



THE BLUE MOON OBSERVER



Door Peninsula Astronomical Society

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www.doorastronomy.org

Meeting notes	page 1
Who We Are	page 2
DPAS Board	page 3
August calendar	page 3
Astronomy quiz	page 4
Programs	page 5
NCRAL Request	page 5
New Members	page 5
Campus issues	page 5
Viewing Nights	page 6
Planets in August	page 6
Other organizations & star parties	page 6

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The August meeting of the Door Peninsula Astronomical Society will take place on Tuesday, August 7 at 7 PM. Steve Ransom-Jones will present a program on "Atmospheres of the Terrestrial Planets". Steve will also deliver the monthly "Learning the Night Sky" feature.

Notes from: DPAS General Meeting July 10, 2018 @ 7 pm

We had another large crowd for our facility as every seat was filled. Looks like we need to scrounge up some extra chairs. Our larger summer attendance makes it difficult for individual introductions like we frequently do in the winter, so we don't bother.

After introductory remarks from our president Gary Henkelmann [upcoming society events; anyone want to be the note taker for our general meetings?], Tom Minahan introduced the the Great Courses video lecture #3: Space, Time & Gravity from the series Dark Matter, Dark Energy: The Dark Side of the Universe Professor Sean Carroll, Ph.D. California Institute of Technology. He did so by explaining how Albert Einstein revoked the Newtonian idea that time is one and synchronized throughout the universe. The new theory of Special Relativity assumes that the observance of passing time is malleable depending on ones (moving) point of view and that space and time are combined into a single concept: space-time.

To see how the passage of time

depends on one's viewpoint, conduct the following thought experiment: Imagine you are with A. Einstein on a streetcar moving extremely fast away from Bern's clock tower. You can observe the clock and surrounding scene through a special telescope. As you and Albert move away, the light from each clock tick takes a little longer to arrive because you're moving away. The ticks of the clock slow down, yes, but because everything stationary at the clock tower scene is synchronized with the clock ticks, the entire scene and everything in it will appear to slow down. Universalized, time is not the same everywhere or from every frame of reference - it's all relative.

Professor Carroll's lecture of course covered space-time and gravity more deeply and broadly than the conclusion from this thought experiment, but it helps people actually believe that space and time are unfixed and changeable. Instead of a crude attempt to summarize the lecture, here is text from thegreatcourses.com: "Einstein taught us that space and time can be combined into space-time, which has the ability to evolve and grow. Indeed, what we think of as gravity is just a *continued on page 3*



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.

Light Pollution and Dark Sky Parks

Tom Minahan

The mission of the International Dark-Sky Association (IDA) "... is to preserve and protect the nighttime environment and our heritage of dark skies through environmentally responsible outdoor lighting." [darksky.org] Light pollution is a serious problem not just for astronomers. It wastes energy, effects crime and safety, and disrupts the ecosystem and wildlife. This is especially true for flowering plants and nocturnal animals, including humans. Poorly shielded outdoor lighting is also just annoying! The fight against light pollution is a huge challenge because the world population keeps growing and the demand for outdoor lighting increases proportionately. But the problem can be allayed with wise decisions by municipalities and city planners and the design and use of smarter night time lighting. Light pollution is the "... inappropriate or excessive use of artificial light ..." which includes glare, skyglow, light trespass and clutter. Glare is the visual discomfort caused by bright and poorly-shielded outdoor lighting, which reduces or eliminates the visibility of one's surroundings. This is particularly hazardous when driving. Skyglow is the brightening of the night sky over populated areas. This is the enemy of astronomers because the excess light is the random noise to the signal of light from an astronomical target. Light trespass is light directed where it is not needed or wanted. If you live near an over-lit auto lot or across the street from a farmyard illuminated by an omnidirectional nova, you understand. When lights are placed too close together or are excessively bright together, the resulting clutter tends to distract. Satellite maps of the night time Earth are a good way to grasp the extent of light pollution across the globe. [e.g. from www.nasa.gov] Light pollution is not just wasteful but harmful to people and ecosystems. Inefficient and poorly-aimed outdoor lighting wastes the light and

