

SPECTRUM

Northern Cross Science Foundation Newsletter

July 2016

Looking Up

July 7, Thursday

General Meeting

6:30 p.m. - **Brat Fry**

Support the Club. Buy a Brat!

7:00 p.m. Astronomy 101

7:30 p.m. - Main Program

July 8, Friday

Public Viewing

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

Harrington Beach

July 9, Saturday

Public Viewing

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

Harrington Beach

July 9, Saturday

Public Viewing

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

Pike Lake

July 21, Thursday

Board Meeting

7:30 p.m.

Jeff Setzer Home

July 30, Saturday

Small Scope Party

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

Harrington Beach

(See Insert)

August 4, Thursday

General Meeting

7:00 p.m. Astronomy 101

7:30 p.m. - Main Program

August 9, Tuesday

Public Viewing

7:00 p.m. - 11:00 p.m.

Pike Lake



Hubble Shatters The Cosmic Record For Most Distant Galaxy...By Ethan Siegel

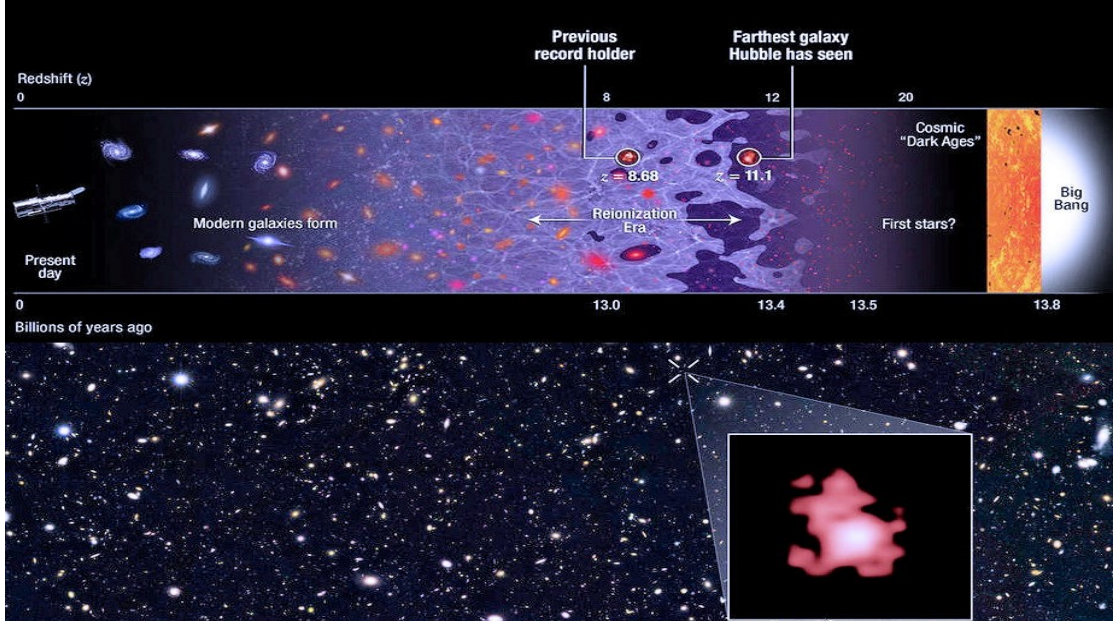
The farther away you look in the distant universe, the harder it is to see what's out there. This isn't simply because more distant objects appear fainter, although that's true. It isn't because the universe is expanding, and so the light has farther to go before it reaches you, although that's true, too. The reality is that if you built the largest optical telescope you could imagine -- even one that was the size of an entire planet -- you still wouldn't see the new cosmic record-holder that Hubble just discovered: galaxy GN-z11, whose light traveled for 13.4 billion years, or 97% the age of the universe, before finally reaching our eyes.

There were two special coincidences that had to line up for Hubble to find this: one was a remarkable technical achievement, while the other was pure luck. By extending Hubble's vision away from the ultraviolet and optical and into the infrared, past 800 nanometers all the way out to 1.6 microns, Hubble became sensitive to light that was severely stretched and redshifted by the expansion of the universe. The most energetic light that hot, young, newly forming stars produce is the Lyman- α line, which is produced at an ultraviolet wavelength of just 121.567 nanometers. But at high redshifts, that

line passed not just into the visible but all the way through to the infrared, and for the newly discovered galaxy, GN-z11, its whopping redshift of **11.1** pushed that line all the way out to 1471 nanometers, more than double the limit of visible light!

