full Moons of 2016.

The scientific term for the phenomenon is "Perigee Moon." Full Moons vary in size because of the oval shape of the Moon's orbit. The Moon follows an elliptical path around Earth with one side (perigee) about 50,000 km closer than the other (apogee). Full Moons that occur on the perigee side of the Moon's orbit seem extra big and bright. Such will be the case on November 14, 2016, when the Moon reaches perigee.

Okay, the Moon appears 14 percent bigger than usual, but can you really tell the difference? It's tricky -- There are no rulers floating in the sky to measure lunar diameters. Hanging high overhead with no reference points to provide a sense of scale, one full Moon can seem much like any other.

The best time to look is when the Moon is near the horizon. For reasons not fully understood by astronomers or psychologists, low-hanging Moons look unnaturally large when they beam through trees, buildings, and other foreground objects.

Folklore holds that all kinds of wacky things happen under the light of a full Moon. Supposedly, hospital admissions increase, the crime rate ticks upward, and people behave strangely. The idea that the full Moon causes mental disorders was widespread in the Middle Ages. Even the word "lunacy," meaning "insanity," comes from the Latin word for "Moon."

The majority of modern studies, however, show no correlation between the phase of the Moon and the incidence of crime, sickness, or human behavior. The truth is, the Moon is less influential than folklore would have us believe.

It's true that a perigee full Moon brings with it extra-high "perigean tides," but according to the National Oceanic and Atmospheric Administration (NOAA) this is nothing to worry about. In most places, lunar gravity at perigee pulls tide waters only a few centimeters (an inch or so) higher than usual. Local geography can amplify the effect to about 15 centimeters (six inches) -- not exactly a great flood.

Super perigee Moons are actually fairly common. The Moon becomes full within a few hours of its closest approach to Earth about once a year on average.

Nevertheless, there is something particularly noteworthy about this month's Super Moon. During the moment of perigee, the centers of the Earth and Moon will be only 221,524 miles apart. That is the closest approach of the Moon to the Earth in over 68 years. Moreover, there will not be a closer one for another 18 years.

During the last closer perigee, on January 26, 1948, the Earth and Moon were separated by only 221,495 miles. They were just 29 miles closer
(Con't on Pg4)

November Meeting Minutes

The Northern Cross Science Foundation was held at the GSC Technology Center in Germantown. President Jeff Setzer opened the meeting at 8:05pm and welcomed 16 members and guests. He said that the long public viewing season was now over and asked for standard reports.

Treasurer Gene DuPree tells the membership that the regular accounts balance is \$10309.80 and the observatory account balance remains at \$1,042.01. He says that 2017 calendars are still available for \$8.00.

Secretary Kevin Bert reports that there were no changes in the club roster. The Astronomical League regional convention will be in Rochester Minnesota on April 21-23.

Dan Bert reports that all is well out at the Observatory as the public viewing evenings are finished for the year. Observatory director Dan Bert will be preparing a final report for the 2016 year on the Observatories activities for the Park.

Jeff Setzer said that he was contacted by a boy scout group in Grafton about an astronomy talk to start off a possible merit badge. Jeff said he was willing to present an astronomy program but was going to inquire about the specific vision and expectations after a presentation. Jeff asked for names of those interested in pooling resources to assist in a scout merit badge. Rick Dusenbery expressed an interest being that he was a scout years back in Grafton. Char-

lotte Dupree and Kevin Bert also were willing to help.

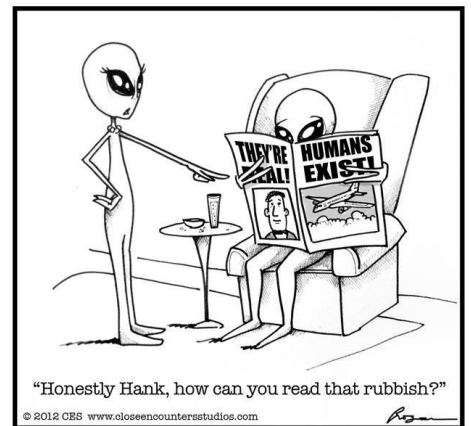
Jeff Setzer explained that there are a total of seven board of directors. Each serves a three year term when elected. When board members meet for the first time they settle on the officer positions among themselves. There are three board members whose term will expire at the end of December. Rick Kazmierski, Gene DuPree and Joyce Jentges who was appointed by the board to fill out the term of Jack Heisler who resigned from the board due to health reasons. Jeff opened nominations for the board of directors. Rick Kazmierski nominated Joyce Jentges, Charlotte DuPree seconded and Joyce accepted. Aris Penikis nominated Rick Kazmierski, Nolan Zadra seconded and Rick accepted. Rick Kazmierski nominated Gene DuPree, Joyce Jentges seconded and Gene accepted to run. Joyce Jentges nominated Rick Dusenbery and Rick declined to run. With no other nominations Kevin Bert made a motion to close nominations, Gene DuPree seconded and with unanimous consent Jeff closed nominations. He reminded members that nominations would again be open prior to next month's election.

