

SPECTRUM

Northern Cross Science Foundation Newsletter

July 2013

LOOKING UP

PLEASE NOTE:

Due to July 4th Holiday, our July General Meeting will be held on Thursday, July 11th.

July 9, Tuesday

Family Fun Night

5:00 - 10:00 p.m.

Horicon Marsh

July 11, Thursday

General Meeting

7:00 p.m. - Astronomy 101

7:30 p.m. - Main Program

Business Meeting to follow

July 12 & 13, Fri-Sat

Public Observing

8:00 p.m.

Harrington Beach

July 13, Saturday

Public Observing

8:00 p.m.

Pike Lake

July 17, Wednesday

Sidewalk Astronomy

7:00 p.m. - 10:00 p.m.

Bayshore Town Center

July 18, Thursday

Board Meeting

7:30 p.m.

Home of Jeff Setzer

July 20, Saturday

Public Viewing

8:00 - 11:00 p.m.

Horicon Marsh

July 27, Saturday

Sun-Day on Saturday

2:00 pm

Home of Kevin Bert

(See details, page .4)

Iridium Satellite Flares by Rick Kazmierski

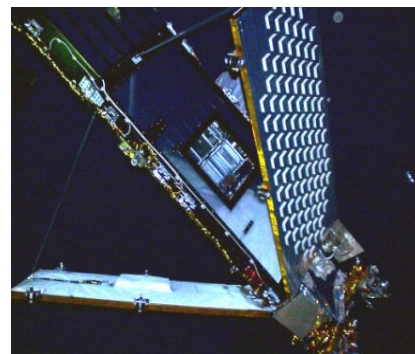
Iridium Satellites are relatively small communication satellites which have been providing spectacular visible reflective flares to observers on the ground for years. These flares can be spectacular. The amateur astronomer, with predictions in-hand, can look like a magician to the uniformed public when he announces the coming of a flare and it magically appears in the sky.

Iridium Satellites

The **Iridium satellite constellation** is a large group of satellites providing voice and data coverage to satellite phones, pagers and integrated transceivers over Earth's entire surface. Iridium Communications Inc. owns and operates the constellation and sells equipment and access to its services. It was originally developed in 1992, and subsequently implemented in October of 1999.

The constellation consists of 66 active satellites in orbit, and additional spare satellites to serve in case of failure. Satellites are in low Earth orbit at a height of approximately 485 mi (781 km) and inclination of 86.4°. Orbital velocity of the satellites is approximately 17,000 mph (27,000 km/h). The satellites orbit from pole to

main bus. The forward antenna faces the direction the satellite is traveling. Occasionally, an antenna reflects sunlight directly down at Earth, creating a predictable and quickly moving illuminated spot on the surface below of about 10 km diameter. To an observer this looks like a bright flash, or flare in the sky, with a duration of a few seconds.



Ranging up to -8 magnitude (rarely to a brilliant -9.5), some of the flares are so bright that they can be seen in the daytime; but they are most impressive at night. This flashing has caused some annoyance to astronomers, as the flares occasionally disturb observations and can damage sensitive equipment.

When not flaring, the satellites are often visible crossing the night sky at a typical magnitude of 6, similar to a dim star.

Flare Prediction Programs

The flares/glints can now be predicted. - operational Iridium satellite maintains its axial and longitudinal position to within very close tolerances. Knowing the satellite's position, its orientation, the relative Sun angle to the satellite, the reflective properties of a mirror and the observers position on Earth, a program can be developed to calculate the projected specular reflection of the Sun from the Main Mission Antennas to an observer. Several free web based programs are available and allow for the accurate prediction of Iridium flares for a specific location and time. They also provide additional data on other satellites, including the ISS (International Space Station).

www.calsky.com

www.heavens-above.com



pole with an orbit of roughly 100 minutes. This design means that there is excellent satellite visibility and service coverage at the North and South poles, where there are few customers.