Hubble itself did the follow-up spectroscopic observations to confirm the existence of this galaxy, but it also got lucky: the only reason this light was visible is because the region of space between this galaxy and our eyes is mostly ionized, which *isn't true* of most locations in the universe at this early time! A redshift of 11.1 corresponds to just 400 million years after the Big Bang, and the hot radiation from young stars doesn't ionize the majority of the universe until 550 million years have passed. In most directions, this galaxy would be invisible, as the neutral gas would block this light, the same way the light from the center of our galaxy is blocked by the dust lanes in the galactic plane. To see farther back, to the universe's first true galaxies, it will take the James Webb Space Telescope. Webb's infrared eyes are much less sensitive to the light-extinction caused by neutral gas than instruments like Hubble. Webb may reach redshift of 15 or even 20 or more, and discover the true answer to one of the universe's greatest mysteries: when the first galaxies came into existence!

Hubble spectroscopically confirms farthest galaxy to date



NASA Spaceplace Astronomy Article .

Images credit: (top); NASA, ESA, P. Oesch (Yale University), G. Bram(STScI), P. van Dokkum (Yale University), and G. Illingworth (University of California, Santa Cruz) (bottom), of the galaxy GN-z11, the most distant and highest-redshifted galaxy ever discovered and spectroscopically confirmed thus far.



June Meeting Minutes

By Kevin Bert

The June Business meeting of the Northern Cross Science Foundation was held at Unitarian Church North. Secretary Kevin Bert opened the meeting at 7:45pm and welcomed 17 members and guests. He then gave the Secretary report that there were no changes in the club roster. The 2016 ALCON national convention will be held in Washington D.C. on August 10 - 13.

There was no Treasurer report.

Observatory Director Dan Bert reports that the support timbers for the roof were stained. A second coat will be needed some time soon along with painting the doors. A June 11th leader is needed for the PVN.

It was noted that Imaging committee members had some great examples in the last Spectrum.

Follow-up discussions on Astronomy Day activities were favorable. Answers for stabilizing the canopy tent in the windy conditions at Port Washington will have to be addressed for future events. Evening weather conditions at Harrington Beach were near perfect. A large number of people had great views that evening with the help of NCSF mem-

bers. Thanks to all who helped make it possible.

Brat fry fund raising is scheduled during a very favorable time on Saturday July 2nd. The Pick & Save store in Germantown will be ready to go from 10:00 to 3:00 and needs more help. Contact Jaime Hanson to sign up for help at the table or for sun viewing.

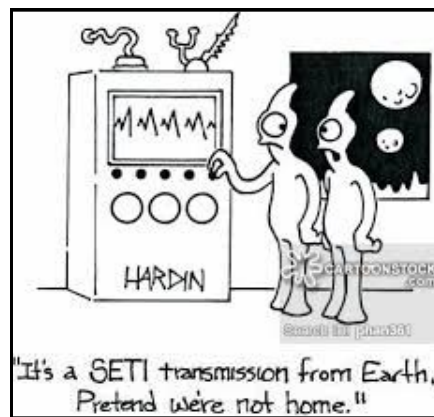
The last board meeting voted in favor of hosting the 2020 NCRAL convention. Organizing for the event would first start in 2018. As with the previous two conventions, member involvement is important.

The Grafton library telescope is regularly checked out and a waiting list is common. It received some needed maintenance as one of the last to use it reported some bothersome glare. This is the first time since it was implemented last year. Collimation and movement remained good. The rubber eyepiece guard was missing and the eye lens was in need of a cleaning. This would account for the reported glare. After installing a new guard and cleaning the lens the scope performed well. It is now back at the library.

The July general meeting will still take place an UCN. With some delays in construction of the new Graphics System Corporation facility in Germantown the

August meeting will hopefully take place in the new facility.

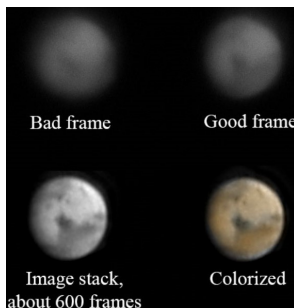
Kevin then covered upcoming June 2016 events. The Wisconsin Observers Weekend runs from the 2nd to the 5th. The 4th has two events. Discovery Day at Pike Lake State Park for sun viewing and a Harrington Beach viewing night. The 5th open park day will have sun viewing and tours of the Observatory at Harrington Beach State Park. The 10th and 11th are consecutive viewing nights at Harrington Beach. The 18th is a yearly member's afternoon event called Sun-Day on Saturday. Evening of the 18th is a public viewing evening at Pike Lake. Lastly the 25th is a viewing night at Achermann Grove Park in Washington County. With no further business Kevin closed the meeting at 8:15 pm



Steady Skies for Mars, two cameras for a single Whirlpool Galaxy...By Ernie Mastroianni

Although Mars has been a bright spectacle this season, observing identifiable details through a telescope has been a challenge. Taking sharp pictures has been even more difficult, especially from my urban backyard where the red planet barely clears the heat of neighboring rooftops.

