SPECTRUM

Northern Cross Science Foundation Newsletter **October 2016**

Looking Up

October 6, Thursday

General Meeting

7:00 p.m. Astronomy 101

7:30 p.m.– Main Program

GSC Technology Center

W189 N11161 Kleinmann Ctr.

Germantown

October 7, Friday

Public Viewing

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

Harrington Beach

October 8, Saturday

Public Viewing

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

Harrington Beach

October 8, Saturday

LacLawrann

Luminary Walk

6:30p.m. - 8:30 p.m.

October 20, Thursday

Board Meeting

7:30 p.m.

Jeff Setzer Home

October 21, Firday

Observatory Training

7:00p.m

Harrington Beach

October 22, Saturday

Haunted Hike

6:00p.m. - 10:00 p.m.

Harrington Beach

October 29, Saturday

Public Viewing

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

Pike Lake

Board of Director's Note *by Jeff Setzer*

Over the past several months, the Board of Directors has had some concerns brought to our attention regarding the use of the observatory and surrounding site. This has prompted the Board to discuss a course of action and the first step is for me to write this article.

Our organization's founding (and primary) mission is science outreach, and as such we host dozens of public observing events every observing season; this year, between May 29 and October 29, we'll have had 25 scheduled public events, 15 of which were at the observatory.

In addition to our regularly-scheduled events, as a recognized leader in astronomy education in our area, we are often asked to help school, scout, and other groups with additional nights at the observatory. Indeed, some of our members have been very generous with their time in this regard, and the Foundation supports their efforts.

As an organization, we also have our own membership's interests to foster. Over the past two years, the Foundation has financed our first true imaging-capable telescope, with the guidance of members most interested in that field. We have also carefully scheduled public events away from New Moon and Last-Quarter weekends; as amateur astronomers interested in personal observing and imaging programs, that dark time at the observatory grounds is precious to our members.

In order to protect the dark sky times at the observatory, we are asking members to not invite members of the public to the observatory grounds during Last Quarter and New Moon weekends. To aid in identifying these "dark times", our Observatory Director has them marked off on the observatory calendar, and he will communicate that the observatory is not to be used for public outreach during those times.

We will also be talking with the Harrington Beach Management to communicate that, unless we tell them specifically we are "open to the public" on a given night, we are not. During "dark times" on our observatory calendar, no member is to tell the park that we are "open to the public".

It is the hope of the Board that these guidelines will make the observatory grounds work for all members and our varied astronomical interests.

Ten Trillionths of Your Suntan Comes From Beyond Our Galaxy

Posted by Guy Pirro Editted by Rick K

Lie on the beach this summer and your body will be bombarded by about one sextillion photons of light per second. Most of these photons, or small packets of energy, originate from the Sun. But a very small fraction have traveled across the Universe for billions of years before ending their existence when they collide with your skin.

Astronomers at the International Center for Radio Astronomy Research (ICRAR) have accurately measured the light hitting the Earth from outside our galaxy over a very broad wavelength range. The research looked at photons whose wavelengths vary from a fraction of a micron (damaging) to millimetres (harmless). But radiation from outside the galaxy constitutes only ten trillionths of your suntan, so there is no immediate need for alarm.

Astrophysicist Professor Simon Driver, who led the study, said that we are constantly bombarded by about 10 billion photons per second from intergalactic space when we're outside, day and night. "Most of the photons of light hitting us originate from the Sun, whether directly, scattered by the sky, or reflected off dust in the Solar System," he said. "However, we're also bathed in radiation from beyond our galaxy, called the extra-galactic background light. These photons are minted in the cores of stars in distant galaxies, and from matter as it spirals into supermassive black holes."

Professor Driver, from the University of Western Australia, measured this ambient radiation in the Universe, from a wide range of wavelengths by combining deep images from a flotilla of space telescopes. He and collaborators from Arizona State University and Cardiff University collated observations from NASA's Galaxy Evolution Explorer and Wide-field Infrared Survey Explorer telescopes, the Spitzer and Hubble space telescopes, the European Space Agency's Herschel space observatory and Australia's Galaxy And Mass Assembly survey to make the most accurate measurements ever of the extra-galactic background light. While 10 billion photons a second might sound like a lot, Professor Driver said we would have to bask in it for trillions of years before it caused any long lasting damage.

Professor Rogier Windhorst, from Arizona State University, said the Universe also comes with its own inbuilt protection as *Continued on Pg 4*

September Meeting Minutes

By Kevin Bert

The September Business meeting of the Northern Cross Science Foundation was held at the GSC Technology Center in Germantown. President Jeff Setzer opened the meeting at 8:15pm and welcomed 24 members and guests. This was the first visit for the membership at the new meeting location. It is an amazing facility and it is hoped to be home for the NCSF for many years to come. The company is a few days away from officially moving in and there remains a bit of finishing work yet to take place. Jeff then asked for standard reports.