Why They Flare

The Iridium communication satellites have a peculiar shape with three polished door-sized antennas, 120° apart and at 40° angles with the

June Meeting Minutes

By Dan Bert

The June Business meeting of the Northern Cross Science Foundation was held at Unitarian Church North. Secretary Kevin Bert opened the meeting at 8:40pm and welcomed 13 members and guests. With many members at WOW, Kevin gave the treasurers report with the balance in the checkbook at \$11,450.80 and \$1,055.06 in the observatory account with upcoming league dues to pay. As secretary he introduced the most recent member, Larry Flamm and his wife Marie from Mequon.

A NCRAL 2014 update was given by Mickey reporting we will have Vivian Hoette from Yerkes as speaker for the convention. No new business was discussed on the imaging committee, only that another meeting would be set soon to summarize the current status.

Bob Radtke reported on his recent outing at Bayshore, having shared sidewalk astronomy with individuals from China, Saudi Arabia and Brazil! Observatory director Dan Bert mentioned leaders are needed for the next observatory event July 12th and 13th.

The plaque recognizing our supporting

members has also been updated for 2013 and is now on display (see insert in newsletter for these members). Dan also reported the May 26th open house cleared up for over 50 visitors to solar view in the afternoon.

Under new business, Kevin mentioned several members had the opportunity to get hands on with the 40" and took part in some cleaning at Yerkes Observatory. To protect this astronomical treasure it was hoped that Yerkes be made a national historic site / monument.

Kevin stated the July meeting would most likely be rescheduled as the first Thursday is July 4th. Look to the upcoming newsletter for the exact date.

Al Steinberg reported at the June 1st Pike Lake event with the help of Gene & Charlotte and Jeff viewing took place under partly cloudy skies. The following day Al setup at the beach to view Jupiter, Venus and Mercury but due to 40 deg. temps only 2 people showed up to view. Lastly an update on the binocular mounts was requested. Kevin reported with fab drawings relocated, a drill press acquired and machine time on the mill at his work looking available, some of the more involved machined parts should be completed this month.

OBSERVATORY PLAQUE

After finalizing the membership roster for 2013 the board has updated the observatory plaque that recognizes the Supporting Members that voluntarily pay higher dues to support the activities of the Northern Cross. The board of Directors would like to thank all the supporting members for their generosity toward the club and encourage all members to check out the plaque next time they are out at Harrington Beach.

David Drapes

Richard Kessler

Rob Powell

Dan Rasch

Rich Sauve

Alan Steinberg

Dave Wierzba

Jerry Kohlmann Jr.

William Large

Mark Hirschmann

Scott Nehring

Deborah Kern

Things to See In the July 2013 Night Sky By Don Miles

Mercury: Closely follows the setting Sun early in the month setting about 9:30pm, and is working its way around the "front" side of the Sun. It's at (mag 3.2) early in the month, but after passing in front of the Sun (so not visible during mid-month), will then lead the Sun as a morning object. On the morning of the 30th, Mercury will be at its "greatest western elongation", meaning it's as far from the Sun to the West as it will get this time around before slipping towards the Sun again, and will have brightened to (mag -0.1).

Venus: Also closely follows the Sun, but unlike Mercury, remains an evening object setting about (10/9:45pm). Venus (mag -3.9) stays about the same distance behind the Sun this whole summer until early fall, then it falls further behind and stays up later in the evening.

Saturn: Is highest in the sky as the Sun is setting, and will set about (2:30am/12:30am). It's still between the constellations Libra & Virgo, and stays put this month. This seems to be the most asked for object at any public event, so if you haven't seen it for a while (or ever), you owe it to yourself to take it in as it's still high in the sky. It's an amazing sight to see for yourself live, and an easy one at (mag 0.5), so you don't need anything but the most modest of scopes. The size

of the scope isn't as important as is the ability to hold whatever you use still.

Pluto & Neptune: Pluto is already up at sunset, transits at (12:30am/11pm), and remains in Sagittarius. It's still a faint target at (mag 14.0), but July is your best chance to see Pluto, as it's highest in the sky now.