Harrington Beach State Park proved an ideal place to escape the atmospheric sludge of the city, and setting up on the southern edge of the parking lot gave me a clear shot through the steady skies above the leafy surroundings. I shot 1200 frames of Mars through my Celestron 9.25, using a monochrome Imaging Source camera attached to a 12mm eyepiece with a #21 orange filter. Despite the good seeing, more than half the frames were unusable. The best frames were aligned, stacked and processed using a freeware program for Macs called Keith's Image Stacker. Examples include a single frame that was discarded, and a single frame that was one of the keepers. Compare them to the black and white stack of several hundred frames. The signal emerges, and the noise is reduced.



The prominent, India-shaped feature named Syrtis Major was facing earth and clearly emerged in the photo. North is up. Other easily visible features included Utopia Planitia, Hellas, and even the small dark patch near the tip of Syrtis Major known as Alcyonis Nodis. Curiosity's landing area is just above the dark patch at far right.

Neither the north or southern polar cap was clearly visible. Finally, I added color based on an albedo map created by planetary cartographer Ralph Aeschliman more than a decade ago. Using Photoshop, I selected the color data from the map, defocused it, and rendered it as a layer, 80 percent transparent. The color layer only enhances the black and white data without adding any detail or masking anything that already exists.

Jaime, with two different astro cameras on two different nights. His one-shot color camera is a QHY10C and his monochromatic camera is an Atik 490EX. "The QHY pixels are 6.05 microns while the Atik has pixels that are 3.59 microns wide. So, the scale of the two images is far different," says Hanson, and he adds that the pixel count for each camera is different too.

But with stacking and processing software that include Grip, Photoshop, and Nebulosity 3, he was able to match the images and reconcile the color data with the monochromatic luminance data. This photo is a proof

of technique to shoot color photos without using color filter wheels.

"I learned a lot from this exercise and think there is a lot of potential for this method," writes Hanson. "One of the nice benefits is that many of the flaws in both the color and luminance data were cancelled out. The

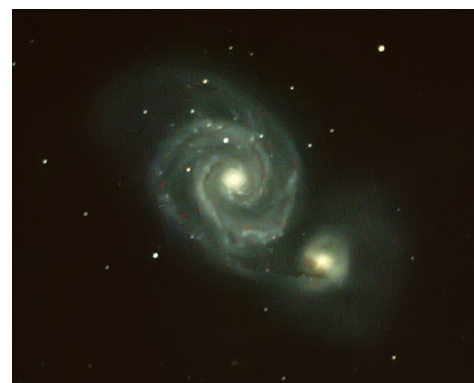


Photo by Jaime Hansen

black and white had large doughnuts from dust and some jpg artifacts. The color was overall noisy from having so few good scans.

one of those flaws showed up the final combination and the overall noise was much lower. I plan to reprocess this at some point to sharpen the features of the galaxies, so I would consider this a work in progress."

July General Meeting

101 Program ...by Jeff Setzer

"2017 Total Solar Eclipse Teaser"

Jeff will be speaking at Northwoods Starfest on the August, 2017 Total Solar Eclipse which will cross the entire continental United States. He will give a short version of that talk at our July meeting, providing some tantalizing facts and things to remember regarding the event.

Main Program... by Jaime Hanson

"Auto guiding for Dummies"

Jaime will take a layman's approach to the topic of auto guiding during astrophotography. He will discuss basic guidescopes and their mounting, use of simple software to acquire a guidestar, and how it is a vital step in the capturing of trail free astrophotos.

June Public Viewing Events

Pike Lake, June 4

By Al Steinberg

Al Steinberg set up for a Solar Viewing at the Pike Lake Discover Day on June 4. He got a peek of the sun, without sunspots, in between the clouds. By 11:30 the clouds turned into rain so he packed up for the day.

Harrington Beach, June 10

By Charlotte DuPree

This was a clear night. There was a small crowd of visitors. They kept coming back to see what new object we had in the big scope. Rich S., Al S., Rick D., Joyce J., had scopes set-up in the parking lot. Kevin helped us in the observatory.

