

SPECTRUM

Northern Cross Science Foundation Newsletter

September 2014

Looking Up

September 3, Wednesday

Public Viewing

7:00 p.m.

Bayshore Town Center

September 4, Thursday

General Meeting

7:00 p.m. - Astronomy 101

7:30 p.m. - Main Program

September 13, Saturday

Community Campfire

6:00 p.m.

Pike Lake State Forest

September 18, Thursday

Board Meeting

7:30 p.m.

Home of Jeff Setzer

September 20, Saturday

After Summer Hike

7:00 p.m.

Harrington Beach State Park

September 26, Friday

Public Viewing

7:00 p.m.

Harrington Beach State Park

September 27, Saturday

Public Viewing

7:00 p.m.

Harrington Beach State Park

October 1, Wednesday

Public Viewing

7:00 p.m.

Bayshore Town Center

The Lake Moon Festival...by Joyce Jentges



Photo's Courtesy of Dan Bert

Northern Cross recently was invited to a festival in Mequon called the Lake Moon Festival. This was a new festival on the bluff of Concordia College which featured an eclectic mix of activities. One of the activities was a run/walk, another was kite flying. They also had bands playing and artists creating paintings at different spots. Then of course, our members showed up with telescopes, big and small. We had a great time showing people the Sun and the Moon, Saturn and Alberio at night. Even though we were quite a distance away from the hub of activity, we generated a lot of interest. There was an almost constant stream of families of all ages who stopped for a glimpse of our celestial treats. People were fascinated by the Sun, despite some clouds. The Coronado SolarMax 90 was available as were several member scopes equipped with solar filters. Festival organizers estimated about 2,000 attendees. This turned out to be a fantastic event to introduce people to our group and

invite them out to a scheduled observatory event.

As night time approached many families returned as the full Moon rose over a picturesque

Lake Michigan. Before we knew what happened we were bombarded with visitors. At one point I counted 25 people in line to look at Saturn through Rob Powell's scope. People were stopping us as we were packing up to see if they could still get a look through a scope.

Being a new festival there are usually kinks to be worked out. There was only one food vendor which had very long lines and ran out of food. I know there were a few of us who left the festival without eating dinner due to the long food lines. Organizers have already said that they plan to have more food vendors next year. Another thing I had an issue with; that there was one grouping of Port-a-potties which were quite a distance away. It gave new meaning to having to plan in advance, if you know what I mean. While we liked the spot they gave our group this year because it was close to parking and right on the bluff, it would be nice to be a little closer and have some facilities closer. The NCSF has already committed to being at this event next year. We look forward to another great day of astronomy outreach which will hopefully draw more visitors to the observatory.



Meteorological Versus Astronomical Autumn—What's the Difference?

National Oceanographic and Atmospheric Administration

September 23, 2014 is officially the first day of autumn according to what the calendar tells us. That is the beginning of astronomical autumn. However, in the meteorological and climatological world, autumn will already be in full swing for 23 days. So why do meteorological and astronomical autumn start on different days? In short, it is because the astronomical seasons are based on the position of the Earth in relation to the sun, whereas the meteorological seasons are based on the annual temperature cycle.

People have used observable periodic natural

phenomena to mark time for thousands of years. The natural rotation of the Earth around the sun forms the basis for the astronomical calendar, in which seasons are defined by two solstices and two equinoxes. Both the solstices and equinoxes are determined based on the Earth's tilt and the sun's alignment over the equator. The solstices mark the times when the sun's annual path is farthest, north or south, from the Earth's equator. The equinoxes mark the times when the sun passes directly above the equator. In the Northern Hemisphere, the summer solstice falls on or around June 21, the winter

Continued on Pg 2

August Meeting Minutes

By Secretary Kevin Bert

The August 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 28 members and guests. He exclaimed that August is already here and the summer is flying by. He then asked for standard reports.

There was no Treasurer report so Secretary Kevin Bert reports that the membership is at 65 with the newest members Dick & Suzanne Kaehler. He forwarded funds from the Observatory donation jar that was delivered by Rob Powell. There was no new Astronomical League information.

Observatory Director Dan Bert noted that the August 29th date is in need of a leader.

Kevin Bert announced that he received delivery of the Imaging committee's Celestron CGE Pro mount. He has it assembled and is checking that it is in good working order. It will later be moved to the Observatory and the next phase of purchasing a wide field refractor will begin.

