



THE BLUE MOON OBSERVER

Door Peninsula Astronomical Society

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www.doorastronomy.org

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April, 2018
Volume 20 Number 4



The April general meeting of DPAS will be held at 7 PM on Tuesday, April 3 at the Ray and Ruthie Stonecipher Astronomy Center. The main program will be next in the film series, The Smooth Expanding Universe. The Learn the Night Sky portion will focus on constellations Draco and Cephus. Both programs and refreshments will be by Steve Ransom-Jones, with refreshment help from his wife Lana.

Meeting Notes from the March 6th General Meeting

Our scribe was unable to provide the notes of our March 6th meeting; your editor will attempt to convey an idea of what took place. President Gary Henkelmann opened the meeting and gave announcements followed by the main program on "The Future of Time Travel". The presentation was well prepared with clever graphics which Steve created and projected as PowerPoint slides. He presented several aspects of time as we experience it, including the concept that time has governed mankind in terms of survival, had enabled mankind in terms of exploration and utility, and seems to carry us in a constant flow. He raised three questions to be addressed in the presentation:

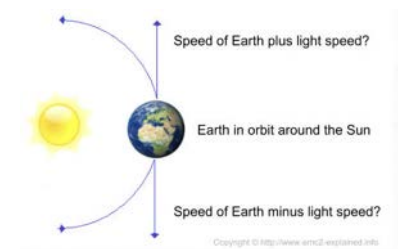
- Can we travel forward in time?
- How do we interact with time?
- Can time be stopped?
- Is it possible to visit the past?

Basic to an understanding of time includes the link between electricity and magnetism, credited to the work of Michael Faraday in 1830. Steve somewhat apologetically showed a series of equations leading to the profound discovery by James Clerk Maxwell in 1861:

$$c = \frac{1}{\sqrt{\mu_0 \epsilon_0}}$$

This relates the speed of light constant to the reciprocal of the square root of the magnetic permeability of free space, times the electric permittivity of free space. (Don't ask!)

Steve went on to illustrate the constancy of the speed of light from the standpoint of the observer by using the illustration of a train moving toward a stationary observer and contrasting the perceived speed of a ball thrown in the direction of travel vs light from a forward directed flashlight.



By measuring this phenomenon using the earth in its orbit around the sun, attempts by scientists to disprove that the speed of light is not increased by
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Who We Are

DPAS is a local club and chapter of the Astronomical League. We are also a club member of the International Dark-Sky Association and the Night Sky Network, teaching arm of the Astronomical Society of the Pacific. We meet on the first Tuesday of every month, with rare exception. Meetings are held at the Ray & Ruthie Stonecipher Astronomy Center unless otherwise announced. We operate and maintain the Leif Everson Observatory which houses a 14" Celestron Schmidt-Cassegrain telescope on a sophisticated tracking mount controlled by computer, and a weather station housed in the observatory. Current weather readings are shown on our web site: www.doorastronomy.org

The StarGarden near the observatory is used for viewing the sky with unaided vision, binoculars and members' telescopes. There are also binocular mounts set in concrete which allow viewers of different heights to view the same object through the same binocular.

The Ray & Ruthie Stonecipher Astronomy Center provides for storage, projects, meetings, warm-up and toilet facilities. It also houses a StarLab, an inflatable planetarium with a sophisticated projection system. The planetarium is used for group presentations.

An Analemmatic Sundial was dedicated on October 20, 2012.

The "astronomy campus" as described here is reached by taking Utah Street east to the stop sign and turning left through the gate onto Stargazer Way. Or you can set your GPS to 2200 Utah.

The Leif Everson Observatory turns 20!

By Barb Henkelmann,
Door Peninsula Astronomical
Society Archivist

Twenty years ago on May 9, 1998, the Leif Everson Observatory had its dedication ceremony. Located at the Door Peninsula Astronomical Society's astronomy campus at 2200 Utah St., Sturgeon Bay, the Observatory has been the focus of many stargazing evenings. From the beginning, the building was a co-operative venture between the Sturgeon Bay School District and the Sturgeon Bay Education Foundation. The Sturgeon Bay Education Foundation was a not-for-profit organization founded to raise funds for the school district and consisted of teachers and community-minded members. One of these members, Jim Maki, 8th grade teacher at T.J. Walker Middle School, was the impetus behind the building of the Observatory. He was an avid astronomer and thought that having an observatory for his students to use to study stars and planets was a great idea. He contacted Ray Stonecipher, retired professor from the University of Wisconsin – White-water, and together they worked to make the Observatory a reality. A site was chosen on Sturgeon Bay School District forest property east of State Highways 42/57 and north of Utah St. The Observatory was the recipient of many monetary donations including a grant from the Peterson Foundation. Francis and Arliss Everson donated a large sum of money to fund the telescope, naming the Observatory "The Leif Everson Observatory" in memory of their teenage son, who died tragically at a football camp.