Pike Lake State Forest, June 18

By Charlotte DuPree

Unfortunately, this event was held two days before full moon, because of a scheduled night hike. The clouds did not cooperate either. The campers, that came, had a good time looking at Jupiter, Mars, Saturn, Moon, in-between the clouds. A few of the local residents also stopped by, and they said they will be back again. Thanks to Rick and Georgine, Rick D., for helping out.

NCSF Fundraiser

July 2nd

Our Brat Fry\Solar Scope viewing was a success! Thanks to **Jaime Hanson** for suggesting this event and doing all of the organizing! We had a wonderful turnout from friends and club support! Our gratitude to the following for their help to not only make this a success but for the fun we all had!: Liz, Gail S., Rob P. Rick D., Kevin B., Rick K., Joyce J., Mickey K. and Rigel...our unofficial club mascot!



Thomas Jefferson Middle School, June 17th

By Rick Kazmierski

At the request of a summer school teacher at the Port Washington Thomas Jefferson Middle school, Mickey and I did Solar Viewing for her classes. There were four consecutive classes of 20 students each, ranging from 2nd grade to middle school. There wasn't a cloud in the sky all morning and the Sun co-operated with several nice prominences.

Sun-Day on Saturday, June 18

By Kevin Bert

Umbrellas have been the usual accessory for the annual Sun-Day on Saturday over the past few years. This June 18th had plenty of sun for the scopes in attendance to soak in the view. One extremely large spot was facing our way. The Coronado displayed a number of nice prominences too. A dozen members and a few other guests had a pleasant afternoon with viewing and conversation. An excellent selection of food was sampled by those that stayed to eat. Thanks to all those that attended and I hope to see even more members next year.



RELATED INFO

Leaders for Public Viewing

July 8th

Harrington Beach

Jeff Setzer

July 9th

Harrington Beach

Dan and Laura Bert

July 9th

Pike Lake

Gene and Charlotte DuPree

August 9th

Pike Lake

Gene and Charlotte DuPree

August 12

West Bend - Cash Bash

Jeff Setzer

August 26th

Harrington Beach

Leaders Needed

August 27th

Harrington Beach

Leaders Needed

August 27th

Sandy Knoll Beach

Gene and Charlotte DuPree

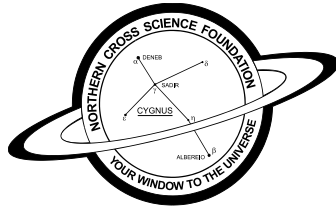
Star Parties!

NORTHWOODS STARFEST 2016

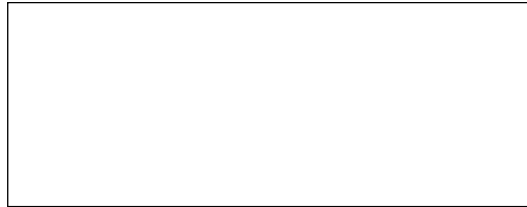
Hobbs Observatory
Beaver Creek Reserve
Fall Creek, Wisconsin
August 5-7, 2016

www.cvastro.org

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Jim & Gwen Plunkett
OBSERVATORY



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Northern Lights Newsletter...forwarded by Kevin Bert

Find through the link below the Summer 2016 NCRAL **Northern Lights** newsletter, Vol. 1., No. 1 (Series II).

[Please share the link below with your membership; they will not likely see the newsletter otherwise.](#)

This newsletter contains important information and serves several purposes:

1. It helps get the word out about events nationally and in the North-Central Region of the Astronomical League.
2. It serves as a benefit of membership to YOUR AL-affiliated club.
3. It provides an avenue for your members' contributions to be published for readers across the NCRAL region.

You may download the current issue at the following URL:

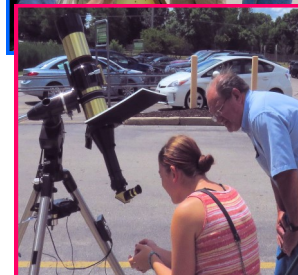
http://www.carlwenning.net/Northern_Lights_Summer_2016.pdf

I anticipate that this and future issues of **Northern Lights** will be available permanently on the NCRAL website at the following URL.

<https://ncral.wordpress.com/>

Thanks to everyone who generously contributed to this issue of **Northern Lights** and to my friend and colleague Jim Gibbs (TCAA/FVAS/NSA) who produced the layout and PDF.

Best wishes, Carl Wenning



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>

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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