Treasurer Gene DuPree reports $10,682.61 in the checking account. The Observatory account remains at at $1,042.01.

Secretary Kevin Bert reports that two former members have joined. Mike and Gail Borchert from Colgate. They have been out of astronomy for years and would like to be active again. The September Reflector should be in most members' hands within the week.

Observatory Director Dan Bert reports that the clock drive of the 20-inch Panarusky telescope is working again. A simple set screw on the main gear needed tightening. A leader for the September 17th public viewing night is needed.

Under new business Jeff Setzer talked on how the West Bend Geo Cache event went. Over 100 people took in his eclipse program when a light rain prevented any chance of observing.

Kevin Bert told the membership that he had seen the astronomy display at the Neville Public Museum in Green Bay. There were many great displays including historical Wisconsin telescopes.

Gene and Charlotte DuPree say that clouds were the only things to see at the solar viewing event at Sandy Knoll Park.

Rob Powell reported that the picnic shelter light was on late on a viewing night. Dan Bert will try to get an answer on how we could shut it off if the park forgets to power it down.

Lac Lawrann has Family Fun Nights on September 28 & 29. A Luminary Walk is scheduled on October 8th as well. Members are invited to bring telescopes.

Jeff then covered upcoming September 2016 events. The 3rd brings us the popular Evening With Nature at the Ice Age Visitor Center near Dundee. Telescope viewing will follow the talk at 8:00pm The 9th and 10th are consecutive public viewing nights at Harrington Beach State Park. Community Campfire at Pike Lake State Park is also held on the 10th and is always well attended. The 17th promotes the After Summer Hike at Harrington Beach. A clear mild night can bring out hundreds of people so any help with telescopes are appreciated. The final scheduled event for September is on the 23rd at Harrington Beach and is the members Binocular Star Party.

With no further business Jeff closed the meeting at 8:50 pm.

The Elephant Trunk ...*By Ernie Mastroianni*

One of the most dramatic images made from Harrington Beach State Park was taken by member **Chad Andrist** over a the span of a several nights this year. Known by the popular name as the Elephant's Trunk Nebula, IC 1396A is a tendril of ionized gas more than 20 light years long, illuminated by a massive star in the northern constellation Cepheus. It is known to be a stellar nursery, with stars as young as 100,000 years. Andrist used a monochrome camera, an 80mm refractor, and three narrow band filters: hydrogen alpha, oxygen III and sulfur II. Each filter allows only a small portion of the spectrum onto the camera sensor, so a generous helping of light is required to reveal the deeply detailed nebulosity. In this case, Andrist took 12 exposures of 7 minutes through each filter for a total exposure time of 4.2 hours. He processed the image using PixInsight software.

Andrist E-mail

The Elephant's Trunk nebula is a concentration of interstellar gas and dust within the much larger ionized gas region IC 1396 located in the constellation Cepheus about 2,400 light years away from Earth. The piece of the nebula shown here is the dark, dense globule IC 1396A; it is commonly called the Elephant's Trunk nebula because of its appearance at visible light wavelengths, where there is a dark patch with a bright, sinuous rim. The bright rim is the surface of the dense cloud that is being illuminated and ionized by a very bright, massive star (HD 206267) that is just to the west of IC 1396A. The entire IC 1396 region is ionized by the massive star, except for dense globules that can protect themselves from the star's harsh ultraviolet rays.The Elephant's Trunk nebula is now thought to be a site of star formation, containing several very young (less than 100,000 yr) stars that were discovered in infrared images in 2003. Two older (but still young, a couple of million years, by the standards of stars, which live for billions of years) stars are present in a small, circular cavity in the head of the globule. Winds from these young stars may have emptied the cavity.The combined action of the light from the massive star ionizing and compressing the rim of the cloud, and the wind from the young stars shifting gas from the center outward lead to very high compression in the Elephant's Trunk nebula. This pressure has triggered the current generation of protostars.

This is the longest integration (exposure time) I've done on an object, and it REALLY paid off. 4 hours and 12 minutes! The color and structures seen here are amazing!

Details:

Scope: Stellarvue SV80ST triplet
Mount: Celestron CGE
Autoguider: SX Lodestar
Camera: QSI 660wsg-8
Ha: 12x420s 1x1 binning
OIII: 12x420s 1x1 binning
SII: 12x420s 1x1 binning
4.2 hours integration
Site of collection: Harrington Beach State Park, overflow parking lot

Pre/post processing: Pixinsight 1.8 Ripley

From the Editor:

Please Note Images in the Newsletter are best viewed in their digital form.

The B&W paper copy poorly reflects the true nature of any image.

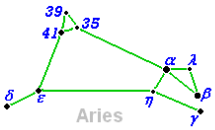
October General Meeting

101 Program ...*by Kevin Bert*

Sketching at the Eyepiece

The Astronomy 101 class for October is "Sketching at the Eyepiece" by Kevin Bert. Keeping written records of observations with the telescope has been done by many for years. Sketches of what was observed have often accompanied them. So much more can be seen when sketching as it forces you to study the subject in greater detail. You don't have to be a great artist to make meaningful sketches. Learn some of the basics on sketching techniques and put them into practice at our next meeting.