Neptune (mag 7.9) is a much easier target, and rises about (11:30pm/9:30pm). It will transit right before sunrise early in the month, and by about 3am late in the month. **Uranus:** Rises about (1am/11pm), and is at (mag 5.8) in the constellation Pisces. It's a tiny target (3.6"), but compared to Pluto, this is a cake-walk.

Mars & Jupiter: After being absent from the skies since late spring, Mars returns as a morning object. It's at (mag 1.5) now, and rises at (4:15/3:45am) in the constellation Taurus. Jupiter (mag -1.9) is also now a morning object, rising shortly after Mars (5/3:30am) in the constellation Gemini. Jupiter will now be visible in the night sky for the rest of the year. As a bonus for those willing to get up early and get your scopes set up... The two planets will pass within three quarters of a degree of each other on the morning of the 22nd. Jupiter will be below Mars, and will be the brighter of the two.

Moon:

July 7th: New Moon

July 15th: First Quarter

July 22nd: Full Moon

July 29th: Last Quarter

Special Events:

There is only one marginal meteor shower this month that won't be completely washed out by the Moon. These are the Southern Delta-Aquarids, which will peak the night of the 27th with estimated peak rates of about 20/hr. The last quarter moon rises at about 11pm, so these won't be as good as they could be either. Enjoy the summer warmth.

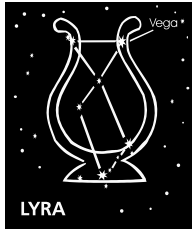


July General Meeting

101 Class... with Kevin Bert

The Astronomy 101 class for July is entitled "The Celestial Yardstick."

There are two observations required in the Universe Sampler to make simple naked eye angular measurements between the stars. The Celestial Yardstick is much more accurate method to obtain angular readings. Lets explore the details of the units of measurement and the simple device.



Constellation of the Month: **Lyra**

Main Program... with Jeff Setzer

Jeff will be presenting on his experiences at "Yerkes Observatory"

In particular, he will discuss the recent cleaning of this historic instrument by members of the amateur astronomy community.



June Events

Solar Viewing June 1st

Reported by Gene DuPree

Gene & Charlotte DuPree were joined by Jeff Setzer and Al Steinberg for this solar day at Pike Lake. Although the day started with skies a bit mushy, it did clear. An estimated 75 visitors were able to view Prominences and Sunspots.

Bayshore Towne Center June 13th

Reported by Jeff Setzer

Due to poor weather on June 12th, this scheduled event was rescheduled for the following night with far better conditions. Several members helped show the Moon and Saturn to a steady crowd of roughly 100 people in total. The July 17th event needs volunteers, as does the August 14th event, as I will be unavailable on both nights. Please let me know if you can commit on one or both nights.

LaLawrann Summer Solstice June 23

Reported by Jeff Setzer

Jeff Setzer represented the NCSF and showed the Sun through his PST during the four hour event. It was very sunny and hot, which made for a lot of conversation about the Sun and how it heats our planet. Approximately 30 visitors and volunteers looked through the telescope.

Cassini to Photograph Earth From Deep Space...NASA

On July 19, 2013, NASA's Cassini spacecraft will photograph Saturn and its entire ring system during a total eclipse of the sun. Cassini has done this twice before during its previous 9 years in orbit, but this time will be different..

"This time, the images to be collected will

capture, in natural color, a glimpse of our own planet next to Saturn and its rings on a day that will be the first time Earthlings know in advance their picture will be taken from a billion miles away," says Carolyn Porco, Cassini imaging team lead at the Space Science Institute in Boulder, Colorado.



Earth will appear as a small, pale blue dot between the rings of Saturn. The entire system is too big for Cassini to capture in a single snapshot, so the spacecraft will create a mosaic, or multi-image portrait.

Cassini will start obtaining the Earth part of the mosaic at 2:27 p.m. PDT (5:27 p.m. EDT or 21:27 UTC) and end about 15 minutes later, all while Saturn is eclipsing the sun from Cassini's point of view. The spacecraft's unique vantage point in Saturn's shadow will provide a special scientific opportunity to look at the planet's rings. At the time of the photo, North America and part of the Atlantic Ocean will be in sunlight.