Jeff encouraged all members to attend the December Meeting. Being the only required meeting for election of board members, it is also the meeting we have our holiday party. Members should bring a snack, dessert or dish to pass and the club will provide soft drinks and partyware. We will continue with the successful White Elephant gifts with those members that would like to participate. No

formal program is scheduled to allow plenty of time for socializing.

Rick Dusenbery commented on a letter he received from Joe Timmerman after visiting his Observatory in Hayward. Joe was impressed with our newsletter and amount of activity our club members are involved with. It is nice to know what other astronomy members think of our operation.

Jeff covered upcoming 2017. January 21st is a Candlelight Ski & Hike at Horicon Marsh, February 4th is a Candlelight Ski & Hike at Harrington Beach State Park with the following week another Candlelight Ski & Hike at Pike Lake State Park. All events are well attended if the weather is good and having some members telescope available would be appreciated. With no further business Jeff closed the meeting at 8:35 pm.



Triangulum Galaxy By Ernie Mastroianni

When seen through a telescope, the face-on spiral galaxy M33 can be a disappointment due to its large size and low surface brightness, especially after viewing its spectacular neighbor, the Andromeda galaxy.

But M33, also known as the Triangulum Galaxy, photographs quite well and is a popular fall target for astrophotographers in the northern hemisphere. The galaxy is a member of our local group, nearly 3 million light years distant and about 50,000 light years across. That's far less than the vast 220,000-light year expanse of Andromeda, and about half the size of our own Milky Way galaxy.

The distinctly red ionized hydrogen clouds are star making factories and stand out sharply in this view. The largest of them (on the galaxy's right side) is NGC-604, discovered by William Herschel in 1784. It spans nearly 1,500 light years, dwarfing the 24 light year expanse of our own Orion Nebula.

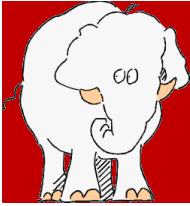
This photo, by Northern Cross club members Nolan Zadra and Chad Andrist, is a

composite of 40 individual exposures of 3 minutes each, taken at the Plunkett Observatory on November 4-5. They used the

club's 5-inch refractor and SBIG 8300 color camera. Processing was by Andrist.



By Nolan Zadra and Chad Andrist



White Elephant Exchange

Entertainment at it's very best! Will this be your year to join in? The more the merrier!

*A White Elephant gift is something lurking around in your astronomy closet gathering dust or the book shelves loaded with books. Do you have drawers loaded with charts and maps?

Or... perhaps, in your travels, you see something funny or yummy, the imagination soars! This is for entertainment and not gain, so we all have a great time

1. Bring an *astronomy-themed, wrapped gift!
2. When the gifts arrive we will have numbers attached to them with matching numbers in a hat.
3. One by one, each participant will draw their prize number and open it to the oohs and ahhs of all present.



Dimming Stars, Erupting Plasma, and Beautiful Nebulae

By Marcus Woo

Boasting intricate patterns and translucent colors, planetary nebulae are among the most beautiful sights in the universe. How they got their shapes is complicated, but astronomers think they've solved part of the mystery—with giant blobs of plasma shooting through space at half a million miles per hour.

Planetary nebulae are shells of gas and dust blown off from a dying, giant star. Most nebulae aren't spherical, but can have multiple lobes extending from opposite sides—possibly generated by powerful jets erupting from the star.

Using the Hubble Space Telescope, astronomers discovered blobs of plasma that could form some of these lobes. "We're quite excited about this," says Raghvendra Sahai, an astronomer at NASA's Jet Propulsion Laboratory. "Nobody has really been able to come up with a good argument for why we have multipolar nebulae."

Sahai and his team discovered blobs launching from a red giant star 1,200 light years away, called V Hydrae. The plasma is 17,000 degrees Fahrenheit and spans 40 astronomical units—roughly the distance between the sun and Pluto. The blobs don't erupt continuously, but once every 8.5 years.

The launching pad of these blobs, the researchers propose, is a smaller, unseen star orbiting V Hydrae. The highly elliptical orbit brings the companion star through the outer layers of the red giant at closest approach. The companion's gravity pulls plasma from the red giant. The material settles into a disk as it spirals into the companion star, whose magnetic field channels the plasma out from its poles, hurling it into space. This happens once per orbit—every 8.5 years—at closest approach.