Constellation of the month: Aries



October Main Program... *Jeff Setzer*

The Great American Eclipse

On August 21, 2017, millions of people across the United States will see nature's most wondrous spectacle — a total eclipse of the Sun. It is a scene of unimaginable beauty; the Moon completely blocks the Sun, daytime becomes a deep twilight, and the Sun's corona shimmers in the darkened sky. Jeff will be your guide to understand, prepare for, and view this rare celestial event.

RELATED INFO

WELCOME

NEW CLUB MEMBER

Bob Gershan

from Fox Point

Leaders for Public Viewing

October 7

Harrington Beach

DuPree's

October 8

Harrington Beach

Leaders Needed

October 8

LacLawrann Luminary Walk

Kazmierski's

October 22

Harrington Beach

Leaders Needed

October 29

Pike Lake

DuPrees's

September Public Viewing Events

Harrington Beach September 9

By Charlotte DuPree

Friday, September 9, Harrington Beach PVN. When we arrived at the observatory there was a home school group, waiting for us to open up. Unfortunately, the sky was full of clouds. Gene focused the 6 inch Dyno scope on the Moon for a very short time. Thanks to Joyce and Rick D. They were in the parking lot, waiting for the sky to clear.

Harrington Beach September 10

By Charlotte DuPree

Saturday, September 10, Pike Lake Community Campfire. We had a perfectly clear sky on this night. Early objects were Venus, Saturn, and Mars. The Straight Wall was visible on the Moon. Some of the summer Milky Way objects were the Wild Duck, Lagoon nebula, Trifid, Dumbbell, Hercules cluster. The best object for me, of course, was NGC 457, aka the Owl Cluster. Around 100 people stopped to look through the scopes. Thanks to Rick and Georgine, and Al for helping out. Rick D. was set-up near the campfire.

Binocular Party, September 23-24

By Kevin Bert

The Binocular Star Party was postponed at the last minute to the 24th of September because of clouds on the 23th. The 24th was also unfortunately cloudy as well.

LacLawrann Conservancy September 28

By Mickey Kazmierski

Wednesday Night Lac Lawrann hosted Family Fun Night! This year, one of the schools was Decorah Elementary School. The weather was fairly clear. Thanks to Charlotte and Gene DuPree and Rick Kazmierski for giving 150 children and parents to the delights of Saturn, Mars, Venus and others. Mickey came up with fun and unique NASA SpacePlace, materials fare given freely for everyone. **Thanks to NASA Space Place! http://spaceplace.nasa.gov**

LacLawrann Conservancy September 29

By Rick Kazmierski

Thursday Night at Lac Lawrann hosted Saukville Public School. Charlotte and Gene DuPree and Rick Kazmierski hosted over 40 people in addition to the LLC volunteers . We had a partly cloudy sky! Venus, Mars and Saturn were viewed. Gene brought his Easy Canopy to cover over the large lights systems, Great idea for future events Gene!

"Observatory training night on Friday October 21st"

This is for members that would like to operate the 20-Inch Panarusky Telescope.

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Jim & Gwen Plunkett OBSERVATORY

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Continued from Pg 1

about half the energy coming from the ultraviolet light of galaxies is converted into a less damaging wavelength by dust grains. "The galaxies themselves provide us with a natural suntan lotion with an SPF of about two," he said.

The study is part of ICRAR's ongoing work to understand the evolution of energy, mass, and structure in the Universe. The research program examines how we went from the smooth distribution of atoms in the early Universe to the emergence of the Periodic Table and the multitude of stars, galaxies, and galaxy clusters we see today.

"The processes which shape and shuffle mass generate vast quantities of energy, dwarfed only by the vastness of space," Professor Driver said. "The precise physics as to how this energy is released is still not fully understood and work continues to build numerical models capable of explaining the energy that we've now measured."

Where your summer suntan comes from:

Sun
1,000,000,000,000,000,000,000 photons per square meter per second

Reflected off the sky
300,000,000,000,000,000,000 photons per square meter per second

Leftover from the Big Bang
10,000,000,000,000,000 photons per square meter per second

Reflected off dust in the Solar System
100,000,000,000,000 photons per square meter per second

Extra-galactic background light
10,000,000,000 photons per square meter per second

The International Center for Radio Astronomy Research (ICRAR) is a joint venture between Curtin University and The University of Western Australia with support and funding from the State Government of Western Australia.

For more information:
http://www.icrar.org/cosmic-suntan/

SPECTRUM

Published by the Northern Cross Science Foundation, Inc. A non-profit organization based in Southeastern Wisconsin.

NCSF is a member of the North-Central Region of the Astronomical League.

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:
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