the energy needed to produce it. Wasted light is that which shines up into the sky or really any light that doesn't directly illuminate the ground. According to futurism.com, an estimated 30% of street light is wasted. This translates into 22,000 gigawatt-hours, or \$2.2 billion a year wasted in the United States alone. According to several studies cited by the IDA, there is no clear scientific evidence that increased outdoor lighting deters crime. Bad outdoor lighting decreases safety by making victims and property easier to see, and glare can allow perpetrators to hide in the unseen background of a blinding street or house light. Inappropriately bright outdoor lighting near orchards disrupts the normal timing of spring blossoming and entire crops can be lost if the plants are induced to bloom before the last spring frost. And, according to placesjournal.org, researchers at the University of Haifa found "... an elevated incidence of breast cancer in woman who live in light-saturated neighborhoods. They suggest that artificial nighttime lighting may interfere with the brain's production of melatonin, a tumor-suppressing hormone." This is just a sampling of the harmful effects of light pollution. Strategies are being used to reduce light pollution that include, among others, encouraging municipalities to use full-cutoff streetlights for new and replacement outdoor lighting. What can you do to reduce light pollution at your home or place of work? Replace or shield lights that emit light out and up so all the light shines downward - it's that simple!

The problem of light pollution is pervasive in all developed areas, but there are still some spots where skies are mostly free of skyglow. Skyglow is a measure of the brightness of the night sky overhead - the less brighter the darker the background with which to see the stars. A quantitative measure of the darkness of a local sky is done with a Sky Quality Meter which precisely measures the amount of ambient light directly overhead, and by *continued on page 4*

DPAS BOARD

Gary Henkelmann, President
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David Lenius, Vice President

Thomas Minahan, Outreach
Coordinator and Board Secretary

Susan Basten, Secretary,
Membership Chairperson, and
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Jacque Axland, Membership
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Steve Ransom-Jones, Program
Coordinator

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

Jim Maki, Academic Coordinator

John W. Beck, Past President
and Webmaster

Dennis Sundin, Member at
Large

Ray Stonecipher, in spirit

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.

Meeting minutes from page 1 manifestation of the curvature of space-time. To find things in the universe - including dark matter and dark energy - all we have to do is map out this curvature." The take-home message is: We need to have a good understanding of gravity in order for astronomers to be able to find the missing/hidden matter in the universe and to envision the evolution of the universe.

Refreshments and homemade treats were provided by John & Elsie Lindgren. Social time was lively and the several new faces stimulated conversation. We also learned that a [retired] professor of physics, John Maggitti, has recently joined our society and, with his wife Liz Welter, have opened a new book store on 3rd Avenue, Novel Bay Booksellers.

Learning the night sky: Tom Minahan asked if anyone here would like to see a black hole? After one tentative hand

was raised came the punch line: you can't see a black hole and no one can because the gravitational field near a black hole is so great as to prevent even light from escaping. Would you like to see a star that co-orbits a 20 solar-mass black hole? You can - with binoculars! First, find the constellation Cygnus, the Swan. It is overhead late on early summer nights and early on late summer nights. Look for the Milky Way and the body and neck of the Swan are right along it with the "head" pointing south. Find the bright star in the middle of the neck, η Cyg. View through binoculars or a telescope at low power. Find the rectangle of dim stars near η Cyg and the dim star between is HDE 226868. This is the star that co-orbits the black hole designated Cygnus X-1. When matter from the star falls into Cygnus X-1, energetic X-rays are emitted from near the hole. This pair was one of the first X-ray sources found in the sky and is the first black hole ever found!

Tom Minahan



AUGUST CALENDAR

Viewing night Saturday, August 11

Invitation to Sister Bay Star Party Thursday, August 16

Outreach viewing at Whitefish Dunes State Park Candle Walk August 18

Viewing at Newport State Park (camping optional) August 10 through 14

Landscape Cleanup at the Astronomy Center Wednesday, August 22, 9-12

Astronomy Quiz

1. What six letter word means an alignment of three celestial objects, as the sun, the earth, and either the moon or a planet, for example during a full moon or a new moon?
2. Which light source emits a "warmer" light: low pressure sodium or high pressure sodium?
3. Ten moons of Jupiter were recently discovered, bringing the total to what number of Jovian moons?
4. The largest galaxies yet discovered are
 - A. Spiral galaxies
 - B. Elliptical galaxies
 - C. Irregular galaxies
5. Official names of the constellations are in latin. What are the names of the following constellations in English?
 - A. Camelopardalis
 - B. Ophiuchus
 - C. Auriga
 - D. Sagittarius
 - E. Boötes
6. In the Milky Way at least, the redder globular clusters are more metal-rich and associated with the _____ while the bluer globular clusters are more metal-poor and tend to be associated with the _____.