Under New Business 2015 Astronomy Calendars are available for interested members. See Charlotte DuPree while they last. The price is a low \$8.00.

Jeff Setzer covered upcoming events for August. This Saturday at Concordia is the first annual Lake Moon Festival. Set up will be next to the southern parking lot overlooking the lake and starts at 4:00 pm. The 16th is an evening at Horicon Marsh Visitor Center. 22-24 is the Northwoods Starfest held near Fall Creek. The 29th is a

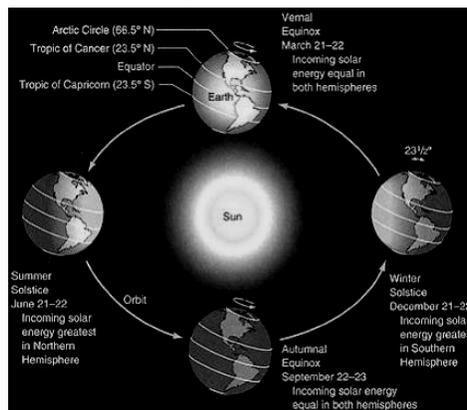
PVN at Harrington Beach. The 30th is a viewing night at the Reuss Ice Age Center in Dundee. The day before our next meeting is a sidewalk astronomy night at Bayshore. It was asked if a date had been set for a viewing night at the Bog. It has yet to be scheduled but expect it sometime in September or October.

Mickey Kazmierski completed a successful moon phase project with children during the main program and reports that next month the special children's class will be Telescopes/Time Machines.

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

MVAA Continued from Pg 1

solstice on or around December 22, the vernal (spring) equinox on or around March 21, and the autumnal equinox on or around September 22. These seasons are reversed but begin on the same dates in the Southern Hemisphere.



Because the Earth actually travels around the sun in 365.24 days, an extra day is

needed every fourth year, creating what we know as Leap Year. This also causes the exact date of the solstices and equinoxes to vary. Additionally, the elliptical shape of the Earth's orbit around the sun causes the lengths of the astronomical seasons to vary between 89 and 93 days. These variations in season length and season start would make it very difficult to consistently compare climatological statistics for a particular season from one year to the next. Thus, the meteorological seasons were born.

Meteorologists and climatologists break the seasons down into groupings of three months based on the annual temperature cycle as well as our calendar. We generally think of winter as the coldest time of the year and summer as the warmest time of the year, with spring and fall being the transition seasons, and that is what the meteorological seasons are based on. Meteorological spring includes March, April, and May; meteorological summer includes June, July, and August; meteorological fall includes September, October, and November; and meteorological winter includes December, January, and February. These seasons were created for meteorological observing and forecasting purposes, and they are more closely tied to our monthly civil calendar than the astronomical seasons are. The length of the seasons is also more consistent for the meteorological seasons, ranging from 90 days for winter of a non-leap year to 92 days for spring and summer.

By following the civil calendar and having less variation in season length and season start, it becomes much easier to calculate seasonal statistics from the monthly statistics, both of which are very useful for agriculture, commerce, and a variety of other purposes.

Things to See In the September 2014 Night Sky By Don Miles

Mercury: Is now trailing the setting Sun, and sets only about an hour after sunset. It's at (-0.2 mag.), but because it's in the evening twilight; it will not stand out like it would if it was in a dark sky. The evening of the 21st is its Greatest Eastern Elongation.

Saturn, Mars, & Pluto: Both also closely follow the setting Sun, and Saturn (0.6 mag) is the first to set, doing so by about (10:30pm/8:30pm) and remains in the constellation Libra. Mars (0.6 mag) sets by about (10:30/9:45pm), but moves across a respectable area of the sky. It also starts the month in the constellation Libra below and to the left of Saturn by less than 5-1/2 degrees, and works its way eastward thru the top of Scorpius, and into the constellation Ophiuchus. It will actually end the month about 3 degrees above the similar colored but brighter star Antares (mag 0.9). Pluto is already up at sunset at (14.1

mag), and still in the constellation Sagittarius. It will be highest in the sky around (9pm/sunset), and will set around (1:30am/11:30pm).