Groundbreaking took place on July 8, 1997, and was a co-operative effort of many people and businesses, headed by Jim Maki with Ray Stonecipher acting as consultant. Local architect, Henry Isaksen of Isaksen Architects, was hired to design the building. Others were

involved in the digging of the foundation, construction of the building using leftover bricks from Sawyer Elementary School and the construction of the fiberglass dome in the school shop class. Sturgeon Bay Utilities donated the underground wires and when Internet service was needed, Charter donated the fiber optic cable. The Observatory houses a 14" Schmidt Cassegrain telescope operated by a tracking mount controlled by computer. When the telescope was installed, it had to be perfectly aligned to the North Star, accomplished by Ray Stonecipher and John W. Beck, computer expert and avid astronomer.

Recent upgrades in software and hardware were installed by DPAS members, Dave Lenius and Steve Ransom-Jones. With the addition of a MallinCam video camera, it allows DPAS to stream images from the telescope live around the world over the Internet web site, www.nightskiesnetwork.ca. During the recent transit of Mercury, DPAS was one of the few sites that had a clear view of the event. In a reverse process on August 21, 2017, on the mostly cloudy day of the total eclipse of the sun, the Observatory's computer was able to capture the eclipse from a clear sky location on the Night Skies Network and project the images to a projection screen located in the Stonecipher Astronomy Center. Hundreds of people came out to experience this historic event.

Throughout its twenty years of operation, the Leif Everson Observatory has focused on countless night sky objects and been the inspiration to many viewers, young and old alike, through viewing nights facilitated by the Door Peninsula Astronomical Society. DPAS opens the Observatory to Society members and the general public monthly, usually on the Saturday evening closest to the new moon, a yearly Astronomy Day, and on special astronomical occasions.

DPAS BOARD

Gary Henkelmann, President
president@doorastronomy.org

Thomas Minahan, Vice President,
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and Board Secretary

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John J. Beck, Past President
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editor@doorastronomy.org

Jim Maki, Academic Coordinator

John W. Beck, Webmaster

Mike Egan, David Lenius,
Jacque Axland, and Steve
Ransom-Jones, Members at Large

Ray Stonecipher, in spirit

In addition, Barbara Henkelmann serves as the DPAS Archivist.

The business of the DPAS is largely conducted at the Board meetings to leave the general meetings open for programs. The Board meetings are held at the Astronomy Center at 7 PM on Monday, 8 days prior to the following general meeting. Members of DPAS are invited to attend Board meetings.



The Blue Moon Observer

Meeting notes from page 1
(added to) the speed of the source.

So what does this mean for time travel? He lead us through a theoretical experiment with a space traveller, a clock on his spaceship, and the (magical) ability to see the clock that the “Starman” is seeing while simultaneously seeing a local clock, both initially set at the same time and running the correct time intervals. From our perspective, the moving clock appears to run slower.

Steve went on to state that Special Relativity allows us to travel into the future and this is measurable, but would require “significant” acceleration. You had to be there.

His next question: How do we interact with time? He illustrated his answer by showing a plot of time vs space. From this he postulated a cone of potential future travel in spacetime. This raises the questions, “Can I travel outside my future light cone? Can I stop time? Can I travel into the past?”

He reminded us of the curvature of spacetime and how gravity can bend light. A black hole’s gravitational well is infinitely deep. Light follows the curve of free space. And light cannot escape from the event horizon.

Back to Starman. He’s flying his Tesla toward a black hole and we again magically watch the Tesla’s clock over Starman’s shoulder. As he nears the event horizon, his clock appears to run slower and slower. When he reaches the event horizon his clock stops. He never falls into the black hole. He showed this in a series of plots on his diagram of space on the horizontal axis and time on the vertical, adding clock ticks as the future light cone tilts toward the event horizon. He maintains that what we have achieved is travel into the future but it requires a very large amount of energy and there is no return. Not

a good way to check on whether you’re going to win the lottery next week. Plus we’ve slowed time and stopped it, and it’s a one-way trip.

Steve then raises the question, “Can we travel to the past? Can we witness historic events? Or change their outcomes? Can we meet our ancestors or ourselves as children?” This would require unusual space-time geometries. Are these possible? He approaches these questions with future light cone diagrams.

The upshot is that wormholes fall into the category of “Scientifically Feasible Conjecture”. Wormholes are permitted by General Relativity but require energy violations, but they are observed at the quantum level. And nobody has yet proved that unusual space-time geometry can’t exist. But there are theories which suggest that they can’t. “Chronological Censorship – every closed timeline passes through an event horizon. This prevents an observer from detecting them Thus preventing causal violation.” The concept of chronological protection agency “prevents the appearance of closed timeline curves ... thus making history safe for the historians.” Then there’s self consistency, you would appear in a different point in the multiverse of space-time events, “thus preserving the flow of the timeline of your origin”.