(Question #6 is adapted from <http://astronomy.swin.edu.au/cosmos/S/Stellar+Populations+Of+Globular+Clusters>)



Dark Sky Parks cont. from p.2

observing the dimmest stars you can see (not near the horizon) and obtaining their magnitude from a sky chart. Magnitude is a measure of a stars brightness on a scale where larger magnitudes are dimmer. For example, Betelgeuse in Orion has mag = +0.42 and the stars in the Big Dipper range from about +2 to +3.31. Every visible star has been assigned a magnitude (some are variable) and these are published widely. If an area has a metered darkness reading > 21.75 and stars of magnitude 6.8 or greater are visible, then that area qualifies for Gold Tier Designation by the IDA: "Night-time environments that have negligible ... impacts from light pollution ..." Many of these areas have been designated International Dark Sky Places, which include parks, communities and sanctuaries. There are over 90 in the world. Did you know that we in Door County have an official Dark-sky Park at Newport State Park? Far from towns and surrounded by forests and Lake Michigan, Newport enjoys exceptionally dark skies and good atmospheric "seeing." Designated as an International Dark Sky Park by the IDA in June, 2017, it is the only such locale in Wisconsin. If you are an amateur astronomer Newport is obviously a choice place to set-up on a clear night, but you don't need a telescope or binoculars to experience the wonder of the milky way in clarity like you may

have never seen before. If you are a city dweller and have rarely if ever been "in the wilderness" at night, you will experience a feast for the eyes. Newport State Park is located at the northeast tip of the Door peninsula east of Ellison Bay at 475 County Hwy. NP. Newport offers backpack camping only and all campsites are hike-in and supplies must be carried in and out. See dnr.wi.gov for more information. Reservations through ReserveAmerica.com.

Join members of the Door Peninsula Astronomical Society for 5 Nights Under Dark Skies on the evenings of August 10-14, 2018 at Newport State Park. A variety of telescopes and binoculars will be at our disposal in the designated viewing area, but feel free to bring your own. Bring your camera or smartphone and we will help you get images of magnified views of astronomical targets. Viewing will begin each night an hour before dark because frequently planets are visible before then. The new moon is on Saturday, August 11, so the glare of moonlight will not interfere with deep-sky observing. If skies are overcast, a program or video of astronomical interest will be shown in the A/V shelter. Bring your curiosity and wonder for an evening under the darkest skies you may ever experience.

The preceding article by Tom Minahan was published in the Peninsula Pulse in July and is used by permission of the Peninsula Pulse and doorcountypulse.com.



The Milky Way as seen from Newport State Park in Ellison Bay, Door County in June, 2017. Photo by Jacob Dannhausen-Brun

Poetry Corner

Dimensions in Thin Air ~ A Fibonacci Poem

Space
Time
Only
Dimensions?
How can one perceive
A view of space beyond 3-D?
In grade school I learned of drawing in
three dimensions
Now we learn superstring theory with
eleven dimensions in M theory
But my drawing paper has only two
dimensions
I can't conceive of eleven
Nor can I draw air
Superstrings
Never
Thrill
Me

NCRAL Request

We received the following request from man, Carl Wenning, North Central Region of the Astronomical League chairman:

“The Astronomical League has about 1,900 members in the North Central Region. To date, as Regional Chair I have direct email access to only about 200 members – Presidents, ALCors, newsletter editors, and the 104 who have directly signed up to receive the Northern Lights newsletter and other announcements by direct email. I want to grow our member email database because important things are happening in the Region and I need to get the word out. Please help me today by having your fellow astronomy club members to go to

<https://goo.gl/gS8SF>

and sign up for direct emails. As a matter of policy, I won't add anyone to the member email database without their permission.”

Note that this request is from Carl and the DPAS Board is not asking you to do this if you don't wish to receive the Northern Lights newsletter by e-mail and you don't care to have NCRAL in possession of your e-mail address.

He also is soliciting entries to a contest for a logo for the North Central Region. This would be separate from the Astronomical League logo and of course from the DPAS logo.

“Don't forget that we have an ongoing contest for designing the first ever NCRAL logo! Draft submissions must be made August 30th so they can be published in the Autumn 2018 issue of the Northern Lights newsletter. We have 5 submissions thus far. See NCRAL LOGO CONTEST GUIDELINES AND CRITERIA on pages 10-11 of the Summer 2018 issue of the Northern Lights newsletter for details.”