Neptune & Uranus: Neptune is already up and in the constellation Aquarius as the Sun is setting, and will transit (when it's directly overhead) at (1am/10:30pm). It sets at (sunrise/4:30am) and is at (7.8 mag), so it not brilliant by any means but still an interesting target. Uranus rises about (9pm/sunset) in the constellation Pisces and is at (5.7 mag). It will transit by about (3:15/1:30am).

Jupiter & Venus: This month Jupiter rises before Venus (4/2:30am), and is still at (-1.8 mag). Views will continue to get better to view as the month goes on as it will be rising earlier and earlier thus distancing itself from the following Sun. Venus (-3.9 mag) is the next to rise, but being so close to the Sun now, much of the expected bril-

liance is lost in the Sun's glare. Early in the month it rises right before the Sun, but will drift back towards the Sun as the month goes on making it impractical to view. It will take a while to work its way around the "back side" of the Sun, but by mid-December will be an evening object as it will be then trailing the Sun.

Moon:

September 2nd: First Quarter
September 8th: Full Moon
September 15th: Last Quarter
September 24th: New Moon

Special Events:

There are no meteor showers worth mentioning this month. The ones even remotely worth looking for will be mostly be washed out by the moon.



September General Meeting

Astronomy 101 by Kevin Bert

Astronomy 101 class for September is entitled
“**Telling Time by the Sun**”

Most of us take for granted how easy it is to tell what time it is. A glance at your wrist or phone, a clock on the wall is all it takes. It is an important aspect of life both now and in the distant past. One of the earliest methods of timekeeping is the sun dial. We will take a look at the basic sun dial and discover how they work.

The Constellation of the month will be Ophiuchus.



Main Program (Video)

“**Sepideh Reaching for the Stars**”

Sepideh is a young Iranian woman who dares to dream - of a future as an astronaut. We follow this brave young Iranian woman as she watches the stars, as well as at school, in the mosque and at home, where tensions steadily rise. As we follow Sepideh, it becomes clear just how at odds her dreams are with her current reality and the expectations of those around her.

“**October Main Program**”

Kim, from **American Science and Surplus** will be presenting “A Science Show” for our October Main Program!

Mark your Calendars! This will be interesting and fun, bring the young along, fun for ALL Ages!

Mickey Kazmierski will give another children's program, to be held after the 101, same time as the adults main Program

September : Telescope ..the Time Machine

Activity: Galaxies!

August Public Events

Pike Lake State Forest, August 2nd

Public Viewing By Charlotte Dupree

We had a clear sky, and looked at the Moon until it got dark enough to look at some deep sky objects. We had more than 50 visitors, from the campground, and residents from Hartford. Thanks to Al for helping.

Bayshore Town Center, August 6

Public Viewing By Jeff Setzer

Don Miles, Robert Radke, and Rick Duesenbury joined me for our August 6th sidewalk astronomy event at Bayshore Town Center. We had reasonable views of the Moon and Saturn through the patchy cloud cover, and over 100 people got their first look through a telescope.

Your next opportunity to try sidewalk astronomy at Bayshore is Wednesday, September 3rd. Contact me if you'd like to participate — the more the merrier!

Horicon Marsh, August 16th

Public Viewing By Charlotte Dupree

We started at 5:00 with Solar viewing. The Sun was in and out of a few clouds. The sunspots and prominences were pretty good. By sunset the clouds were thicker. Again the movie night crowd missed out viewing the night sky. The cold front in the North, that we were worried about all day, came blowing along and the rain chased us home around 9:00. Thanks to Rick D. for helping.

Northwoods Starfest, August 22—24th

By Charlotte Dupree

The start of Northwood Starfest had nice Solar viewing with sunspots and prominences. By the time the brat fry started there was around 50 people setting up. The clouds, which turned out to be high fog, hung around until after the evening talk.

As the fog disappeared all scopes were aimed toward the comet C2014E2 Jacques, in Cassiopeia. Movement was very apparent within a half hour of viewing. By the time we came back from the midnight snack, we lost the clear sky with the return of the see through thin clouds. It stayed cloudy and muggy all day Saturday. Kevin and Jeff gave their evolution tag team talk in the afternoon, and there was a swap and sell. A catered dinner was served this year, which was excellent. Door prizes were good to the NCSF attendees, as we all (8) came home with something. All good things must come to an end. You will want to mark the dates for: 2015, August 13-14-15th!