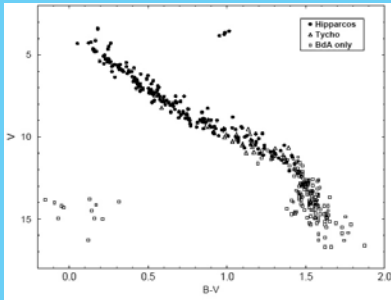
“However
There is the smallest possibility that, given the laws of physics as we understand them today, that such geometries are possible.”

Few questions were raised and the assembled folks took advantage of refreshments supplied by Barb Henkelmann.

Refreshed, we were oriented to the night sky by Dave Lenius, wielding and distributing planispheres to demonstrate how to locate what’s *continued on page 4*

Astronomy Quiz

1. Look at this HR diagram. Which does it represent:
 - a. M 13, the Great Globular Cluster in Hercules
 - b. The Hyades cluster in Taurus.



2. Two identical Schmidt-Cassegrain telescopes are properly polar-aligned and level. One is mounted on a wedge set at the latitude of the telescope, the other is mounted level. Both are directed at a deep sky object with a clock drive which keeps the object centered in the camera. Which is better for long exposures and why?



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up at different times and dates. The constellation Taurus was his topic. Unlike the circumpolar constellations, Taurus is a zodiac object meaning that it lies on the ecliptic and appears certain times of the year. It is visible late autumn through early spring; in the summer it rises and sets with the sun so is not visible.

Dave showed how to spot Orion, then follow an imaginary line through Orion's belt to the bright star Aldebaran and on to the Pleiades, both items being in Taurus, the bull. The Hyades, another open cluster, is visible about the point in the V shape formed by the bull's horns. Far from Aldebaran but still within Taurus is M1, the Crab Nebula which is the remains of a cataclysmic supernova explosion that lit up the daytime sky in 1054 A.D. It lies between Elnath, the second brightest star in Taurus, and Betelgeuse, the bright red supergiant in Orion.

Clouds did not allow viewing after the meeting.

Ed

From the Planetary Society

After more than 15 years going it alone, I'm thrilled to announce that Planetary Radio has joined the Panoply Media family, one of the world's leading podcast networks.

Planetary Radio is already one of the most popular programs about space exploration. This move will allow us to make the show even better, and it will enable many more space fans to discover and enjoy the show.

All of the great content will still be coming to you from The Planetary Society, just as it always has. With one exception, you'll find the show in all the usual places on the web, including iTunes, Apple Podcasts, Google Play, Stitcher, Panoply.fm, and our own website. The exception is SoundCloud, which unfortunately

does not support Panoply's state-of-the-art technology. By the way, we're still heard on more than 100 public radio stations around North America.

Joining Panoply also means that sponsored announcements will replace the Planetary Society promotional announcements that have been part of the show from the beginning. We will use the revenue generated from these sponsors to ensure the future of Planetary Radio and to enhance our coverage of the final frontier.

Listeners, I always want to hear from you. Write to me at

planetaryradio@planetary.org.

I hope those of you who've never heard the show will give it a try! Last week's episode features three great conversations about the late Stephen Hawking, led by our CEO Bill Nye's thoughts.

Listen to Planetary Radio and you'll discover yet another way The Planetary Society leads the world as it shares the passion, beauty and joy (the PB&J) of space. Thanks!

Mat Kaplan

Planetary Radio Host and Producer



Created in 2003 by high-school student Jennifer Barlow, International Dark Sky Week has grown to become a worldwide event and a key component of Global Astronomy Month. Each year it is held in April around Astronomy Day. This year celebrations begin Sunday, April 15, and run through Saturday, April 21 (click here for resources to use during the week).

continued on page 5, column 2

Poetry Corner

Lessons on equanimity written in the
starlit sky

From my perch, spanning the vast,
fathomless sky at night,
where 100 billion galaxies
vie with one another, for foothold,
shoals of fish on the swim
in diverse forms of being
(or nothingness of various kind)
in cycles of birth from dust,
growth, death in dark holes and rebirth.

I now see only a lone star above,
cowering at a far corner, in silence
anxiety ridden as she's alone
in this celestial grand opera house.

Wonder, where had gone all,
the spectacular display of star power,
profligacy of fish of ocean above
proudly displaying just yesterday.

Lessons, on equanimity perhaps,
nature teaches, writing on the night sky.

K Balachandran
Kerala, India
December, 2015

<https://hellopoetry.com/words/nightsky/>



The Blue Moon Observer

2018 Programs

A tentative schedule of programs for the general meetings has been developed by program director Steve Ransom-Jones and approved by the board. Changes may be made if situations arise.