New Members

Welcome to our new member, Stephen Koptik from Ada, MI. New members are welcome.

Programs

September: Great Courses

Video: Cosmology in Einstein's Universe

October: Black Holes

November: Video: Galaxies and Clusters

December: Video: Gravitational Lensing

Astronomy Campus Issues

Landscape Cleanup Day:

Wednesday, August 12, 9-12

Star Garden: Tom Minnehan is investigating repairs and keeps it trimmed

Planet walk signs: The replacement signs have arrived. Installation will involve working with the bird deterrents. An issue is that following the trail from one planet sign to the next is no longer an obvious path as a result of new connecting paths.

Stain project: The Astronomy Center building and the railing could use a fresh coat of stain. Nothing has been scheduled.

Leif Everson Observatory: The 14" Celestron Schmidt-Cassegrain telescope had been removed from the mount and sent to be totally refurbished. Meanwhile a 10" Newtonian telescope has been mounted as a temporary measure. Replacing the Celestron with a Ritchey-Cretien type of telescope for wider and flatter field is being pursued.

Astronomy Quiz Answers

6. "In the Milky Way at least, the redder GCs are more metal-rich and associated with the galactic bulge, while the bluer GCs are more metal-poor and tend to be associated with the halo."

- E. The Herdsman
- D. The Archer
- C. The Charoteer
- B. The Serpent Holder
- A. The Giraffe

5.

- A. The Giraffe

galaxies.

4. By far the largest galaxies so far discovered are elliptical

3. The total number of Jovian moons now stands at 79.

2. Low pressure sodium light

sources emit a warmer light and is preferred in areas where wildlife can be affected.

1. Szyzgy, pronounced "siz i jee".

Viewing Nights 2018

August 11
September 8
October 6
November 10
December 8

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

www.doorastronomy.org

See also August Calendar on page 3.

Events by Related Organizations

The International Dark-Skies Association will hold its 30th Annual General Meeting November 9-11 in Snowbird, Utah.

<http://darksky.org/about/annual-general-meeting/>

The Astronomical Society of the Pacific's Annual Meeting is held at Sonoma Wine Country, California on September 10-13.

<http://campaign.r20.constantcontact.com/render?m=1115682242375&ca=c80c26a5-d002-425c-ae91-f5c8dbd8e87a>

The **Las Vegas Astronomical Society** hosts its Cathedral Gorge Campout and Star Party, September 7-8.

<http://lvastronomy.com/index.php/events/upcoming-events>

The **Iowa Star Party** is held at Coon Rapids, IA, Sept. 6-10.

<http://www.iowastarparty.com/>

The Northern Lights Starfest will be held Sept. 5-9 at Long Lake Conservation Center in Palisade, MN

<http://www.mnastro.org/northern-nights-star-fest/>

The Great Lakes Association of Astronomy Clubs hosts Astronomy at the Beach at Kent Lake area of Island Lake State Recreation Area, Sept 14-15.

<https://www.glaac.org/astronomy-at-the-beach/>

The Planets in August

Mercury – rushes between Earth and sun and later in the month it emerges into the dawn twilight. It should be visible without optical aid by the 22nd. August 26 is a rather good morning apparition, because the line from planet to sun forms a steep angle with our August morning horizon. It rises 1½ hours before sunrise.

Venus – continues to outshine August's other evening planets by a huge margin, brightening from magnitude -4.3 to -4.6 over the course of the month. August 17th and resembles a roughly half moon phase (49-percent illuminated) through a telescope.

Mars – dominates the sky east of Saturn. Fresh from last months close approach to Earth, Mars is still very bright and fiery. But it fades noticeably during August, from magnitude -2.8 to -2.1, while its disk in a telescope shrinks in apparent size by about 15-percent. The planet is highest when due south, which corresponds to around 12:30 a.m. at the beginning of the month; two hours earlier at the end.

Jupiter – hangs modestly high in the southwest at dusk. For many weeks around August 6, the eastern edge of its disk is noticeably shadowed, and eclipses of its largest moons are more readily observable. Jupiter sets as early as 10:20 p.m. (daylight saving time) by the end of the month.

Saturn – can be easily located by going out in late twilight and looking south-southeast at the beginning of August, or due south around month's end. Saturn is the bright "star" roughly a third of the way up in the sky; the farther south you are the higher it will be. Later in the evening Saturn swings low to the southwest.

More at
<https://www.space.com/33619-visible-planets-guide.html>