HBSP, August 29

Public Viewing Rob Powell

Several NCSF members were on hand to greet the public at the observatory on 8/29/14. About 35 visitors, nearly a quarter of them under age 10, enjoyed views of the crescent moon, Saturn, M13, and M57. Clouds rolled in at 9pm. The Ranger asked if we could open the building again on Saturday, 8/30, based on campers' requests.

HBSP, Additional Dates

Public Viewing Rob Powell

At the Rangers request, we opened the observatory on these dates:

8/5 (55 visitors), 8/7 (29 visitors), 8/15 (56 visitors), and, 8/31 (82 visitors).

Saturn was the favorite object to view, and as the nights wore on, we typically observed M13, M27, M57, M11, M17, M20, M51, and Albireo. Because of their proximity, For those that stayed late into the evening, It was always a treat to star hop, first with binoculars, then naked eye, to M31.

RELATED INFO

Public Viewing Leaders

September 3

Bayshore Town Center
Jeff Setzer

September 13

Pike Lake State Forest
Charlotte and Gene DuPree

September 20

Harrington Beach
Charlotte and Gene DuPree

September 26

Harrington Beach
Leaders Needed

September 27

Harrington Beach
Charlotte and Gene DuPree

October 1

Bayshore Town Center
Jeff Setzer

October 4

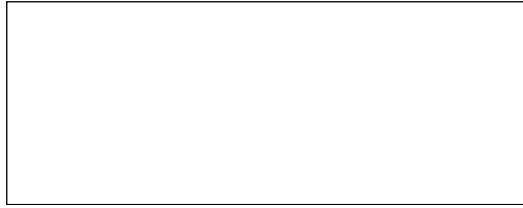
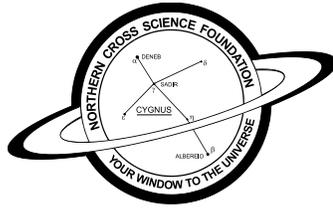
Pike Lake State Forest
Gene and Charlotte DuPree

Jim & Gwen Plunkett OBSERVATORY



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Droughts, Floods, and the Earth's Gravity, by the GRACE of NASA

By Dr. Ethan Siegel

When you think about gravitation here on Earth, you very likely think about how constant it is, at 9.8 m/s^2 (32 ft/s^2). Only that is not quite right. Depending on how thick the Earth's crust is, whether you're slightly closer to or farther from the Earth's center, or what the density of the material beneath you is, you'll experience slight variations in Earth's gravity as large as 0.2%, something you'd need to account for if you were a pendulum-clock-maker.

However, surprisingly, the amount of *water content* stored on land in the Earth actually changes the gravity field of where you are by a significant, measurable amount. Over land, water is stored in lakes, rivers, aquifers, soil moisture, snow and glaciers. Even a change of just a few centimeters in the water table of an area can be clearly discerned by our best space-borne mission: NASA's twin Gravity Recovery and Climate Experiment (GRACE) satellites.

Since its 2002 launch, GRACE has seen the water-table-equivalent of the United States (and the rest of the world) change significantly over that time.

supplies are vital for agriculture and provide half of the world's drinking water. Yet GRACE has seen California's central valley and the southern high plains rapidly deplete their groundwater reserves, endangering a significant portion of the nation's food supply. Meanwhile, the upper Missouri River Basin—recently home to severe flooding—continues to see its water table rise.

NASA's GRACE satellites are the only pieces of equipment currently capable of making these global, precision measurements, providing our best knowledge for mitigating these terrestrial changes. Thanks to GRACE, we've been able to quantify the water loss of the Colorado River Basin (65 cubic kilometers), add months to the lead-time water managers have for flood prediction, and better predict the impacts of droughts worldwide. As NASA scientist Matthew Rodell says, "Without GRACE we would have no routine, global measurements of changes in groundwater availability. Other satellites can't do it, and ground-based monitoring is inadequate." Even though the GRACE satellites are nearing the end of their lives, the GRACE Follow-On satellites will be launched in 2017, providing us with this valuable data far into the future. Although the climate is surely changing, it's water availability, *not* sea level rise, that's the largest near-term danger, and the most important aspect we can work to understand! Learn more about NASA's GRACE mission here: http://www.nasa.gov/mission_pages/Grace/

This Article, a Courtesy of the
NASA Space Place



SPECTRUM

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The NCSF supports the International Dark sky association.



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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.
Mequon, WI 53097