"While Earth will be only about a pixel in size from Cassini's vantage point 1.44 billion kilometers away, the team is looking forward to giving the world a chance to see what their home looks like from Saturn," says Linda Spilker, Cassini project scientist at NASA's Jet Propulsion Laboratory in Pasadena, Calif. "We hope you'll join us in waving at Saturn from Earth, so we can commemorate this special opportunity."

RELATED INFO

New Members

NCSF Welcomes New Club Members

Larry and Marie Flamm

Mequon

Leaders for Public Viewing

July 9

Horicon Marsh

Gene and Charlotte DuPree

July 12

Harrington Beach

Leaders Needed

July 13

Harrington Beach

Leaders Needed

July 13

Pike Lake State Forest

Gene and Charlotte DuPree

July 17

Bayshore Towne Center

Jeff Setzer

July 20

Horicon

Gene and Charlotte DuPree

STAR PARTIES - 2013

Northwoods Starfest

August 9 - 11th

Hobbs Observatory

Fall Creek, WI

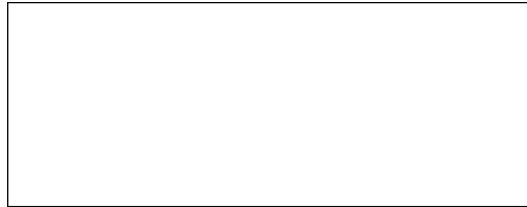
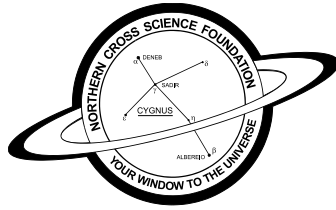
www.cvastro.org

Jim and Gwen Plunkett Observatory



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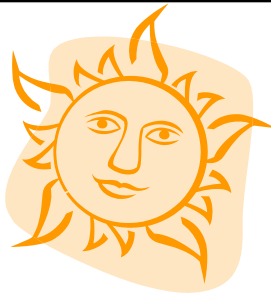
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Sun-Day on Saturday ...by Kevin Bert

July 27th is the date set for this year's Sun-Day on Saturday members' event at my home in the town of Grafton. Solar activity is on the rise and a relaxed setting away from a public setting gives members a chance to spend time conversing while enjoying the sights of our nearest star. This will be another opportunity to view through the Coronado and a variety of the members' sun viewing telescopes. I will give a demonstration on how to set up and operate the club's Coronado for those that are interested in using it in the future, at 2:30. The event will start at 2:00 pm and you can park on the lawn as in other years to set up your own telescopes any time after 2:00 pm.

This is a member's family event that combines leisurely solar viewing with a picnic type atmosphere. I will provide soft drinks and snacks throughout the day. Feel free to come and go as you please, as we will view into the evening if there is an interest. Those that plan to be here at 5:00 pm. and would like to stay and eat should bring a dish to pass. I will provide soft drinks and your choice of sloppy Joes or brats. Please bring a lawn chair too.

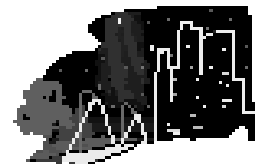
If it is raining, the event will be cancelled. If cloudy, you can still come to eat and talk astronomy as I will still give the Coronado demo. My address is on the back cover of the Spectrum. If in doubt of conditions or in need of directions, call me at 375-2239. I hope to see you there.

SPECTRUM

Is published by the Northern Cross Science Foundation, Inc. A nonprofit organization based in the state of Southeastern Wisconsin and is a Member of the North-Central Region of the Astronomical League.



The NCSF supports the International Dark sky association.



Send inquiries to:

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This Issue, along with back Issues of SPECTRUM, can be found on the NCSF Web Site.

<http://www.ncsf.info>

Monthly Meeting Information

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