May: Measuring Gravity
(Newton to LIGO)

June: Video: Space, Time
and Gravity

July: Atmospheric Physics
of the Terrestrial Planets

August: Video: Cosmol-
ogy in Einstein's Universe

September: Black Holes

October: Video: Galaxies
and Clusters

November: Intentionally
left open

December: Video: Gravi-
tational Lensing

The monthly series of pro-
grams, in addition to the
feature programs, will be
“Learning the Sky and Con-
stellations.”

*International Dark-Sky Association
from page 4*

In explaining why she started the week, Barlow said, “I want people to be able to see the wonder of the night sky without the effects of light pollution. The universe is our view into our past and our vision into the future I want to help preserve its wonder.”

International Dark Sky Week draws attention to the problems associated with light pollution and promotes simple solutions to mitigate it.

What an appropriate prelude to NCRAL 2018 which we host this May. Two of our speakers will be giving proven information about light including too much, poorly directed, light trespass, and adverse health and environmental aspects of excessive and inappropriate lighting. Also there will be a presentation on Door County’s own IDA Dark Sky Park at Newport. See page 6.

Keep in mind that to attend the NCRAL Annual Conference here on May 4 & 5, you must register.

You can register by filling out the online form at

<https://www.doorastronomy.org/ncral-2018>

or you can print the form from the site and mail it in. (The \$20 discount for early registration ended March 30).

Viewing Nights

April 14

May 19

June 16

July 14*

August 11*

September 8

October 6

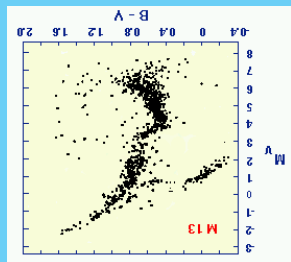
November 10

December 8

*May be cancelled because it gets dark so late.

Astronomy Quiz Answers

2. Either mount would be satisfactory for visual observing (unless a field rotator was added to the one not on a wedge) the image would rotate and only the very center of the image would not be blurred.



1. The Hyades open cluster. Notice the absence of a cutoff from the main sequence, in contrast to the HR diagram of M13, typical of a globular cluster as shown below.

Viewing Nights 2018

April 14

May 19

June 16

July 14*

August 11*

September 8

October 6

November 10

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*May be cancelled because it gets dark so late.

Times will be posted in the Blue Moon Observer and on the website:

www.doorastronomy.org



NCRAL 2018 Speakers List



Newport State Park IDA designation
Saturday 9-10

Beth Bartoli is the Naturalist at Newport State Park in Door County, our Recently designated Dark Sky Site. The designation was awarded after years of work by her, the staff of the park and our Door Peninsula Astronomical Society. She helps conduct astronomy programs at the park and states “We never tire of seeing that ‘aha’ moment on the upturned faces of our visitors as they gaze toward the heavens”. The Wisconsin Department of Natural Resources and Newport State Park are committed to protect our dark sky through lighting projects, community education and outreach.

One Star at a Time
Saturday 10:30-11:30

Audrey Fischer works through her organization, One Star at a Time, to create star parks in Chicago and around the world. Star parks are designated areas where the light are off or directed downward. As a Chicago native, she knows that it isn't a perfect place for stargazing, but she is working to return stars back into all cities. Audrey stated during an interview for the Chicago Tribune “Starlight belongs to each and every person in the world. A starry night gives people a reason to look up and to realize that others from around the globe share the same sky. Starlight is the path to closer understanding of our universe, each other and ourselves – and maybe it's even a path toward peace”.

Near Earth Objects
Saturday 1-2

Tyler Linder is a professional astronomer supported by NSASA's Near Earth Object Observations (NEOO) research grants to track and study the Near Earth Asteroid (NEA) population. His presentation will focus on the information that can be obtained by asteroid characterization, both through light curve analysis as well as visible and near-infrared spectroscopy. The collaboration between amateur and professional astronomers uses middle and high school students as well as undergraduate students.

Innovators Developing Accessible Tools For Astronomy
Saturday 2:30-3:30

Kate Meredith is the Education Director at the University of Chicago Yerkes Observatory in Williams Bay, Wisconsin. She is currently working on a program for students with low vision and blindness to develop image processing software. The three-year project, Innovators Developing Accessible Tools for Astronomy (IDATA) is funded by the National Science Foundation. She will explore what else we can do with invisible data that will allow everyone access to the same quality and quantity of information.

Light Pollution
Saturday Evening

Kevin Poe is the Green Energy Project Manager at the National Park Service at Bryce Canyon, Utah. He is a second-generation Park Ranger and owner of Dark Ranger Telescope Tours. Kevin calls himself the Dark Ranger to make environmental advocacy cool and heroic, and describes himself as a Planet Hugger. Teaching awareness of light pollution and understanding of the universe to people of all ages through lectures and stories is his goal.