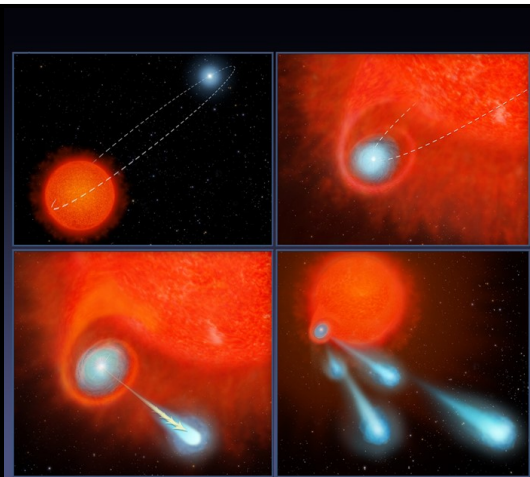
When the red giant exhausts its fuel, it will shrink and get very hot, producing ultraviolet radiation that will excite the shell of gas blown off from it in

the past. This shell, with cavities carved in it by the cannon-balls that continue to be launched every 8.5 years, will thus become visible as a beautiful bipolar or multipolar planetary nebula.

The astronomers also discovered that the companion's disk appears to wobble, flinging the cannonballs in one direction during one orbit, and a slightly different one in the next. As a result, every other orbit, the flying blobs block starlight from the red giant, which explains why V Hydrae dims every 17 years. For decades, amateur astronomers have been monitoring this variability, making V Hydrae one of the most well-studied stars.

Because the star fires plasma in the same few directions repeatedly, the blobs would create multiple lobes in the nebula—and a pretty sight for future astronomers.

If you'd like to teach kids about how our sun compares to other stars, please visit the NASA Space Place: <http://spaceplace.nasa.gov/sun-compare/en/>



This four-panel graphic illustrates how the binary-star system V Hydrae is launching balls of plasma into space. Image credit: NASA/ESA/STScI

RELATED INFO

Leaders for Public Viewing

January 21, Saturday

Horicon Marsh

DuPree's

February 4, Saturday

Harrington Beach

DuPree's

February 11, Saturday

Pike Lake State Forest

DuPree's

"Election Notice"

The December General Meeting will include the election to fill three open Board member positions.

Meet an Astronaut!

By Joyce Jentges

Spaceport Sheboygan is hosting Astronaut Col. Jeffery Williams on December 3. Admission is \$5.00 and you can choose from two different times:

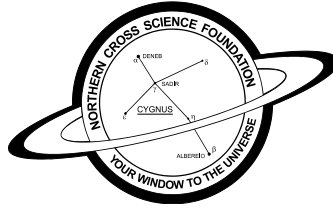
10:00-11:30 or 1:30-3:00. Call 210-595-0725 for tickets or look up their Facebook page. Spaceport Sheboygan is in Sheboygan next to Blue Harbor.

Calendars

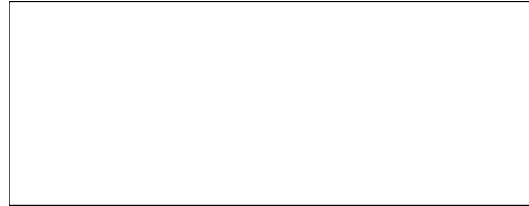
The DuPree's have 2017 Astronomy Magazine calendars for sale for \$8, while the supply lasts. See Gene or Charlotte at the next General Meeting. You can't beat the price!



SPECTRUM
5327 Cascade Drive
West Bend, WI 53095



Jim & Gwen Plunkett
OBSERVATORY



2016 Board of Directors

President - Jeff Setzer
1418 Trillium CT
West Bend, WI 53095
262-338-8614
astrosetz@hotmail.com

Vice-President - Rick Kazmierski
262-305-1895
rickkaz@charter.net

Secretary - Kevin Bert
2292 Ridgewood Road
Grafton, WI 53024
262-674-0610
kevin.bert@hotmail.com

Treasurer - Gene DuPree
6219 Jay St.
Myra, WI 53095
262-675-0941
grdupree@charter.net

Dan Bert - Observatory Director
262-357-1973
1517 Green Valley Rd.
Grafton, WI 53024
dbert64@gmail.com

Jaime Hanson
6927 W Springdale Ct.
Mequon, WI 53072
414-333-6453
astrodad@gmx.com

Joyce Jentges
336 N Main Street, Apt.3
Cedar Grove, WI 53013
262 483- 4270
joycejentges@hotmail.com

(Con't from Pg1)

together. The next time the perigee is closer than this month's will be on November 25, 2034, when they will be only 221,486 miles apart -- 39 miles closer together than they will be this month. Both of those occasions qualify as Super Moons.

On November 14, the Moon is at perigee at 6:21 AM EST. The Full Moon occurs at 8:52 AM EST -- just an hour and a half later. Incidentally, the Moon at that moment will have set below the horizon for most of the United States. Only on the West Coast will it still be above the horizon.



Just in case you didn't see the SuperMoon.
A tortilla in the window works great!

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.

Monthly Meeting Information

7:00 p.m. Astronomy 101 Mtg.
7:30 p.m. Main Program
Location at the -

GSC Technology Center
W189 N11161 Kleinmann Dr
Germantown, WI 53022

Spectrum Newsletter
5327 Cascade Drive
West Bend, WI 53095

Please send your Questions, Suggestions, Articles, and photos to:
rickkaz@charter.net